VOLUME 1 OF 2

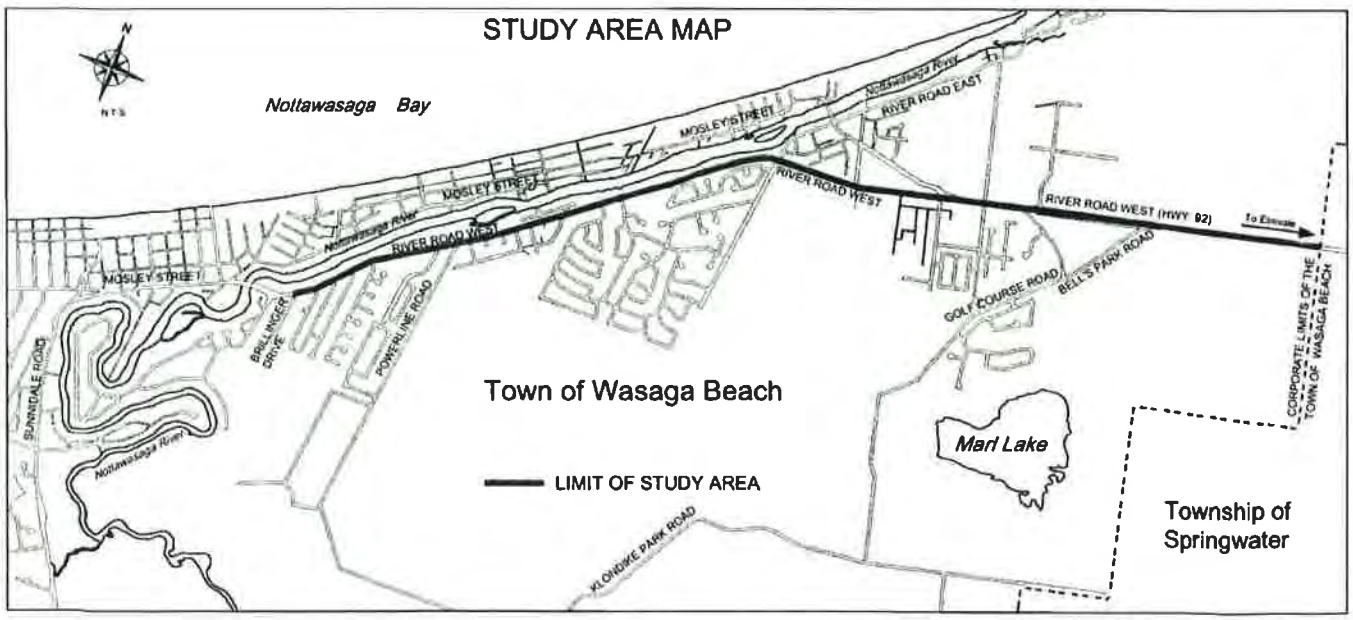
File: 109049
September 2010

Ainley GROUP
CONSULTING ENGINEERS & PLANNERS

The Beach is Just the Beginning.
WASAGA Beach

Town of Wasaga Beach
River Road West
from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment

Environmental Study Report



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Phase1 Report

1.0 Introduction

River Road West from Brillinger Drive to eastern Town limits is approximately 7.9 km in length. River Road West connects with Simcoe Road 92 to the east and Mosley Street to the west. As the Town's main east/west transportation corridor, River Road West plays an important role in servicing commuter, recreational and tourist traffic in the area. River Road West is mainly a two-lane road having a rural cross-section (i.e. partially paved shoulders and open ditches on both sides) with an exception of the section from Main Street to Zoo Park Road, which has 4 lanes with an urban cross-section (curbs and gutters and sidewalks on both sides).

Traffic studies, including traffic projections, completed in 1999 and 2007 determined that four-lane roadways were or would be warranted in certain areas of the Town including River Road West from Brillinger Drive to the eastern Town limits. The traffic projections indicated a 4 lane warrant would be justified and suggested timeline for the widening work for the following sections of River Road West:

- From Oxbow Park Road (to Brillinger Drive) to Powerline Road 2008 – 2009;
- From Powerline Road to Main Street 2010 – 2013;
- From Zoo Park Road to Bell's Park Road 2009 – 2010; and
- From Bell's Park Road to the eastern Town limits (timeline was not identified).

The recently completed *Town of Wasaga Beach Schoonertwon Bridge Class Environmental Assessment Environmental Study Report* indicates that widening Schoonertown Bridge to 4 lanes immediately west of the subject site including upgrade of River Road West from Schoonertown Bridge (to Brillinger Drive) to Main Street is the preferred solution. The design option for the eastern section of roadway from Schoonertown Bridge to Brillinger Drive had not been determined as it would be based on the future cross-section further along River Road West to the east.

In April 2009, the Town retained the Ainley Group to complete a Schedule C, Class EA to determine the Preferred Solution to address traffic congestion in the area of River Road West from Brillinger Drive to the eastern Town limits.

2.0 Project Team

The Class EA Project Team included Town staff, Ainley staff and personnel from sub-consultants who provided specific information into the planning process. A list of Project Team members is provided as follows:

Town of Wasaga Beach	Jim McIntosh Kevin Lalonde
Ainley & Associates Limited (AAL) Class EA Documentation and Design Alternatives	Mike Neumann Larry Young Tom Nollert Lilly Chen Mike McDonald

Archaeological Research Associates Ltd. Stage 1 Archaeological Study	Paul Racher Patrick Hoskins
J. Coulter Associates Noise Assessments	John Coulter Tobin Cooper
Azimuth Environmental Consulting Inc. Natural Environment Assessment	Brad Baker Matt Stuart

3.0 Purpose of the Class Environmental Assessment

The purpose of the Class Environmental Assessment (Class EA) is to document the planning process undertaken to identify the problem, identify and evaluate the solutions and to select the preferred solution and design through a public consultation process and to resolve any issues that arise during the planning process. The planning has been completed in accordance with a Schedule C Activity as outlined in the Municipal Engineers Association's Class EA document dated October 2000, as amended in 2007.

4.0 Project Schedule

A copy of the project schedule (revised to show actual dates) is included in Appendix A of this Environmental Study Report (ESR). The schedule provides information for reference purposes as to the sequence of events through Phases 1 to 4 of the planning process. A table of meetings (Table 1) is provided below, summarizing all meetings held during the planning process.

TABLE 1 – SUMMARY OF MEETINGS

DATE dd/mm/yr	EVENT
30/04/09	Public Works Committee Meeting to recommend the project
08/07/09	Project Status Review Meeting
24/09/09	Project Meeting to select "Recommended Option"
29/10/09	PIC # 1 – to present "Recommended Option" to public
18/11/09	Public Works Committee Meeting – selection of "Preferred Option"
08/01/10	Project Meeting – discussion of design concepts
14/01/10	Public Works Committee Meeting – selection of "design concepts"
18/02/10	PIC # 2 – to present "Recommended Design" to public
26/06/10	PIC # 3 – to present "Recommended Design" and 2010 Infiltration Study and ATR Count Results to public

5.0 Study Area

The limits of the Study Area are as shown on the Notice of Study Commencement (Appendix B). The Study Area was enlarged to allow for the inclusion of alternative solutions involving Mosley Street, Main Street and area to the south of River Road West.

6.0 Service Area

The Service Area is considered to be the entire Town. Traffic congestion occurs along River Road West and Mosley Street in the summer months. It is also noted that a significant increase in residential development has contributed to the traffic congestion problem. Therefore, it is suggested that the entire Town will benefit from a resolution to the problem.

7.0 Review Agencies

As part of the Phase 1 process, a list of Review Agencies was prepared. The list was revised as needed during the planning process. A copy of the initial List including response email from the NVCA and letters from the MOE, INAC and AFN are included in Appendix B.

8.0 Background Reviews

8.1 Previous Studies

8.1.1 Town of Wasaga Beach, Public Works Department, 10 Year Capital Works Forecast Update, 2008 – 2017, Summary Brief (Ainley Group, May 2008, File 107192)

The 10 Year Forecast was based on previously completed studies and reports. It identified improvements, acquisitions and financial needs with respect to roads, storm drains, sanitary and water projects over the period from 2008 to 2017. The widening of different sections of River Road West was listed as five out of the eighteen road construction projects. The construction timelines and estimated costs for these projects are summarized in the 10 Year Forecast.

This 10 Year Forecast has been updated and will continue to be updated with the Town's priorities on an ongoing basis.

8.1.2 Town of Wasaga Beach, 2006 Transportation Study Update (Ainley Group, December, 2006 and revised April 2007, File 106097)

The purpose of the 2006 Transportation Study was to update the 1999 Study which identified roadway improvements that were required at that time and over a 5 and 10-year time horizon. The 1999 projections were compared to actual traffic counts done in 2006. Future projections were estimated for the years 2011 (5 year) and 2016 (10 year). A summary of actual traffic counts and

estimated projections for different sections of River Road West from Oxbow Park Drive to easterly Town limits is presented in Table 2.

The maximum capacity of 2 lane urban roads is generally from 12,000 to 15,000 vehicles per day depending on the number of side streets and or entrances. The actual AADT's recorded along the section of River Road West over the past 10 years were under the maximum capacity range for a 2-lane road. However, the estimated projections for 2011 and 2016 reach or exceed 15,000, the Study determined that the section of River Road West should be increased from 2 lanes to 4 lanes. The timing for the 4-lane warrant is summarized in Table 3.

TABLE 2 – ACTUAL AND ESTIMATED TRAFFIC VOLUMES

SECTIONS OF RIVER ROAD WEST	ACTUAL COUNTS					PROJECTIONS			
	1999		2006		Annual	2011	Annual	2016	Annual
	AADT	SWEDT	AADT	SWEDT	Growth	AADT	Growth	AADT	Growth
From Oxbow Park Dr to Powerline Rd	9300	12050	11900	18525	3.52%	15275	5.12%	19750	5.37%
From Powerline Rd to Main Street	6750	10225	9550	16100	4.96%	12650	5.78%	18200	7.55%
From Main Street to Bell's Park Rd	6375	16000	8000	19375	3.24%	12125	8.67%	17550	7.68%
From Bell's Park Rd to Town Limit	6000	14575	7000	17650	2.20%	10350	8.14%	15375	8.24%

TABLE 3 – TIMING FOR 4-LANE WARRANT

SECTIONS OF RIVER ROAD WEST	TIMING FOR 4-LANE WARRANT
From Oxbow Park Dr to Powerline Rd	2011
From Powerline Rd to Main Street	2016
From Main Street to Bell's Park Rd	2016
From Bell's Park Rd to Town Limit	2016

In addition, the Study suggested future consideration of a new road crossing of the Nottawasaga River and a bridge at Powerline Road was mentioned as a possible location for such a crossing. The Study also confirmed that "...a by-pass would do little to relieve traffic within the Town....". That statement is in reference to a by-pass road around the Town.

In summary, the previously completed traffic studies concluded that the section of River Road West is currently under its rated capacity (AADT) and that a widening of the road is warranted in the next 5 or 10 years. The Study also confirmed that a by-pass route around the Town would not sufficiently reduce traffic within the Town to eliminate the need for improvements to existing roads.

8.1.3 Town of Wasaga Beach, East-West Transportation Route Study (Ainley Group, October, 2008, File 108072)

AAL completed a Study to assess the need for an east-west transportation route and to outline possible options for such a route. The findings and recommendations from that report are applicable to this Class EA.

The Report provides a history of the issue of an east-west by-pass route around the Town including an initial assessment completed by the MTO in 1974. The MTO identified the possibility of a "new Highway 26" as a potential "East-West Parkway". The Report also notes that a conceptual alignment for a potential by-pass route was identified in the 1999 Transportation Study (AAL) and that the estimated cost for such an alignment would be in the order of $27,000,000 to construct. The Report also noted that the 1999 Study addressed a public conception that a large volume of trucks travel non-stop through the Town using River Road West thus requiring a Town by-pass. Data obtained for the 1999 Study showed that truck traffic accounted for approximately 10% of the total traffic volume and showed that there was a much larger volume of truck traffic in the commercial area. This suggests that the majority of truck traffic was stopping in Town for business. The Study also determined that a large percentage of the car traffic was due to the developments along River Road West and Mosley St. The Study concluded that a low volume of traffic would use a by-pass route if one were to be built.

The 2006 Study confirmed the necessity of widening Mosley St. and River Rd. West and recognized that some portions of that route had been widened to four lanes. The Report also reiterated that an additional bridge across the Nottawasaga River would help to reduce some of the east-west congestion by providing an alternate north-south route for tourists. The 2006 Study also confirmed that truck traffic in Town is predominately due to commercial activity at the Town center (for in-Town business) and therefore a new by-pass would not be cost effective.

The East-West Transportation Route Study included an "origin-destination study" to confirm the previous observation with respect to through traffic. The work done in 2008 was completed by Ontario Traffic Inc. (OTI) using computers set up in the Town to record actual licence plates and vehicle travel times across Town. The OTI study found that of a total of 7,257 vehicles recorded over a 12 hours period, only 386 (5.3%) traveled non-stop across Town. The OTI assessment confirmed the 1999 study conclusion that only 10% or less of the total traffic volume travels directly through Town.

The East-West Transportation Route Study concluded the following:

1. The Town of Wasaga Beach may not warrant the high cost of construction for a new alternative east-west route at this time. However:
2. The County of Simcoe proposes improvements to existing Nottawasaga Sideroad 27/28 and Concession 12, which will provide an alternative east-west route. The Town should maintain communications with the County throughout the improvement process and consider improvements to Vigo Road to complete Alternative #3 (Highway 26 – Notawasaga Sideroad 27/28 – new road construction – Concession Road 12 – Flos Road 4 – Vigo Road) considered in this report.
3. Additional directional signage and improvements to existing signage should be provided within Town and outside of Town limits through consultation with the MTO, the MNR, and the County of Simcoe. Existing sign deficiencies and new sign recommendations are to be completed through a separate study.

4. Widening and improvements to existing Mosley Street and River Road West should be completed in accordance with the 2008 Public Works 10-Year Capital Works Forecast.
5. Initiate a traffic volume monitoring program and conduct traffic volume counts at Town major intersections every 5 years to identify the potential future need of an alternative route within Town. It is suggested that the most effective alternative route may be Alternative #1 (Highway 26 – Ramblewood Drive – Knox Road – new road construction – Powerline Road – Klondike Park Road – Golf Course Road – Bell's Park Road – River Road West – County Road 92) or an alignment similar to the East West Parkway (Alternative #3).

Please note that since the completion of the Town's Study, the Ministry of Transportation has completed a Class Environmental Assessment Study for the new Highway 26 alignment between Wasaga Beach and Collingwood. The Alternative #1 alignment noted in the Town's report would no longer include a through connection to Highway 26. This route would now connect to the new 4-lane alignment of 45th Street with Knox Road.

Based on a review of all background reports including the recent East-West Transportation Route Study, it is suggested that the Town follow the recommendations outlined in the East-West Transportation Route Study, which include a continuation of widening and improvements to existing Mosley Street and River Road West. Although a by-pass route is not warranted at this time (insufficient through traffic), the Town should review the need for such a route every 5 years.

8.2 Base Plan

Base Plan mapping for River Road West from Brillinger Drive to eastern Town limits was provided by the Town (created based on Simcoe County GIS mapping). A copy of the base plan assembled by the study team is included in Appendix C. Based on the base plan, Plan Drawings of the existing site conditions were prepared (Ainley Drawings No. 109049 – RC1 to RC13). Copies of these existing conditions drawings were sent to various utilities and the utility information was added to the drawings as necessary. A complete set of the Drawings is included in Appendix C. Should any other locations within the Study Area be selected as the site of the Preferred Solution, a base plan will be prepared at those locations.

8.3 Drainage Review

A brief site review of the River Road West drainage system from Schoonertown Bridge to Main Street was completed on May 26, 2009. A memo outlining the details of the review is included in Appendix D. The reviewer notes that currently most of the overland flow from River Road West enters a network of existing ditches located on the north or south side of River Road West. Eventually, flows from the existing ditches enter a network of existing culverts. From there, the flows enter the underground storm sewers and are released to the river. The memo also notes that the area between Main Street and Schoonertown Bridge is very flat and many times the water is stored in the ditches or slowly drains to the river.

In the future, should widening of River Road West be selected as the preferred solution, an urban storm sewer drainage system should be introduced.

Five existing outlets were identified as potential future outlets. Outlet 1 is located across from Powerline Road. Outlet 2 is on Pauline Drive. Outlet 3 is located at the end of Access Road. Outlet

4 is located across from Silver Birch Avenue. Outlet 6 is located between Odell Gate and Access Road.

One proposed outlet (outlet 5) near the intersection of Oxbow Park Road/River Road West (south side) is recommended.

A site review of the River Road West drainage system from Main Street to the eastern town limits was conducted on August 27, 2009. A memo outlining the details of the review is also included in Appendix D.

Two existing outlets were identified. One is at the north end of Zoo Park Road behind the Sturgeon Point of Marina. Water from this outlet flows north to Nottawasaga River. Another is located at the large culvert (1.2 m high and 1.0 m wide) between Baywood Golf & Country Club and the eastern Town limits. Water from this outlet flows south to Marl Lake.

8.4 Traffic Analysis

A traffic analysis was completed in August 2009 and revised in October 2009. A memo outlining the details of the analysis is in included in Appendix E.

Traffic projections were based on historic data coupled with the most recent 2009 summer traffic count data and up-to-date development information provided by the Town. The most recent traffic counts were conducted for eight major intersections along the section of River Road West. The 2009 traffic counts indicate that the actual traffic volume growths are lower than the 2006 projections for the past three years. The annual growth rates projected in the analysis are approximately 1-2% lower than the 2006 projections. This is probably due to a cooler summer and reduced tourism in the area this year. Based on our discussion with the Ministry of Natural Resources, they have also seen an approximately 1/3 reduction in tourist visitor traffic in 2009 to Wasaga Beach.

A total of 29 intersections have been considered in the analysis. The intersection operational analysis was based on the methodology outlined in the *Highway Capacity Manual.* Synchro 7 software has been used for the analysis. All intersections operate acceptably in the 2009 and 2011 horizons during the AM and PM peak hour considered with an exception that the Silver Birch Avenue intersection (westerly intersection) will operate at a poor level of service (F) during the PM peak hour in the 2011 horizon. A poor level of service (F) will occur at four intersections (Oxbow Park Road, Fernbrook Drive, Silver Birch Avenue (westerly intersection) and Silver Birch Avenue (easterly intersection) in the 2016 horizon during the PM peak hour. In the 2026 horizon, most of the unsignalized intersections will operate at a poor level of service except seven intersections (Centre Street, Talla Court, Oak Tree Court, Antigua Drive, Caribbean Drive, Pauline Drive and Bell's Park Road). Signalized intersections will operate acceptably through the 2026 horizon.

Mid-block capacity of the road was also assessed. Based on the assessment, the existing traffic volumes are 15 to 65 % under the theoretical planning capacity of River Road West except the section east and west of Oxbow Park Road where volumes are near the capacity. Whereas, the 2011 projected volumes are 25 to 55 % under the theoretical planning capacity except the section from west of Oxbow Park Road to east of Silver Birch Avenue (easterly intersection) where volumes are at and near the capacity. However, the 2016 projected volumes are at or over the road's capacity from west of Oxbow Park Road to east of Blueberry Trail. The 2026 projected volumes are over the road's capacity except the section of road currently has 2 lanes per direction from Main Street to Zoo Park Road.

The need for a pedestrian signal was considered. Pedestrian signals are currently provided at the signalized intersections along the road and at a school crossing. Existing pedestrian traffic crossing River Road West at unsignalized intersections is in the order of 0 to 3 persons per hour. Pedestrian signals are not warranted. However, in consideration to providing sidewalks and bike lanes on River Road West, these facilities may attract more users in the future. Therefore, pedestrian crossing opportunity was considered. A traffic signal is suggested where a pedestrian signal is recommended.

Given that a traffic signal and two lanes for each direction on River Road West have been recommended at the intersection of Oxbow Park Road in the Schoonertown Bridge EA project, the traffic analysis suggests the following improvements:

Before 2011 horizon
- a centre left turn lane from east of Oxbow Park Road to Blueberry Trail; and
- a traffic signal (including a pedestrian signal) and an exclusive left turn lane or right turn taper on each approach at River Road West with Powerline Road and Silver Birch Avenue (easterly intersection).

2011 or Before 2016 horizon
- a centre left turn lane from Blueberry Trail to Main Street/Ansley Road.

2016 or Before 2026 horizon
- a centre left turn lane from Zoo Park Road to the eastern Town limits; and
- a traffic signal (including a pedestrian signal) and an exclusive left turn lane or right turn taper on each approach at River Road West with Theme Park Drive and Bell's Park Road.

2026 and Beyond
- two lanes in each direction from east of Oxbow Park Road to the eastern Town limits.

The analysis recommends that the next Town wide transportation study update (scheduled for 2012) review the assumptions and counts in the analysis, in considering that the 2009 counts were conducted during a cool week and a summer with lower tourism traffic.

8.5 Geotechnical

Over the past 38 years, the Town of Wasaga Beach has been well defined with respect to soil conditions. For the purposes of this Class EA, it is considered that the soil conditions are suitable for road widening and reconstruction. Should an urbanization option be selected as a Preferred Solution that includes this type of work, a more detailed and up-to-date geotechnical assessment may be required as part of the final detail design.

The approach to the road congestion problem was assessed with respect to soil conditions as part of the Provincial sewage and water works "Programmes" of the late 1970s and early 1980s. Dominion Soil Investigation Limited was retained by Ainley & Associates Limited in the 1970s to undertake a complete geotechnical investigation of the area of the Town that was to receive wastewater collection and water supply servicing. Two investigations were undertaken by Dominion and several boreholes were drilled along River Road West from Brillinger Drive to the easterly limit of town. Boreholes were drilled in 1970 and as part of the 1974 investigation.

In the recent years, Terraprobe has conducted two major geotechnical investigations in the area. One is for the East End Servicing project (2002); another is for the Zoo Park Road reconstruction project (2009). Boreholes were drilled in 2002 and a borehole was drilled in 2009.

A copy of an overall plan from each investigation of the area is provided in Appendix F along with copies of the twenty-seven applicable borehole logs.

It is considered that these borehole logs provide sufficient information for the purposes of this Class EA, to confirm the geotechnical conditions for future road urbanization projects. A more detailed geotechnical assessment will be required should this option be selected as the Preferred Solution.

The 1970 Geotechnical Investigations can be used to define soil conditions at other sites within the Study Area should a more detailed assessment of other options be required. However, it should be noted that shallow soil conditions throughout the Study Area are generally consistent. Based on a review of previously drilled boreholes, the soil conditions throughout the Study Area can be generally described as follows:

River Road West from Oxbow Park Drive to Powerline Road (Dominion boreholes)

- Fine sand, compact to dense, brown and grey
- Groundwater 6 to 11 foot depth

River Road West from Powerline Road to Blueberry Trail (Dominion boreholes)

- Fine sand, trace of silt, compact to dense, brown and grey
- Groundwater 4 to 10 foot depth

River Road West from Blueberry Trail to Zoo Park Road North (Dominion boreholes and Terraprobe boreholes)

- Medium to fine sand, trace of silt, trace of gravel, compact to dense, brown and gray, some organic matter near Blueberry Trail
- Groundwater 2.5 to 5 foot depth

River Road West from Zoo Park Road North to Bell's Park Road (Dominion boreholes and Terraprobe borehole)

- Fine sand, trace of silt, brown and grey
- Groundwater 3.5 to 11 foot depth

River Road West from Bell's Park Road to the Town Line (Dominion boreholes)

- Silty clay, sandy silt, brown
- Groundwater 6 to 15 foot depth

The overall condition of the pavement surface for the entire study length is fair to poor and likely in need of resurfacing.

8.6 Natural Environment

Azimuth Environmental Consulting Inc. (Azimuth) was retained to provide an assessment of the natural environment in the area around the existing River Road West from Brillinger Drive to the eastern Town limit. The Existing Conditions Report is included in the Impact Assessment Report. This Preliminary Report provides information on existing environmental conditions with respect to terrestrial (vegetation and wildlife) and aquatic (fish species) resources. A copy of the Impact

Assessment Report dated February 2010 is included in Appendix G. The Impact Assessment Report assesses environmental impacts for two alternative design concepts and provides construction mitigation measures.

The environmental report concludes that both design concepts have the potential to result in minor impacts to the Natural Heritage Features present in the area. For the area form Brillinger Drive to Main Street, the concept that remains in the existing River Road West ROW will result in less impact overall and thus it is recommended. Beyond Zoo Park Road to the eastern Town limits, both concepts would result in similar minimal impacts and thus either concept is recommended in the location.

8.7 Heritage/Archaeological

A Stage 1 Archaeological Report was prepared by Archaeological Research Associates Ltd. (ARA) in August 2009. The final report was submitted to the Ministry of Culture to be entered into the Provincial register of Reports. No registered archaeological sites were found within the limits of study area. Although, the H.M.S Nancy (a British Schooner built at Fort Detroit in 1789) site is within one kilometre of the study area, the ship was burned to the waterline, and the remains were found and raised and stored in the Nancy Museum in 1928. The Report suggests a Stage 2 assessment. This assessment may be undertaken during a future detail design assignment. A copy of the Stage 1 Assessment Report is included in Appendix H.

8.8 Noise Assessment

Noise Assessment was completed by J. E. Coulter Associates Limited (Coulter). A copy of the draft Report is included in Appendix I. The September 15, 2009 Report identifies the net increase in the sound levels as approximately 2dB resulting from additional traffic if the road is widened to 4 lanes. The Report states that "...the potential increment in sound levels attributable to implementation of the project is insignificant, and mitigation measures are not required to satisfy MTO/MOE protocol as the implementation of the project does not increase the sound level by 5 dB or more."

8.9 Existing Utilities and Services

With respect to existing roadways, the section of Mosley St. from 3rd St. to Main St. has been urbanized and widened to 3 to 4 lanes whereas, from River Road West to 3rd Street Mosley Street has 2 lanes and is an un-urbanized roadway.

River Road West from Brillinger Drive to Main Street and from Zoo Park Road to eastern Town limits is a 2 lane, un-urbanized roadway whereas, from Main Street to Zoo Park Road is a 4 lane urbanized roadway.

For both Mosley Street and River Road West, the Study Area is serviced with municipal water distribution and wastewater collection/treatment systems with an exception for the area from Bell's Park Road to the easterly Town limits. This area currently has no municipal water and sewer services. In addition, there are Bell Telephone, Wasaga Beach Hydro, Enbridge Gas and Rogers Cable TV services throughout the Study Area.

With respect to the River Road West, the existing utilities, including existing stormwater drains are shown on the Preliminary Plan Drawings (copies of Drawings No. 109049 – RC1 to RC13 in

Appendix C). The location of existing utilities will be taken into consideration when determining roadway options on River Road West.

8.10 Property Requirements

The existing right-of-way of River Road West from Brillinger Drive to the eastern Town limits varies in width from 20 metres to 60 metres, as follows:

- 20 metres from Brillinger Drive to Main Street;
- 30 metres from Main Street to Theme Park Drive;
- 60 metres from Theme Park Drive to Bell's Park Road; and
- 30 metres from Bell's Park Road to the eastern Town limits.

For the section of River Road West that currently has 20 metres of right-of-way, if design options include sidewalks, bicycle lane, turn lanes and additional through lanes, additional right-of-way may be required.

With respect to the section of Mosley Street from River Road West to Main Street, right-of-ways are in the range of 9 to 20 metres. Therefore, property would need to be obtained along Mosley Street from Willow Street to 2nd Street, from 50 metres east of 12th Street to Old Mosley Street, from 20th Street to 21st Street and from 24th Street to 27th Street, in order to provide a minimum 20 metre wide right-of-way. The lands on Mosley Street have been developed and therefore, property acquisition will be difficult and costly and impact on the socio-economic environment will be significant.

8.11 Provincial Regulations and Acts

The proposed works will be planned, designed and approved under the following Provincial Regulations, Acts and Guidelines:

- Ontario Environmental Assessment Act as administered by the Ministry of the Environment (MEA Class EA planning process)
- Ontario Water Resources Act as administered by the Ministry of the Environment
- Endangered Species Act as administered by the Ministry of Natural Resources
- Fish and Wildlife Conservation Act as administered by the Ministry of Natural Resources
- Ontario Heritage Act as established by the Ontario Ministry of Culture
- Nottawasaga Valley Conservation Authority as established by the Conservation Authority Act as administered by the Ministry of Natural Resources
- Highway Traffic Act (Ontario)

8.12 Federal Regulations and Acts

The proposed works will be planned, designed and approved under the following Federal Regulations, Acts and Guidelines:

- Fisheries Act as administered by the Department of Fisheries and Oceans Canada
- Department of Transport Act

8.13 Active Transportation Plan for the Town of Wasaga Beach

Meridian Planning Consultants Inc. was retained by the Town to prepare a report on the feasibility of implementing an "Active Transportation Plan" for the Town. The Report dated August 2008, provides preliminary details of roadway cross-sections, incorporating sidewalks, boulevards, bike lanes, turning lanes and vehicle lanes. This Report was reviewed as part of Phase 3 of this Class EA planning process to identify design concepts. It should be noted that the report did not address the need to provide an utility corridor within the right-of-way which further impacts the right-of-way required to incorporate all improvements.

9.0 Study Area Description

The natural environment of the River Road West area is described in the Azimuth Report (see Appendix G).

With respect to the socio-economic environment, general information was obtained from the Town's Web site.

The Town of Wasaga Beach is a popular four-season tourist destination situated in Simcoe County at the southern end of Georgian Bay. It is nestled in an around 14 kilometers of sandy beach on Nottawasaga Bay and the Nottawasaga River. The Town area covers some 61 km^2 of land. The natural resources are primarily associated with the Town's location on Nottawasaga Bay and the River, which provide the principal basis for the Town's tourist economy. There are over 16,000 full-time residents and 16,000 seasonal and part-time residents. In addition, it is estimated that two million tourists visit the Town each year.

Lands along River Road West from Brillinger Drive to Blueberry Trail are mainly residential lands. A public Elementary School is on the south side of the road between Silver Birch Avenue and Odell Gate. In this area, most of the residential lots on the north side of the road are backing onto the Nottawassaga River. South of the residential lands on the south side of the road is the Wasaga Beach Provincial Park. The Park is known for its naturally occurring sand dunes. The Park also provides hiking and cross county skiing trails. Many prime real estate lots are located along this section of River Road West.

The Wasaga Beach Provincial Park stretches to the east from Blueberry Trail to Westbury Road immediately south side of River Road West, whereas, on the north side of this section of River Road West are mainly institutional and residential lands including a public library.

Along River Road West from Westbury Road to Bell's Park Road are mainly commercial lands including tourism commercial, district commercial, recreational commercial and campground commercial lands.

Along River Road West from Bell's Park Road to the eastern Town limit are mainly rural lands with an exception that a piece of recreational commercial land on the north side of the road. On the south side of the road, lands are designated as district commercial and residential (currently there is golf course). Thus, in the future, they will be developed as district commercial and residential lands.

10.0 Problem Statement

Based on the Transportation Studies completed between 1999 and 2007, the current annual average daily traffic (AADT) volume reaches the maximum range (12,000 to 15,000 vehicles per day) for a two-lane roadway especially for the section from Brillinger Drive to Powerline Road. Allowing for future growth-related traffic projections based on a 10-year forecast, the Town of Wasaga Beach has identified additional road capacity required to enhance safety in the area of River Road West from Brillinger Drive to the easterly Town limits. The Town also recognizes the need to improve the roadway pavement condition and surface drainage problems in the area. In addition to addressing road capacity, safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town is intending to incorporate recommendations outlined in the Town's Active Transportation Plan Study. This will identify and possibly plan for the integration of active transportation components such as pedestrian, bicycle and public transit.

11.0 Phase1 Consultation Process

The Notice of Study Commencement was advertised in the Wasaga Sun newspaper on May 27 and June 3, 2009. Copies of the Notice were sent (under cover of a letter) to various review agencies on May 19, 2009. A copy of the Notice, the covering letter and the distribution list are included in Appendix B.

A letter dated May 28, 2009 was received from the MOE. A copy of the letter is included in Appendix B. The MOE requirements have been addressed in Section 16 of this report.

The NVCA advised via email that the Conservation Authority was concerned about shorter wetland setback distance for the Provincially Significant Wasaga Beach Wetland Complex located immediately south of River Road West and east of Blueberry Trail. The NVCA also has concerns about a sensitive species of snake, a meanderbelt erosion hazard on the road at the Powerline Road/River Road intersection and a decrease in developable space on the already hazardous properties adjacent to the river along River Road West etc. if River Road West is widened. The NVCA concerns have been addressed in the Environmental Impact Assessment report (Appendix G) as well as in Section 16 of this report.

12.0 Preliminary Development of Assessment Criteria and Rating/Weighting System

A preliminary list of Assessment Criteria (in no particular order) is provided as follows:

1. Aesthetics – view of new or widened road
2. Economic – capital cost and financing
3. Social – disruption of traffic flow during construction and disruption to businesses
4. Fish – loss of fish habitat
5. Heritage Resources – potential for archaeological loss as a result of construction
6. Public Safety – improvement to traffic flow and pedestrian safety and during construction

7. Noise – as a result of a widened road
8. Impacts on existing developed properties – as a result of road widening
9. Soils and Geology (erosion/sedimentation) – as a result of construction
10. Surface Water Drainage – impacts to existing drainage patterns
11. Terrestrial Vegetation and Wildlife – impacts to vegetation communities and wildlife
12. Utilities – disruption and need for protection and/or relocation
13. Response to Problem Statement

It is suggested that the criteria be assessed under three general categories, namely;

1. Natural Environment
2. Socio-Economic Environment
3. Technical and Safety Considerations.

Considering the fact that the social impacts are, for the most part, temporary (during construction) and that, although the natural habitat of the area needs to be recognized, the impacts to the natural environment will be minimal and can be mitigated. Therefore, it is suggested that the Technical criteria needs to be more heavily considered than the Socio-Economic factors and the Natural Environment considerations. The suggested weightings are as follows:

Natural Environment = 30%

- Watercourses/Fisheries - 15%
- Terrestrial Vegetation and Wildlife - 15%

Socio-Economic = 30%

- Social impacts to residents and businesses - 7.5%
- Social impacts at social features (parks, public access) - 2%
- Noise Impacts - 5%
- Archaeological and Heritage - 5%
- Capital Cost - 7.5%
- Operating Cost - 3%

Technical = 40%

- Construction, Design, Land Ownership - 5%
- Pavement and drainage conditions - 5%
- Impacts on existing utilities - 5%

- Operational (traffic flow and pedestrian safety) - 25%

Total - 100%

13.0 Phase 1 Report

The DRAFT Phase 1 Report was prepared and submitted to the Town on September 24, 2009.

Phase 2 Report

14.0 Identification and Description of Solutions

14.1 Option 1 - Do Nothing

The "Do Nothing" option is to be considered for all Environmental Assessments including Class EA's. Under this option, no improvements would be made to the existing River Road West nor to any of the other roadways (Mosley St and other alternative by-pass routes). Traffic congestion would remain a problem and would worsen as growth within the Town occurs. Considering the fact that this option does not address the problem, no further assessment is required.

14.2 Option 2 - Improve Mosley St. From River Road West to Main St. & Main St. From Mosley St. to River Road West & River Road West From Main St. to Eastern Town Limits

Improvements have been made to Mosley Street from 45th Street to River Road West. This was done to improve traffic movement to and from the west through the Town, in and out of the central core area. Improvements have also been made on Mosley St. from 3rd St. to Main St. (3 lanes).

An option, which has been suggested for consideration, is to improve Mosley Street from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the eastern Town limits. This could be done by widening Mosley Street and by widening the existing Main Street Bridge to 4 lanes in addition to widening River Road West from Main Street to the eastern Town limits. This option might improve traffic movement across Town along the north side of the River but it must be recognised that the north side of the River along Mosley is a destination area and therefore, traffic congestion is to be expected. Travellers, who do not wish to visit the destination area, typically do not use Mosley Street from Main Street to River Road West. They travel along River Road West.

It should also be noted that there are other roads, which parallel Mosley Street (Dunkerron Avenue and Old Molsey Street), which take some traffic during peak periods on long weekends in the summer. In addition, according to the 2006 Traffic Study, a widening of Mosley Street from River Road West to 3rd. Street is not warranted (see summary below). It is considered that a future upgrade of River Road West would be more beneficial to improving traffic movement.

The assessment of this option includes general impacts associated with a widening of Mosley Street from River Road West to Main Street. It should be noted that the existing ROW along Mosley Street is only 15 m (50 feet) and that most of the intersections do not line up (off-set in the original property layout). Therefore, the cost of widening that portion of Mosley would be higher than normal (compared to a 20 m ROW and straight property lines).

The 2006 Transportation Study Update identifies a traffic problem on Mosley Street from River Road West to 3rd Street as follows:

1999

Actual AADT recorded in 1999	= 4,925 vehicles
Actual SWADT recorded in 1999	= 14,550 "
Projected AADT for 2004	= 5,650 "
Projected AADT for 2006	= 5,927 "
Projected AADT for 2009	= 6,350 "

2006

Actual AADT recorded in 2006	= 5,800 (-2.1% from 1999 projection)
Actual SWADT recorded in 2006	= 21,575
Actual AADT Growth rate/year	= 2.34%
Actual SWADT Growth Rate/year	= 5.63%
Projected 2011 AADT	= 6,400 (growth factor = 1.1%/year)
Projected 2016 AADT	= 7,150 (growth factor = 1.12%/year)

AADT = Average Annual Daily Traffic
SWADT = Summer Weekend Average Daily Traffic

As noted previously, the maximum capacity of 2 lane urban roads is generally from 12,000 to 15,000 vehicles per day depending on the number of side streets and or entrances. The projected traffic numbers for Mosley Street from River Road West to 3rd Street are considerably less than 12,000 and therefore, a widening is not warranted.

Similar traffic volumes (AADT 5,750 or less in 2011, AADT 7,150 or less in 2016) are projected for Mosley Street from 3rd Street to Main Street and Main Street from Mosley Street to River Road West in the 2006 Transportation Study Update. Thus, a widening is not warranted for this Option.

The location and general details of this option are shown on Drawing No. 109049-OP1 (copy included in Appendix J).

14.3 Option 3 – Improve River Road West from Brilliger Drive to Easterly Town Limits

A widening and urbanization of River Road West from Brillinger Drive to the easterly Town limits would reduce traffic congestion and address the problem statement. This option was identified in previously completed traffic studies as being a priority with respect to roadway improvements within the Town.

A widening of Schoonertown Bridge on River Road West west of Brillinger Drive has been identified as the preferred solution for the recently completed Schoonertown Bridge Class Environmental Assessment.

The location and general details of this option are shown on Drawing No. 109049-OP1 (copy included in Appendix J).

14.4 Option 4 - Develop A New By-Pass Route from Highway 26 to County Road 92 Including Building a New Connection from Knox Road to Powerline Road

Another option that was previously identified is to develop a new by-pass route from Highway 26 to Ramblewood Drive to Knox Road to new road connection to Powerline Road to Klondike Park Road to Golf Course Road to Bell's Park Road to River Road West and then to County Road 92. The purpose of this option is to divert east and west through traffic movement away from River Road West and/or Mosley Street and to reduce traffic congestion by providing an alternate east-west route. However, the Town's 1999 Transportation Study, 2006 Transportation Study Update and 2008 East-West Transportation Route Study indicate that only approximately 10% of the total traffic volumes travels directly through the Town and could benefit from a by-pass and that the low volume of traffic does not justify the high costs associated with constructing a Town by-pass.

In addition, this option requires acquisition of MNR land (approximately 500 metres in length road allowance), a new bridge and approximately 2.4 km in length new road construction through potentially environmentally sensitive lands. It may be difficult to obtain approvals.

As noted previously, the Ministry of Transportation has completed a Class Environmental Assessment study for the new Highway 26 alignment between Wasaga Beach and Collingwood. Both Ramblewood Drive and the old section of Highway 26 north of Ramblewood Drive would be closed at the new alignment of Highway 26. As a result, this route would connect to 45th Street at Knox Road.

The location and general details of this option are shown on Drawing No. 109049-OP1 (copy included in Appendix J).

14.5 Option 5 – Adopt Portion of the County of Simcoe's Alternate East/West Corridor Through the Georgian Triangle Outside of the Town from Highway 26 to County Road 92 via 27/28 Sideroad, 12 Concession, Flos Road 4 and Vigo Road

This option, which was also identified in the Town's East-west Transportation Route Study, is to adopt a portion of the County of Simcoe's Alternate East/West Corridor through the Georgian Triangle outside of the Town from Highway 26 to County Road 92 via 27/28 Sideroad, 12 Concession, Flos Road 4 and Vigo Road. Similar to Option 4, the purpose of this option is to divert east and west through traffic movement away from River Road West and/or Mosley Street and to reduce traffic congestion by providing an alternate east-west route. However, as indicated previously, only approximately 10% of the total traffic volumes travelling directly through the Town could benefit from a by-pass route.

Although, upgrading the section of Sideroad 27/28 to County road standards and replacement of the existing single lane Vigo Bridge on Flos Road 4 near Vigo Road are short term (0 – 10 years) improvements identified in the County's Transportation Master Plan, whereas upgrading 12 Concession and the section of Flos Road 4 to County road standards are medium term (10 – 20 years) improvements listed in the same Plan, this route is entirely outside of the Town of Wasaga

Beach limits and therefore would require municipal agreements with the County of Simcoe and/or the Township of Clearview and/or the Township of Springwater.

In addition, horizontal alignment improvements (approximate 1.0 km) would be required for the connection of Sideroad 27/28 to Concession 12. Property acquisition would be required for this 1.0 km of new road construction.

The location and general details of this option are shown on Drawing No. 109049-OP1 (copy included in Appendix J).

15.0 Inventory of Natural and Socio-Economic Environments

A Natural Environmental Existing Conditions Report was completed by Azimuth Environmental Consulting Inc. and included in the Impact Assessment Report in Appendix G. The Report was prepared for the section of River Road West from Brillinger Drive to the easterly Town limits. Should another Option be selected as a preferred solution, an environmental assessment for that Option will be required. The potential impacts on the natural environment with respect to a widening of the section of River Road West from Brillinger Drive to the easterly Town limits have also be identified by Azimuth in the Environmental Impact Assessment Report dated February 2010. A copy of this report is included in Appendix G.

The socio-economic environment of the Wasaga Beach area is described in Section 9 of this ESR.

16.0 Review Agency Comments

16.1 General

As a result of the publication of the Notice of Study Commencement, only one letter response was received (MOE letter dated May 28, 2009). However, email comments were received from the NVCA and MNR.

16.2 Nottawasaga Valley Conservation Authority

Azimuth Environmental Consulting on behalf of the Ainley Group was advised that the Conservation Authority was concerned about the wetland setback area south of River Road West east of Blueberry Trail, a meanderbelt erosion hazard at the Powerline Road/River Road West intersection, a sensitive species of snake and deer yards in the area.

NVCA's comments have been addressed in Azimuth's Environmental Impact Assessment report.

The environmental report indicates that should the urbanization of River Road West remain within the existing road ROW, it will result in very minimal vegetation removal which would appear to include no significant features. The report also outlines that the recommended road improvements do not pose a major threat to the existing form and function of aquatic habitat within the Lower Nottawasaga River Subwatershed. Temporary impacts associated with construction practices are fully mitigable through the effective use of sediment and erosion controls. The recommended enclosure of indirect and direct fish habitat will potentially result in a HADD, however an appropriate

compensation plan may be developed in consultation with NVCA and DFO that can result in a greater overall "gain", providing increased habitat/water quality than the existing roadside ditch habitat, thus providing an overall improvement to the watershed.

16.3 Ministry of Natural Resources

Azimuth Environmental Consulting on behalf of the Ainley Group was advised that several natural heritage features are located within the 30 m of existing road and right-of-way. These natural heritage features are Wasaga Beach Provincially Significant Wetland, Wasaga Dunes Life Science Area of Natural and Scientific Interest (provincial) Wasaga Beach Provincial Park, Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest ANSI (provincial), Provincially Significant Wildlife Habitat (Deeryards).

MNR also advised that a sensitive species of snake is present in the area and has been observed in the right-of-way and adjacent lands. This species is protected from killing, harming, harassing, possession and trade under the Endangered Species Act 2007. Mitigation measures should be adopted to ensure the protection of this species. The following approaches are suggested:

- All construction and site workers should be informed of the potential for this species to be present, be aware that it is protected under the ESA 2007. Observations of this species should be reported to the MNR Midhurst District Office.
- If silt fencing is present, construction site inspectors should inspect it daily for the presence of snakes and holes in the material. Standard grade of silt fencing should be used instead of reinforced higher quality silt fencing.
- Construction should occur during April 15 to October 31, which is outside of the active season for this species.

MNR's comments have been addressed in the Environmental Impact Assessment report included in Appendix G. The report points out that the road urbanization is not expected to directly impact the deer wintering area. The recommended concept will remain within the existing road ROW, and will thus result in very minimal vegetation removal which would appear to include no significant features.

MNR's recommendations should be adopted during construction (Phase 5).

16.4 Ministry of Environment

The MOE, in its letter dated May 28, 2009, identified numerous requirements that would need to be met during the completion of the ESR. A response to the requirements is summarized under the topics as noted in the MOE letter.

Ecosystem Protection and Restoration

For the River Road West option, all proposed works are within an existing road allowance. The existing ecosystem can be described as the existing River Road West ROW. A Stage 1 Archaeological Assessment was undertaken. Although no registered archaeological site was found within the study area, it was recommended a stage 2 Archaeological Assessment be conducted.

In addition, a Natural Environmental Impact Component Assessment was undertaken to identify terrestrial and aquatic resources. The Report documented the existing conditions, assessed environmental impacts as well as recommended mitigating measures.

There are no significant Woodlands or Valley Lands on or adjacent to the study area. However, the Wasaga Dunes Life Science Area of Natural and Scientific Interest, the Wasaga Backland Park Reserve Earth Science Area of Natural and Scientific Interest, and a portion of the Wasaga Beach Provincially Significant Wetland complex are within 30 metres of the existing road and right-of-way in the wooded area to the south of River Road West, east of Blueberry Trail. This wooded area and the mixed forest area at the Powerline Road intersection have been identified as Significant Habitat for a Sensitive Snake Species and as potential deeryard. Proposed work within these areas may be subject to approval from the NVCA.

The ESR was prepared in accordance with Official Plan Policies (Section 4.5 of the Simcoe County OP and Section 13 of the Wasaga Beach OP) and discusses the future level of growth with respect to traffic volumes. The proposed improvements to River Road West has been planned to accommodate growth and will alleviate traffic congestion and enhance safety.

Surface Water and Groundwater

MOE Guideline B-6 (January 1995) was reviewed with respect to proposed work within and near the small watercourse that flows north-south beneath River Road West at the eastern limits of the study area (between Bell's Park Road and Vigo Road) and the ditch areas that support indirect fish habitat. Sediment and Erosion Control Measures will be designed to prevent deposition during and after construction.

The small watercourse supports warm water baitfish. There are ditch areas that support indirect fish habitat. The recommended improvements have the potential to harmfully alter approximately 980 m^2 of aquatic habitat as a result of the requirement for one culvert extension on the small tributary to Little Marl Creek and the enclosure of the areas of permanently flowing open ditches. The NVCA will be contacted prior to final design to determine mitigation measures during and after the construction.

It is recognized that the widening of River Road West will result in an increased pavement surface area which will add stormwater runoff to the River. The final design will include stormwater collection and treatment facilities in accordance with the MOE's Design Manual.

There may be private wells in the area. It is noted that the area from Brillinger Drive to Bell's Park Road is served by municipal water service. As part of the EA, water services will be provided for the area from Bell's Park Road to the eastern Town limits, and thus, impacts to groundwater as a result of construction would be minimal. Any potential impacts can be mitigated.

A Spills Contingency Plan will be a requirement of the contractor.

During construction, groundwater taking or discharge may be required. A MOE Permit to Take Water may be required.

Dust and Noise

Dust production during construction will be mitigated using water.

Noise mitigation measures during construction will include restrictions on times of construction. The Noise Assessment determined that the net increase in the sound levels would be approximately 2dB if the road is widened to 4-lane (worse case scenario) 10 years after project completion. This may occur in 2026. Coulter noted that the potential increment in sound levels attributable to implementation of the project is insignificant, and mitigation measures are not required to satisfy

MTO/MOE protocol as the implementation of the project does not increase the sound level by 5dB or more.

Construction mitigation measures for both noise and dust will be included in the final design.

Servicing and Facilities

This component of the MOE's letter does not apply to this Project.

Waste Materials and Spills

There may be some removal of topsoil as a result of the construction. Any waste generated during construction should be disposed of in accordance with MOE requirements.

There are no existing waste disposal sites within the proposed work area.

All existing underground utilities have been identified and are shown on the Preliminary Drawings.

Based on knowledge of the area, the presence of underground storage tanks within the proposed site of the works (Road Allowance) is not anticipated.

Mitigation and Monitoring

The MOE's requirements for mitigation and monitoring will be addressed as part of the final design. Environmental impacts and mitigation measures have been identified in Section 17 hereinafter.

Construction monitoring will include the following;

- monitoring of sediment and siltation mitigation measures
- updating spills containment measures and facilities
- dust control measures
- presence of contaminated soils.

A post-construction assessment of surface water collection and treatment facilities will be undertaken.

Planning and Policy

The need for a Heritage Assessment was considered and is not likely required. This will be confirmed with the MCL. Should a Heritage Assessment be required, this assessment may be undertaken during a future detail design assignment.

The provision of a widened River Road West will support growth.

Class EA Process

The Class EA planning process meets the requirements of the MEA Class EA Document and the ESR provides documentation of the process. A list of the subsequent permits and other approvals is presented in Section 30 of this ESR.

First Nations Consultation

Notices were sent to First Nations contacts (see letters in Appendices B, M and P)

16.5 DFO

It is anticipated that an application will have to be made to the DFO as part of the final design.

17.0 Identification of Impacts and Mitigative Measures

17.1 Construction Impacts

The MEA Class EA Document (Appendix 2) provides a list of "Potential Adverse Environmental Effects". That list has been used to determine the potential impacts due to the construction with respect to work on the section of River Road West. The headings of the following sections are taken from that Appendix.

17.1.1 Surface Drainage System

Existing roadside drainage ditches discharge directly into the Nottawasaga River or Marl Lake. As a result of construction, the potential for sediment to be discharged into the River or Lake will be high. Sediment traps and check dams will need to be constructed and maintained in all adjacent ditches for the duration of construction and until storm sewer system has been constructed.

Erosion control measures will need to be in place for the construction of replacement and extension of the existing culvert at the small watercourse crossing River Road West between Bell's Park Road and Vigo Road.

Fuel spills could occur and therefore spill control measures will need to be undertaken.

17.1.2 Groundwater

Construction activities (i.e. dewatering of trenches, cut and fill operation, additional paved areas) all have the potential to disrupt ground water flow by altering ground water levels. Construction of underground storm sewer, sanitary sewer, watermain and culverts should be in a dry season such as summer to minimized impacts.

17.1.3 Fish, Aquatic Wildlife and Vegetation

As a result of the construction of the culvert at the watercourse between Bell's Park Road and the eastern Town limits (expansion and replacement), and the closure of the areas of permanently flowing open ditches (approximately 980 m^2 in total), there may be potential impacts to aquatic habitat. The construction will be restricted to non-critical times to minimize impacts. An appropriate compensation plan may be developed in consultation with NVCA and DFO.

17.1.4 Terrestrial Vegetation and Wildlife

Should Improve River Road West be selected as a preferred solution, there will be some loss of trees at the intersection of Powerline Road, the south side of River Road West from Blueberry Trail to Beck Street and the north side of the road approximately 500 metre in length west of Bell's Park

Road. The impacts will be mitigated by planting new trees in the areas in accordance with Town Policy.

The utility corridor or boulevard area will be reinstated with either sod or seed and mulch. Should any trees be lost as a result of new roadway construction, compensation for the loss will be made by planting trees along the edges of the ROW or/and along the utility corridor/boulevard area in accordance with Town Policy.

17.1.5 Heritage Resources

The Stage 1 Archaeological Report identifies no historical sites within the existing River Road West right-of-way. A copy of the Stage 1 Assessment Report is included in Appendix H. ARA advised that a Stage 2 Archaeological Assessment be conducted. This will be subject to Ministry of Culture's decision. Should a Stage 2 Archaeological Assessment be required, this assessment may be undertaken during a future detail design assignment.

17.1.6 Agricultural

There are no agricultural resources that will be impacted.

17.1.7 Residential, Institutional, Commercial and Industrial

The construction of road widening at either the River Road West or Mosley Street locations will impact traffic flow for the duration of the work, which will impact existing residential and commercial properties. There are no institutional or industrial endeavours in the Mosley Street area. However, there is a public elementary School and a public library on the section of River Road West. A new by-pass route or an outside of the Town by-pass route will have a lesser impact on traffic and will affect the immediately adjacent properties only.

It is likely that the in-water work will have to be undertaken during the summer or winter months to avoid fish spawning seasons in the spring and fall at the watercourse between Bell's Park Road and the eastern Town limits on River Road West and the ditch areas that may contain seasonal standing water. In addition, tourist and local traffic flow will be impacted during construction at both the River Road West and Mosley Street locations. In order to mitigate impacts to both the natural and the socio-economic environments, the following staged construction schedule is proposed:

- In-water work at the watercourse and the areas of permanently flowing open ditches during the summer or winter months, subject to timing restriction imposed by the NVCA. Tourist and local traffic flow across the culvert can be maintained while this work is undertaken.
- Access to the School and the library will be maintained during construction on River Road West.
- The work on roads (Mosley St or River Road West) can be undertaken avoiding construction on long weekends to mitigate traffic issues during the summer.
- Any final reinstatement can be undertaken in the spring of the following year.

17.1.8 Outdoor Recreation

During the construction at the River Road West and the Mosley Street sites, there may be some disruption of recreational traffic. This could be mitigated by staging construction to one side of the

road at a time. A minimum one lane with advisory construction signing for traffic will be provided at all times.

17.1.9 Soils Geology

The effects of soil erosion will be mitigated by providing sedimentation control measures. The final slopes will be reinstated with grass to prevent erosion.

17.1.10 Topography/Landforms

There are no significant landscape features at the River Road West site.

17.1.11 Climatic Features

In order to reduce loss of existing windscreen, the removal of vegetation will be minimal. Any vegetation loss will be restored as part of the project in conformance with municipal tree removal By-law No. 2008-05.

17.1.12 Public Health

Exhaust emissions from construction equipment will be restricted to normal working hours.

Precautions will be taken during refuelling of construction equipment in order to prevent contamination of surface and groundwater.

17.1.13 Construction Noise

J. E. Coulter Associates Limited completed a noise assessment for the River Road West site (see Reports in Appendix I). With respect to the impacts of construction noise, Coulter noted:

- No vibratory compaction or pilling will be required during construction.
- A low to moderate impact on the surrounding residences from grinding and paving, pavement breaking and pulverizing are anticipated.
- Limit hours of construction to between 0700 to 1900 Monday to Saturday
- All construction activities should adhere to the Town's noise bylaw (By Law No. 81-7 Sections 2, 2.1 and 2.2)

17.2 Future Impacts

The MEA Class EA Document (Appendix 2) was also reviewed with respect to permanent impacts. The headings of the following clauses are taken from that Appendix.

17.2.1 Surface Drainage Systems

Volume of surface runoff will increase as a result of widening to River Road West or Mosley Street, however, this can be minimized through design measures in the final design. The surface drainage system will be improved as a result of the urbanization.

17.2.2 Groundwater

No permanent impacts to the groundwater are anticipated as a result of construction.

17.2.3 Fish, Aquatic Wildlife and Vegetation

Permanent loss of fish and aquatic habitat is not anticipated for improvement works on Mosley Street.

Construction in some areas (approximately 980 m^2 in total) on River Road West may potentially result in a HADD (harmful alteration, disruption or destruction of fish habitat). However, an appropriate compensation plan may be developed in consultation with NVCA and DFO.

17.2.4 Terrestrial Vegetation and Wildlife

It is considered that there will be no loss of terrestrial vegetation as a result of improvements to Mosley Street. Improvements to River Road West will result in very minimal vegetation removal. However, the vegetation removal would appear to include no significant features. Compensation will be made for tree loss at the new by-pass route site if that option is selected.

17.2.5 Heritage Resources

It is suggested that if no heritage resources are discovered as a result of construction, there will be no long term impact to archaeological or heritage resources.

17.2.6 Agriculture

No permanent impacts to agricultural endeavours will result for the River Road West or Mosley Street or new by-pass route Options. However, approximately 2 hectares of farmland would be lost if the out-of-Town by-pass route is selected.

17.2.7 Residential, Institutional, Commercial and Industrial

Traffic flow will be improved as a result of improvements to River Road West or Mosley Street.

17.2.8 Outdoor Recreation

No permanent impact to outdoor recreation will result for any of the options.

17.2.9 Soils Geology

No permanent impact to soils will result for any of the options.

17.2.10 Topography/Landforms

There are no significant landscape features at any of the four routes.

17.2.11 Climatic Features

Any vegetation loss will restored as part of the project.

17.2.12 Public Health

A positive impact to public health is anticipated with all of the options resulting from incorporation of active transportation.

17.2.13 Operational Noise

J. E. Coulter Associates Limited also commented on the impact of increased traffic noise due to the widened River Road West. Coulter noted that the net increase in sound levels as approximately 2dB resulting from additional traffic if the road is widened to 4 lanes. Coulter also noted that "...the potential increment in sound levels attributable to implementation of the project is insignificant, and the mitigation measures are not required to satisfy MTO/MOE protocol as the implementation of the project does not increase the sound level by 5dB or more."

18.0 Evaluation of Alternatives

18.1 General

The evaluation of Options 2, 3, 4 and 5 is based on several considerations as follows:

- Does it address the identified problem? (traffic congestion, pedestrian safety issues, drainage and pavement structure deficiencies on River Road West)
- Does it respond to public comments?
- How does it compare to other Options?

All four of the identified Options (# 2, 3, 4 and 5) address part of the identified problem of increased traffic. Options 4 and 5 will have a minor impact on traffic improvement. However, only Option 3 – Improve River Road West addresses pedestrian safety issues, drainage and pavement structure deficiencies on River Road West.

Public comments were reviewed as part of the evaluation process and comments are addressed in Section 23 hereinafter.

A comparison of the four options has been made and is presented in Section 18.3.

18.2 Evaluation Criteria and Weighting

The evaluation criteria and weighting of the criteria were provided in Section 12. No change is recommended for the Phase 2 assessment.

18.3 Assessment of Alternatives

The assessment of alternatives was undertaken in September, 2009. The Summary Score Analysis (Weighted Rankings) is provided in Table 4. The option with the lowest total score is considered the

best alternative with respect to the environmental evaluation criteria and with respect to responding to the identified problem of increased traffic flow, pedestrian safety issues, and drainage and pavement structure deficiencies on River Road West. That is, a negative impact will increase the weighted ranking of an option.

TABLE 4 – EVALUATION OF ALTERNATIVE OPTIONS

EVALUATION CRITERIA	WEIGHTINGS %	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Natural Environment – 30%					
Watercourse/Fisheries	15	9	9	14	14
Terrestrial Vegetation and Wildlife	15	8	9	15	8
Sub-totals	30	17	18	29	22
Socio-Economic Environment – 30%					
Social Impacts to Residents and Businesses	7.5	7.5	5	4	5
Social Impacts at Social Features	2	2	1.5	0	0
Noise Impacts	5	3	3	5	3
Archaeological and Heritage	5	2.5	2.5	2.5	2.5
Capital Cost	7.5	5	5	7.5	2
Operating Cost	3	2	2	3	2
Sub-totals	30	22	18.5	22	14.5
Technical – 40%					
Construction, Design, Land Ownership	5	4	2.5	5	4
Pavement and Drainage Conditions	5	1	0	2	5
Impacts on Existing Utilities	5	4	4	3	3
Operational (addresses traffic needs)	25	15	5	20	20
Sub-totals	40	24	12	30	32
Totals	**100**	**63**	**48.5**	**81**	**68.5**

The rationale for the weighted rankings is presented under the various evaluation criteria.

Watercourses/Fisheries – 15%

Options 2, 3, and 4 share the watercourse crossing River Road West between Bell's Park Road and the eastern Town limits. Option 4 – the new by-pass route has an additional watercourse crossing the existing road allowance near the intersection of 45th Street/Knox Road West. Option 4 also needs a new bridge for crossing the Nottawasaga River. Option 5 – the out-of-Town by-pass route

has the most watercourses (20 in total including 2 bridge crossings) crossing the road. Seven watercourses cross the section of Vigo Road, whereas, five watercourses (including one bridge crossing) cross the section of Flos Road 4, five watercourses (including one bridge crossing) cross the section of Concession Road 12 and three watercourses cross the section of 27/28 Sideroad.

It is suggested that all four options will impact fish habitat due to construction activities. However, the construction of a new bridge on the new by-pass route and improvements to the out-of-Town by-pass route will have a greater impact than either of Options 2 or 3 (improvements to Mosley Street or River Road West). Although the loss of fish habitat or impact to fish habitat can be mitigated, there will be greater loss or impact under Options 4 and 5. Options 2 and 3 received scores of 9/15 while Options 4 and 5 were ranked at 14/15 (greater negative environmental impact).

Terrestrial Vegetation and Wildlife – 15%

For the Mosley Street Option, should widening be required, there are potential impacts to approximately 800 metres in length wooded areas that are next to one side of the right-of-way. No known Areas of Natural Scientific Interest life science lands and Areas of Natural Scientific Interest earth science lands will be affected. No known wildlife resources are in the area.

For the River Road West Option, should widening be required, potential impacts exist to approximately 1100 metres in length wooded areas that are next to one side of the right-of-way. Approximately 40 metres in length Areas of Natural Scientific Interest life science land that is next to one side of the right-of-way will be potentially affected, so as to approximately 450 metres in length Areas of Natural Scientific Interest earth science land, approximately 100 metres in length provincially significant wetlands, and approximately 800 metres in length areas that have wildlife resources including a sensitive species of snake and deeryards. Those impacts would be realized should right-of-way widening be required.

For the new by-pass route Option, should widening be not required for the next 20 years, the 2.4 km new road area (4.8 hectares) will be affected. This new road area is covered by vegetation and is identified as significant habitat and natural heritage land (likely including Areas of Natural Scientific Interest life science land, Areas of Natural Scientific Interest earth science land and wildlife recourses such as a sensitive species of snake and deeryards).

For the out-of-Town by-pass route Option, should road widening be not required for the next 20 years, the 1.0 km new road area and the Vigo Bridge widening area will be affected. There are no trees in the new road area, whereas, removal of trees will be required for Vigo Bridge widening. No known Areas of Natural Scientific Interest life science lands and Areas of Natural Scientific Interest earth science lands will be affected. No known wildlife resources are in the area.

Planting of new trees along the new roadway will mitigate the negative impact, but the loss will be greater for Option 4 than the other three Options. Options 2 and 5 received scores of 8/15, Option 3 was ranked at 9/15 and Option 4 was ranked at 15/15 (greater negative environmental impact).

Social Impacts to Residents and Businesses – 7.5%

The negative social impacts to residents and businesses will be realized during construction only. Following construction, it is considered that positive impacts will realized regardless of the Option selected. With respect to negative impacts during construction, it is considered that Option 2 (Mosley Street) will be viewed as the most negative by existing property owners who would have to sell a portion of their properties on either side or both sides of the road to accommodate a widening. It is also suggested that work along Mosley Street (Option 2) would be more disruptive to residents

and businesses than the work that would be required along River Road West (Option 3). Therefore, Option 2 was given a ranking of 7.5/7.5.

Similarly, property owners on the south side of Concession Road 12 near County Road 7 would have to sell a portion or the entire area of their properties to accommodate a new realignment, should Option 5 be selected. Work along the new by-pass route (Option 4) is considered less disruptive to residents and businesses than work that would be required along River Road West and the out-of-Town by-pass route (Option 5). Therefore, Option 4 was ranked at 4/7.5 and Options 3 and 5 were ranked at 5/7.5.

Social Impacts at Social Features – 2%

During construction, there will be disruption of access to certain locations for any of the four Options.

For the Mosley Street Option, construction along the road will impact the businesses and residents on both sides of the road including accesses to Beach Areas 1 to 4. Given the Mosley Street area is within the core area of the Town, potential negative impact to the small Town environment is higher than any other Options.

For the River Road West Option, most of the lands on both sides of the road have been developed including a public school and a public library. Accesses to these developments will be affected during construction. This Option has a higher potential to negatively impact the small Town environment of Wasaga Beach than Options 4 and 5 (by-pass routes).

Both the new by-pass route and the out-of-Town by-pass route go through rural areas and avoid the core area of the Town, therefore, have low potential to negatively impact the small Town environment of Wasaga Beach.

Options 2 and 3 were ranked at 2/2 and 1.5/2 respectively, whereas, Options 4 and 5 were ranked at 0/2.

Noise Impacts – 5%

Construction noise is considered temporary and will not exist after the project is implemented. Thus, permanent noise impacts due to increase in traffic volumes are considered to be more important.

The noise analysis concluded that Noise Assessment consultant, noise impacts would be insignificant as a result of widening of River Road West. Sound level would increase to 67 dB from 65 dB and no mitigation measures would be required.

For Option 5, given that the realignment section of new road is close to the existing road (the distance between the new realignment and the existing road is less than 300 metres), significant increase in noise is not anticipated.

However, for Option 4, significant increase in noise is expected in the new road connection area between Knox Road and Powerline Road.

Therefore, Option 4 was ranked 5/5, whereas, Options 2, 3 and 5 were ranked 3/5.

Archaeological and Heritage – 5%

No archaeological impacts to any of the options are anticipated. Thus a ranking of 2.5/5 was given to all four options. The archaeological assessment did not reveal any significant finds.

Capital Cost – 7.5%

Preliminary capital cost estimates were prepared for Options 1, 2, 3, and 4 and copies are included in Appendix K. It is recognized that utility relocation will be required for Options 2 and 3 (Mosley St and River Rd. West). Utility relocation was also considered for Option 4 (new in Town by-pass). Benchmark costs for utilities were applied. Costs for property acquisition are not included.

Given that improvement works for the Vigo Bridge, 27/28 Sideroad, Concession Road 12 and Flos Road 4 will be done by Simcoe County, Option 5 is the least expensive option. Option 2 (Mosley Street) is a little less costly than the improvement works on River Road West. Option 4 (new by-pass) would be the most expensive one. Therefore, Option 4 was given a ranking of 7.5/7.5. Both River Road West (Option 3) and Mosley Street (Option 2) were ranked at 5/7.5, and Option 5 (lowest price estimate) was ranked at 2/7.5.

Operating Cost – 3%

Widening of both Mosley Street and River Road West would result in similar increases in maintenance costs. Therefore, both of those options were ranked at 2/3. The addition of 2.4 km of new road (Option 4) would result in a significant increase to the Town's road maintenance budget and therefore, that option was ranked at 3/3. For the out-of-Town by-pass (Option 5), the Town might be responsible for a portion of the maintenance cost should this option is selected. Thus, this option was ranked at 2/3.

Construction, Design and Land Ownership – 5%

In reviewing the four Options, it is noted that construction, design and land ownership issues associated with Option 4 (a new by-pass) will be more onerous than for the other three Options. Should this option be selected, it would need to acquire right-of-way from MNR lands for 500 metres of road length and to construct 2.4 km in length of new road including a new bridge within an area of topographic challenging. Therefore, a ranking of 5/5 has been given to Option 3 for this criterion.

Although the details of the widening are not yet known (the need for sidewalks, bike lanes etc. will be determined in Phase 3), it is considered that widening of Mosley Street will be more difficult than widening of River Road West. Land ownership would be an issue on Mosley Street as several sections of the road have insufficient right-of-ways (in the order of 9 to 15 metres). Right-of-way acquisition would be difficult and costly. Therefore, Option 2 (Mosley Street) was ranked at 4/5.

Option 5 (out-of-Town by-pass) also has land ownership issues. The 1 km new road realignment between 27/28 Sideroad and Concession Road 12 would need right-of-way acquisition from private property owners. Thus, this option was ranked at 4/5.

Option 3 (River Road West) was ranked at 2.5/5 due to the fact that River Road West has a minimum of 20 metres of right-of-way and right-of-ways on several sections of the road are in the range of 30 to 60 metres.

Pavement and Drainage Conditions – 5%

Only Option 3 (Improve River Road West) will fully address the current deteriorating pavement structure and drainage conditions on River Road West from Brillinger Drive to the eastern Town Limits. Option 2 (Mosley Street) would address the pavement and drainage conditions on the section of River Road West from Main Street to the eastern Town limits. Whereas, Option 4 would address the pavement and drainage conditions on the section of River Road West from Bell's Park

Road to the eastern Town limits. Pavement and drainage deficiency on River Road West would not be addressed if Option 5 (out-of-Town by-pass) is selected.

Therefore, Option 3 was ranked at 0/5, Option 2 was ranked at 1/5, Option 4 was ranked at 2/5, and Option 5 was ranked at 5/5.

Impacts on Utilities – 5%

Utility impacts on the new by-pass route and the out-of-Town by-pass route are considered to be minimal given that widening is not likely required. Therefore, both Options 4 and 5 were ranked at 3/5.

The existing utilities on both Mosley Street and River Road West are similar in nature and extent and therefore, impacts of construction at both sites will be similar. A ranking of 4/5 was given to both Options 2 and 3.

Operational – 25%

Both Option 4 (new by-pass) and Option 5 (out-of-Town by-pass) will not address long term vehicular demands on River Road West, given only 10% traffic volumes currently on River Road West would use a by-pass route. There would be a slight increase in left turn volumes at the intersections of River Road West with Bell's Park Road and Knox Road with 45th Street for Option 4 and the intersections of Highway 92 with Vigo Road, Vigo Road with Flos Road 4 and 27/28 Sideroad with Highway 26 for Option 5. Therefore, a ranking of 20/25 was given to both Options 4 and 5.

Option 2 will not be as effective in addressing long term vehicular demands on River Road West as an actual widening of River Road West. In addition, as a result of diversion of River Road West traffic volumes to Mosley Street, significant increase in left turn volumes at intersections of Mosley Street/River Road West, River Road West/Main Street, Mosley Street/18th Street North and Mosley Street/Old Mosley Street would affect the operations of these intersections and reduce efficiency. Therefore, Option 2 (Mosley Street) was ranked at 15/25, whereas, Option 3 (River Road West) was ranked at 5/25.

A detailed evaluation table is provided in Appendix L.

19.0 Phase 2 – Selection of Recommended Solution

Based on the score analysis of the four options, it is recommended that the Town select Option 3, improve River Road West from Brillinger Drive to the Eastern Town limits, as the Recommended Phase 2 Solution.

20.0 Phase 2 Public Information Centre No. 1

A Public Information Centre (PIC) was held in Phase 2 to present the Options to the public and to identify the Recommended Solution. A notice of Public Information Centre was published in the local newspaper on October 14 and October 21 and the PIC was held on October 29, 2009. A copy of the Notice is included in Appendix M. Letters were sent to the list of review agencies and a copy

of the letter and the communication list are included in Appendix M. Copies of the PIC presentation Plates are also included in Appendix M. Email correspondence from the Ministry of Culture is included in Appendix M.

A memo summary of the Phase 2 PIC was prepared and a copy is included in Appendix M. The Communications Plan was updated to include 40 members of the public who wanted to be kept informed of the study progress.

A response letter to the residents' comments was prepared and sent to the residents who would like to be informed and a copy of the letter is included in Appendix M as well.

21.0 By-Pass Option Consideration

Given that a number of people selected a bypass route (either an in Town by-pass route – Option 4 or an out of Town by-pass route – Option 5) as a preferred solution, the need and justification for a by-pass route was further reviewed and compared with other communities. The results are summarized in Table 5.

As indicated in Table 5, future 2026 total bypass AADT on River Road West are in the order of 1600 to 2400, whereas, existing/future bypass AADT are in the order of 9,000 to 14,000 on Main Street and First Street in Shelburne and Collingwood respectively. Truck bypass volumes on River Road West are also considered light (6 to 8%) as compared to those on Grand River Street (53%) and Main Street (64%).

TABLE 5 – BYPASS ROUTE WARRANT COMPARISON

CITY/TOWN	Wasaga Beach	Collingwood	Paris	Shelburne
Road/Highway	River Road West	First Street[1] (Highway 26)	Grand River Street[2]	Main Street[3] (Highway 10)
Current AADT	7,400 – 12,200 (2009)	30,000 (2005)	unknown	Over 17,800 (2006)
Future AADT	16, 100 – 23,900 (2026)	40,000 – 44,000 (2015)	unknown	unknown
% Total Bypass Volumes	5 – 9 % (2008)	Over 30 %	unknown	44 – 54 %
% Truck Bypass Volumes	6 – 8 % (2008)	unknown	53%	64%
Right-of-Way Width	20 m	30 m	30 m	unknown
Existing Number of Lanes	2 (one lane in each direction)	4 (two lanes in each direction)	3 (two northbound lanes, one southbound lane)	4 (two lanes in each direction)
Future Number of Lanes	To be determined	5 (two lanes in each direction and a two-way left turn lane)	unknown	unknown
Will Active Transportation be	Yes	Yes, 3 m multi use trail on the north side and 1.5	unknown	unknown

CITY/TOWN	Wasaga Beach	Collingwood	Paris	Shelburne
accommodated?		m sidewalk on the south side		
Is a bypass Warranted?	"No" at this time	Yes (by MTO and the County of Simcoe)	Yes (by the County of Brant)	Yes (by MTO)
When will the bypass be implemented?	unknown	In 15 to 20 years	2011 to 2021	unknown

1. Data derived from "Environmental Study Report, First Street and Huron Street (Highway 26), Reconstruction and Infrastructure Improvements, Town of Collingwood" R. J. Burnside August 2006
2. Data derived from "County of Brant, Truck Route Study" TSH June 2004 and "County of Brant, Transportation Master Plan" IBI December 2008
3. Data derived from "Highway 10 Bypass Finally in the Works" Orangeville Citizen August 7, 2008

In addition, the County of Simcoe has recognized the need for an additional east-west route between Highway 93/Highway 400 and Collingwood given that currently Highway 26 is the only higher tier road in the area. This route is identified as 27/28 Nottawasaga Sideroad, 12th Concession, Vigo Bridge and Flos Road 4 and will be implemented in the next 20 years (see Appendix J). This route combined with County Road 29 can be used as a bypass route to provide an alternate connection between the west end of Highway 92 (east of River Road West) and Highway 26 north of Stayner. As County Roads are designated as commercial goods corridors, truck volumes can be diverted to County Roads.

In light of the above, an additional by-pass route built by the Town is not justified at this time. As suggested in the Town's 2008 East-West Transportation Route Study, the Town should review the need for a by-pass route within the Town on an ongoing basis (every 5 years).

22.0 Selection of Phase 2 Preferred Solution

The selection of the Phase 2 Preferred Solution was presented and accepted at a Town Public Works Committee meeting held on November 18, 2009 (see copy of minutes in Appendix N). The Town determined that the Preferred Solution would be to improve River Road West from Brlillinger Drive to the eastern Town limits.

23.0 Phase 2 Report

The DRAFT Phase 2 Report was prepared and submitted to the Town on December 4, 2009.

Phase 3 Report

24.0 Identification and Description of Design Concepts

Alternative design concepts were identified and developed based on the recommendations of the Traffic Analysis and the need for accommodating active transportation. A 1.0 m utility corridor is also identified as necessary to facilitate street lights, gas, Bell, hydro and other utility lines. The design concepts are included in Table 6.

TABLE 6 – DESIGN CONCEPTS

CONCEPT #	DESCRIPTION	ROW WIDTH REQUIREMENT (m)	ESTIMATED COST
1	1- 3.5 m centre left turn lane[1], 2 - 3.5 m curb lanes 2 – 1.8 m sidewalks, 2 – 1.5 m bike lanes 2 – 0.5 m barrier curbs 2 – 0.95 m utility corridors	20.0	$30,100,000
2	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 1 – 1.8 m sidewalk; 1 – 3 m multi-use path 2 – 0.5 m barrier curbs 2 – 1.6 m utility corridors	20.0	$24,700,000
3	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 2 – 3 m multi-use paths 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	20.0	$25,500,000
4	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 1 – 1.8 m sidewalk, 1 – 3 m multi-use path 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	21.3	$32,300,000
5	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 3 m multi-use paths 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	22.5	$32,800,000
6	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 3 m multi-use paths, 2 – 1.5 m boulevards 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	25.5	$33,000,000
7	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 2 – 1.8 m sidewalks, 1 – 1.5 m bike lane 2 – 0.5 m barrier curbs 2 – 1.45 m utility corridors	20.0	$29,600,000

CONCEPT #	DESCRIPTION	ROW WIDTH REQUIREMENT (m)	ESTIMATED COST
8	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 1.8 m sidewalks 2 – 0.5 m barrier curbs 2 – 0.95 m utility corridors	20.0	$30,100,000
9	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 1.8 m sidewalks, 1 – 1.5 m bike lane 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	21.6	$30,600,000

[1] Less than desirable lane width is provided in order to fit the design to the existing ROW.

Concept 6 was created for a safety reason. Due to the limited available right-of-way width (20 m), no boulevards are provided for all the other concepts. However, for roads of high traffic volumes and high speed, such as the section of River Road West from Bell's Park Road to the eastern Town limits where the posted speed is 70 km/h, a minimum of 1.5 metres boulevard between the barrier curb and sidewalk/multi use path should be considered. This 1.5 metres wide boulevard has been included in Concept 6 to provide a separation distance between vehicles and pedestrians/bicyclists. The need for a boulevard separation has been discussed further in Section 25.

Costs for each concept were estimated. Detailed cost estimates are provided in Appendix O. As noted in Appendix O, unit prices for new road lanes and roadway reconstruction are based on benchmark costs from Wasaga Beach Projects; all prices have been adjusted to 2010 dollars; prices do not include property acquisition costs; prices include estimate of utility relocation costs which is $4,700,000 for each concept.

Based on the Traffic Analysis for the section of River Road West, 3 vehicular lanes will be sufficient for the 2026 traffic volumes. However, if traffic volumes continue to grow, 4 lanes will be required to accommodate future traffic in 2026 and beyond. Or if traffic volumes grow faster than projected, 4 lanes will be required sooner than expected. Both 3 lanes and 4 lanes should be considered, although, additional right-of-way would be required to accommodate some of the 4 lane concepts. If Concept 4 or 5 or 6 or 8 or 9 (4 lanes) is selected, the 4-lane road should be marked and used as a 3-lane road and have the flexibility to be changed to 4 lanes when it is needed.

It should be noted that at some point in the future (beyond 2026), a 4-lane cross-section will eventually become congested should traffic volumes continue to increase. At that point in time, an alternate (by-pass route) becomes more feasible from an economical stand point.

25.0 Boulevard Separation Consideration

For all nine design concepts to be evaluated, where on-road bike lanes are not provided, a multi use path (or sidewalks) has been included. To fit the design to the 20 metre right-of-way, a boulevard separation between pedestrians/bicyclists and vehicles was not able to be included in most of the concepts. However, the need for a boulevard separation was reviewed.

The TAC (Transportation Association of Canada)'s *Geometric Design Guide for Canadian Roads* stresses the importance of boulevards as follows:

- The separation between the sidewalk and the vehicular traffic provides increased safety for pedestrians and children at play.

- The probability of a vehicle/pedestrian collision is reduced by placing the sidewalk some distance from the curb.
- Pedestrians are less likely to be splashed by passing vehicles in wet weather.
- The conflict is minimized between pedestrians and solid waste or recycling containers temporarily stored at curb side for scheduled pick up.
- Space is provided for various street hardware (signs, transit shelters and fire hydrants), and streetscaping elements.
- An area is provided for the storage of snow plowed off the roadway.
- Changes to the cross-slope of the sidewalk to provide for appropriate driveway gradients are minimized through the use of the boulevard area to affect the grade change.
- Space is provided for both surface and underground utilities.

The TAC Manual also states that the incorporation of boulevards is particularly important for streets with design speeds greater than 60 km/h.

The County of Simcoe Master Transportation Plan indicates that on low volume County Roads, with traffic volumes of less than 3000 vehicles per day, an on-road cycling facility could be provided by paving the shoulder (3.0 metres in width). Otherwise, for higher volume roads, an off-road facility (1.5 metres bike lanes or 2.2 metres bike paths) could be provided within the road right-of-way along the back slope of the ditch. It is recognized that County Roads usually have a higher posted speed limit (80 km/h).

The County of Brant Transportation Master Plan suggests an off-road bike path when traffic volumes are higher than 5000 vehicles per day per lane and vehicle operating speed is higher than 70 km/h.

In light of the above, given the section of River Road West from Bell's Park Road to the eastern Town limits has a posted speed limit of 70 km/h, a boulevard between the barrier curb and the sidewalk/multi use path is warranted at the location. To be consistent with the cross section east of Bell's Park Road and west of Zoo Park Road (where a boulevard is currently provided), a boulevard is also suggested for the section from Zoo Park Road to Bell's Park Road. It is noted that a wider right-of-way (30 to 60 metres) is available on the section of River Road West from Zoo Park Road to the eastern Town limits.

26.0 Sidewalk Immediately Beside the Curb

In most of the design concepts considered, sidewalks are placed immediately beside the curbs. The TAC *Geometric Design Guide for Canadian Roads* states "The typical minimum clear sidewalk width is 1.5 m. Where sidewalks are placed directly against the curb, the sidewalk width is normally increased by a minimum of 0.5 m. This additional width provides for street hardware placement and allows the proximity of moving traffic or opening of doors of parked cars." As such, the minimum sidewalk width is increased to 2.0 m, should the sidewalk is placed immediately beside the curb.

The 2.0 m minimum sidewalk width is measured from the face of the curb to the far edge of the sidewalk. The 1.8 m sidewalk width used in the design concepts is measured from the back of the curb to the far edge of the sidewalk. As per the Ontario Provincial Standard Drawing OPSD 600.040, for a standard concrete barrier curb, the distance between the face of the curb and the back of the curb is 0.2 m. Therefore, the 1.8 m sidewalk width meets the minimum requirements.

27.0 Pedestrian Volumes

Pedestrian traffic counts along the section of River Road West were conducted at the intersections of Oxbow Park Road, Powerline Road, Silver Birch Avenue (easterly intersection), Blueberry Trail/Access Road, Westbury Road, Main Street, Zoo Park Road and Bell's Park Road from July 14, 2009 to July 22, 2009 during the AM and PM peak hours. The numbers of pedestrians walking along River Road West in both directions (east/west) are summarized in Table 7.

TABLE 7 – PEDESTRIAN TRAFFIC VOLUMES ON RIVER ROAD WEST

Location (Along River Road West)	AM Peak Hour	PM Peak Hour
Oxbow Park Road	20	26
Powerline Road	10	13
Silver Birch Avenue (easterly intersection)	7	8
Access Road	3	2
Blueberry Trail	1	5
Westbury Road	8	11
Main Street	5	8
Ansley Road	5	1
Zoo Park Road North	2	3
Zoo Park Road South	2	2
Bell's Park Road	0	0

As indicated above, pedestrian volumes along the section of River Road West are in the range of 0 to 26 persons per hour during the peak hours with the highest near Oxbow Park Road and the lowest at Bell's Park Road. Pedestrian volumes are considered light and less than 0.5 person per minute each side. The minimum sidewalk width should be sufficient. Additional sidewalk width is not required.

28.0 Bike Lanes on Higher Volume Roads

The TAC Manual indicates that the typical minimum one-way bike lane width is 1.5 m. The minimum 1.5 m bike lane width consists of a 1.0 m bicycle design envelope width and the 0.5 m minimum clearance to the edge of traffic lane for a speed limit of 60 km/h or less. This clearance width should be sufficient for cars and bicycles to travel safely side by side. If the volume of traffic (AADT) on the vehicular lane beside the bike lane exceeds 6000 or trucks exceed 10% or speed limit is increased to 80 km/h, the minimum clearance is recommended to be increased from0.5 m to 1.0 m. The additional 0.5 m clearance between the bicycle envelope and the vehicle is desirable, where "wind" force exerted on bicycle riders from heavy vehicles is a concern, or where motor vehicles constantly pass bicycle riders.

As per the projected AADT data in the Traffic Analysis for the section of River Road West from Brillinger Drive to the eastern Town limits, AADT will exceed 6000 per lane from Brillinger Drive to Powerline Road in 2011, from Powerline Road to Main Street and from Zoo Park Road to Bell's Park Road in 2016, and from Bell's Park Road to the eastern Town limits in 2026, should a 3-lane cross-section be used and 15% of traffic be accommodated by the centre turn lane. Therefore, an additional 0.5 m to a total of 2.0 m bike lane width is desirable. However, given the limited right-of-way width (20 m) for the section of River Road West from Brillinger Drive to Main Street, a 1.5 m bike lane width has been used.

29.0 Right-Of-Way Width Requirement

It is identified in the Town's Official Plan that River Road West from Mosley Street to Main Street is an arterial road and from Main Street to the eastern Town limits is a controlled access road. The Official Plan Section 16.2.8.1 states "Arterial roads should be designed primarily to facilitate traffic movements between major land use activity areas in the Town"; and Section 16.2.8.2 a) states "The appropriate rights-of-way shall be provided which will facilitate the future provision of public transportation".

In addition, the Town's Active Transportation Plan has identified River Road West as one of the Town's bike routes. To accommodate all three components – traffic movements, public transportation, and active transportation, the existing 20 metres right-of-way on River Road West from Brillinger Drive to Main Street is considered insufficient.

The minimum right-of-way width for arterial roads is in the range of 26 to 36 metres as defined in the Town of Collingwood's Official Plan. The Township of Clearview's Official Plan states arterial roads shall have a minimum right-of-way width of 26 to 40 metres. The Township of Springwater's Official Plan indicates that wherever possible arterial roads shall have a minimum right-of-way width of 30 metres.

In light of the above, it would be desirable to have a 26 metre basic minimum right-of-way width for the section of River Road West from Brillinger Drive to Main Street with 30 metre being the preferred minimum.

30.0 Impacts and Mitigation Measures

The impacts of all of the Phase 3, 3-lane/4-lane design options were identified and addressed as part of the Phase 2 assessment (see Section 17).

Mitigation measures were also identified under Section 17.

31.0 Evaluation of Design Concepts

Design Concepts 1 to 9 were evaluated by using the same evaluation criteria and weighting of the criteria provided in Section 12. The Summary Score Analysis (Weighted Rankings) is provided in Table 8. The design concepts are shown on Plates 8 to 15 of the Phase 3 PIC material (Appendix P). A detailed Evaluation Table is provided in Appendix Q.

TABLE 8 – EVALUATION OF ALTERNATIVE DESIGN CONCEPTS

EVALUATION CRITERIA		WIEGHT-INGS	CONCEPT								
		%	1	2	3	4	5	6	7	8	9
Natural Environment – 30%											
Watercourses/Fisheries		15	9	9	9	9	9	9	9	9	9
Terrestrial Vegetation and Wildlife		15	9	9	9	10.5	10.5	10.5	9	9	10.5
Sub-totals		30	18	18	18	19.5	19.5	19.5	18	18	19.5
Socio-Economic Environment – 30%											
Social Impacts to Residents and Business		7.5	5	5	5	5	5	5	5	5	5
Social Impacts at Social Features		2	1	1	1	1	1	1	1	1	1
Noise Impacts		5	3	3	3	3	3	3	3	3	3
Archaeological and Heritage		5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Capital Cost		7.5	5.3	4.5	4.5	5.3	5.3	5.3	4.5	5.3	5.3
Operating Cost		3	2.1	1.8	1.8	2.1	2.1	2.1	1.8	2.1	2.1
Sub-totals		30	18.9	17.8	17.8	18.9	18.9	18.9	17.8	18.9	18.9
Technical – 40%											
Construction, Design, Land Ownership		5	2.5	2.5	2.5	4	4	4	2.5	2.5	4
Pavement and Drainage Conditions		5	0	0	0	0	0	0	0	0	0
Impacts on Existing Utilities		5	4	4	4	4	4	4	4	4	4
Operational	Future Capacity	10	0	2	2	0	0	0	2	0	0
	Flexibility	5	0	4	4	0	0	0	4	0	0
	Pedestrian Safety	5	2	0.5	0.5	2	2	1.5	3.5	2	4
	Future Public Transportation	5	1.5	4	4	1.5	1.5	1.5	4	1.5	1.5
Sub-totals		40	10	17	17	11.5	11.5	11	20	10	13.5
Totals		**100**	**46.9**	**52.8**	**52.8**	**49.9**	**49.9**	**49.4**	**55.8**	**46.9**	**51.9**

Since the design concepts are very similar in nature, the scores/rankings are the same in most cases except for the criteria of Terrestrial Vegetation and Wildlife, Capital Cost, Operating Cost, Land Ownership and Operational. Scores/rankings for the nine design concepts are slightly different in those areas as detailed below:

Terrestrial Vegetation and Wildlife – 15%

As per the Environmental Impact Assessment Report prepared by Azimuth Environmental Consulting Inc. for the Section of River Road West, all concepts within or extended beyond the existing 20m right-of-way will have impact on the existing vegetation along the road and Wasaga Beach Provincial Park area to the east of Blueberry Trail and the south of River Road West. The Wasaga Beach Provincial Park area consists of the Wasaga Dunes Life Science Area of Natural and Scientific Interest, the Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest, and the Wasaga Beach Provincially Significant Wetland. However, the concepts within the 20m right-of-way will result in less removal of the identified features.

Impacts to the wildlife in the area are similar in all nine concepts. Therefore, Concepts 1, 2, 3, 7 and 8 were ranked at 9/15, whereas, Concepts 4, 5, 6 and 9 were ranked at 10.5/15.

Capital Cost – 7.5%

Preliminary capital cost estimates were prepared for design Concepts 1 to 9 and copies are included in Appendix O. Given that the cost for utility relocation will be about the same, for the purposes of Phase 3 analysis, the estimates for road works were used to evaluate options.

The wider the roads surface the higher the cost. As a result, the costs for Concepts 1, 4, 5, 6, 8 and 9 are higher than the costs for Concepts 2, 3 and 7. Therefore, Concepts 2, 3 and 7 were ranked at 4.5/7.5, whereas, Concepts 1, 4, 5, 6, 8 and 9 were ranked at 5.3/7.5.

Operating Cost – 3%

Similarly the wider the road the higher the maintenance costs. The width of asphalt surface between barrier curbs is 13.5 m for Concepts 1, 4, 5, 6 and 8. The asphalt surface of Concept 9 is wider (15 m). Whereas the width of asphalt surface between barrier curbs is 11.0 m for Concepts 2 and 3, and 12.5 m for Concept 7. Although, there will be maintenance costs for sidewalks/multi-use paths and the total width of sidewalks/multi-use paths for each concept is different, the maintenance costs for sidewalks/multi-use paths are less than those for asphalt surface between barrier curbs. Therefore, Concepts 2, 3 and 7 were ranked at 1.8/3, whereas, Concepts 1, 4, 5, 6, 8 and 9 were ranked at 2.1/3.

Construction, Design, Land Ownership – 5%

For the section of River Road West from Brillinger Drive to Main Street, right-of-way width is 20 metres. As Concepts 4, 5, 6 and 9 requires a right-of-way width of 21.3, 22.5, 25.5 and 21.6 metres respectively; additional right-of-way is required for these Concepts. Additional right-of-way may be required for Concepts 1 and 8 in 2026 to accommodate active transportation, should the road be remarked to have 4 lanes. Similarly, additional right-of-way may also be required for Concepts 2, 3 and 7, should the road be widened to 4 lanes. However, 20 metre right-of-way width is sufficient for Concepts 1, 2, 3, 7 and 8 before 2026. Therefore, Concepts 4, 5, 6 and 9 were ranked at 4/5, while Concepts 1, 2, 3, 7 and 8 were ranked 2.5/5.

Operational – 25%

Four sub-criteria under operational were identified as future capacity, flexibility, pedestrian safety and future public transportation and their weightings are 10, 5, 5 and 5% respectively.

For future capacity, although, all nine design concepts would address the problem statement and provide road capacity to accommodate future 2026 traffic volumes, Concepts 4, 5, 6, 8 and 9 would accommodate longer term (2026 and beyond) vehicular demands. Concept 1 can also be remarked to provide 4 lanes. In this case, both bike lanes would be lost and one or both sidewalks would need to be replaced by multi-use paths to accommodate bicycle traffic. As a result, additional right-of-way would be required. Concepts 1, 4, 5, 6, 9 and 9 were ranked at 0/10, while, Concepts 2, 3 and 7 were ranked at 2/10.

For flexibility, Concepts 1, 4, 5, 6, 8 and 9 have the flexibility to convert the road to 4 lanes when it is needed by re-marking the road. Concepts 2, 3 and 7 are lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands. Therefore, Concepts 1, 4, 5, 6, 8 and 9 were ranked 0/5, whereas, Concepts 2, 3 and 7 were ranked 4/5.

For pedestrian safety, Concepts 2 and 3 provide shorter distance for pedestrian to cross the road. Curb to curb distance would be 11 metres in Concepts 2 and 3, 12.5 metres in Concept 7, whereas, 13.5 metres in Concepts 1, 4, 5, 6 and 8, 15 metres in Concept 9. Sidewalks or multi use paths are placed immediately beside barrier curbs in Concepts 1 to 5 and 7 to 9. Pedestrians may not feel safe to walk on those sidewalks/multi use paths. Only Concept 6 provides a minimum of 1.5 metres boulevard to separate pedestrian traffic from vehicular traffic. Concepts 7 and 9 provide only a single one-way bike lane. Bicycles traveling in another direction may have to use sidewalks or vehicular lanes. Either way would create conflicts with pedestrians or motor vehicles. Therefore, Concepts 2 and 3 were ranked 0.5/5, Concept 6 was ranked 1.5/5, Concepts 1, 4, 5 and 8 were ranked 2/5, Concept 7 was ranked 3.5/5 and Concept 9 was ranked 4/5.

For future public transportation, sufficient pavement width may be provided in Concepts 1, 4, 5, 6, 8 and 9, should the outside lanes be used as bus lanes or bay area. However, there would be no room for bus bay area or bus lanes in Concepts 2, 3 and 7. When buses stop to load and unload riders, all vehicles in behind will have to stop, given that there would not be another lane available in these Concepts. Therefore, Concepts 1, 4, 5, 6, 8 and 9 were ranked at 1.5/5, while Concepts 2, 3 and 7 were ranked at 4/5.

In total, Concept 6 was ranked at 3/25, Concepts 1, 4, 5 and 8 were ranked at 3.5/25, Concept 9 was ranked at 5.5/25, whereas, Concepts 2 and 3 were ranked at 10.5/25, Concept 7 was ranked at 13.5/25 for operational.

32.0 Roundabout Consideration at Main Street

A roundabout design concept was considered at the intersection of River Road West with Main Street given that this is the only location which has sufficient right-of-way to accommodate a roundabout.

A roundabout is considered safer than a signalized intersection as there are less conflict points in a roundabout than in a regular intersection. Another reason for safety benefits in roundabout is slower vehicle travel speeds. In order to manoeuvre around the circle in a roundabout, vehicles have to reduce their speeds. A roundabout is also considered a more environmentally friendly option in that it keeps vehicles moving and reduces the number and duration of vehicle stops. As a result, it helps to reduce greenhouse gas emissions and save energy.

A two-lane roundabout (two lanes around the centre island) with two entry lanes and two exiting lanes on each approach and a channelized right turn lane on the east approach was modeled by using Synchro 7 software for the 2026 PM peak traffic volumes (critical condition). The results are summarized Table 9.

TABLE 9 – ROUNDABOUT OPERATIONS

MOVEMENT	EB	WB	NB	SB
Crossing Volumes	528	140	1239[1]	796
Volume/Capacity	0.87 – **1.08**	0.62 – 0.75	0.11 – 0.14	0.82 – **1.04**
Overall v/c	0.87 – **1.08**			

[1] Crossing flow exceeds 1200, method is not applicable.

As noted above, volumes are over capacity for the eastbound and southbound approaches and the overall intersection. Errors occurred for the northbound approach as the crossing volume exceeds the maximum limit. As a result, the roundabout is not able to accommodate the future traffic and is not recommended for the location.

33.0 Selection of Recommended Design

Based on the assumption that the selected design concepts (cross-section) should be feasible for construction along River Road West without the need to obtain large sections of private property beyond the road allowance before 2026 and considering the flexibility to meet the future longer term (2026 and beyond) vehicular demands and the flexibility to meet the future public transportation needs, Concept 1 was selected as the Recommended Phase 3 Design Concept for the section of River Road West from Brillinger Drive to Main Street.

Given that the existing right-of-way width is wider (in the range of 30 to 60 metres) for the section of River Road West from Main Street to the easterly Town limits, and that the speed limit is higher (70 km/h) from Bell's Park Road to the eastern Town limits, Concept 6 was selected for the section of River Road West from Zoo Park Road to the eastern Town limits to provide a minimum of 1.5 m boulevard to separate pedestrian traffic from vehicular traffic.

In additional to the road cross-section, pedestrian crossing opportunities were also considered. A traffic signal is recommended at the intersections of River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Drive and Bell's Park Road. These were presented at the February 18, 2010 PIC.

34.0 Phase 3 Public Information Centre No. 2

A Public Information Centre (PIC) # 2 was held in Phase 3 (February 18, 2010) to present the Design Concepts to the public and to identify the Recommended Design. A notice of Public Information Centre was published in the local newspaper on February 10 and 17 and the PIC was held on February 18, 2010. A copy of the Notice is included in Appendix P. Letters were sent to the list of review agencies and a copy of the letter and the communication list is included in Appendix P. Copies of the PIC presentation Plates are also included in Appendix P.

A memo summary of the Phase 3 PIC was prepared and a copy is included in Appendix P. The Communications Plan was updated.

A response letter to the residents' comments was prepared and sent to the residents who would like to be informed. A copy of the letter is included in Appendix P as well.

During the public comment period two weeks following the PIC, a petition from the residents in the area was received. A response letter to the petition was also prepared and sent to the residents who signed the petition. A copy of the Petition, the letter and the contact list are included in Appendix P.

35.0 2010 Infiltration Study and ATR Count

Several comments were received regarding truck by-pass volumes at night time along with the petition that is in opposition to the flexibility for future expansion of River Road West to 4 lanes. In response to these, the Town has an Infiltration Study carried out on the east-west route and a week long ATR (Automatic Traffic Recording) count conducted on the section of River Road West between Brillinger Drive to Powerline Road in May 2010. The Infiltration Study Report and ATR count data are included in Appendix R.

Similar to the 2008 Infiltration Study, in the 2010 Infiltration Study, license plates for both cars and trucks were recorded at the locations of Mosley Street east of Highway 26 and River Road West west of Bell's Park Road from 6:00 to 18:00 in a 15 minute interval on Tuesday, May 4, 2010. Should a same license plate be recorded at both ends of the route within a 30 minute period, the vehicle is considered a by-pass vehicle. The results of both the 2008 and 2010 Infiltration Studies are summarized in Table 10.

TABLE 10 – EAST AND WEST ROUTE INFILTRATION STUDY RESULTS

Direction	Vehicle	% By-Pass Vehicles (Travel Time<=30 minutes)	
		2008 Study	2010 Study
From Mosley Street east of Highway 26 to River Road West west of Bell's Park Road	Cars	4.66%	4.31%
	Trucks	6.49%	7.27%
	Total	4.81%	4.54%
From River Road West west of Bell's Park Road to Mosley Street east of Highway 26	Cars	10.17%	9.11%
	Trucks	7.88%	9.25%
	Total	8.88%	9.12%

As indicated in Table 10, for the eastbound traffic, the percent of total by-pass volume has slightly decreased to 4.54% in 2010 from 4.81% in 2008, however, the percent of truck by-pass volume has increased to 7.27% in 2010 from 6.49% in 2028. For the westbound traffic, both the percent of total by-pass volume and the percent of truck by-pass volume have increased slightly, the percent of truck by-pass volume has increased to 9.25% in 2010 from 7.88% in 2008.

Based on a review of by-pass route warrants in other municipalities as shown in Table 5, the percents of total by-pass volumes are in the range of 30% to 50% and the percents of truck by-pass

volumes are in the order of 50% to 60%. As such, the current percents of by-pass volumes on the east-west route do not warrant a by-pass. Based on the percent of truck by-pass growth rate of 0.685% per year from 2008 to 2010 (more critical than the percent of total by-pass growth rate), the percent of truck by-pass volume will warrant a by-pass in approximately 70 years.

The ATR count data was collected from May 14 to May 20 inclusive in 2010 at a location between Brillinger Drive and Powerline Road. The results were summarized in Table 11.

TABLE 11 – ATR COUNT SUMMARY

Direction	ADT	% Trucks				Number of Trucks			
		Average Day	6am – 6pm	6pm – 6am	10pm – 6am	Average Day	6am – 6pm	6pm – 6am	10pm – 6am
EB	5837	9.90%	11.31%	5.85%	4.17%	578	489	89	14
WB	5569	9.93%	11.09%	6.05%	2.98%	553	475	78	10
Total	11406	9.91%	11.20%	5.94%	3.57%	1131	964	167	24

As shown in Table 11, the percent of truck volumes on an average day is 9.91%. The average daytime (6am to 6pm) percent of truck volume is 11.2% which is almost twice of the night time one (5.94%). The average percent of truck volumes further reduces to 3.57% for the period of 10pm to 6am. On average, there are 24 trucks on the section of River Road West during the period of 10pm to 6am. This translates to 3 trucks per hour. As a result, night time truck volumes are not considered high. However, given the number of residential units in the area, the Town may consider to restrict truck traffic during the period 10pm to 6am through by-laws and enforcement.

As per the Town's 2006 Transportation Study Update (dated May 2007), June traffic volumes represent the average conditions. To reflect the June volumes, the May ATD (average daily traffic) have been increased by 7% to 12200 (rounded), based on commuter tourist recreation characters of the road and related MTO 2006 Seasonal Variation Curves. The 2006 AADT on the section of River Road West is 11900 vehicles, whereas the 2010 AADT is 12200. This translates to a 0.62% per year increase in traffic volumes from 2006 to 2010.

36.0 Phase 3 Public Information Centre No. 3

To provide an additional opportunity for the public to provide comments, a third Public Information Centre (PIC) # 3 was held in Phase 3 (June 26, 2010) to present the Design Concepts to the public and to identify the Recommended Design. A notice of Public Information Centre was published in the local newspaper on June 9, 16 and 23 and the PIC was held on June 26, 2010. A copy of the Notice is included in Appendix S. Letters were sent to the list of review agencies as well as approximately 400 property owners along the road and a copy of the letter and the communication list is included in Appendix S (for privacy protection reasons, property owners' list is not included). Copies of the PIC presentation Plates are also included in Appendix S.

A memo summary of the Phase 3 PIC was prepared and a copy is included in Appendix S. The Communications Plan was updated.

A response letter to the residents' comments was prepared and sent to the residents who would like to be informed. A copy of the letter is included in Appendix S as well.

Before the PIC, additional signatures for the same petition were received from the residents in the area. A response letter to the petition was also prepared and sent to the residents who signed the petition. A copy of the petition and the letter are included in Appendix S.

37.0 Recommended Construction Schedule

The traffic congestion problem currently exists especially on the section of River Road West near Oxbow Park Drive and therefore, it is recommended that the Town proceed to final design upon completion of this Class EA planning process with construction following immediately thereafter for the section of River Road West from Oxbow Park Road to Powerline Road.

With respect to the final design phase, it is anticipated that the Class EA will be completed by the end of November 2010 and that design will be initiated in 2011 subject to council approval. Allowing for the fact that various approvals will be needed as part of the final design (DFO, NVCA, MNR, MOE and possibly MCL), it is anticipated that the design phase will be lengthy and will not be completed until the end of 2011.

A suggested construction schedule was identified in Section 17.1.7. This suggested construction schedule was developed to mitigate construction impacts on the fish habitat at the watercourse between Bell's Park Road and the eastern Town limits, indirect fish habitat at the areas of permanently flowing open ditches as well as the heavy traffic periods on the summer tourist season. The suggestions are as follows:

- In-water work (foundation construction) at the watercourse upstream of Marl Lake will not be permitted between March 31st and June 30th, subject to timing restriction imposed by the NVCA. Tourist and local traffic flow across the culvert can be maintained while this work is undertaken. Any works involving the flowing ditches/tributary should be completed 'in the dry', during low water levels, or by means of temporary diversions.
- Construction activities involving the removal of vegetation should be restricted from occurring between the beginning of April to the end of July to avoid impacting resting birds.
- Other construction works should occur during April 15 to October 31, which is outside of the active season for a sensitive species of snake in the area. The road work should be undertaken avoiding construction on long weekends to mitigate traffic issues during the summer.
- Any final reinstatement can be undertaken in the spring of the following year.

38.0 Review of Public Comments, Approval Requirements and Related Design Implications

Over the course of the Class EA planning process comments were received from review agencies, Town Staff, Council members and the public. A summary of the comments that must be addressed as part of the final design is presented in the Table below and includes a preliminary list of the necessary design approvals.

COMMENT/REQUIREMENT	DESIGN IMPLICATION
Canada Post mail boxes are located on the opposite side of the road and will be difficult and unsafe to access when crossing 3 or 4 lanes of traffic.	The Town is to work with Canada Post at the detail design stage and would prefer to relocate mail boxes to the same side as the houses are located, so that residents can walk to access their mail boxes without crossing the road.
Purchase private properties to minimize environmental impacts.	This will be considered during the detail design stage as part of other mitigating measures.
NVCA concerns including the preservation of the Provincially Significant Wasaga Beach Wetland Complex located directly south of River Road West after Blueberry Trail, a meander belt erosion hazard extending onto the road a the Powerline Road intersection, a sensitive species in the area, the headwaters of Little Marl Creek support baitfish	Permits will be required from the NVCA as part of the final design to the five areas (total 980 m^2) identified in Azimuth's Environmental Impact Assessment Report. The Town will potentially be required to develop a fish habitat compensation plan that replaces ("no net loss") the habitat lost by the enclosure of the ditches.
Property line location for the funeral home east of Theme Park Drive and on the opposite side of the waterpark is incorrect. The Town doesn't own the parking lot area near the road.	Property lines are priliminary, for illustration purposes only and will be confirmed in the detail design stage.
MNR requirements	Obtain MNR approval
Stormwater Management Plan	Review Stormwater Management Planning and Design Manual re: mitigation measures
Spills Contingency Plan	Prepare preliminary plan for discussion and finalization with contractor
Permit to Take Water	Obtain permit for approval for any dewatering necessary during construction
Dust mitigation during construction	Allow for dust control measures as part of the contractual obligations of the constructor

A suggested list of subsequent Permits and/or Approvals to be obtained prior to construction of the proposed works is as follows:

- NVCA – Permit for Development, Interference with Wetlands & Alterations to Shorelines & Water Courses;
- NVCA – (potentially) Federal Authorization for Works or Undertakings Affecting Fish Habitat;
- NVCA – Letter of Advise to the DFO re: Fisheries review and assessment of loss of habitat;
- DFO – Approval if a Letter of Advice is not provided by NVCA
- MOE – Approval for storm sewers; and
- Municipal Approvals for roadway design

39.0 Selection of Preferred Design

Following the public review period after the Phase 3 PIC # 3 (June 26, 2010), a final review of the comments received was completed. On August 26, 2010 the Town was asked to select the Preferred Solution. The details of the Preferred Solution were outlined by Ainley Group as follows:

- Four lane transition on River Road West from Oxbow Park Drive to Brillinger Drive complete with 3.0m wide left turn lane, 3.25m wide curb lanes, 3.5m wide centre lanes, 1.0m paved shoulders with 0.5m concrete curb and gutter, 1.8m wide concrete sidewalks and street lights as necessary for the 4-lane section, whereas, 3.5m wide centre left turn lane, 3.5m wide curb lanes, 1.5m wide bike lanes with 0.5m concrete curb and gutter, 1.8m wide concrete sidewalks and street lights as necessary for the 3-lane section,
- Widening of the existing River Road West from Brillinger Drive to Main Street to provide for three lanes with 3.5m wide centre left turn lane, 3.5m wide curb lanes, 1.5m wide bike lanes, 1.8m wide sidewalks and street lights as necessary (Concept 1),
- Widening of River Road West from Zoo Park Road to the eastern Town limits with 13.5 m asphalt platform (given that the potential timing of construction is 2023-2024, the 13.5m asphalt platform will likely include two 3.5m centre lanes and two 3.25m wide curb lanes) with 0.5m concrete curb and gutter on each side, 1.5m boulevards, 3.0m wide multi-use paths and street lights as necessary (Concept 6), and
- Traffic signals and intersection improvements at River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Drive and Bell's Park Road.

The Preferred Design was shown on Ainley Drawing No. 109049 – PLAN and was presented at the February 18, 2010 PIC and June 26, 2010 PIC (copy in Appendix T).

The Town subsequently confirmed the selection of the Preferred Design and authorized Ainley to complete the ESR on August 26, 2010.

Phase 4 Report

40.0 Draft ESR

A Draft ESR was prepared to be placed on public record. A copy of the Draft ESR was provided to the Town on August 26, 2010.

41.0 Notice of Completion

A Notice of Completion was prepared and was published in the Wasaga Sun on September 29 and October 6, 2010, advising the public of the 30 day review of the ESR. A copy of the Notice of Completion was also sent to the Review Agencies and previously interested members of the public. A copy of the Notice and related letters is included in Appendix U.

42.0 Final ESR

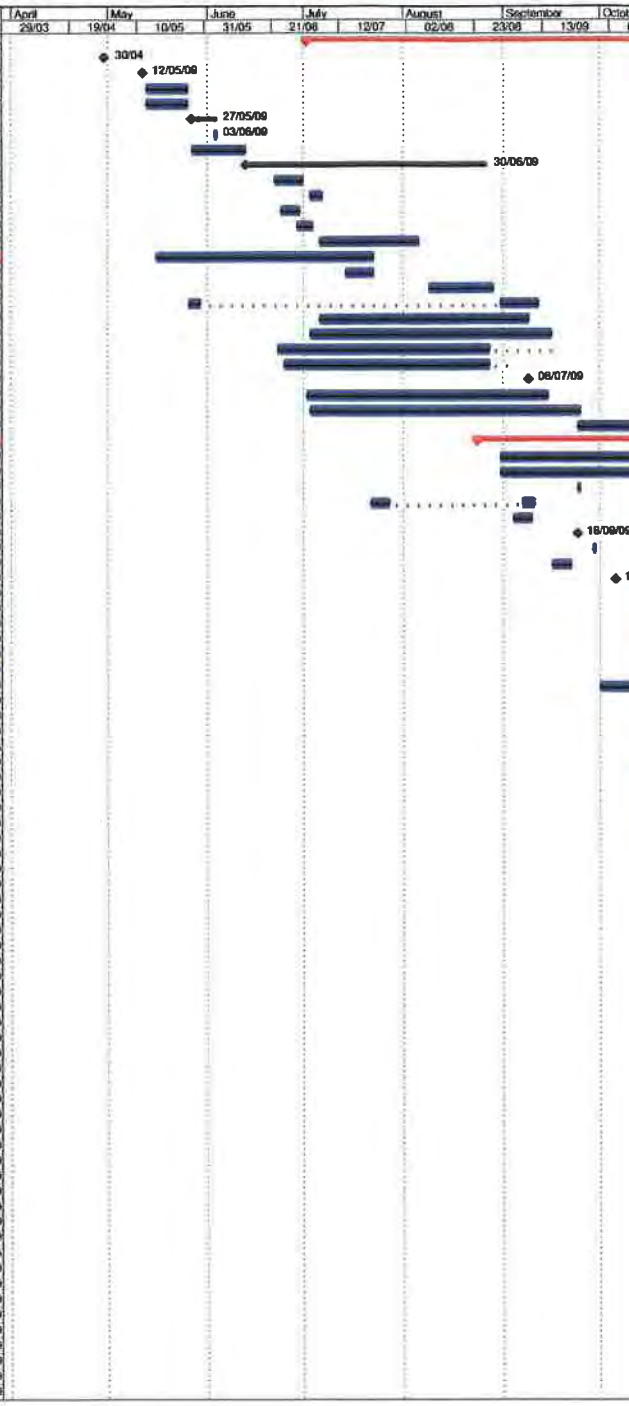
The ESR was finalized following the 30 day public review.

APPENDIX A

Final Project Schedule

Town of Wasaga Beach River Road West Urbani

ID	Task Name	Duration	Start	Finish	Actual Start	Actual Finish
1	Task- Phase 1	21 days	Thu 02/07/09	Thu 05/11/09	NA	NA
2	Public Works Commitee Meeting	0 days	Thu 30/04/09	Thu 30/04/09	Thu 30/04/09	Thu 30/04/09
3	Council Approval	1 day	Tue 12/05/09	Tue 12/05/09	Tue 12/05/09	Tue 12/05/09
4	Develop Communication Plan	9 days	Wed 13/05/09	Mon 25/05/09	Wed 13/05/09	Mon 25/05/09
5	Draft Notice of Study Commencement	9 days	Wed 13/05/09	Mon 25/05/09	Wed 13/05/09	Mon 25/05/09
6	Publish Notice- Send to Review Agencies	8 days	Wed 27/05/09	Wed 03/06/09	Wed 27/05/09	Wed 03/06/09
7	Publish Notice- Send to Review Agencies	1 day	Wed 03/06/09	Wed 03/06/09	Wed 03/06/09	Wed 03/06/09
8	Public Review Period	13 days	Wed 27/05/09	Fri 12/06/09	Wed 27/05/09	Fri 12/06/09
9	Review comments	53 days	Sat 13/06/09	Wed 26/08/09	Sat 13/06/09	Wed 26/08/09
10	Existing cross-sections and right of way info	7 days	Mon 22/06/09	Tue 30/06/09	Mon 22/06/09	Tue 30/06/09
11	Review Geotechnical Information	2 days	Fri 03/07/09	Mon 06/07/09	Fri 03/07/09	Mon 06/07/09
12	Review Traffic Study	4 days	Wed 24/06/09	Mon 29/06/09	Wed 24/06/09	Mon 29/06/09
13	Prepare base plans	5 days	Mon 29/06/09	Fri 03/07/09	Mon 29/06/09	Fri 03/07/09
14	Obtain existing Utilities and Services info	23 days	Mon 06/07/09	Wed 05/08/09	Mon 06/07/09	Wed 05/08/09
15	New Tasks	48 days	Sat 16/05/09	Wed 22/07/09	Sat 16/05/09	Wed 22/07/09
16	Traffic Counts	7 days	Tue 14/07/09	Wed 22/07/09	Tue 14/07/09	Wed 22/07/09
17	Traffic Analysis	15 days	Sat 08/08/09	Fri 28/08/09	Sat 08/08/09	Fri 28/08/09
18	Drainage Assessmen	14 days	Tue 28/05/09	Fri 11/09/09	Tue 26/05/09	Fri 11/09/09
19	Review Drainage Assesment	47 days	Mon 06/07/09	Tue 08/09/09	Mon 06/07/09	Tue 08/09/09
20	Complete Stage 1 Archaeological Assessment	53 days	Fri 03/07/09	Tue 15/09/09	Fri 03/07/09	Tue 15/09/09
21	Complete Noise Assessment	48 days	Tue 23/06/09	Tue 15/09/09	Tue 23/06/09	Tue 15/09/09
22	Complete Natural Environment Assessment	46 days	Thu 25/06/09	Thu 03/09/09	Thu 25/06/09	Thu 03/09/09
23	Submit Project Schedule to Town for Review	1 day	Wed 08/09/09	Wed 09/09/09	Wed 09/09/09	Wed 09/09/09
24	Prepare Phase 1 Report	53 days	Thu 02/07/09	Mon 14/09/09	Thu 02/07/09	Mon 14/09/09
25	Town Review of Phase 1 Report	69 days	Fri 03/07/09	Thu 24/09/09	Fri 03/07/09	Thu 24/09/09
26	Finalize Phase 1 Report	260 days	Thu 24/09/09	Wed 22/09/10	Thu 24/09/09	Wed 22/09/10
27	Task- Phase 2	50 days	Mon 24/08/09	Fri 30/10/09	NA	NA
28	Identify Alternative Solutions	275 days	Mon 31/08/09	Fri 17/09/10	Mon 31/08/09	Fri 17/09/10
29	Environmental Inventory (Land Use)	270 days	Mon 31/08/09	Fri 10/09/10	Mon 31/08/09	Fri 10/09/10
30	Meeting with Town Staff	1 day	Thu 24/09/09	Thu 24/09/09	Thu 24/09/09	Thu 24/09/09
31	Prepare Cost Estimates	8 days	Wed 22/07/09	Thu 10/09/09	Wed 22/07/09	Thu 10/09/09
32	Assess Solution Evaluation Matrix	4 days	Fri 04/09/09	Wed 09/09/09	Fri 04/09/09	Wed 09/09/09
33	Select Recommended Option	1 day	Thu 24/09/09	Thu 24/09/09	Thu 24/09/09	Thu 24/09/09
34	Prepare Notice of PIC	1 day	Tue 29/09/09	Tue 29/09/09	Tue 29/09/09	Tue 29/09/09
35	Prepare PIC material	4 days	Wed 16/09/09	Mon 21/09/09	Wed 16/09/09	Mon 21/09/09
36	Meet with Town- Committee of the Whole	1 day	Tue 06/10/09	Tue 06/10/09	Tue 06/10/09	Tue 06/10/09
37	Publish Notice- Send to Review Agencies	6 days	Wed 14/10/09	Wed 21/10/09	Wed 14/10/09	Wed 21/10/09
38	Town Review of Traffic Analysis and PIC material	1 day	Tue 27/10/09	Tue 27/10/09	Tue 27/10/09	Tue 27/10/09
39	Hold PIC	1 day	Thu 29/10/09	Thu 29/10/09	Thu 29/10/09	Thu 29/10/09
40	Public Review Period	11 days	Fri 30/10/09	Fri 13/11/09	Fri 30/10/09	Fri 13/11/09
41	Review comments	1 day	Fri 30/10/09	Fri 30/10/09	Fri 30/10/09	Fri 30/10/09
42	Update Communications Plan	1 day	Fri 06/11/09	Fri 06/11/09	Fri 06/11/09	Fri 06/11/09
43	Prepare Phase 2 Report	47 days	Thu 01/10/09	Fri 04/12/09	Thu 01/10/09	Fri 04/12/09
44	Meet with Town - Public Works Commitee	1 day	Wed 18/11/09	Wed 18/11/09	Wed 18/11/09	Wed 18/11/09
45	Town Review of Phase 2 Report	9 days	Fri 04/12/09	Wed 16/12/09	Fri 04/12/09	Wed 16/12/09
46	Finalize Phase 2 Report	199 days	Thu 17/12/09	Tue 21/09/10	Thu 17/12/09	Tue 21/09/10
47	Task- Phase 3	65 days	Mon 19/10/09	Fri 15/01/10	NA	NA
48	Identify Alternative Design Option	16 days	Mon 19/10/09	Wed 11/11/09	Mon 19/10/09	Wed 11/11/09
49	Confirm Evaluation Criteria	34 days	Tue 27/10/09	Fri 11/12/09	Tue 27/10/09	Fri 11/12/09
50	Prepare Cost Estimates	34 days	Tue 27/10/09	Fri 11/12/09	Tue 27/10/09	Fri 11/12/09
51	Assess solutions - evaluation matrix	34 days	Tue 27/10/09	Fri 11/12/09	Tue 27/10/09	Fri 11/12/09
52	Select Technically Preferred Design	1 day	Fri 08/01/10	Fri 08/01/10	Fri 08/01/10	Fri 08/01/10
53	Prepare Notice of PIC	1 day	Thu 17/12/09	Thu 17/12/09	Thu 17/12/09	Thu 17/12/09
54	Prepare PIC Material	11 days	Mon 21/12/09	Mon 04/01/10	Mon 21/12/09	Mon 04/01/10
55	Meet with Town - Public Works Commitee	1 day?	Thu 14/01/10	Thu 14/01/10	Thu 14/01/10	Thu 14/01/10
56	Meet with Town - Committee of the Whole	0 days	Tue 02/02/10	Tue 02/02/10	Tue 02/02/10	Tue 02/02/10
57	Publish Notice - Send to Review Agencies	12 days	Tue 02/02/10	Wed 17/02/10	Tue 02/02/10	Wed 17/02/10
58	Hand deliver notice to adjacent properties	4 days	Tue 09/02/10	Fri 12/02/10	Tue 09/02/10	Fri 12/02/10
59	Hold PIC #2	1 day	Thu 18/02/10	Thu 18/02/10	Thu 18/02/10	Thu 18/02/10
60	Public Review Period	12 days	Thu 18/02/10	Fri 05/03/10	Thu 18/02/10	Fri 05/03/10
61	Review Comments	4 days	Mon 08/03/10	Thu 11/03/10	Mon 08/03/10	Thu 11/03/10
62	Update Communications Plan	1 day	Thu 11/03/10	Thu 11/03/10	Thu 11/03/10	Thu 11/03/10
63	Meet with Town - Public Works Commitee	1 day	Thu 25/03/10	Thu 25/03/10	Thu 25/03/10	Thu 25/03/10
64	Meet with Town - Public Works Commitee	1 day	Thu 29/04/10	Thu 29/04/10	Thu 29/04/10	Thu 29/04/10
65	Infiltration Study	1 day	Tue 04/05/10	Tue 04/05/10	Tue 04/05/10	Tue 04/05/10
66	ATR(Automatic Traffic Recording) Count	5 days?	Fri 14/05/10	Thu 20/05/10	Fri 14/05/10	Thu 20/05/10
67	Review Infiltration Study and ATR Count	9 days?	Mon 17/05/10	Thu 27/05/10	Mon 17/05/10	Thu 27/05/10
68	Prepare Notice of PIC #3	1 day	Wed 26/05/10	Wed 26/05/10	Wed 26/05/10	Wed 26/05/10
69	Publish Notice - Send to Review Agencies and meida	6 days	Wed 09/06/10	Wed 23/06/10	Wed 09/06/10	Wed 23/06/10
70	Prepare PIC Material	11 days	Thu 03/06/10	Thu 17/06/10	Thu 03/06/10	Thu 17/06/10
71	Hold PIC #3	0 days	Sat 26/06/10	Sat 26/06/10	Sat 26/06/10	Sat 26/06/10
72	Public Review Period	10 days	Sat 26/06/10	Fri 09/07/10	Sat 26/06/10	Fri 09/07/10
73	Review comments	5 days	Fri 09/07/10	Thu 15/07/10	Fri 09/07/10	Thu 15/07/10
74	Update Communications Plan	2 days	Wed 14/07/10	Thu 15/07/10	Wed 14/07/10	Thu 15/07/10
75	Meet with Town - Public Works Commitee	1 day	Thu 22/07/10	Thu 22/07/10	Thu 22/07/10	Thu 22/07/10
76	Prepare Phase 3 Report	191 days	Wed 11/11/09	Wed 04/08/10	Wed 11/11/09	Wed 04/08/10
77	Town Review of Phase 3 Report	4 days	Wed 11/08/10	Mon 16/08/10	Wed 11/08/10	Mon 16/08/10
78	Meet with Town - Public Works Commitee	1 day?	Thu 26/08/10	Thu 26/08/10	Thu 26/08/10	Thu 26/08/10
79	Finalize Phase 3 Report	9 days	Mon 16/08/10	Thu 26/08/10	Mon 16/08/10	Thu 26/08/10
80	Task- Phase 4	46 days	Mon 11/01/10	Mon 15/03/10	NA	NA
81	Prepare Drain ESR	15 days	Thu 26/08/10	Wed 15/09/10	Thu 26/08/10	Wed 15/09/10
82	Prepare Drain Notice of Completion	1 day	Mon 16/08/10	Mon 16/08/10	Mon 16/08/10	Mon 16/08/10
83	Present ESR to Town - Committee of the Whole	1 day	Thu 26/08/10	Thu 26/08/10	Thu 26/08/10	Thu 26/08/10
84	Revise Notice of Completion	1 day	Mon 20/09/10	Mon 20/09/10	Mon 20/09/10	Mon 20/09/10
85	Publish Notice - Send to Review Agencies	6 days	Wed 29/09/10	Wed 06/10/10	Wed 29/09/10	Wed 06/10/10
86	Public Review Period (30 days)	23 days	Wed 29/09/10	Fri 29/10/10	Wed 29/09/10	Fri 29/10/10
87	Review Comments	5 days	Mon 01/11/10	Fri 05/11/10	Mon 01/11/10	Fri 05/11/10
88	Update Communications Plan	1 day	Fri 05/11/10	Fri 05/11/10	Fri 05/11/10	Fri 05/11/10
89	Issue memo to MOE	1 day	Mon 08/11/10	Mon 08/11/10	Mon 08/11/10	Mon 08/11/10



APPENDIX B

Notice of Commencement and Related Letters

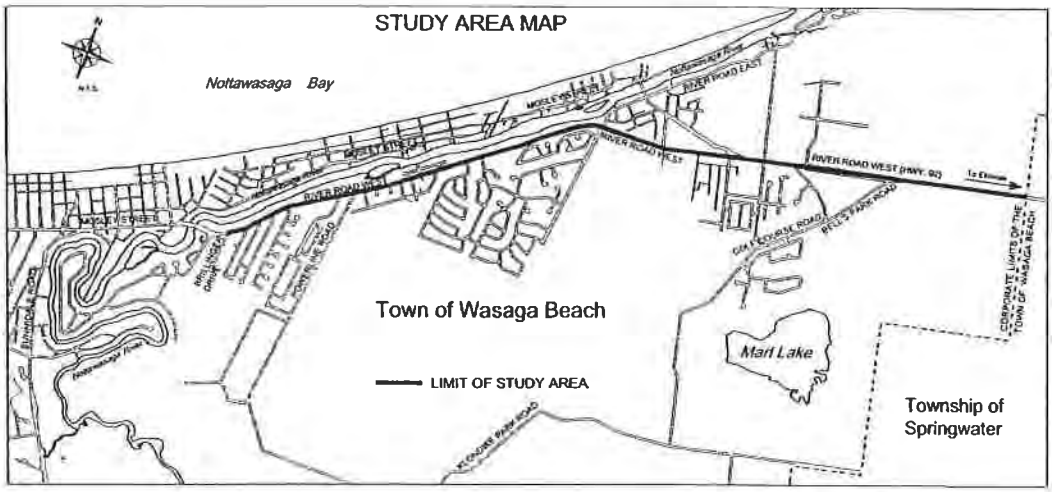
TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION FROM BRILLINGER DRIVE
TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The Town of Wasaga Beach is undertaking a study to address existing and future traffic congestion along River Road West from Brillinger Drive to the easterly limit of the Town. Based on studies completed between 1999 and 2007 the current annual average daily traffic (AADT) volume is within the maximum range (12,000 to 15,000 vehicles per day) for a two-lane roadway. Allowing for future growth-related traffic projections based on a 10-year forecast, the Town of Wasaga Beach has identified a traffic congestion problem in the area of River Road West from Brillinger Drive to the easterly limit of Town. In addition to addressing vehicular traffic issues, this Class EA planning process will recognize the fact that the Town is proceeding with an Active Transportation Plan Study, which will identify and possibly plan for the integration of active transportation components such as pedestrian, bicycle and public transit.

The Study Area is described as River Road West from Brillinger Drive to the easterly limit of the Town. The Service Area is considered to be the entire Town.

The limits of the Study Area are shown on the plan provided below.



This Class Environmental Assessment (EA) Study will follow the planning and design process for Schedule 'C' projects as described in the Municipal Class Environmental Assessment Document (October 2000 as amended in 2007), published by the Municipal Engineer's Association. Public input and comment on the problem, the Study Areas and the Service Area are invited for incorporation into the planning for any new transportation system upgrades. Comments will be received until June 12th, 2009. Two future Public Information Centres (PIC's) will be held to present solutions to the problem. A Notice will be issued prior to each PIC date.

If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Town or the Consultant undertaking the study.

This notice issued May 27th, 2009.

Mr. Jim McIntosh
Director of Public Works
30 Lewis Street
Wasaga Beach, Ontario
L9Z 1A1
Tel: (705) 429-2540
Fax: (705) 429-8226
Email: publicworksdirector@wasagabeach.com

Mr. Reid Mitchell, C.E.T.
Senior Technologist
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: mitchell@ainleygroup.com

May 8, 2008

File No. 109049

«Title» «First_Name» «Last_Name», «Title1»
«Agency»
«Address»
«Town», «Postal_Code»

Ref: **Town of Wasaga Beach**
River Road West Upgrade from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Study Commencement

Dear «Title» «Last_Name»:

We have been retained by the Town of Wasaga Beach to document a Class EA planning process to address traffic congestion along River Road West from Brillinger Drive to the easterly limit of the Town. Please see the attached copy of the Notice of Study Commencement, which will appear in the local newspaper on _____ and _____, 2009.

Please contact the undersigned if you have any comments or questions with respect to this Notice.

Yours truly

AINLEY & ASSOCIATES LIMITED

Reid Mitchell, CET
Encl.

cc: Jim McIntosh, Director of Public Works

RM/wlp/S:\109049\Reports\review agencies letter.doc

Title	First Name	Last Name	Title	Agency	Address	Town	Postal Code
Mr.	George	Vadeboncoeur	CAO	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Ray	Kelso	Manager of Planning & Development	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Jim	McIntosh	Director of Public Works	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Mike	McWilliam	Fire Chief	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Wayne	Wilson	CAO	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Glenn	Switzer	Director of Engineering	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Ms.	Peggy	Young	Senior Planner	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Graham	Findlay	Area Biologist	Ministry of Natural Resources	2284 Nursery Road	Midhurst, ON	L0L 1X0
Mr.	John	Fisher	Park Superintendent	Wasaga Beach Provincial Park (MNR)	11-22nd Street, North	Wasaga Beach, ON	L9Z 2V9
Mr.	Chris	Hyde	District Manager	Ministry of the Environment	54 Cedar Pointe Drive, Unit 1203	Barrie, ON	L4N 5R7
Ms.	Chunmei	Liu	Environmental Assessment and Planning	Ministry of the Environment	5775 Yonge Street, 8th Floor	North York, ON	M2M 4J1
Mr.	Winston	Wong	Heritage Planner	Ministry of Culture	400 University Aven. 4th Floor	Toronto, ON	M7A 2R9
				Ministry of Labour	400 University Aven.	Toronto, ON	M7A 1T7
Mr.	Paul	Trace	Manager Planning & Technical Services	Wasaga Distribution	950 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Colin	Bonnell	Manager Access Network	Bell Canada	2nd Fl. 136 Bayfield Street	Barrie, ON	L4M 3B1
Mr.	Bernie	Cyr	System Planner	Rogers Cable Systems	1 Sperling Dr., Box 8500	Barrie, ON	L4M 6B8
Ms.	Diedre	Broude	Manager	Enbridge Gas	500 Consumers Rd.	North York, ON	M2J 1P8
Mr.	Luke	Cechetto	Const. (Existing Dev.)	Enbridge Gas	10 Churchill Drive	Barrie, ON	L4N 8Z6
Const.	Mark	Kinney	Community Policing Officer	Ontario Provincial Police	1000 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Wayne	White		Ontario Clean Water Agency	100 Woodland Drive	Wasaga Beach, ON	L9Z 2V4
Mr.	Surrinder	Singh Gill	Policy Advisor	Ministry of Aboriginal Affairs	720 Bay Street, 4th Floor	Toronto, ON	M5G 2K1
	C.	O'Meara	Bayfield Institute	Dept. of Fisheries & Oceans	867 Lakeshore Road, Box 5050	Burlington, ON	L7R 4A6
Ms.	Miranda	Lesperance	Environmental Officer, Ontario Region	Indian & Northern Affairs Canada	25 St. Clair Ave., E., 8th Floor	Toronto, ON	M4T 1M2
			Administrative Office	Chiefs of Ontario	111 Peter Street, Suite 804	Toronto, ON	M5V 2H1
				Metis Nation of Ontario	500 Old St. Patrick St., Unit 3	Ottawa, ON	K1N 9G4
			Trebla Building	Assembly of First Nations	473 Albert St., Suite 810	Ottawa, ON	K1R 5B4
Mr.	Dave	Simpson		Mississaugas of Alderville First Nation	P.O. Box 4	Roseneath, ON	K0K 2X0
			Cedar Point Post Office	Chippewas of Beausoliel First Nation		via Penetanguishene,	L0K 1P0
				Chippewas of Georgina Island	RR#2, Box 12	Sutton West, ON	L0E 1R0
				Moose Deer Point First Nation	P.O. Box 119	Mactier, ON	P0C 1H0
				Mnjikaning First Nation	5884 Rama Road, Suite 200	Rama, ON	L0K 1T0
Ms.	Kelly	LaRocca	Councillor	Mississaugas of Scugog	RR#5, 22521 Island Road	Port Perry, ON	L9L 1B6
				Curve Lake First Nation	Curve Lake Post Office	Curve Lake, ON	K0L 1R0
				Wahta Mohawk	P.O. Box 327	Bala, ON	P0C 1A0
Ms.	Wanda	McGonigle		Ojibways of Hiawatha First Nation	RR#2	Keene, ON	K0L 2G0
Mrs.	Heather	Bastien		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Mr.	Luc	Lainé		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Chief	Kris	Nahrgang		Kawartha Nishnawbe First Nation		Lakefield, ON	
Chief	Bryan	LaForme		Mississaugas of the New Credit	2789 Mississauga Road, RR#6	Hagersville, ON	N0A 1H0

Reid Mitchell 109049

From: Patti Young [pyoung@nvca.on.ca]
Sent: June 4, 2009 2:53 PM
To: Reid Mitchell
Subject: RE: Class EA, River Road west from Brillinger Dr. to eastern limit of Town

Thanks Reid, we look forward to receiving the report on the natural environment review.

Patti

From: Reid Mitchell [mailto:mitchell@ainleygroup.com]
Sent: Thursday, June 04, 2009 2:50 PM
To: Patti Young
Cc: Norman Sandberg; Mike Neumann; Kevin Lalonde
Subject: RE: Class EA, River Road west from Brillinger Dr. to eastern limit of Town

Patti. We will do that. We are still in Phase 1, arranging our background reviews of the Natural Environment, Geotechnical, Archaeological (Heritage) and Noise. We will keep you informed.

Regards,

Reid Mitchell, C.E.T.
Senior Environmental Technologist
Ainley Group, Collingwood
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Email: mitchell@ainleygroup.com
Phone: 705-445-3451 Ext.135
Cell: 444-4837
Fax: 705-445-0968

-----Original Message-----
From: Patti Young [mailto:pyoung@nvca.on.ca]
Sent: June 4, 2009 2:32 PM
To: Reid Mitchell
Subject: Class EA, River Road west from Brillinger Dr. to eastern limit of Town

Good afternoon Reid,
This EA covers areas that are regulated by NVCA due to presence of watercourses and associated hazards and environmental areas, and wetland setback area. There is a particularly large natural area between Blueberry Trail and Westbury Road. Please keep NVCA informed of study progress.

Regards,
Patti Young

Patti Young, B.Sc.
Senior Planner

Ministry of the Environment
5775 Yonge Street
8th Floor
North York ON M2M 4J1

Ministère de l'Environnement
5775, rue Yonge
8e étage
North York ON M2M 4J1

Technical Support
Central Region

Appui technique
Région du Centre

Tel: (416) 326-6700
Fax: (416) 325-6345

Ontario

May 28, 2009

File: EA05-02-05

Jim McIntosh
Director of Public Works
Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, Ontario L9Z 1A1

RE: River Road West Urbanization from Brillinger Drive to Easter Town Limits
Town of Wasaga Beach
Class Environmental Assessment
Notice of Study Commencement

The Ministry of the Environment (MOE) has received your Notice of Study Commencement for the above noted Environmental Assessment (EA) undertaking. This response acknowledges that the study is following the approved environmental planning process for a Schedule C project under the *Municipal Engineers Association Municipal Class Environmental Assessment* (Class EA).

Based on the information submitted, the MOE Central Region is providing the general comments to assist you and your project team members in effectively addressing the following issues:

- Ecosystem Protection and Restoration
- Surface Water and Groundwater
- Dust and Noise
- Servicing and Facilities
- Waste Materials and Spills
- Mitigation and Monitoring
- Planning and Policy
- Class EA Process
- Aboriginal Peoples Consultation

Ecosystem Protection and Restoration

Any impacts to ecosystem form and function must be avoided where possible. The Environmental Assessment Report (ESR) should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

All natural heritage features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The MOE's records confirm that the following sensitive environmental features are located within or adjacent to the study area:

- Areas of Natural and Scientific Interest (ANSIs)
- Rare Species of Flora or Fauna
- Wetlands
- Watercourses
- Woodlots

The ESR must include a sufficient level of information to demonstrate that there will be no negative impacts on these environmental features. The MOE also recommends consulting with the Ministry of Natural Resources (MNR), Fisheries and Oceans Canada (DFO) and your local conservation authority

be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

Any potential approval requirements for groundwater taking or discharge should be identified in the ESR. In particular, a Permit to Take Water (PTTW) under the *Ontario Water Resources Act* will be required for any water takings that exceed 50,000 litres per day. A PTTW application must be accompanied by an assessment of potential effects as noted above, and may require a higher level of detail than what is provided in the ESR. Please note that when significant long-term water taking is proposed, the maximum rate identified in the ESR must not be exceeded in any subsequent PTTW applications. For more information on the application and approval process, The MOE suggests you refer to the MOE *Permit to Take Water Manual* (April 2005).

Dust and Noise

Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities. If dust suppressants are proposed to be used, The MOE recommends the use of non-chloride based compounds to protect water quality.

Servicing and Facilities

Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have a Certificate of Approval before it can operate lawfully. Please consult with the Environmental Assessment and Approvals Branch to determine whether a new or amended Certificate of Approval will be required for any proposed infrastructure.

The MOE recommends referring to the MOE's "D-Series" guidelines – *Land Use Compatibility* to ensure that all applicable Ministry procedures are followed in planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

Waste Materials and Spills

All waste generated during construction must be disposed of in accordance with the MOE's requirements.

The EPA and Regulation 347 in particular, require waste to be classified and disposed of appropriately. Waste is to be transported by haulers who have a Certificate of Approval – Waste Management System. Where waste is other than solid non-hazardous, the generator requires a Generator Registration Number from the MOE and has obligations regarding manifesting of waste. When determining the waste category, the proponent must ensure compliance with Schedule 4 of Regulation 347. This would include construction waste, as well as any excavated materials.

Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with Part XV.1 of the *Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. The MOE recommends contacting the MOE's Barrie District Office for further consultation if contaminated sites are present.

Please include in the ESR a list of all subsequent permits or other approvals that may be required for the implementation of the preferred alternative, including Permits to Take Water, Certificates of Approval or other ministerial approvals, approval under the *Canadian Environmental Assessment Act* (CEAA), and conservation authority permits.

Please note that the MOE's guidelines and other information related to the issues noted above are available at www.ene.gov.on.ca under the publications link. The MOE encourages you to review all the available guides and to reference any relevant information in the ESR.

Aboriginal Peoples Consultation

Please note that as part of the required stakeholder and agency consultation, you are advised to contact the Ministry of Aboriginal Affairs and the Department of Indian and Northern Affairs to determine potentially affected Aboriginal Peoples in the project area. Please refer to the website http://www.ene.gov.on.ca/en/eaab/aboriginal-resources.php for a list of appropriate government contacts.

Once identified, you are advised to provide notification directly to the Aboriginal Peoples who may be affected by the project and provide them with an opportunity to participate in any planned public consultation sessions and comment on the project.

Thank you for the opportunity to comment on this project. Please ensure that the MOE's Central Region, **EA and Planning Coordinator**, is placed on the project mailing list and submit this office the copies of any PIC materials and handouts as well as the Notice of Completion when completed.

Should you or any members of your project team have any questions regarding the above, please feel free to contact me at (416) 326-4886 or via an email: Chunmei.Liu@ontario.ca. Myself or any of Central Region's EA and Planning Coordinators would be pleased to assist you.

Yours truly,

Chunmei Liu
Environmental Assessment and Planning Coordinator
Air, Pesticides and Environmental Planning

c. C. Hood, Manager, Barrie District Office, MOE
R. Mitchell, Ainley & Associates Limited
Central Region EA File
A & P File

Reid Mitchell

1090491

From: PMDU, DataRequests (MAA) [DataRequests.PMDU@ontario.ca]
Sent: June 4, 2009 12:56 PM
To: PMDU, DataRequests (MAA)
Subject: Request to update your mailing list to send - EA notifications and invitations to Public Information Centres
Importance: High

Kindly update your mailing list to reflect that Surinder Singh Gill is no longer responsible for Environmental Assessment (EA) notifications.

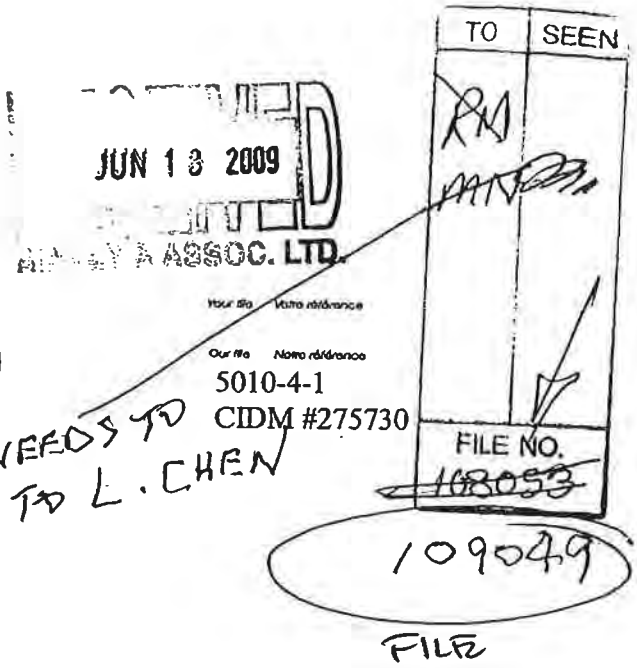
Please mail all Notifications of EA study projects or any Invitations to Public Information Centres or public meetings to:

Martin Rukavina
Advisor
Ministry of Aboriginal Affairs
Aboriginal and Ministry Relationships
160 Bloor Street East, 9th Floor
Toronto ON M7A 2E6

Please acknowledge the receipt of this mail and contact us via email if you have any questions or concerns.

Thank you
Performance Measures & Data Unit
Strategic Policy & Planning Division
Ministry of Aboriginal Affairs

Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada



June 10, 2009

Reid Mitchell, CET
Ainley and Associates Limited
280 Pretty River Parkway,
Collingwood, ON.
L9Y 4J5

Dear Reid Mitchell:

RE: Town of Wasaga Beach
River Road West Upgrade from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Study Commencement

Thank you for your correspondence of May 19, 2009 regarding the above mentioned project. Indian and Northern Affairs Canada will not be providing a review of the proposed project; however, it is important to contact all potentially interested First Nation communities directly to invite them to participate in this review.

To assist with identifying First Nations and other Aboriginal groups within the vicinity of a specific proposed project, INAC Ontario Region - Environment can provide the following information sources:

- The Chiefs of Ontario website (http://www.chiefs-of-ontario.org) provides a directory of contact information for all First Nations and Chiefs, as well as a map of the locations of all Ontario First Nations.

- Natural Resources Canada produced provincial maps, showing all First Nation reserve lands, are available for purchase at:
http://cccm.nrcan.gc.ca/english/canada_lands_index_e.asp

- Natural Resources Canada's online *Historical Indian Treaties* map, showing historical First Nation treaties across Canada, is available at:
http://atlas.nrcan.gc.ca/site/english/maps/historical/indiantreaties/historicaltreaties

- A search by place name at the Canadian Geographical Names database (http://geonames.nrcan.gc.ca/search/search_e.php) will generate a map which shows any nearby Indian reserve lands in grey.

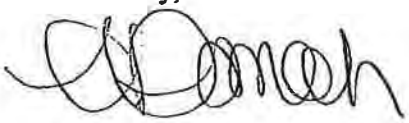
- The Métis Nation of Ontario (http://www.metisnation.org/) may be able to provide information regarding Métis interests with respect to a particular project.

- The Ontario Federation of Indian Friendship Centres website provides a list of all friendship centres in Ontario, at: http://www.ofifc.org/Centres/OfficeList.asp?Region='ON'

For any enquiries regarding land claims in within the project area, please contact Lynn Bernard, Director General of the Comprehensive Claims Branch at (819) 994-7521; Ralph Brant, Director General of Specific Claims Branch at (819) 994-2323 and Franklin Roy, Director General of Litigation Management and Resolution Branch at (819) 997-3582.

Also, please review the *Environmental Assessment and Federal Coordination Standards* document included with this letter for the revised policy and standards associated with both provincial and federal environmental assessments.

Sincerely,



April Desmoulin
Jr. Environmental Officer
Environment Unit
INAC - Ontario Region
100 Anemki Drive – Suite 101
Thunder Bay, Ontario P7J 1A5

Canada

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

June 10, 2009

Your File Votre référence

Our File Notre référence
5010-1
#275033

To Whom It May Concern:

RE: Environmental Assessment and Federal Coordination Standards
Indian and Northern Affairs Canada – Ontario Region

The Ontario Region of Indian and Northern Affairs Canada (INAC) has a 30 calendar day standard for responding to environmental assessment notifications, including federal coordination requests (FCRs) under the Canadian Environmental Assessment Act, as well as other environmental assessment correspondence relating to provincial and municipal undertakings. However, correspondence being directed to people who are no longer with the Department or who occupy a different position within the Department as well as misdirected mail can cause significant delays in this response time.

To resolve this issue, INAC has established a new procedure that we request your organization adopt when sending environmental assessment correspondence. All unsolicited correspondence concerning environmental assessment requests and notifications that are taking place within the Province of Ontario should be directed to:

Environment Unit
Re: Environmental Assessment Coordination
Indian and Northern Affairs Canada
25 St. Clair Avenue East, 8th Floor
Toronto, Ontario, M4T 1M2

INAC has also created a centralized email address where we accept FCRs and other environmental assessment notifications. This address is EACoordination_ON@inac-ainc.gc.ca.

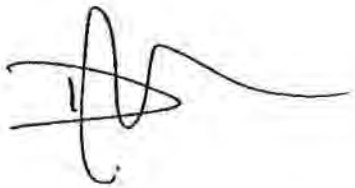
Letters should be dated and project bulletins should have a covering page that includes the date and the intended recipient. Please keep in mind that just one letter should be sent to the Department regardless of geographical location of the project and that this letter should be addressed to the appropriate recipient mentioned above.

Also, please ensure that notifications are sent within a practicable time frame, particularly when involving invitation to public consultation events.

Questions or comments can be directed to Daniel Johnson at 416-973-5899 or via email at johnsonda@inac.gc.ca.

Thank you for your cooperation.

Sincerely,



Daniel Johnson
Environmental Officer
Environmental Services Unit
Ontario Region

25 St. Clair Avenue E. 8th Floor
Toronto, Ontario M4T 1M2
T: 416-973-5899
F: 416-954-4328
E: daniel.johnson@inac-ainc.gc.ca

Canada

Assembly of First Nations

473 Albert Street, Suite 810
Ottawa, Ontario K1R 5B4
Telephone: 613-241-6789 Fax: 613-241-5808
www.afn.ca

Assemblée des Premières Nations

473, rue Albert, pièce 810
Ottawa (Ontario) K1R 5B4
Téléphone: 613-241-6789 Télécopieur: 613-241-5808
www.afn.ca

TO | SEEN

FILE NO. 109049

RECEIVED JUL 29 2009 AINLEY & ASSOC. LTD.

July 14th, 2009

Mr. Reid Mitchell, C.E.T.
Senior Technologist
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON, L9Y 4J5

Dear Mr. Reid:

Re: Town of Wasaga Beach
River Road West Upgrade from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Study Commencement

The Assembly of First Nations (AFN) is in receipt of your letter received on May 26th, 2009 regarding the Notice of Study Commencement for the River Road West Upgrade from Brillinger Drive to Eastern Town Limits. The AFN is a national representative organization of over 630 First Nation's communities in Canada. The AFN is designed to present the views of the various First Nations through their leaders in areas such as: Aboriginal and Treaty Rights, Economic Development, Education, Languages and Literacy, Health, Housing, Social Development, Justice, Taxation, Land Claims, Environment, and a whole array of issues that are of common concern. First Nation leaders meet quarterly to set national policy and direction through resolution.

Please be advised that the AFN functions only as a representative organization. As such, the organization cannot be construed as a government, agent, principle, administrator and/or contractor for any of the First Nation communities who are members of the AFN. As AFN does not have any entitlement to the lands in question and cannot speak on behalf of the First Nation communities in your area, we are not in a position to provide any comments on the Notice of Study Commencement for the River Road West Upgrade from Brillinger Drive to Eastern Town Limits.

I would recommend that you provide the information you have given the AFN to the First Nation communities in the vicinity of the Town of Wasaga Beach. You should also

.../2

personally contact the First Nation communities in the area to provide them with more detailed information. It is these First Nation communities who may be impacted by the Notice of Study Commencement for the River Road West Upgrade from Brillinger Drive to Eastern Town Limits, and/or may have outstanding land claims in the area and/or may use this area for traditional harvesting activities. I have provided a list of the First Nation communities in the area for your reference as an attachment to this letter.

Please be advised that the Supreme Court of Canada has recently issued a number of judgments that provides clarity on the duty to consult and accommodate. In *Haida Nation v. British Columbia (Minister of Forests) and Weyerhaeuser* the Supreme Court held that there is a duty to consult and accommodate where there is knowledge of the potential existence of an Aboriginal right or title and conduct that may adversely affect it. Furthermore, the Supreme Court held in *Taku River Tlingit First Nation v. British Columbia* that where the potential for negative derivative impact on aboriginal claims is high, First Nations are entitled to something significantly deeper than minimal consultation and to a level of responsiveness that can be characterized as accommodation.

It is in the nature of respect for the first peoples that consultation and accommodation should be pursued. I commend your association for being proactive in attempting to inform us of your plans. I would strongly recommend that you please offer this courtesy to the First Nation communities in your area.

Sincerely,

Stuart Wuttke
Acting Director, Environmental Stewardship Unit

First Nation Communities in the Vicinity of the Town of Wasaga Beach

Chippewas of Georgina Island
RR2, PO Box 13
Sutton West, ON, L0E 1R0
Phone: (705) 437-1337

Chippewas of Mnjikaning First Nation (Rama)
5884 Rama Road
Suite 200 Rama, ON, L0K 1T0
Phone: (705) 325-3611

Beausoleil First Nation
1 Ogema Street
Christian Island, ON, L0K1C0
Phone: (705) 247-2051

Chippewas of Nawash Unceded First Nation
R.R. 5
Wiarton, ON, N0H 2T0
Phone: (519) 534-1689

Saugeen First Nation
Highway #21, R.R. #1
Southampton, ON, NOH 2LO
Phone: (519) 797-2781

Wahta Mohawk First Nation
Box 260
Bala, ON, P0C 1A0
Phone: (705) 762-2354

Upper Mohawk First Nation
c/o Six Nations of the Grand River
P.O. Box 5000
Ohsweken, ON, N0A 1M0
Phone: (519) 445-2201
Fax: (519) 445-4208

Moose Deer Point First Nation
P. O. Box 119
3719 Twelve Mile Bay Road
Mactier, ON, P0C 1H0

Beausoleil First Nation
One O-Gema Street
Christian Island, ON
L0K 1C0
705-247-2051 Fax: 705-247-2239 Email: acopegog@chimnissing.ca

TO	SEEN
DM DR	
AC	LC
File	
FILE NO. 109049	

August 20, 2009

Ainley & Associates Limited
280 pretty River Parkway,
Collingwood, Ontario,
L9Y 4J5

Attention: Mr. Mike Neuman, P. Eng

RE: Town of Wasaga Beach - Class Environmental Assessment

This to acknowledge receipt of your letter dated August 6, 2009, received on August 12, 2009.

A copy of your letter has been forwarded to Karry Sandy, Barrister/Solicitor, and Coordinator for the Williams Treaty First Nations for further review and response directly to you. Ms Sandy's address is 8 Creswick Court, Barrie, ON, L4M 2J7 and her telephone number is (705) 792, 5087.

We appreciate your taking the time to share this important information with us.

Sincerely

Jennifer Copegog

Jennifer Copegog
Lands Manager
Beausoleil First Nation

June, 2009

ZTOO	SEEN
RM	
MN	DS
FILE NO.	
109099	

Mr. Reid Mitchell
Ainley & Associates
Collingwood

Dear Reid:

I am writing in regard to the River Rd. W. assessment.

Being a resident on this road at #1700, River Rd W., I recognize a few key features that would be strongly desireable.

1. a defined (curbed?) walkway
2. a defied, (not curbed) with a line on the lane, bicycle path. This bicycle lane should not be less then 1 m. wide & one way only, alongside the same direction as the cars
3. three lanes for cars
   a) two for regular traffic
   b) 1 for turning only

I strongly believe that residents on the south side of the river need "human friendly" as opposed to "car friendly" conditions on the one road that gives them east-west access

to our commercial + tourist parts of town. If we don't do a good jot of making this roadway safe & enjoyable for pedestrians + bicycles, we will doom our town to decades of "car only culture".

Thank you for your attention and for keeping me informed of developments re the River Rd. W. Study.

Yours sincerely,

[redacted]

[redacted]

1700 River Rd W
Wasaga Beach
Ont L9Z 2S2

705 429 2349

June 25, 2009

To Whom It May Concern:

RE: THE WIDENING OF RIVER ROAD WEST

I am concerned about the amount of traffic that will converge at River Road and Brillinger Drive. It is difficult now to make a left turn from my street when I leave in the morning for work.

It's going to be a nightmare for me to make the same turn with all of the traffic.

What about all the noise and pollution at the end of the street?

I really can't see how this is going to be beneficial in reducing traffic!

Yours truly,

[redacted]

42 Brillinger Drive
Wasaga Beach, ON
L9Z 1L4

Ainley GROUP CONSULTING ENGINEERS PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

November 23, 2009

File No. 109049

Technical Support
Central Region
Ministry of the Environment
5775 Young Street, 8th Floor
North York, Ontario
M2M 4J1

Attn: Chunmei Liu
Environmental Assessment and Planning Coordinator
Air, Pesticides and Environmental Planning

Ref: Town of Wasaga Beach
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment

Dear Ms. Liu:

Thank you for your correspondence pertaining to the above noted Class Environmental Assessment (EA) for River Road West in the Town of Wasaga Beach. We have noted your concerns and will ensure that your comments are addressed in completing the Environmental Study Report.

In the interim, we wish to respond to your comments. Our responses to your comments are as follows:

Ecosystem Protection and Restoration

For the River Road West option, all proposed works will be within an existing road allowance. The existing ecosystem can be described as the existing River Road West ROW. A Stage 1 Archaeological Assessment was completed by Archaeological Research Associates Ltd in August 2009. No registered archaeological site was found within the study area. The Archaeological Report has been submitted to the Ministry of Culture for review.

In addition, a Natural Environment Existing Conditions Assessment was undertaken by Azimuth Environmental Consulting Inc. to identify terrestrial and aquatic resources. The Report documented the existing conditions and a more detailed report (Natural Environmental Impact Assessment) will be prepared following identification of design options (Phase 3 of the EA).

There are no significant Woodlands or Valley Lands on or adjacent to the study area. However, the Wasaga Dunes Life Science Area of Natural and Scientific Interest, the Wasaga Backland Park Reserve Earth Science Area of Natural and Scientific Interest, and a portion of the Wasaga Beach Provincially Significant Wetland Complex are within 30 metres of the existing road and right-of-way in the wooded area to the south of River Road West, east of Blueberry Trail. This wooded area and the mixed forest area at the Powerline Road intersection have been identified as Significant Habitat for a Sensitive Snake Species and as potential deeryard. Proposed work within these areas will be subject to approval from the DFO and the NVCA.

The ESR will be prepared with due regard to the Official Plan Policies (Clause 4.5 of the Simcoe County OP and Section 13 of the Wasaga Beach OP) and will discuss the future level of growth with respect to traffic volumes. The proposed improvements to River Road West have been planned to accommodate growth and will alleviate traffic congestion and enhance safety.

Surface Water and Groundwater

MOE Guideline B-6 (January 1995) will be reviewed with respect to proposed work within and near the small watercourse that flows north-south beneath River Road West at the eastern limits of the study area (between Bell's Park Road and Vigo Road). Sediment and Erosion Control Measures will be identified as necessary. These will be required to be designed to prevent deposition during and after construction.

The small watercourse supports warm water baitfish. Loss of fish habitat is not anticipated. The NVCA will be identified to be contacted prior to final design to determine mitigation measures during and after the construction.

It is recognized that the widening of River Road West will result in an increased pavement surface area which will add stormwater runoff to the River. We will indicate that the final design will be required to include stormwater collection and treatment facilities in accordance with the MOE's Design Manual.

There may be private wells in the area. It is noted that the area from Brillinger Drive to Bell's Park Road is served by municipal water service. As part of the EA, we will recommend that water services be provided for the area from Bell's Park Road to the eastern Town limits and, thus, impacts to groundwater as a result of construction would be minimal. Any potential impacts can be mitigated.

We will indicate in the Environmetnal Study Report (ESR) that a Spills Contingency Plan will be a requirement of the contractor.

During construction, groundwater taking or discharge may be required. We will indicate that an MOE Permit to Take Water may be required.

Dust and Noise

Dust production during construction will be mitigated using water.

Noise mitigation measures during construction will include restrictions on times of construction. The Noise Assessment determined that the net increase in the sound levels would be approximately 2dB if the road is widened to 4-lane (worse case scenario) 10 years after project completion assuming in 2021. Our noise consultant J.E. Coulter and Associates noted that the potential increment in sound levels attributable to implementation of the project is insignificant, and mitigation measures are not required to satisfy MTO/MOE protocol as the implementation of the project does not increase the sound level by 5dB or more.

The ESR will indicate that construction mitigation measures for both noise and dust will be included in the final design.

Servicing and Facilities

This component of the MOE's letter does not apply to this Project.

Waste Materials and Spills

There may be some removal of topsoil as a result of the construction. The ESR will indicate that any waste generated during construction should be disposed of in accordance with MOE requirements.

There are no existing waste disposal sites within the proposed work area.

The ESR will include all existing underground utilities identified and they will be shown on the Preliminary Drawings.

Based on knowledge of the area, the presence of underground storage tanks within the proposed site of the works (Road Allowance) is not anticipated.

Mitigation and Monitoring

The MOE's requirements for mitigation and monitoring will be addressed as part of the final design. Environmental impacts and mitigation measures will be identified in the Environmental Study Report.

Construction monitoring will include the following:

- monitoring of sediment and siltation mitigation measures
- updating spills containment measures and facilities
- dust control measures
- presence of contaminated soils.

A post-construction assessment of surface water collection and treatment facilities will be undertaken.

Planning and Policy

Provincial Policy Statements will be reviewed as part of the EA.

The provision of a widened River Road west will support growth.

Class EA Process

The Class EA planning process meets the requirements of the MEA Class EA Document and the Environmental Study Report will provide documentation of the process. A list of the subsequent permits and other approvals will be included in the Environmental Study Report.

First Nations Consultation

To date, the following review agencies have been advised of the project:

- Department of Indian and Northern Affairs
- Ministry of Aboriginal Affairs
- Chiefs of Ontario
- Metis Nation of Ontario
- Assembly of First Nations
- Mississaugas of Alderville First Nation
- Chippewas of Beausoleil First Nation
- Beausoleil First Nation
- Williams Treaty First Nations
- Chippewas of Georgian Island
- Chippewas of Nawash Unceded First Nation
- Moose Deer Point First Nation
- Mnjikaning First Nation
- Mississaugas of Scugog
- Saugeen First Nation
- Curve Lake First Nation
- Wahta Mohawk
- Upper Mohawk First Nation
- Ojibways of Hiawatha First Nation

- Huron Wendat Council
- Kawartha Nishnawbe First Nation
- Mississaugas of the New Credit

To date, we have not received any responses.

We will also continue to keep you informed as the project develops and be sure to forward the material that you requested when completed.

Please contact the undersigned if you have any further concerns or questions with respect to this project.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Jim McIntosh, Director of Public Works

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Ainley CONSULTING ENGINEERS PLANNERS

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280 Pretty River Parkway, Collingwood, ON L9Y4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

August 6, 2009

File #109049

Beausoleil First Nation
1 Ogema Street
Christian Island, Ontario
L0K 1C0

Ref: Town of Wasaga Beach
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Study Commencement

Dear Sir or Madam:

We have been retained by the Town of Wasaga Beach to document a Class EA planning process to address traffic congestion along River Road West from Brillinger Drive to the easterly limit of the Town. Please see the attached copy of the Notice of Study Commencement, which appeared in the local newspaper on May 27th and June 3rd, 2009.

The Notice has been sent to the Assembly of First Nations in Ottawa on May 19, 2009. We received their response on July 29, 2009. They recommended that we provide the notice to you as well.

Please note that Mr. Reid Mitchell is no longer available for this project due to his workload. Please contact the undersigned if you have any comments or questions with respect to this project.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.
cc: Jim McIntosh, Director of Public Works
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Email: collingwood@ainleygroup.com

August 6, 2009

File #109049

Chippewas of Nawash Unceded First Nation
R.R. 5
Wiarton, Ontario
N0H 2T0

Ref: Town of Wasaga Beach
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Study Commencement

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Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.
cc: Jim McIntosh, Director of Public Works
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Email: collingwood@ainleygroup.com

August 6, 2009

File #109049

Saugeen First Nation
Highway #21, R.R. #1
Southampton, Ontario
N0H 2L0

Ref: Town of Wasaga Beach
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Study Commencement

Dear Sir or Madam:

We have been retained by the Town of Wasaga Beach to document a Class EA planning process to address traffic congestion along River Road West from Brillinger Drive to the easterly limit of the Town. Please see the attached copy of the Notice of Study Commencement, which appeared in the local newspaper on May 27th and June 3rd, 2009.

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Please note that Mr. Reid Mitchell is no longer available for this project due to his workload. Please contact the undersigned if you have any comments or questions with respect to this project.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.
cc: Jim McIntosh, Director of Public Works
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Ainley CONSULTING ENGINEERS PLANNERS

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Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

August 6, 2009

File #109049

Upper Mohawk First Nation
c/o Six Nations of the Grand River
P.O. Box 5000
Ohsweken, Ontario
N0A 1M0

Ref: Town of Wasaga Beach
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Study Commencement

Dear Sir or Madam:

We have been retained by the Town of Wasaga Beach to document a Class EA planning process to address traffic congestion along River Road West from Brillinger Drive to the easterly limit of the Town. Please see the attached copy of the Notice of Study Commencement, which appeared in the local newspaper on May 27th and June 3rd, 2009.

The Notice has been sent to the Assembly of First Nations in Ottawa on May 19, 2009. We received their response on July 29, 2009. They recommended that we provide the notice to you as well.

Please note that Mr. Reid Mitchell is no longer available for this project due to his workload. Please contact the undersigned if you have any comments or questions with respect to this project.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.
cc: Jim McIntosh, Director of Public Works
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Ainley GROUP CONSULTING ENGINEERS PLANNERS

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Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

August 18, 2009

File #109049

Assembly of First Nations
473 Albert Street, Suite 810
Ottawa, Ontario
K1R 5B4

Attn: Stuart Wuttke
Acting Director, Environmental Stewardship Unit

Ref: Town of Wasaga Beach
River Road West Class Environmental Assessment

Dear Mr Wuttke:

Thank you for your response letter dated July 14, 2009. We received your letter on July 29, 2009. In your letter, you recommended us to provide the Notice of Study Commencement to the First Nation communities in the vicinity of the Town of Wasaga Beach and you also provided us a list of these First Nation communities.

Of the eight (8) First Nation communities listed in your letter, four (4) were already in our mailing list, and thus we had sent them the Notice of Study Commencement in May. For the rest four (4) First Nation communities, we have sent them the Notice of Study Commencement and added them to our mailing list after we received your letter.

Please note that Mr. Reid Mitchell is no longer available for this project due to his workload. Please contact the undersigned if you have any comments or questions with respect to this project.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
cc: Jim McIntosh, Director of Public Works
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LLC

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario L4N 8Z7
Tel: (705) 726-3371 • Fax: (705) 726-4391
E-mail: barrie@ainleygroup.com

July 7, 2009

File No. 109049

[redacted]
1700 River Road West
Wasaga Beach, Ontario
L9Z 2S2

Ref: **Town of Wasaga Beach**
River Road West Class EA

Dear Mr. [redacted]

As Project Managers for the River Road West Class EA, we are responding to your letter dated June 2009, received on June 30, 2009 (copy attached). We have responded to your comments in the order presented in your letter.

1. As per the 2008 Wasaga Beach Active Transportation Plan, River Road West is identified as one of the sidewalk routes and should provide sidewalks on both sides of the street. Sidewalks will be one of the key components considered in Phase 3 – Alternative Design Concepts for Preferred Solution of this Class EA, should upgrading River Road West be selected as the preferred solution.

2. The 2008 Active Transportation Plan also identified River Road West as bicycle route. Bike lanes on both sides of the road are suggested in the Plan. Similarly, bike lanes will be considered in Phase 3 of this Class EA, should upgrading River Road West be selected as the preferred solution.

3. Likewise, three lanes (one lane for each direction, one two-way left-turn lane) on River Road West will be one of the design alternatives considered in Phase 3 of this Class EA, should upgrading River Road West be selected as the preferred solution.

This project is following the Municipal Class Environmental Assessment (EA) process. As per the Municipal Engineers Association, the Municipal Class EA Planning and Design Process have five phases.

Phase 1 – Problem or Opportunity. During this phase, problems or deficiencies shall be identified, and opportunities shall be addressed. Any factors that lead to the conclusion that an improvement or change is needed shall be documented. Review of earlier studies will assist in defining the problem. This phase shall lead to the development of a clear statement of the problem or opportunity being addressed. From the problem statement, the scope of the project shall be developed.

Phase 2 – Alternative Solutions. In this phase, alternative solutions to the problem or opportunity shall be identified. A physical description of the area where the project is to occur shalll be prepared. A general inventory of the natural, social and economic environments shall be developed and considered. Impact of alternative solutions on the environment and mitigating measures shall be identified. Taking the environmental and other factors into consideration, all reasonable alternative solutions shall be evaluated. This may lead to the preliminary identification of a recommended solution. At this point, we will consult review agencies and public regarding the problem or opportunity and alternative solutions to the problem or opportunity. Based on the result of the consultation, the preferred solution shall be selected or confirmed.

Phase 3 – Alternative Design Concepts for Preferred Solution. Phase 3 outlines a process similar to that in Phase 2. Alternative designs for the preferred solutions shall be identified and described. A detailed inventory of the natural, social and economic environments shall be prepared. The impact

of each alternative design on the environment shall then be established. Appropriate mitigating measures shall also be identified and evaluated. Taking the environmental impacts and mitigating measures into consideration, the alternative designs shall be evaluated. This will probably lead to the preliminary identification of a recommended design. At this point, we will consult review agencies and the public including those who previously expressed interest and/or concern and those directly affected by the project, to solicit comment and input. Having gained further input from interested parties, the preferred design can be selected or confirmed. The Town is now able to preliminarily finalize the preferred design.

Phase 4 – Environmental Study Report. The Town is required to document in a report all the activities undertaken to date through Phases 1, 2, and 3. The Environmental Study Report (ESR) is intended to be a traceable and easily understood record of the Town's decision-making process. The ESR will be placed on the public record for at least 30 days for review by the public and review agencies. A notice of completion shall be issued to the public and review agencies. If no request for an Order is received by the Minister within the review period, then the Town may proceed to Phase 5.

Phase 5 – Implementation. In this Phase, contract drawings and tender documents shall be completed. The project shall be constructed and placed into operation. The monitoring program outlined in the ESR shall be undertaken to ensure that the environmental provisions and commitments made in the ESR are fulfilled and are effective.

We wish to thank you for your interest in this Class EA and we encourage you to provide comment as the planning proceeds. We are in Phase 1 (Problem or Opportunity) of this Class EA. There will be two Public Information Centres (PICs) for this project. One will be in Phase 2 and another in Phase 3. Each time, a Notice of Public Information Centre will be published in the local newspaper. We are continuing to document the Class EA planning process to address traffic congestion in the area of River Road West from Brillinger Drive to the easterly Town limits on behalf of the Town of Wasaga Beach.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Jim McIntosh, Director of Public Works, Town of Wasaga Beach
Kevin Lalonde, Public Works Engineer, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group

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LLC

Ainley GROUP
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Ainley & Associates Limited
550 Welham Road, Barrie, Ontario L4N 8Z7
Tel: (705) 726-3371 • Fax: (705) 726-4391
E-mail: barrie@ainleygroup.com

July 8, 2009

File No. 109049

[redacted]
42 Brillinger Drive
Wasaga Beach, Ontario
L9Z 1L4

Ref: **Town of Wasaga Beach**
River Road West Class EA

Dear Ms. [redacted]

As Project Managers for the River Road West Class Environmental Assessment (EA), we are responding to your letter dated June 25, 2009, received on June 30, 2009 (copy attached). We have responded to your comments in the order presented in your letter.

1. Traffic counts dated June 22, 2006 indicate that peak hour volumes on River Road West west of Brillinger Drive are in the order of 330 to 650 vehicles per hour per lane (vphpl). Based on planning standards, an arterial road should have a capacity in the order of 800 vphpl. Although, River Road West is identified in the Town of Wasaga Beach's Official Plan as arterial road, the actual capacity on River Road West in the area may be lower given the number of driveway access points on the road and the close distances between intersections. Should the EA process conclude the need to address capacity issues along River Road West in this area, additional lane capacity is an option which may be considered to reduce the number of vehicles per lane.

2. Based on the project traffic growth rates, we agree that it will become more difficult in the future to make a left turns from Brillinger Drive if the recommended option were to do nothing. That is why this Class EA is being undertaken to address the traffic congestion problem.

3. As part of the Class EA, we have engaged specialists to undertake a noise assessment and natural environmental impact assessment. The results of the study will be evaluated and utilized as part of the Class EA.

4. Traffic congestion is the primary reason for undertaking the EA on this section of River Road West. One of the key components of this Class EA is looking for a preferred solution to the problem and later a preferred design option to the selected solution. We believe the result of this Class EA will benefit you and other users of River Road West.

We wish to thank you for your interest in this Class EA and we encourage you to provide comment as the planning proceeds. There will be two Public Information Centres (PICs) for this project. One is planned for early October this year and another is planned for early December. Each time, a Notice of Public Information Centre will be published in the local newspaper. We are continuing to document the Class EA planning process to address traffic congestion in the area of River Road West from Brillinger Drive to the easterly Town limits on behalf of the Town of Wasaga Beach.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Jim McIntosh, Director of Public Works, Town of Wasaga Beach
Kevin Lalonde, Public Works Engineer, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group

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Lilly Chen

From: Mike Neumann [neumann@ainleygroup.com]
Sent: July 2, 2009 12:05 PM
To: [redacted], Jim McIntosh
Cc: Lilly Chen
Subject: RE: Project Info

Hello Mr. [redacted]

You will be added to our mailing list and we will keep you informed as the project proceeds. This project is following the Municipal Class Environmental Assessment (EA) process and we will look at various solutions and later alternative options to address existing and future transportation capacity problems along River Road West. We cannot pre-determine that the roadway will be widened without full a thorough alternative evaluation process that is traceable and transparent. The process will also provide for full public consultation throughout. Keeping the EA process in mind, one of the alternative options to be considered could include roadway widening. Please do not hesitate to contact me if you should require further clarifications.

Regards,

Mike Neumann, P.Eng
Vice-President, Transportation Engineering

Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

neumann@ainleygroup.com
phone (705) 445-3451 ext.145
fax (705) 445-0968
cell (705) 443-1721
www.ainleygroup.com

-----Original Message-----
From: Jim McIntosh [mailto:publicworksdirector@wasagabeach.com]
Sent: July 2, 2009 9:41 AM
To: [redacted]
Cc: 'Mike Neumann'
Subject: RE: Project Info

Mr. [redacted]

I have forwarded your request for information on to Mr. Mike Neuman of Ainley Group. He will respond to your request.

Regards
J.McIntosh
Public Works Director

From: [redacted]
Sent: Wednesday, July 01, 2009 11:52 AM
To: publicworksdirector@wasagabeach.com
Subject: Project Info

Dear Mr. Lewis:
Please put me on the mailing list for info pertaining to projects involving River Rd. West and the Schooner Town Bridge. Is there any road widening planned West of Brillinger Dr. ?
This can be email or PO.
Thanks.

[redacted]
2094 River Rd. W.
Wasaga Beach ON
L9Z 2V8
429-5659

APPENDIX C

Preliminary Base Plan and Utility Information
River Road West from Brillinger Drive to Eastern Town Limits

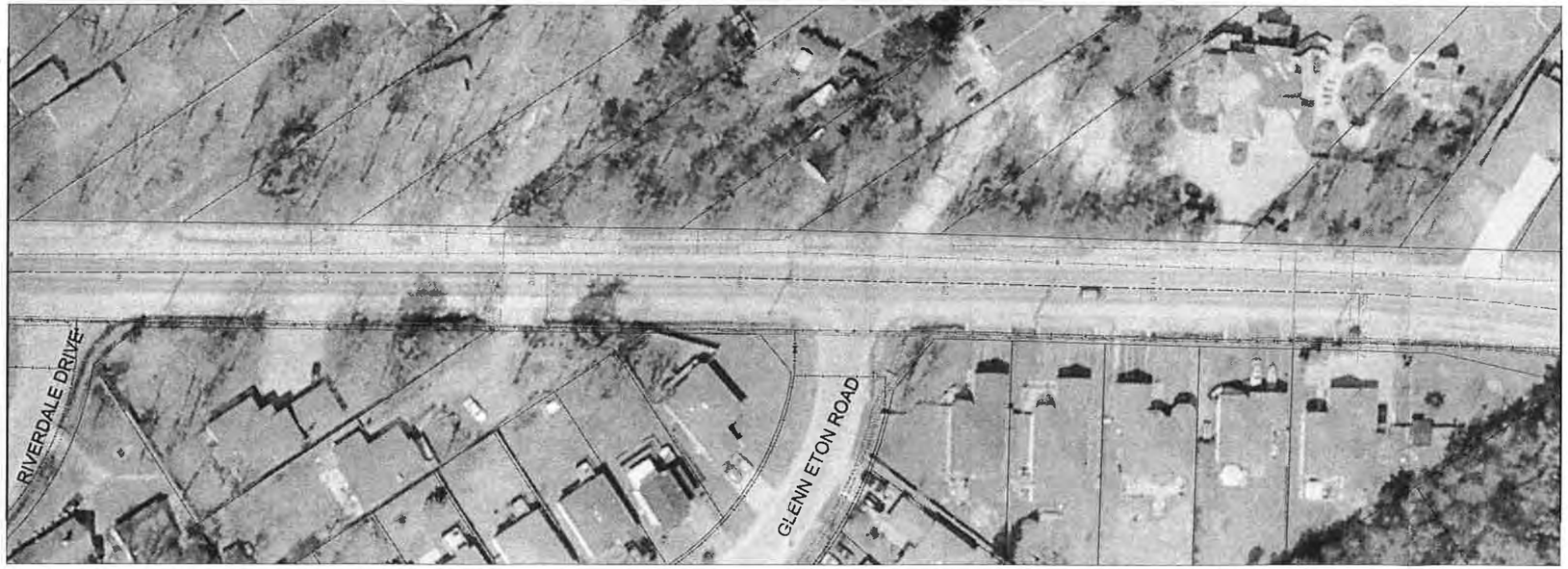
RIVER ROAD WEST

STA. 0+640

STA. 0+940

MATCH LINE

STA. 0+940



STA. 1+240

MATCH LINE

PLOT TAT

LEGEND

BURIED FIBRE
AERIAL FIBRE
BURIED COAX
AERIAL COAX
PEDESTAL
EXISTING GAS
EXISTING BELL
EXISTING HYDRO

CONTRACTOR'S RESPONSIBILITY
Contractor must verify all dimensions prior to commencing any work. Any discrepancies must be reported to the Engineer before commencing work. Drawings are not to be scaled.

NO.	REVISIONS	DATE	INITIAL

Not Valid Unless Signed And Dated

PRELIMINARY

SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA 0+640 TO STA 1+240

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC1

PLOT list

LEGEND

BURIED FIBRE	FBC	PEDESTAL	
AERIAL FIBRE	FCC FCC FCC	EXISTING GAS	G G G
BURIED COAX	CTV CTV CTV	EXISTING BELL	B B B
AERIAL COAX	CTV	EXISTING HYDRO	H H H

CONTRACT DRAWINGS:
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DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 1+240 TO STA. 1+840

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC2

PLOT 1:1

LEGEND

BURIED FIBRE	——T/C——	PEDESTAL	☒
AERIAL FIBRE	——T/C——T/C——T/C——	EXISTING GAS	——G——G——G——
BURIED COAX	——CTV——CTV——CTV——	EXISTING BELL	——B——B——B——
AERIAL COAX	——CTV——	EXISTING HYDRO	

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TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

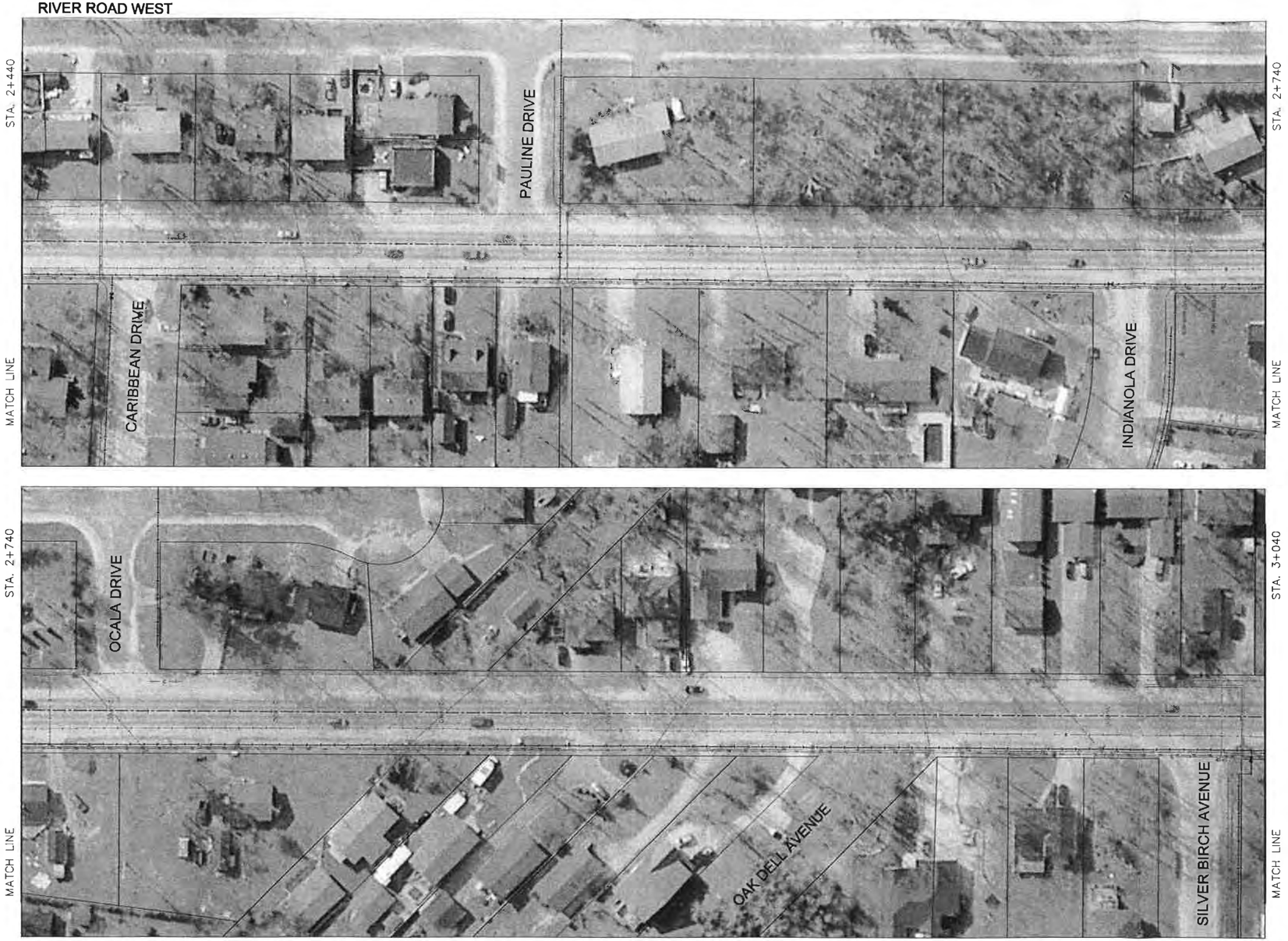
RIVER ROAD WEST
STA. 1+840 TO STA. 2+440

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC3

RIVER ROAD WEST



LEGEND

BURIED FIBRE	FOC	PEDESTAL	
AERIAL FIBRE	FOC FOC FOC	EXISTING GAS	G G G
BURIED COAX	COX COX CTV	EXISTING BELL	B B B
AERIAL COAX	CTV	EXISTING HYDRO	H H H

CONTRACT DRAWINGS:
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NO.	REVISIONS	DATE	INITIAL

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SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 2+440 TO STA. 3+040

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No. | DWG. 109049-RC4

RIVER ROAD WEST

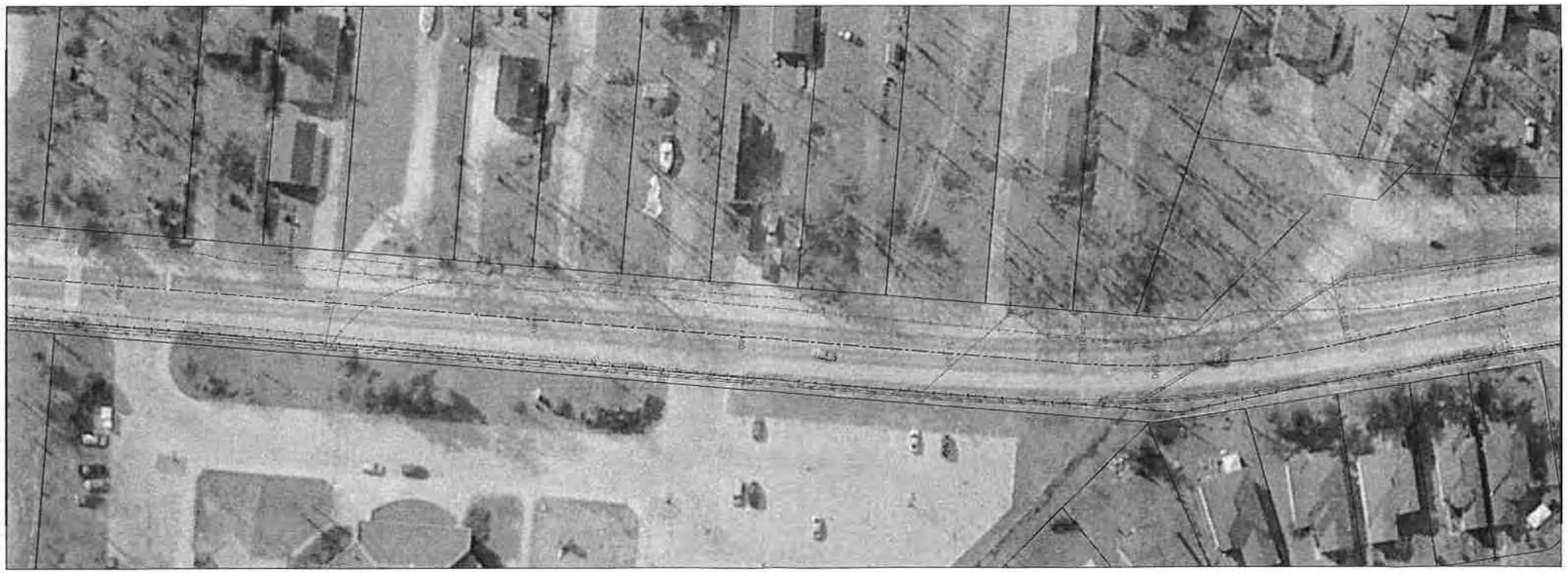
STA. 3+040

STA. 3+340

MATCH LINE

MATCH LINE

STA. 3+340



STA. 3+640

MATCH LINE

MATCH LINE

LEGEND

BURIED FIBRE — FOC —

AERIAL FIBRE — FOC — FOC — FOC —

BURIED COAX — CTV — CTV — CTV —

AERIAL COAX — CTV —

PEDESTAL ☒

EXISTING GAS — G — G — G —

EXISTING BELL — B — B — B —

EXISTING HYDRO — H — H — H —

CONTRACT DRAWINGS:
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SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 3+040 TO STA. 3+640

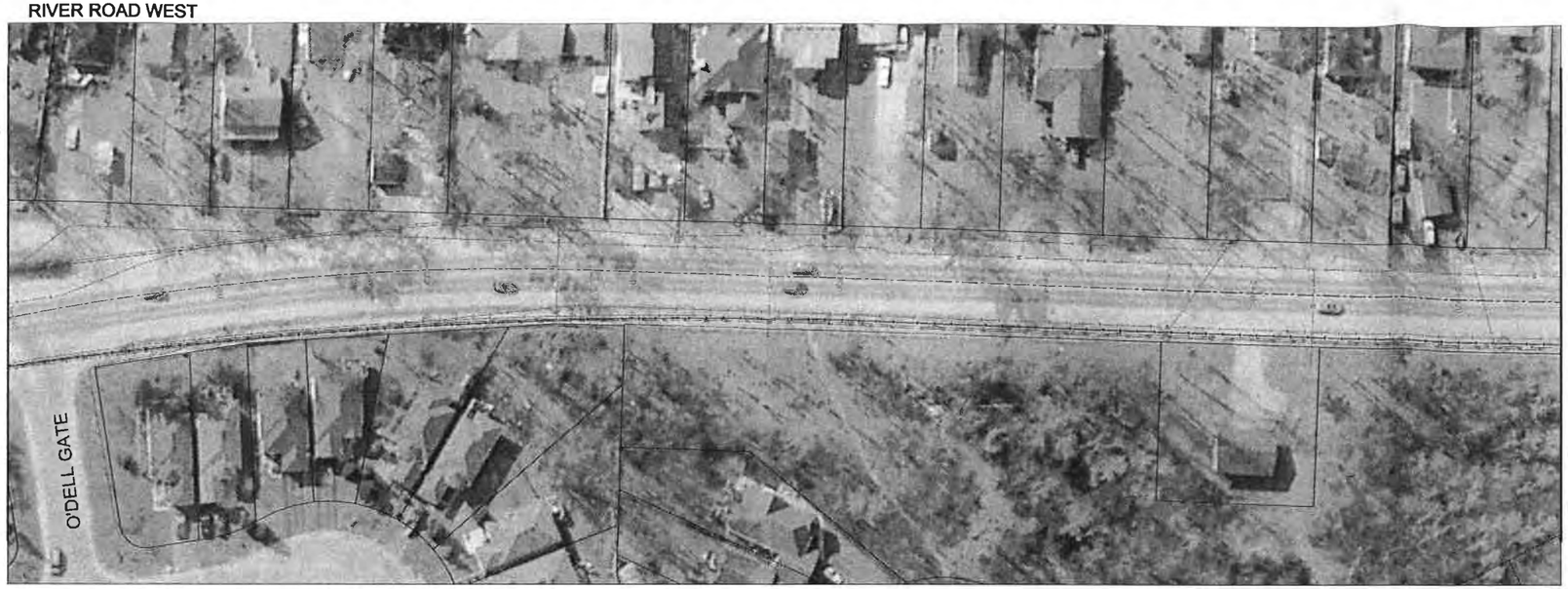
Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC5

RIVER ROAD WEST

STA. 3+640

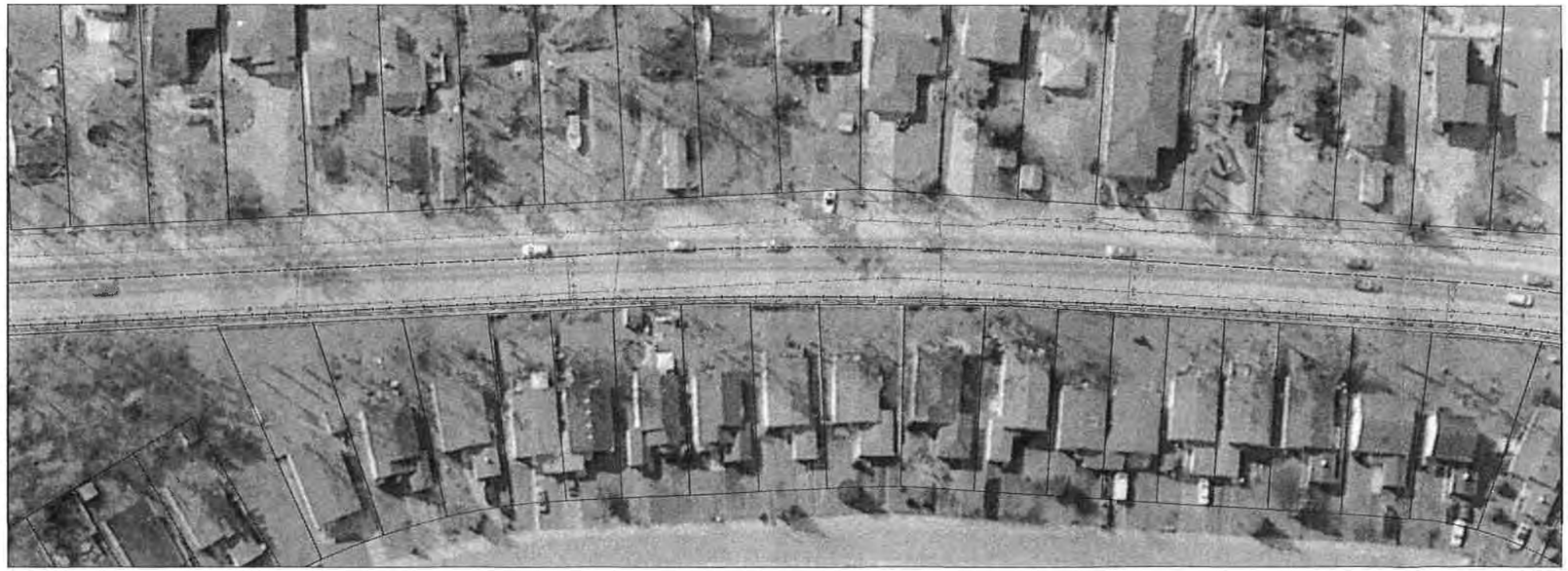


STA. 3+940

MATCH LINE

MATCH LINE

STA. 3+940



STA. 4+240

MATCH LINE

MATCH LINE

LEGEND

BURIED FIBRE — FOC —

AERIAL FIBRE — FOC — FOC —

BURIED COAX — CTV — CTV —

AERIAL COAX — CTV —

PEDESTAL

EXISTING GAS — G — G —

EXISTING BELL — B — B —

EXISTING HYDRO — H — H —

CONTRACT DRAWINGS:
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DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 3+640 TO STA. 4+240

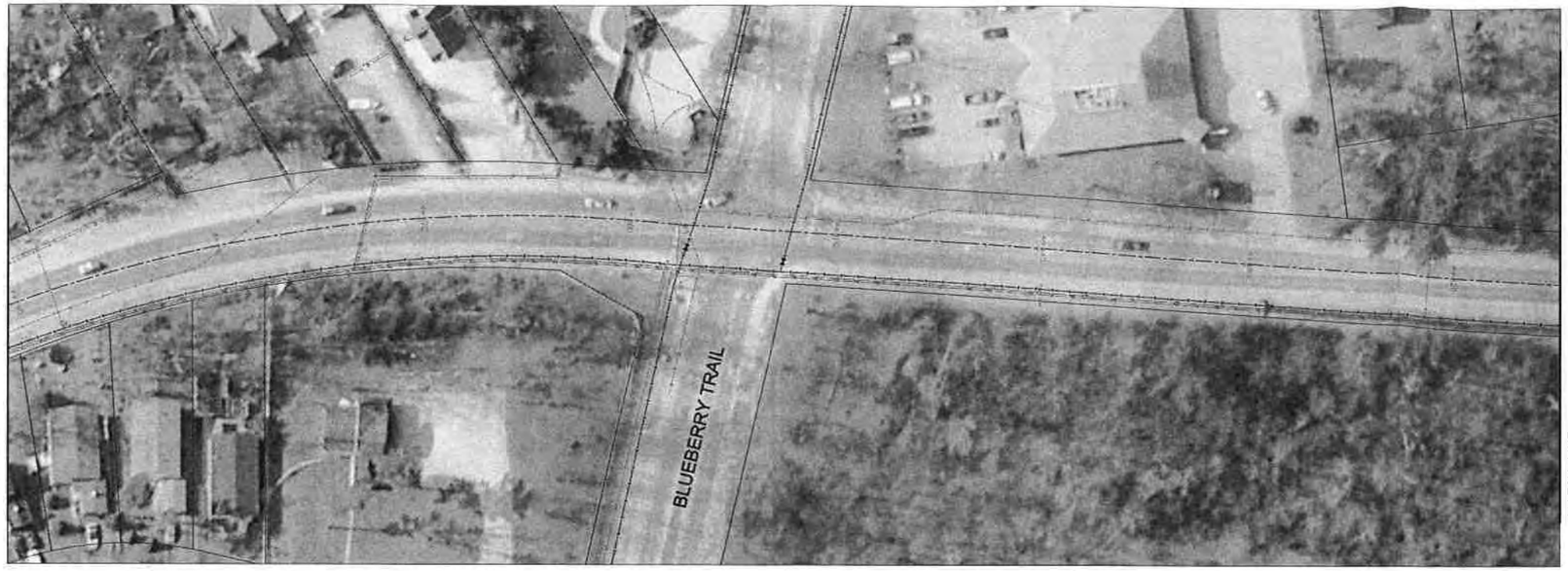
Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC6

RIVER ROAD WEST

STA. 4+240

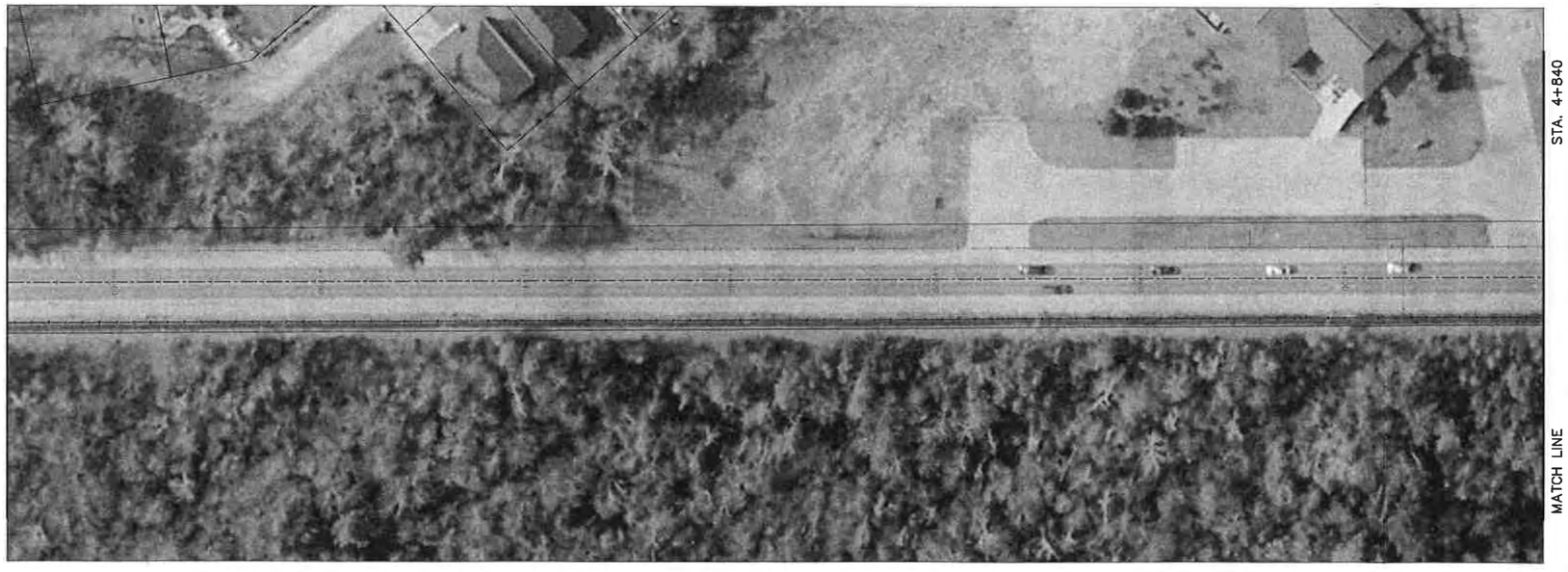


STA. 4+540

MATCH LINE

MATCH LINE

STA. 4+540



STA. 4+840

MATCH LINE

MATCH LINE

PLOT 1=1

LEGEND

BURIED FIBRE — FOC —
AERIAL FIBRE — FOC — FOC —
BURIED COAX — CTV — CTV — CTV —
AERIAL COAX — CTV —
PEDESTAL
EXISTING GAS — G — G — G —
EXISTING BELL — B — B — B —
EXISTING HYDRO — H — H — H —

CONTRACT DRAWINGS:
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TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 4+240 TO STA. 4+840

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC7

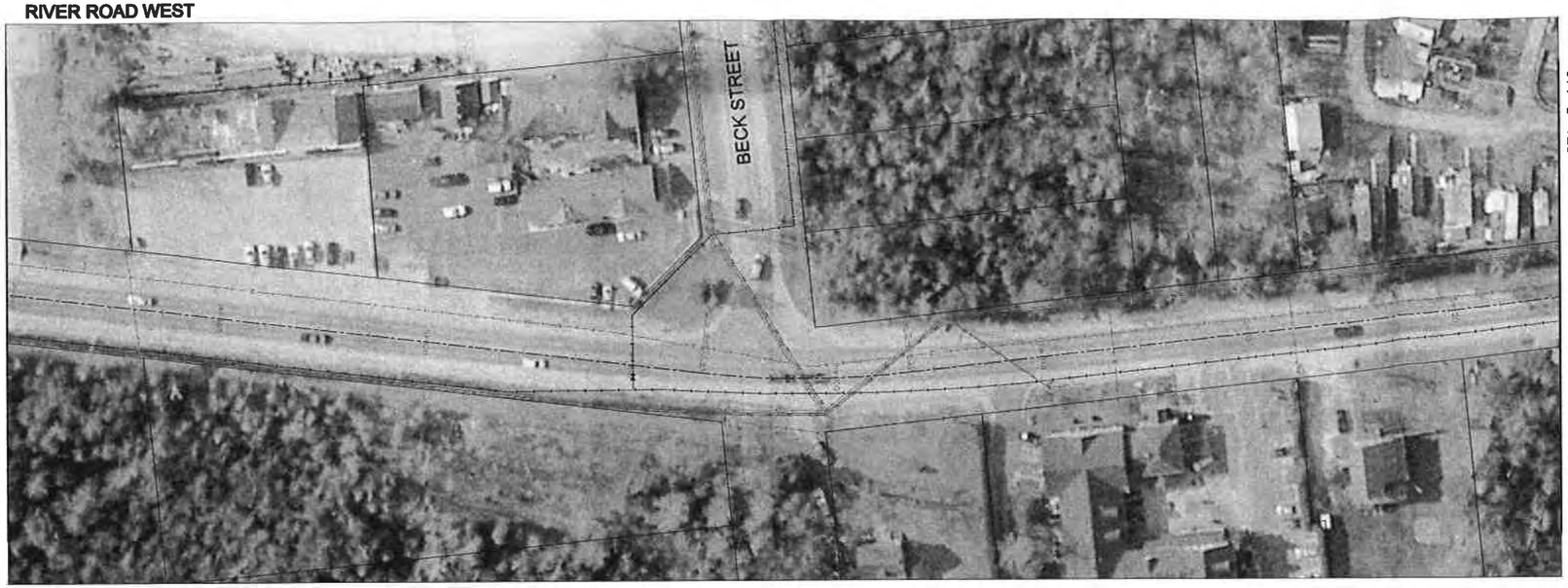
RIVER ROAD WEST

STA. 4+840

BECK STREET

STA. 5+140

MATCH LINE



STA. 5+140

STA. 5+440

WESTBURY ROAD

MATCH LINE

MATCH LINE

PLOT 1=1

LEGEND

BURIED FIBRE	FOC	PEDESTAL	☒
AERIAL FIBRE	FOA FOE FOC	EXISTING GAS	G G G
BURIED COAX	CTV CTV CTV	EXISTING BELL	B B B
AERIAL COAX	CTA	EXISTING HYDRO	H H H

CONTRACT DRAWINGS:
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CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 4+840 TO STA. 5+440

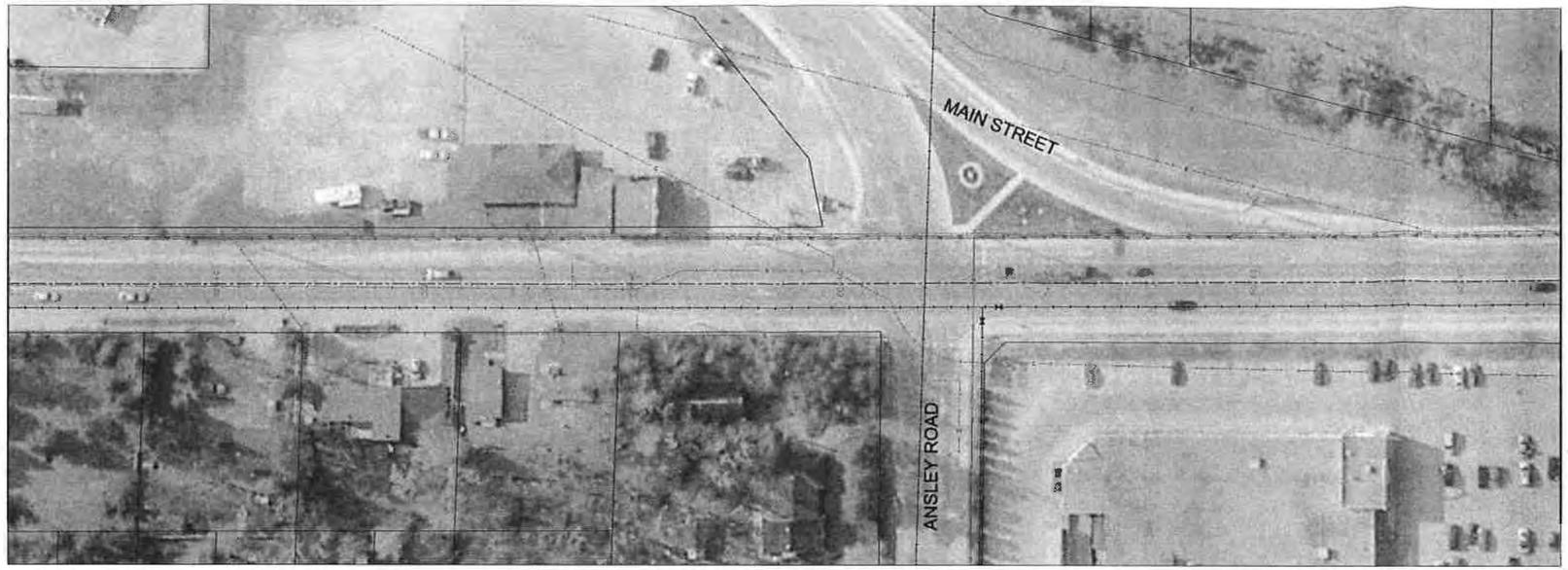
Aboy GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC8

RIVER ROAD WEST

STA. 5+440

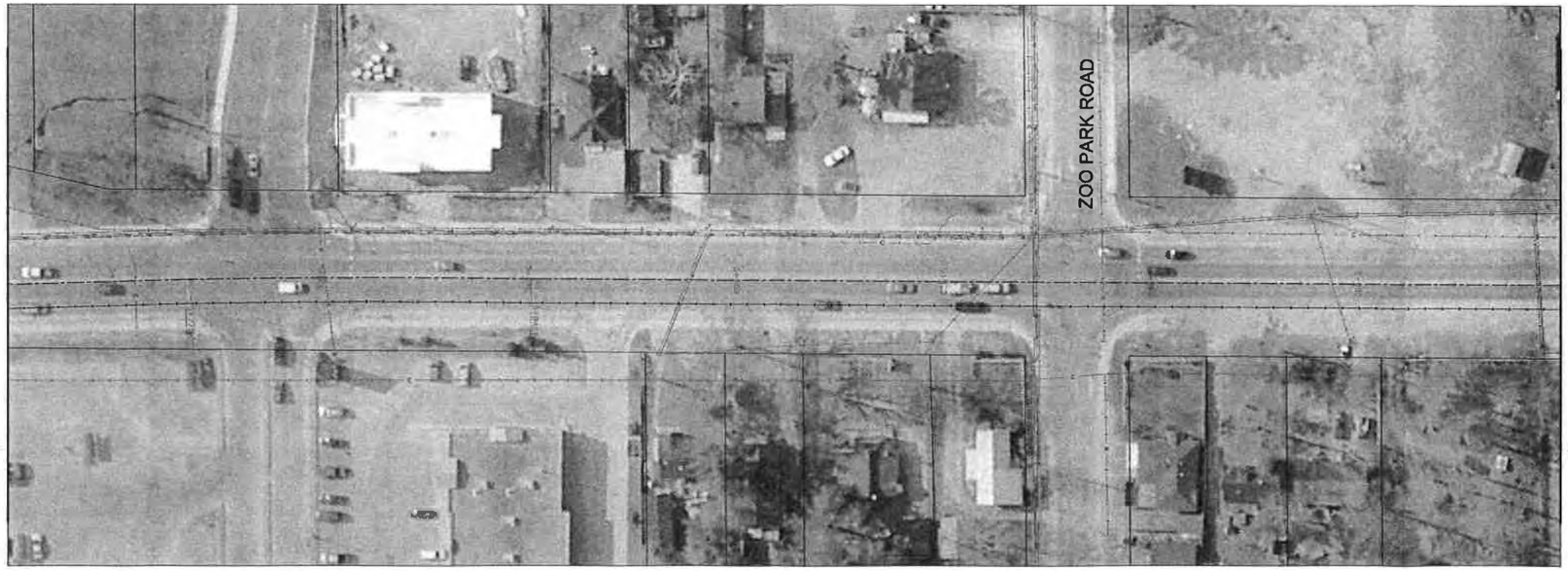


STA. 5+740

MATCH LINE

MATCH LINE

STA. 5+740



STA. 6+040

MATCH LINE

MATCH LINE

PLOT 1=1

LEGEND

BURIED FIBRE — PEDESTAL

AERIAL FIBRE — EXISTING GAS

BURIED COAX — EXISTING BELL

AERIAL COAX — EXISTING HYDRO

CONTRACT DRAWINGS:
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DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 5+440 TO STA. 6+040

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

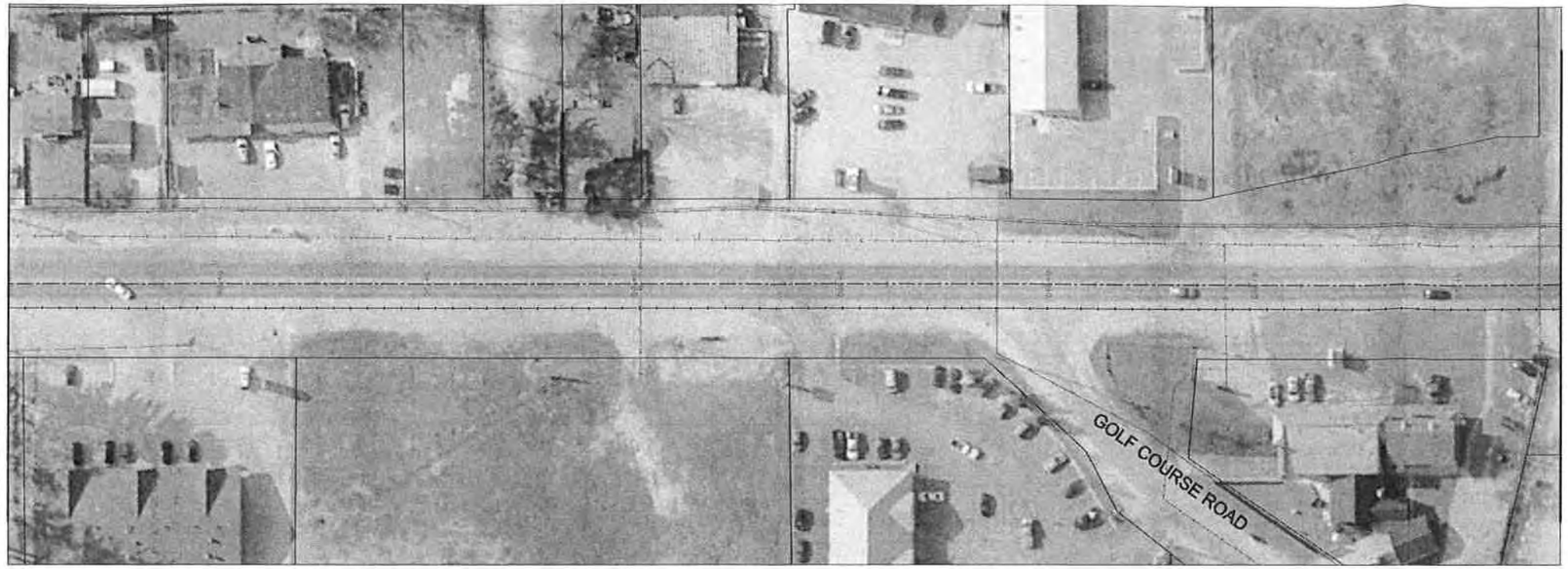
DWG. 109049-RC9

RIVER ROAD WEST

STA. 6+040

STA. 6+340

MATCH LINE



MATCH LINE

STA. 6+340

THEME PARK DRIVE

STA. 6+640

MATCH LINE

PLOT 1=1

LEGEND

BURIED FIBRE — F/C —

AERIAL FIBRE — F/E — F/C — F/C —

BURIED COAX — C/V — C/V — C/V —

AERIAL COAX — C/V —

PEDESTAL

EXISTING GAS — G — G — M — G —

EXISTING BELL — B — B — B —

EXISTING HYDRO — H — H — H —

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DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 6+040 TO STA. 6+640

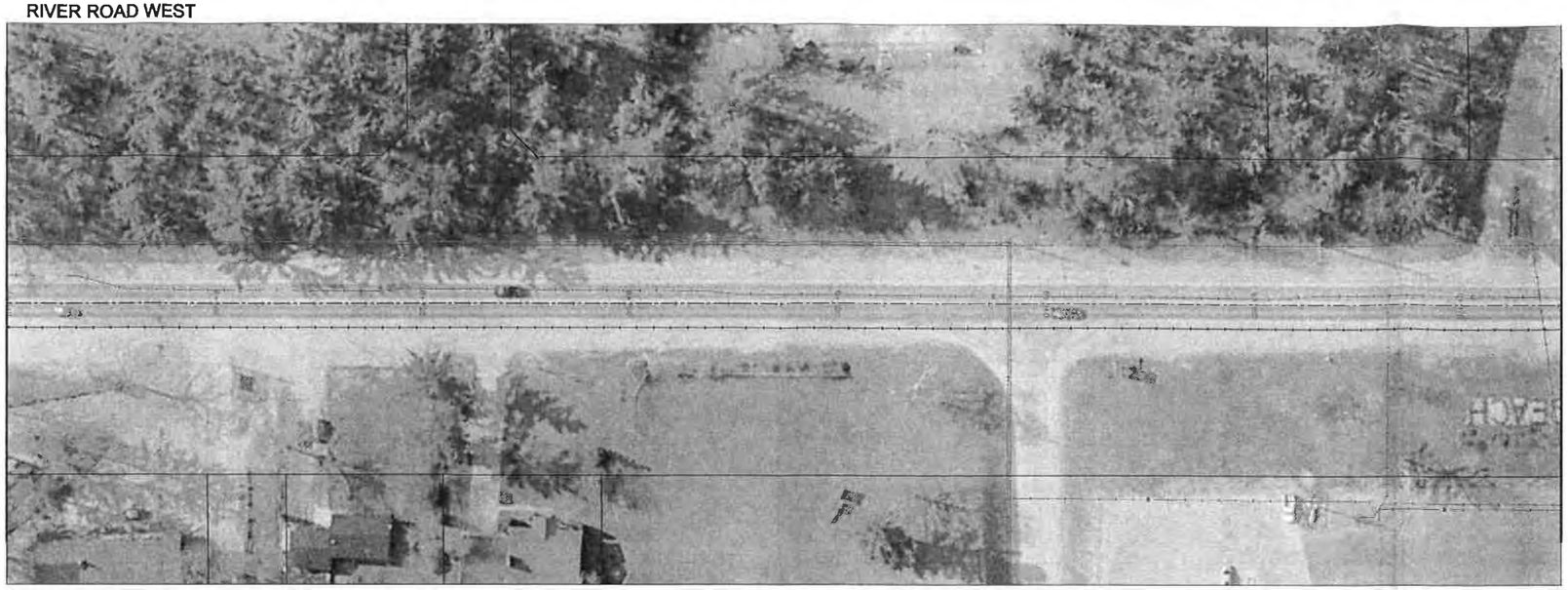
Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC10

RIVER ROAD WEST

STA. 6+640

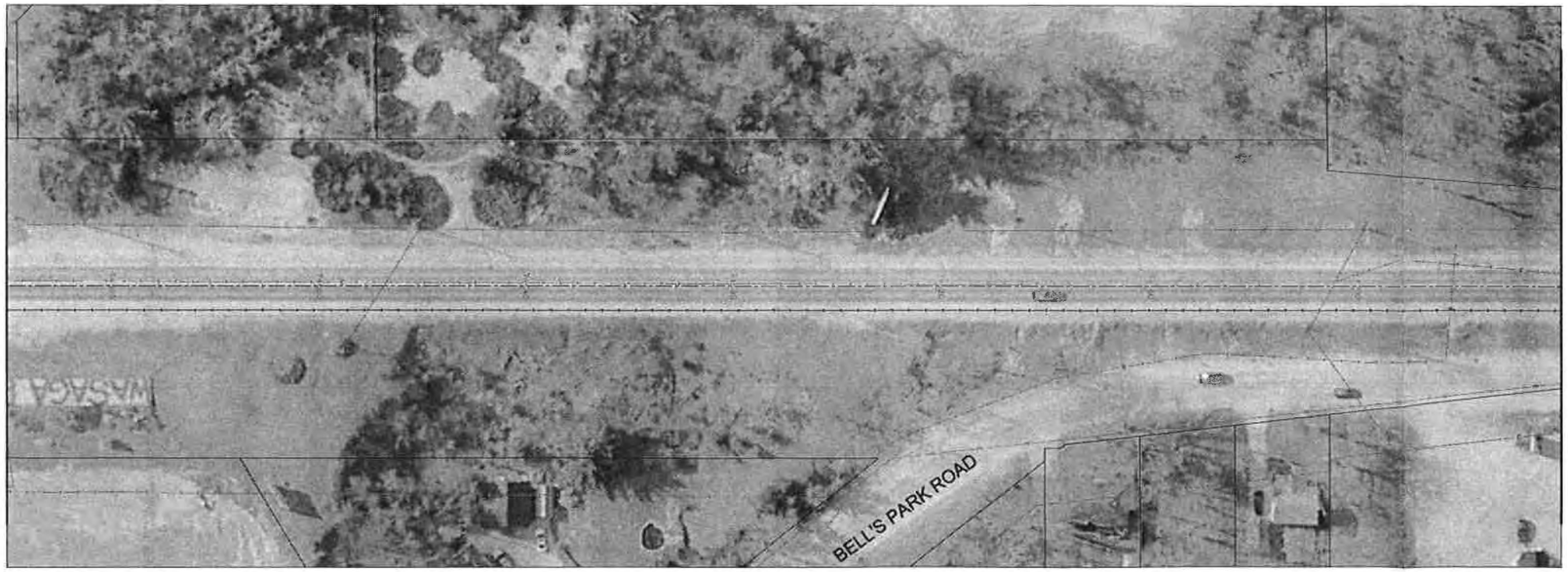


MATCH LINE

STA. 6+940

MATCH LINE

STA. 6+940



STA. 7+240

MATCH LINE

PLOT 1:1

LEGEND

BURIED FIBRE	PEDESTAL		
AERIAL FIBRE	EXISTING GAS		
BURIED COAX	EXISTING BELL		
AERIAL COAX	EXISTING HYDRO		

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DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 6+640 TO STA. 7+240

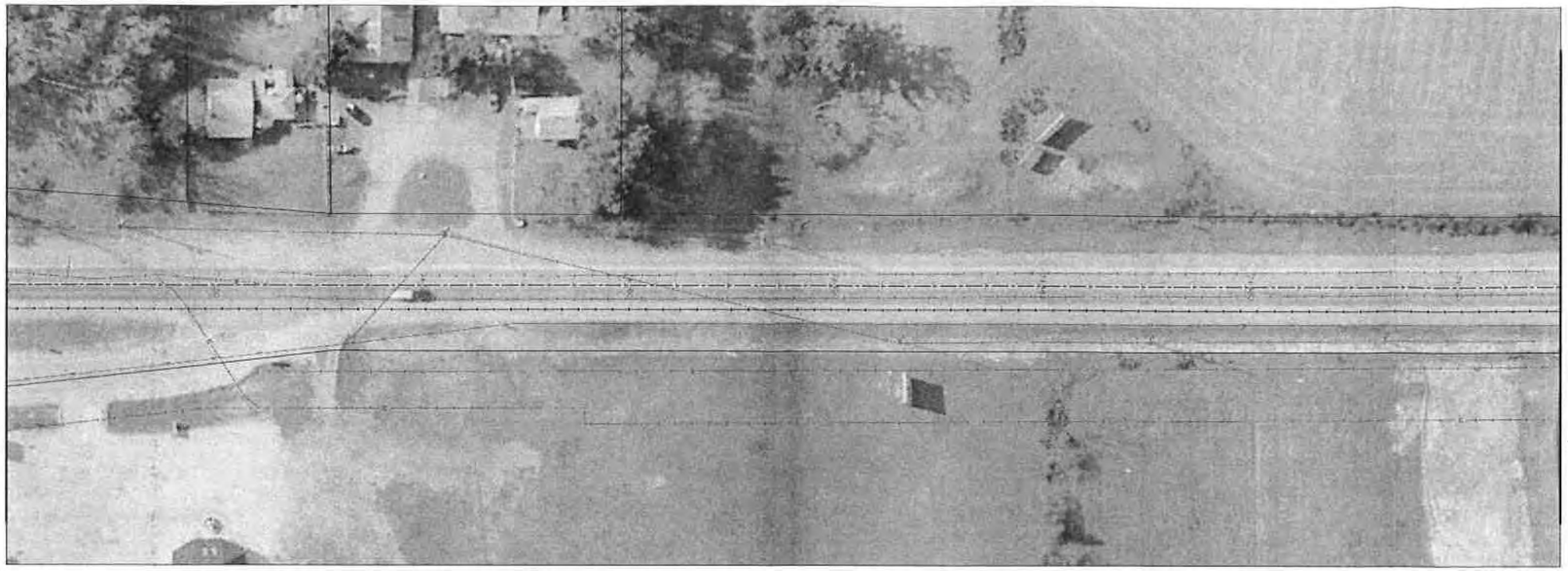
Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC11

RIVER ROAD WEST

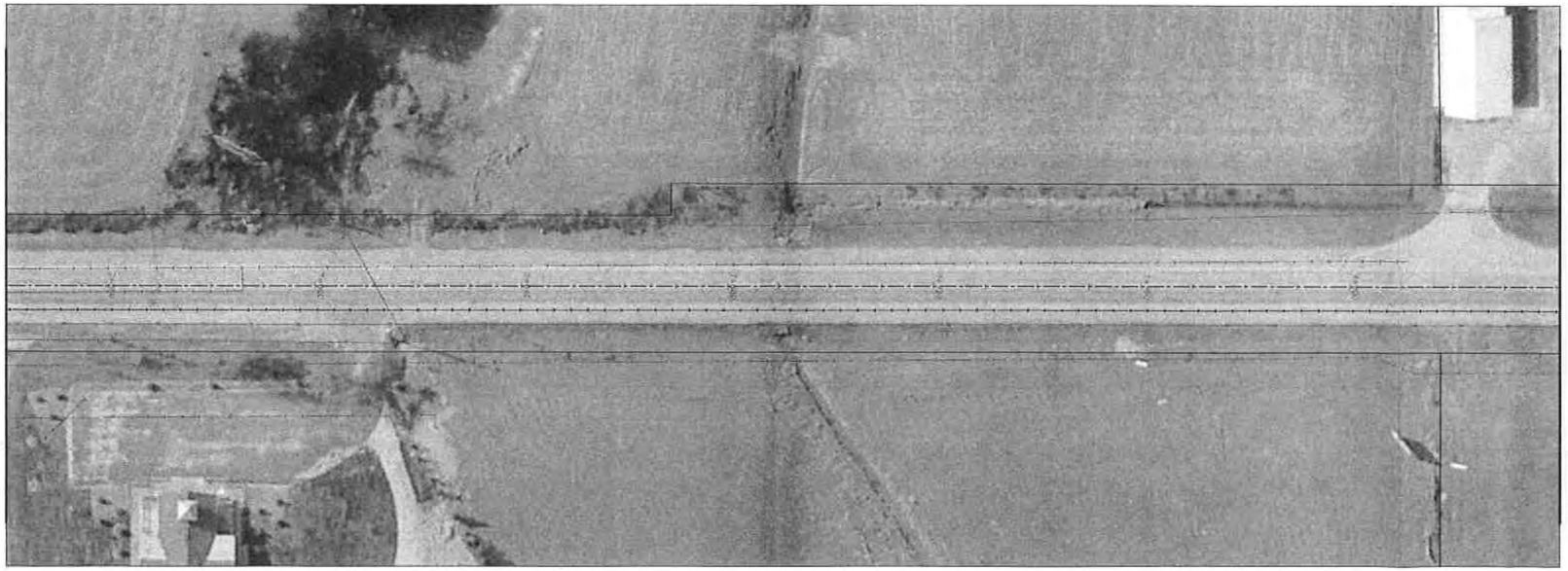
STA. 7+240



MATCH LINE

STA. 7+540

MATCH LINE



STA. 7+540

STA. 7+840

MATCH LINE

MATCH LINE

PLOT DATE

LEGEND

BURIED FIBRE	T0C	PEDESTAL	⊠
AERIAL FIBRE	F0C T0C F0C	EXISTING GAS	G G G
BURIED COAX	C1% C1% C1%	EXISTING BELL	B B B
AERIAL COAX	C1%	EXISTING HYDRO	H H H

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NO.	REVISIONS	DATE	INITIAL

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PRELIMINARY

SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 7+240 TO STA. 7+840

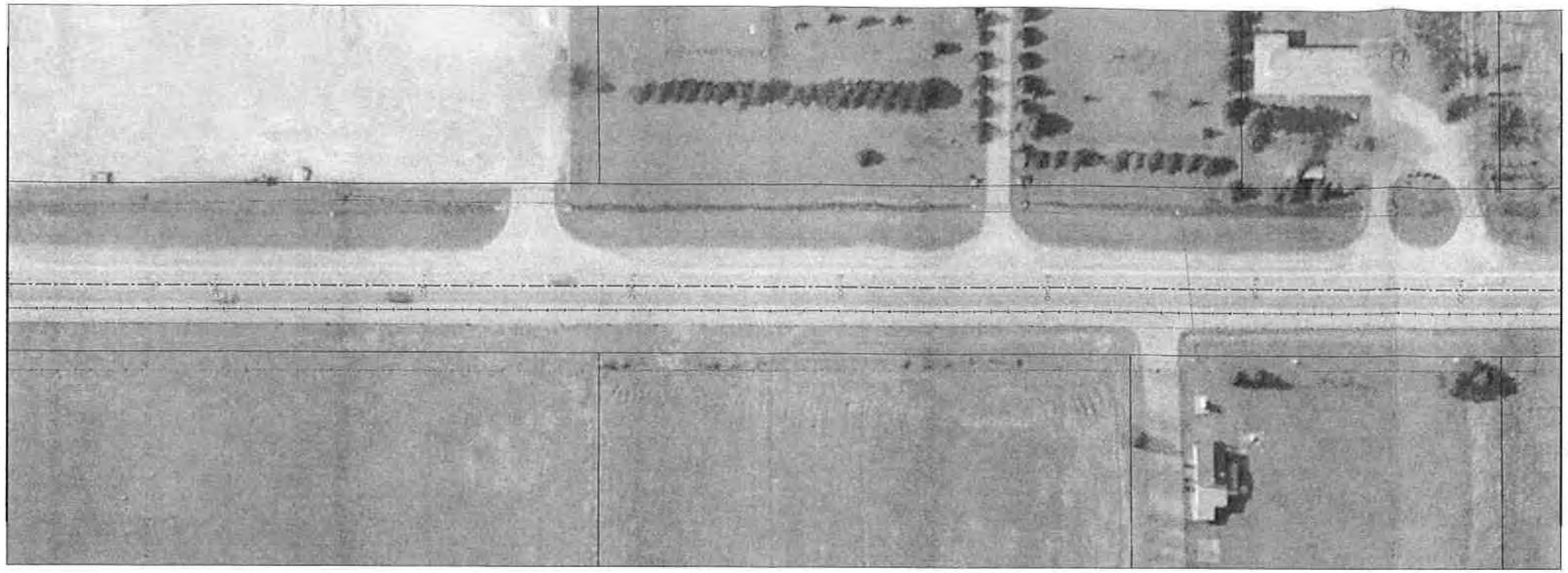
Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC12

RIVER ROAD WEST

STA. 7+840

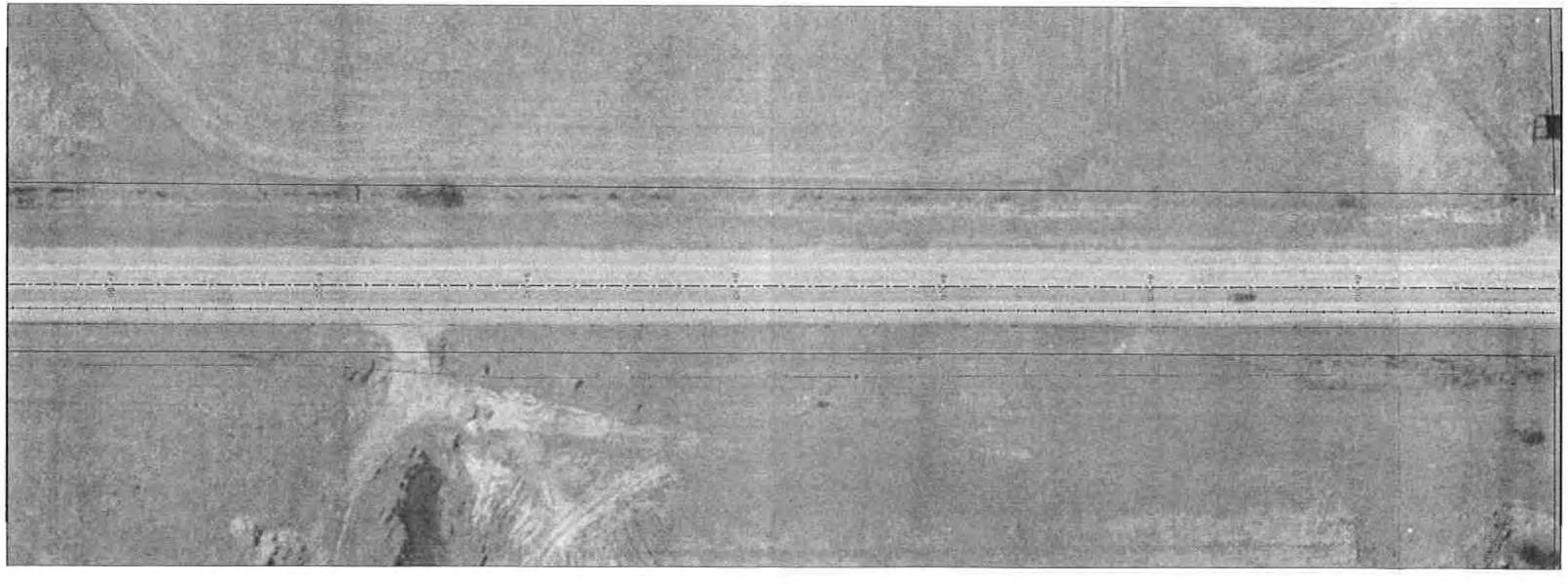


STA. 8+140

MATCH LINE

MATCH LINE

STA. 8+140



STA. 8+438.75

MATCH LINE

PLOT 1:1

LEGEND

BURIED FIBRE — FOC —

AERIAL FIBRE — FOC — FOC —

BURIED COAX — CTV — CTV — CTV —

AERIAL COAX — CTV —

PEDESTAL

EXISTING GAS — G — G — G —

EXISTING BELL — B — B — B —

EXISTING HYDRO — H — H — H —

CONTRACT DRAWINGS: Contractor must verify all dimensions and be responsible for same. Any discrepancies must be reported to the Engineer before commencing work. Drawings are not to be scaled. Ainley & Associates Limited claims copyright to this drawing and it may not be used for any purpose other than that stipulated in the contract between the owner/client and the Engineer without the express written consent of Ainley & Associates Limited.

NO	REVISIONS	DATE	INITIAL

Not Valid Unless Signed And Dated

PRELIMINARY

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SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 7+840 TO STA. 8+439

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC13

APPENDIX D

Drainage Assessment Memos

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

Ainley & Associates Limited
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Email: collingwood@ainleygroup.com

To: **Mike Neumann**

Copies to: **Chris Jones**
Lilly Chen

From: **Marvin Ponce**

Date: **May 28, 2009**

Ref: **Town of Wasaga Beach**
Schoonertown Bridge Widening
Site Review-Potential outlets to Nottawasaga river

File: **109049**

On Tuesday May 26, 2009 I performed a site review on River Road West as suggested by MN. The main purpose of the site review was to locate and identify existing and potential future outlet points from River Road West and into Nottawasaga River. This memo identifies potential outlets between Schoonertown Bridge and Main Street only. (Approximately 5kms). Another site review between Main Street and the east town limits of Wasaga Beach will be completed in the future.

CURRENT CONDITIONS:

Currently, River Road West is a 2-lane paved road with no curbs. Most of the overland flow from River Road West enters a network of existing ditches located on the north or south side of River Road West. Eventually, flows from the existing ditches enter a network of existing culverts. From there, it enters the underground storm sewer and the flows are released to the river.

The area between Main Street and Schoonertown Bridge is very flat and many times the water is stored in the ditches or slowly drains to the river.

FUTURE CONDITIONS

It is my understanding, in the future; River Road West may have 3-lanes and possibly 4 lanes. Widening River Road West will increase the runoff from the road. The flows from the new road would need to be conveyed through a sewer network to an outlet, and into Nottawasaga River. One design option includes conveying all the flows from River Road West (through a proposed storm sewer pipe) from and beyond Main Street and into a ditch located near Schoonertown Bridge. Due to the flatness of the area and the distance the water would have to travel, most of the proposed pipe would have be installed extremely flat and the outlet pipe would have to be a really large pipe. (1050mm or larger).

From the constructibility point of view, this would be extremely complicated. Therefore, the need for locating existing outlets to the river from River Road West was important.

DRAINAGE SITE REVIEW AND FINDINGS.

The following 5 existing outlets were located from River Road West to The Nottawasaga River. (Between Main Street and Schroonertown Bridge). One proposed outlet near Oxbow Park Drive and River road west is also recommended.

Outlet 1 located across from Power Line Road.
Outlet 2 on Pauline Drive.
Outlet 3 located at end of access road.
Outlet 4 across from intersection of River road west and Silver Birch Avenue.
Outlet 5 proposed outlet near Intersection of Oxbow Park Drive/River road west (South side).
Outlet 6 Existing outlet between Odell Gate and Access Road.

Outlet 1 currently includes uncontrolled overland flows from River Road West and adjacent areas are being picked up by existing ditches south of River Road West. From the ditch, the water enters a relatively big concrete inlet structure located on Power Line Road. The culvert first crosses Powerline and then it crosses River Road West. The flows are then being released to an existing outlet about 100ft from the road. I also found a MH in front of the outlet. This can be considered as a potential outlet.
The outlet is approximately 15m from Nottawasaga River.

The second potential outlet identified is located on Pauline Drive. The uncontrolled overland flows from the road enter the existing ditches leading to existing concrete culverts. From there its being conveyed through storm sewers releasing to an existing outlet near the Nottawasaga River located at the end of Pauline drive on Town property. I was able to locate 2 storm manholes on Pauline Drive.

The third potential outlet is located at the end of Access Road. This is a very large outlet concrete structure located just meters from Nottawasaga River. Approximately a 1600mm corrugated pipe. Again, overland flows from River Road West and Blueberry Trail enter the storm sewer system through an existing catch basin and existing ditch located on River Road West and existing ditch on Blueberry Trail. It was not clear if the water from residential areas south of River Road West enter the storm sewer system. Catch basins located near the residential areas were found but it was not clear if the residential areas are using the same outlet.

The fourth outlet is located north from the Silver Birch Avenue and River Road West intersections. Uncontrolled flows from River Road West enters the underground storm sewer system through catch basins located on Silver Birch Avenue. It is very possible that the storm sewer system also carries the flows from residential areas south of River Road West.

A proposed outlet identified initially is located near Oxbow Park Drive and River Road West. Currently the overland flows drain to adjacent lands north of River Road West. In the future, this outlet will convey the flows between near Riverdale Drive and Oxbow Park Drive.

The sixth outlet as indicted by The Town Engineer, Kevin Lalonde, is located between Odell Gate and Access Road. The location of this possible outlet is on an easement between houses #1190 and #1186 on River Road West.

Again, the site review was done only for the areas between Main Street and Schoonertown Bridge for the purpose of finding potential outlets to the Nottawasaga River.

Selected photos of the existing infrastructure on River Road West can be found in the attached Appendix A.

Prepared by Marvin Ponce. P. Eng.
Ainley Group
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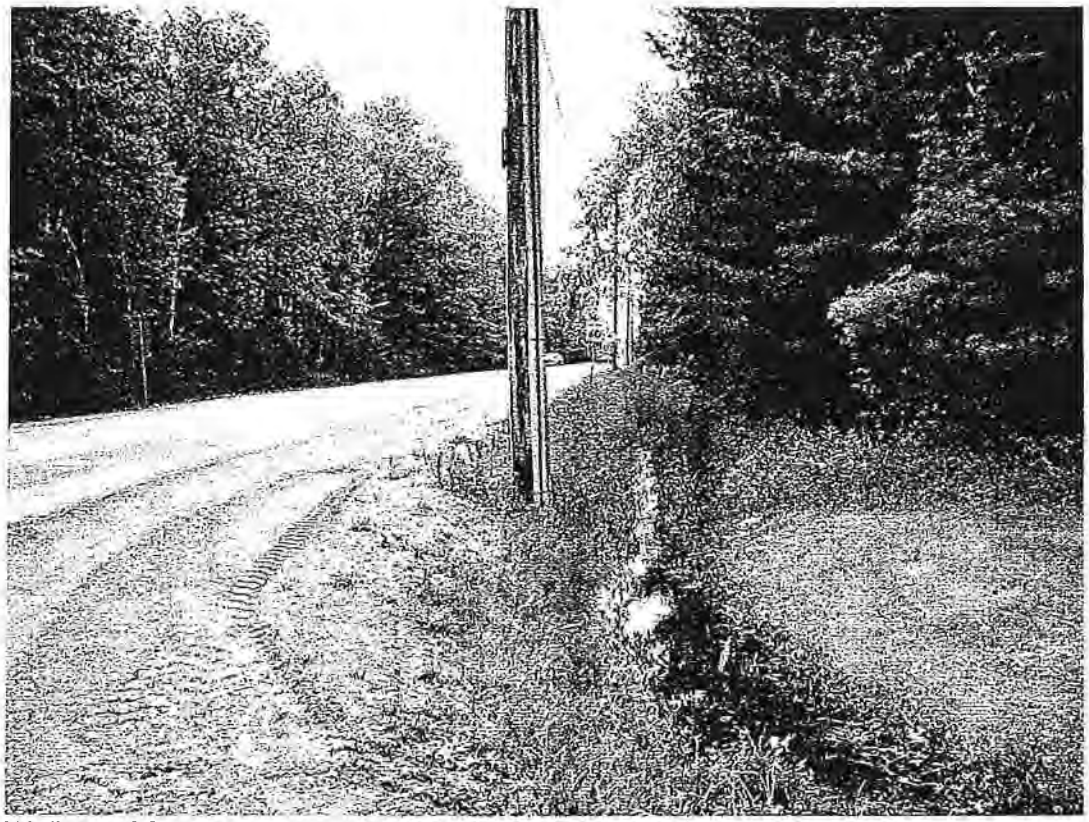
APPENDIX A

SELECTED PHOTOS FROM RIVER ROAD WEST

OVERLAND FLOWS NEAR RIVERDALE ACCUMULATES DURING RAIN EVENTS.
IMPROPER DRAINAGE CONDITIONS.



WATER ACCUMULATION ON POWERLINE CREATING BREEDING GROUNDS FOR MOSQUITOS

TYPICAL DAMAGED CULVERTS ON RIVER ROAD WEST IN NEED OF MAINTENANCE OR UPGRADES.

EXCESSIVE EROSION AND SEDIMENT ENTERING THE EXISTING STORM SEWER NETWORK.

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

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To: **Mike Neumann**

Copies to: **Chris Jones**
Lilly Chen

From: **Marvin Ponce**

Date: **September 8, 2009**

Ref: **Town of Wasaga Beach**
River Road West Urbanization Class EA from Main Street to Eastern Town Limits.
Site Review-Potential outlets to Nottawasaga river

File: **109049**

This is to follow up on a letter provided on May 28 2009 outlining the site review on River Road West from Schoonertown Bridge to Main Street.

The following letter outlines a second site review from Main Street in Wasaga Beach to the eastern Town limits of Town of Wasaga Beach.

On Thursday August 27, 2009 I performed a site review on River Road West. As in the previous letter, the main purpose of the site review was to locate and identify existing and potential outlet points from River Road West and into The Nottawasaga River.

CURRENT CONDITIONS:
Currently, River Road West is a 4 lane paved road with curb and gutter from Ansley Road (Opposite side to Main Street) to about 60m East from Zoo Park Road. Overland flows are conveyed by Storm sewers located on River Road West. It is my understanding that the flows from this section of River Road West are being carried away by existing storm sewers and existing ditches to a storm outlet behind the Sturgeon Point Marina. It is clear this section of River Road West has been upgraded recently. Overland flows from Zoo Park South enters the sewer network through a catchbasin located at the Zoo Park Road/River Road West intersection.

From about 60m East from Zoo Park Road, River Road West becomes a 2 lane paved road with no curb or gutter. Between Golf Course Road and Zoo Park Road, two inlet catchbasins were found on the south side of River Road West.

It is possible that the 2 inlet catchbasins are connected to the storm sewer outletting to Zoo Park North.

From Golf course road to about 0.7 kms to the east, the road grade starts to increase. The Overland flows from the road sheet flows to the gravel shoulder on both sides of the road. The overland flows then drains toward to low laying areas or the embankment on the north side of River Road West. Sandy soil conditions were observed on both sides of the road. Due to the soil characteristics of the area, very low erosion occurs.

However, gullies can be observed on both sides of the road.

A drainage divide is located near the Wasaga Star Arena. From the wasaga Star Arena to the town limits, all of the overland flows from the road travel to gravel shoulders on both sides of the street. An inlet catchbasin was identified on Bell Park Road, which takes the runoff from the gravel shoulders to existing ditches on River Road West.

Well-defined ditches can be found on both sides of the River Road West from Baywood Golf & Country Club heading east. A low point exists between the Town limits and the Bell Park Road. I was not able to see any water stored in the ditches. It would appear that the ditches take the water to an existing outlet located under River Road West. A series of CSP culverts are clearly visible north of River Road West.

FUTURE CONDITIONS

During my drainage field review I was able to identify at least 2 future residential areas south of River Road West beside the existing recreation areas (Baywood Golf & Country Club). It is my understanding, in the future that River Road West may potentially included 3-lanes or possibly 4 lanes. Widening River Road West will increase the runoff from the road. The flows from the new road would need to be conveyed through a sewer network to an outlet, and into Nottawasaga River. It is possible this outlet will serve the future residential areas.

DRAINAGE SITE REVIEW AND FINDINGS

One potential outlet was clearly identified between the Town limits and Baywood Golf & Country Club. It can be observed, this outlet services a large drainage area south of River Road West. A large concrete culvert structure was found under the road. The size is approximately 1.2m in height and about 1.0m wide. I was not able to get access to the structure, as it was located in a very swampy area. The culvert looks damaged at both ends. It is recommended to consider replacing at the time River Road West is reconstructed. Potentially, in the future, we could use this as a storm outlet from the Road.

The area where the concrete outlet structure was located is fairly flat. Water was observed at both ends of the culvert but the water was not flowing. A second field inspection by Ariane Stewart failed to confirm the direction of water flow. It is suspected, the water flows south to Marl Lake.

Selected photos of the existing infrastructure on River Road West can be found in the attached Appendix A.

Prepared by Marvin Ponce P. Eng.
Ainley Group
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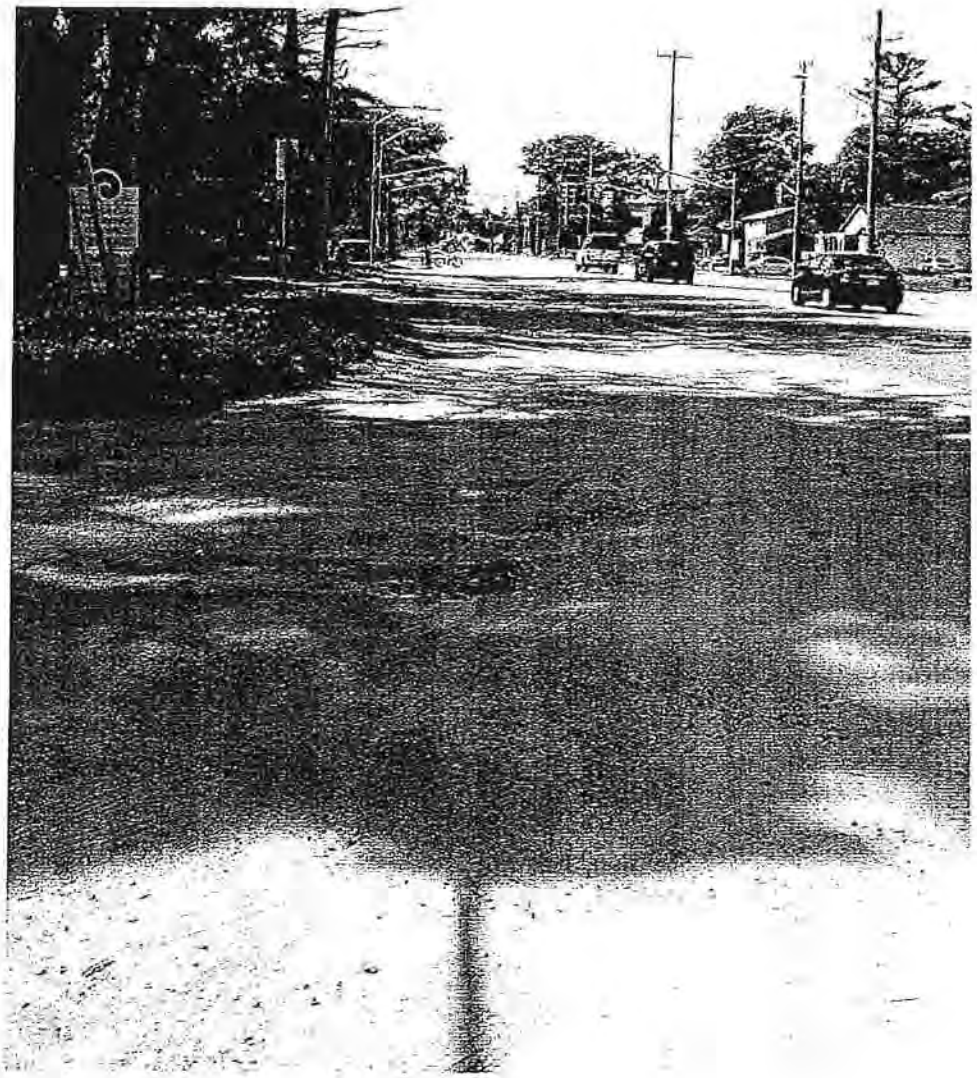
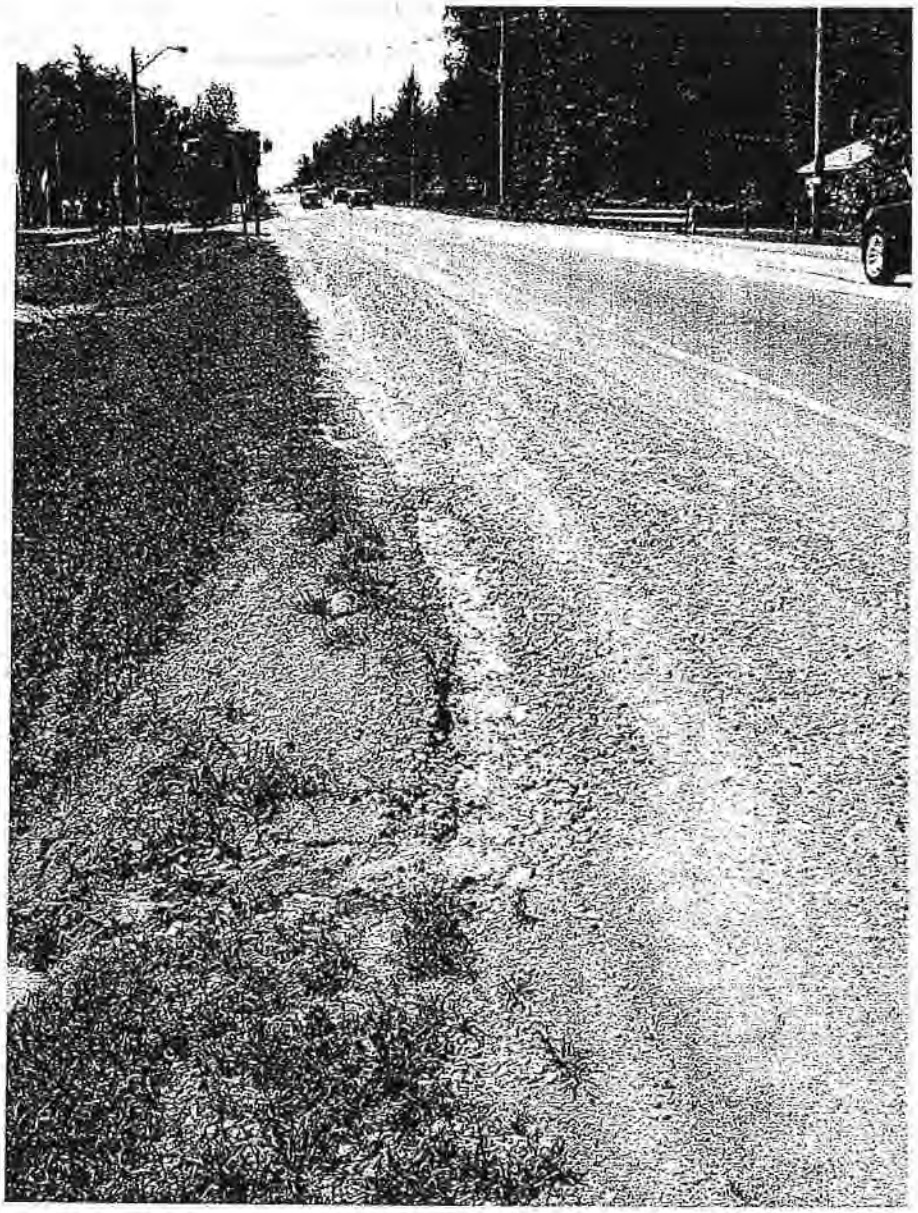
APPENDIX A

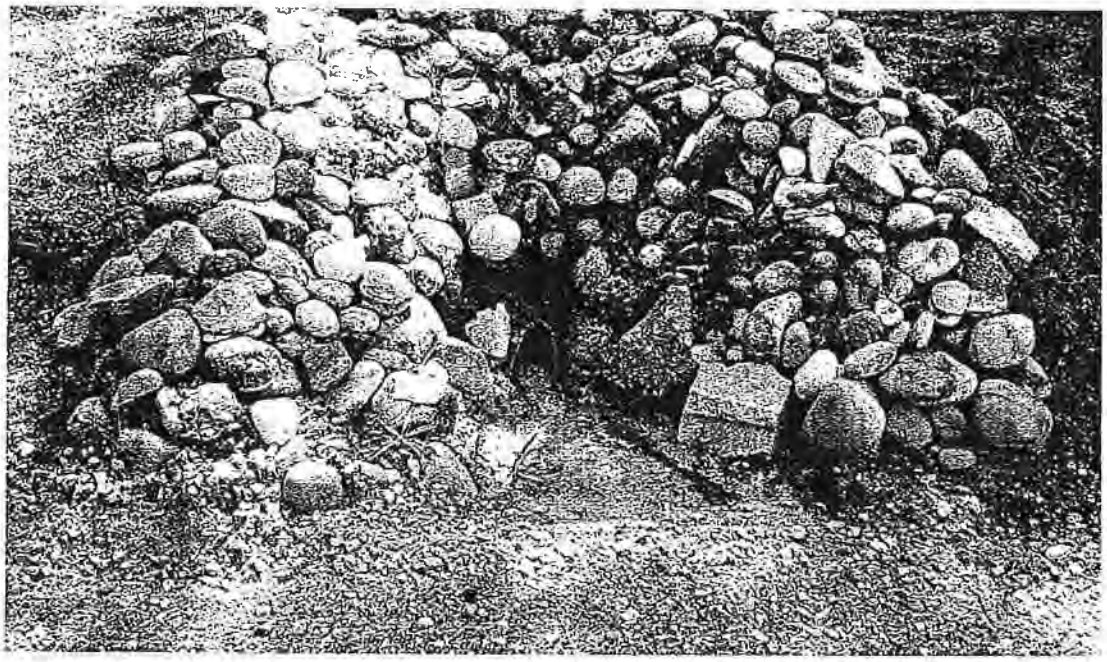
SELECTED PHOTOS FROM RIVER ROAD WEST



River Road West and Zoo Park. Sediment accumulation due to improper drainage.



Road damaged due to erosion and poor drainage.



UNDERSIZED STORM OUTLET FROM COMMERCIAL AREAS TO RIVER ROAD WEST AND AGING INFRASTRUCTURE ON RIVER ROAD WEST.

APPENDIX E

Traffic Analysis Memo

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

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To: **Mike Neumann**

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Kevin Lalonde – Town of Wasaga Beach
Tom Nollert – Ainley And Associates
Larry Young – Ainley And Associates

From: **Lilly Chen**

Date: **August 14, 2009, Revised October 8, 2009**

Ref: **Town of Wasaga Beach – River Road West Class EA Traffic Analysis**

File: **109049**

This Traffic analysis is prepared in conjunction with a Schedule C Municipal Class Environmental Assessment for River Road West Urbanization from Brillinger Drive to the easterly Town limits (total length of 7.9 kilometres).

In 2006, the Town retained Ainley And Associates Limited and completed a Transportation Study Update. The 2006 Transportation Study Update identified major road and intersection improvement needs for the Town's road network, including widening of the subject section of River Road West. However, to fulfill the requirements of this EA, more detailed road and intersection improvement needs to the section of River Road West are to be identified. In addition, traffic count data and traffic volume projections need to be updated given the significant changes in development activities in the area.

The overall purpose of the **Traffic Analysis** is to assess the transportation needs of the subject length of road under existing conditions and future traffic projections for the horizon years of 2011, 2016 and 2026. This analysis will be completed to address the project problem and/or opportunity statement and to evaluate alternative solutions to arrive at a preferred solution. Further to arriving at a preferred solution, an evaluation of alternative designs to arrive at a preferred design in conjunction with Phases 1, 2 and 3 of the Class EA will be completed.

1. Existing Traffic Volumes

Traffic Counts conducted on Thursday, June 22, 2006 are available from the 2006 Transportation Study Update for the following intersections:

- River Road & Oxbow Park Drive
- River Road & Powerline Road
- River Road & Main Street

Additional traffic counts were conducted on Tuesday, September 19, 2006 by OTI on behalf of MMM for the Stonebridge by the Bay Development Traffic Impact Study at the following intersections:

- River Road & the Bayside Mall Access
- River Road & Main Street
- Zoo Park Road

Recent traffic counts were undertaken by Ainley And Associates Limited from July 14, 2009 to July 22 2009 at the following intersections (the count data is provided in Appendix I):

- River Road & Oxbow Park Drive
- River Road & Powerline Road
- River Road & Silver Birch Avenue (easterly intersection)
- River Road & Blueberry Trail
- River Road & Westbury Road
- River Road & Main Street

- Zoo Park Road
- Bell's Park Road

A review of the traffic volumes along River Road West from July 2009 (representative of summer conditions) and June 2006, September 2006 (both average conditions) indicated comparable volumes along the River Road West corridor in consideration of a reasonable annual growth rate. Thus, the traffic counts are considered representative of typical conditions with the exception of southbound left turn PM peak hour traffic volumes on Main Street at River Road West. This is probably because summer volumes on Main Street are higher. To obtain lane balance (i.e. traffic volumes down stream should be comparable with the one upstream), a summer factor of 1.5 has been applied for the southbound left turn PM peak hour traffic volumes on Main Street at River Road West.

Traffic volumes on all the other side streets have been estimated based on existing development land uses, sizes, applicable ITE trip generation rates and the existing traffic patterns along the section of River Road West with an exception of traffic volumes on the Bayside Mall Driveway and Promenade Mews. Traffic volumes on the Bayside Mall Driveway and Promenade Mews have been derived from the September 2006 counts and the traffic volume projections for the developments of Stonebridge by the Bay and Georgian Glen Estates (report *Traffic Impact Study Update, Proposed Mixed-Use Development, River Road West and Main Street, Town of Wasaga Beach*). It is assumed that 50% of the site volumes for the Stonebridge by the Bay development and 100% of the Georgian Glen Estates volumes are currently on the road network.

The corresponding 2009 peak hour traffic volumes are shown in Figure 1 for 29 intersections. While it is recognized that there are a number of private commercial and residential access points along the section of River Road West, most are relatively minor and thus need not be explicitly addressed from an operational perspective.

Figure 1 illustrates the peak hour volumes on this section of River Road West which are in the order of 200 to 450 vehicles per hour per direction during the AM peak and 350 to 700 vehicles per hour during the PM peak with higher volumes near Oxbow Park Road, Silver Birch Avenue and lower volumes near Bell's Park Road.

With respect to pedestrian traffic, crossing volumes were observed during the traffic counts. The highest peak hour pedestrian volumes are in the order of 25 persons crossing River Road West at Main Street. Pedestrian traffic is in the order of 10 to 23 persons crossing River Road West during the peak periods at the other signalized intersections within the study area and 0 to 3 persons crossing River Road West at the unsignalized intersections.

2. Historic Traffic Growth

The Town's *2006 Transportation Study Update* indicates that the AADT (Annual Average Daily Traffic Volume) on the section of River Road West had grown in an annual growth rate of 2.2% to 5.0% from 1999 to 2006 as specified in Table 1.

Table 1 - AADT Growth on River Road West

Section of River Road West	AADT		Annual Growth Rate
	1999	2006	
From Oxbow Park Rd to Powerline Rd	9,300	11,900	3.52%
Form Powerline Rd to Main St.	6,750	9,550	4.96%
From Main St to Bell's Park Rd	6,375	8,000	3.24%
From Bell's Park Rd to Town Limit	6,000	7,000	2.20%

The 2009 counts were also compared with the 2006 counts. For a total of AM and PM peak hour volumes on both lanes on River Road West, an annual growth rate of –0.3% to 5.7% has been calculated and provided in Table 2.

Table 2 indicates that growth rates are higher between Main Street and Zoo Park Road, given that part of a major mix-use development has been built in the area during the period from 2006 to 2009 and that the 2009 counts were conducted in July, summer volumes are higher on Main Street and the surrounding area. For the

west part of the River Road West, peak hour traffic volume growth rates are in the order of –0.3% to 2.1% per year for the past three years.

Table 2 – Peak Hour Volume Growth on River Road West

Section of River Road West	Total AM & PM Peak Hour Volumes on Both Lanes		Annual Growth Rate
	2006	2009	
West of Oxbow Park Road	2140	2120	-0.3%
East of Oxbow Park Road	2016	2025	0.1%
West of Powerline Road	1797	1885	1.6%
East of Powerline Road	1756	1869	2.1%
West of Main Street	1338	1381	1.1%
East of Main Street	1635	1894	5.0%
West of Zoo Park Road	1552	1833	5.7%
East of Zoo Park Road	1268	1414	3.7%

3. Projected Growth

In developing future traffic projections, consideration has been given to population and employment forecasts in addition to specific development growth information provided by the Town.

Population & Employment Trends

Traffic growth will depend largely on the population and employment growth of an area. The population and employment forecasts for the Town of Wasaga Beach are documented in *Population, Household & Employment Forecasts Update, Simcoe County, Final Report*. Future population and employment projections are provided in Table 3.

Table 3 - Population and Employment Forecasts

Community	Population			Employment		
	2001	2026	Annual Growth	2001	2026	Annual Growth
Town of Wasaga Beach	12,419	28,900	3.4%	2,320	5,600	3.6%

Source: *Population, Household & Employment Forecasts Update, Simcoe County, Final Report*. Hemson Consulting Ltd., May 2004.

Growth from Specific Developments

A number of specific developments within and adjacent to the study area have been considered. These are illustrated in Figure 2 and are listed below:

1) Berkley Homes Westbury Phase 2 located on the west side of Westbury, south of Road River Road West – 124 single family detached units;
2) Georgian Glen expansion at the north of River Road West, west of Zoo Park Road – 13 mobile home units;
3) Hamount Phase 3 commercial on the north side of River Road West, east of Main Street – commercial;
4) Wasaga Country Life Phase 4C accessed via Theme Park Road, north of River Road West – 123 resort units;
5) Waterside Retirement Lodge (Jarlette) on the east side of Zoo Park Road, north of River Road West – 89 retirement units;
6) York Contracting at the north-east quadrant of River Road West/Zoo Park Road – commercial;
7) Ansley Grove Subdivision on the east side of Ansley Road, south of River Road West – 22 townhouse/condo units;
8) Baywood New England Village Condo at the south-east quadrant of Bell's Park Road/River Road West – 96 condo units;

9) Baywood New England Village Gateway on the south side of River Road West east of Bell's Park Road – 1335 single family units;
10) Blueberry Village Phase 2 on the south side of Royal Beach Drive, west of Blueberry Trail – 17 townhouse units;
11) Hamount Residential/Commercial Phase 4 on the south side of River Road East, east of Main Street – 440 medium to high residential units;
12) Iantorno Development on the west side of Bell's Park Road, east of Golf Course Road – 12 single family units;
13) Mollela (Devlin) Subdivision on the east side of Westbury Road, south of River Road West – 60 single family units;
14) Sergautis Townhouse on the east side of Westbury Road, south of River Road West – 16 townhouse units;
15) Regency Homes on the west side of Theme Park Drive, north of River Road West – 56 single family units;
16) DiGiovanni Group Tourist Resort on the east side of Zoo Park Road, south of River Road East – 177 resort units; and
17) Sceptre Development on the north side of River Road West, west of Bell's Park Road – 755 resort units.

Developments numbers 1 to 6 are currently under construction. Developments numbers 7 to 15 are committed developments. Their site plans have been approved. Developments numbers 16 to 17 are uncommitted developments. Their proposals haven't been approved. For the purpose of this report and to assess the ultimate conditions, we have assumed that 100% build-out of these developments will occur in the 2026 horizon. Development phases are provided in detail in Table 4 as per the Town's Planning Department's direction.

Trips generated by the developments numbers 3 and 11 have been derived from the report *Traffic Impact Study Update, Proposed Mixed-Use Development, River Road West and Main Street, Town of Wasaga Beach.* As indicated previously, it is assumed that 50% of the Hamount Development (Stonebridge by the Bay Development) traffic volumes are currently on the road system.

Trips generated by the other developments have been specifically estimated, given the size and type of developments, corresponding trip rates as per the *ITE Trip Generation Manual.* The following have been employed:

- single family units – trip rates correspond to "single family detached housing" (ITE land use code 210);
- mobile home units – trip rates correspond to "mobile home park" (ITE land use code 240);
- resort units – trip rates based on the average rates from "resort hotel" (ITE land use code 310;
- retirement units – trip rates correspond to "congregate care facility" (ITE land use code 253);
- commercial (York Contracting) – trip rates based on the average rates from "specialty retail centre" (ITE land use code 814), AM rate was assumed to be 1/3 of the PM rate, entering/exiting split was assumed to be the same as the one for shopping centre land use, size of 23,000 sq. ft GFA, 30% pass-by trips and site access on Zoo Park Road were assumed; and
- townhouse/condo units, condo units, townhouse units – trip rates based on the average rates from "residential condominium/townhouse" (ITE land use code 230).

In all cases, the development specific trip estimates were assigned to River Road West and its intersecting roads based on the existing traffic patterns. The resulting traffic volumes attributed to the above noted developments are presented in Appendix II.

Table 4 – Development Phasing

No.	Development	Build Out Timing/Phasing		
		2011	2016	2026
Committed Developments – Approved and/or Under Construction				
1	Berkley Homes	100%		
2	Georgian Glen expansion	100%		
3	Hamount Phase 3 - Commercial	75%	100%	
4	Wasaga Country Life – Phase 4C	50%	100%	
5	Waterside Retirement Lodge (Jarlette)	100%		
6	York Contracting	50%	100%	
Committed Developments – Draft/Site Plan Approved				
7	Ansley Grove Subdivision	0%	100%	
8	Baywood New England Village Condos	100%		
9	Baywood New England Village (Gateway)	10%	40%	100%
10	Blueberry Village Phase 2	0%	40%	100%
11	Hamount Residential/Commercial (Phase 4)	40%	100%	
12	Iantorno Development	0%	100%	
13	Mollela (Devlin) – Westbury Road	0%	100%	
14	Sergautis Townhouse	0%	100%	
15	Theme Park Dr. – Regency Homes	100%		
Uncommitted Development - Proposals				
16	DiGiovanni Group – Tourist Resort	0%	15%	100%
17	Sceptre – River Road West	0%	15%	100%

4. Future Traffic Volumes

Peak Hour Volumes

Given that development growth has been considered specifically and that peak hour volume growth rates for the west part of the River Road West are in the order of –0.3% to 2.1% for the past three years, an annual general background growth rate of 2.0% was applied for traffic volumes on River Road West, Powerline Road and Bell's Park Road.

Estimates of future traffic volumes for the years 2011, 2016 and 2026 have been determined based on the following:

- 2009 traffic volumes;
- development specific volumes (as per volumes provided in Figures 1B to 16B); and
- consideration for the 2011, 2016 and 2026 horizon year growth rates.

The resulting future traffic projections are provided in Figures 3 to 5 for the 2011, 2016 and 2026 horizon respectively. The AM and PM peak hour volumes are provided, reflective of weekday conditions.

Projected Growth Rates

Based on the projected 2011, 2016 and 2026 total traffic volumes, annual peak hour volume growth rates have been calculated and summarized in Table 5.

Table 5 – Projected Growth Rates

Section of River Road West	Projected Annual Growth Rate		
	2009-2011	2011-2016	2016-2026
West of Oxbow Park Road	9%	4%	3%
East of Oxbow Park Road	9%	4%	3%
West of Powerline Road	10%	4%	3%
East of Powerline Road	10%	4%	3%
West of Silver Birch Ave (easterly intersection)	10%	4%	3%
East of Silver Birch Ave (easterly intersection)	10%	4%	3%
West of Blueberry Trail	12%	4%	3%
East of Blueberry Trail	12%	4%	3%
West of Westbury Road	13%	5%	3%
East of Westbury Road	12%	5%	3%
West of Main Street	12%	4%	3%
East of Main Street	11%	4%	3%
West of Zoo Park Road	12%	5%	3%
East of Zoo Park Road	15%	5%	4%
West of Bell's Park Road	14%	5%	3%
East of Bell's Park Road	13%	5%	3%

Daily Volumes

Daily volumes have been documented in the Town's *2006 Transportation Study Update* for the period from 2006 to 2016. However, based on the actual 2009 counts and the changes in development activities, the 2006 projections need to be updated. The 2009 AADT have been calculated based on the actual growth rates provided in Table 3 and the 2006 AADT. The 2011 and 2016 AADT have been adjusted based on the above growth rates. The 2026 volumes have been projected based on an assumed annual growth rate of 3-4%, which includes background general growth and development growth in the area. The resulting AADT projections are summarized in Table 6. The 2026 AADT is approximately 8000 to 9000 less than the 2006 projections.

Table 6 – Projected AADT (?)

Section of River Road West	Projected AADT			
	2009	2011	2016	2026
From Oxbow Park Rd to Powerline Rd	12200	14600	17800	23900
Form Powerline Rd to Main St.	10000	12300	15000	20200
From Main St to Bell's Park Rd	9200	11700	14900	20400
From Bell's Park Rd to Town Limit	7400	9400	12000	16100

5. Speed Limit & Existing 2009 Lane Configuration

The speed limit on River Road West from Brilliger Drive to Bell's Park Road (inclusive) is 50 km/h whereas, from east of Bell's Park Road to the eastern Town limits is 70 km/h. These speed limits are considered typical of major roads within municipal boundaries.

The existing configurations of the key 29 intersections are illustrated in Figure 6. River Road West provides a

single lane per direction from Brillinger Drive to the easterly Town limit except the section from Main Street to Zoo Park Road. From Main Street to Zoo Park Road, River Road West has a 4-lane cross-section with 2 lanes per direction. A left-turn lane is provided on each approach at Blueberry Trail intersection. A left-turn lane and a right-turn lane are provided on River Road West at Westbury Road. A left-turn lane is also provided on Main Street, Ansley Road and Zoo Park Road. A channelized right turn lane is provided at Main Street, north approach, as illustrated in Figure 6.

6. Existing Intersection Operations

Based on the existing intersection lane configurations and control, analyses of the key intersections were conducted for the existing peak hour traffic volumes. The methodology applied was consistent with the *Highway Capacity Manual* method for unsignalized and signalized intersections and the Synchro Delay method for signalized intersections as employed in the software program Synchro 7.

Table 7 summarizes the results of the analysis with level of service (LOS), estimated delays (measured in seconds) and volume to capacity (v/c) ratio provided. Level of service A, corresponding to minimal delays, is the best whereas level of service F, corresponding to high delays, is generally considered poor conditions. When volume is less than capacity, v/c ratio is less than 1. Otherwise, v/c ratio equals to 1 or more than 1, which means volume reaches capacity or is more than capacity.

For unsignalized intersections, the level of service corresponds to the minor street lane groups given that the major street movements proceed relatively unimpeded. For signalized intersections, the results pertain to the average intersection delay and assume optimal signal timing and phasing to achieve the most efficient overall network operations through signal coordination. If the actual situations are under expectations, adjustments to the signal timing and/or phasing can be readily implemented. Level of service definitions and the corresponding detailed worksheets are included in Appendix III.

As per the analyses, acceptable levels of service (D or better) occur at all intersections under existing conditions and thus no improvements related to intersection operations are required at this time on the basis of the intersection operational analysis.

Table 7 – 2009 Intersection Operations

Intersection		Control	AM Peak Hour			PM Peak Hour		
			Delays(s)	LOS	v/c	Delays(s)	LOS	v/c
River Rd W & Oxbow Park Dr.	NB	stop	17	C	0.19	29	D	0.31
River Rd W & Brillinger Dr.	NB	stop	15	B	0.07	22	C	0.08
River Rd W & Innisbrook Dr.	NB	stop	15	B	0.08	22	C	0.08
River Rd W & Riverdale Dr.	NB	stop	15	B	0.09	22	C	0.10
River Rd W & Glen Eton Rd	NB	stop	15	C	0.14	22	C	0.15
River Rd W & Smallman Dr.	NB	stop	15	B	0.14	19	C	0.13
River Rd W & Centre St.	SB	stop	13	B	0.01	16	C	0.01
River Rd W & Fernbrook Dr.	NB	stop	19	C	0.39	23	C	0.35
River Rd W & Powerline Rd	NB	stop	15	C	0.10	18	C	0.18
River Rd W & Lauderdale Blvd	NB	stop	14	B	0.04	17	C	0.03
River Rd W & Talla Court	NB	stop	13	B	0.01	17	C	0.01
River Rd W & Oak Tree Court	NB	stop	14	B	0.01	17	C	0.01
River Rd W & Antigua Dr.	NB	stop	14	B	0.03	16	C	0.02
River Rd W & Caribbean Dr.	NB	stop	14	B	0.03	16	C	0.02
River Rd W & Pauline Dr.	SB	stop	12	B	0.02	16	C	0.02
River Rd W & Indianola Cres.	NB	stop	15	B	0.01	21	C	0.01
River Rd W & Ocala Dr.	SB	stop	12	B	0.01	17	C	0.01
River Rd W & Silver Birch Ave. (west)	NB	stop	18	C	0.32	32	D	0.40
River Rd W & Silver Birch Ave. (east)	NB	stop	15	B	0.18	24	C	0.14
River Rd W & Odell Gate	NB	stop	14	B	0.15	20	C	0.16
River Rd W & Blueberry Trail/Access	All	signal	12	B	0.26	13	B	0.38
River Rd W & Beck St.	SB	stop	12	B	0.02	14	B	0.03
River Rd W & Westbury Rd	All	signal	13	B	0.28	15	B	0.35
River Rd W & Main St	All	signal	10	A	0.35	12	B	0.52
River Rd W & Promenade Mews	All	signal	19	B	0.19	16	B	0.28
River Rd W & Zoo Park Rd	All	signal	9	A	0.27	12	B	0.37
River Rd W & Golf Course Rd	NB	stop	12	B	0.04	17	C	0.04
River Rd W & Theme Park Rd	SB	stop	11	B	0.07	13	B	0.20
River Rd W & Bell's Park Rd	NB	stop	10	B	0.06	12	B	0.06

7. Future 2011, 2016 & 2026 Operations with Existing Road System

The operations of the key study area intersections were investigated based upon the existing configurations and the 2011, 2016 and 2026 traffic projections previously presented. The intent of this is to determine if improvements are required beyond the existing intersection configurations and to gauge the appropriate timing. The results of the 2011, 2016 and 2026 analyses are presented in Tables 8 to 10 respectively whereas the corresponding worksheets are provided in Appendix III.

Levels of service deteriorate at all area intersections as traffic volumes increase. Acceptable levels of service (E or better) will be provided at most of the intersections in the 2011 horizon with an exception of the intersection of Silver Birch Avenue (westerly intersection), where, a poor level of service (F) will be provided during the PM peak hour. Thus, improvements to the intersection should be considered.

For the 2016 horizon, a poor level of service (F) will also occur at the intersections of River Road West with Oxbow Park Road, Fernbrook Drive and Silver Birch Avenue (easterly intersection) during the PM peak hour. This is indicative of the need for future intersection improvements.

Similarly, in the 2026 horizon, intersection improvements should be considered at the intersections of River Road West with Brillinger Drive, Innisbrook Drive, Riverdale Drive, Glen Eton Road, Smallman Drive, Powerline Road, Lauderdale Boulevard, Indianola Crescent, Ocala Drive, Odell Gate, Beck Street and Theme Park Road.

Table 8 – 2011 Intersection Operations

Intersection		Control	AM Peak Hour			PM Peak Hour		
			Delays(s)	LOS	v/c	Delays(s)	LOS	v/c
River Rd W & Oxbow Park Dr.	NB	stop	20	C	0.24	46	E	0.45
River Rd W & Brillinger Dr.	NB	stop	17	C	0.09	29	D	0.11
River Rd W & Innisbrook Dr.	NB	stop	17	C	0.10	29	D	0.12
River Rd W & Riverdale Dr.	NB	stop	17	C	0.11	30	D	0.14
River Rd W & Glen Eton Rd	NB	stop	18	C	0.17	31	D	0.21
River Rd W & Smallman Dr.	NB	stop	18	C	0.17	25	D	0.17
River Rd W & Centre St.	SB	stop	15	B	0.02	20	C	0.02
River Rd W & Fernbrook Dr.	NB	stop	25	C	0.48	35	D	0.47
River Rd W & Powerline Rd	NB	stop	18	C	0.13	25	C	0.25
River Rd W & Lauderdale Blvd	NB	stop	17	C	0.04	21	C	0.04
River Rd W & Talla Court	NB	stop	15	C	0.01	21	C	0.01
River Rd W & Oak Tree Court	NB	stop	17	C	0.01	21	C	0.01
River Rd W & Antigua Dr.	NB	stop	17	C	0.04	20	C	0.03
River Rd W & Caribbean Dr.	NB	stop	17	C	0.04	20	C	0.03
River Rd W & Pauline Dr.	SB	stop	13	B	0.02	20	C	0.03
River Rd W & Indianola Cres.	NB	stop	17	C	0.02	27	D	0.02
River Rd W & Ocala Dr.	SB	stop	13	B	0.01	21	C	0.01
River Rd W & Silver Birch Ave. (west)	NB	stop	23	C	0.39	**57**	**F**	0.56
River Rd W & Silver Birch Ave. (east)	NB	stop	18	C	0.22	33	D	0.20
River Rd W & Odell Gate	NB	stop	16	C	0.18	27	D	0.22
River Rd W & Blueberry Trail/Access	All	signal	13	B	0.31	17	B	0.48
River Rd W & Beck St.	SB	stop	13	B	0.02	17	C	0.05
River Rd W & Westbury Rd	All	signal	13	B	0.37	15	B	0.40
River Rd W & Main St	All	signal	10	B	0.42	9	A	0.53
River Rd W & Promenade Mews	All	signal	17	B	0.25	16	B	0.36
River Rd W & Zoo Park Rd	All	signal	11	B	0.33	13	B	0.45
River Rd W & Golf Course Rd	NB	stop	15	B	0.05	24	C	0.06
River Rd W & Theme Park Rd	SB	stop	12	B	0.15	16	C	0.33
River Rd W & Bell's Park Rd	NB	stop	13	B	0.02	14	B	0.08

Table 9 – 2016 Intersection Operations

Intersection		Control	AM Peak Hour			PM Peak Hour		
			Delays(s)	LOS	v/c	Delays(s)	LOS	v/c
River Rd W & Oxbow Park Dr.	NB	stop	27	D	0.32	**91**	**F**	0.69
River Rd W & Brillinger Dr.	NB	stop	22	C	0.12	44	E	0.16
River Rd W & Innisbrook Dr.	NB	stop	22	C	0.13	43	E	0.17
River Rd W & Riverdale Dr.	NB	stop	22	C	0.15	45	E	0.21
River Rd W & Glen Eton Rd	NB	stop	23	C	0.23	48	E	0.31
River Rd W & Smallman Dr.	NB	stop	23	C	0.22	37	E	0.25
River Rd W & Centre St.	SB	stop	17	C	0.02	27	D	0.03
River Rd W & Fernbrook Dr.	NB	stop	39	E	0.62	**65**	**F**	0.67
River Rd W & Powerline Rd	NB	stop	24	C	0.19	39	E	0.39
River Rd W & Lauderdale Blvd	NB	stop	21	C	0.06	28	D	0.06
River Rd W & Talla Court	NB	stop	18	C	0.01	28	D	0.01
River Rd W & Oak Tree Court	NB	stop	20	C	0.01	28	D	0.01
River Rd W & Antigua Dr.	NB	stop	21	C	0.05	26	D	0.05
River Rd W & Caribbean Dr.	NB	stop	20	C	0.05	27	D	0.04
River Rd W & Pauline Dr.	SB	stop	15	C	0.03	26	D	0.04
River Rd W & Indianola Cres.	NB	stop	21	C	0.02	38	E	0.03
River Rd W & Ocala Dr.	SB	stop	15	C	0.02	29	D	0.02
River Rd W & Silver Birch Ave. (west)	NB	stop	34	D	0.52	**132**	**F**	0.85
River Rd W & Silver Birch Ave. (east)	NB	stop	23	C	0.28	**53**	**F**	0.30
River Rd W & Odell Gate	NB	stop	21	C	0.24	42	E	0.32
River Rd W & Blueberry Trail/Access	All	signal	14	B	0.38	17	B	0.54
River Rd W & Beck St.	SB	stop	16	C	0.03	26	D	0.08
River Rd W & Westbury Rd	All	signal	14	B	0.42	14	B	0.48
River Rd W & Main St	All	signal	8	A	0.42	13	B	0.64
River Rd W & Promenade Mews	All	signal	18	B	0.31	15	B	0.46
River Rd W & Zoo Park Rd	All	signal	15	B	0.38	11	B	0.55
River Rd W & Golf Course Rd	NB	stop	20	C	0.07	45	E	0.11
River Rd W & Theme Park Rd	SB	stop	15	B	0.20	24	C	0.48
River Rd W & Bell's Park Rd	NB	stop	13	B	0.12	18	C	0.13

Table 10 – 2026 Intersection Operations

Intersection		Control	AM Peak Hour			PM Peak Hour		
			Delays(s)	LOS	v/c	Delays(s)	LOS	v/c
River Rd W & Oxbow Park Dr.	NB	stop	**50**	**F**	0.52	**408**	**F**	**1.45**
River Rd W & Brillinger Dr.	NB	stop	35	E	0.19	**101**	**F**	0.33
River Rd W & Innisbrook Dr.	NB	stop	35	D	0.20	**100**	**F**	0.35
River Rd W & Riverdale Dr.	NB	stop	34	D	0.23	**110**	**F**	0.43
River Rd W & Glen Eton Rd	NB	stop	39	E	0.35	**136**	**F**	0.62
River Rd W & Smallman Dr.	NB	stop	38	E	0.34	**85**	**F**	0.47
River Rd W & Centre St.	SB	stop	24	C	0.03	49	E	0.05
River Rd W & Fernbrook Dr.	NB	stop	**112**	**F**	0.95	**254**	**F**	**1.22**
River Rd W & Powerline Rd	NB	stop	42	E	0.38	**155**	**F**	0.91
River Rd W & Lauderdale Blvd	NB	stop	31	D	0.09	**50**	**F**	0.11
River Rd W & Talla Court	NB	stop	26	D	0.01	50	E	0.03
River Rd W & Oak Tree Court	NB	stop	30	D	0.02	50	E	0.03
River Rd W & Antigua Dr.	NB	stop	31	D	0.08	45	E	0.08
River Rd W & Caribbean Dr.	NB	stop	31	D	0.08	48	E	0.08
River Rd W & Pauline Dr.	SB	stop	20	C	0.04	47	E	0.07
River Rd W & Indianola Cres.	NB	stop	32	D	0.04	**76**	**F**	0.06
River Rd W & Ocala Dr.	SB	stop	20	C	0.02	**53**	**F**	0.04
River Rd W & Silver Birch Ave. (west)	NB	stop	**84**	**F**	0.80	**558**	**F**	**1.7**
River Rd W & Silver Birch Ave. (east)	NB	stop	41	E	0.43	**152**	**F**	0.61
River Rd W & Odell Gate	NB	stop	34	D	0.35	**108**	**F**	0.60
River Rd W & Blueberry Trail/Access	All	signal	15	B	0.47	24	C	0.64
River Rd W & Beck St.	SB	stop	23	C	0.04	**90**	**F**	0.26
River Rd W & Westbury Rd	All	signal	15	B	0.53	15	B	0.59
River Rd W & Main St	All	signal	9	A	0.51	25	C	0.74
River Rd W & Promenade Mews	All	signal	18	B	0.42	12	B	0.63
River Rd W & Zoo Park Rd	All	signal	10	B	0.48	12	B	0.69
River Rd W & Golf Course Rd	NB	stop	46	E	0.17	**285**	**F**	0.52
River Rd W & Theme Park Rd	SB	stop	22	C	0.29	**88**	**F**	0.88
River Rd W & Bell's Park Rd	NB	stop	17	C	0.18	28	D	0.24

8. Mid-Block Capacity

While the capacity of a road system is effectively dictated by the capacity of its intersections, mid-block capacity has also been considered in the analysis for the need for additional through lanes in this section of River Road West.

Road Capacity

River Road West from Brillinger Drive to Main Street is classified as an arterial road, whereas from Main Street to the eastern Town limit as controlled access road in the Town's *Official Plan*. The primary purpose of an arterial road or controlled access road is to carry high volumes of traffic and provide through travel routes across and

within the Town. Direct access points onto an arterial road shall typically be limited. For planning purposes, the capacity of an arterial road is generally in the order of 800 to 900 vehicles per hour per lane, which considers the adverse impacts on road capacity resulting from reduced travel speeds, vehicle composition, intersection effects and the presence of intersecting side streets and driveways. For purposes of this assignment, a capacity of 800 vehicles per hour lane has been assumed.

Volume to Capacity Ratio

To determine the adequacy of the existing road system and hence the need for additional through lanes, the existing and projected traffic volumes were compared to the assumed road capacity. The resulting volume to capacity (v/c) ratios are provided in Table 11 for the critical peak hour volume (greatest of the AM and PM volumes by direction) and in considering the existing road configuration (2 lanes per direction from Main Street to Zoo Park Road and 1 lane per direction for the rest of the road). Ratios of v/c in excess of 1.0 indicate that the volumes exceed the road capacity and thus additional capacity (eg. additional lanes) is required. Ratios greater than or equal to 0.9 suggest that the road section will operate at or near capacity and operations will begin to breakdown (ie. the road is operating at 90% or more of its capacity). The provision of additional through lanes should be considered at this point to ensure appropriate road capacity is provided.

Table 11 – Mid-Block v/c Ratios – Existing Road System with Existing & Future Volumes

Section of River Road West	2009		2011		2016		2026	
	vol.	v/c	vol.	v/c	vol.	v/c	vol.	v/c
West of Oxbow Park Road	760	**0.95**	900	**1.13**	1050	**1.31**	1300	**1.63**
East of Oxbow Park Road	730	**0.91**	870	**1.09**	1030	**1.29**	1280	**1.60**
West of Powerline Road	590	0.74	730	**0.91**	870	**1.09**	1090	**1.36**
East of Powerline Road	590	0.74	730	**0.91**	870	**1.09**	1090	**1.36**
West of Silver Birch Ave (easterly intersection)	670	0.84	800	**1.00**	940	**1.18**	1160	**1.45**
East of Silver Birch Ave (easterly intersection)	590	0.74	720	**0.90**	860	**1.08**	1120	**1.40**
West of Blueberry Trail	470	0.59	600	0.75	720	**0.90**	910	**1.14**
East of Blueberry Trail	470	0.59	590	0.74	720	**0.90**	910	**1.14**
West of Westbury Road	430	0.54	560	0.70	680	0.85	880	**1.10**
East of Westbury Road	410	0.51	520	0.65	650	0.81	880	**1.10**
West of Main Street	400	0.50	490	0.61	610	0.76	830	**1.04**
East of Main Street	630	0.39	750	0.47	880	0.55	1100	0.69
West of Zoo Park Road	560	0.35	700	0.44	850	0.53	1170	0.73
East of Zoo Park Road	420	0.53	530	0.66	690	0.86	1010	**1.26**
West of Bell's Park Road	360	0.45	460	0.58	600	0.75	800	**1.00**
East of Bell's Park Road	400	0.50	500	0.63	640	0.80	850	**1.06**

As indicated, the existing traffic volumes are 15 to 65 % under the theoretical planning capacity of River Road West except the section east and west of Oxbow Park Road where volumes are near the capacity. Whereas, the 2011 projected volumes are 25 to 55 % under the theoretical planning capacity except the section from west of Oxbow Park Road to east of Silver Birch Avenue (easterly intersection) where volumes are at and near the capacity. However, the 2016 projected volumes are near or over the road's capacity from west of Oxbow Park Road to east of Blueberry Trail. The 2026 projected volumes are over the road's capacity except the section of road currently has 2 lanes per direction from Main Street to Zoo Park Road.

Therefore, the mid-block capacity analysis suggests there may be a need for additional lanes in each direction for the section of River Road West near east and west of Oxbow Park Road in the current 2009 horizon, for the section of River Road West from Oxbow Park Road to Silver Birch Avenue (easterly intersection) in the 2011 horizon, from Silver Birch Avenue (easterly intersection) to Blueberry Trail in the 2016 horizon, and from Blueberry Trail to Main Street and from Zoo Park Road to the eastern Town limit in the 2026 horizon.

These findings are based upon the mid-block capacity analysis. It is noted that the need for the additional through lanes is also investigated in the detailed intersection assessments (Section 11).

9. Current Left Turn Lane Requirements

Based on the existing 2009 traffic volumes indicated in Figure 1 and MTO left turn lane criteria, the following left turn lanes are warranted on the section of River Road West in the study area:

- 15 metre westbound left turn lane on River Road West at Oxbow Park Drive;
- 15 metre westbound left turn lane on River Road West at Glen Eton Road;
- 15 metre westbound left turn lane on River Road West at Smallman Drive;
- 25 metre westbound left turn lane on River Road West at Fernbrook Drive;
- 15 metre westbound left turn lane on River Road West at Powerline Road;
- 15 metre westbound left turn lane on River Road West at Silver Birch Avenue (westerly intersection);
- 15 metre westbound left turn lane on River Road West at Silver Birch Avenue (easterly intersection); and
- 15 metre eastbound left turn lane on River Road West at Theme Park Road.

Based on a design speed of 60 km/h, these left turn lanes should include a 30 metre parallel length and a 100 metre taper.

10. Intersection Improvements – Signals

The need for a traffic signal at the intersections of Fernbrook Drive, Silver Birch Avenue (westerly intersection) and Golf Course Road (critical intersections) was reviewed based on MTO traffic signal warrants and the projected peak hour traffic volumes for the 2026 planning horizon. A traffic signal is not warranted at any of these intersections. The completed signal warrants are provided in Appendix D. It is noted that the need for a traffic signal is further investigated in the pedestrian signal assessment (Section 15).

11. Intersection Improvements – Operations

As identified in Section 7, intersection improvements are required in the 2011 horizon at the Silver Birch Avenue (westerly intersection) intersection, in the 2016 horizon at the Oxbow Park Road, Fernbrook Drive and Silver Birch Avenue (easterly intersection) intersections, and in the 2026 horizon at most of the unsignalized intersections except the Centre Street, Talla Court, Oak Tree Court, Antigua Drive, Caribbean Drive, Pauline Drive and Bell's Park Road intersections. Summaries of the operational assessments are provided below whereas detailed worksheets are provided in Appendix E.

River Road West & Oxbow Park Road

Given that a traffic signal has been suggested at the intersection in the Schoonertown Bridge EA project, a traffic signal with two lanes on the River Road West approaches (one through lane and one left-through or right-through lane) and an exclusive left turn lane and a right turn lane on the Oxbow Park Road approach are assumed in the 2011, 2016 and 2026 horizons to maximize performance of the intersection. The results of the operational analysis are summarized in Table 12.

Table 12 – Intersection Operations – River Road West & Oxbow Park Road

River Road West Improvement			Control	AM Peak Hour			PM Peak Hour		
				Delays	LOS	v/c	Delays	LOS	v/c
2 lanes per direction with a through lane and a left-through or right-through shared lane at the intersection	2011	all	signal	7	A	0.35	8	A	0.46
2 lanes per direction with a through lane and a left-through or right-through shared lane at the intersection	2016	all	signal	7	A	0.40	8	A	0.52
2 lanes per direction with a through lane and a left-through or right-through shared lane at the intersection	2026	all	signal	8	A	0.47	8	A	0.58

As indicated in Table 12, an excellent level of service (A) will be provided through the 2026 horizon, no further improvements are required at the intersection.

River Road West & Silver Birch Avenue (Westerly Intersection)

The following improvements were considered for the 2011 horizon:
- adding an additional through lane in each direction on River Road West;
- adding a left turn lane on left turn lane on River Road West; and
- adding a continuous centre left turn lane on River Road West.

Based on either one of these improvements (an additional through lane or a left turn lane or a centre left turn lane on River Road West), the resulting intersection operations and levels of service are provided in Table 13.

Table 13 – Intersection Operations – River Road West & Silver Birch Avenue (Westerly Intersection)

River Road West Improvement			Control	AM Peak Hour			PM Peak Hour		
				Delays	LOS	v/c	Delays	LOS	v/c
4-lane with 2 lanes per direction	2011	NB	stop	17	C	0.30	33	D	0.39
1 lane per direction & a westbound left turn lane	2011	NB	stop	23	C	0.39	**57**	**F**	0.56
3-lane with 1 lane per direction & a centre turn lane	2011	NB	stop	14	B	0.25	19	C	0.25
3-lane with 1 lane per direction & a centre turn lane	2016	NB	stop	16	C	0.29	24	C	0.30
3-lane with 1 lane per direction & a centre turn lane	2026	NB	stop	20	C	0.35	36	E	0.42

As the 3-lane with a centre turn lane option provides a better level of service for the minor street approach, it was also applied to the 2016 and 2026 horizons. The results of the operational analysis are also provided in Table 13. As indicated in Table 13, the centre turn lane option is sufficient to achieve acceptable levels of service in the 2026 horizon.

Intersection Operations with a Centre Turn Lane

The centre turn lane option was applied to the Fernbrook Drive and Silver Birch Avenue (easterly intersection) intersections that require improvements in the 2016 horizon and the other 15 intersections that require improvements in the 2026 horizon. The results of the operational analyses are summarized in Tables 14 and 15 for the 2016 and 2026 horizons respectively.

As Tables 14 and 15 indicate, an acceptable level of service (B to E) will be provided at all the other intersections in the 2016 and 2026 horizons. Thus, adding a center left turn lane is sufficient for the area unsignalized intersections through the 2026 horizon.

Table 14 – 2016 Other Intersection Operations – With a Centre Left Turn Lane

Intersection		Control	AM Peak Hour			PM Peak Hour		
			Delays(s)	LOS	v/c	Delays(s)	LOS	v/c
River Rd W & Fernbrook Drive	NB	stop	18	C	0.36	22	C	0.33
River Rd W & Silver Birch Ave. (easterly intersection)	NB	stop	14	B	0.16	19	C	0.11

Table 15 – 2026 Other Intersection Operations – With a Centre Left Turn Lane

Intersection		Control	AM Peak Hour			PM Peak Hour		
			Delays(s)	LOS	v/c	Delays(s)	LOS	v/c
River Rd W & Brillinger Dr.	NB	stop	17	C	0.08	42	E	0.15
River Rd W & Innisbrook Dr.	NB	stop	17	C	0.09	41	E	0.17
River Rd W & Riverdale Dr.	NB	stop	16	C	0.10	26	D	0.12
River Rd W & Glen Eton Rd	NB	stop	17	C	0.16	26	D	0.18
River Rd W & Smallman Dr.	NB	stop	17	C	0.16	25	D	0.17
River Rd W & Fernbrook Dr.	NB	stop	23	C	0.45	33	D	0.45
River Rd W & Powerline Rd	NB	stop	18	C	0.17	28	D	0.35
River Rd W & Lauderdale Blvd	NB	stop	16	C	0.04	21	C	0.04
River Rd W & Indianola Cres.	NB	stop	16	C	0.02	23	C	0.02
River Rd W & Ocala Dr.	SB	stop	16	C	0.02	22	C	0.01
River Rd W & Silver Birch Ave. (easterly intersection)	NB	stop	17	C	0.20	25	D	0.15
River Rd W & Odell Gate	NB	stop	16	C	0.17	23	C	0.19
River Rd W & Beck St.	SB	stop	13	B	0.02	19	C	0.05
River Rd W & Golf Course Rd	NB	stop	17	C	0.05	22	C	0.05
River Rd W & Theme Park Rd	SB	stop	15	B	0.19	33	D	0.58

12. Future Left Turn Lane Requirements

Based on the future 2011 and 2016 traffic volumes indicated in Figures 3 and 4, existing intersection configurations and MTO left turn lane criteria, the following left turn lanes are warranted on the section of River Road West in the study area:

2011

- 25 metre westbound left turn lane on River Road West at Oxbow Park Drive;
- 25 metre westbound left turn lane on River Road West at Glen Eton Road;
- 25 metre westbound left turn lane on River Road West at Smallman Drive;
- 40 metre westbound left turn lane on River Road West at Fernbrook Drive;
- 25 metre westbound left turn lane on River Road West at Powerline Road;
- 30 metre westbound left turn lane on River Road West at Silver Birch Avenue (westerly intersection);
- 25 metre westbound left turn lane on River Road West at Silver Birch Avenue (easterly intersection);
- 25 metre eastbound left turn lane on River Road West at Theme Park Road; and
- 15 metre westbound left turn lane on River Road West at Bell's Park Road.

2016

- 40 metre westbound left turn lane on River Road West at Oxbow Park Drive;
- 40 metre westbound left turn lane on River Road West at Glen Eton Road;
- 40 metre westbound left turn lane on River Road West at Smallman Drive;
- 50 metre westbound left turn lane on River Road West at Fernbrook Drive;

- 30 metre westbound left turn lane on River Road West at Powerline Road;
- 40 metre westbound left turn lane on River Road West at Silver Birch Avenue (westerly intersection);
- 40 metre westbound left turn lane on River Road West at Silver Birch Avenue (easterly intersection);
- 30 metre eastbound left turn lane on River Road West at Theme Park Road; and
- 25 metre westbound left turn lane on River Road West at Bell's Park Road.

For the 2026 horizon, given that all the unsignalized intersections would operate acceptably if a center left turn lane is constructed, it is assumed that a center left turn lane is provided on River Road West from Oxbow Park Road to Main Street and from Zoo Park Road to the eastern Town limits.

Based on a design speed of 60 km/h, the above left turn lanes should include a 30 metre parallel length and a 100 metre taper.

14. Intersection Spaces and Numbers of Driveway Access Points

The distances between intersections and the numbers of driveway access points along the section of River Road West were reviewed and summarized in Table 16.

Table 16 – Intersection Space and Number of Driveway Access Points

Road Section	Number of Access Points			Distance (km)	Density (driveways per km)
	North	South	Total		
Brillinger Drive to Innisbrook Drive	9	5	14	0.16	88
Innisbrook Drive to Riverdale Drive	5	2	7	0.15	47
Riverdale Drive to Glen Eton Road	5	2	7	0.15	47
Glen Eton Road to Smallman Drive	5	5	10	0.17	59
Smallman Drive to Centre Street	24	20	44	0.51	86
Centre Street to Fernbrook Drive	0	1	1	0.07	14
Fernbrook Drive to Powerline Road	0	1	1	0.12	8
Powerline Road to Lauderdale Blvd	1	0	1	0.11	9
Lauderdale Blvd to Talla Court	3	3	6	0.11	55
Talla Court to Oak Tree Court	6	4	10	0.14	71
Oak Tree Court to Antigua Drive	2	1	3	0.1	30
Antigua Drive to Caribbean Drive	4	3	7	0.11	64
Caribbean Drive to Pauline Drive	1	4	5	0.09	56
Pauline Drive to Indianola Drive	0	4	4	0.15	27
Indianola Drive to Ocala Drive	0	1	1	0.06	17
Ocala Drive to Silver Birch Ave (westerly int.)	11	9	20	0.26	77
Silver Birch Ave (westerly int.) to Silver Birch Ave (easterly int.)	8	6	14	0.15	93
Silver Birch Ave (easterly int.) to O'Dell Gate	23	7	30	0.47	64
O'Dell Gate to Blueberry Trail	43	1	44	0.73	60
Blueberry Trail to Beck Street	5	0	5	0.6	8
Beck Street to Westbury Road	2	7	9	0.34	26
Westbury Road to Main Street	4	10	14	0.3	47
Main Street to Promenade Mews	0	0	0	0.17	0
Promenade Mews to Zoo Park Road	5	5	10	0.16	63

Road Section	Number of Access Points			Distance (km)	Density (driveways per km)
	North	South	Total		
Zoo Park Road to Golf Course Road	12	6	18	0.29	62
Golf Course Road to Theme Park Road	1	2	3	0.11	27
Theme Park Road to Bell's Park Road	6	12	18	0.79	23
Bell's Park Road to the eastern Town limits	10	4	14	1.3	11
Total	195	125	320	7.9	41

Given the number of driveway access points along the road, a centre left turn lane should be considered.

The benefits of a centre left turn lane are as follows:
- provides left turn lanes at all intersecting roads and driveways, which will allow turning vehicles to leave the through lane and seek safe refuge in the centre lane while they complete their turn; and
- allows vehicles entering River Road West from the minor side streets and driveways to complete their manoeuvre in two steps – travel from the side street/driveway to the centre lane and then merge from the centre lane into the through lane – which provides improved service and reduces the potential for conflicts.

15. Pedestrian Signals

Pedestrian signals are currently provided at the following six locations along the section of River Road West:
- East of Silver Birch Avenue (easterly intersection) – school crossing
- Blueberry Trail/Access Road – signalized intersection
- Westbury Road – signalized intersection
- Main Street/Ansley Road – signalized intersection
- Promenade Mews/Bayside Mall – signalized intersection
- Zoo Park Road – signalized intersection

Given that the intersection of Oxbow Park Drive will be signalized, a pedestrian signal should be provided at the location.

Based on the current traffic counts, pedestrian traffic crossing River Road West at the unsignalized intersections are in the order of 0 to 3 persons per hour. Pedestrian signals are not warranted. However, the Town's 2008 Active Transportation Plan identifies River Road West as a route for bike lanes and sidewalks. Future pedestrian traffic may be higher as those bike lanes and sidewalks would attract more users. Opportunity for pedestrian crossing River Road West was reviewed.

In the Town's 2008 Active Transportation Plan, a pedestrian bridge at Powerline Road and Silver Birch Avenue (easterly intersection) is suggested for pedestrians to cross the Nottawasaga River and to connect the north and south portions of Town. To facilitate pedestrian crossing River Road West and going to/from the north portion of Town, a pedestrian signal along with a traffic signal on River Road West at Powerline Road and Silver Birch Avenue (easterly intersection) is recommended. In addition, these pedestrian signals would also provide safe pedestrian crossing opportunities between the pedestrian signals at Oxbow Park Drive and the school crossing east of Silver Birch Avenue.

In order to provide safe pedestrian crossing opportunities between Zoo Park Road and the eastern Town limits and in consideration of future traffic volumes on Theme Park Road, a pedestrian signal along with a traffic signal is also recommended at Theme Park Road and Bell's Park Road.

To maximize the performance of these signalized intersections, an exclusive left turn lane or right turn taper on each approach is recommended.

16. Recommendations

Based on the above intersection operations, mid-block capacity and the current and future left turn lane requirement analyses, and in consideration of the number of driveway access points on the section of River Road West, the following improvements are recommended:

Before 2011 horizon

- a centre left turn lane from east of Oxbow Park Road to Blueberry Trail; and
- a traffic signal (including a pedestrian signal) and an exclusive left turn lane or right turn taper on each approach at River Road West with Powerline Road and Silver Birch Avenue (easterly intersection).

2011 or Before 2016 horizon

- a centre left turn lane from Blueberry Trail to Main Street/Ansley Road.

2016 or Before 2026 horizon

- a centre left turn lane from Zoo Park Road to the eastern Town limits; and
- a traffic signal (including a pedestrian signal) and an exclusive left turn lane or right turn taper on each approach at River Road West with Theme Park Road and Bell's Park Road.

2026 horizon and Beyond

- two lanes in each direction from east of Oxbow Park Road to the eastern Town limits.

In conclusion, as an interim condition for the ultimate 4-lane scenario, a continuous centre left lane from approximately 100 metres east of Oxbow Park Road to Main Street and from Zoo Park Road to the eastern Town limits along River Road West is recommended.

Figure 7 illustrates the proposed road configuration through the year 2026, showing a centre left turn lane as discussed. Intersection control measures (eg. stop control or signal control) are also noted.

It is noted that the above recommendations are based on the 2009 summer traffic counts and the assumptions of 2% annual background growth, 100% full build out of the developments along River Road West by 2026 and no seasonal variation for the traffic volumes on River Road West. Given that the 2009 counts were conducted during a cool week, and a summer with lower tourism activities, we would recommend that the next Town wide transportation study update (scheduled for 2011) should review the assumptions and counts in this report.

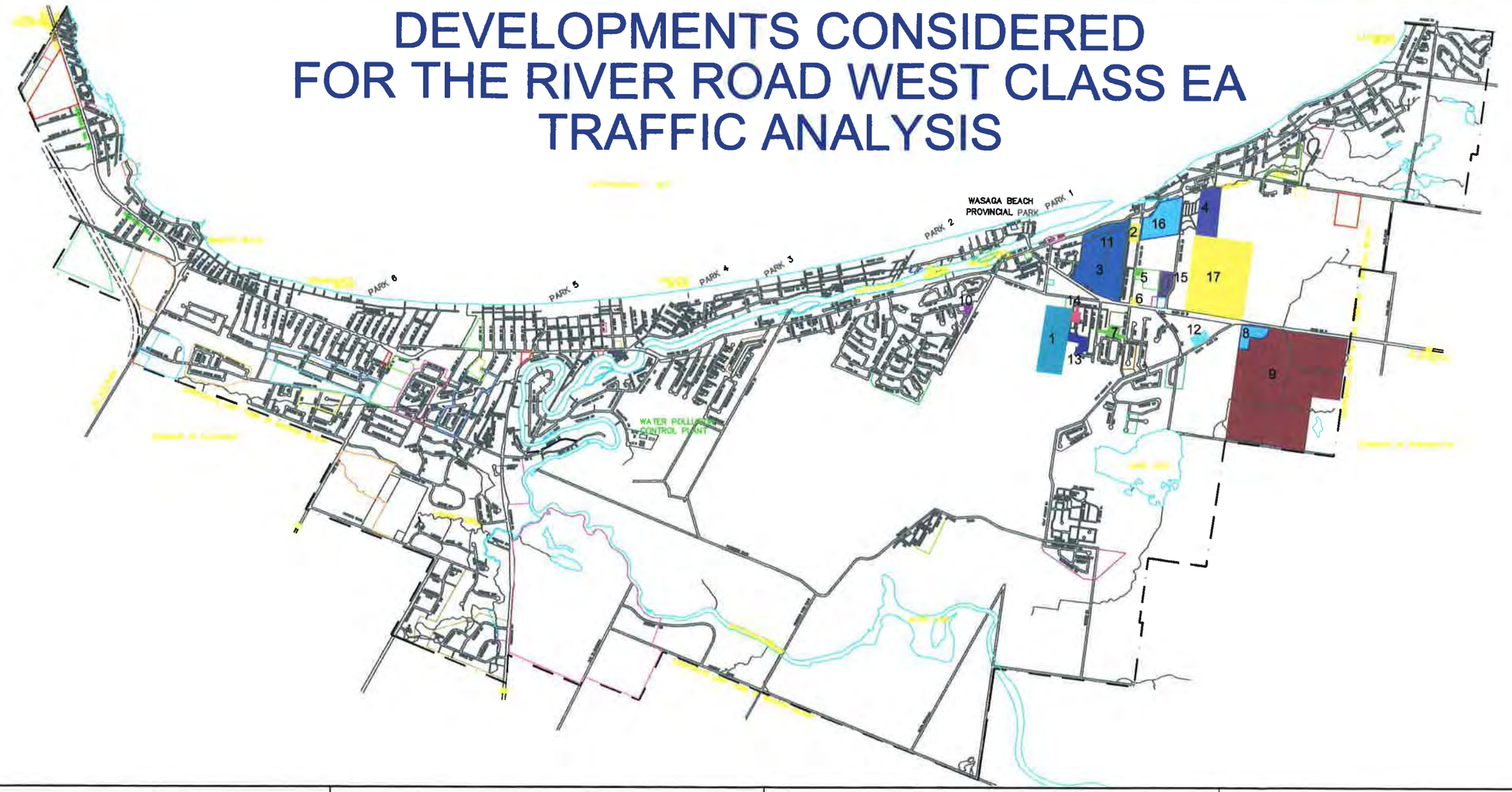
T:\109049\109049-Lilly\Working Files\Traffic Analysis\MEMO_River_Rd_Traffic_Analysis.doc

100 Weekday AM peak hour
(100) Weekday PM peak hour

Ainley CONSULTING ENGINEERS PLANNERS

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE 1 - EXISTING 2009 TRAFFIC VOLUMES

DEVELOPMENTS CONSIDERED FOR THE RIVER ROAD WEST CLASS EA TRAFFIC ANALYSIS



1 BERKLEY HOMES - WESTBURY - PHASE 2
2 GEORGIAN GLEN EXPANSION
3 HAMOUNT PHASE 3 - COMMERCIAL
4 WASAGA COUNTRY LIFE - PHASE 4C
5 WATERSIDE RETIREMENT LODGE (JARLETTE)
6 YORK CONTRACTING - RRW @ ZOO PARK RD
7 ANSLEY GROVE SUBDIVISION
8 BAYWOOD NEW ENGLAND VILLAGE CONDOS
9 BAYWOOD NEW ENGLAND VILLAGE (GATEWAY)
10 BLUEBERRY VILLAGE PH2
11 HAMOUNT RESIDENTIAL/COMMERCIAL (PHASE 4)
12 IANTORNO DEVELOPMENT
13 MOLLELA (DEVLIN) - WESTBURY ROAD
14 SERGAUTIS TOWNHOUSE
15 THEME PARK DRIVE - REGENCY HOMES
16 DIGIOVANNI GROUP - TOURIST RESORT
17 SCEPTRE - RRW

The Beach is Just the Beginning...
WASAGA Beach

100m 0 500m 1 Km 2 Km

Ainley

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
TRAFFIC ANALYSIS

SCALE: AS NOTED
DATE: AUG 2009
DWG. 109049–Fig 2

100 Weekday AM peak hour
(100) Weekday PM peak hour

Ainley CONSULTING ENGINEERS PLANNERS

TOWN OF WASAGA BEACH

RIVER ROAD WEST CLASS EA

FIGURE 3 - 2011 TOTAL TRAFFIC VOLUMES

100 Weekday AM peak hour
(100) Weekday PM peak hour

Ainley CONSULTING ENGINEERS PLANNERS

TOWN OF WASAGA BEACH

RIVER ROAD WEST CLASS EA

FIGURE 4 - 2016 TOTAL TRAFFIC VOLUMES

100 Weekday AM peak hour
(100) Weekday PM peak hour

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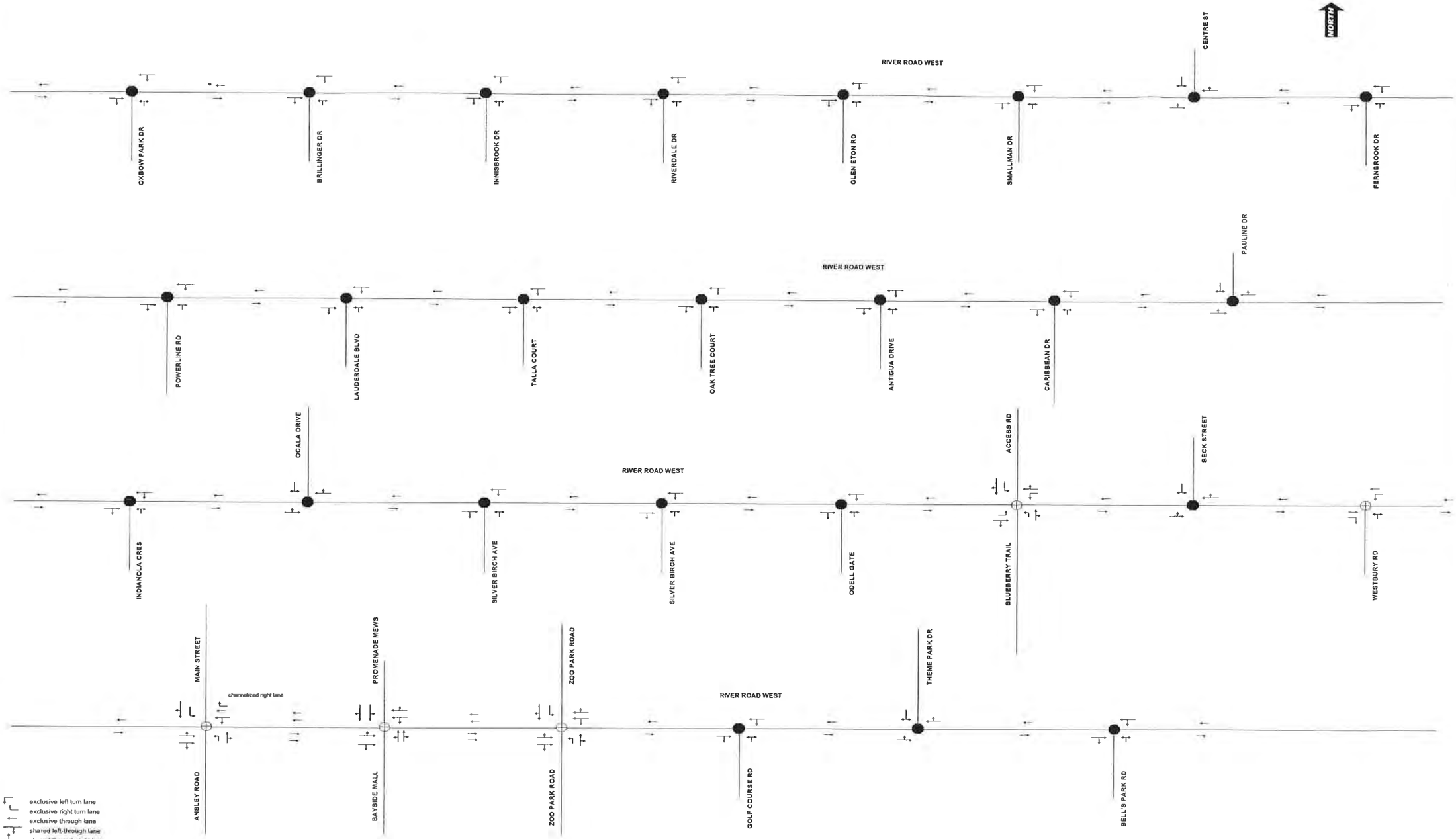
TOWN OF WASAGA BEACH

RIVER ROAD WEST CLASS EA

FIGURE 5 - 2026 TOTAL TRAFFIC VOLUMES



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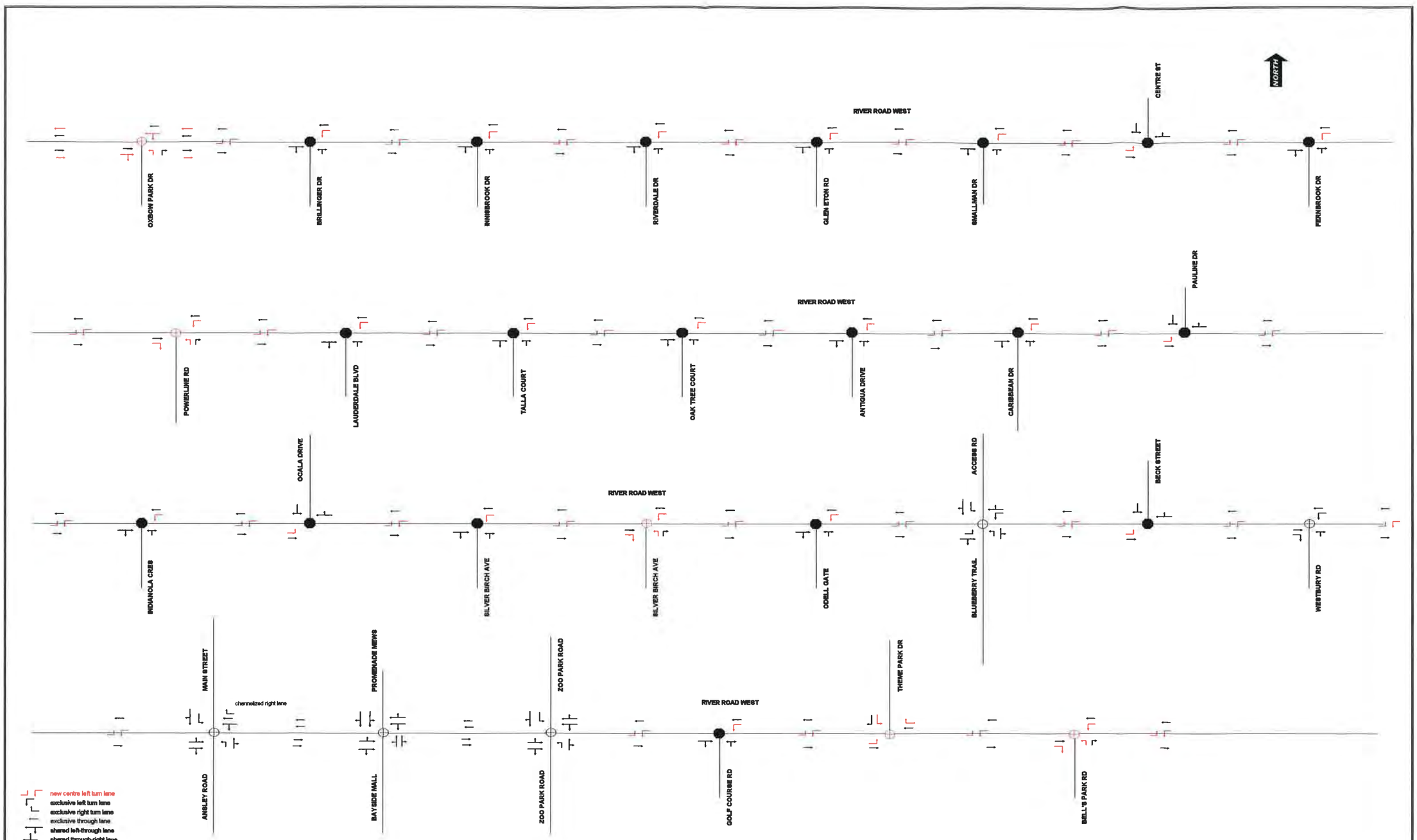
TOWN OF WASAGA BEACH

RIVER ROAD WEST CLASS EA

FIGURE 6 - EXISTING (2009) INTERSECTION CONFIGURATION & CONTROL



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TOWN OF WASAGA BEACH

RIVER ROAD WEST CLASS EA

FIGURE 7 - FUTURE (2026) INTERSECTION CONFIGURATION & CONTROL

APPENDIX I

2009 Traffic Counts

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 14, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Oxbow Park Drive	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0

NORTH LEG	
Total Vehicles	0
% Trucks Entering	-
Vehicles Entering	0
Pedestrians	0
Ped Crossing	↔

Oxbow Park Drive

TOTAL	0	0	0
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	0	0	0

0	TOTAL
0	Heavy Trucks
0	Light Trucks
0	Autos

EAST LEG	
Total Vehicles	797
% Trucks Entering	5.4%
Vehicles Entering	444
Pedestrians	0
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
480	15	8	457

Autos	Light Trucks	Heavy Trucks	TOTAL
0	0	0	0
413	8	14	435
7	0	2	9

River Road West

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River Road West

0	0	0	0
332	12	3	317
38	0	0	38
TOTAL	Heavy Trucks	Light Trucks	Autos

337	3	13	353
Autos	Light Trucks	Heavy Trucks	Total

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	370
% Trucks Entering	4.1%
Total Vehicles	850

Autos	45
Light Trucks	0
Heavy Trucks	2
TOTAL	47

44	0	20	Autos
0	0	0	Light Trucks
1	0	1	Heavy Trucks
45	0	21	TOTAL

Oxbow Park Drive

SOUTH LEG	
Ped Crossing	↔
Pedestrians	20
Vehicles Entering	66
% Trucks Entering	3.0%
Total Vehicles	113

8:15 to **9:15**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 14, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Oxbow Park Drive	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0

NORTH LEG	
Total Vehicles	0
% Trucks Entering	-
Vehicles Entering	0
Pedestrians	0
Ped Crossing	↔

Oxbow Park Drive

TOTAL	0	0	0
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	0	0	0

0	TOTAL
0	Heavy Trucks
0	Light Trucks
0	Autos

EAST LEG	
Total Vehicles	1228
% Trucks Entering	2.0%
Vehicles Entering	496
Pedestrians	0
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
507	4	4	499

Autos	Light Trucks	Heavy Trucks	TOTAL
0	0	0	0
461	4	4	469
25	1	1	27

River Road West

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River Road West

0	0	0	0
706	4	7	695
57	0	0	57
TOTAL	Heavy Trucks	Light Trucks	Autos

719	7	6	732
Autos	Light Trucks	Heavy Trucks	Total

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	763
% Trucks Entering	1.4%
Total Vehicles	1270

Autos	82
Light Trucks	1
Heavy Trucks	1
TOTAL	84

38	0	24	Autos
0	0	0	Light Trucks
0	0	2	Heavy Trucks
38	0	26	TOTAL

Oxbow Park Drive

SOUTH LEG	
Ped Crossing	↔
Pedestrians	26
Vehicles Entering	64
% Trucks Entering	3.1%
Total Vehicles	148

16:30 to **17:30**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Lauren Pignin	**Jurisdiction/Date**	Town of Wasaga Beach	July 14, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Powerline Road	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0

NORTH LEG	
Total Vehicles	0
% Trucks Entering	-
Vehicles Entering	0
Pedestrians	0
Ped Crossing	↔

Powerline Road

TOTAL	0	0	0
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	0	0	0

0	TOTAL	
0	Heavy Trucks	
0	Light Trucks	
0	Autos	

EAST LEG	
Total Vehicles	794
% Trucks Entering	6 9%
Vehicles Entering	391
Pedestrians	0
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
402	17	10	375

Autos	Light Trucks	Heavy Trucks	TOTAL
0	0	0	0
352	10	17	379
12	0	0	12

River Road West

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River Road West

0	0	0	0
389	10	6	373
23	0	0	23
TOTAL	Heavy Trucks	Light Trucks	Autos

387	6	10	403
Autos	Light Trucks	Heavy Trucks	Total

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	412
% Trucks Entering	3 9%
Total Vehicles	814

Autos	35
Light Trucks	0
Heavy Trucks	0
TOTAL	35

23	0	14	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
23	0	14	TOTAL

Powerline Road

SOUTH LEG	
Ped Crossing	↔
Pedestrians	10
Vehicles Entering	37
% Trucks Entering	0 0%
Total Vehicles	72

7:45 to **8:45**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Lauren Pignin	**Jurisdiction/Date**	Town of Wasaga Beach	July 14, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Powerline Road	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0

NORTH LEG	
Total Vehicles	0
% Trucks Entering	-
Vehicles Entering	0
Pedestrians	0
Ped Crossing	↔

Powerline Road

TOTAL	0	0	0
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	0	0	0

0	TOTAL
0	Heavy Trucks
0	Light Trucks
0	Autos

EAST LEG	
Total Vehicles	1075
% Trucks Entering	2.9%
Vehicles Entering	483
Pedestrians	0
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
478	7	7	464

Autos	Light Trucks	Heavy Trucks	TOTAL
0	0	0	0
442	7	7	456
27	0	0	27

River Road West

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River Road West

0	0	0	0
559	2	4	553
34	0	0	34
TOTAL	Heavy Trucks	Light Trucks	Autos

Autos	Light Trucks	Heavy Trucks	Total
586	4	2	592

Autos	61
Light Trucks	0
Heavy Trucks	0
TOTAL	61

22	0	33	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
22	0	33	TOTAL

Powerline Road

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	593
% Trucks Entering	1.0%
Total Vehicles	1071

SOUTH LEG	
Ped Crossing	↔
Pedestrians	13
Vehicles Entering	55
% Trucks Entering	0.0%
Total Vehicles	116

15:45 to **16:45**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Lauren Pignin	**Jurisdiction/Date**	Town of Wasaga Beach	July 15, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Silver Birch Ave	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0

Total Vehicles	0
% Trucks Entering	-
Vehicles Entering	0
Pedestrians	0
Ped Crossing	↔
NORTH LEG	

Silver Birch Ave

TOTAL	0	0	0
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	0	0	0

0	TOTAL
0	Heavy Trucks
0	Light Trucks
0	Autos

Total Vehicles	661
% Trucks Entering	5.3%
Vehicles Entering	323
Pedestrians	0
Ped Crossing	↕
EAST LEG	

Total	Heavy Trucks	Light Trucks	Autos
372	7	10	355

Autos	Light Trucks	Heavy Trucks	TOTAL
0	0	0	0
301	10	7	318
5	0	0	5

River Road West

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River Road West

0	0	0	0
321	11	9	301
23	0	0	23
TOTAL	Heavy Trucks	Light Trucks	Autos

318	9	11	338
Autos	Light Trucks	Heavy Trucks	Total

Autos	28
Light Trucks	0
Heavy Trucks	0
TOTAL	28

54	0	17	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
54	0	17	TOTAL

Silver Birch Ave

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	344
% Trucks Entering	5.8%
Total Vehicles	716

SOUTH LEG	
Ped Crossing	↔
Pedestrians	7
Vehicles Entering	71
% Trucks Entering	0.0%
Total Vehicles	99

8:15 to **9:15**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Lauren Pignin	**Jurisdiction/Date**	Town of Wasaga Beach	July 15, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Silver Birch Ave	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0

NORTH LEG	
Total Vehicles	0
% Trucks Entering	-
Vehicles Entering	0
Pedestrians	0
Ped Crossing	↔

Silver Birch Ave

TOTAL	0	0	0
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	0	0	0

0	TOTAL
0	Heavy Trucks
0	Light Trucks
0	Autos

EAST LEG	
Total Vehicles	1169
% Trucks Entering	3.6%
Vehicles Entering	581
Pedestrians	0
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
582	10	10	562

Autos	Light Trucks	Heavy Trucks	TOTAL
0	0	0	0
542	10	10	562
18	1	0	19

River Road West

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River Road West

0	0	0	0
578	1	9	568
90	0	0	90
TOTAL	Heavy Trucks	Light Trucks	Autos

578	9	1	588
Autos	Light Trucks	Heavy Trucks	Total

WEST LEG	
Ped Crossing	↕
Pedestrians	0
Vehicles Entering	668
% Trucks Entering	1.5%
Total Vehicles	1250

Autos	108
Light Trucks	1
Heavy Trucks	0
TOTAL	109

20	0	10	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
20	0	10	TOTAL

Silver Birch Ave

SOUTH LEG	
Ped Crossing	↔
Pedestrians	18
Vehicles Entering	30
% Trucks Entering	0.0%
Total Vehicles	139

16:30 to **17:30**

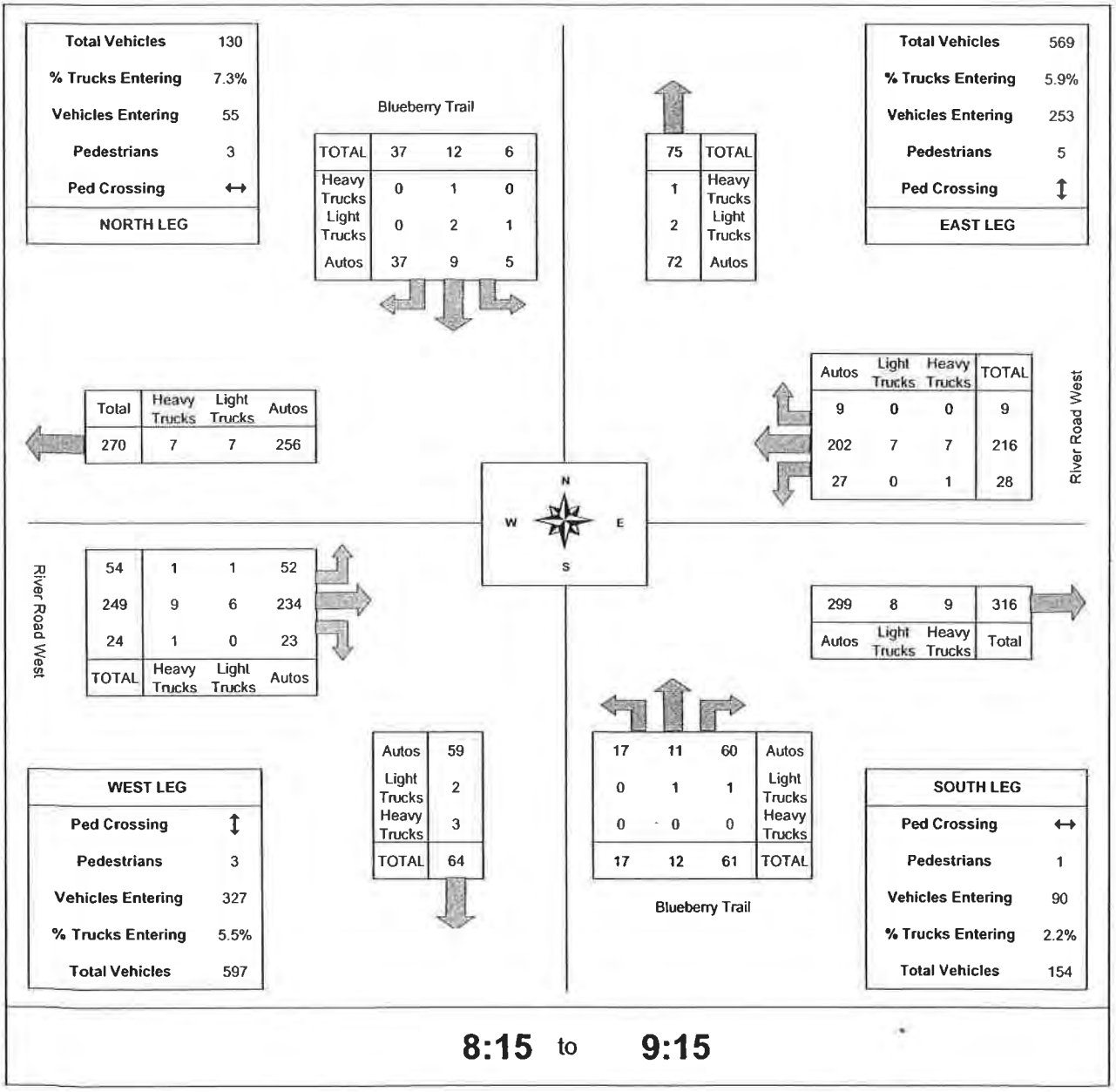
Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 15, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Blueberry Trail	N-S
Project Number	109049	**Intersection Control**	traffic signal	

Additional Comments 0



8:15 to **9:15**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 15, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Blueberry Trail	N-S
Project Number	109049	**Intersection Control**	traffic signal	

Additional Comments 0

NORTH LEG	
Total Vehicles	197
% Trucks Entering	0.0%
Vehicles Entering	116
Pedestrians	2
Ped Crossing	↔

Blueberry Trail

TOTAL	78	33	5
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	78	33	5

81	TOTAL
0	Heavy Trucks
0	Light Trucks
81	Autos

EAST LEG	
Total Vehicles	916
% Trucks Entering	2.7%
Vehicles Entering	450
Pedestrians	21
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
459	6	7	446

Autos	Light Trucks	Heavy Trucks	TOTAL
7	0	0	7
349	6	6	361
82	0	0	82

River Road West

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River Road West

56	0	0	56
402	1	7	394
14	0	0	14
TOTAL	Heavy Trucks	Light Trucks	Autos

455	8	3	466
Autos	Light Trucks	Heavy Trucks	Total

WEST LEG	
Ped Crossing	↕
Pedestrians	2
Vehicles Entering	472
% Trucks Entering	1.7%
Total Vehicles	931

Autos	129
Light Trucks	0
Heavy Trucks	0
TOTAL	129

19	18	56	Autos
1	0	1	Light Trucks
0	0	2	Heavy Trucks
20	18	59	TOTAL

Blueberry Trail

SOUTH LEG	
Ped Crossing	↔
Pedestrians	5
Vehicles Entering	97
% Trucks Entering	4.1%
Total Vehicles	226

16:15 to **17:15**

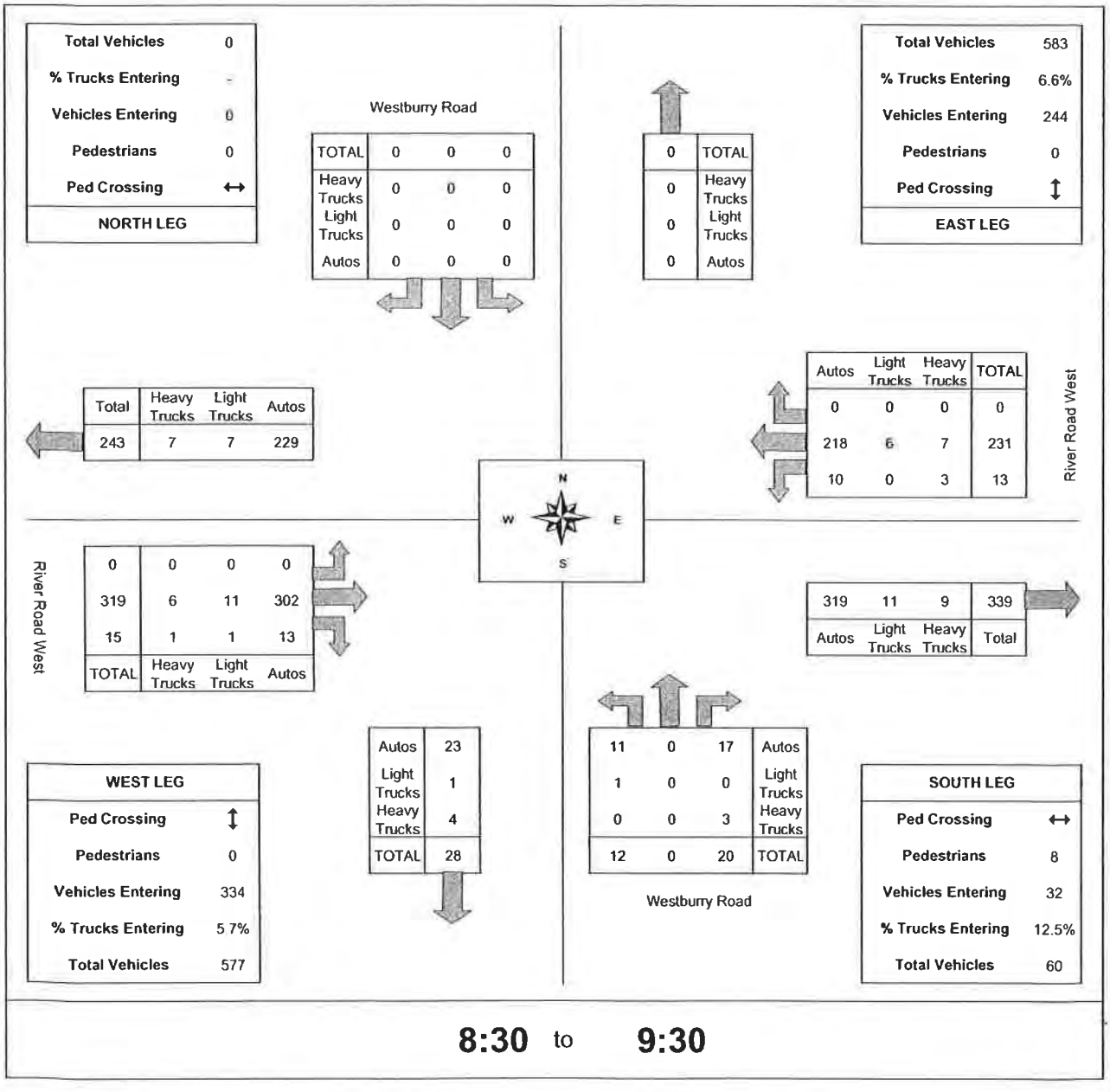
Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 16, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Westbury Road	N-S
Project Number	109049	**Intersection Control**	traffic signal	

Additional Comments 0



8:30 to 9:30

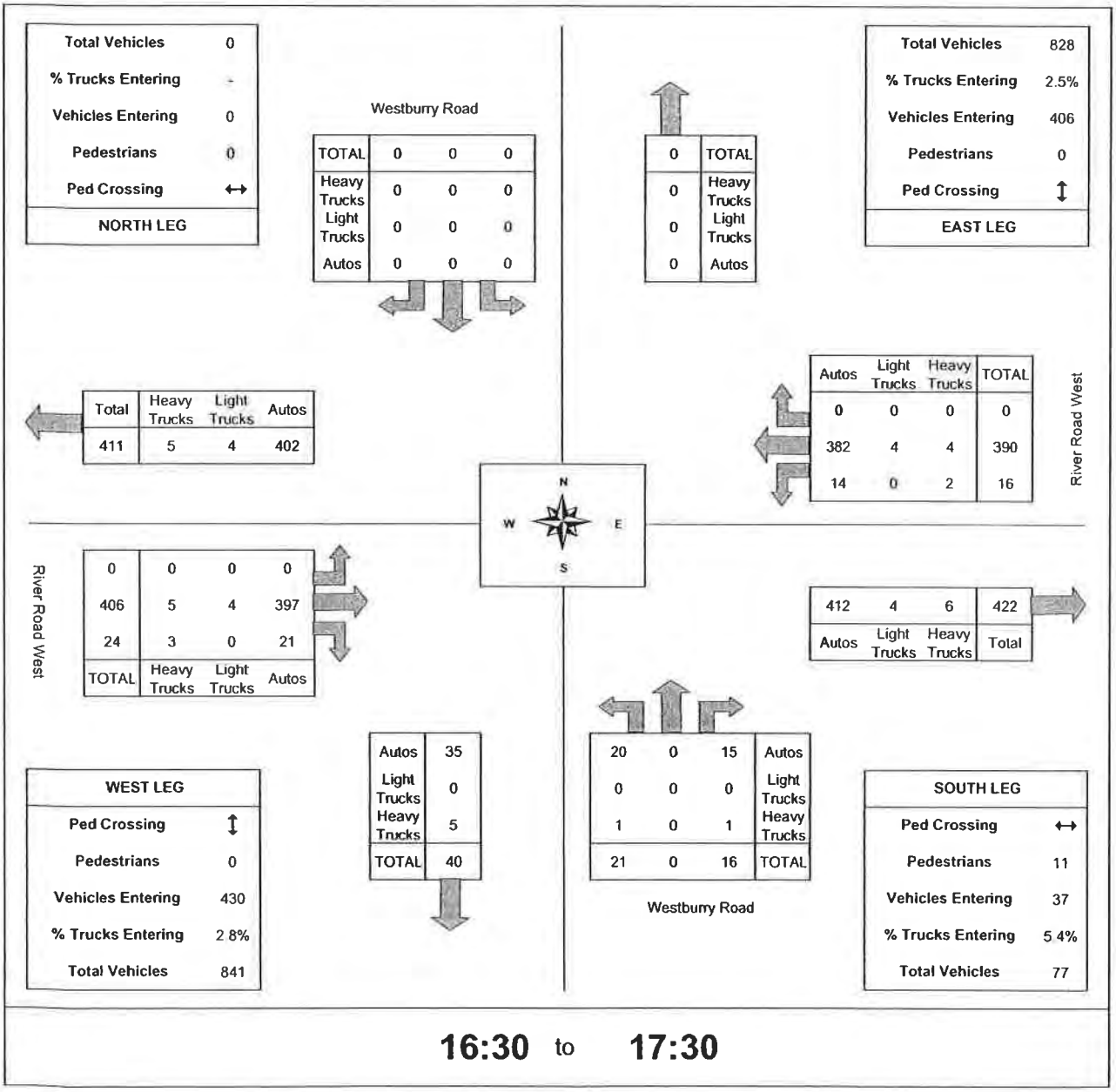
Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 16, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Westbury Road	N-S
Project Number	109049	**Intersection Control**	traffic signal	

Additional Comments 0



16:30 to 17:30

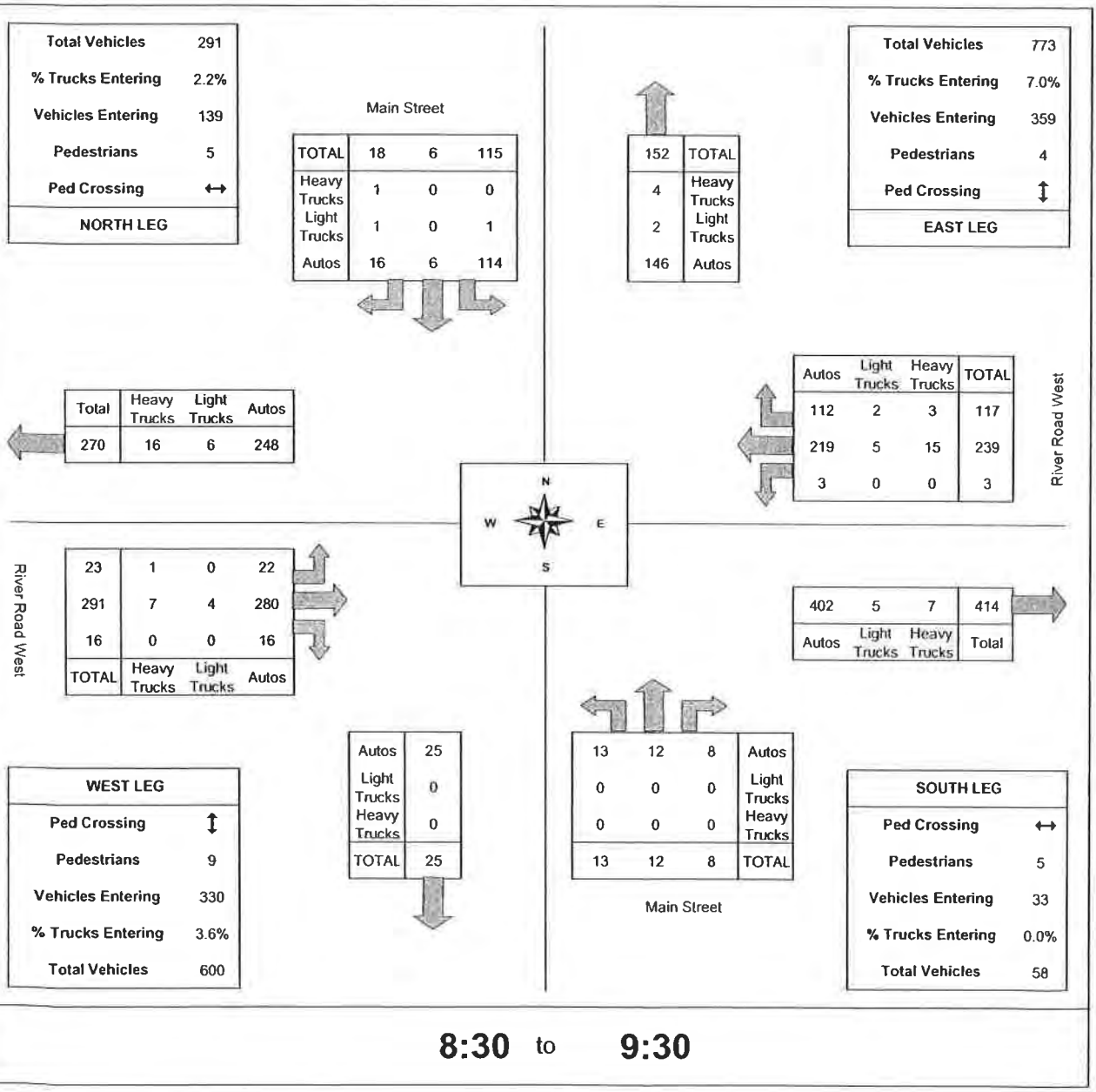
Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 21, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Main Street	N-S
Project Number	109049	**Intersection Control**	traffic signal	

Additional Comments 0



8:30 to **9:30**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 21, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Main Street	N-S
Project Number	109049	**Intersection Control**	traffic signal	

Additional Comments 0

NORTH LEG	
Total Vehicles	735
% Trucks Entering	0 6%
Vehicles Entering	506
Pedestrians	8
Ped Crossing	↔

Main Street

TOTAL	44	43	419
Heavy Trucks	0	0	3
Light Trucks	0	0	0
Autos	44	43	416

229	TOTAL
0	Heavy Trucks
3	Light Trucks
226	Autos

EAST LEG	
Total Vehicles	1261
% Trucks Entering	3.6%
Vehicles Entering	494
Pedestrians	14
Ped Crossing	↕

Total	Heavy Trucks	Light Trucks	Autos
379	8	8	363

Autos	Light Trucks	Heavy Trucks	TOTAL
166	2	0	168
300	8	8	316
10	0	0	10

River Road West

N
W E
S

River Road West

46	0	1	45
341	4	1	336
15	0	0	15
TOTAL	Heavy Trucks	Light Trucks	Autos

759	1	7	767
Autos	Light Trucks	Heavy Trucks	Total

WEST LEG	
Ped Crossing	↕
Pedestrians	11
Vehicles Entering	402
% Trucks Entering	1.5%
Total Vehicles	781

Autos	68
Light Trucks	0
Heavy Trucks	0
TOTAL	68

19	15	7	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
19	15	7	TOTAL

Main Street

SOUTH LEG	
Ped Crossing	↔
Pedestrians	1
Vehicles Entering	41
% Trucks Entering	0 0%
Total Vehicles	109

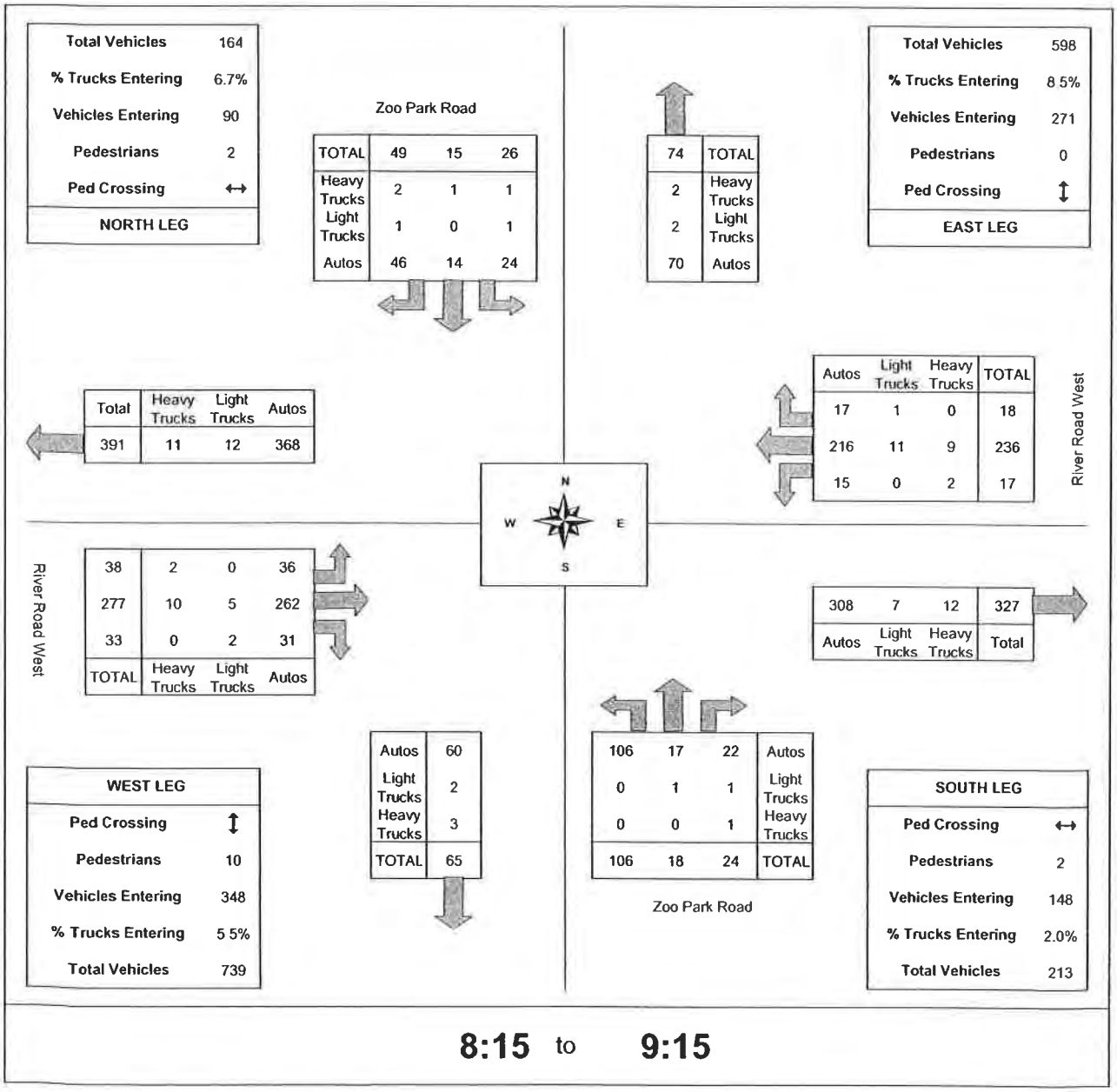
16:00 to **17:00**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 21, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Zoo Park Road	N-S
Project Number	109049	**Intersection Control**	Traffic signal	
Additional Comments	0			



8:15 to **9:15**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Olivia Marchand	**Jurisdiction/Date**	Town of Wasaga Beach	July 21, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Zoo Park Road	N-S
Project Number	109049	**Intersection Control**	traffic signal	

Additional Comments 0

NORTH LEG	
Total Vehicles	192
% Trucks Entering	1.1%
Vehicles Entering	90
Pedestrians	3
Ped Crossing	↔

Zoo Park Road

TOTAL	55	16	19
Heavy Trucks	1	0	0
Light Trucks	0	0	0
Autos	54	16	19

EAST LEG	
Total Vehicles	816
% Trucks Entering	3.0%
Vehicles Entering	400
Pedestrians	0
Ped Crossing	↕

102	TOTAL
0	Heavy Trucks
0	Light Trucks
102	Autos

Total	Heavy Trucks	Light Trucks	Autos
530	8	8	514

Autos	Light Trucks	Heavy Trucks	TOTAL
21	0	0	21
354	6	6	366
13	0	0	13

River Road West

N
W E
S

River Road West

72	0	0	72
392	3	6	383
100	0	0	100
TOTAL	Heavy Trucks	Light Trucks	Autos

407	6	3	416
Autos	Light Trucks	Heavy Trucks	Total

WEST LEG	
Ped Crossing	↕
Pedestrians	4
Vehicles Entering	564
% Trucks Entering	1.6%
Total Vehicles	1094

Autos	129
Light Trucks	0
Heavy Trucks	0
TOTAL	129

106	9	5	Autos
2	0	0	Light Trucks
1	0	0	Heavy Trucks
109	9	5	TOTAL

Zoo Park Road

SOUTH LEG	
Ped Crossing	↔
Pedestrians	2
Vehicles Entering	123
% Trucks Entering	2.4%
Total Vehicles	252

16:30 to **17:30**

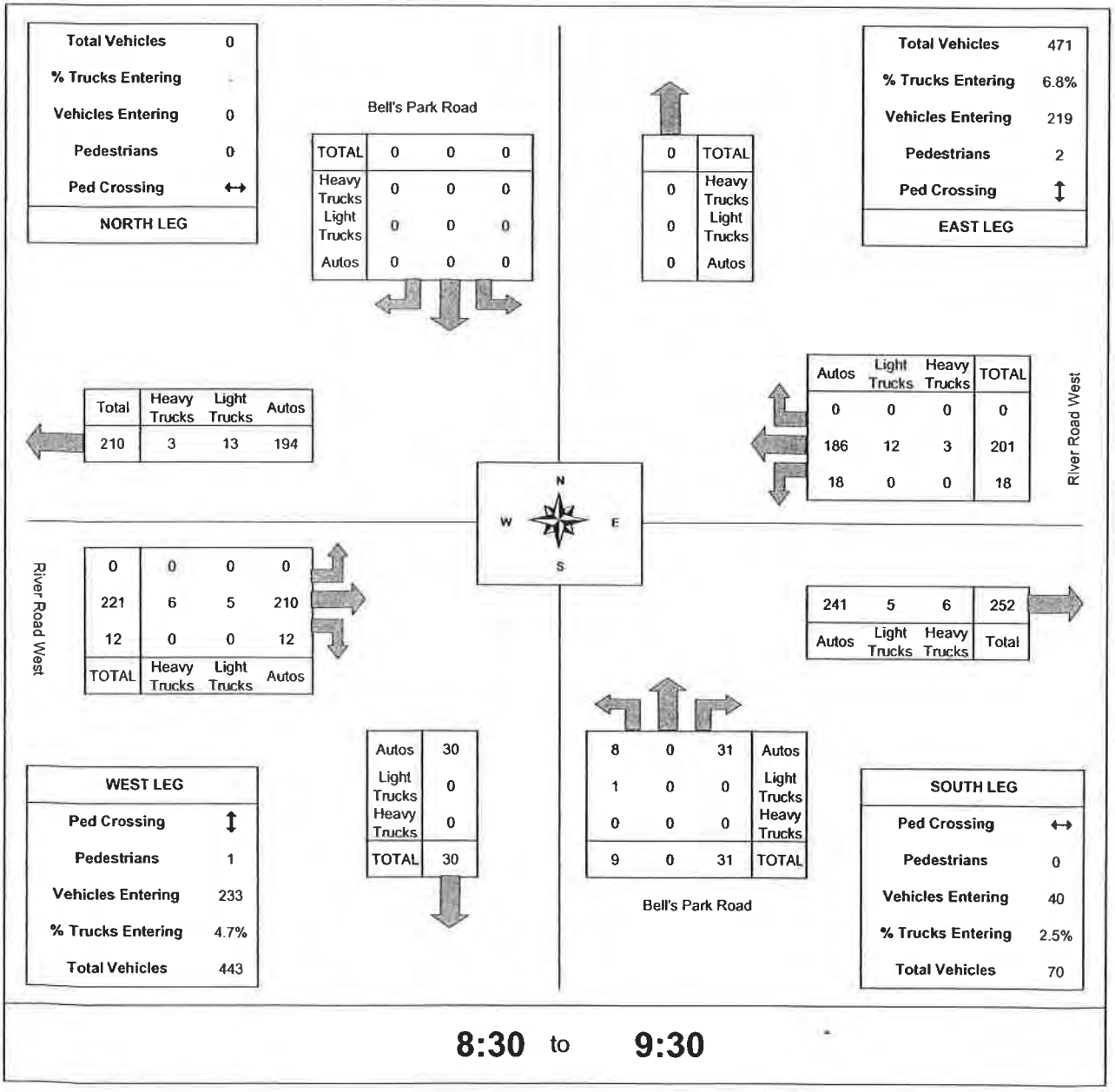
Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
AM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Lauren Pignin	**Jurisdiction/Date**	Town of Wasaga Beach	July 22, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Bell's Park Road	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0



8:30 to **9:30**

Ainley CONSULTING ENGINEERS PLANNERS

INTERSECTION COUNT
PM PEAK HOUR

GENERAL INFORMATION

Surveyor Name	Lauren Pignin	**Jurisdiction/Date**	Town of Wasaga Beach	July 22, 2009
Weather Conditions	0	**Major Street**	River Road West	E-W
Project Name	River Road West EA	**Minor Street**	Bell's Park Road	N-S
Project Number	109049	**Intersection Control**	stop control on minor street	

Additional Comments 0

Total Vehicles	0
% Trucks Entering	-
Vehicles Entering	0
Pedestrians	0
Ped Crossing	↔
NORTH LEG	

Bell's Park Road

TOTAL	0	0	0
Heavy Trucks	0	0	0
Light Trucks	0	0	0
Autos	0	0	0

0	TOTAL
0	Heavy Trucks
0	Light Trucks
0	Autos

Total Vehicles	757
% Trucks Entering	2.5%
Vehicles Entering	395
Pedestrians	0
Ped Crossing	↕
EAST LEG	

Total	Heavy Trucks	Light Trucks	Autos
362	5	5	352

Autos	Light Trucks	Heavy Trucks	TOTAL
0	0	0	0
343	5	5	353
42	0	0	42

River Road West

N
W E
S

River Road West

0	0	0	0
340	3	9	328
5	0	0	5
TOTAL	Heavy Trucks	Light Trucks	Autos

350	9	3	362
Autos	Light Trucks	Heavy Trucks	Total

Autos	47
Light Trucks	0
Heavy Trucks	0
TOTAL	47

9	0	22	Autos
0	0	0	Light Trucks
0	0	0	Heavy Trucks
9	0	22	TOTAL

Bell's Park Road

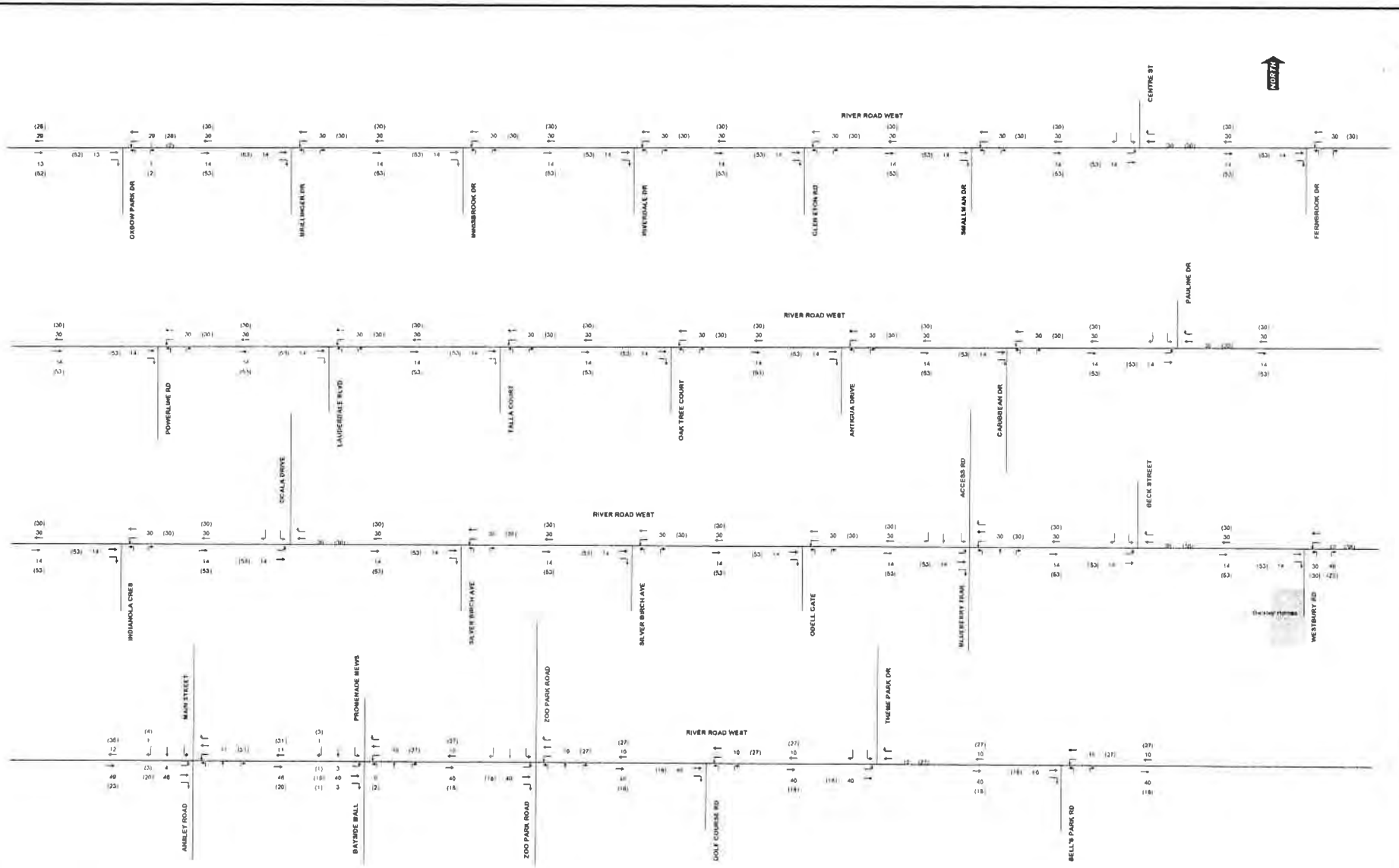
WEST LEG	
Ped Crossing	↕
Pedestrians	2
Vehicles Entering	345
% Trucks Entering	3.5%
Total Vehicles	707

SOUTH LEG	
Ped Crossing	↔
Pedestrians	0
Vehicles Entering	31
% Trucks Entering	0.0%
Total Vehicles	78

16:15 to 17:15

APPENDIX II

Development Traffic Volumes

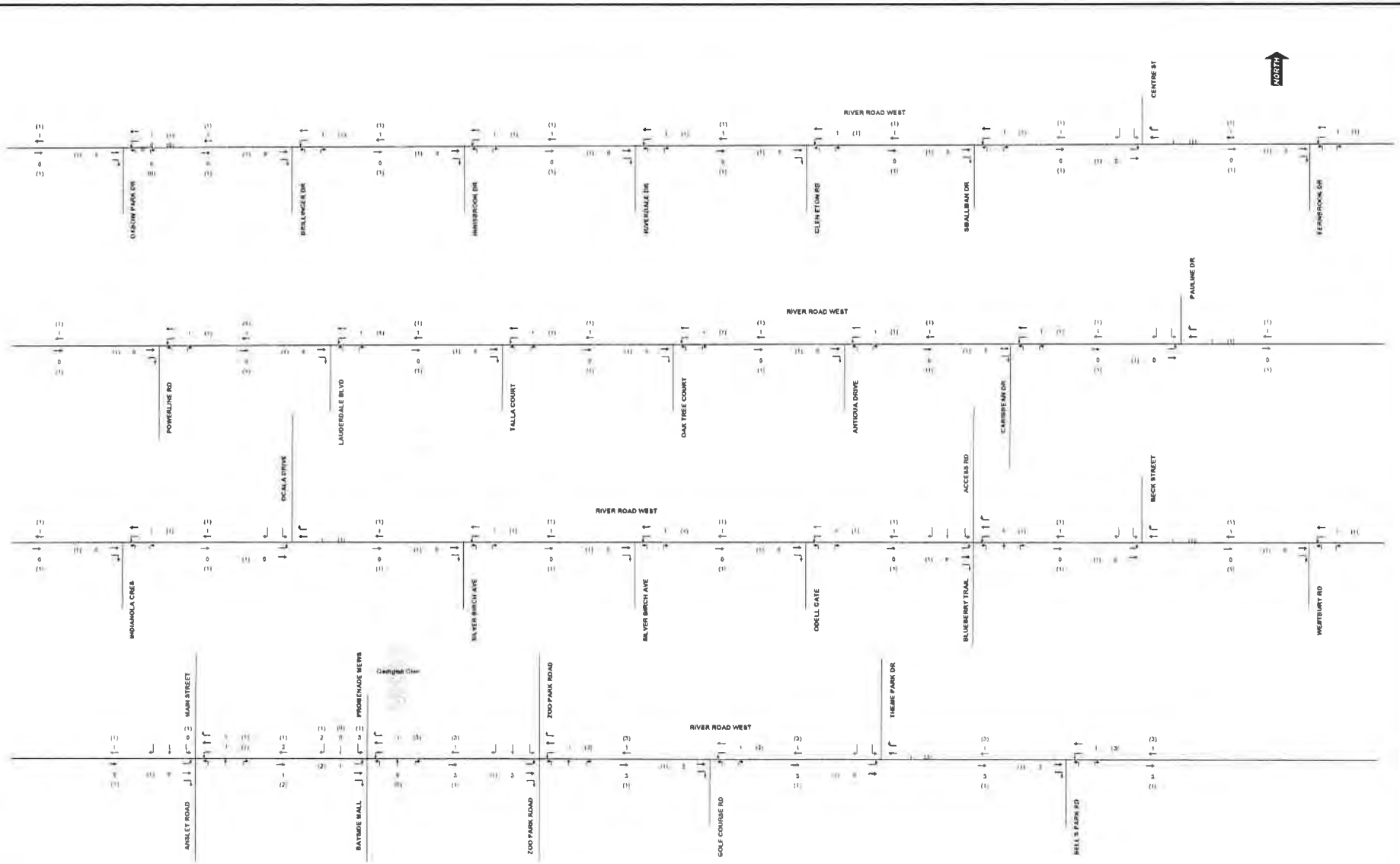


(XX) Weekday AM peak hour
(100) Weekday PM peak hour

Ainley

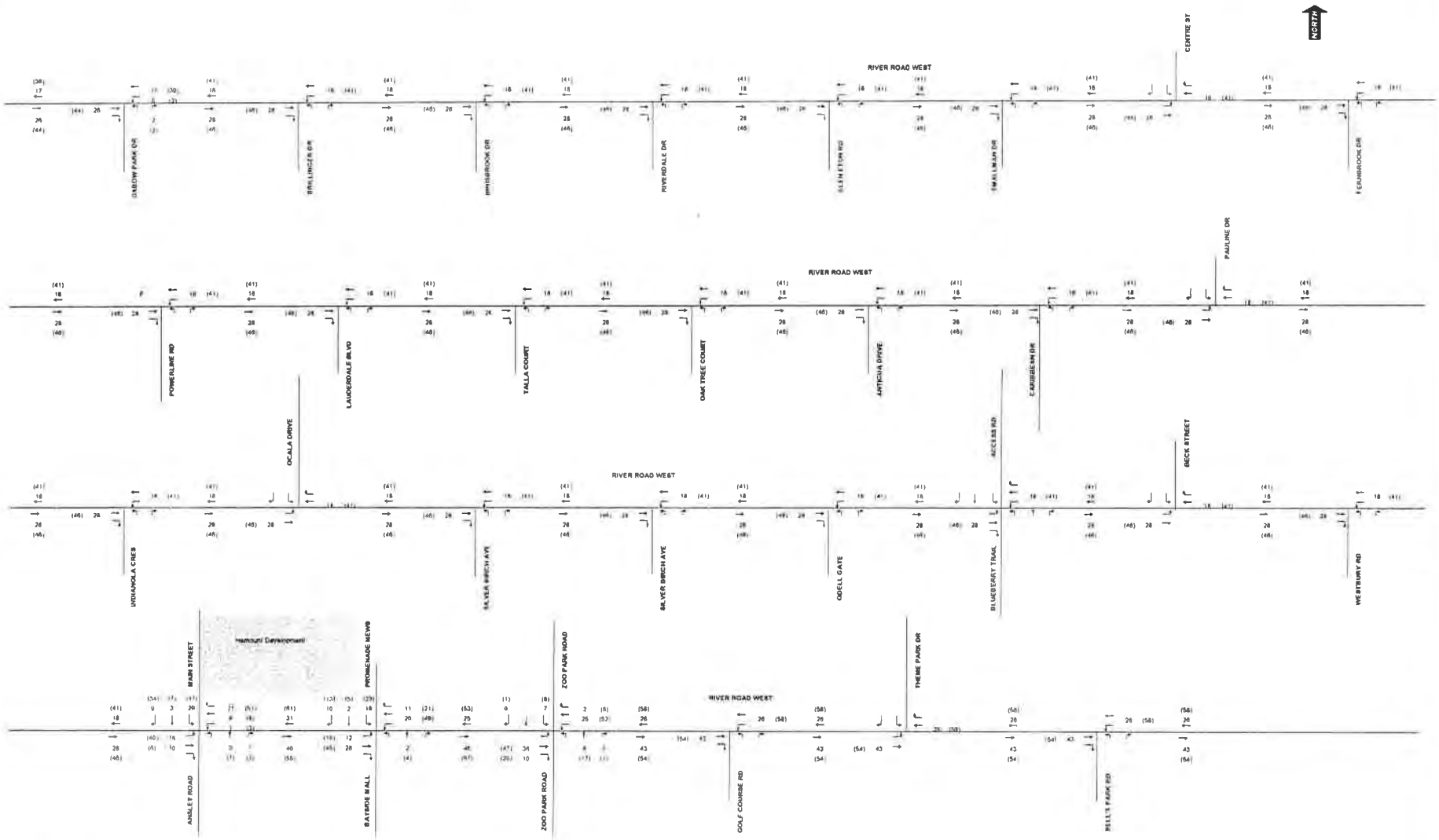
TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA

FIGURE B1 - BERKLEY HOMES DEVELOPMENT GENERATED TRAFFIC VOLUMES



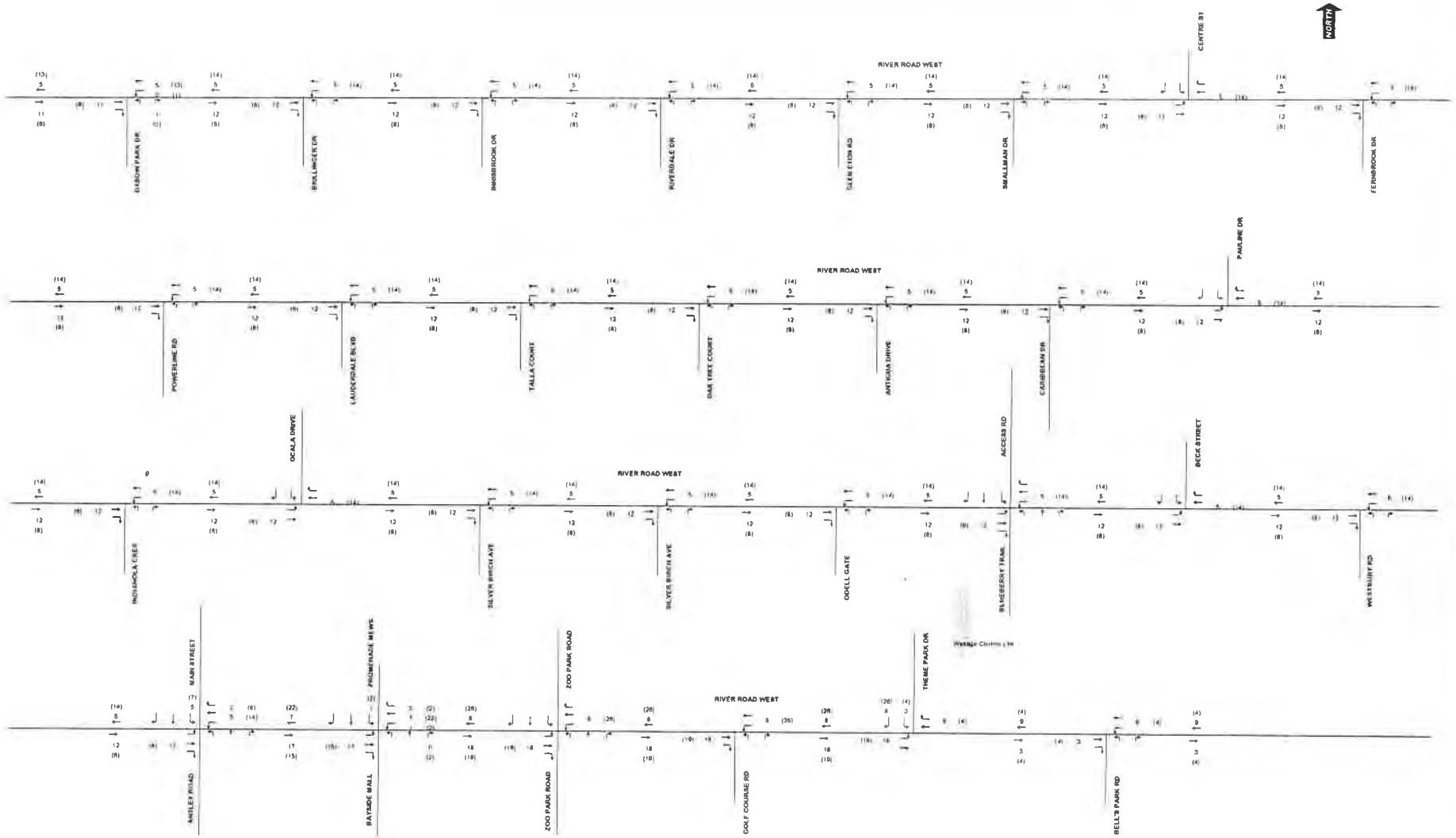
(##) Weekday AM peak hour
(100) Weekday PM peak hour

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE 62 - GEORGIAN GLEN EXPANSION GENERATED TRAFFIC VOLUMES



(100) Weekday PM peak hour

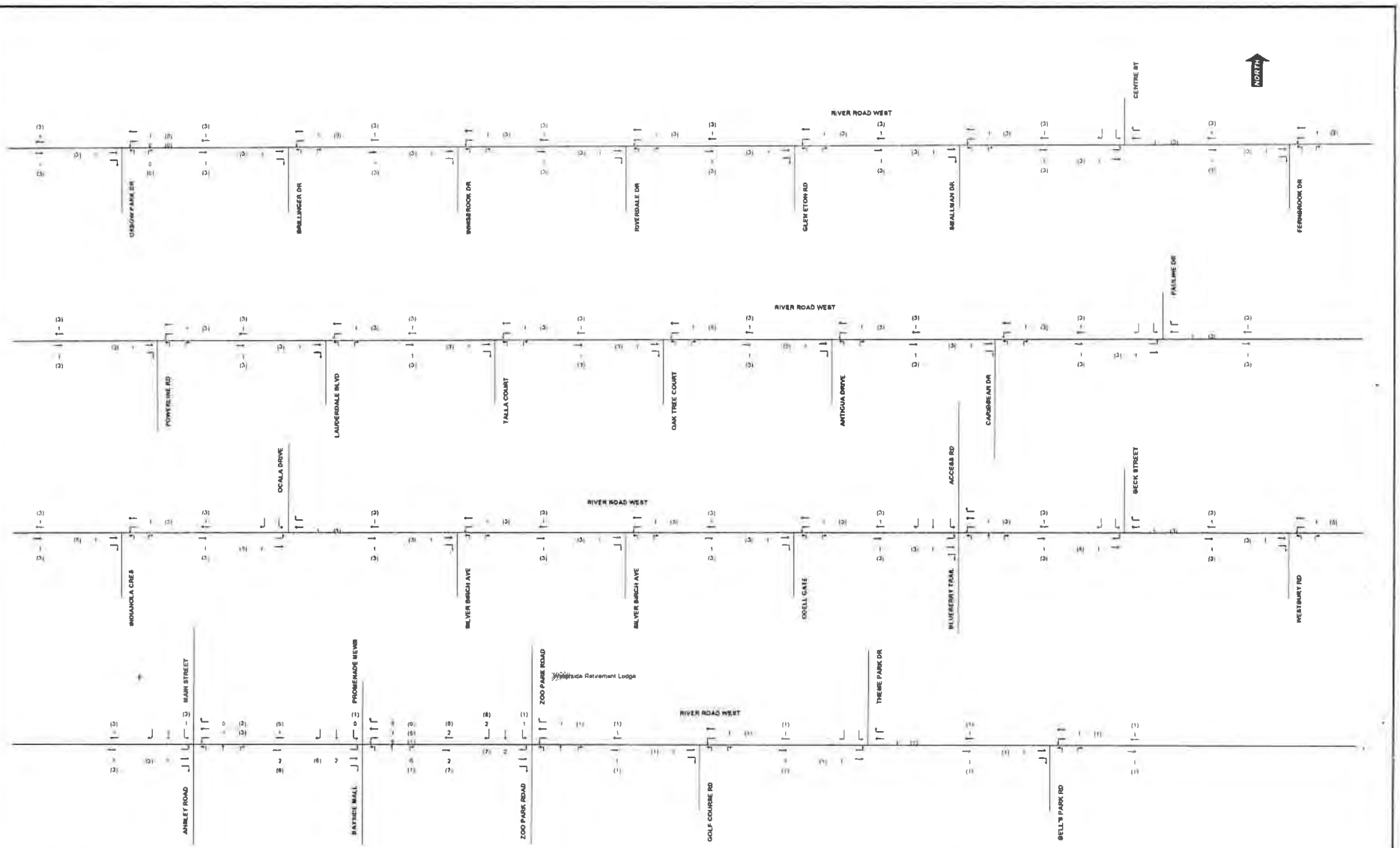
TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B3 - HAMOUNT DEVELOPMENT GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

Ainley

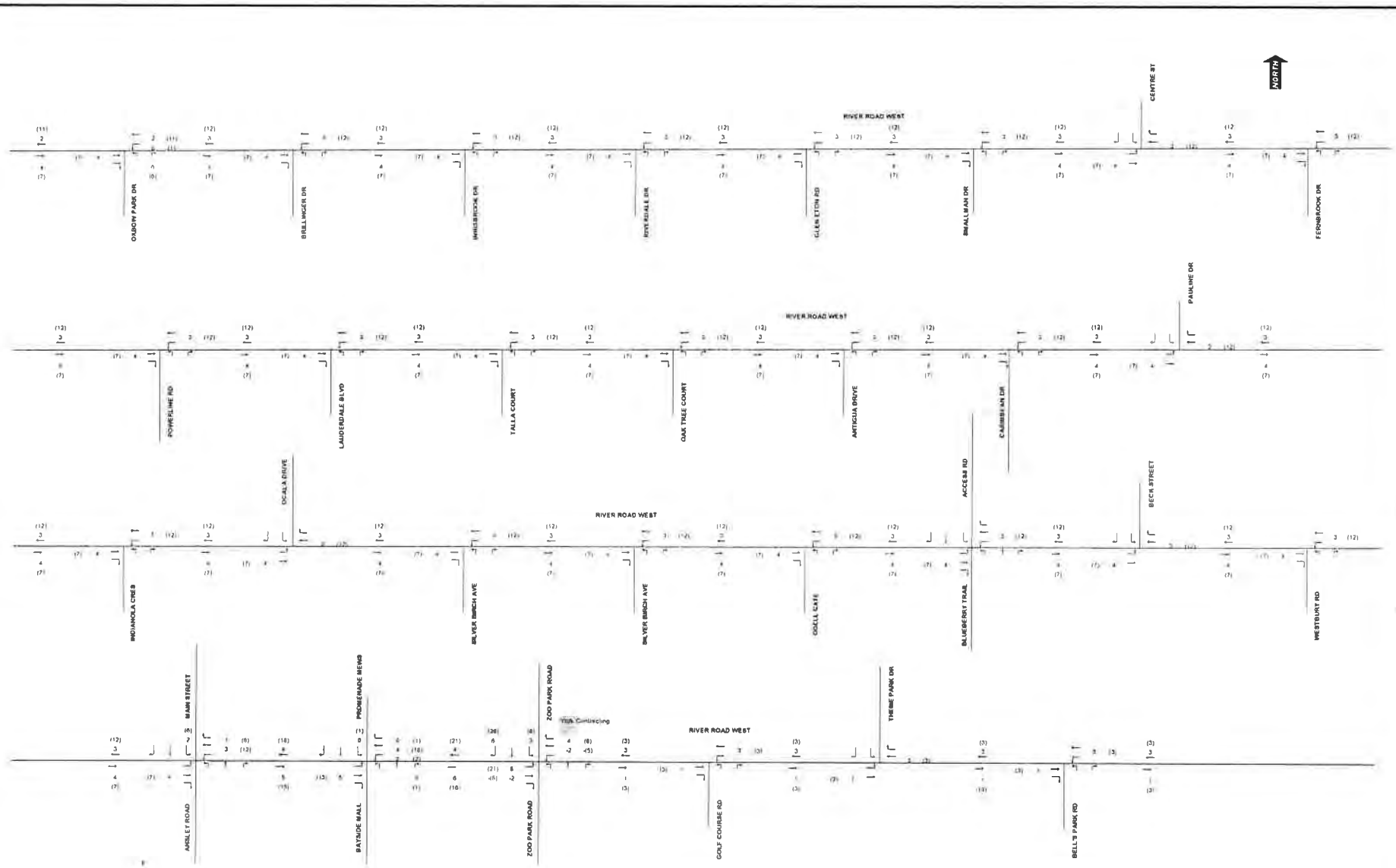
TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B4 - WASAGA COUNTRY LIFE RESORT GENERATED TRAFFIC VOLUMES



(AM) Weekday AM peak hour
(PM) Weekday PM peak hour

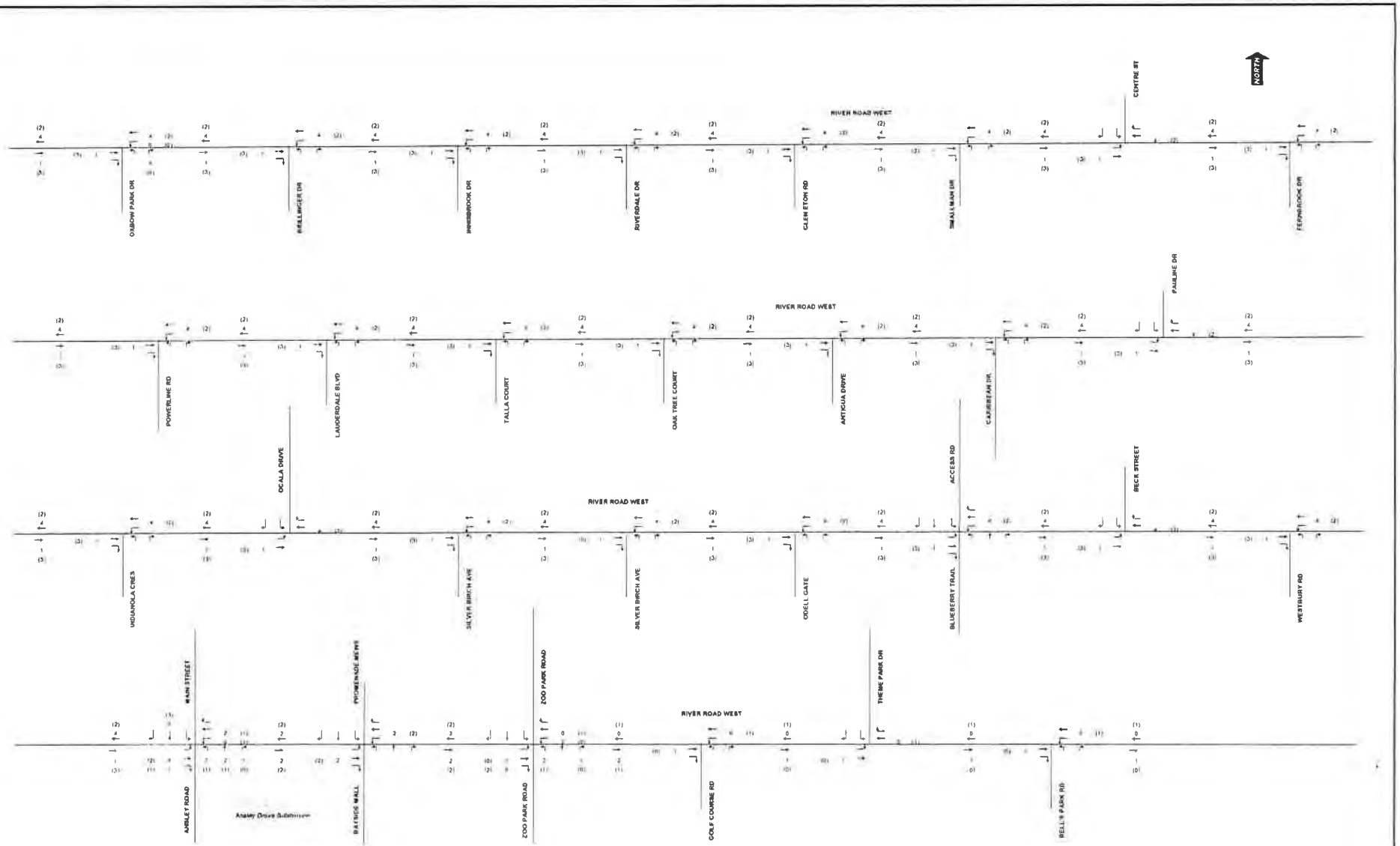
Ainley

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B5 - WATERSIDE RETIREMENT LODGE DEVELOPMENT GENERATED TRAFFIC VOLUMES



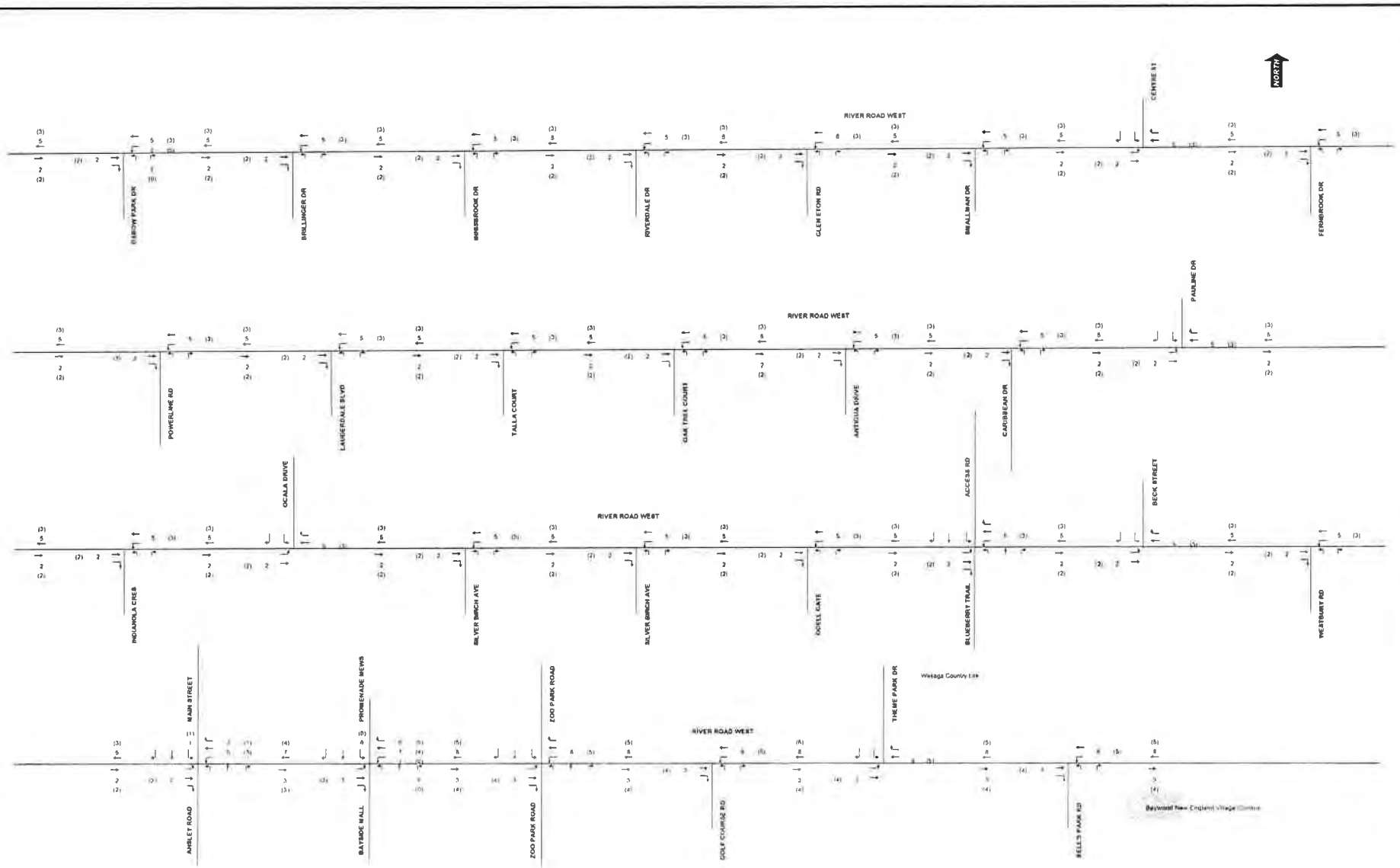
100 Weekday AM peak hour
(100) Weekday PM peak hour

TOWN OF WARADA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B6 - YORK CONTRACTING DEVELOPMENT GENERATED TRAFFIC VOLUMES



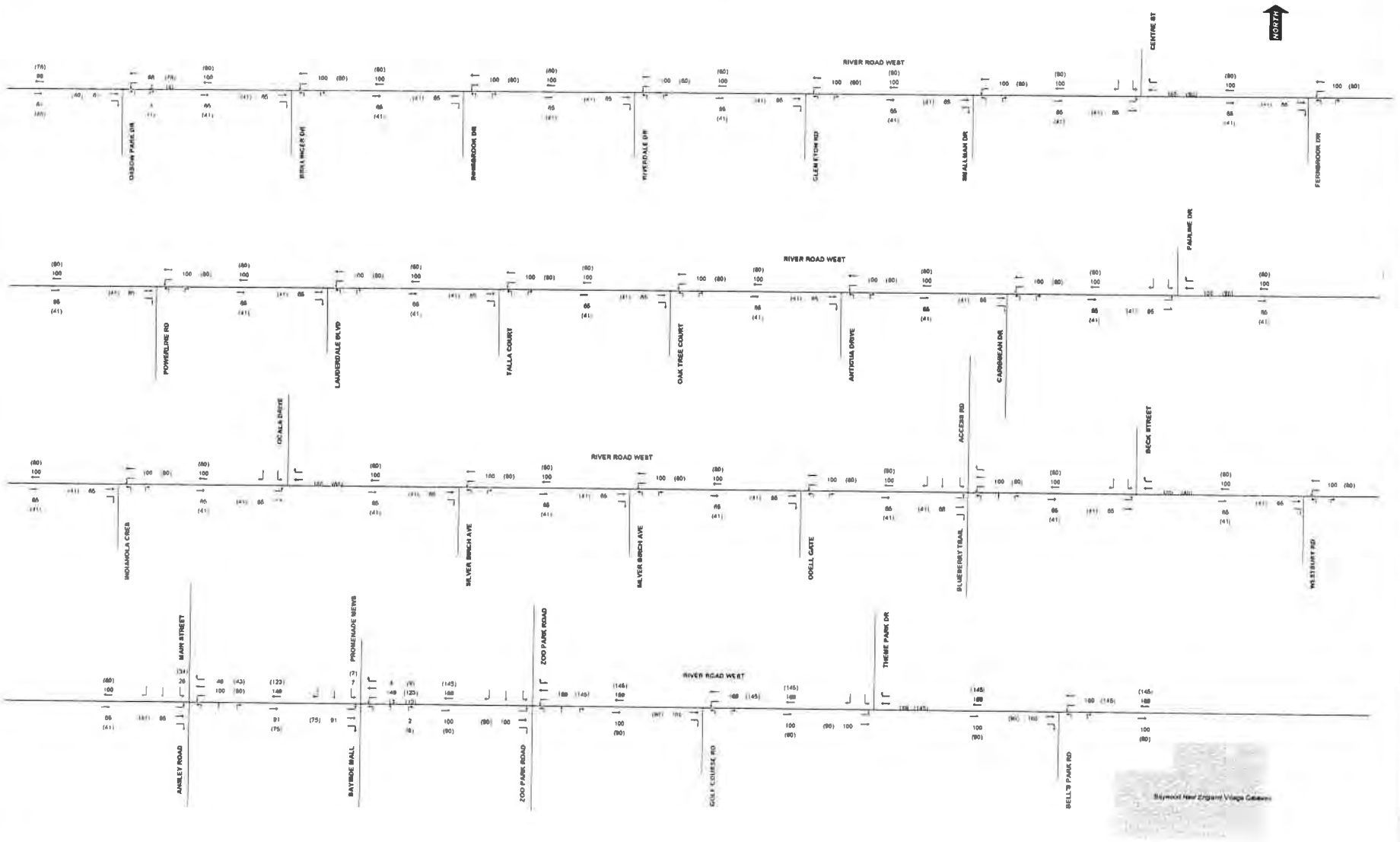
(AM) Weekday AM peak hour
(PM) Weekday PM peak hour

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE 87 - ANSLEY GROVE SUBDIVISION GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B8 - BAYWOOD NEW ENGLAND VILLAGE CONDOS DEVELOPMENT GENERATED TRAFFIC VOLUMES

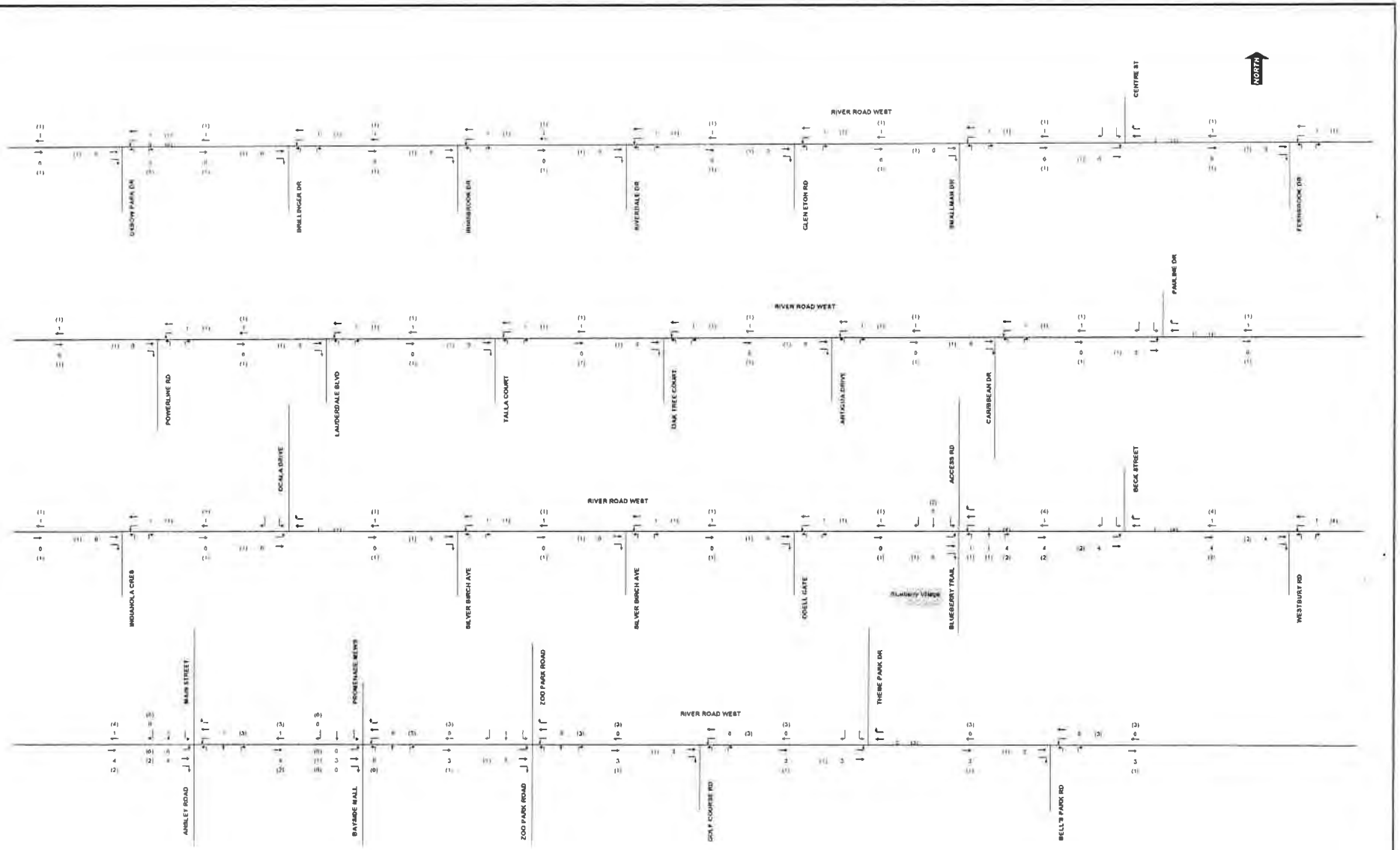


100 Weekday AM peak hour
(100) Weekday PM peak hour

Ainley

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA

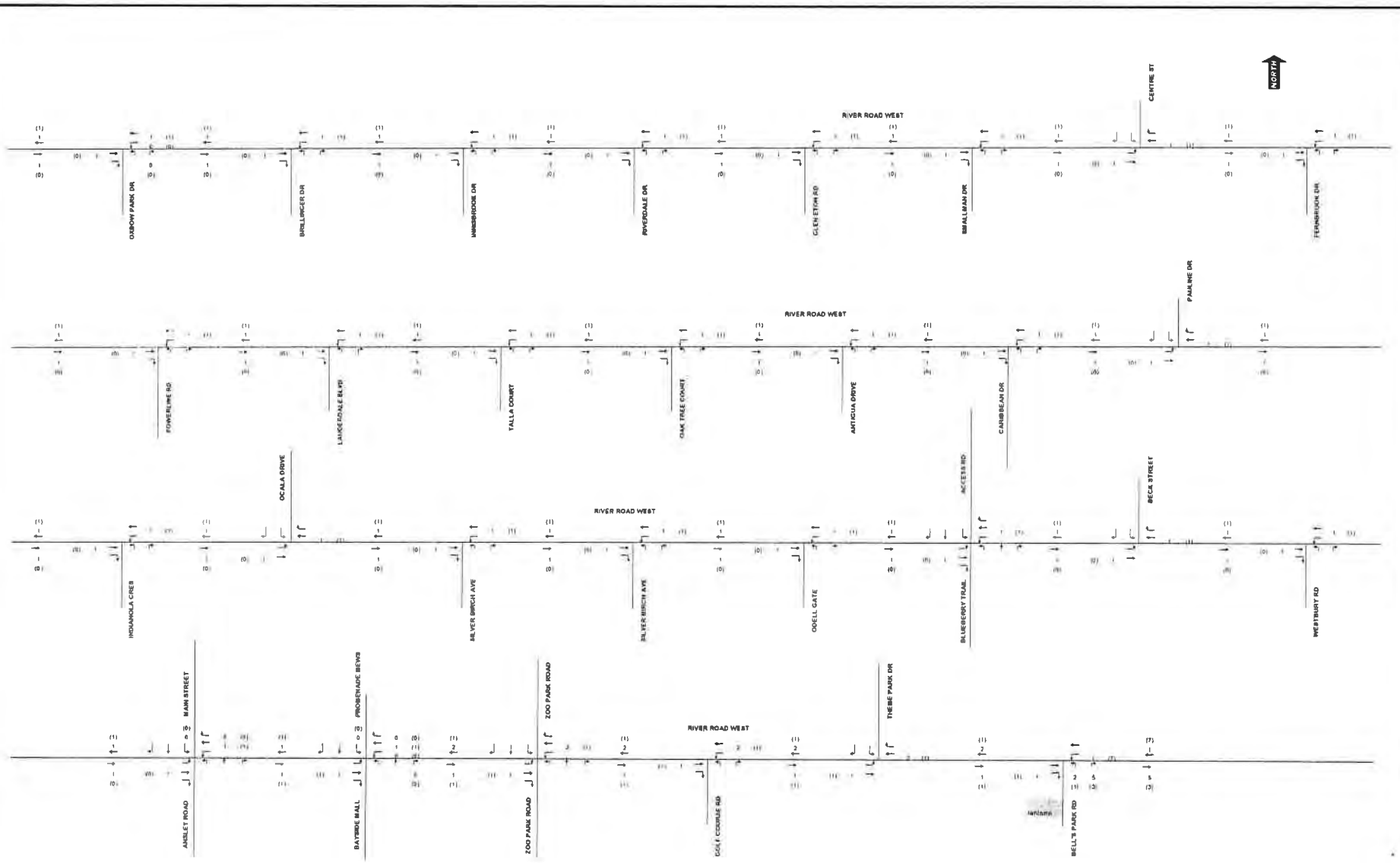
FIGURE B8 - BAYWOOD NEW ENGLAND VILLAGE GATEWAY DEVELOPMENT GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

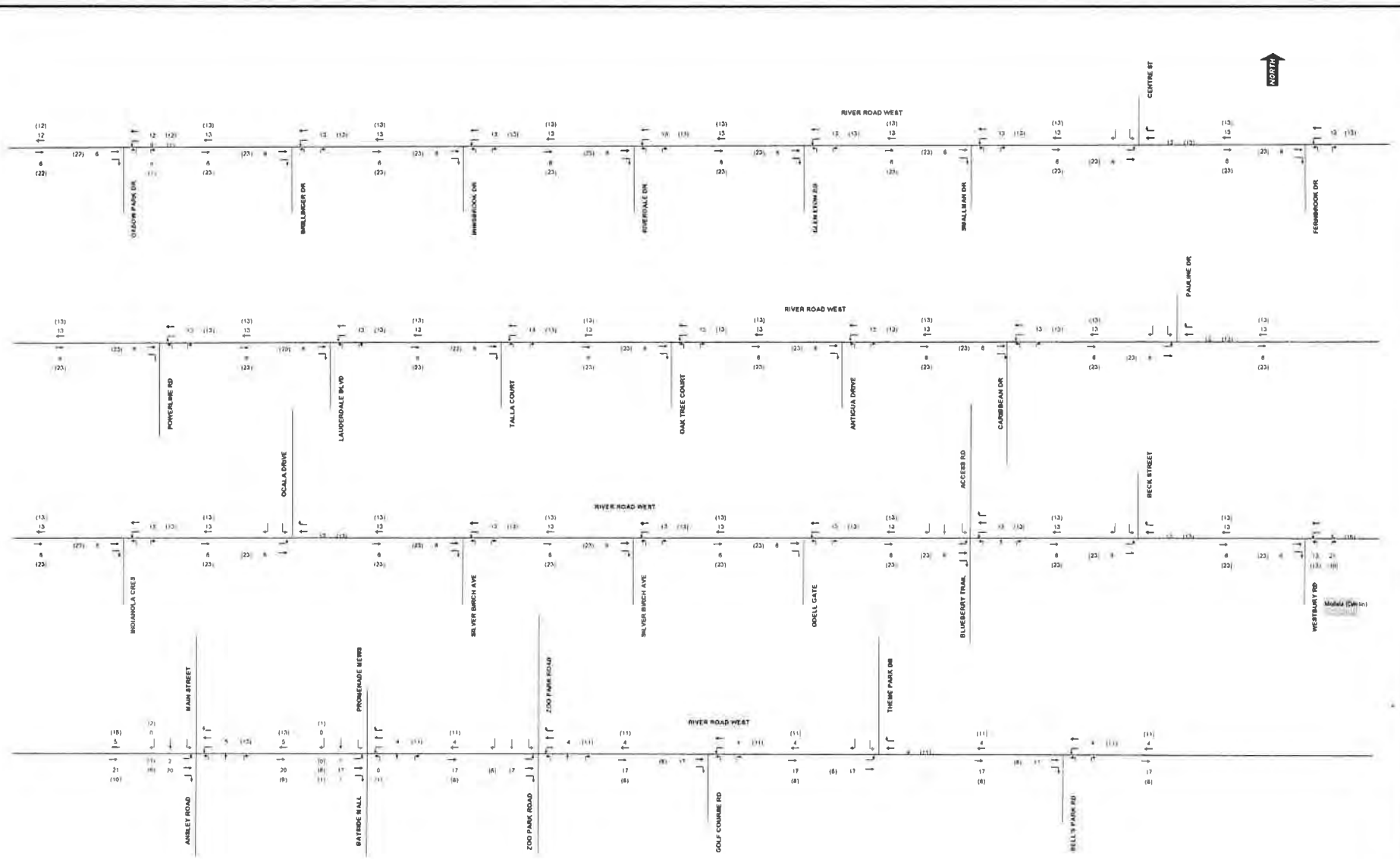
Ainley

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B10 - BLUEBERRY VILLAGE PHASE II DEVELOPMENT GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

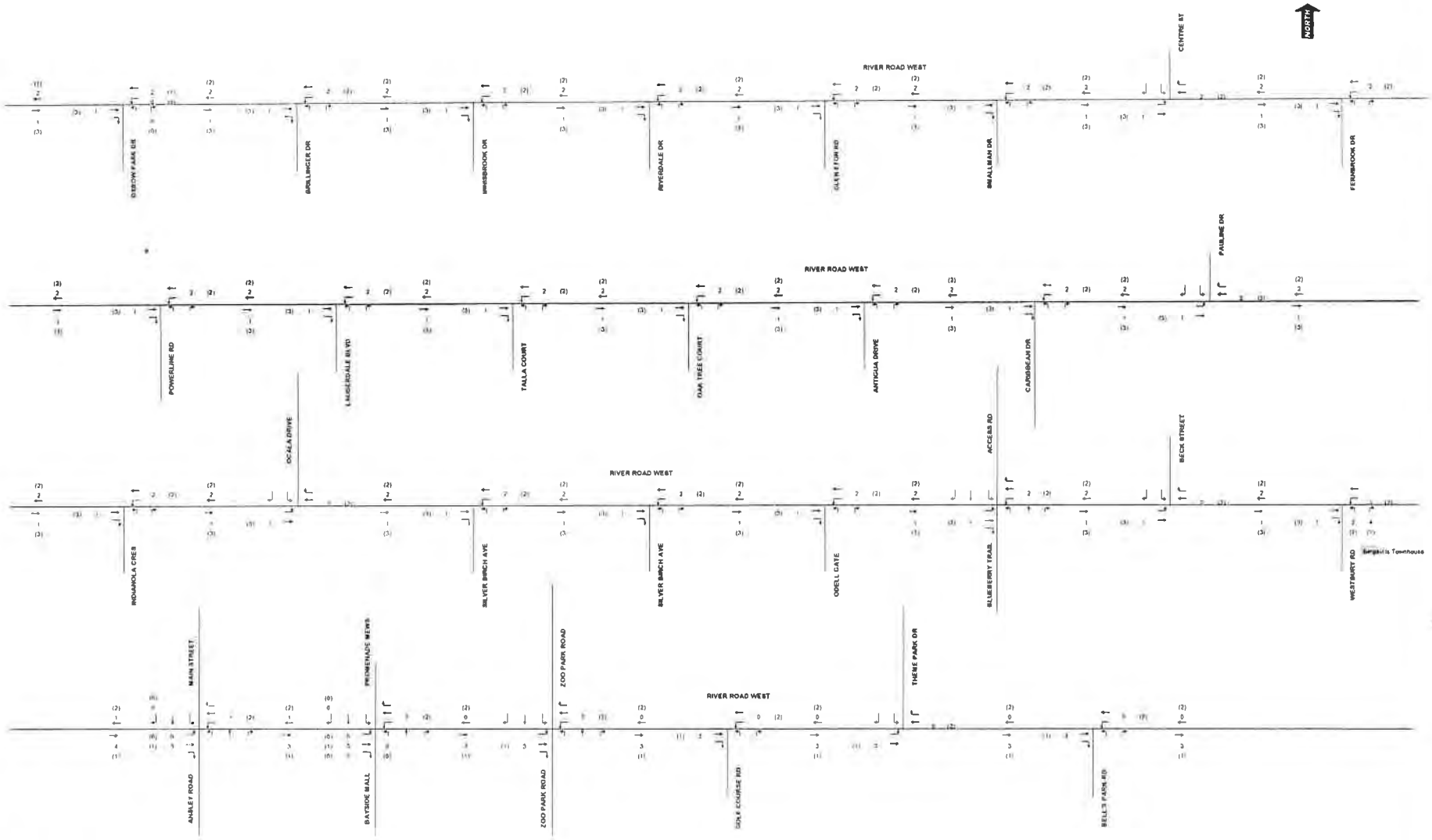
TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B11 - IANTOMO DEVELOPMENT GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

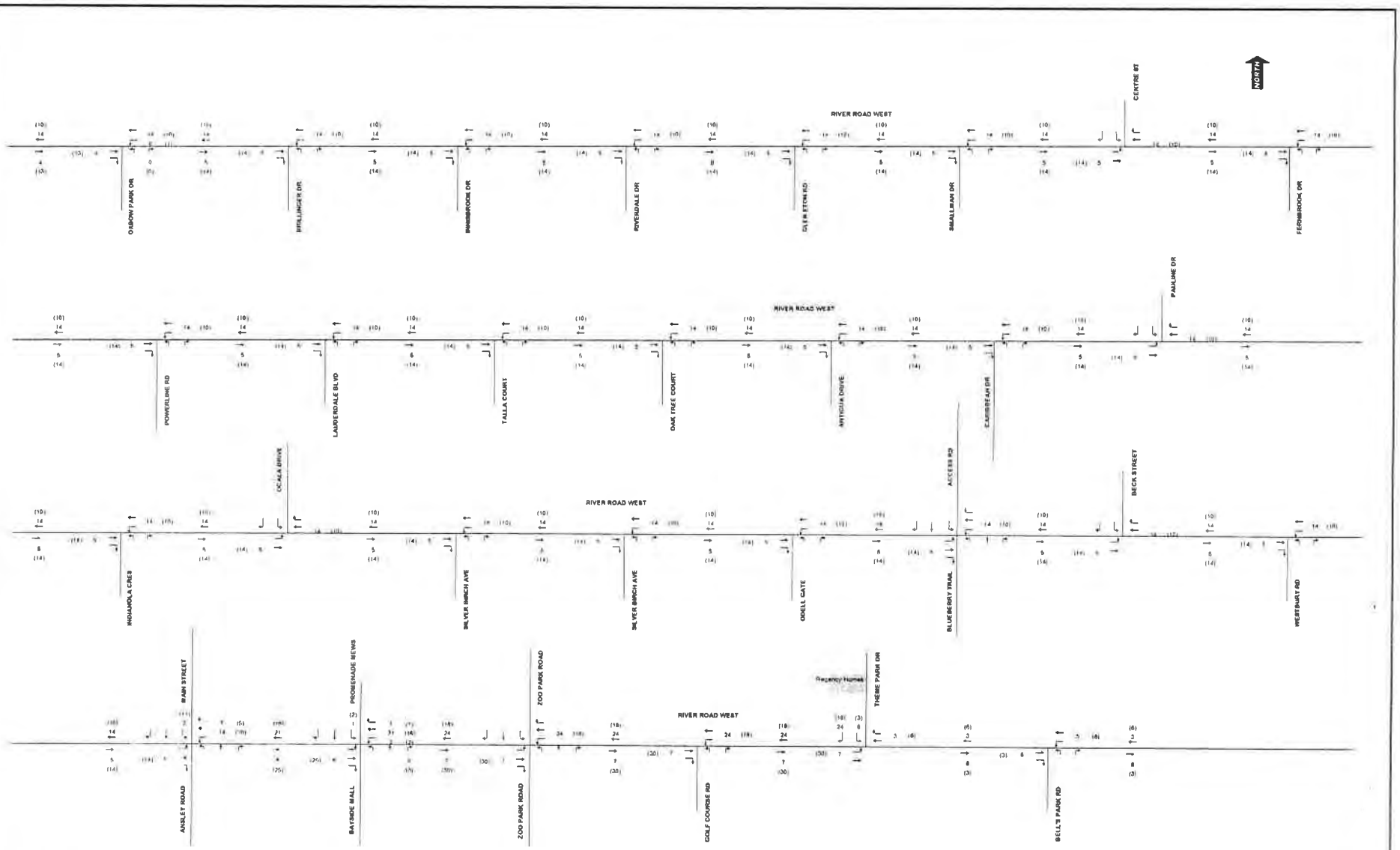
Ainley

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B12 - MOLLELA (DEVLIN) DEVELOPMENT GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

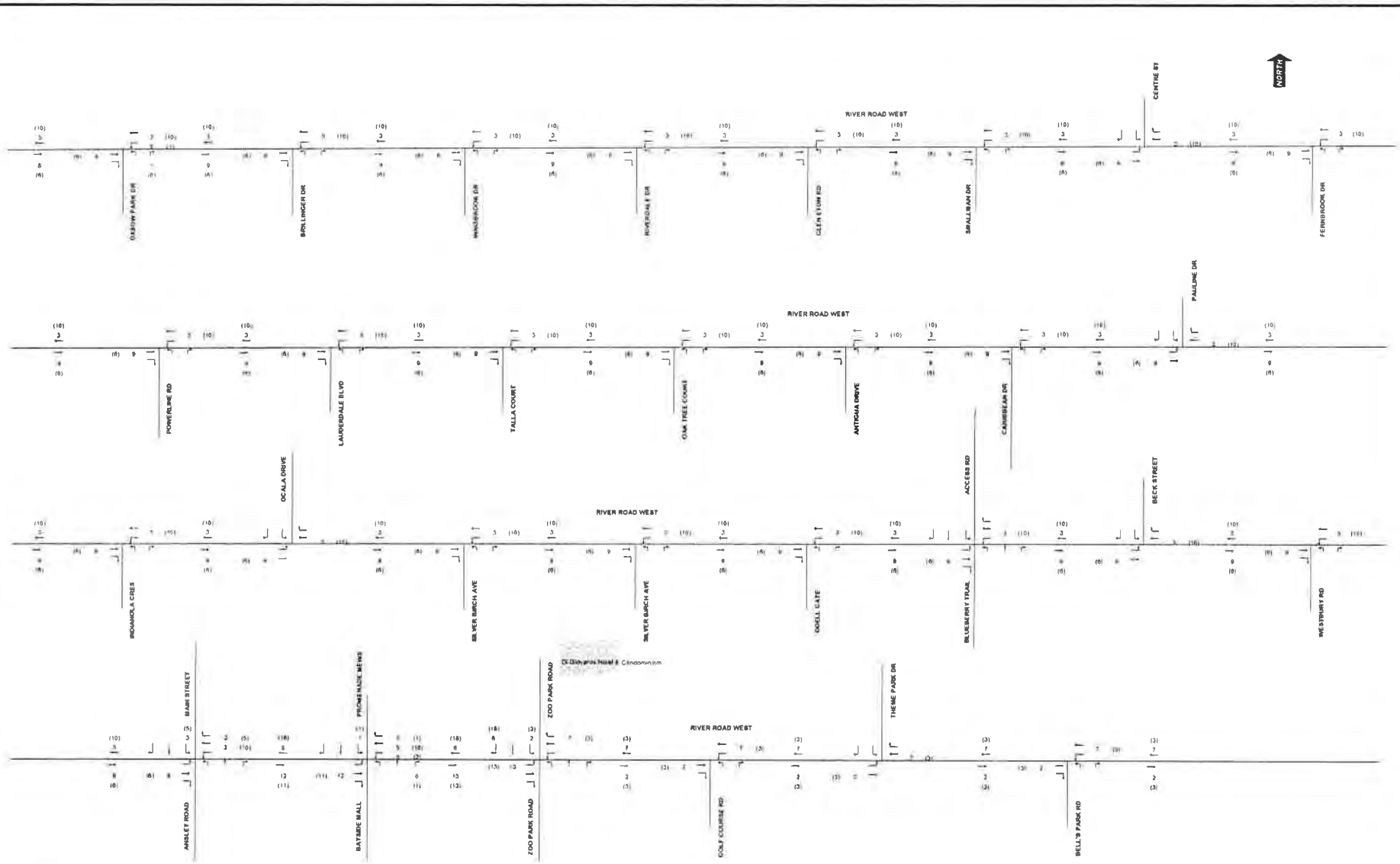
TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B13 - BERGANTIS TOWNHOUSE DEVELOPMENT GENERATED TRAFFIC VOLUMES



TOWN OF WASAGA BEACH

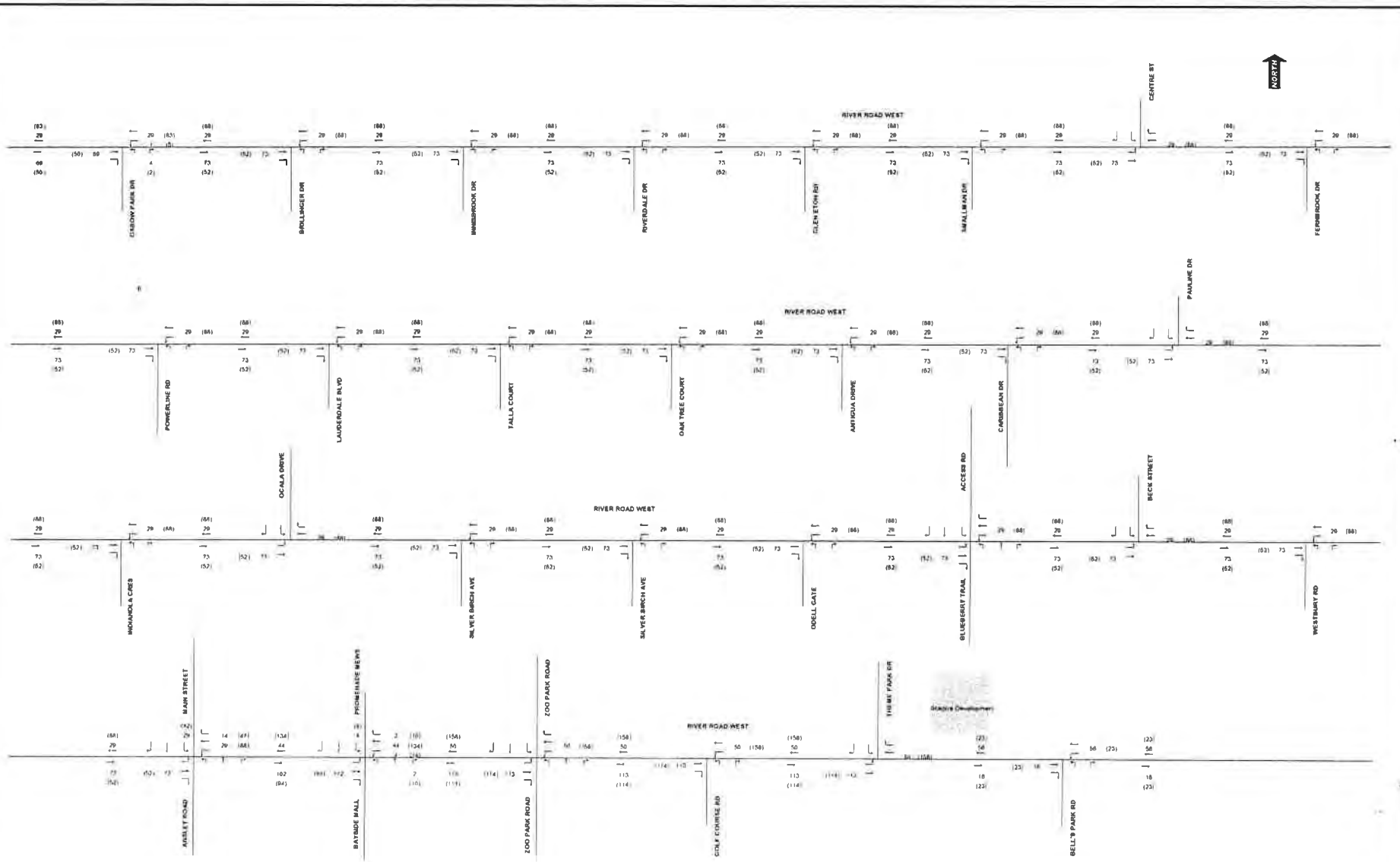
RIVER ROAD WEST CLASS EA

FIGURE B14 - REGENCY HOMES DEVELOPMENT GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B15 - DIGIOVANNI HOTEL AND CONDOMINIUM DEVELOPMENT GENERATED TRAFFIC VOLUMES



100 Weekday AM peak hour
(100) Weekday PM peak hour

Ainley

TOWN OF WASAGA BEACH
RIVER ROAD WEST CLASS EA
FIGURE B18 - SCEPTRE DEVELOPMENT GENERATED TRAFFIC VOLUMES

APPENDIX III

Operational Analyses – Existing Road System

Ainley GROUP CONSULTING ENGINEERS PLANNERS

LEVEL OF SERVICE

CAPACITY ANALYSIS AT UNSIGNALIZED INTERSECTIONS
Highway Capacity Manual Methodology

The level of service at an unsignalized intersection is determined on the basis of control delay for each critical lane. This method of analysis is taken from the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 1997.

The average control delay for any particular critical movement (control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay) is a function of the service rate or capacity of the approach and degree of saturation. The level of service criteria for unsignalized intersections is outlined below and is related to ranges in vehicle delay.

Level of Service	Expected Delay to Minor Street Traffic	Average Control Delay 'd' (sec/veh)
A	Little or no delays	$0 < d \leq 10$
B	Short traffic delays	$10 < d \leq 15$
C	Average traffic delays	$15 < d \leq 25$
D	Long traffic delays	$25 < d \leq 35$
E	Very long traffic delays	$35 < d \leq 50$
F	Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection	$d > 50$

280 Pretty River Parkway
Collingwood, Ontario L9Y 4J5
Tel: (705) 445-3451 Fax: (705) 445-0968

Ainley GROUP CONSULTING ENGINEERS PLANNERS

LEVEL OF SERVICE

CAPACITY ANALYSIS AT SIGNALIZED INTERSECTIONS
Highway Capacity Manual Methodology

The capacity of signalized intersections has been determined in terms of delay taken from Chapter 9 of the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 2000.

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". Level of Service (LOS) for signalized intersections is defined in terms of delay, which is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Only the portion of total delay attributed to the control facility is quantified. This control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay. The following table describes in detail the characteristics of each level:

Level of Service	Features	Average Control Delay 'd' (sec/veh)
A	Describes operations with very low control delay, up to 10 seconds/vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay.	$d \leq 10$
B	Describes operations with control delay greater than 10 seconds and up to 20 seconds/vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays.	$10 < d \leq 20$
C	Describes operations with control delay greater than 20 seconds and up to 35 seconds/vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.	$20 < d \leq 35$
D	Describes operations with control delay greater than 35 seconds and up to 55 seconds/vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable.	$35 < d \leq 55$
E	Describes operations with control delay greater than 55 seconds and up to 80 seconds/vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$55 < d \leq 80$
F	**LOS F** describes operations with control delay in excess of 80 seconds/vehicle. This *oversaturation*, considered to be unacceptable to most drivers, occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels.	$d > 80$

280 Pretty River Parkway
Collingwood, Ontario L9Y 4J5
Tel: (705) 445-3451 Fax: (705) 445-0968

2009 Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	332	38	8	435	45	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	361	41	10	473	49	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			402		874	382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			402		874	382
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		85	97
cM capacity (veh/h)			1156		316	666

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	402	483	72
Volume Left	0	10	49
Volume Right	41	0	23
cSH	1700	1156	381
Volume to Capacity	0.24	0.01	0.19
Queue Length 95th (m)	0.0	0.2	5.5
Control Delay (s)	0.0	0.3	16.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.3	16.8
Approach LOS			C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	345	7	2	426	18	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	378	8	2	463	20	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			384		847	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		847	380
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1175		331	667

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	384	465	28
Volume Left	0	2	20
Volume Right	6	0	9
cSH	1700	1175	392
Volume to Capacity	0.23	0.00	0.07
Queue Length 95th (m)	0.0	0.0	1.9
Control Delay (s)	0.0	0.1	14.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	14.9
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	33	20	348	12	6	383
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	22	378	13	7	416
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	814	385			391	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	814	385			391	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	97			99	
cM capacity (veh/h)	345	663			1167	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	58	391	423
Volume Left	36	0	7
Volume Right	22	13	0
cSH	422	1700	1167
Volume to Capacity	0.14	0.23	0.01
Queue Length 95th (m)	3.8	0.0	0.1
Control Delay (s)	14.9	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	14.9	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	4	1	390	428	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	1	424	465	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	892	466	466			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	892	466	466			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	312	597	1095			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	7	425	466
Volume Left	2	1	0
Volume Right	4	0	1
cSH	458	1095	1700
Volume to Capacity	0.01	0.00	0.27
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	13.0	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	23	11	346	9	2	387
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	12	376	10	2	421
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	806	381			386	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	806	381			386	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	98			100	
cM capacity (veh/h)	351	666			1173	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	386	423
Volume Left	25	0	2
Volume Right	12	10	0
cSH	414	1700	1173
Volume to Capacity	0.09	0.23	0.00
Queue Length 95th (m)	2.3	0.0	0.0
Control Delay (s)	14.5	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	14.5	0.0	0.1
Approach LOS	B		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	32.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	36	17	343	14	3	383
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	18	373	15	3	416
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			255			
pX, platoon unblocked						
vC, conflicting volume	803	380			388	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	803	380			388	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	97			100	
cM capacity (veh/h)	352	667			1170	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	388	420
Volume Left	39	0	3
Volume Right	18	15	0
cSH	414	1700	1170
Volume to Capacity	0.14	0.23	0.00
Queue Length 95th (m)	3.8	0.0	0.1
Control Delay (s)	15.1	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	15.1	0.0	0.1
Approach LOS	C		

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	32.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	94	57	355	33	17	335
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	62	386	36	18	364
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	805	404			422	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	805	404			422	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	90			98	
cM capacity (veh/h)	346	647			1137	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	164	422	382
Volume Left	102	0	18
Volume Right	62	36	0
cSH	420	1700	1137
Volume to Capacity	0.39	0.25	0.02
Queue Length 95th (m)	14.6	0.0	0.4
Control Delay (s)	19.0	0.0	0.6
Lane LOS	C		A
Approach Delay (s)	19.0	0.0	0.6
Approach LOS	C		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	23	14	389	23	12	379
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	15	423	25	13	412
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	873	435			448	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	873	435			448	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			99	
cM capacity (veh/h)	317	621			1112	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	40	448	425
Volume Left	25	0	13
Volume Right	15	25	0
cSH	389	1700	1112
Volume to Capacity	0.10	0.26	0.01
Queue Length 95th (m)	2.7	0.0	0.3
Control Delay (s)	15.3	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	15.3	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	8	5	400	3	2	383
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	5	435	3	2	416
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	857	436			436	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	857	436			436	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	327	620			1122	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	14	438	418
Volume Left	9	0	2
Volume Right	5	3	0
cSH	400	1700	1122
Volume to Capacity	0.04	0.26	0.00
Queue Length 95th (m)	0.9	0.0	0.0
Control Delay (s)	14.3	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	14.3	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	9	347	8	2	408
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	10	377	9	2	443
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	829	382			386	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	829	382			386	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			100	
cM capacity (veh/h)	340	666			1173	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	386	445
Volume Left	22	0	2
Volume Right	10	9	0
cSH	401	1700	1173
Volume to Capacity	0.08	0.23	0.00
Queue Length 95th (m)	2.0	0.0	0.0
Control Delay (s)	14.8	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	14.8	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	405	1	0	381
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1	440	1	0	414
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	855	441			441	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	855	441			441	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	329	616			1119	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	3	441	414
Volume Left	2	0	0
Volume Right	1	1	0
cSH	389	1700	1119
Volume to Capacity	0.01	0.26	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	14.3	0.0	0.0
Lane LOS	B		
Approach Delay (s)	14.3	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		31.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	405	0	0	383
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	440	0	0	416
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	857	440			440	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	857	440			440	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	328	617			1120	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	440	416
Volume Left	1	0	0
Volume Right	1	0	0
cSH	428	1700	1120
Volume to Capacity	0.01	0.26	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	13.4	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.4	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		31.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	NBR	NBR2	NWL	NWR	SWL2	SWL
Lane Configurations						
Volume (veh/h)	321	23	54	17	5	318
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	349	25	59	18	5	346
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			718	361	374	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			718	361	374	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			85	97	100	
cM capacity (veh/h)			394	683	1185	

Direction, Lane #	NB 1	NW 1	SW 1
Volume Total	374	77	351
Volume Left	0	59	5
Volume Right	25	18	0
cSH	1700	438	1185
Volume to Capacity	0.22	0.18	0.00
Queue Length 95th (m)	0.0	5.1	0.1
Control Delay (s)	0.0	15.0	0.2
Lane LOS		B	A
Approach Delay (s)	0.0	15.0	0.2
Approach LOS		B	

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	7	8	403	3	1	374
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	9	438	3	1	407
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	848	440			441	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	848	440			441	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	331	617			1119	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	12	441	408
Volume Left	8	0	1
Volume Right	4	3	0
cSH	398	1700	1119
Volume to Capacity	0.03	0.26	0.00
Queue Length 95th (m)	0.7	0.0	0.0
Control Delay (s)	14.3	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	14.3	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	4	406	2	1	369
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	4	441	2	1	401
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	846	442			443	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	846	442			443	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	333	615			1117	

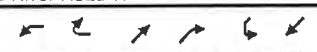
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	443	402
Volume Left	8	0	1
Volume Right	4	2	0
cSH	399	1700	1117
Volume to Capacity	0.03	0.26	0.00
Queue Length 95th (m)	0.7	0.0	0.0
Control Delay (s)	14.3	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	14.3	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	2	346	2	7	403	1
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	376	2	8	438	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	439		819	439		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	439		819	439		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	100		99	99		
cM capacity (veh/h)	1121		344	618		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	378	10	439
Volume Left	2	2	0
Volume Right	0	8	1
cSH	1121	525	1700
Volume to Capacity	0.00	0.02	0.26
Queue Length 95th (m)	0.0	0.5	0.0
Control Delay (s)	0.1	12.0	0.0
Lane LOS	A	B	
Approach Delay (s)	0.1	12.0	0.0
Approach LOS		B	

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	1	347	2	0	399
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	377	2	0	434
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	812	378			379	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	812	378			379	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	345	666			1179	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	5	379	434
Volume Left	4	0	0
Volume Right	1	2	0
cSH	385	1700	1179
Volume to Capacity	0.01	0.22	0.00
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	14.5	0.0	0.0
Lane LOS	B		
Approach Delay (s)	14.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	315	33	7	365
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	32	342	36	8	397
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	772	360			378	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	772	360			378	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	95			99	
cM capacity (veh/h)	365	684			1180	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	130	378	404
Volume Left	99	0	8
Volume Right	32	36	0
cSH	412	1700	1180
Volume to Capacity	0.32	0.22	0.01
Queue Length 95th (m)	10.7	0.0	0.2
Control Delay (s)	17.7	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	17.7	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	49	15	320	18	4	266
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	16	348	20	4	289
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	655	358			367	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	655	358			367	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	98			100	
cM capacity (veh/h)	429	687			1191	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	70	367	293
Volume Left	53	0	4
Volume Right	16	20	0
cSH	470	1700	1191
Volume to Capacity	0.15	0.22	0.00
Queue Length 95th (m)	4.1	0.0	0.1
Control Delay (s)	14.0	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	14.0	0.0	0.2
Approach LOS	B		

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	28.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	4	1	347	425	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	1	377	462	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	841	462	462			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	841	462	462			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	334	600	1099			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	5	378	462
Volume Left	1	1	0
Volume Right	4	0	0
cSH	518	1099	1700
Volume to Capacity	0.01	0.00	0.27
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	12.0	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	12.0	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	32.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2009 AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	313	240	3	5	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	340	261	3	5	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked						
vC, conflicting volume	264				609	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	264				609	262
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1300				457	776

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	343	264	9
Volume Left	3	0	5
Volume Right	0	3	3
cSH	1300	1700	540
Volume to Capacity	0.00	0.16	0.02
Queue Length 95th (m)	0.1	0.0	0.4
Control Delay (s)	0.1	0.0	11.8
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	11.8
Approach LOS			B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		28.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2009 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	249	24	28	216	9	17	12	61	8	12	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1838		1770	1851		1770	1629		1770	1652	
Flt Permitted	0.61	1.00		0.58	1.00		0.72	1.00		0.71	1.00	
Satd. Flow (perm)	1130	1838		1078	1851		1346	1629		1314	1652	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	271	26	30	235	10	18	13	66	7	13	40
RTOR Reduction (vph)	0	9	0	0	4	0	0	38	0	0	23	0
Lane Group Flow (vph)	59	288	0	30	241	0	18	41	0	7	30	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.3	11.3		11.3	11.3		17.7	17.7		17.7	17.7	
Effective Green, g (s)	11.3	11.3		11.3	11.3		17.7	17.7		17.7	17.7	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.43	0.43		0.43	0.43	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	311	507		297	510		581	703		567	713	
v/s Ratio Prot		c0.16			0.13			c0.03			0.02	
v/s Ratio Perm	0.05			0.03			0.01			0.01		
v/c Ratio	0.19	0.57		0.10	0.47		0.03	0.06		0.01	0.04	
Uniform Delay, d1	11.4	12.8		11.1	12.4		6.7	6.8		6.7	6.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.5		0.1	0.7		0.1	0.2		0.0	0.1	
Delay (s)	11.8	14.2		11.2	13.1		6.8	7.0		6.7	6.9	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.8			12.9			6.9			6.8	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM Average Control Delay	12.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.26				
Actuated Cycle Length (s)	41.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	40.5%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	319	15	13	231	12	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	1863	1583	1770	1863	1674	
Flt Permitted	1.00	1.00	0.51	1.00	0.98	
Satd. Flow (perm)	1863	1583	950	1863	1674	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	16	14	251	13	22
RTOR Reduction (vph)	0	11	0	0	13	0
Lane Group Flow (vph)	347	5	14	251	22	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	12.3	12.3	12.3	12.3	17.1	
Effective Green, g (s)	12.3	12.3	12.3	12.3	17.1	
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.41	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	554	470	282	554	691	
v/s Ratio Prot	c0.19			0.13	c0.01	
v/s Ratio Perm		0.00	0.01			
v/c Ratio	0.63	0.01	0.05	0.45	0.03	
Uniform Delay, d1	12.6	10.3	10.4	11.8	7.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.0	0.1	0.6	0.1	
Delay (s)	14.8	10.3	10.5	12.4	7.3	
Level of Service	B	B	B	B	A	
Approach Delay (s)	14.8			12.3	7.3	
Approach LOS	B			B	A	

Intersection Summary				
HCM Average Control Delay	13.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	41.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	30.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (vph)	23	291	16	3	239	117	13	12	6	115	6	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.94		1.00	0.85	
Flt Protected		1.00			1.00	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (prot)		3502			3537	1583	1770	1698		1770	1583	
Flt Permitted		0.91			0.95	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (perm)		3187			3351	1583	1770	1698		1770	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	316	17	3	260	127	14	13	9	125	7	20
RTOR Reduction (vph)	0	7	0	0	0	92	0	6	0	0	15	0
Lane Group Flow (vph)	0	351	0	0	283	35	14	16	0	125	12	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		8.9			8.9	8.9	0.9	11.7		7.8	7.8	
Effective Green, g (s)		8.9			8.9	8.9	0.9	11.7		7.8	7.8	
Actuated g/C Ratio		0.27			0.27	0.27	0.03	0.36		0.24	0.24	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		870			915	432	49	609		423	379	
v/s Ratio Prot							c0.01	0.01		c0.07		
v/s Ratio Perm		c0.11			0.08	0.02					0.01	
v/c Ratio		0.40			0.29	0.08	0.29	0.03		0.30	0.03	
Uniform Delay, d1		9.7			9.3	8.8	15.5	6.8		10.2	9.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.1	3.2	0.0		0.4	0.0	
Delay (s)		10.0			9.5	8.9	18.7	6.8		10.5	9.5	
Level of Service		A			A	A	B	A		B	A	
Approach Delay (s)		10.0			9.3			11.4		10.4		
Approach LOS		A			A			B		B		

Intersection Summary					
HCM Average Control Delay	9.8	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.35				
Actuated Cycle Length (s)	32.6	Sum of lost time (s)		15.0	
Intersection Capacity Utilization	45.6%	ICU Level of Service		A	
Analysis Period (min)	15				

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2009 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	21	316	22	29	345	18	28	2	19	13	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.94			0.95	
Flt Protected		1.00			1.00			0.97			0.97	
Satd. Flow (prot)		3496			3501			3232			3267	
Flt Permitted		0.90			0.89			0.86			0.87	
Satd. Flow (perm)		3164			3122			2864			2938	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	343	24	32	375	20	28	2	21	14	2	8
RTOR Reduction (vph)	0	12	0	0	9	0	0	10	0	0	4	0
Lane Group Flow (vph)	0	378	0	0	418	0	0	41	0	0	20	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		12.0			12.0			26.0			26.0	
Effective Green, g (s)		12.0			12.0			26.0			26.0	
Actuated g/C Ratio		0.24			0.24			0.52			0.52	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		759			749			1489			1528	
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.13			c0.01			0.01	
v/c Ratio		0.50			0.56			0.03			0.01	
Uniform Delay, d1		16.4			16.7			5.8			5.8	
Progression Factor		1.00			1.30			1.00			1.00	
Incremental Delay, d2		0.5			0.9			0.0			0.0	
Delay (s)		16.9			22.6			5.9			5.8	
Level of Service		B			C			A			A	
Approach Delay (s)		16.9			22.6			5.9			5.8	
Approach LOS		B			C			A			A	

Intersection Summary				
HCM Average Control Delay	18.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	44.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

2009 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	277	33	17	235	18	106	18	24	26	15	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	0.92		1.00	0.85	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3470			3493		1770	1705		1770	1648	
Flt Permitted		0.87			0.91		0.71	1.00		0.73	1.00	
Satd. Flow (perm)		3038			3175		1326	1705		1354	1648	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	301	36	18	257	20	115	20	26	28	16	53
RTOR Reduction (vph)	0	20	0	0	13	0	0	12	0	0	24	0
Lane Group Flow (vph)	0	359	0	0	262	0	115	34	0	28	45	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		11.0			11.0		27.0	27.0		27.0	27.0	
Effective Green, g (s)		11.0			11.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio		0.22			0.22		0.54	0.54		0.54	0.54	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		668			699		716	921		731	890	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.12			0.09		c0.09			0.02		
v/c Ratio		0.54			0.40		0.16	0.04		0.04	0.05	
Uniform Delay, d1		17.2			16.7		5.8	5.4		5.4	5.4	
Progression Factor		0.18			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.4		0.5	0.1		0.1	0.1	
Delay (s)		4.0			17.1		6.3	5.5		5.5	5.5	
Level of Service		A			B		A	A		A	A	
Approach Delay (s)		4.0			17.1			6.0			5.5	
Approach LOS		A			B			A			A	

Intersection Summary				
HCM Average Control Delay	8.6	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	44.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2009 AM

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	323	4	2	208	13	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	351	4	2	226	14	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			355		584	353
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			268		513	265
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1204		483	718

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	355	228	18
Volume Left	0	2	14
Volume Right	4	0	4
cSH	1700	1204	523
Volume to Capacity	0.21	0.00	0.04
Queue Length 95th (m)	0.0	0.0	0.9
Control Delay (s)	0.0	0.1	12.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.1
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2009 AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	70	223	176	34	10	31
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	242	191	37	11	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	226				604	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226				604	210
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				98	96
cM capacity (veh/h)	1340				435	830

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	318	228	45
Volume Left	76	0	11
Volume Right	0	37	34
cSH	1340	1700	660
Volume to Capacity	0.06	0.13	0.07
Queue Length 95th (m)	1.4	0.0	1.7
Control Delay (s)	2.3	0.0	10.7
Lane LOS	A		B
Approach Delay (s)	2.3	0.0	10.7
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	221	12	18	201	9	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	240	13	20	218	10	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			253		504	247
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			253		504	247
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	96
cM capacity (veh/h)			1312		519	792

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	253	238	43
Volume Left	0	20	10
Volume Right	13	0	34
cSH	1700	1312	708
Volume to Capacity	0.15	0.01	0.06
Queue Length 95th (m)	0.0	0.4	1.5
Control Delay (s)	0.0	0.8	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	10.4
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	709	57	27	469	38	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	743	60	28	494	40	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			803		1324	773
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			803		1324	773
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		76	93
cM capacity (veh/h)			821		155	399

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	803	522	67
Volume Left	0	28	40
Volume Right	60	0	27
cSH	1700	821	218
Volume to Capacity	0.47	0.03	0.31
Queue Length 95th (m)	0.0	0.9	10.1
Control Delay (s)	0.0	1.0	28.8
Lane LOS		A	D
Approach Delay (s)	0.0	1.0	28.8
Approach LOS			D

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	712	20	9	486	10	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	749	21	9	512	11	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			771		1291	760
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			771		1291	760
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	98
cM capacity (veh/h)			844		178	406

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	771	521	18
Volume Left	0	9	11
Volume Right	21	0	7
cSH	1700	844	232
Volume to Capacity	0.45	0.01	0.08
Queue Length 95th (m)	0.0	0.3	2.0
Control Delay (s)	0.0	0.3	21.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.3	21.8
Approach LOS			C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	14	21	632	33	26	478
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	22	665	35	27	503
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1241	683			700	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1241	683			700	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	95			97	
cM capacity (veh/h)	187	449			897	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	37	700	531
Volume Left	15	0	27
Volume Right	22	35	0
cSH	288	1700	897
Volume to Capacity	0.13	0.41	0.03
Queue Length 95th (m)	3.5	0.0	0.8
Control Delay (s)	19.3	0.0	0.8
Lane LOS	C		A
Approach Delay (s)	19.3	0.0	0.8
Approach LOS	C		

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		56.4%	ICU Level of Service B
Analysis Period (min)		15	

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	2	4	630	439	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	4	663	462	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1136	464	466			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1136	464	466			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	223	598	1095			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	4	667	466
Volume Left	2	4	0
Volume Right	2	0	4
cSH	324	1095	1700
Volume to Capacity	0.01	0.00	0.27
Queue Length 95th (m)	0.3	0.1	0.0
Control Delay (s)	16.2	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	16.2	0.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		46.3%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	9	679	26	12	481
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	9	715	27	13	506
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1260	728			742	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1260	728			742	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			99	
cM capacity (veh/h)	185	423			865	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	742	519
Volume Left	15	0	13
Volume Right	9	27	0
cSH	238	1700	865
Volume to Capacity	0.10	0.44	0.01
Queue Length 95th (m)	2.7	0.0	0.4
Control Delay (s)	21.9	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	21.9	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	14	651	41	18	472
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	15	685	43	20	497
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1244	707			728	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1244	707			728	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	97			98	
cM capacity (veh/h)	188	435			875	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	728	517
Volume Left	22	0	20
Volume Right	15	43	0
cSH	243	1700	875
Volume to Capacity	0.15	0.43	0.02
Queue Length 95th (m)	4.2	0.0	0.6
Control Delay (s)	22.4	0.0	0.6
Lane LOS	C		A
Approach Delay (s)	22.4	0.0	0.6
Approach LOS	C		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	40	60	533	95	75	403
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	63	561	100	79	424
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1193	611			661	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1193	611			661	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	87			91	
cM capacity (veh/h)	189	494			927	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	105	661	503
Volume Left	42	0	79
Volume Right	63	100	0
cSH	300	1700	927
Volume to Capacity	0.35	0.39	0.09
Queue Length 95th (m)	12.2	0.0	2.2
Control Delay (s)	23.3	0.0	2.3
Lane LOS	C		A
Approach Delay (s)	23.3	0.0	2.3
Approach LOS	C		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	22	33	559	34	27	456
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	35	588	36	28	480
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1143	606			624	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1143	606			624	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	93			97	
cM capacity (veh/h)	215	497			957	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	58	624	508
Volume Left	23	0	28
Volume Right	35	36	0
cSH	326	1700	957
Volume to Capacity	0.18	0.37	0.03
Queue Length 95th (m)	5.1	0.0	0.7
Control Delay (s)	18.4	0.0	0.8
Lane LOS	C		A
Approach Delay (s)	18.4	0.0	0.8
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	5	583	9	7	479
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	5	614	9	7	504
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1137	618			623	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1137	618			623	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	221	489			958	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	9	623	512
Volume Left	4	0	7
Volume Right	5	9	0
cSH	318	1700	958
Volume to Capacity	0.03	0.37	0.01
Queue Length 95th (m)	0.7	0.0	0.2
Control Delay (s)	16.7	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	16.7	0.0	0.2
Approach LOS	C		

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization	41.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	8	697	22	10	484
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	8	734	23	11	509
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1276	745			757	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1276	745			757	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			99	
cM capacity (veh/h)	182	414			854	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	20	757	520
Volume Left	12	0	11
Volume Right	8	23	0
cSH	238	1700	854
Volume to Capacity	0.08	0.45	0.01
Queue Length 95th (m)	2.2	0.0	0.3
Control Delay (s)	21.5	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	21.5	0.0	0.3
Approach LOS	C		

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization	48.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	586	2	2	486
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	617	2	2	512
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1134	618			619	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1134	618			619	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	224	489			961	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	619	514
Volume Left	1	0	2
Volume Right	1	2	0
cSH	307	1700	961
Volume to Capacity	0.01	0.36	0.00
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	16.8	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	16.8	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	587	1	1	486
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	618	1	1	512
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1132	618			619	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1132	618			619	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	224	489			961	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	619	513
Volume Left	1	0	1
Volume Right	1	1	0
cSH	308	1700	961
Volume to Capacity	0.01	0.36	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	16.8	0.0	0.0
Lane LOS	C		A
Approach Delay (s)	16.8	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBR	NBR2	NWL	NWR	SWL2	SWL
Lane Configurations						
Volume (veh/h)	578	90	20	10	19	562
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	608	95	21	11	20	592
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1287	656	703	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1287	656	703	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			68	98	98	
cM capacity (veh/h)			177	469	894	

Direction, Lane #	NB 1	NW 1	SW 1
Volume Total	703	32	612
Volume Left	0	21	20
Volume Right	95	11	0
cSH	1700	223	894
Volume to Capacity	0.41	0.14	0.02
Queue Length 95th (m)	0.0	3.9	0.5
Control Delay (s)	0.0	23.8	0.8
Lane LOS		C	A
Approach Delay (s)	0.0	23.8	0.8
Approach LOS		C	

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		44.7%	ICU Level of Service A
Analysis Period (min)		15	

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	3	5	580	7	5	484
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	5	611	7	5	509
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1134	814			618	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1134	814			618	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	223	492			962	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	8	618	515
Volume Left	3	0	5
Volume Right	5	7	0
cSH	338	1700	962
Volume to Capacity	0.02	0.36	0.01
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	15.9	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	15.9	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		41.0%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	4	578	7	5	486
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	4	608	7	5	512
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1134	612			615	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1134	612			615	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	223	493			964	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	615	517
Volume Left	3	0	5
Volume Right	4	7	0
cSH	324	1700	964
Volume to Capacity	0.02	0.36	0.01
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	16.4	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	16.4	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	8	599	2	4	552	2
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	631	2	4	581	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	583		1229	582		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583		1229	582		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	99		99	99		
cM capacity (veh/h)	991		195	513		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	639	6	583
Volume Left	8	2	0
Volume Right	0	4	2
cSH	991	332	1700
Volume to Capacity	0.01	0.02	0.34
Queue Length 95th (m)	0.2	0.5	0.0
Control Delay (s)	0.2	16.1	0.0
Lane LOS	A	C	
Approach Delay (s)	0.2	16.1	0.0
Approach LOS		C	

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	635	5	1	551
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	668	5	1	580
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1253	671			674	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1253	671			674	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	190	456			917	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	3	674	581
Volume Left	2	0	1
Volume Right	1	5	0
cSH	238	1700	917
Volume to Capacity	0.01	0.40	0.00
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	20.5	0.0	0.0
Lane LOS	C		A
Approach Delay (s)	20.5	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	25	602	111	24	558
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	634	117	25	587
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1330	692			751	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1330	692			751	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	94			97	
cM capacity (veh/h)	166	444			859	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	83	751	613
Volume Left	56	0	25
Volume Right	27	117	0
cSH	209	1700	859
Volume to Capacity	0.40	0.44	0.03
Queue Length 95th (m)	14.3	0.0	0.7
Control Delay (s)	33.2	0.0	0.8
Lane LOS	D		A
Approach Delay (s)	33.2	0.0	0.8
Approach LOS	D		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	14	528	60	13	446
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	15	556	63	14	469
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1084	587			619	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1084	587			619	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	97			99	
cM capacity (veh/h)	237	509			961	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	45	619	483
Volume Left	31	0	14
Volume Right	15	63	0
cSH	287	1700	961
Volume to Capacity	0.16	0.36	0.01
Queue Length 95th (m)	4.4	0.0	0.3
Control Delay (s)	19.9	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	19.9	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	2	5	672	580	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	5	707	611	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1329	611	612			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1329	611	612			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	99			
cM capacity (veh/h)	170	494	967			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	3	713	612
Volume Left	1	5	0
Volume Right	2	0	1
cSH	302	967	1700
Volume to Capacity	0.01	0.01	0.36
Queue Length 95th (m)	0.3	0.1	0.0
Control Delay (s)	17.0	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	17.0	0.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2009 PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	457	408	3	6	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	481	429	3	6	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked	0.95				0.95	0.95
vC, conflicting volume	433				931	431
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	381				904	379
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	1123				291	637

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	491	433	15
Volume Left	9	0	6
Volume Right	0	3	8
cSH	1123	1700	422
Volume to Capacity	0.01	0.25	0.03
Queue Length 95th (m)	0.2	0.0	0.9
Control Delay (s)	0.3	0.0	13.8
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.8
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2009 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	402	14	82	361	7	20	18	59	5	33	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1853		1770	1858		1770	1649		1770	1667	
Flt Permitted	0.47	1.00		0.40	1.00		0.66	1.00		0.70	1.00	
Satd. Flow (perm)	870	1853		739	1858		1270	1649		1312	1667	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	423	15	86	380	7	21	19	62	5	35	82
RTOR Reduction (vph)	0	3	0	0	1	0	0	38	0	0	50	0
Lane Group Flow (vph)	59	435	0	86	386	0	21	43	0	5	67	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.8	13.8		13.8	13.8		16.1	16.1		16.1	16.1	
Effective Green, g (s)	13.8	13.8		13.8	13.8		16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.38	0.38		0.38	0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	610		243	612		488	634		504	641	
v/s Ratio Prot		c0.23			0.21			0.03			c0.04	
v/s Ratio Perm	0.07			0.12			0.02			0.00		
v/c Ratio	0.21	0.71		0.35	0.63		0.04	0.07		0.01	0.10	
Uniform Delay, d1	10.1	12.3		10.7	11.9		8.1	8.2		8.0	8.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	3.9		0.9	2.1		0.2	0.2		0.0	0.3	
Delay (s)	10.5	16.2		11.6	14.0		8.2	8.4		8.0	8.6	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		15.6			13.6			8.3			8.6	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM Average Control Delay	13.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	41.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	48.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
8: River Road W & Westbury Rd

2009 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	
Volume (vph)	405	24	16	390	21	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.84	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	1863	1583	1770	1863	1705	
Flt Permitted	1.00	1.00	0.41	1.00	0.97	
Satd. Flow (perm)	1863	1583	765	1863	1705	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	427	25	17	411	22	17
RTOR Reduction (vph)	0	15	0	0	10	0
Lane Group Flow (vph)	427	10	17	411	29	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	13.7	13.7	13.7	13.7	16.1	
Effective Green, g (s)	13.7	13.7	13.7	13.7	16.1	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.39	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	611	519	251	611	657	
v/s Ratio Prot	c0.23			0.22	c0.02	
v/s Ratio Perm		0.01	0.02			
v/c Ratio	0.70	0.02	0.07	0.67	0.04	
Uniform Delay, d1	12.3	9.5	9.7	12.1	8.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.0	0.1	2.9	0.1	
Delay (s)	15.7	9.5	9.8	15.0	8.2	
Level of Service	B	A	A	B	A	
Approach Delay (s)	15.4			14.8	8.2	
Approach LOS	B			B	A	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	41.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	34.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
10: River Road W & Main Street

2009 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations		↔↑			↔↑	↱	↰	↰		↰	↱	
Volume (vph)	46	341	15	10	315	168	19	15	7	279	43	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.95		1.00	0.85	
Flt Protected		0.99			1.00	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (prot)		3499			3534	1583	1770	1718		1770	1583	
Flt Permitted		0.86			0.93	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (perm)		3027			3289	1583	1770	1718		1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	359	16	11	333	177	20	16	7	294	45	46
RTOR Reduction (vph)	0	5	0	0	0	127	0	4	0	0	32	0
Lane Group Flow (vph)	0	418	0	0	344	50	20	19	0	294	59	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	21		61		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		10.6			10.6	10.6	0.9	15.1		11.2	11.2	
Effective Green, g (s)		10.6			10.6	10.6	0.9	15.1		11.2	11.2	
Actuated g/C Ratio		0.28			0.28	0.28	0.02	0.40		0.30	0.30	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		851			925	445	42	688		526	470	
v/s Ratio Prot							c0.01	0.01		c0.17		
v/s Ratio Perm		c0.14			0.10	0.03					0.04	
v/c Ratio		0.49			0.37	0.11	0.48	0.03		0.56	0.12	
Uniform Delay, d1		11.3			10.9	10.1	18.2	6.8		11.2	9.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.3	0.1	6.3	0.0		1.3	0.1	
Delay (s)		11.7			11.1	10.2	26.4	6.9		12.5	9.8	
Level of Service		B			B	B	C	A		B	A	
Approach Delay (s)		11.7			10.8			16.0		11.8		
Approach LOS		B			B			B		B		

Intersection Summary				
HCM Average Control Delay	11.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	37.7	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			
! Phase conflict between lane groups.				
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2009 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	25	466	37	47	451	33	46	5	50	28	4	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.98			0.99			0.92			0.91	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3494			3491			3201			3155	
Flt Permitted		0.90			0.85			0.83			0.87	
Satd. Flow (perm)		3165			2976			2731			2794	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	491	39	49	475	35	48	5	53	29	4	55
RTOR Reduction (vph)	0	13	0	0	11	0	0	28	0	0	29	0
Lane Group Flow (vph)	0	543	0	0	548	0	0	78	0	0	59	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		14.4			14.4			23.6			23.6	
Effective Green, g (s)		14.4			14.4			23.6			23.6	
Actuated g/C Ratio		0.29			0.29			0.47			0.47	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		912			857			1289			1319	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.18			c0.03			0.02	
v/c Ratio		0.60			0.64			0.06			0.04	
Uniform Delay, d1		15.3			15.5			7.2			7.1	
Progression Factor		1.00			1.13			1.00			1.00	
Incremental Delay, d2		1.1			1.5			0.1			0.1	
Delay (s)		16.3			19.1			7.3			7.2	
Level of Service		B			B			A			A	
Approach Delay (s)		16.3			19.1			7.3			7.2	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	53.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

2009 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Volume (vph)	72	392	100	13	366	21	109	9	5	19	16	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.97			0.99		1.00	0.95		1.00	0.88	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3423			3508		1770	1763		1770	1647	
Flt Permitted		0.83			0.92		0.71	1.00		0.75	1.00	
Satd. Flow (perm)		2843			3238		1319	1763		1394	1647	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	76	413	105	14	385	22	115	9	5	20	17	58
RTOR Reduction (vph)	0	42	0	0	9	0	0	3	0	0	31	0
Lane Group Flow (vph)	0	552	0	0	412	0	115	11	0	20	44	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.7			14.7		23.3	23.3		23.3	23.3	
Effective Green, g (s)		14.7			14.7		23.3	23.3		23.3	23.3	
Actuated g/C Ratio		0.29			0.29		0.47	0.47		0.47	0.47	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		836			952		615	822		650	768	
v/s Ratio Prot								0.01			0.03	
v/s Ratio Perm		c0.19			0.13		c0.09			0.01		
v/c Ratio		0.66			0.43		0.19	0.01		0.03	0.06	
Uniform Delay, d1		15.5			14.3		7.8	7.2		7.2	7.3	
Progression Factor		0.58			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9			0.3		0.7	0.0		0.1	0.1	
Delay (s)		10.8			14.6		8.5	7.2		7.3	7.5	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		10.8			14.6			8.3			7.4	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	11.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2009 PM

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	400	16	3	440	10	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	421	17	3	463	11	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.85		0.85	0.85
vC, conflicting volume			438		899	429
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			250		792	240
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	100
cM capacity (veh/h)			1118		303	879

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	438	466	12
Volume Left	0	3	11
Volume Right	17	0	1
cSH	1700	1118	319
Volume to Capacity	0.26	0.00	0.04
Queue Length 95th (m)	0.0	0.1	0.9
Control Delay (s)	0.0	0.1	16.7
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	16.7
Approach LOS			C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2009 PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	60	331	350	12	14	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	348	368	13	15	104
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	381				849	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	381				849	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				95	84
cM capacity (veh/h)	1177				313	672

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	412	381	119
Volume Left	63	0	15
Volume Right	0	13	104
cSH	1177	1700	588
Volume to Capacity	0.05	0.22	0.20
Queue Length 95th (m)	1.4	0.0	6.0
Control Delay (s)	1.7	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	1.7	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	340	5	42	353	9	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	358	5	44	372	9	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			383		821	361
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			383		821	361
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		97	97
cM capacity (veh/h)			1195		332	684

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	383	416	33
Volume Left	0	44	9
Volume Right	5	0	23
cSH	1700	1195	523
Volume to Capacity	0.21	0.04	0.06
Queue Length 95th (m)	0.0	0.9	1.6
Control Delay (s)	0.0	1.2	12.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	12.3
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

2011 Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	394	40	10	525	45	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	428	43	11	571	49	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			472		1042	450
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			472		1042	450
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		81	96
cM capacity (veh/h)			1090		252	609

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	472	582	75
Volume Left	0	11	49
Volume Right	43	0	26
cSH	1700	1090	316
Volume to Capacity	0.28	0.01	0.24
Queue Length 95th (m)	0.0	0.2	7.2
Control Delay (s)	0.0	0.3	19.9
Lane LOS		A	C
Approach Delay (s)	0.0	0.3	19.9
Approach LOS			C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	412	7	2	517	18	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	448	8	2	562	20	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			455		1018	452
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			455		1018	452
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	99
cM capacity (veh/h)			1105		262	608

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	455	564	28
Volume Left	0	2	20
Volume Right	8	0	9
cSH	1700	1105	318
Volume to Capacity	0.27	0.00	0.09
Queue Length 95th (m)	0.0	0.0	2.3
Control Delay (s)	0.0	0.1	17.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	17.4
Approach LOS			C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	33	20	414	12	6	472
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	22	450	13	7	513
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	983	457			463	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	983	457			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	96			99	
cM capacity (veh/h)	274	604			1098	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	58	463	520
Volume Left	36	0	7
Volume Right	22	13	0
cSH	346	1700	1098
Volume to Capacity	0.17	0.27	0.01
Queue Length 95th (m)	4.7	0.0	0.1
Control Delay (s)	17.5	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	17.5	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	4	1	458	519	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	1	498	564	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1065	565	565			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1065	565	565			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	246	525	1007			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	7	499	585
Volume Left	2	1	0
Volume Right	4	0	1
cSH	381	1007	1700
Volume to Capacity	0.02	0.00	0.33
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	14.6	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	14.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	23	11	412	9	2	478
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	12	448	10	2	520
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	977	453			458	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	977	453			458	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	98			100	
cM capacity (veh/h)	278	607			1103	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	458	522
Volume Left	25	0	2
Volume Right	12	10	0
cSH	337	1700	1103
Volume to Capacity	0.11	0.27	0.00
Queue Length 95th (m)	2.9	0.0	0.0
Control Delay (s)	17.0	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	17.0	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	36	17	408	14	3	472
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	18	443	15	3	513
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	971	451			459	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	971	451			459	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	97			100	
cM capacity (veh/h)	280	608			1102	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	459	516
Volume Left	39	0	3
Volume Right	18	15	0
cSH	338	1700	1102
Volume to Capacity	0.17	0.27	0.00
Queue Length 95th (m)	4.8	0.0	0.1
Control Delay (s)	17.8	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	17.8	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	94	57	421	33	17	422
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	62	458	36	18	459
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	971	476			493	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	971	476			493	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	63	89			98	
cM capacity (veh/h)	278	589			1070	

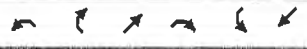
Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	164	493	477
Volume Left	102	0	18
Volume Right	62	36	0
cSH	345	1700	1070
Volume to Capacity	0.48	0.29	0.02
Queue Length 95th (m)	19.7	0.0	0.4
Control Delay (s)	24.6	0.0	0.5
Lane LOS	C		A
Approach Delay (s)	24.6	0.0	0.5
Approach LOS	C		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	24	15	458	24	12	468
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	16	498	26	13	509
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1046	511			524	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1046	511			524	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	97			99	
cM capacity (veh/h)	250	563			1043	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	42	524	522
Volume Left	26	0	13
Volume Right	16	26	0
cSH	318	1700	1043
Volume to Capacity	0.13	0.31	0.01
Queue Length 95th (m)	3.6	0.0	0.3
Control Delay (s)	18.1	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	18.1	0.0	0.4
Approach LOS	C		

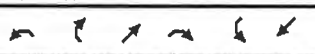
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	473	1	0	470
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1	514	1	0	511
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1026	515			515	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1026	515			515	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	260	560			1050	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	3	515	511
Volume Left	2	0	0
Volume Right	1	1	0
cSH	317	1700	1050
Volume to Capacity	0.01	0.30	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	16.5	0.0	0.0
Lane LOS	C		
Approach Delay (s)	16.5	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	473	0	0	472
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	514	0	0	513
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1027	514			514	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1027	514			514	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	280	560			1051	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	514	513
Volume Left	1	0	0
Volume Right	1	0	0
cSH	355	1700	1051
Volume to Capacity	0.01	0.30	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	15.2	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.2	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	8	5	465	3	2	472
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	5	509	3	2	513
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1026	510			512	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1026	510			512	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	259	563			1053	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	14	512	515
Volume Left	9	0	2
Volume Right	5	3	0
cSH	327	1700	1053
Volume to Capacity	0.04	0.30	0.00
Queue Length 95th (m)	1.1	0.0	0.0
Control Delay (s)	16.5	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	16.5	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	9	412	8	2	499
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	10	448	9	2	542
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	999	452			457	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	999	452			457	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			100	
cM capacity (veh/h)	269	607			1104	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	457	545
Volume Left	22	0	2
Volume Right	10	9	0
cSH	328	1700	1104
Volume to Capacity	0.10	0.27	0.00
Queue Length 95th (m)	2.6	0.0	0.0
Control Delay (s)	17.2	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	17.2	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBR	NBR2	NWL	NWR	SWL2	SWL
Lane Configurations						
Volume (veh/h)	388	23	54	17	5	404
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	420	25	59	18	5	439
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			882	432	445	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			882	432	445	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			81	97	100	
cM capacity (veh/h)			315	623	1116	

Direction, Lane #	NB 1	NW 1	SW 1
Volume Total	445	77	445
Volume Left	0	59	5
Volume Right	25	18	0
cSH	1700	357	1116
Volume to Capacity	0.26	0.22	0.00
Queue Length 95th (m)	0.0	6.5	0.1
Control Delay (s)	0.0	17.8	0.2
Lane LOS		C	A
Approach Delay (s)	0.0	17.8	0.2
Approach LOS		C	

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	7	4	474	2	1	457
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	4	515	2	1	497
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1015	516			517	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1015	516			517	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	264	559			1048	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	12	517	498
Volume Left	8	0	1
Volume Right	4	2	0
cSH	328	1700	1048
Volume to Capacity	0.04	0.30	0.00
Queue Length 95th (m)	0.9	0.0	0.0
Control Delay (s)	16.5	0.0	0.0
Lane LOS	C		A
Approach Delay (s)	16.5	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	4	474	2	1	497
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	4	515	2	1	497
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1015	516			517	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1015	516			517	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	264	559			1048	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	517	498
Volume Left	8	0	1
Volume Right	4	2	0
cSH	326	1700	1048
Volume to Capacity	0.04	0.30	0.00
Queue Length 95th (m)	0.9	0.0	0.0
Control Delay (s)	16.5	0.0	0.0
Lane LOS	C		A
Approach Delay (s)	16.5	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		35.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	2	412	2	7	492	1
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	448	2	8	535	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	536		988	535		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	536		988	535		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	100		99	99		
cM capacity (veh/h)	1032		274	545		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	450	10	536
Volume Left	2	2	0
Volume Right	0	8	1
cSH	1032	447	1700
Volume to Capacity	0.00	0.02	0.32
Queue Length 95th (m)	0.1	0.5	0.0
Control Delay (s)	0.1	13.2	0.0
Lane LOS	A	B	
Approach Delay (s)	0.1	13.2	0.0
Approach LOS		B	

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		66.3%	ICU Level of Service C
Analysis Period (min)		15	

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	1	412	2	0	489
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	448	2	0	532
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	980	449			450	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	980	449			450	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	277	610			1110	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	5	450	532
Volume Left	4	0	0
Volume Right	1	2	0
cSH	311	1700	1110
Volume to Capacity	0.02	0.26	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	16.8	0.0	0.0
Lane LOS	C		
Approach Delay (s)	16.8	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	380	33	7	453
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	32	413	36	8	492
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	939	431			449	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	939	431			449	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	95			99	
cM capacity (veh/h)	291	624			1111	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	130	449	500
Volume Left	99	0	8
Volume Right	32	36	0
cSH	334	1700	1111
Volume to Capacity	0.39	0.26	0.01
Queue Length 95th (m)	14.3	0.0	0.2
Control Delay (s)	22.5	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	22.5	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	49	15	385	18	4	351
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	16	418	20	4	382
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	818	428			438	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	818	428			438	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	97			100	
cM capacity (veh/h)	344	627			1122	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	70	438	386
Volume Left	53	0	4
Volume Right	16	20	0
cSH	385	1700	1122
Volume to Capacity	0.18	0.26	0.00
Queue Length 95th (m)	5.2	0.0	0.1
Control Delay (s)	16.4	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	16.4	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

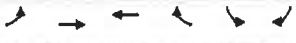
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	4	1	412	515	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	1	448	561	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1011	561	561			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1011	561	561			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	265	527	1010			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	5	449	561
Volume Left	1	1	0
Volume Right	4	0	0
cSH	440	1010	1700
Volume to Capacity	0.01	0.00	0.33
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	13.3	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	13.3	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2011 AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	377	324	3	5	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	410	352	3	5	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked						
vC, conflicting volume	355				770	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355				770	354
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1203				368	1090

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	413	355	9
Volume Left	3	0	5
Volume Right	0	3	3
cSH	1203	1700	446
Volume to Capacity	0.00	0.21	0.02
Queue Length 95th (m)	0.1	0.0	0.5
Control Delay (s)	0.1	0.0	13.2
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	13.2
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2011 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	311	24	28	298	9	17	12	61	6	12	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1843		1770	1854		1770	1629		1770	1652	
Flt Permitted	0.53	1.00		0.48	1.00		0.72	1.00		0.71	1.00	
Satd. Flow (perm)	989	1843		902	1854		1346	1629		1314	1652	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	338	26	30	324	10	18	13	66	7	13	40
RTOR Reduction (vph)	0	7	0	0	3	0	0	39	0	0	24	0
Lane Group Flow (vph)	59	357	0	30	331	0	18	40	0	7	29	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.5	12.5		12.5	12.5		17.1	17.1		17.1	17.1	
Effective Green, g (s)	12.5	12.5		12.5	12.5		17.1	17.1		17.1	17.1	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.41	0.41		0.41	0.41	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	297	554		271	557		553	670		540	679	
v/s Ratio Prot		c0.19			0.18			c0.02			0.02	
v/s Ratio Perm	0.06			0.03			0.01			0.01		
v/c Ratio	0.20	0.64		0.11	0.59		0.03	0.06		0.01	0.04	
Uniform Delay, d1	10.8	12.6		10.5	12.4		7.3	7.4		7.3	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	2.6		0.2	1.7		0.1	0.2		0.0	0.1	
Delay (s)	11.2	15.2		10.7	14.1		7.4	7.6		7.3	7.5	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		14.6			13.6			7.5			7.4	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM Average Control Delay	13.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.31				
Actuated Cycle Length (s)	41.6	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	43.8%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
8: River Road W & Westbury Rd

2011 AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	369	29	25	284	42	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	1863	1583	1770	1863	1675	
Flt Permitted	1.00	1.00	0.44	1.00	0.98	
Satd. Flow (perm)	1863	1583	828	1863	1675	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	401	32	27	309	46	75
RTOR Reduction (vph)	0	20	0	0	46	0
Lane Group Flow (vph)	401	12	27	309	75	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	13.3	13.3	13.3	13.3	16.1	
Effective Green, g (s)	13.3	13.3	13.3	13.3	16.1	
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.39	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	599	509	266	599	651	
v/s Ratio Prot	c0.22			0.17	c0.04	
v/s Ratio Perm		0.01	0.03			
v/c Ratio	0.67	0.02	0.10	0.52	0.12	
Uniform Delay, d1	12.1	9.6	9.9	11.4	8.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.8	0.0	0.2	0.8	0.4	
Delay (s)	15.0	9.6	10.0	12.2	8.5	
Level of Service	B	A	B	B	A	
Approach Delay (s)	14.6			12.0	8.5	
Approach LOS	B			B	A	

Intersection Summary				
HCM Average Control Delay	12.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	41.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	37.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
10: River Road W & Main Street

2011 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (vph)	36	376	16	3	300	145	13	13	9	140	7	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.94		1.00	0.85	
Flt Protected		1.00			1.00	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (prot)		3505			3538	1583	1770	1697		1770	1583	
Flt Permitted		0.89			0.95	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (perm)		3125			3354	1583	1770	1697		1770	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	409	17	3	326	158	14	14	10	152	8	25
RTOR Reduction (vph)	0	5	0	0	0	111	0	6	0	0	19	0
Lane Group Flow (vph)	0	460	0	0	329	47	14	18	0	152	14	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		10.3			10.3	10.3	0.9	12.5		8.8	8.8	
Effective Green, g (s)		10.3			10.3	10.3	0.9	12.5		8.8	8.8	
Actuated g/C Ratio		0.30			0.30	0.30	0.03	0.36		0.25	0.25	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		925			993	469	46	610		437	391	
v/s Ratio Prot							c0.01	0.01		c0.09		
v/s Ratio Perm		c0.15			0.10	0.03					0.01	
v/c Ratio		0.50			0.33	0.10	0.30	0.03		0.35	0.04	
Uniform Delay, d1		10.1			9.8	8.9	15.8	7.2		10.8	10.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.2	0.1	3.7	0.0		0.5	0.0	
Delay (s)		10.5			9.8	9.0	20.4	7.2		11.3	10.0	
Level of Service		B			A	A	C	A		B	A	
Approach Delay (s)		10.5			9.5			12.1		11.0		
Approach LOS		B			A			B		B		

Intersection Summary				
HCM Average Control Delay	10.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	34.8	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	31.4%	ICU Level of Service	A	
Analysis Period (min)	15			
! Phase conflict between lane groups.				
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2011 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	30	415	25	33	429	26	40	2	27	13	3	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.94			0.95	
Flt Protected		1.00			1.00			0.97			0.97	
Satd. Flow (prot)		3500			3499			3237			3267	
Flt Permitted		0.88			0.86			0.84			0.87	
Satd. Flow (perm)		3104			3094			2795			2922	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	451	27	36	466	28	43	2	29	14	3	9
RTOR Reduction (vph)	0	9	0	0	9	0	0	15	0	0	5	0
Lane Group Flow (vph)	0	502	0	0	521	0	0	59	0	0	21	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		13.8			13.8			24.2			24.2	
Effective Green, g (s)		13.8			13.8			24.2			24.2	
Actuated g/C Ratio		0.28			0.28			0.48			0.48	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		857			854			1353			1414	
v/s Ratio Prot												
v/s Ratio Perm		0.16			c0.17			c0.02			0.01	
v/c Ratio		0.59			0.61			0.04			0.02	
Uniform Delay, d1		15.6			15.8			6.8			6.7	
Progression Factor		1.00			1.11			1.00			1.00	
Incremental Delay, d2		1.0			1.2			0.1			0.0	
Delay (s)		16.7			18.8			6.9			6.7	
Level of Service		B			B			A			A	
Approach Delay (s)		16.7			18.8			6.9			6.7	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	16.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

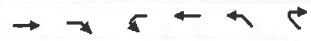
2011 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Volume (vph)	44	379	38	17	321	22	108	21	24	32	15	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	0.92		1.00	0.86	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3479			3499		1770	1714		1770	1643	
Flt Permitted		0.87			0.91		0.71	1.00		0.73	1.00	
Satd. Flow (perm)		3028			3198		1319	1714		1351	1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	412	41	18	349	24	115	23	26	35	16	59
RTOR Reduction (vph)	0	15	0	0	11	0	0	13	0	0	30	0
Lane Group Flow (vph)	0	486	0	0	380	0	115	36	0	35	45	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2		24.8	24.8		24.8	24.8	
Effective Green, g (s)		13.2			13.2		24.8	24.8		24.8	24.8	
Actuated g/C Ratio		0.26			0.26		0.50	0.50		0.50	0.50	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		799			844		654	850		670	815	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.16			0.12		c0.09			0.03		
v/c Ratio		0.61			0.45		0.18	0.04		0.05	0.06	
Uniform Delay, d1		16.1			15.4		7.0	6.5		6.5	6.5	
Progression Factor		0.53			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			0.4		0.6	0.1		0.1	0.1	
Delay (s)		9.8			15.8		7.5	6.6		6.7	6.7	
Level of Service		A			B		A	A		A	A	
Approach Delay (s)		9.8			15.8			7.3			6.7	
Approach LOS		A			B			A			A	

Intersection Summary				
HCM Average Control Delay	11.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2011 AM



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	432	4	2	298	13	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	470	4	2	322	14	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.84		0.84	0.84
vC, conflicting volume			474		798	472
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			279		664	276
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	99
cM capacity (veh/h)			1079		357	541

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	474	324	18
Volume Left	0	2	14
Volume Right	4	0	4
cSH	1700	1079	398
Volume to Capacity	0.28	0.00	0.05
Queue Length 95th (m)	0.0	0.0	1.2
Control Delay (s)	0.0	0.1	14.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	14.5
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2011 AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	86	312	235	42	19	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	339	255	46	21	64
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	301				804	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	301				804	278
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				94	92
cM capacity (veh/h)	1260				326	761

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	433	301	85
Volume Left	93	0	21
Volume Right	0	46	64
cSH	1260	1700	574
Volume to Capacity	0.07	0.18	0.15
Queue Length 95th (m)	1.9	0.0	4.1
Control Delay (s)	2.3	0.0	12.4
Lane LOS	A		B
Approach Delay (s)	2.3	0.0	12.4
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	319	12	19	269	9	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	347	13	21	292	10	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			360		687	353
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			360		687	353
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	95
cM capacity (veh/h)			1199		408	690

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	360	313	45
Volume Left	0	21	10
Volume Right	13	0	35
cSH	1700	1199	598
Volume to Capacity	0.21	0.02	0.07
Queue Length 95th (m)	0.0	0.4	1.9
Control Delay (s)	0.0	0.7	11.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	11.5
Approach LOS			B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	840	57	32	573	38	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	884	60	34	603	40	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			944		1585	914
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			944		1585	914
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		65	90
cM capacity (veh/h)			727		114	331

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	944	637	72
Volume Left	0	34	40
Volume Right	60	0	32
cSH	1700	727	160
Volume to Capacity	0.56	0.05	0.45
Queue Length 95th (m)	0.0	1.2	16.4
Control Delay (s)	0.0	1.2	44.5
Lane LOS		A	E
Approach Delay (s)	0.0	1.2	44.5
Approach LOS			E

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	850	20	9	595	10	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	895	21	9	626	11	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			916		1551	905
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			916		1551	905
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		91	98
cM capacity (veh/h)			745		124	335

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	916	636	18
Volume Left	0	9	11
Volume Right	21	0	7
cSH	1700	745	167
Volume to Capacity	0.54	0.01	0.11
Queue Length 95th (m)	0.0	0.3	2.8
Control Delay (s)	0.0	0.3	29.1
Lane LOS		A	D
Approach Delay (s)	0.0	0.3	29.1
Approach LOS			D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	14	21	763	33	26	587
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	22	803	35	27	618
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1493	821			838	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1493	821			838	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	94			97	
cM capacity (veh/h)	131	375			796	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	37	838	645
Volume Left	15	0	27
Volume Right	22	35	0
cSH	215	1700	796
Volume to Capacity	0.17	0.49	0.03
Queue Length 95th (m)	4.8	0.0	0.9
Control Delay (s)	25.2	0.0	0.9
Lane LOS	D		A
Approach Delay (s)	25.2	0.0	0.9
Approach LOS	D		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	2	4	765	546	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	4	805	575	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1391	577	579			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1391	577	579			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	156	516	995			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	4	809	579
Volume Left	2	4	0
Volume Right	2	0	4
cSH	240	995	1700
Volume to Capacity	0.02	0.00	0.34
Queue Length 95th (m)	0.4	0.1	0.0
Control Delay (s)	20.3	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	20.3	0.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	9	815	28	12	590
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	9	858	27	13	621
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1518	872			885	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1518	872			885	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	97			98	
cM capacity (veh/h)	129	350			765	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	885	634
Volume Left	15	0	13
Volume Right	9	27	0
cSH	171	1700	765
Volume to Capacity	0.14	0.52	0.02
Queue Length 95th (m)	3.9	0.0	0.4
Control Delay (s)	29.5	0.0	0.4
Lane LOS	D		A
Approach Delay (s)	29.5	0.0	0.4
Approach LOS	D		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	14	782	41	19	581
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	15	823	43	20	812
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1496	845			866	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1496	845			866	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	96			97	
cM capacity (veh/h)	132	383			777	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	866	832
Volume Left	22	0	20
Volume Right	15	43	0
cSH	177	1700	777
Volume to Capacity	0.21	0.51	0.03
Queue Length 95th (m)	6.1	0.0	0.6
Control Delay (s)	30.7	0.0	0.7
Lane LOS	D		A
Approach Delay (s)	30.7	0.0	0.7
Approach LOS	D		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	40	60	664	95	75	509
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	63	699	100	79	536
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1443	749			799	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1443	749			799	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	85			90	
cM capacity (veh/h)	132	412			824	

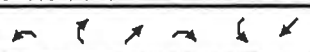
Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	105	799	615
Volume Left	42	0	79
Volume Right	63	100	0
cSH	223	1700	824
Volume to Capacity	0.47	0.47	0.10
Queue Length 95th (m)	18.6	0.0	2.5
Control Delay (s)	34.9	0.0	2.5
Lane LOS	D		A
Approach Delay (s)	34.9	0.0	2.5
Approach LOS	D		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	23	34	691	35	28	564
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	36	727	37	29	594
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1398	746			764	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1398	746			764	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	91			97	
cM capacity (veh/h)	150	414			849	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	80	764	623
Volume Left	24	0	29
Volume Right	36	37	0
cSH	242	1700	849
Volume to Capacity	0.25	0.45	0.03
Queue Length 95th (m)	7.6	0.0	0.9
Control Delay (s)	24.8	0.0	0.9
Lane LOS	C		A
Approach Delay (s)	24.8	0.0	0.9
Approach LOS	C		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	52.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	5	716	9	7	589
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	5	754	9	7	620
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1393	758			763	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1393	758			763	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			99	
cM capacity (veh/h)	155	407			849	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	9	763	627
Volume Left	4	0	7
Volume Right	5	0	0
cSH	236	1700	849
Volume to Capacity	0.04	0.45	0.01
Queue Length 95th (m)	1.0	0.0	0.2
Control Delay (s)	20.9	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	20.9	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	8	835	22	10	593
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	8	879	23	11	624
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1538	891			902	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1538	891			902	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	98			99	
cM capacity (veh/h)	126	341			754	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	20	902	635
Volume Left	12	0	11
Volume Right	8	23	0
cSH	172	1700	754
Volume to Capacity	0.12	0.53	0.01
Queue Length 95th (m)	3.1	0.0	0.3
Control Delay (s)	28.7	0.0	0.4
Lane LOS	D		A
Approach Delay (s)	28.7	0.0	0.4
Approach LOS	D		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	719	2	2	595
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	757	2	2	626
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1388	758			759	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1388	758			759	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	157	407			853	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	759	628
Volume Left	1	0	2
Volume Right	1	2	0
cSH	226	1700	853
Volume to Capacity	0.01	0.45	0.00
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	21.0	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	21.0	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	721	1	1	595
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	759	1	1	626
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1388	759			760	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1388	759			760	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	157	406			852	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	760	627
Volume Left	1	0	1
Volume Right	1	1	0
cSH	227	1700	852
Volume to Capacity	0.01	0.45	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	21.0	0.0	0.0
Lane LOS	C		A
Approach Delay (s)	21.0	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	20	10	711	90	19	675
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	11	748	95	20	711
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1546	796			843	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1546	796			843	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	97			97	
cM capacity (veh/h)	123	387			793	

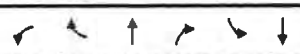
Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	32	843	731
Volume Left	21	0	20
Volume Right	11	95	0
cSH	159	1700	793
Volume to Capacity	0.20	0.50	0.03
Queue Length 95th (m)	5.7	0.0	0.6
Control Delay (s)	33.2	0.0	0.7
Lane LOS	D		A
Approach Delay (s)	33.2	0.0	0.7
Approach LOS	D		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	3	5	713	7	5	594
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	5	751	7	5	625
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1390	754			758	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1390	754			758	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	158	409			853	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	8	758	631
Volume Left	3	0	5
Volume Right	5	7	0
cSH	254	1700	853
Volume to Capacity	0.03	0.45	0.01
Queue Length 95th (m)	0.8	0.0	0.1
Control Delay (s)	19.8	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	19.8	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	4	711	7	6	596
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	4	748	7	6	627
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1390	752			758	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1390	752			758	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	158	410			855	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	756	633
Volume Left	3	0	5
Volume Right	4	7	0
cSH	241	1700	855
Volume to Capacity	0.03	0.44	0.01
Queue Length 95th (m)	0.8	0.0	0.1
Control Delay (s)	20.4	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	20.4	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	6	732	2	4	864	2
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	6	771	2	4	699	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	701		1487	700		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	701		1487	700		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	99		98	99		
cM capacity (veh/h)	896		136	439		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	779	6	701
Volume Left	6	2	0
Volume Right	0	4	2
cSH	896	251	1700
Volume to Capacity	0.01	0.03	0.41
Queue Length 95th (m)	0.2	0.6	0.0
Control Delay (s)	0.3	19.7	0.0
Lane LOS	A	C	
Approach Delay (s)	0.3	19.7	0.0
Approach LOS		C	

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	770	5	1	664
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	811	5	1	699
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1514	813			816	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1514	813			816	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	132	378			812	

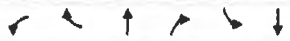
Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	3	816	700
Volume Left	2	0	1
Volume Right	1	5	0
cSH	168	1700	812
Volume to Capacity	0.02	0.48	0.00
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	26.8	0.0	0.0
Lane LOS	D		A
Approach Delay (s)	26.8	0.0	0.0
Approach LOS	D		

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	50.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	26	735	111	24	671
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	774	117	25	706
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1589	832			891	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1589	832			891	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	51	93			97	
cM capacity (veh/h)	115	369			781	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	83	891	732
Volume Left	56	0	25
Volume Right	27	117	0
cSH	148	1700	761
Volume to Capacity	0.56	0.52	0.03
Queue Length 95th (m)	22.7	0.0	0.8
Control Delay (s)	56.6	0.0	0.9
Lane LOS	F		A
Approach Delay (s)	56.6	0.0	0.9
Approach LOS	F		

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	65.9%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	14	658	60	13	554
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	15	693	63	14	583
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1335	724			756	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1335	724			756	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	97			98	
cM capacity (veh/h)	187	426			855	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	45	756	597
Volume Left	31	0	14
Volume Right	15	63	0
cSH	208	1700	855
Volume to Capacity	0.22	0.44	0.02
Queue Length 95th (m)	6.4	0.0	0.4
Control Delay (s)	27.1	0.0	0.4
Lane LOS	D		A
Approach Delay (s)	27.1	0.0	0.4
Approach LOS	D		

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	49.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	2	5	808	694	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	5	851	731	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1592	731	732			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1592	731	732			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	99			
cM capacity (veh/h)	117	422	873			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	3	856	732
Volume Left	1	5	0
Volume Right	2	0	1
cSH	228	873	1700
Volume to Capacity	0.01	0.01	0.43
Queue Length 95th (m)	0.3	0.1	0.0
Control Delay (s)	21.1	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	21.1	0.2	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	56.5%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2011 PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	585	514	3	6	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	616	541	3	6	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked	0.81				0.81	0.81
vC, conflicting volume	544				1177	543
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320				1102	318
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	99
cM capacity (veh/h)	1004				188	585

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	625	544	15
Volume Left	9	0	6
Volume Right	0	3	8
cSH	1004	1700	307
Volume to Capacity	0.01	0.32	0.05
Queue Length 95th (m)	0.2	0.0	1.2
Control Delay (s)	0.3	0.0	17.3
Lane LOS	A		C
Approach Delay (s)	0.3	0.0	17.3
Approach LOS			C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2011 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	528	14	82	466	7	20	18	58	5	33	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.89		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1855		1770	1859		1770	1649		1770	1667	
Flt Permitted	0.34	1.00		0.25	1.00		0.66	1.00		0.70	1.00	
Satd. Flow (perm)	632	1855		471	1859		1270	1649		1312	1667	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	556	15	86	491	7	21	19	62	5	35	82
RTOR Reduction (vph)	0	2	0	0	1	0	0	39	0	0	52	0
Lane Group Flow (vph)	59	569	0	86	497	0	21	42	0	5	65	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.36	0.36		0.36	0.36	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	230	675		171	676		462	600		477	606	
v/s Ratio Prot		c0.31			0.27			0.03			c0.04	
v/s Ratio Perm	0.09			0.18			0.02			0.00		
v/c Ratio	0.26	0.84		0.50	0.73		0.05	0.07		0.01	0.11	
Uniform Delay, d1	9.8	12.8		10.9	12.2		9.1	9.1		8.9	9.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	9.4		2.3	4.1		0.2	0.2		0.0	0.4	
Delay (s)	10.4	22.3		13.2	16.3		9.2	9.4		9.0	9.6	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		21.1			15.9			9.3			9.6	
Approach LOS		C			B			A			A	

Intersection Summary					
HCM Average Control Delay	17.2	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.48				
Actuated Cycle Length (s)	44.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	56.0%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
8: River Road W & Westbury Rd

2011 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	478	77	52	466	51	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	1863	1583	1770	1863	1706	
Flt Permitted	1.00	1.00	0.30	1.00	0.97	
Satd. Flow (perm)	1863	1583	561	1863	1706	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	503	81	55	491	54	41
RTOR Reduction (vph)	0	36	0	0	24	0
Lane Group Flow (vph)	503	45	55	491	71	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	20.2	20.2	20.2	20.2	22.8	
Effective Green, g (s)	20.2	20.2	20.2	20.2	22.8	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.41	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	684	581	206	684	707	
v/s Ratio Prot	c0.27			0.26	c0.04	
v/s Ratio Perm		0.03	0.10			
v/c Ratio	0.74	0.08	0.27	0.72	0.10	
Uniform Delay, d1	15.1	11.3	12.2	15.0	9.8	
Progression Factor	1.00	1.00	0.48	0.67	1.00	
Incremental Delay, d2	4.1	0.1	0.7	3.4	0.3	
Delay (s)	19.2	11.4	6.5	13.5	10.1	
Level of Service	B	B	A	B	B	
Approach Delay (s)	18.1			12.8	10.1	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: River Road W & Main Street

2011 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (vph)	70	409	15	11	402	218	19	19	8	330	47	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.96		1.00	0.85	
Flt Protected		0.99			1.00	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (prot)		3498			3534	1583	1770	1721		1770	1583	
Flt Permitted		0.81			0.93	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (perm)		2860			3294	1583	1770	1721		1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	431	16	12	423	227	20	20	8	347	49	69
RTOR Reduction (vph)	0	4	0	0	0	167	0	4	0	0	39	0
Lane Group Flow (vph)	0	517	0	0	435	60	20	24	0	347	79	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		14.5			14.5	14.5	1.4	28.5		24.1	24.1	
Effective Green, g (s)		14.5			14.5	14.5	1.4	28.5		24.1	24.1	
Actuated g/C Ratio		0.26			0.26	0.26	0.03	0.52		0.44	0.44	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		754			868	417	45	892		776	694	
v/s Ratio Prot							c0.01	0.01		c0.20		
v/s Ratio Perm		c0.18			0.13	0.04					0.05	
v/c Ratio		0.69			0.50	0.14	0.44	0.03		0.45	0.11	
Uniform Delay, d1		18.2			17.2	15.5	26.4	6.5		10.8	9.1	
Progression Factor		0.31			0.39	0.45	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.2			0.4	0.1	6.9	0.1		1.9	0.3	
Delay (s)		7.9			7.1	7.2	33.3	6.5		12.7	9.5	
Level of Service		A			A	A	C	A		B	A	
Approach Delay (s)		7.9			7.1			17.7		11.6		
Approach LOS		A			A			B		B		

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
! Phase conflict between lane groups.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2011 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	35	561	36	53	578	50	65	7	61	30	6	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.93			0.91	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3499			3488			3216			3181	
Flt Permitted		0.88			0.83			0.80			0.86	
Satd. Flow (perm)		3100			2898			2647			2782	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	612	40	56	608	53	68	7	64	32	6	61
RTOR Reduction (vph)	0	9	0	0	13	0	0	36	0	0	34	0
Lane Group Flow (vph)	0	678	0	0	704	0	0	103	0	0	65	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		18.8			18.8			24.2			24.2	
Effective Green, g (s)		18.8			18.8			24.2			24.2	
Actuated g/C Ratio		0.34			0.34			0.44			0.44	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1060			991			1165			1215	
v/s Ratio Prot												
v/s Ratio Perm		0.22			c0.24			c0.04			0.02	
v/c Ratio		0.64			0.71			0.09			0.05	
Uniform Delay, d1		15.2			15.7			9.0			8.8	
Progression Factor		1.13			0.80			1.00			1.00	
Incremental Delay, d2		1.1			2.3			0.2			0.1	
Delay (s)		18.3			15.0			9.1			8.9	
Level of Service		B			B			A			A	
Approach Delay (s)		18.3			15.0			9.1			8.9	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

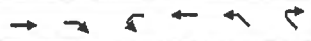
2011 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	89	501	111	13	486	30	109	18	6	27	16	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.96		1.00	0.88	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3433			3504		1770	1798		1770	1633	
Flt Permitted		0.78			0.93		0.70	1.00		0.74	1.00	
Satd. Flow (perm)		2686			3253		1295	1796		1360	1633	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	527	117	14	512	32	115	19	6	28	17	78
RTOR Reduction (vph)	0	32	0	0	9	0	0	3	0	0	45	0
Lane Group Flow (vph)	0	706	0	0	549	0	115	22	0	28	50	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.6			19.6		23.4	23.4		23.4	23.4	
Effective Green, g (s)		19.6			19.6		23.4	23.4		23.4	23.4	
Actuated g/C Ratio		0.36			0.36		0.43	0.43		0.43	0.43	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		958			1159		551	764		587	695	
v/s Ratio Prot								0.01			0.03	
v/s Ratio Perm		c0.26			0.17		c0.09			0.02		
v/c Ratio		0.74			0.47		0.21	0.03		0.05	0.07	
Uniform Delay, d1		15.4			13.7		10.0	9.2		9.3	9.4	
Progression Factor		0.83			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.7			0.3		0.9	0.1		0.2	0.2	
Delay (s)		12.5			14.0		10.8	9.3		9.4	9.6	
Level of Service		B			B		B	A		A	A	
Approach Delay (s)		12.5			14.0			10.5			9.5	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2011 PM



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	518	16	3	572	10	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	545	17	3	602	11	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.77		0.77	0.77
vC, conflicting volume			562		1162	554
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			274		1058	263
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			986		190	593

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	562	605	12
Volume Left	0	3	11
Volume Right	17	0	1
cSH	1700	986	202
Volume to Capacity	0.33	0.00	0.06
Queue Length 95th (m)	0.0	0.1	1.4
Control Delay (s)	0.0	0.1	23.9
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	23.9
Approach LOS			C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2011 PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	99	407	447	20	19	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	104	428	471	21	20	137
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	492				1118	481
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	492				1118	481
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				90	77
cM capacity (veh/h)	1072				207	585

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	533	492	157
Volume Left	104	0	20
Volume Right	0	21	137
cSH	1072	1700	474
Volume to Capacity	0.10	0.29	0.33
Queue Length 95th (m)	2.5	0.0	11.4
Control Delay (s)	2.8	0.0	16.3
Lane LOS	A		C
Approach Delay (s)	2.6	0.0	16.3
Approach LOS			C

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	421	5	44	458	9	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	443	5	46	482	9	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			448		1021	448
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			448		1021	446
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		96	96
cM capacity (veh/h)			1112		251	612

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	448	528	34
Volume Left	0	46	9
Volume Right	5	0	24
cSH	1700	1112	436
Volume to Capacity	0.26	0.04	0.08
Queue Length 95th (m)	0.0	1.0	2.0
Control Delay (s)	0.0	1.2	13.9
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	13.9
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	82.3%	ICU Level of Service	B
Analysis Period (min)	15		

2016 Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	487	44	12	637	45	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	529	48	13	692	49	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			577		1272	553
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			577		1272	553
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		73	94
cM capacity (veh/h)			996		183	532

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	577	705	79
Volume Left	0	13	49
Volume Right	48	0	30
cSH	1700	996	244
Volume to Capacity	0.34	0.01	0.32
Queue Length 95th (m)	0.0	0.3	10.6
Control Delay (s)	0.0	0.3	26.7
Lane LOS		A	D
Approach Delay (s)	0.0	0.3	26.7
Approach LOS			D

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	510	7	2	630	18	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	554	8	2	685	20	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			562		1247	558
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			562		1247	558
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	98
cM capacity (veh/h)			1009		191	529

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	562	687	28
Volume Left	0	2	20
Volume Right	8	0	9
cSH	1700	1009	238
Volume to Capacity	0.33	0.00	0.12
Queue Length 95th (m)	0.0	0.1	3.2
Control Delay (s)	0.0	0.1	22.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	22.2
Approach LOS			C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	33	20	513	12	6	581
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	22	558	13	7	632
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1209	564			571	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1209	564			571	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	96			99	
cM capacity (veh/h)	201	525			1002	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	58	571	638
Volume Left	36	0	7
Volume Right	22	13	6
cSH	262	1700	1002
Volume to Capacity	0.22	0.34	0.01
Queue Length 95th (m)	6.6	0.0	0.2
Control Delay (s)	22.6	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	22.6	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	4	1	581	632	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	1	510	687	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1299	688	688			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1299	688	688			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	178	447	906			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	7	511	688
Volume Left	2	1	0
Volume Right	4	0	1
cSH	297	906	1700
Volume to Capacity	0.02	0.00	0.40
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	17.4	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	17.4	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	23	11	510	9	2	585
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	12	554	10	2	636
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1199	559			564	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1199	559			564	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	98			100	
cM capacity (veh/h)	204	528			1007	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	564	638
Volume Left	25	0	2
Volume Right	12	10	0
cSH	255	1700	1007
Volume to Capacity	0.15	0.33	0.00
Queue Length 95th (m)	4.0	0.0	0.1
Control Delay (s)	21.5	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	21.5	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	36	17	506	14	3	580
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	18	550	15	3	630
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1195	558			565	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1195	558			565	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	97			100	
cM capacity (veh/h)	205	529			1007	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	58	565	634
Volume Left	39	0	3
Volume Right	18	15	0
cSH	256	1700	1007
Volume to Capacity	0.23	0.33	0.00
Queue Length 95th (m)	6.8	0.0	0.1
Control Delay (s)	23.1	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	23.1	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	94	57	520	33	17	525
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	62	565	36	18	571
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1191	583			601	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1191	583			601	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	50	88			98	
cM capacity (veh/h)	203	512			978	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	164	601	589
Volume Left	102	0	18
Volume Right	62	36	0
cSH	263	1700	976
Volume to Capacity	0.62	0.35	0.02
Queue Length 95th (m)	30.4	0.0	0.5
Control Delay (s)	38.9	0.0	0.5
Lane LOS	E		A
Approach Delay (s)	38.9	0.0	0.5
Approach LOS	E		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	26	16	559	26	14	576
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	17	608	28	15	626
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1278	822			638	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1278	822			638	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	96			98	
cM capacity (veh/h)	160	487			948	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	45	636	641
Volume Left	28	0	15
Volume Right	17	28	0
cSH	237	1700	948
Volume to Capacity	0.19	0.37	0.02
Queue Length 95th (m)	5.6	0.0	0.4
Control Delay (s)	23.7	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	23.7	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	8	5	572	3	2	580
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	5	622	3	2	630
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1258	623			625	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1258	623			625	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			100	
cM capacity (veh/h)	188	486			958	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	14	625	633
Volume Left	9	0	2
Volume Right	5	3	0
cSH	246	1700	956
Volume to Capacity	0.06	0.37	0.00
Queue Length 95th (m)	1.5	0.0	0.1
Control Delay (s)	20.5	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	20.5	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	9	510	8	2	610
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	10	554	9	2	663
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1226	559			563	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1226	559			563	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	98			100	
cM capacity (veh/h)	197	529			1008	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	563	665
Volume Left	22	0	2
Volume Right	10	9	0
cSH	244	1700	1008
Volume to Capacity	0.13	0.33	0.00
Queue Length 95th (m)	3.5	0.0	0.1
Control Delay (s)	21.9	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	21.9	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2		577		0	578
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1	627	1	0	628
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1256	628			628	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1256	628			628	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	189	483			954	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	3	628	628
Volume Left	2	0	0
Volume Right	1	1	0
cSH	237	1700	954
Volume to Capacity	0.01	0.37	0.00
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	20.4	0.0	0.0
Lane LOS	C		
Approach Delay (s)	20.4	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	577	0	0	580
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	627	0	0	630
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1258	627			627	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1258	627			627	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	189	483			955	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	627	630
Volume Left	1	0	0
Volume Right	1	0	0
cSH	271	1700	955
Volume to Capacity	0.01	0.37	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	18.4	0.0	0.0
Lane LOS	C		
Approach Delay (s)	18.4	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBR	NBR2	NWL	NWR	SWL2	SWL
Lane Configurations						
Volume (veh/h)	481	23	54	17	5	506
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	523	25	59	18	5	550
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1096	535	548	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1096	535	548	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			75	97	99	
cM capacity (veh/h)			235	545	1022	

Direction, Lane #	NB 1	NW 1	SW 1
Volume Total	548	77	555
Volume Left	0	59	5
Volume Right	25	18	0
cSH	1700	272	1022
Volume to Capacity	0.32	0.28	0.01
Queue Length 95th (m)	0.0	9.1	0.1
Control Delay (s)	0.0	23.4	0.2
Lane LOS		C	A
Approach Delay (s)	0.0	23.4	0.2
Approach LOS		C	

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	7	4	578	3	1	570
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	4	628	3	1	620
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1252	630			632	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1252	630			632	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			100	
cM capacity (veh/h)	190	462			951	

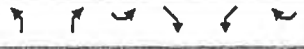
Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	12	632	621
Volume Left	8	0	1
Volume Right	4	3	0
cSH	244	1700	951
Volume to Capacity	0.05	0.37	0.00
Queue Length 95th (m)	1.2	0.0	0.0
Control Delay (s)	20.5	0.0	0.0
Lane LOS	C		A
Approach Delay (s)	20.5	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	4	578	2	1	364
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	4	628	2	1	613
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1245	629			630	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1245	629			630	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			100	
cM capacity (veh/h)	192	482			952	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	630	614
Volume Left	8	0	1
Volume Right	4	2	0
cSH	248	1700	952
Volume to Capacity	0.05	0.37	0.00
Queue Length 95th (m)	1.2	0.0	0.0
Control Delay (s)	20.4	0.0	0.0
Lane LOS	C		A
Approach Delay (s)	20.4	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	2	510	2	7	603	1
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	554	2	8	655	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	657		1215	656		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	657		1215	656		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	100		99	98		
cM capacity (veh/h)	931		200	485		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	557	10	657
Volume Left	2	2	0
Volume Right	0	8	1
cSH	931	359	1700
Volume to Capacity	0.00	0.03	0.39
Queue Length 95th (m)	0.1	0.7	0.0
Control Delay (s)	0.1	15.3	0.0
Lane LOS	A	C	
Approach Delay (s)	0.1	15.3	0.0
Approach LOS		C	

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	1	511	2	0	599
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	555	2	0	651
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1208	557			556	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1208	557			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	202	530			1013	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	5	558	651
Volume Left	4	0	0
Volume Right	1	2	0
cSH	231	1700	1013
Volume to Capacity	0.02	0.33	0.00
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	21.0	0.0	0.0
Lane LOS	C		
Approach Delay (s)	21.0	0.0	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	41.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	475	33	7	560
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	32	516	36	8	609
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1158	534			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1158	534			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	54	94			99	
cM capacity (veh/h)	215	546			1018	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	130	552	618
Volume Left	99	0	8
Volume Right	32	36	0
cSH	252	1700	1018
Volume to Capacity	0.52	0.32	0.01
Queue Length 95th (m)	21.8	0.0	0.2
Control Delay (s)	33.7	0.0	0.2
Lane LOS	D		A
Approach Delay (s)	33.7	0.0	0.2
Approach LOS	D		

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	48.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	49	15	480	18	4	446
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	16	522	20	4	485
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1025	532			541	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1025	532			541	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	97			100	
cM capacity (veh/h)	259	548			1027	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	70	541	489
Volume Left	53	0	4
Volume Right	16	20	0
cSH	296	1700	1027
Volume to Capacity	0.24	0.32	0.00
Queue Length 95th (m)	7.2	0.0	0.1
Control Delay (s)	20.9	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	20.9	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	4	1	511	629	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	1	555	684	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1241	684	684			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1241	684	684			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	193	449	909			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	5	557	684
Volume Left	1	1	0
Volume Right	4	0	0
cSH	355	909	1700
Volume to Capacity	0.02	0.00	0.40
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	15.3	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	15.3	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2016 AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	473	416	3	5	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	514	452	3	5	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	455				974	454
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				926	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	99
cM capacity (veh/h)	1098				272	629

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	517	455	8
Volume Left	3	0	5
Volume Right	0	3	3
cSH	1098	1700	346
Volume to Capacity	0.00	0.27	0.03
Queue Length 95th (m)	0.1	0.0	0.6
Control Delay (s)	0.1	0.0	15.7
Lane LOS	A		C
Approach Delay (s)	0.1	0.0	15.7
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2016 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	398	24	28	366	9	17	12	53	6	12	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1847		1770	1856		1770	1628		1770	1652	
Flt Permitted	0.44	1.00		0.37	1.00		0.72	1.00		0.70	1.00	
Satd. Flow (perm)	814	1847		691	1856		1346	1628		1312	1652	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	433	26	30	400	10	18	13	58	7	13	40
RTOR Reduction (vph)	0	5	0	0	2	0	0	42	0	0	25	0
Lane Group Flow (vph)	59	454	0	30	408	0	18	36	0	7	28	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.1	14.1		14.1	14.1		16.1	16.1		16.1	16.1	
Effective Green, g (s)	14.1	14.1		14.1	14.1		16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.38	0.38		0.38	0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	272	617		231	620		514	621		501	630	
v/s Ratio Prot		c0.25			0.22			c0.02			0.02	
v/s Ratio Perm	0.07			0.04			0.01			0.01		
v/c Ratio	0.22	0.74		0.13	0.66		0.04	0.06		0.01	0.04	
Uniform Delay, d1	10.1	12.4		9.8	12.0		8.2	8.3		8.1	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	4.5		0.3	2.5		0.1	0.2		0.1	0.1	
Delay (s)	10.5	16.9		10.0	14.5		8.3	8.5		8.2	8.3	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		16.2			14.2			8.4			8.3	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM Average Control Delay	14.3	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.36				
Actuated Cycle Length (s)	42.2	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	48.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
8: River Road W & Westbury Rd

2016 AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	460	36	31	361	56	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	1863	1583	1770	1863	1674	
Flt Permitted	1.00	1.00	0.30	1.00	0.98	
Satd. Flow (perm)	1863	1583	564	1863	1674	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	500	39	34	392	61	102
RTOR Reduction (vph)	0	18	0	0	60	0
Lane Group Flow (vph)	500	21	34	392	103	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	20.1	20.1	20.1	20.1	22.9	
Effective Green, g (s)	20.1	20.1	20.1	20.1	22.9	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.42	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	681	579	206	681	697	
v/s Ratio Prot	c0.27			0.21	a0.06	
v/s Ratio Perm		0.01	0.06			
v/c Ratio	0.73	0.04	0.17	0.58	0.15	
Uniform Delay, d1	15.1	11.2	11.8	14.0	10.0	
Progression Factor	1.00	1.00	0.28	0.53	1.00	
Incremental Delay, d2	4.1	0.0	0.4	1.1	0.4	
Delay (s)	19.2	11.2	3.6	8.6	10.4	
Level of Service	B	B	A	A	B	
Approach Delay (s)	18.7			8.2	10.4	
Approach LOS	B			A	B	

Intersection Summary				
HCM Average Control Delay	13.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	44.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
10: River Road W & Main Street

2016 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (vph)	47	477	17	4	376	174	15	17	10	169	9	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.94		1.00	0.85	
Flt Protected		1.00			1.00	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (prot)		3508			3538	1583	1770	1704		1770	1583	
Flt Permitted		0.87			0.95	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (perm)		3065			3353	1583	1770	1704		1770	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	518	18	4	409	189	16	18	11	184	10	30
RTOR Reduction (vph)	0	4	0	0	0	137	0	5	0	0	17	0
Lane Group Flow (vph)	0	583	0	0	413	52	16	24	0	184	23	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		15.2			15.2	15.2	1.4	27.8		23.4	23.4	
Effective Green, g (s)		15.2			15.2	15.2	1.4	27.8		23.4	23.4	
Actuated g/C Ratio		0.28			0.28	0.28	0.03	0.51		0.43	0.43	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		847			927	437	45	861		753	673	
v/s Ratio Prot							c0.01	0.01		c0.10		
v/s Ratio Perm		c0.19			0.12	0.03					0.01	
v/c Ratio		0.69			0.45	0.12	0.36	0.03		0.24	0.03	
Uniform Delay, d1		17.8			16.4	14.9	26.4	6.8		10.1	9.2	
Progression Factor		0.41			0.26	0.41	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0			0.3	0.1	4.8	0.1		0.8	0.1	
Delay (s)		9.3			4.5	6.3	31.1	6.9		10.9	9.3	
Level of Service		A			A	A	C	A		B	A	
Approach Delay (s)		9.3			5.1			15.5		10.6		
Approach LOS		A			A			B		B		

Intersection Summary					
HCM Average Control Delay	8.0	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	55.0	Sum of lost time (s)		15.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service		B	
Analysis Period (min)	15				
! Phase conflict between lane groups.					
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews 2016 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	37	541	28	38	542	34	53	3	32	14	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.98			0.99			0.95			0.95	
Flt Protected		1.00			1.00			0.97			0.97	
Satd. Flow (prot)		3508			3499			3248			3272	
Flt Permitted		0.87			0.87			0.82			0.87	
Satd. Flow (perm)		3065			3059			2739			2907	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	588	28	41	589	37	58	3	35	15	4	10
RTOR Reduction (vph)	0	7	0	0	10	0	0	19	0	0	5	0
Lane Group Flow (vph)	0	649	0	0	657	0	0	77	0	0	24	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		17.5			17.5			25.5			25.5	
Effective Green, g (s)		17.5			17.5			25.5			25.5	
Actuated g/C Ratio		0.32			0.32			0.46			0.46	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		975			973			1270			1348	
v/s Ratio Prot												
v/s Ratio Perm		0.21			c0.21			c0.03			0.01	
v/c Ratio		0.67			0.68			0.06			0.02	
Uniform Delay, d1		16.2			16.3			8.1			8.0	
Progression Factor		1.27			0.87			1.00			1.00	
Incremental Delay, d2		1.5			1.8			0.1			0.0	
Delay (s)		22.1			16.0			8.2			8.0	
Level of Service		C			B			A			A	
Approach Delay (s)		22.1			16.0			8.2			8.0	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM Average Control Delay	18.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road 2016 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	504	43	17	426	28	108	24	25	37	15	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	0.92		1.00	0.88	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3488			3504		1770	1720		1770	1641	
Flt Permitted		0.86			0.92		0.71	1.00		0.72	1.00	
Satd. Flow (perm)		3011			3216		1316	1720		1346	1641	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	548	47	18	463	28	117	26	27	40	16	62
RTOR Reduction (vph)	0	12	0	0	9	0	0	14	0	0	33	0
Lane Group Flow (vph)	0	637	0	0	500	0	117	39	0	40	45	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.1			17.1		25.9	25.9		25.9	25.9	
Effective Green, g (s)		17.1			17.1		25.9	25.9		25.9	25.9	
Actuated g/C Ratio		0.31			0.31		0.47	0.47		0.47	0.47	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		936			1000		620	810		634	773	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.21			0.16		c0.09			0.03		
v/c Ratio		0.68			0.50		0.19	0.05		0.06	0.06	
Uniform Delay, d1		16.6			15.5		8.4	7.9		7.9	7.9	
Progression Factor		0.85			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9			0.4		0.7	0.1		0.2	0.1	
Delay (s)		16.0			15.9		9.1	8.0		8.1	8.1	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		16.0			15.9			8.8			8.1	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	14.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2016 AM

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	568	4	2	402	13	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	617	4	2	437	14	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.74		0.74	0.74
vC, conflicting volume			622		1061	620
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			320		910	317
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			923		228	508

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	622	439	18
Volume Left	0	2	14
Volume Right	4	0	4
cSH	1700	923	262
Volume to Capacity	0.37	0.00	0.07
Queue Length 95th (m)	0.0	0.1	1.8
Control Delay (s)	0.0	0.1	19.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	19.8
Approach LOS			C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2016 AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	95	428	333	47	20	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	465	362	51	22	68
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	413				1059	388
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	413				1059	388
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				90	90
cM capacity (veh/h)	1146				226	661

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	568	413	90
Volume Left	103	0	22
Volume Right	0	51	68
cSH	1146	1700	451
Volume to Capacity	0.09	0.24	0.20
Queue Length 95th (m)	2.4	0.0	5.9
Control Delay (s)	2.4	0.0	15.0
Lane LOS	A		B
Approach Delay (s)	2.4	0.0	15.0
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	420	15	22	374	12	41
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	457	16	24	407	13	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			473		919	465
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			473		919	465
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	93
cM capacity (veh/h)			1089		295	596

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	473	430	58
Volume Left	0	24	13
Volume Right	16	0	45
cSH	1700	1089	485
Volume to Capacity	0.28	0.02	0.12
Queue Length 95th (m)	0.0	0.5	3.2
Control Delay (s)	0.0	0.7	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	13.4
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	993	57	37	707	38	33
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1045	60	39	744	40	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1105		1897	1075
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1105		1897	1075
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		44	87
cM capacity (veh/h)			632		72	267

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1105	783	75
Volume Left	0	39	40
Volume Right	60	0	35
cSH	1700	632	109
Volume to Capacity	0.65	0.06	0.69
Queue Length 95th (m)	0.0	1.6	28.7
Control Delay (s)	0.0	1.7	91.4
Lane LOS		A	F
Approach Delay (s)	0.0	1.7	91.4
Approach LOS			F

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1007	20	9	736	10	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1060	21	9	775	11	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1081		1864	1071
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1081		1864	1071
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	97
cM capacity (veh/h)			645		79	268

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	1081	784	18
Volume Left	0	9	11
Volume Right	21	0	7
cSH	1700	645	111
Volume to Capacity	0.64	0.01	0.16
Queue Length 95th (m)	0.0	0.4	4.4
Control Delay (s)	0.0	0.4	43.5
Lane LOS		A	E
Approach Delay (s)	0.0	0.4	43.5
Approach LOS			E

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	14	21	910	33	26	727
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	22	958	35	27	765
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1795	975			993	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1795	975			993	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	93			96	
cM capacity (veh/h)	85	305			697	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	37	993	793
Volume Left	15	0	27
Volume Right	22	35	0
cSH	150	1700	697
Volume to Capacity	0.25	0.58	0.04
Queue Length 95th (m)	7.4	0.0	1.0
Control Delay (s)	36.7	0.0	1.1
Lane LOS	E		A
Approach Delay (s)	36.7	0.0	1.1
Approach LOS	E		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	2	4	913	682	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	4	961	718	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1689	720	722			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1689	720	722			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	102	428	880			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	4	965	722
Volume Left	2	4	0
Volume Right	2	0	4
cSH	165	880	1700
Volume to Capacity	0.03	0.00	0.42
Queue Length 95th (m)	0.6	0.1	0.0
Control Delay (s)	27.4	0.1	0.0
Lane LOS	D	A	
Approach Delay (s)	27.4	0.1	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	9	965	26	12	730
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	9	1019	27	13	768
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1826	1033			1046	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1826	1033			1046	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	97			98	
cM capacity (veh/h)	83	282			665	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	1046	781
Volume Left	15	0	13
Volume Right	9	27	0
cSH	115	1700	665
Volume to Capacity	0.21	0.62	0.02
Queue Length 95th (m)	6.0	0.0	0.5
Control Delay (s)	44.6	0.0	0.9
Lane LOS	E		A
Approach Delay (s)	44.6	0.0	0.5
Approach LOS	E		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	14	932	41	19	720
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	15	981	43	20	758
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1801	1003			1024	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1801	1003			1024	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	95			97	
cM capacity (veh/h)	85	294			676	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	1024	778
Volume Left	22	0	20
Volume Right	15	43	0
cSH	119	1700	678
Volume to Capacity	0.31	0.60	0.03
Queue Length 95th (m)	9.6	0.0	0.7
Control Delay (s)	48.3	0.0	0.8
Lane LOS	E		A
Approach Delay (s)	48.3	0.0	0.8
Approach LOS	E		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	40	60	801	95	75	640
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	63	843	100	79	674
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1725	893			943	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1725	893			943	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	52	81			89	
cM capacity (veh/h)	87	340			727	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	105	943	753
Volume Left	42	0	79
Volume Right	63	100	0
cSH	157	1700	727
Volume to Capacity	0.67	0.55	0.11
Queue Length 95th (m)	30.8	0.0	2.9
Control Delay (s)	64.9	0.0	2.8
Lane LOS	F		A
Approach Delay (s)	64.9	0.0	2.8
Approach LOS	F		

Intersection Summary				
Average Delay		5.0		
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	25	38	831	39	31	702
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	40	875	41	33	739
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1699	895			916	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1699	895			916	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	88			96	
cM capacity (veh/h)	97	339			745	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	66	916	772
Volume Left	26	0	33
Volume Right	40	41	0
cSH	170	1700	745
Volume to Capacity	0.39	0.54	0.04
Queue Length 95th (m)	13.6	0.0	1.1
Control Delay (s)	39.0	0.0	1.2
Lane LOS	E		A
Approach Delay (s)	39.0	0.0	1.2
Approach LOS	E		

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization	72.5%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	5	859	9	7	729
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	5	904	9	7	767
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1691	909			914	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1691	909			914	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	102	333			746	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	9	914	775
Volume Left	4	0	7
Volume Right	5	9	0
cSH	165	1700	746
Volume to Capacity	0.06	0.54	0.01
Queue Length 95th (m)	1.4	0.0	0.2
Control Delay (s)	28.1	0.0	0.3
Lane LOS	D		A
Approach Delay (s)	28.1	0.0	0.3
Approach LOS	D		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	8	990	22	10	734
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	8	1042	23	11	773
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1847	1054			1065	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1847	1054			1065	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	97			98	
cM capacity (veh/h)	81	275			654	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	20	1065	783
Volume Left	12	0	11
Volume Right	8	23	0
cSH	115	1700	654
Volume to Capacity	0.17	0.63	0.02
Queue Length 95th (m)	4.8	0.0	0.4
Control Delay (s)	42.9	0.0	0.5
Lane LOS	E		A
Approach Delay (s)	42.9	0.0	0.5
Approach LOS	E		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	882	2	2	736
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	907	2	2	775
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1687	908			909	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1687	908			909	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	103	333			749	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	909	777
Volume Left	1	0	2
Volume Right	1	2	0
cSH	157	1700	749
Volume to Capacity	0.01	0.53	0.00
Queue Length 95th (m)	0.3	0.0	0.1
Control Delay (s)	28.2	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	28.2	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	884	1	1	736
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	909	1	1	775
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1687	910			911	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1687	910			911	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	103	333			748	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	911	776
Volume Left	1	0	1
Volume Right	1	1	0
cSH	157	1700	748
Volume to Capacity	0.01	0.54	0.00
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	28.2	0.0	0.0
Lane LOS	D		A
Approach Delay (s)	28.2	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBR	NBR2	NWL	NWR	SWL2	SWL
Lane Configurations						
Volume (veh/h)	853	90	20	10	19	824
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	898	95	21	11	20	867
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1853	945	993	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1853	945	993	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			73	97	97	
cM capacity (veh/h)			79	317	697	

Direction, Lane #	NB 1	NW 1	SW 1
Volume Total	993	32	887
Volume Left	0	21	20
Volume Right	95	11	0
cSH	1700	105	697
Volume to Capacity	0.58	0.30	0.03
Queue Length 95th (m)	0.0	9.1	0.7
Control Delay (s)	0.0	53.1	0.8
Lane LOS		F	A
Approach Delay (s)	0.0	53.1	0.8
Approach LOS		F	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	3	5	855	7	5	734
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	5	900	7	5	773
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1587	904			907	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1587	904			907	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			99	
cM capacity (veh/h)	102	336			750	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	8	907	778
Volume Left	3	0	5
Volume Right	5	7	0
cSH	181	1700	750
Volume to Capacity	0.05	0.53	0.01
Queue Length 95th (m)	1.2	0.0	0.2
Control Delay (s)	25.9	0.0	0.2
Lane LOS	D		A
Approach Delay (s)	25.9	0.0	0.2
Approach LOS	D		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	4	853	7	5	737
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	4	898	7	5	776
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1588	902			905	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1588	902			905	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			99	
cM capacity (veh/h)	102	336			751	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	905	781
Volume Left	3	0	5
Volume Right	4	7	0
cSH	170	1700	751
Volume to Capacity	0.04	0.53	0.01
Queue Length 95th (m)	1.1	0.0	0.2
Control Delay (s)	27.2	0.0	0.2
Lane LOS	D		A
Approach Delay (s)	27.2	0.0	0.2
Approach LOS	D		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	8	877	2	4	812	2
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	923	2	4	855	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	857		1796	856		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	857		1796	856		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	99		98	99		
cM capacity (veh/h)	784		87	358		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	932	6	857
Volume Left	8	2	0
Volume Right	0	4	2
cSH	784	176	1700
Volume to Capacity	0.01	0.04	0.50
Queue Length 95th (m)	0.3	0.9	0.0
Control Delay (s)	0.3	26.2	0.0
Lane LOS	A	D	
Approach Delay (s)	0.3	26.2	0.0
Approach LOS		D	

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	113.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	919	5	1	812
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	967	5	1	855
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1827	970			973	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1827	970			973	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	84	307			709	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	3	973	856
Volume Left	2	0	1
Volume Right	1	5	0
cSH	111	1700	709
Volume to Capacity	0.03	0.57	0.00
Queue Length 95th (m)	0.7	0.0	0.0
Control Delay (s)	38.3	0.0	0.0
Lane LOS	E		A
Approach Delay (s)	38.3	0.0	0.0
Approach LOS	E		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		58.7%	ICU Level of Service B
Analysis Period (min)		15	

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	83	26	880	111	24	820
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	926	117	25	863
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1898	985			1043	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1898	985			1043	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	24	91			96	
cM capacity (veh/h)	73	301			667	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	83	1043	888
Volume Left	56	0	25
Volume Right	27	117	0
cSH	98	1700	667
Volume to Capacity	0.85	0.61	0.04
Queue Length 95th (m)	38.0	0.0	0.9
Control Delay (s)	132.0	0.0	1.1
Lane LOS	F		A
Approach Delay (s)	132.0	0.0	1.1
Approach LOS	F		

Intersection Summary			
Average Delay		5.9	
Intersection Capacity Utilization		73.7%	ICU Level of Service D
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	14	795	60	13	691
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	15	837	63	14	727
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1823	868			900	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1523	868			900	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	96			98	
cM capacity (veh/h)	111	352			755	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	45	900	741
Volume Left	31	0	14
Volume Right	15	63	0
cSH	143	1700	755
Volume to Capacity	0.32	0.53	0.02
Queue Length 95th (m)	10.1	0.0	0.4
Control Delay (s)	41.5	0.0	0.5
Lane LOS	E		A
Approach Delay (s)	41.5	0.0	0.5
Approach LOS	E		

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	56.8%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	2	5	961	845	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	5	1012	889	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1912	890	891			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1912	890	891			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	74	342	761			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	3	1017	891
Volume Left	1	5	0
Volume Right	2	0	1
cSH	155	761	1700
Volume to Capacity	0.02	0.01	0.52
Queue Length 95th (m)	0.5	0.2	0.0
Control Delay (s)	28.7	0.2	0.0
Lane LOS	D	A	
Approach Delay (s)	28.7	0.2	0.0
Approach LOS	D		

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	64.6%	ICU Level of Service		C
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2016 PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	715	648	3	8	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	753	682	3	8	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked	0.70				0.70	0.70
vC, conflicting volume	685				1455	684
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329				1438	327
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	856				101	497

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	762	685	15
Volume Left	9	0	6
Volume Right	0	3	8
cSH	856	1700	186
Volume to Capacity	0.01	0.40	0.08
Queue Length 95th (m)	0.3	0.0	2.0
Control Delay (s)	0.3	0.0	26.0
Lane LOS	A		D
Approach Delay (s)	0.3	0.0	26.0
Approach LOS			D

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		54.8%	ICU Level of Service
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2016 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	651	14	84	593	7	20	18	60	5	34	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1857		1770	1860		1770	1648		1770	1669	
Flt Permitted	0.26	1.00		0.19	1.00		0.68	1.00		0.70	1.00	
Satd. Flow (perm)	475	1857		358	1860		1269	1648		1311	1669	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	685	15	88	624	7	21	19	63	5	36	82
RTOR Reduction (vph)	0	2	0	0	1	0	0	43	0	0	56	0
Lane Group Flow (vph)	59	698	0	88	630	0	21	39	0	5	62	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.9	22.9		22.9	22.9		16.1	16.1		16.1	16.1	
Effective Green, g (s)	22.9	22.9		22.9	22.9		16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.32	0.32		0.32	0.32	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213	834		161	835		401	520		414	527	
v/s Ratio Prot		c0.38			0.34			0.02			c0.04	
v/s Ratio Perm	0.12			0.25			0.02			0.00		
v/c Ratio	0.28	0.84		0.55	0.76		0.05	0.07		0.01	0.12	
Uniform Delay, d1	8.8	12.4		10.3	11.7		12.1	12.2		12.0	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	7.4		3.8	3.9		0.2	0.3		0.1	0.5	
Delay (s)	9.6	19.8		14.0	15.6		12.4	12.5		12.0	12.9	
Level of Service	A	B		B	B		B	B		B	B	
Approach Delay (s)		19.0			15.4			12.5			12.8	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	16.6	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.54				
Actuated Cycle Length (s)	51.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Volume (vph)	578	104	69	583	65	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	1863	1583	1770	1863	1705	
Flt Permitted	1.00	1.00	0.24	1.00	0.97	
Satd. Flow (perm)	1863	1583	442	1863	1705	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	608	109	73	614	68	53
RTOR Reduction (vph)	0	37	0	0	33	0
Lane Group Flow (vph)	608	72	73	614	88	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	25.4	25.4	25.4	25.4	22.6	
Effective Green, g (s)	25.4	25.4	25.4	25.4	22.6	
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.38	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	789	670	187	789	642	
v/s Ratio Prot	0.33			c0.33	c0.05	
v/s Ratio Perm		0.05	0.17			
v/c Ratio	0.77	0.11	0.39	0.78	0.14	
Uniform Delay, d1	14.8	10.5	12.0	14.9	12.3	
Progression Factor	1.00	1.00	0.28	0.48	1.00	
Incremental Delay, d2	4.5	0.1	1.2	4.5	0.4	
Delay (s)	19.3	10.5	4.6	11.5	12.7	
Level of Service	B	B	A	B	B	
Approach Delay (s)	18.0			10.8	12.7	
Approach LOS	B			B	B	

Intersection Summary				
HCM Average Control Delay	14.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations		↑↑			↑↑	↱	↰	↰		↰	↱	
Volume (vph)	90	490	16	13	510	267	20	23	9	378	53	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.96		1.00	0.85	
Flt Protected		0.99			1.00	1.00	0.95	0.96		0.95	1.00	
Satd. Flow (prot)		3498			3535	1583	1770	1724		1770	1583	
Flt Permitted		0.73			0.93	1.00	0.95	0.96		0.95	1.00	
Satd. Flow (perm)		2577			3290	1583	1770	1724		1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	516	17	14	537	281	21	24	9	398	56	88
RTOR Reduction (vph)	0	3	0	0	0	196	0	5	0	0	51	0
Lane Group Flow (vph)	0	625	0	0	551	85	21	28	0	398	93	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		18.1			18.1	18.1	1.4	29.9		25.5	25.5	
Effective Green, g (s)		18.1			18.1	18.1	1.4	29.9		25.5	25.5	
Actuated g/C Ratio		0.30			0.30	0.30	0.02	0.50		0.42	0.42	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		777			992	478	41	859		752	673	
v/s Ratio Prot							c0.01	0.02		c0.22		
v/s Ratio Perm		c0.24			0.17	0.05					0.06	
v/c Ratio		0.80			0.56	0.18	0.51	0.03		0.53	0.14	
Uniform Delay, d1		19.3			17.6	15.5	29.0	7.7		12.8	10.5	
Progression Factor		0.67			0.48	0.46	1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.9			0.6	0.1	10.4	0.1		2.8	0.4	
Delay (s)		17.8			9.0	7.3	39.3	7.7		15.4	11.0	
Level of Service		B			A	A	D	A		B	B	
Approach Delay (s)		17.8			8.4			20.0		14.2		
Approach LOS		B			A			C		B		

Intersection Summary				
HCM Average Control Delay	13.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	75.3%	ICU Level of Service	D	
Analysis Period (min)	15			
! Phase conflict between lane groups.				
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2016 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	38	717	39	61	746	65	81	9	68	31	8	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.93			0.91	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3505			3488			3226			3182	
Flt Permitted		0.87			0.81			0.78			0.85	
Satd. Flow (perm)		3050			2835			2568			2732	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	755	41	64	785	68	85	9	72	33	8	67
RTOR Reduction (vph)	0	7	0	0	12	0	0	45	0	0	42	0
Lane Group Flow (vph)	0	829	0	0	905	0	0	121	0	0	66	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		25.4			25.4			22.6			22.6	
Effective Green, g (s)		25.4			25.4			22.6			22.6	
Actuated g/C Ratio		0.42			0.42			0.38			0.38	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1291			1200			967			1029	
v/s Ratio Prot												
v/s Ratio Perm		0.27			c0.32			c0.05			0.02	
v/c Ratio		0.64			0.75			0.13			0.06	
Uniform Delay, d1		13.7			14.7			12.2			11.9	
Progression Factor		1.29			0.71			1.00			1.00	
Incremental Delay, d2		0.8			2.6			0.3			0.1	
Delay (s)		18.5			13.0			12.5			12.1	
Level of Service		B			B			B			B	
Approach Delay (s)		18.5			13.0			12.5			12.1	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	15.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

2016 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	102	627	122	13	644	37	110	26	8	34	16	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.97		1.00	0.87	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3443			3508		1770	1812		1770	1626	
Flt Permitted		0.72			0.93		0.68	1.00		0.74	1.00	
Satd. Flow (perm)		2499			3267		1276	1812		1370	1626	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	660	128	14	678	39	116	27	8	36	17	95
RTOR Reduction (vph)	0	26	0	0	8	0	0	4	0	0	60	0
Lane Group Flow (vph)	0	869	0	0	723	0	116	29	0	36	52	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		25.7			25.7		22.3	22.3		22.3	22.3	
Effective Green, g (s)		25.7			25.7		22.3	22.3		22.3	22.3	
Actuated g/C Ratio		0.43			0.43		0.37	0.37		0.37	0.37	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1070			1399		474	673		509	604	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.35			0.22		c0.09			0.03		
v/c Ratio		0.81			0.52		0.24	0.04		0.07	0.09	
Uniform Delay, d1		15.0			12.6		13.0	12.0		12.2	12.2	
Progression Factor		0.34			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3			0.3		1.2	0.1		0.3	0.3	
Delay (s)		9.5			12.9		14.3	12.2		12.4	12.5	
Level of Service		A			B		B	B		B	B	
Approach Delay (s)		9.5			12.9			13.8			12.5	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	11.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2016 PM

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	652	16	3	744	10	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	686	17	3	783	11	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.69		0.69	0.69
vC, conflicting volume			703		1484	695
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			338		1477	325
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	100
cM capacity (veh/h)			837		95	491

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	703	786	12
Volume Left	0	3	11
Volume Right	17	0	1
cSH	1700	837	102
Volume to Capacity	0.41	0.00	0.11
Queue Length 95th (m)	0.0	0.1	3.0
Control Delay (s)	0.0	0.1	44.6
Lane LOS		A	E
Approach Delay (s)	0.0	0.1	44.6
Approach LOS			E

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2016 PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	108	524	597	21	21	142
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	114	552	628	22	22	149
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	651				1418	639
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	651				1418	639
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				83	69
cM capacity (veh/h)	936				132	476

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	665	651	172
Volume Left	114	0	22
Volume Right	0	22	149
cSH	936	1700	357
Volume to Capacity	0.12	0.38	0.48
Queue Length 95th (m)	3.3	0.0	20.1
Control Delay (s)	3.0	0.0	24.1
Lane LOS	A		C
Approach Delay (s)	3.0	0.0	24.1
Approach LOS			C

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	527	7	55	588	12	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	555	7	58	619	13	29
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			562		1293	558
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			562		1293	558
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		93	94
cM capacity (veh/h)			1009		169	529

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	562	677	42
Volume Left	0	58	13
Volume Right	7	0	29
cSH	1700	1009	323
Volume to Capacity	0.33	0.06	0.13
Queue Length 95th (m)	0.0	1.5	3.6
Control Delay (s)	0.0	1.5	17.8
Lane LOS		A	C
Approach Delay (s)	0.0	1.5	17.8
Approach LOS			C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

2026 Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	873	53	14	833	45	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	708	56	15	877	47	36
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			764		1643	736
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			764		1643	736
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		56	91
cM capacity (veh/h)			849		108	419

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	764	892	83
Volume Left	0	15	47
Volume Right	56	0	36
cSH	1700	849	159
Volume to Capacity	0.45	0.02	0.52
Queue Length 95th (m)	0.0	0.4	20.8
Control Delay (s)	0.0	0.5	50.3
Lane LOS		A	F
Approach Delay (s)	0.0	0.5	50.3
Approach LOS			F

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	706	7	2	826	18	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	743	7	2	869	19	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			751		1621	747
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			751		1621	747
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		83	98
cM capacity (veh/h)			859		113	413

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	751	872	27
Volume Left	0	2	19
Volume Right	7	0	8
cSH	1700	859	146
Volume to Capacity	0.44	0.00	0.19
Queue Length 95th (m)	0.0	0.1	5.3
Control Delay (s)	0.0	0.1	35.4
Lane LOS		A	E
Approach Delay (s)	0.0	0.1	35.4
Approach LOS			E

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	33	20	709	12	6	766
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	35	21	746	13	6	806
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1572	753			759	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1572	753			759	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	95			99	
cM capacity (veh/h)	121	410			853	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	56	759	813
Volume Left	35	0	6
Volume Right	21	13	0
cSH	164	1700	853
Volume to Capacity	0.34	0.45	0.01
Queue Length 95th (m)	11.2	0.0	0.2
Control Delay (s)	37.8	0.0	0.2
Lane LOS	E		A
Approach Delay (s)	37.8	0.0	0.2
Approach LOS	E		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	4	1	788	828	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	4	1	808	872	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1683	872	873			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1683	872	873			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	104	350	773			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	6	809	873
Volume Left	2	1	0
Volume Right	4	0	1
cSH	195	773	1700
Volume to Capacity	0.03	0.00	0.51
Queue Length 95th (m)	0.8	0.0	0.0
Control Delay (s)	24.1	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	24.1	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	23	11	706	9	2	771
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	12	743	9	2	812
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1564	748			753	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1564	748			753	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	97			100	
cM capacity (veh/h)	123	412			857	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	753	814
Volume Left	24	0	2
Volume Right	12	9	0
cSH	159	1700	857
Volume to Capacity	0.23	0.44	0.00
Queue Length 95th (m)	6.6	0.0	0.1
Control Delay (s)	34.2	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	34.2	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	36	17	702	14	3	755
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	38	18	739	15	3	805
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1558	746			754	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1558	746			754	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	98			100	
cM capacity (veh/h)	123	413			858	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	56	754	808
Volume Left	38	0	3
Volume Right	18	15	0
cSH	159	1700	856
Volume to Capacity	0.35	0.44	0.00
Queue Length 95th (m)	11.6	0.0	0.1
Control Delay (s)	39.3	0.0	0.1
Lane LOS	E		A
Approach Delay (s)	39.3	0.0	0.1
Approach LOS	E		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	94	57	718	33	17	698
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	99	60	756	35	18	735
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1544	773			791	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1544	773			791	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	20	85			98	
cM capacity (veh/h)	124	399			830	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	159	791	753
Volume Left	99	0	18
Volume Right	60	35	0
cSH	167	1700	830
Volume to Capacity	0.95	0.47	0.02
Queue Length 95th (m)	57.8	0.0	0.5
Control Delay (s)	112.1	0.0	0.6
Lane LOS	F		A
Approach Delay (s)	112.1	0.0	0.6
Approach LOS	F		

Intersection Summary				
Average Delay	10.7			
Intersection Capacity Utilization	65.8%	ICU Level of Service		C
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	32	20	766	32	17	760
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	34	21	806	34	18	800
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1659	823			840	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1659	823			840	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	94			98	
cM capacity (veh/h)	105	373			795	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	55	840	818
Volume Left	34	0	18
Volume Right	21	34	0
cSH	145	1700	795
Volume to Capacity	0.38	0.49	0.02
Queue Length 95th (m)	12.8	0.0	0.6
Control Delay (s)	44.2	0.0	0.6
Lane LOS	E		A
Approach Delay (s)	44.2	0.0	0.6
Approach LOS	E		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	63.6%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	8	5	782	3	2	765
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	5	823	3	2	805
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1634	825			828	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1634	825			828	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	111	373			804	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	14	826	807
Volume Left	8	0	2
Volume Right	5	3	0
cSH	152	1700	804
Volume to Capacity	0.09	0.49	0.00
Queue Length 95th (m)	2.3	0.0	0.1
Control Delay (s)	31.0	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	31.0	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	9	707	8	2	801
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	9	744	8	2	843
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1598	748			753	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1598	748			753	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	98			100	
cM capacity (veh/h)	117	412			857	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	31	753	845
Volume Left	21	0	2
Volume Right	9	8	0
cSH	151	1700	857
Volume to Capacity	0.20	0.44	0.00
Queue Length 95th (m)	5.6	0.0	0.1
Control Delay (s)	34.9	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	34.9	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	786	1	0	762
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	829	1	0	802
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1632	830			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1632	830			831	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	111	370			802	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	3	831	802
Volume Left	2	0	0
Volume Right	1	1	0
cSH	145	1700	802
Volume to Capacity	0.02	0.49	0.00
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	30.3	0.0	0.0
Lane LOS	D		
Approach Delay (s)	30.3	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	786	0	0	765
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	829	0	0	805
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1635	829			829	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1635	829			829	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	111	370			802	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	829	805
Volume Left	1	0	0
Volume Right	1	0	0
cSH	171	1700	802
Volume to Capacity	0.01	0.49	0.00
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	26.3	0.0	0.0
Lane LOS	D		
Approach Delay (s)	26.3	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBR	NBR2	NWL	NWR	SWL2	SWL
Lane Configurations						
Volume (veh/h)	671	23	54	17	5	674
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	706	24	57	18	5	709
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1438	718	731	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1438	718	731	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			61	96	99	
cM capacity (veh/h)			146	429	874	

Direction, Lane #	NB 1	NW 1	SW 1
Volume Total	731	75	715
Volume Left	0	57	5
Volume Right	24	18	0
cSH	1700	173	874
Volume to Capacity	0.43	0.43	0.01
Queue Length 95th (m)	0.0	15.7	0.1
Control Delay (s)	0.0	40.8	0.2
Lane LOS		E	A
Approach Delay (s)	0.0	40.8	0.2
Approach LOS		E	

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	7	4	786	3	1	753
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	4	827	3	1	793
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1624	829			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1624	829			831	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			100	
cM capacity (veh/h)	113	371			802	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	12	831	794
Volume Left	7	0	1
Volume Right	4	3	0
cSH	151	1700	802
Volume to Capacity	0.08	0.49	0.00
Queue Length 95th (m)	2.0	0.0	0.0
Control Delay (s)	30.8	0.0	0.0
Lane LOS	D		A
Approach Delay (s)	30.8	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	4	789	2	1	745
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	4	831	2	1	784
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1618	832			833	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1618	832			833	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			100	
cM capacity (veh/h)	114	389			800	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	833	785
Volume Left	7	0	1
Volume Right	4	2	0
cSH	152	1700	800
Volume to Capacity	0.08	0.49	0.00
Queue Length 95th (m)	2.0	0.0	0.0
Control Delay (s)	30.7	0.0	0.0
Lane LOS	D		A
Approach Delay (s)	30.7	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.6%	ICU Level of Service A
Analysis Period (min)		15	

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	2	706	2	7	793	1
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	743	2	7	835	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	838		1583	835		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	836		1583	835		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	100		98	98		
cM capacity (veh/h)	798		119	387		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	745	9	836
Volume Left	2	2	0
Volume Right	0	7	1
cSH	798	251	1700
Volume to Capacity	0.00	0.04	0.49
Queue Length 95th (m)	0.1	0.9	0.0
Control Delay (s)	0.1	19.9	0.0
Lane LOS	A	C	
Approach Delay (s)	0.1	19.9	0.0
Approach LOS		C	

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		101.2%	ICU Level of Service G
Analysis Period (min)		15	

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	1	707	2	0	787
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1	744	2	0	828
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1574	745			746	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1574	745			746	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	121	414			862	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	5	746	828
Volume Left	4	0	0
Volume Right	1	2	0
cSH	141	1700	862
Volume to Capacity	0.04	0.44	0.00
Queue Length 95th (m)	0.9	0.0	0.0
Control Delay (s)	31.5	0.0	0.0
Lane LOS	D		
Approach Delay (s)	31.5	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	683	33	7	740
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	96	31	698	35	7	779
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1509	715			733	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1509	715			733	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	27	93			99	
cM capacity (veh/h)	132	431			872	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	126	733	786
Volume Left	96	0	7
Volume Right	31	35	0
cSH	158	1700	872
Volume to Capacity	0.80	0.43	0.01
Queue Length 95th (m)	41.4	0.0	0.2
Control Delay (s)	83.7	0.0	0.2
Lane LOS	F		A
Approach Delay (s)	83.7	0.0	0.2
Approach LOS	F		

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	49	15	670	18	4	602
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	52	16	705	19	4	634
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1357	715			724	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1357	715			724	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	96			100	
cM capacity (veh/h)	164	431			878	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	724	638
Volume Left	52	0	4
Volume Right	16	19	0
cSH	191	1700	878
Volume to Capacity	0.35	0.43	0.00
Queue Length 95th (m)	11.9	0.0	0.1
Control Delay (s)	33.7	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	33.7	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	4	1	707	825	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	4	1	744	868	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1615	868	868			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1615	868	868			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	114	352	776			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	5	745	868
Volume Left	1	1	0
Volume Right	4	0	0
cSH	248	776	1700
Volume to Capacity	0.02	0.00	0.51
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	19.8	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	19.8	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2026 AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	663	565	3	5	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	698	595	3	5	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked	0.80				0.80	0.80
vC, conflicting volume	598				1301	596
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374				1251	372
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	99
cM capacity (veh/h)	949				152	540

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	701	598	8
Volume Left	3	0	5
Volume Right	0	3	3
cSH	949	1700	208
Volume to Capacity	0.00	0.35	0.04
Queue Length 95th (m)	0.1	0.0	1.0
Control Delay (s)	0.1	0.0	23.0
Lane LOS	A		C
Approach Delay (s)	0.1	0.0	23.0
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2026 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	570	24	20	530	9	18	13	65	8	12	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1852		1770	1858		1770	1631		1770	1653	
Flt Permitted	0.30	1.00		0.24	1.00		0.72	1.00		0.70	1.00	
Satd. Flow (perm)	558	1852		450	1858		1347	1631		1311	1653	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	600	25	21	558	9	19	14	68	8	13	39
RTOR Reduction (vph)	0	3	0	0	1	0	0	45	0	0	26	0
Lane Group Flow (vph)	57	622	0	31	585	0	19	37	0	5	26	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.7	20.7		20.7	20.7		16.2	16.2		16.2	16.2	
Effective Green, g (s)	20.7	20.7		20.7	20.7		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.33	0.33		0.33	0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	236	784		190	787		446	540		434	548	
v/s Ratio Prot		c0.34			0.30			c0.02			0.02	
v/s Ratio Perm	0.10			0.07			0.01			0.00		
v/c Ratio	0.24	0.79		0.16	0.72		0.04	0.07		0.01	0.05	
Uniform Delay, d1	9.1	12.2		8.7	11.7		11.1	11.2		11.0	11.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	5.5		0.4	3.2		0.2	0.2		0.1	0.2	
Delay (s)	9.6	17.8		9.1	14.9		11.3	11.4		11.0	11.3	
Level of Service	A	B		A	B		B	B		B	B	
Approach Delay (s)		17.1			14.6			11.4			11.2	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	15.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	48.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	57.5%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
8: River Road W & Westbury Rd

2026 AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	651	36	31	507	56	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	1863	1583	1770	1863	1674	
Flt Permitted	1.00	1.00	0.20	1.00	0.98	
Satd. Flow (perm)	1863	1583	365	1863	1674	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	685	38	33	534	59	99
RTOR Reduction (vph)	0	11	0	0	65	0
Lane Group Flow (vph)	685	27	33	534	93	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	27.3	27.3	27.3	27.3	20.7	
Effective Green, g (s)	27.3	27.3	27.3	27.3	20.7	
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.34	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	848	720	166	846	578	
v/s Ratio Prot	c0.37			0.29	c0.06	
v/s Ratio Perm		0.02	0.09			
v/c Ratio	0.81	0.04	0.20	0.63	0.16	
Uniform Delay, d1	14.1	9.1	9.8	12.5	13.6	
Progression Factor	1.00	1.00	0.36	0.70	1.00	
Incremental Delay, d2	5.7	0.0	0.5	1.4	0.6	
Delay (s)	19.8	9.1	4.1	10.1	14.2	
Level of Service	B	A	A	B	B	
Approach Delay (s)	19.2			9.7	14.2	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: River Road W & Main Street

2026 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (vph)	47	661	17	4	525	217	15	17	10	212	9	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.94		1.00	0.85	
Flt Protected		1.00			1.00	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (prot)		3515			3538	1583	1770	1704		1770	1583	
Flt Permitted		0.88			0.95	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (perm)		3068			3357	1583	1770	1704		1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	696	18	4	553	228	16	18	11	223	9	26
RTOR Reduction (vph)	0	3	0	0	0	154	0	6	0	0	17	0
Lane Group Flow (vph)	0	760	0	0	557	74	16	23	0	223	21	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		19.6			19.6	19.6	1.4	28.4		24.0	24.0	
Effective Green, g (s)		19.6			19.6	19.6	1.4	28.4		24.0	24.0	
Actuated g/C Ratio		0.33			0.33	0.33	0.02	0.47		0.40	0.40	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1009			1097	517	41	807		708	633	
v/s Ratio Prot							c0.01	0.01		c0.13		
v/s Ratio Perm		c0.25			0.17	0.05					0.01	
v/c Ratio		0.75			0.51	0.14	0.39	0.03		0.31	0.03	
Uniform Delay, d1		18.0			16.3	14.3	28.9	8.4		12.4	10.9	
Progression Factor		0.48			0.25	0.52	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5			0.3	0.1	6.0	0.1		1.2	0.1	
Delay (s)		11.2			4.8	7.6	34.9	8.5		13.5	11.0	
Level of Service		B			A	A	C	A		B	B	
Approach Delay (s)		11.2			5.5			17.9		13.2		
Approach LOS		B			A			B		B		

Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

l Phase conflict between lane groups.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2026 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	37	774	28	49	759	41	65	3	32	14	4	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		1.00			0.99			0.95			0.94	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3515			3503			3262			3247	
Flt Permitted		0.88			0.83			0.80			0.86	
Satd. Flow (perm)		3084			2900			2678			2872	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	815	27	52	799	43	68	3	34	15	4	13
RTOR Reduction (vph)	0	5	0	0	7	0	0	21	0	0	8	0
Lane Group Flow (vph)	0	876	0	0	887	0	0	84	0	0	24	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		24.5			24.5			23.5			23.5	
Effective Green, g (s)		24.5			24.5			23.5			23.5	
Actuated g/C Ratio		0.41			0.41			0.39			0.39	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1259			1184			1049			1125	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.31			c0.03			0.01	
v/c Ratio		0.70			0.75			0.08			0.02	
Uniform Delay, d1		14.7			15.1			11.5			11.2	
Progression Factor		1.54			0.74			1.00			1.00	
Incremental Delay, d2		1.4			2.5			0.1			0.0	
Delay (s)		24.0			13.7			11.6			11.2	
Level of Service		C			B			B			B	
Approach Delay (s)		24.0			13.7			11.6			11.2	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM Average Control Delay	16.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

2026 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	732	43	17	630	32	108	24	25	38	15	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	0.92		1.00	0.88	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3499			3510		1770	1720		1770	1639	
Flt Permitted		0.84			0.92		0.70	1.00		0.72	1.00	
Satd. Flow (perm)		2940			3232		1312	1720		1348	1639	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	771	45	18	663	34	114	25	26	40	16	65
RTOR Reduction (vph)	0	8	0	0	7	0	0	16	0	0	39	0
Lane Group Flow (vph)	0	872	0	0	708	0	114	35	0	40	42	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		23.8			23.8		24.2	24.2		24.2	24.2	
Effective Green, g (s)		23.8			23.8		24.2	24.2		24.2	24.2	
Actuated g/C Ratio		0.40			0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1166			1282		529	694		544	661	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.30			0.22		c0.09			0.03		
v/c Ratio		0.75			0.55		0.22	0.05		0.07	0.06	
Uniform Delay, d1		15.5			14.0		11.7	10.9		11.0	11.0	
Progression Factor		0.24			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3			0.5		0.9	0.1		0.3	0.2	
Delay (s)		6.1			14.5		12.6	11.0		11.3	11.1	
Level of Service		A			B		B	B		B	B	
Approach Delay (s)		6.1			14.5			12.1			11.2	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2026 AM

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	809	4	2	604	13	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	852	4	2	636	14	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.64		0.64	0.64
vC, conflicting volume			656		1494	654
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			489		1490	486
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		84	99
cM capacity (veh/h)			684		87	371

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	856	638	18
Volume Left	0	2	14
Volume Right	4	0	4
cSH	1700	684	106
Volume to Capacity	0.50	0.00	0.17
Queue Length 95th (m)	0.0	0.1	4.6
Control Delay (s)	0.0	0.1	45.9
Lane LOS		A	E
Approach Delay (s)	0.0	0.1	45.9
Approach LOS			E

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2026 AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	95	643	527	47	20	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	100	677	555	49	21	88
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	604				1456	579
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	604				1456	579
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				84	87
cM capacity (veh/h)	974				128	515

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	777	604	87
Volume Left	100	0	21
Volume Right	0	49	66
cSH	974	1700	298
Volume to Capacity	0.10	0.36	0.29
Queue Length 95th (m)	2.7	0.0	9.5
Control Delay (s)	2.5	0.0	22.0
Lane LOS	A		C
Approach Delay (s)	2.5	0.0	22.0
Approach LOS			C

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	553	18	27	579	14	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	582	19	28	609	15	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			601		1258	592
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			601		1258	592
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		92	90
cM capacity (veh/h)			976		183	506

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	601	638	66
Volume Left	0	28	15
Volume Right	19	0	52
cSH	1700	976	364
Volume to Capacity	0.35	0.03	0.18
Queue Length 95th (m)	0.0	0.7	5.3
Control Delay (s)	0.0	0.8	17.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	17.1
Approach LOS			C

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1242	57	44	950	38	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1307	60	46	1000	40	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1367		2430	1337
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1367		2430	1337
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		0	80
cM capacity (veh/h)			502		32	187

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1367	1046	77
Volume Left	0	46	40
Volume Right	60	0	37
cSH	1700	502	53
Volume to Capacity	0.80	0.09	1.45
Queue Length 95th (m)	0.0	2.4	56.5
Control Delay (s)	0.0	3.3	407.9
Lane LOS		A	F
Approach Delay (s)	0.0	3.3	407.9
Approach LOS			F

Intersection Summary			
Average Delay	14.0		
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1260	20	9	990	10	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1326	21	9	1042	11	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1347		2398	1337
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1347		2398	1337
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		71	98
cM capacity (veh/h)			511		36	187

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	1347	1052	18
Volume Left	0	9	11
Volume Right	21	0	7
cSH	1700	511	54
Volume to Capacity	0.79	0.02	0.33
Queue Length 95th (m)	0.0	0.5	9.4
Control Delay (s)	0.0	0.7	101.3
Lane LOS		A	F
Approach Delay (s)	0.0	0.7	101.3
Approach LOS			F

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	14	21	1142	33	26	978
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	22	1202	35	27	1029
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2304	1218			1237	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2304	1219			1237	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	63	90			95	
cM capacity (veh/h)	40	220			593	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	37	1237	1057
Volume Left	15	0	27
Volume Right	22	35	0
cSH	79	1700	563
Volume to Capacity	0.47	0.73	0.05
Queue Length 95th (m)	15.4	0.0	1.2
Control Delay (s)	85.4	0.0	1.7
Lane LOS	F		A
Approach Delay (s)	85.4	0.0	1.7
Approach LOS	F		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	2	4	1146	924	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	4	1206	973	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2189	975	977			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2189	975	977			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	99			
cM capacity (veh/h)	50	305	706			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	4	1211	977
Volume Left	2	4	0
Volume Right	2	0	4
cSH	85	706	1700
Volume to Capacity	0.05	0.01	0.57
Queue Length 95th (m)	1.2	0.1	0.0
Control Delay (s)	49.3	0.2	0.0
Lane LOS	E	A	
Approach Delay (s)	49.3	0.2	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	9	1213	26	12	983
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	9	1277	27	13	1035
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2351	1291			1304	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2351	1291			1304	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	95			98	
cM capacity (veh/h)	39	200			531	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	1304	1047
Volume Left	15	0	13
Volume Right	9	27	0
cSH	56	1700	531
Volume to Capacity	0.43	0.77	0.02
Queue Length 95th (m)	12.9	0.0	0.6
Control Delay (s)	110.3	0.0	0.9
Lane LOS	F		A
Approach Delay (s)	110.3	0.0	0.9
Approach LOS	F		

Intersection Summary				
Average Delay		1.5		
Intersection Capacity Utilization		75.4%	ICU Level of Service	D
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	14	1169	41	19	971
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	15	1231	43	20	1022
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2314	1252			1274	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2314	1252			1274	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	93			95	
cM capacity (veh/h)	40	210			545	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	1274	1042
Volume Left	22	0	20
Volume Right	15	43	0
cSH	59	1700	545
Volume to Capacity	0.62	0.75	0.04
Queue Length 95th (m)	20.5	0.0	0.9
Control Delay (s)	136.0	0.0	1.3
Lane LOS	F		A
Approach Delay (s)	136.0	0.0	1.3
Approach LOS	F		

Intersection Summary				
Average Delay		2.7		
Intersection Capacity Utilization		76.3%	ICU Level of Service	D
Analysis Period (min)		15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	40	60	1009	95	75	873
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	63	1062	100	79	919
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2189	1112			1162	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2189	1112			1162	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	3	75			87	
cM capacity (veh/h)	43	254			601	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	105	1162	998
Volume Left	42	0	79
Volume Right	63	100	0
cSH	86	1700	601
Volume to Capacity	1.22	0.68	0.13
Queue Length 95th (m)	60.5	0.0	3.6
Control Delay (s)	254.3	0.0	4.1
Lane LOS	F		A
Approach Delay (s)	254.3	0.0	4.1
Approach LOS	F		

Intersection Summary			
Average Delay	13.6		
Intersection Capacity Utilization	120.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	31	46	1048	48	36	948
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	33	48	1101	51	40	998
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2204	1126			1152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2204	1126			1152	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	29	81			93	
cM capacity (veh/h)	46	249			607	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	81	1152	1038
Volume Left	33	0	40
Volume Right	48	51	0
cSH	89	1700	607
Volume to Capacity	0.91	0.68	0.07
Queue Length 95th (m)	40.2	0.0	1.7
Control Delay (s)	154.7	0.0	2.2
Lane LOS	F		A
Approach Delay (s)	154.7	0.0	2.2
Approach LOS	F		

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	5	1050	9	7	981
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	5	1137	9	7	1033
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2189	1142			1146	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2189	1142			1146	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	98			99	
cM capacity (veh/h)	49	244			609	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	9	1146	1040
Volume Left	4	0	7
Volume Right	5	9	0
cSH	89	1700	609
Volume to Capacity	0.11	0.67	0.01
Queue Length 95th (m)	2.8	0.0	0.3
Control Delay (s)	50.4	0.0	0.4
Lane LOS	F		A
Approach Delay (s)	50.4	0.0	0.4
Approach LOS	F		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	8	1239	22	10	987
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	8	1304	23	11	1039
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2378	1316			1327	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2376	1316			1327	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	96			98	
cM capacity (veh/h)	37	193			520	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	20	1327	1049
Volume Left	12	0	11
Volume Right	8	23	0
cSH	56	1700	520
Volume to Capacity	0.35	0.78	0.02
Queue Length 95th (m)	10.3	0.0	0.5
Control Delay (s)	100.3	0.0	0.7
Lane LOS	F		A
Approach Delay (s)	100.3	0.0	0.7
Approach LOS	F		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	1084	2	2	990
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	1141	2	2	1042
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2188	1142			1143	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2188	1142			1143	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	50	244			611	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	1143	1044
Volume Left	1	0	2
Volume Right	1	2	0
cSH	83	1700	611
Volume to Capacity	0.03	0.67	0.00
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	49.6	0.0	0.1
Lane LOS	E		A
Approach Delay (s)	49.6	0.0	0.1
Approach LOS	E		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	1086	1	1	990
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	1143	1	1	1042
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2188	1144			1144	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2188	1144			1144	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	50	243			611	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	2	1144	1043
Volume Left	1	0	1
Volume Right	1	1	0
cSH	83	1700	611
Volume to Capacity	0.03	0.67	0.00
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	49.5	0.0	0.1
Lane LOS	E		A
Approach Delay (s)	49.5	0.0	0.1
Approach LOS	E		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBR	NBR2	NWL	NWR	SWL2	SWL
Lane Configurations						
Volume (veh/h)	1073	90	20	10	19	1097
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1129	95	21	11	20	1155
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			2372	1177	1224	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2372	1177	1224	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			43	95	98	
cM capacity (veh/h)			37	233	569	

Direction, Lane #	NB 1	NW 1	SW 1
Volume Total	1224	32	1175
Volume Left	0	21	20
Volume Right	95	11	0
cSH	1700	51	569
Volume to Capacity	0.72	0.61	0.04
Queue Length 95th (m)	0.0	19.4	0.9
Control Delay (s)	0.0	152.4	1.4
Lane LOS		F	A
Approach Delay (s)	0.0	152.4	1.4
Approach LOS		F	

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	3	5	1075	7	5	988
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	5	1132	7	5	1040
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2188	1135			1139	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2188	1135			1139	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			99	
cM capacity (veh/h)	50	246			613	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	8	1139	1046
Volume Left	3	0	5
Volume Right	5	7	0
cSH	99	1700	613
Volume to Capacity	0.08	0.67	0.01
Queue Length 95th (m)	2.2	0.0	0.2
Control Delay (s)	44.8	0.0	0.3
Lane LOS	E		A
Approach Delay (s)	44.8	0.0	0.3
Approach LOS	E		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	57.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	4	1073	7	5	991
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	4	1129	7	5	1043
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2187	1133			1137	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2187	1133			1137	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			99	
cM capacity (veh/h)	50	247			615	

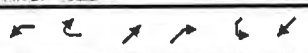
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	1137	1048
Volume Left	3	0	5
Volume Right	4	7	0
cSH	92	1700	615
Volume to Capacity	0.08	0.67	0.01
Queue Length 95th (m)	2.1	0.0	0.2
Control Delay (s)	47.8	0.0	0.3
Lane LOS	E		A
Approach Delay (s)	47.8	0.0	0.3
Approach LOS	E		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	8	1101	2	4	1083	2
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	1159	2	4	1140	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1142		2317	1141		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1142		2317	1141		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	99		95	98		
cM capacity (veh/h)	612		41	244		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	1167	6	1142
Volume Left	8	2	0
Volume Right	0	4	2
cSH	612	92	1700
Volume to Capacity	0.01	0.07	0.67
Queue Length 95th (m)	0.3	1.7	0.0
Control Delay (s)	0.6	47.0	0.0
Lane LOS	A	E	
Approach Delay (s)	0.6	47.0	0.0
Approach LOS		E	

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	142.1%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	1153	5	1	1082
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	1214	5	1	1139
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2357	1216			1219	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2357	1216			1219	
tC, single (s)	8.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	100			100	
cM capacity (veh/h)	39	221			572	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	3	1219	1140
Volume Left	2	0	1
Volume Right	1	5	0
cSH	54	1700	572
Volume to Capacity	0.06	0.72	0.00
Queue Length 95th (m)	1.5	0.0	0.0
Control Delay (s)	76.0	0.0	0.1
Lane LOS	F		A
Approach Delay (s)	76.0	0.0	0.1
Approach LOS	F		

Intersection Summary					
Average Delay	0.1				
Intersection Capacity Utilization	71.0%	ICU Level of Service	C		
Analysis Period (min)	15				

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	26	1106	111	24	1092
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	1164	117	25	1149
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2423	1223			1281	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2423	1223			1281	
tC, single (s)	8.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	87			95	
cM capacity (veh/h)	34	219			542	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	83	1281	1175
Volume Left	56	0	25
Volume Right	27	117	0
cSH	47	1700	542
Volume to Capacity	1.77	0.75	0.05
Queue Length 95th (m)	66.3	0.0	1.2
Control Delay (s)	557.5	0.0	1.9
Lane LOS	F		A
Approach Delay (s)	557.5	0.0	1.9
Approach LOS	F		

Intersection Summary					
Average Delay	19.2				
Intersection Capacity Utilization	87.9%	ICU Level of Service	E		
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	14	1002	60	13	935
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	15	1056	63	14	984
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2098	1086			1118	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2098	1086			1118	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	94			98	
cM capacity (veh/h)	56	263			625	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	45	1118	998
Volume Left	31	0	14
Volume Right	15	63	0
cSH	75	1700	625
Volume to Capacity	0.60	0.66	0.02
Queue Length 95th (m)	21.2	0.0	0.5
Control Delay (s)	108.3	0.0	0.7
Lane LOS	F		A
Approach Delay (s)	108.3	0.0	0.7
Approach LOS	F		

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	2	5	1204	1122	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	5	1267	1181	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2459	1182	1182			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2459	1182	1182			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	99			
cM capacity (veh/h)	33	231	591			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	3	1273	1182
Volume Left	1	5	0
Volume Right	2	0	1
cSH	76	591	1700
Volume to Capacity	0.04	0.01	0.70
Queue Length 95th (m)	1.0	0.2	0.0
Control Delay (s)	53.3	0.4	0.0
Lane LOS	F	A	
Approach Delay (s)	53.3	0.4	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2026 PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	905	884	3	6	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	953	931	3	6	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			341			
pX, platoon unblocked	0.57				0.57	0.57
vC, conflicting volume	934				1904	932
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	498				2214	495
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				76	97
cM capacity (veh/h)	602				27	326

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	962	934	15
Volume Left	9	0	6
Volume Right	0	3	8
cSH	602	1700	56
Volume to Capacity	0.02	0.55	0.26
Queue Length 95th (m)	0.4	0.0	7.2
Control Delay (s)	0.5	0.0	90.1
Lane LOS	A		F
Approach Delay (s)	0.5	0.0	90.1
Approach LOS			F

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2026 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	825	15	86	815	7	21	19	61	5	35	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.89		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1858		1770	1860		1770	1650		1770	1670	
Flt Permitted	0.13	1.00		0.13	1.00		0.68	1.00		0.70	1.00	
Satd. Flow (perm)	249	1858		249	1860		1268	1650		1308	1670	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	868	16	91	858	7	22	20	64	5	37	82
RTOR Reduction (vph)	0	1	0	0	0	0	0	46	0	0	59	0
Lane Group Flow (vph)	59	883	0	91	865	0	22	38	0	5	60	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	29.9	29.9		29.9	29.9		16.1	16.1		16.1	16.1	
Effective Green, g (s)	29.9	29.9		29.9	29.9		16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	128	958		128	959		352	458		363	464	
v/s Ratio Prot		c0.48			0.46			0.02			c0.04	
v/s Ratio Perm	0.24			0.37			0.02			0.00		
v/c Ratio	0.48	0.92		0.71	0.90		0.06	0.08		0.01	0.13	
Uniform Delay, d1	8.9	13.0		10.7	12.7		15.4	15.5		15.2	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	13.9		17.0	11.5		0.3	0.4		0.1	0.8	
Delay (s)	11.5	26.8		27.7	24.2		15.7	15.8		15.3	16.3	
Level of Service	B	C		C	C		B	B		B	B	
Approach Delay (s)		25.9			24.5			15.8			16.2	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	24.2	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	58.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	753	104	69	815	65	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	1863	1583	1770	1863	1705	
Flt Permitted	1.00	1.00	0.22	1.00	0.97	
Satd. Flow (perm)	1863	1583	409	1863	1705	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	793	109	73	858	68	53
RTOR Reduction (vph)	0	18	0	0	26	0
Lane Group Flow (vph)	793	91	73	858	95	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	61.3	61.3	61.3	61.3	26.7	
Effective Green, g (s)	61.3	61.3	61.3	61.3	26.7	
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.27	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1142	970	251	1142	455	
v/s Ratio Prot	0.43			c0.46	c0.06	
v/s Ratio Perm		0.06	0.18			
v/c Ratio	0.69	0.09	0.29	0.75	0.21	
Uniform Delay, d1	13.0	7.9	9.1	13.9	28.5	
Progression Factor	1.00	1.00	0.57	0.93	1.00	
Incremental Delay, d2	1.9	0.0	0.6	2.6	1.0	
Delay (s)	14.9	8.0	5.7	15.4	29.5	
Level of Service	B	A	A	B	C	
Approach Delay (s)	14.1			14.8	29.5	
Approach LOS	B			B	C	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (vph)	90	651	16	13	723	337	20	23	9	436	53	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.96		1.00	0.85	
Flt Protected		0.99			1.00	1.00	0.95	0.96		0.95	1.00	
Satd. Flow (prot)		3507			3536	1583	1770	1724		1770	1583	
Flt Permitted		0.64			0.93	1.00	0.95	0.96		0.95	1.00	
Satd. Flow (perm)		2248			3303	1583	1770	1724		1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	685	17	14	761	355	21	24	9	459	56	88
RTOR Reduction (vph)	0	2	0	0	0	217	0	5	0	0	49	0
Lane Group Flow (vph)	0	795	0	0	775	138	21	28	0	459	95	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		38.8			38.8	38.8	2.8	49.2		43.4	43.4	
Effective Green, g (s)		38.8			38.8	38.8	2.8	49.2		43.4	43.4	
Actuated g/C Ratio		0.39			0.39	0.39	0.03	0.49		0.43	0.43	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		872			1282	614	50	848		768	687	
v/s Ratio Prot							c0.01	0.02		c0.26		
v/s Ratio Perm		c0.35			0.23	0.09					0.06	
v/c Ratio		0.91			0.60	0.22	0.42	0.03		0.60	0.14	
Uniform Delay, d1		29.0			24.5	20.5	47.8	13.1		21.6	17.0	
Progression Factor		0.93			0.77	0.42	1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.5			0.6	0.1	5.6	0.1		3.4	0.4	
Delay (s)		38.5			19.4	8.7	53.4	13.2		25.0	17.5	
Level of Service		D			B	A	D	B		C	B	
Approach Delay (s)		38.5			16.0			28.8		23.2		
Approach LOS		D			B			C		C		

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2026 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	38	969	39	62	1082	80	94	9	66	31	8	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.94			0.90	
Flt Protected		1.00			1.00			0.97			0.99	
Satd. Flow (prot)		3513			3493			3238			3142	
Flt Permitted		0.84			0.73			0.75			0.84	
Satd. Flow (perm)		2967			2564			2487			2670	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	1020	41	65	1118	84	99	9	72	33	8	83
RTOR Reduction (vph)	0	3	0	0	6	0	0	55	0	0	64	0
Lane Group Flow (vph)	0	1098	0	0	1282	0	0	125	0	0	60	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		64.9			64.9			23.1			23.1	
Effective Green, g (s)		64.9			64.9			23.1			23.1	
Actuated g/C Ratio		0.65			0.65			0.23			0.23	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1926			1664			574			617	
v/s Ratio Prot												
v/s Ratio Perm		0.37			c0.50			c0.05			0.02	
v/c Ratio		0.57			0.77			0.22			0.10	
Uniform Delay, d1		9.8			12.3			31.1			30.2	
Progression Factor		0.77			0.86			1.00			1.00	
Incremental Delay, d2		0.3			2.1			0.9			0.3	
Delay (s)		7.8			10.2			32.0			30.6	
Level of Service		A			B			C			C	
Approach Delay (s)		7.8			10.2			32.0			30.6	
Approach LOS		A			B			C			C	

Intersection Summary				
HCM Average Control Delay	11.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

2026 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	877	122	13	958	39	110	26	6	36	16	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.97		1.00	0.87	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3464			3518		1770	1812		1770	1620	
Flt Permitted		0.65			0.93		0.67	1.00		0.74	1.00	
Satd. Flow (perm)		2257			3278		1258	1812		1370	1620	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	923	128	14	1008	41	116	27	6	38	17	112
RTOR Reduction (vph)	0	11	0	0	3	0	0	5	0	0	86	0
Lane Group Flow (vph)	0	1159	0	0	1060	0	116	28	0	38	43	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		64.9			64.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)		64.9			64.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio		0.65			0.65		0.23	0.23		0.23	0.23	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1455			2127		290	419		316	374	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.51			0.32		c0.09			0.03		
v/c Ratio		0.79			0.50		0.40	0.07		0.12	0.11	
Uniform Delay, d1		12.7			9.1		32.6	30.0		30.4	30.4	
Progression Factor		0.44			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.7			0.2		4.1	0.3		0.8	0.6	
Delay (s)		8.2			9.3		36.7	30.4		31.2	31.0	
Level of Service		A			A		D	C		C	C	
Approach Delay (s)		8.2			9.3			35.3			31.0	
Approach LOS		A			A			D			C	

Intersection Summary				
HCM Average Control Delay	11.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2026 PM

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	908	16	3	1080	10	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	954	17	3	1137	11	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	293					
pX, platoon unblocked			0.62		0.62	0.62
vC, conflicting volume			971		2105	982
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			645		2477	632
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		48	100
cM capacity (veh/h)			582		20	298

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	971	1140	12
Volume Left	0	3	11
Volume Right	17	0	1
cSH	1700	582	22
Volume to Capacity	0.57	0.01	0.52
Queue Length 95th (m)	0.0	0.1	12.2
Control Delay (s)	0.0	0.2	284.6
Lane LOS		A	F
Approach Delay (s)	0.0	0.2	284.6
Approach LOS			F

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2026 PM

Movement	SBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	108	761	910	21	21	142
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	114	801	958	22	22	149
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	980				1997	969
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	980				1997	969
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				60	51
cM capacity (veh/h)	704				55	308

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	915	980	172
Volume Left	114	0	22
Volume Right	0	22	149
cSH	704	1700	194
Volume to Capacity	0.16	0.58	0.88
Queue Length 95th (m)	4.6	0.0	54.0
Control Delay (s)	4.3	0.0	87.5
Lane LOS	A		F
Approach Delay (s)	4.3	0.0	87.5
Approach LOS			F

Intersection Summary			
Average Delay	9.2		
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	689	8	68	787	14	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	725	8	69	828	15	36
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			734		1697	729
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			734		1697	729
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		84	92
cM capacity (veh/h)			871		94	423

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	734	898	51
Volume Left	0	69	15
Volume Right	8	0	36
cSH	1700	871	209
Volume to Capacity	0.43	0.08	0.24
Queue Length 95th (m)	0.0	2.1	7.3
Control Delay (s)	0.0	2.1	27.7
Lane LOS		A	D
Approach Delay (s)	0.0	2.1	27.7
Approach LOS			D

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

APPENDIX IV

Signal Warrants

Ainley CONSULTING ENGINEERS PLANNERS

TRAFFIC SIGNAL WARRANT

GENERAL INFORMATION

Analyst	Lilly Chen	**Jurisdiction/Date**	Wasaga Beach	Aug 26 2009
Agency or Company	Ainley & Associates	**East-West Street**	River Road West	
Analysis Period	2026	**North-South Street**	Fernbrook Drive	
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West	
T Intersection	Yes	**Approach Lanes per Direction**	1	
		Hours of Traffic Volume Data	AM & PM peaks only	
Additional Comments	existing road configuration			

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending		Hour 1 AM peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8 PM peak	AM + PM 4
MAJOR STREET										
Eastbound	right	**33**							**95**	**32**
	thru	**718**							**1009**	**432**
	left									**0**
Westbound	right									**0**
	thru	**698**							**873**	**393**
	left	**17**							**75**	**23**
MINOR STREET										
Northbound	right	**57**							**60**	**29**
	thru									**0**
	left	**94**							**40**	**34**
Southbound	right									**0**
	thru									**0**
	left									**0**
PEDESTRIANS										
crossing MAJOR street		**1**							**1**	**1**
crossing MINOR street		**1**							**1**	**1**
APPROACH VOLUMES										
major		1466							2052	880
minor		151							100	63
TOTAL		1617							2152	942
CROSSING VOLUMES										
TOTAL		95							41	34
note 1		94							40	
note 2		0							0	
note 3		0							0	
3a		no							no	
3b		yes							yes	
note 4		1							1	

NOTES

Traffic crossing MAJOR street defined as:

note 1: Left turns from both minor street approaches
note 2: The heaviest through volume from the minor street
note 3: 50% of the heavier left turn movement from the major street when both of the following are met:
3a: the left turn volume > 120
3b: the left turn volume + opposing volume > 720
note 4: Pedestrians crossing the major street

ACCIDENT HISTORY

Reportable accidents over the past 36 months susceptible to correction by a traffic signal	months 1 to 12	-
	months 13 to 24	-
	months 25 to 36	-

Ainley CONSULTING ENGINEERS PLANNERS

TRAFFIC SIGNAL WARRANT

GENERAL INFORMATION

Analyst	Lilly Chen	**Jurisdiction/Date**	Wasaga Beach Aug 26 2009
Agency or Company	Ainley & Associates	**East-West Street**	River Road West
Analysis Period	2026	**North-South Street**	Fernbrook Drive
Flow Conditions	Restricted flow (urban)	**Major Street**	River Road West
T Intersection	Yes	**Approach Lanes per Direction**	1
		Hours of Traffic Volume Data	AM & PM peaks only
Additional Comments	existing road configuration		

JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

JUSTIFICATION	GUIDANCE	HOUR ENDING: AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak	No. of hours with compliance: 100%	80%+	
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	1617	942	942	942	942	942	942	2152	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	151	63	63	63	63	63	63	100	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 170 (full intersection) OR VOL x 100 / 256 (free intersection)	59%	25%	25%	25%	25%	25%	25%	39%	0	0	31%
(RESTRICTED FLOW)	BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS											NO
SIGNAL JUSTIFICATION 1:	LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS											NO

JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

JUSTIFICATION	GUIDANCE	HOUR ENDING: Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	No. of hours with compliance: 100%	80%+	
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	1466	880	880	880	880	880	880	2052	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	95	34	34	34	34	34	34	41	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 75	100%	45%	45%	45%	45%	45%	45%	55%	1	1	53%
(RESTRICTED FLOW)	BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS											NO
SIGNAL JUSTIFICATION 2:	LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS											NO

JUSTIFICATION 3 - COLLISION EXPERIENCE

	Preceeding Months	Number of Collisions	% Fulfillment
A. Number of reportable collisions susceptible to prevention by a traffic signal	1 - 12	-	-
	13 - 24	-	-
	25 - 36	-	-
	annual average	-	-
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency.	☐ YES	☑ NO	0%
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.	☐ YES	☑ NO	0%
SIGNAL JUSTIFICATION 3: ALL OF 3A, 3B & 3C FULFILLED TO 100%?		NO	

JUSTIFICATION 4 - COMBINATION JUSTIFICATION

JUSTIFICATION SATISFIED 80% OR MORE			Two Justifications Satisfied 80% or more
Justification 1	Minimum Vehicle Volume	NO	NO
Justification 2	Delay to Cross Traffic	NO	
Justification 3	Collision Experience	-	

JUSTIFCATION SUMMARY

ARE TRAFFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION?	NO

Ainley CONSULTING ENGINEERS PLANNERS

TRAFFIC SIGNAL WARRANT

GENERAL INFORMATION

Analyst	Lilly Chen	**Jurisdiction/Date**	Wasaga Beach — Aug 26 2009
Agency or Company	Ainley & Associates	**East-West Street**	River Road West
Analysis Period	2026	**North-South Street**	Silver Birch Ave (west one)
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West
T Intersection	Yes	**Approach Lanes per Direction**	1
		Hours of Traffic Volume Data	AM & PM peaks only

Additional Comments existing road configuration

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending		Hour 1 AM peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8 PM peak	AM + PM 4
MAJOR STREET										
Eastbound	right	33							111	36
	thru	663							1106	442
	left									0
Westbound	right									0
	thru	740							1092	458
	left	7							24	8
MINOR STREET										
Northbound	right	29							26	14
	thru									0
	left	91							53	36
Southbound	right									0
	thru									0
	left									0
PEDESTRIANS										
crossing MAJOR street		1								0
crossing MINOR street		1							1	1
APPROACH VOLUMES										
major		1443							2333	944
minor		120							79	50
TOTAL		1563							2412	994
CROSSING VOLUMES										
TOTAL		92							53	36
note 1		91							53	
note 2		0							0	
note 3		0							0	
3a		no							no	
3b		no							yes	
note 4		1							0	

NOTES

Traffic crossing MAJOR street defined as:

note 1: Left turns from both minor street approaches
note 2: The heaviest through volume from the minor street
note 3: 50% of the heavier left turn movement from the major street when both of the following are met:
3a: the left turn volume > 120
3b: the left turn volume + opposing volume > 720
note 4: Pedestrians crossing the major street

ACCIDENT HISTORY

Reportable accidents over the past 36 months susceptible to correction by a traffic signal	months 1 to 12	-
	months 13 to 24	-
	months 25 to 36	-

Ainley CONSULTING ENGINEERS PLANNERS

TRAFFIC SIGNAL WARRANT

GENERAL INFORMATION

Analyst	Lilly Chen	**Jurisdiction/Date**	Wasaga Beach Aug 26 2009
Agency or Company	Ainley & Associates	**East-West Street**	River Road West
Analysis Period	2026	**North-South Street**	Silver Birch Ave (west one)
Flow Conditions	Restricted flow (urban)	**Major Street**	River Road West
T Intersection	Yes	**Approach Lanes per Direction**	1
		Hours of Traffic Volume Data	AM & PM peaks only
Additional Comments	existing road configuration		

JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

JUSTIFICATION	GUIDANCE	HOUR ENDING: AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak	No. of hours with compliance: 100%	80%+	
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	1563	994	994	994	994	994	994	2412	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 OR VOL x 100 / 900 (1 lane approach on main road) (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	120	50	50	50	50	50	50	79	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 170 OR VOL x 100 / 255 (full intersection) (tee intersection)	47%	20%	20%	20%	20%	20%	20%	31%	0	0	24%
(RESTRICTED FLOW)		BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS										NO
SIGNAL JUSTIFICATION 1:		LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS										NO

JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

JUSTIFICATION	GUIDANCE	HOUR ENDING: Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	No. of hours with compliance: 100%	80%+	
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	1443	944	944	944	944	944	944	2333	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 OR VOL x 100 / 900 (1 lane approach on main road) (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	92	36	36	36	36	36	36	53	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 75	100%	48%	48%	48%	48%	48%	48%	71%	1	1	58%
(RESTRICTED FLOW)		BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS										NO
SIGNAL JUSTIFICATION 2:		LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS										NO

JUSTIFICATION 3 - COLLISION EXPERIENCE

	Preceding Months	Number of Collisions	% Fulfillment
A. Number of reportable collisions susceptible to prevention by a traffic signal	1 - 12	-	-
	13 - 24	-	-
	25 - 36	-	-
	annual average	-	-
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency	☐ YES	☑ NO	0%
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.	☐ YES	☑ NO	0%
SIGNAL JUSTIFICATION 3: ALL OF 3A, 3B & 3C FULFILLED TO 100%?	NO		

JUSTIFICATION 4 - COMBINATION JUSTIFICATION

JUSTIFICATION SATISFIED 80% OR MORE			Two Justifications Satisfied 80% or more
Justification 1	- Minimum Vehicle Volume	NO	NO
Justification 2	- Delay to Cross Traffic	NO	
Justification 3	- Collision Experience	-	

JUSTIFCATION SUMMARY

ARE TRAFFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION?	NO

Ainley CONSULTING ENGINEERS PLANNERS

TRAFFIC SIGNAL WARRANT

GENERAL INFORMATION

Analyst	Lilly Chen	**Jurisdiction/Date**	Wasaga Beach — Aug 26 2009
Agency or Company	Ainley & Associates	**East-West Street**	River Road West
Analysis Period	2026	**North-South Street**	Golf Course Road
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West
T Intersection	Yes	**Approach Lanes per Direction**	1
		Hours of Traffic Volume Data	AM & PM peaks only

Additional Comments existing road configuration

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending	Hour 1 AM peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8 PM peak	AM + PM 4
MAJOR STREET									
Eastbound right	**4**							**16**	**5**
thru	**809**							**906**	**429**
left									**0**
Westbound right									**0**
thru	**604**							**1080**	**421**
left	**2**							**3**	**1**
MINOR STREET									
Northbound right	**4**							**1**	**1**
thru									**0**
left	**13**							**10**	**6**
Southbound right									**0**
thru									**0**
left									**0**
PEDESTRIANS									
crossing MAJOR street	**1**							**1**	**1**
crossing MINOR street	**1**							**1**	**1**
APPROACH VOLUMES									
major	1419							2005	856
minor	17							11	7
TOTAL	1436							2016	863
CROSSING VOLUMES									
TOTAL	14							11	6
note 1	13							10	
note 2	0							0	
note 3	0							0	
3a	no							no	
3b	yes							yes	
note 4	1							1	

NOTES

Traffic crossing MAJOR street defined as:

note 1: Left turns from both minor street approaches
note 2: The heaviest through volume from the minor street
note 3: 50% of the heavier left turn movement from the major street when both of the following are met:
3a: the left turn volume > 120
3b: the left turn volume + opposing volume > 720
note 4: Pedestrians crossing the major street

ACCIDENT HISTORY

Reportable accidents over the past 36 months susceptible to correction by a traffic signal	months 1 to 12	-
	months 13 to 24	-
	months 25 to 36	-

Ainley CONSULTING ENGINEERS PLANNERS

TRAFFIC SIGNAL WARRANT

GENERAL INFORMATION

Analyst	Lilly Chen	**Jurisdiction/Date**	Wasaga Beach Aug 26 2009
Agency or Company	Ainley & Associates	**East-West Street**	River Road West
Analysis Period	2026	**North-South Street**	Golf Course Road
Flow Conditions	Restricted flow (urban)	**Major Street**	River Road West
T Intersection	Yes	**Approach Lanes per Direction**	1
		Hours of Traffic Volume Data	AM & PM peaks only
Additional Comments	existing road configuration		

JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME

JUSTIFICATION	GUIDANCE	HOUR ENDING: AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak	No. of hours with compliance: 100%	80%+	
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	1436	863	863	863	863	863	863	2016	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	17	7	7	7	7	7	7	11	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 170 (full intersection) OR VOL x 100 / 255 (tee intersection)	7%	3%	3%	3%	3%	3%	3%	4%	0	0	3%
(RESTRICTED FLOW)	BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS											NO
SIGNAL JUSTIFICATION 1:	LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS											NO

JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC

JUSTIFICATION	GUIDANCE	HOUR ENDING: Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	No. of hours with compliance: 100%	80%+	
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	1419	856	856	856	856	856	856	2005	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 720 (1 lane approach on main road) OR VOL x 100 / 900 (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	14	6	6	6	6	6	6	11	100%	80%+	Average Compliance
	COMPLIANCE % VOL x 100 / 75	19%	8%	8%	8%	8%	8%	8%	15%	0	0	10%
(RESTRICTED FLOW)	BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS											NO
SIGNAL JUSTIFICATION 2:	LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS											NO

JUSTIFICATION 3 - COLLISION EXPERIENCE

	Preceeding Months	Number of Collisions	% Fulfillment
A. Number of reportable collisions susceptible to prevention by a traffic signal	1 - 12	-	-
	13 - 24	-	-
	25 - 36	-	-
	annual average	-	-
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency	☐ YES	☑ NO	0%
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more	☐ YES	☑ NO	0%
SIGNAL JUSTIFICATION 3: ALL OF 3A, 3B & 3C FULFILLED TO 100%?	NO		

JUSTIFICATION 4 - COMBINATION JUSTIFICATION

JUSTIFICATION SATISFIED 80% OR MORE			Two Justifications Satisfied 80% or more
Justification 1	Minimum Vehicle Volume	NO	NO
Justification 2	Delay to Cross Traffic	NO	
Justification 3	Collision Experience	-	

JUSTIFCATION SUMMARY

ARE TRAFFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION?	NO

APPENDIX V

Operational Analyses – Improvements

2011 Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	394	40	10	525	45	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3491			3536	1770	1583
Flt Permitted	1.00			0.94	0.95	1.00
Satd. Flow (perm)	3491			3321	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	428	43	11	571	49	26
RTOR Reduction (vph)	17	0	0	0	0	20
Lane Group Flow (vph)	454	0	0	582	49	6
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	10.5			10.5	6.4	6.4
Effective Green, g (s)	10.5			10.5	6.4	6.4
Actuated g/C Ratio	0.36			0.36	0.22	0.22
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1268			1207	392	351
v/s Ratio Prot	0.13				c0.03	
v/s Ratio Perm				c0.18		0.00
v/c Ratio	0.36			0.48	0.12	0.02
Uniform Delay, d1	6.7			7.1	9.0	8.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.2			0.3	0.1	0.0
Delay (s)	6.9			7.4	9.2	8.8
Level of Service	A			A	A	A
Approach Delay (s)	6.9			7.4	9.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	28.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	840	57	32	573	38	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3530	1770	1583
Flt Permitted	1.00			0.86	0.95	1.00
Satd. Flow (perm)	3505			3051	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	884	60	34	603	40	32
RTOR Reduction (vph)	10	0	0	0	0	26
Lane Group Flow (vph)	934	0	0	637	40	6
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	14.0			14.0	6.3	6.3
Effective Green, g (s)	14.0			14.0	6.3	6.3
Actuated g/C Ratio	0.43			0.43	0.20	0.20
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1519			1322	345	309
v/s Ratio Prot	c0.27				c0.02	
v/s Ratio Perm				0.21		0.00
v/c Ratio	0.61			0.48	0.12	0.02
Uniform Delay, d1	7.1			6.6	10.7	10.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			0.3	0.2	0.0
Delay (s)	7.8			6.8	10.9	10.5
Level of Service	A			A	B	B
Approach Delay (s)	7.8			6.8	10.7	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	32.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	380	33	7	453
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	32	413	36	8	492
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	692	224			449	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	692	224			449	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	96			99	
cM capacity (veh/h)	375	779			1108	

Direction, Lane #	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	130	275	174	172	328
Volume Left	99	0	0	8	0
Volume Right	32	0	36	0	0
cSH	429	1700	1700	1108	1700
Volume to Capacity	0.30	0.16	0.10	0.01	0.19
Queue Length 95th (m)	10.1	0.0	0.0	0.2	0.0
Control Delay (s)	17.0	0.0	0.0	0.4	0.0
Lane LOS	C			A	
Approach Delay (s)	17.0	0.0		0.1	
Approach LOS	C				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	26	735	111	24	671
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	774	117	25	706
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1236	445			891	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1236	445			891	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	95			97	
cM capacity (veh/h)	163	560			757	

Direction, Lane #	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	83	516	375	261	471
Volume Left	56	0	0	25	0
Volume Right	27	0	117	0	0
cSH	212	1700	1700	757	1700
Volume to Capacity	0.39	0.30	0.22	0.03	0.28
Queue Length 95th (m)	13.9	0.0	0.0	0.8	0.0
Control Delay (s)	32.5	0.0	0.0	1.3	0.0
Lane LOS	D			A	
Approach Delay (s)	32.5	0.0		0.5	
Approach LOS	D				

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	380	33	7	453
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	32	413	36	8	492
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	939	431			449	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	939	431			449	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	95			99	
cM capacity (veh/h)	291	624			1111	

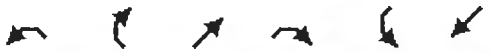
Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	130	449	8	492
Volume Left	99	0	8	0
Volume Right	32	36	0	0
cSH	334	1700	1111	1700
Volume to Capacity	0.39	0.26	0.01	0.29
Queue Length 95th (m)	14.3	0.0	0.2	0.0
Control Delay (s)	22.5	0.0	8.3	0.0
Lane LOS	C		A	
Approach Delay (s)	22.5	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	26	735	111	24	671
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	774	117	25	706
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1589	832			891	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1589	832			891	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	51	93			97	
cM capacity (veh/h)	115	369			761	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	83	891	25	706
Volume Left	56	0	25	0
Volume Right	27	117	0	0
cSH	148	1700	761	1700
Volume to Capacity	0.56	0.52	0.03	0.42
Queue Length 95th (m)	22.7	0.0	0.8	0.0
Control Delay (s)	56.6	0.0	9.9	0.0
Lane LOS	F		A	
Approach Delay (s)	56.6	0.0	0.3	
Approach LOS	F			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	380	33	7	453
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	32	413	36	8	492
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	939	431			449	
vC1, stage 1 conf vol	431					
vC2, stage 2 conf vol	508					
vCu, unblocked vol	939	431			449	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	95			99	
cM capacity (veh/h)	501	624			1111	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	130	449	8	492
Volume Left	99	0	8	0
Volume Right	32	36	0	0
cSH	526	1700	1111	1700
Volume to Capacity	0.25	0.26	0.01	0.29
Queue Length 95th (m)	7.8	0.0	0.2	0.0
Control Delay (s)	14.1	0.0	8.3	0.0
Lane LOS	B		A	
Approach Delay (s)	14.1	0.0	0.1	
Approach LOS	B			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	26	735	111	24	671
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	774	117	25	706
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1589	832			891	
vC1, stage 1 conf vol	832					
vC2, stage 2 conf vol	757					
vCu, unblocked vol	1589	832			891	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	93			97	
cM capacity (veh/h)	322	369			761	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	83	891	25	706
Volume Left	56	0	25	0
Volume Right	27	117	0	0
cSH	336	1700	761	1700
Volume to Capacity	0.25	0.52	0.03	0.42
Queue Length 95th (m)	7.7	0.0	0.8	0.0
Control Delay (s)	19.2	0.0	9.9	0.0
Lane LOS	C		A	
Approach Delay (s)	19.2	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

2016 Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	487	44	12	637	45	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3495			3536	1770	1583
Flt Permitted	1.00			0.94	0.95	1.00
Satd. Flow (perm)	3495			3314	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	529	48	13	692	49	30
RTOR Reduction (vph)	14	0	0	0	0	24
Lane Group Flow (vph)	563	0	0	705	49	6
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	11.8			11.8	6.4	6.4
Effective Green, g (s)	11.8			11.8	6.4	6.4
Actuated g/C Ratio	0.39			0.39	0.21	0.21
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1366			1295	375	335
v/s Ratio Prot	0.16				c0.03	
v/s Ratio Perm				c0.21		0.00
v/c Ratio	0.41			0.54	0.13	0.02
Uniform Delay, d1	6.7			7.1	9.6	9.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.2			0.5	0.2	0.0
Delay (s)	6.9			7.6	9.8	9.4
Level of Service	A			A	A	A
Approach Delay (s)	6.9			7.6	9.7	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	30.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	993	57	37	707	38	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3510			3530	1770	1583
Flt Permitted	1.00			0.85	0.95	1.00
Satd. Flow (perm)	3510			3006	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1045	60	39	744	40	35
RTOR Reduction (vph)	8	0	0	0	0	21
Lane Group Flow (vph)	1097	0	0	783	40	14
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	15.6			15.6	6.3	6.3
Effective Green, g (s)	15.6			15.6	6.3	6.3
Actuated g/C Ratio	0.46			0.46	0.19	0.19
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1615			1383	329	294
v/s Ratio Prot	c0.31				c0.02	
v/s Ratio Perm				0.26		0.01
v/c Ratio	0.68			0.57	0.12	0.05
Uniform Delay, d1	7.2			6.7	11.5	11.3
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.2			0.5	0.2	0.1
Delay (s)	8.3			7.2	11.7	11.4
Level of Service	A			A	B	B
Approach Delay (s)	8.3			7.2	11.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	33.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	94	57	520	33	17	525
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	62	565	36	18	571
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1191	583			601	
vC1, stage 1 conf vol	583					
vC2, stage 2 conf vol	608					
vCu, unblocked vol	1191	583			601	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	88			98	
cM capacity (veh/h)	421	512			976	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	164	601	589
Volume Left	102	0	18
Volume Right	62	36	0
cSH	451	1700	976
Volume to Capacity	0.36	0.35	0.02
Queue Length 95th (m)	13.1	0.0	0.5
Control Delay (s)	17.5	0.0	0.5
Lane LOS	C		A
Approach Delay (s)	17.5	0.0	0.5
Approach LOS	C		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	40	60	801	95	75	640
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	63	843	100	79	674
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1725	893			943	
vC1, stage 1 conf vol	893					
vC2, stage 2 conf vol	832					
vCu, unblocked vol	1725	893			943	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	81			89	
cM capacity (veh/h)	282	340			727	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	105	943	753
Volume Left	42	0	79
Volume Right	63	100	0
cSH	314	1700	727
Volume to Capacity	0.33	0.55	0.11
Queue Length 95th (m)	11.5	0.0	2.9
Control Delay (s)	22.1	0.0	2.8
Lane LOS	C		A
Approach Delay (s)	22.1	0.0	2.8
Approach LOS	C		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	475	33	7	560
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	32	516	36	8	609
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1158	534			552	
vC1, stage 1 conf vol	534					
vC2, stage 2 conf vol	624					
vCu, unblocked vol	1158	534			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	94			99	
cM capacity (veh/h)	432	546			1018	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	130	552	8	609
Volume Left	99	0	8	0
Volume Right	32	36	0	0
cSH	455	1700	1018	1700
Volume to Capacity	0.29	0.32	0.01	0.36
Queue Length 95th (m)	9.4	0.0	0.2	0.0
Control Delay (s)	16.1	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	16.1	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	26	880	111	24	820
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	926	117	25	863
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1898	985			1043	
vC1, stage 1 conf vol	985					
vC2, stage 2 conf vol	914					
vCu, unblocked vol	1898	985			1043	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	91			96	
cM capacity (veh/h)	264	301			667	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	83	1043	25	863
Volume Left	56	0	25	0
Volume Right	27	117	0	0
cSH	275	1700	667	1700
Volume to Capacity	0.30	0.61	0.04	0.51
Queue Length 95th (m)	9.9	0.0	0.9	0.0
Control Delay (s)	23.7	0.0	10.6	0.0
Lane LOS	C		B	
Approach Delay (s)	23.7	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	481	23	5	506	54	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	523	25	5	550	59	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			548		1096	535
vC1, stage 1 conf vol					535	
vC2, stage 2 conf vol					561	
vCu, unblocked vol			548		1096	535
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	97
cM capacity (veh/h)			1022		452	545

Direction, Lane #	NB 1	SB 1	SB 2	NW 1
Volume Total	548	5	550	77
Volume Left	0	5	0	59
Volume Right	25	0	0	18
cSH	1700	1022	1700	471
Volume to Capacity	0.32	0.01	0.32	0.16
Queue Length 95th (m)	0.0	0.1	0.0	4.6
Control Delay (s)	0.0	8.5	0.0	14.1
Lane LOS		A		B
Approach Delay (s)	0.0	0.1		14.1
Approach LOS				B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	853	90	19	824	20	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	898	95	20	867	21	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			993		1853	945
vC1, stage 1 conf vol					945	
vC2, stage 2 conf vol					907	
vCu, unblocked vol			993		1853	945
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		92	97
cM capacity (veh/h)			697		273	317

Direction, Lane #	NB 1	SB 1	SB 2	NW 1
Volume Total	993	20	867	32
Volume Left	0	20	0	21
Volume Right	95	0	0	11
cSH	1700	697	1700	286
Volume to Capacity	0.58	0.03	0.51	0.11
Queue Length 95th (m)	0.0	0.7	0.0	2.9
Control Delay (s)	0.0	10.3	0.0	19.1
Lane LOS		B		C
Approach Delay (s)	0.0	0.2		19.1
Approach LOS				C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

2026 Traffic Volumes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	673	53	14	833	45	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3500			3536	1770	1583
Flt Permitted	1.00			0.93	0.95	1.00
Satd. Flow (perm)	3500			3304	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	708	56	15	877	47	36
RTOR Reduction (vph)	12	0	0	0	0	29
Lane Group Flow (vph)	752	0	0	892	47	7
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	14.0			14.0	6.5	6.5
Effective Green, g (s)	14.0			14.0	6.5	6.5
Actuated g/C Ratio	0.43			0.43	0.20	0.20
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1508			1423	354	317
v/s Ratio Prot	0.21				c0.03	
v/s Ratio Perm				c0.27		0.00
v/c Ratio	0.50			0.63	0.13	0.02
Uniform Delay, d1	6.7			7.2	10.7	10.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			0.9	0.2	0.0
Delay (s)	7.0			8.1	10.9	10.5
Level of Service	A			A	B	B
Approach Delay (s)	7.0			8.1	10.7	
Approach LOS	A			A	B	

Intersection Summary				
HCM Average Control Delay	7.7	HCM Level of Service		A
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	32.5	Sum of lost time (s)		12.0
Intersection Capacity Utilization	46.3%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	706	7	2	826	18	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	743	7	2	869	19	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	166					
pX, platoon unblocked			0.68		0.68	0.68
vC, conflicting volume			751		1621	747
vC1, stage 1 conf vol					747	
vC2, stage 2 conf vol					874	
vCu, unblocked vol			390		1679	384
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	98
cM capacity (veh/h)			789		305	448

Direction, Lane #	NB 1	SB 1	SB 2	NW 1
Volume Total	751	2	889	27
Volume Left	0	2	0	19
Volume Right	7	0	0	8
cSH	1700	789	1700	338
Volume to Capacity	0.44	0.00	0.51	0.08
Queue Length 95th (m)	0.0	0.1	0.0	2.1
Control Delay (s)	0.0	9.6	0.0	16.6
Lane LOS		A		C
Approach Delay (s)	0.0	0.0		16.6
Approach LOS				C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	33	20	709	12	6	766
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	35	21	746	13	6	806
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1572	753			759	
vC1, stage 1 conf vol	753					
vC2, stage 2 conf vol	819					
vCu, unblocked vol	1572	753			759	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	95			99	
cM capacity (veh/h)	330	410			853	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	56	759	6	806
Volume Left	35	0	6	0
Volume Right	21	13	0	0
cSH	358	1700	853	1700
Volume to Capacity	0.16	0.45	0.01	0.47
Queue Length 95th (m)	4.4	0.0	0.2	0.0
Control Delay (s)	17.0	0.0	9.3	0.0
Lane LOS	C		A	
Approach Delay (s)	17.0	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	4	1	788	828	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	4	1	808	872	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1683	872	873			
vC1, stage 1 conf vol	872					
vC2, stage 2 conf vol	811					
vCu, unblocked vol	1683	872	873			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	308	350	773			

Direction, Lane #	SE 1	NE 1	NE 2	SW 1
Volume Total	6	1	808	873
Volume Left	2	1	0	0
Volume Right	4	0	0	1
cSH	335	773	1700	1700
Volume to Capacity	0.02	0.00	0.48	0.51
Queue Length 95th (m)	0.5	0.0	0.0	0.0
Control Delay (s)	16.0	9.7	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.0	0.0		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	23	11	706	9	2	771
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	12	743	9	2	812
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1564	748			753	
vC1, stage 1 conf vol	748					
vC2, stage 2 conf vol	816					
vCu, unblocked vol	1564	748			753	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	97			100	
cM capacity (veh/h)	332	412			857	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	36	753	2	812
Volume Left	24	0	2	0
Volume Right	12	9	0	0
cSH	355	1700	857	1700
Volume to Capacity	0.10	0.44	0.00	0.48
Queue Length 95th (m)	2.7	0.0	0.1	0.0
Control Delay (s)	16.3	0.0	9.2	0.0
Lane LOS	C		A	
Approach Delay (s)	16.3	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	36	17	702	14	3	765
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	38	18	739	15	3	805
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1558	746			754	
vC1, stage 1 conf vol	746					
vC2, stage 2 conf vol	812					
vCu, unblocked vol	1558	746			754	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	98			100	
cM capacity (veh/h)	334	413			856	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	56	754	3	805
Volume Left	38	0	3	0
Volume Right	18	15	0	0
cSH	356	1700	856	1700
Volume to Capacity	0.16	0.44	0.00	0.47
Queue Length 95th (m)	4.4	0.0	0.1	0.0
Control Delay (s)	17.0	0.0	9.2	0.0
Lane LOS	C		A	
Approach Delay (s)	17.0	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	94	57	718	33	17	698
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	99	60	756	35	18	735
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1544	773			791	
vC1, stage 1 conf vol	773					
vC2, stage 2 conf vol	771					
vCu, unblocked vol	1544	773			791	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	85			98	
cM capacity (veh/h)	334	399			830	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	159	791	18	735
Volume Left	99	0	18	0
Volume Right	60	35	0	0
cSH	356	1700	830	1700
Volume to Capacity	0.45	0.47	0.02	0.43
Queue Length 95th (m)	17.8	0.0	0.5	0.0
Control Delay (s)	23.1	0.0	9.4	0.0
Lane LOS	C		A	
Approach Delay (s)	23.1	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	32	20	768	32	17	780
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	34	21	808	34	18	800
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1659	823			840	
vC1, stage 1 conf vol	823					
vC2, stage 2 conf vol	836					
vCu, unblocked vol	1659	823			840	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	94			98	
cM capacity (veh/h)	310	373			795	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	55	840	18	800
Volume Left	34	0	18	0
Volume Right	21	34	0	0
cSH	331	1700	795	1700
Volume to Capacity	0.17	0.49	0.02	0.47
Queue Length 95th (m)	4.7	0.0	0.6	0.0
Control Delay (s)	18.0	0.0	9.6	0.0
Lane LOS	C		A	
Approach Delay (s)	18.0	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	8	5	782	3	2	765
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	5	823	3	2	805
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1634	825			825	
vC1, stage 1 conf vol	825					
vC2, stage 2 conf vol	809					
vCu, unblocked vol	1634	825			825	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	318	373			804	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	14	826	2	805
Volume Left	8	0	2	0
Volume Right	5	3	0	0
cSH	337	1700	804	1700
Volume to Capacity	0.04	0.48	0.00	0.47
Queue Length 95th (m)	1.0	0.0	0.1	0.0
Control Delay (s)	16.1	0.0	9.5	0.0
Lane LOS	C		A	
Approach Delay (s)	16.1	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	9	707	8	2	801
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	9	744	8	2	843
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			325			
pX, platoon unblocked	0.67	0.67			0.67	
vC, conflicting volume	1598	748			753	
vC1, stage 1 conf vol	748					
vC2, stage 2 conf vol	847					
vCu, unblocked vol	1643	375			382	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	98			100	
cM capacity (veh/h)	310	448			788	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	31	753	2	843
Volume Left	21	0	2	0
Volume Right	9	8	0	0
cSH	343	1700	788	1700
Volume to Capacity	0.09	0.44	0.00	0.50
Queue Length 95th (m)	2.3	0.0	0.1	0.0
Control Delay (s)	16.5	0.0	9.6	0.0
Lane LOS	C		A	
Approach Delay (s)	16.5	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	788	1	0	762
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	829	1	0	802
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1632	830			831	
vC1, stage 1 conf vol	830					
vC2, stage 2 conf vol	802					
vCu, unblocked vol	1632	830			831	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	319	370			802	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	3	831	0	802
Volume Left	2	0	0	0
Volume Right	1	1	0	0
cSH	334	1700	1700	1700
Volume to Capacity	0.01	0.49	0.00	0.47
Queue Length 95th (m)	0.2	0.0	0.0	0.0
Control Delay (s)	15.9	0.0	0.0	0.0
Lane LOS	C			
Approach Delay (s)	15.9	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	788	0	0	765
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	829	0	0	805
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1635	829			829	
vC1, stage 1 conf vol	829					
vC2, stage 2 conf vol	805					
vCu, unblocked vol	1635	829			829	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	319	370			802	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	2	829	0	805
Volume Left	1	0	0	0
Volume Right	1	0	0	0
cSH	342	1700	1700	1700
Volume to Capacity	0.01	0.49	0.00	0.47
Queue Length 95th (m)	0.1	0.0	0.0	0.0
Control Delay (s)	15.8	0.0	0.0	0.0
Lane LOS	C			
Approach Delay (s)	15.8	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	671	23	5	674	54	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	706	24	5	709	57	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			731		1438	718
vC1, stage 1 conf vol					718	
vC2, stage 2 conf vol					720	
vCu, unblocked vol			731		1438	718
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		84	96
cM capacity (veh/h)			874		360	429

Direction, Lane #	NB 1	SB 1	SB 2	NW 1
Volume Total	731	5	709	75
Volume Left	0	5	0	57
Volume Right	24	0	0	18
cSH	1700	874	1700	375
Volume to Capacity	0.43	0.01	0.42	0.20
Queue Length 95th (m)	0.0	0.1	0.0	5.8
Control Delay (s)	0.0	9.1	0.0	17.0
Lane LOS		A		C
Approach Delay (s)	0.0	0.1		17.0
Approach LOS				C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	7	4	786	3	1	753
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	4	827	3	1	793
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1624	829			831	
vC1, stage 1 conf vol	829					
vC2, stage 2 conf vol	795					
vCu, unblocked vol	1624	829			831	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	321	371			802	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	12	831	1	793
Volume Left	7	0	1	0
Volume Right	4	3	0	0
cSH	337	1700	802	1700
Volume to Capacity	0.03	0.49	0.00	0.47
Queue Length 95th (m)	0.9	0.0	0.0	0.0
Control Delay (s)	16.1	0.0	9.5	0.0
Lane LOS	C		A	
Approach Delay (s)	16.1	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	4	789	2	1	745
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	4	831	2	1	784
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1618	832			833	
vC1, stage 1 conf vol	832					
vC2, stage 2 conf vol	786					
vCu, unblocked vol	1618	832			833	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	322	369			800	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	12	833	1	784
Volume Left	7	0	1	0
Volume Right	4	2	0	0
cSH	337	1700	800	1700
Volume to Capacity	0.03	0.49	0.00	0.46
Queue Length 95th (m)	0.9	0.0	0.0	0.0
Control Delay (s)	16.0	0.0	9.5	0.0
Lane LOS	C		A	
Approach Delay (s)	16.0	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Volume (veh/h)	2	706	793	1	2	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	743	835	1	2	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	838				1583	836
vC1, stage 1 conf vol					835	
vC2, stage 2 conf vol					747	
vCu, unblocked vol	836				1583	835
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	98
cM capacity (veh/h)	798				328	367

Direction, Lane #	NB 1	NB 2	SB 1	SE 1
Volume Total	2	743	836	9
Volume Left	2	0	0	2
Volume Right	0	0	1	7
cSH	798	1700	1700	358
Volume to Capacity	0.00	0.44	0.49	0.03
Queue Length 95th (m)	0.1	0.0	0.0	0.7
Control Delay (s)	9.5	0.0	0.0	15.3
Lane LOS	A			C
Approach Delay (s)	0.0		0.0	15.3
Approach LOS				C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	1	707	2	0	787
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1	744	2	0	828
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1574	745			746	
vC1, stage 1 conf vol	745					
vC2, stage 2 conf vol	828					
vCu, unblocked vol	1574	745			746	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	331	414			862	

Direction, Lane #	WB 1	NE 1	SW 1	SW 2
Volume Total	5	746	0	828
Volume Left	4	0	0	0
Volume Right	1	2	0	0
cSH	344	1700	1700	1700
Volume to Capacity	0.02	0.44	0.00	0.49
Queue Length 95th (m)	0.4	0.0	0.0	0.0
Control Delay (s)	15.6	0.0	0.0	0.0
Lane LOS	C			
Approach Delay (s)	15.6	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	91	29	683	33	7	740
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	96	31	695	35	7	779
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1509	715			733	
vC1, stage 1 conf vol	715					
vC2, stage 2 conf vol	794					
vCu, unblocked vol	1509	715			733	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	93			99	
cM capacity (veh/h)	343	431			872	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	126	733	7	779
Volume Left	96	0	7	0
Volume Right	31	35	0	0
cSH	361	1700	872	1700
Volume to Capacity	0.35	0.43	0.01	0.46
Queue Length 95th (m)	12.3	0.0	0.2	0.0
Control Delay (s)	20.3	0.0	9.2	0.0
Lane LOS	C		A	
Approach Delay (s)	20.3	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	49	15	670	18	4	602
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	52	16	705	19	4	634
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1357	715			724	
vC1, stage 1 conf vol	715					
vC2, stage 2 conf vol	642					
vCu, unblocked vol	1357	715			724	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	96			100	
cM capacity (veh/h)	380	431			878	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	67	724	4	634
Volume Left	52	0	4	0
Volume Right	16	19	0	0
cSH	391	1700	878	1700
Volume to Capacity	0.17	0.43	0.00	0.37
Queue Length 95th (m)	4.9	0.0	0.1	0.0
Control Delay (s)	16.1	0.0	9.1	0.0
Lane LOS	C		A	
Approach Delay (s)	16.1	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	4	1	707	825	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	4	1	744	868	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1615	868	868			
vC1, stage 1 conf vol	868					
vC2, stage 2 conf vol	748					
vCu, unblocked vol	1615	868	868			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	321	352	776			

Direction, Lane #	SE 1	NE 1	NE 2	SW 1
Volume Total	5	1	744	868
Volume Left	1	1	0	0
Volume Right	4	0	0	0
cSH	345	776	1700	1700
Volume to Capacity	0.02	0.00	0.44	0.51
Queue Length 95th (m)	0.4	0.0	0.0	0.0
Control Delay (s)	15.8	9.6	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.8	0.0		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2026 AM +Imp

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	683	565	3	5	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	698	595	3	5	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)			341			
pX, platoon unblocked	0.78				0.78	0.78
vC, conflicting volume	598				1301	596
vC1, stage 1 conf vol					596	
vC2, stage 2 conf vol					704	
vCu, unblocked vol	345				1245	343
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	948				387	546

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	3	698	598	8
Volume Left	3	0	0	5
Volume Right	0	0	3	3
cSH	948	1700	1700	435
Volume to Capacity	0.00	0.41	0.35	0.02
Queue Length 95th (m)	0.1	0.0	0.0	0.5
Control Delay (s)	8.8	0.0	0.0	13.4
Lane LOS	A			B
Approach Delay (s)	0.0		0.0	13.4
Approach LOS				B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2026 AM +Imp

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	570	24	29	530	9	18	13	65	6	12	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util, Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1852		1770	1858		1770	1631		1770	1653	
Flt Permitted	0.30	1.00		0.24	1.00		0.72	1.00		0.70	1.00	
Satd. Flow (perm)	558	1852		450	1858		1347	1631		1311	1653	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	600	25	31	558	9	19	14	68	6	13	39
RTOR Reduction (vph)	0	3	0	0	1	0	0	45	0	0	26	0
Lane Group Flow (vph)	57	622	0	31	566	0	19	37	0	6	26	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.7	20.7		20.7	20.7		16.2	16.2		16.2	16.2	
Effective Green, g (s)	20.7	20.7		20.7	20.7		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.33	0.33		0.33	0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	236	784		190	787		446	540		434	548	
v/s Ratio Prot		c0.34			0.30			c0.02			0.02	
v/s Ratio Perm	0.10			0.07			0.01			0.00		
v/c Ratio	0.24	0.79		0.16	0.72		0.04	0.07		0.01	0.05	
Uniform Delay, d1	9.1	12.2		8.7	11.7		11.1	11.2		11.0	11.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	5.5		0.4	3.2		0.2	0.2		0.1	0.2	
Delay (s)	9.6	17.8		9.1	14.9		11.3	11.4		11.0	11.3	
Level of Service	A	B		A	B		B	B		B	B	
Approach Delay (s)		17.1			14.6			11.4			11.2	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	15.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	48.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	57.5%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
8: River Road W & Westbury Rd

2026 AM +Imp

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰↑	
Volume (vph)	651	36	31	507	56	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	1863	1583	1770	1863	1674	
Flt Permitted	1.00	1.00	0.20	1.00	0.98	
Satd. Flow (perm)	1863	1583	365	1863	1674	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	685	38	33	534	59	99
RTOR Reduction (vph)	0	11	0	0	65	0
Lane Group Flow (vph)	685	27	33	534	93	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	27.3	27.3	27.3	27.3	20.7	
Effective Green, g (s)	27.3	27.3	27.3	27.3	20.7	
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.34	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	848	720	166	848	578	
v/s Ratio Prot	c0.37			0.29	c0.06	
v/s Ratio Perm		0.02	0.09			
v/c Ratio	0.81	0.04	0.20	0.63	0.16	
Uniform Delay, d1	14.1	9.1	9.8	12.5	13.6	
Progression Factor	1.00	1.00	0.38	0.70	1.00	
Incremental Delay, d2	5.7	0.0	0.5	1.4	0.6	
Delay (s)	19.8	9.1	4.1	10.1	14.2	
Level of Service	B	A	A	B	B	
Approach Delay (s)	19.2			9.7	14.2	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: River Road W & Main Street

2026 AM +Imp

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations		↑↑↱			↰↑	↱	↰	↰↑		↰	↱	
Volume (vph)	47	661	17	4	525	217	15	17	10	212	9	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.94		1.00	0.85	
Flt Protected		1.00			1.00	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (prot)		3515			3538	1583	1770	1704		1770	1583	
Flt Permitted		0.88			0.95	1.00	0.95	0.97		0.95	1.00	
Satd. Flow (perm)		3089			3357	1583	1770	1704		1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	696	18	4	553	228	16	18	11	223	9	29
RTOR Reduction (vph)	0	3	0	0	0	154	0	6	0	0	17	0
Lane Group Flow (vph)	0	760	0	0	557	74	16	23	0	223	21	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	2		6		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		19.6			19.6	19.6	1.4	28.4		24.0	24.0	
Effective Green, g (s)		19.6			19.6	19.6	1.4	28.4		24.0	24.0	
Actuated g/C Ratio		0.33			0.33	0.33	0.02	0.47		0.40	0.40	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1009			1097	517	41	807		708	633	
v/s Ratio Prot							c0.01	0.01		c0.13		
v/s Ratio Perm		c0.25			0.17	0.05					0.01	
v/c Ratio		0.75			0.51	0.14	0.39	0.03		0.31	0.03	
Uniform Delay, d1		18.0			16.3	14.3	28.9	8.4		12.4	10.9	
Progression Factor		0.48			0.28	0.52	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5			0.3	0.1	8.0	0.1		1.2	0.1	
Delay (s)		11.2			4.6	7.6	34.9	8.5		13.5	11.0	
Level of Service		B			A	A	C	A		B	B	
Approach Delay (s)		11.2			5.5			17.9		13.2		
Approach LOS		B			A			B		B		

Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2026 AM +imp

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	37	774	26	49	759	41	55	3	32	14	4	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		1.00			0.99			0.95			0.94	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3515			3503			3262			3247	
Flt Permitted		0.88			0.83			0.80			0.86	
Satd. Flow (perm)		3084			2900			2678			2872	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	815	27	52	799	43	58	3	34	15	4	13
RTOR Reduction (vph)	0	5	0	0	7	0	0	21	0	0	8	0
Lane Group Flow (vph)	0	876	0	0	887	0	0	84	0	0	24	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		24.5			24.5			23.5			23.5	
Effective Green, g (s)		24.5			24.5			23.5			23.5	
Actuated g/C Ratio		0.41			0.41			0.39			0.39	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1259			1184			1049			1125	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.31			c0.03			0.01	
v/c Ratio		0.70			0.75			0.08			0.02	
Uniform Delay, d1		14.7			15.1			11.5			11.2	
Progression Factor		1.54			0.74			1.00			1.00	
Incremental Delay, d2		1.4			2.5			0.1			0.0	
Delay (s)		24.0			13.7			11.6			11.2	
Level of Service		C			B			B			B	
Approach Delay (s)		24.0			13.7			11.6			11.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

2026 AM +imp

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Volume (vph)	61	732	43	17	630	32	108	24	25	38	15	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	0.92		1.00	0.88	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3498			3510		1770	1720		1770	1639	
Flt Permitted		0.84			0.92		0.70	1.00		0.72	1.00	
Satd. Flow (perm)		2940			3232		1312	1720		1348	1639	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	771	45	18	663	34	114	25	26	40	16	65
RTOR Reduction (vph)	0	8	0	0	7	0	0	16	0	0	39	0
Lane Group Flow (vph)	0	872	0	0	708	0	114	35	0	40	42	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		23.8			23.8		24.2	24.2		24.2	24.2	
Effective Green, g (s)		23.8			23.8		24.2	24.2		24.2	24.2	
Actuated g/C Ratio		0.40			0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1166			1282		529	694		544	661	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.30			0.22		c0.09			0.03		
v/c Ratio		0.75			0.55		0.22	0.05		0.07	0.06	
Uniform Delay, d1		15.5			14.0		11.7	10.9		11.0	11.0	
Progression Factor		0.24			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3			0.5		0.9	0.1		0.3	0.2	
Delay (s)		6.1			14.5		12.6	11.0		11.3	11.1	
Level of Service		A			B		B	B		B	B	
Approach Delay (s)		6.1			14.5			12.1			11.2	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	809	4	2	604	13	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	852	4	2	636	14	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	293					
pX, platoon unblocked			0.64		0.64	0.64
vC, conflicting volume			858		1494	854
vC1, stage 1 conf vol					854	
vC2, stage 2 conf vol					640	
vCu, unblocked vol			491		1490	487
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	99
cM capacity (veh/h)			685		317	370

Direction, Lane #	EB 1	WB 1	WB 2	NW 1
Volume Total	856	2	636	18
Volume Left	0	2	0	14
Volume Right	4	0	0	4
cSH	1700	685	1700	328
Volume to Capacity	0.50	0.00	0.37	0.05
Queue Length 95th (m)	0.0	0.1	0.0	1.4
Control Delay (s)	0.0	10.3	0.0	16.6
Lane LOS		B		C
Approach Delay (s)	0.0	0.0		16.6
Approach LOS				C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	95	643	527	47	20	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	100	677	555	49	21	66
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	604				1458	579
vC1, stage 1 conf vol					579	
vC2, stage 2 conf vol					877	
vCu, unblocked vol	604				1458	579
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	90				93	87
cM capacity (veh/h)	974				319	515

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	100	677	604	87
Volume Left	100	0	0	21
Volume Right	0	0	49	66
cSH	974	1700	1700	448
Volume to Capacity	0.10	0.40	0.35	0.19
Queue Length 95th (m)	2.7	0.0	0.0	5.7
Control Delay (s)	9.1	0.0	0.0	15.0
Lane LOS	A			B
Approach Delay (s)	1.2		0.0	15.0
Approach LOS				B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	553	18	27	579	14	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	582	19	28	609	15	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			601		1258	592
vC1, stage 1 conf vol					592	
vC2, stage 2 conf vol					666	
vCu, unblocked vol			**601**		**1258**	**592**
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		95	90
cM capacity (veh/h)			976		399	506

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	601	28	609	66
Volume Left	0	28	0	15
Volume Right	19	0	0	52
cSH	1700	976	1700	478
Volume to Capacity	0.35	0.03	0.36	0.14
Queue Length 95th (m)	0.0	0.7	0.0	3.8
Control Delay (s)	0.0	8.8	0.0	13.7
Lane LOS		A		B
Approach Delay (s)	0.0	0.4		13.7
Approach LOS				B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1242	57	44	950	38	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3516			3531	1770	1583
Flt Permitted	1.00			0.83	0.95	1.00
Satd. Flow (perm)	3516			2952	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1307	60	46	1000	40	37
RTOR Reduction (vph)	5	0	0	0	0	25
Lane Group Flow (vph)	1362	0	0	1046	40	12
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	22.4			22.4	6.6	6.6
Effective Green, g (s)	22.4			22.4	6.6	6.6
Actuated g/C Ratio	0.55			0.55	0.16	0.16
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1921			1613	285	255
v/s Ratio Prot	c0.39				c0.02	
v/s Ratio Perm				0.35		0.01
v/c Ratio	0.71			0.65	0.14	0.05
Uniform Delay, d1	6.9			6.5	14.8	14.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.2			0.9	0.2	0.1
Delay (s)	8.1			7.4	15.0	14.6
Level of Service	A			A	B	B
Approach Delay (s)	8.1			7.4	14.8	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	41.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1260	20	9	990	10	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1326	21	9	1042	11	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	166					
pX, platoon unblocked			0.45		0.45	0.45
vC, conflicting volume			1347		2398	1337
vC1, stage 1 conf vol					1337	
vC2, stage 2 conf vol					1061	
vCu, unblocked vol			1163		3482	1140
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		91	93
cM capacity (veh/h)			272		120	111

Direction, Lane #	NB 1	SB 1	SB 2	NW 1
Volume Total	1347	9	1042	18
Volume Left	0	9	0	11
Volume Right	21	0	0	7
cSH	1700	272	1700	116
Volume to Capacity	0.79	0.03	0.61	0.15
Queue Length 95th (m)	0.0	0.9	0.0	4.2
Control Delay (s)	0.0	18.7	0.0	41.6
Lane LOS		C		E
Approach Delay (s)	0.0	0.2		41.6
Approach LOS				E

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	14	21	1142	33	26	975
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	22	1202	35	27	1029
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2304	1219			1237	
vC1, stage 1 conf vol	1219					
vC2, stage 2 conf vol	1084					
vCu, unblocked vol	2304	1219			1237	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	90			95	
cM capacity (veh/h)	204	220			563	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	37	1237	27	1029
Volume Left	15	0	27	0
Volume Right	22	35	0	0
cSH	213	1700	563	1700
Volume to Capacity	0.17	0.73	0.05	0.61
Queue Length 95th (m)	4.9	0.0	1.2	0.0
Control Delay (s)	25.4	0.0	11.7	0.0
Lane LOS	D		B	
Approach Delay (s)	25.4	0.0	0.3	
Approach LOS	D			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	2	2	4	1146	924	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	4	1206	973	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2189	975	977			
vC1, stage 1 conf vol	975					
vC2, stage 2 conf vol	1215					
vCu, unblocked vol	2189	975	977			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	220	305	706			

Direction, Lane #	SE 1	NE 1	NE 2	SW 1
Volume Total	4	4	1206	977
Volume Left	2	4	0	0
Volume Right	2	0	0	4
cSH	256	706	1700	1700
Volume to Capacity	0.02	0.01	0.71	0.57
Queue Length 95th (m)	0.4	0.1	0.0	0.0
Control Delay (s)	19.3	10.1	0.0	0.0
Lane LOS	C	B		
Approach Delay (s)	19.3	0.0		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	9	1213	28	12	983
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	9	1277	27	13	1035
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2351	1291			1304	
vC1, stage 1 conf vol	1291					
vC2, stage 2 conf vol	1060					
vCu, unblocked vol	2351	1291			1304	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	95			98	
cM capacity (veh/h)	198	200			531	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	24	1304	13	1035
Volume Left	15	0	13	0
Volume Right	9	27	0	0
cSH	199	1700	531	1700
Volume to Capacity	0.12	0.77	0.02	0.61
Queue Length 95th (m)	3.3	0.0	0.6	0.0
Control Delay (s)	25.6	0.0	11.9	0.0
Lane LOS	D		B	
Approach Delay (s)	25.6	0.0	0.1	
Approach LOS	D			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	14	1189	41	19	971
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	15	1231	43	20	1022
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2314	1252			1274	
vC1, stage 1 conf vol	1252					
vC2, stage 2 conf vol	1062					
vCu, unblocked vol	2314	1252			1274	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	93			96	
cM capacity (veh/h)	203	210			545	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	37	1274	20	1022
Volume Left	22	0	20	0
Volume Right	15	43	0	0
cSH	206	1700	545	1700
Volume to Capacity	0.18	0.75	0.04	0.60
Queue Length 95th (m)	5.1	0.0	0.9	0.0
Control Delay (s)	26.3	0.0	11.9	0.0
Lane LOS	D		B	
Approach Delay (s)	26.3	0.0	0.2	
Approach LOS	D			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	40	60	1009	95	75	873
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	63	1062	100	79	919
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2189	1112			1162	
vC1, stage 1 conf vol	1112					
vC2, stage 2 conf vol	1077					
vCu, unblocked vol	2189	1112			1162	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	75			87	
cM capacity (veh/h)	208	254			601	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	105	1162	79	919
Volume Left	42	0	79	0
Volume Right	63	100	0	0
cSH	233	1700	601	1700
Volume to Capacity	0.45	0.68	0.13	0.54
Queue Length 95th (m)	17.4	0.0	3.6	0.0
Control Delay (s)	32.5	0.0	11.9	0.0
Lane LOS	D		B	
Approach Delay (s)	32.5	0.0	0.9	
Approach LOS	D			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	31	46	1046	48	38	948
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	33	48	1101	51	40	998
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2204	1126			1152	
vC1, stage 1 conf vol	1126					
vC2, stage 2 conf vol	1078					
vCu, unblocked vol	2204	1126			1152	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	81			93	
cM capacity (veh/h)	215	249			607	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	81	1152	40	998
Volume Left	33	0	40	0
Volume Right	48	51	0	0
cSH	234	1700	607	1700
Volume to Capacity	0.35	0.68	0.07	0.59
Queue Length 95th (m)	11.8	0.0	1.7	0.0
Control Delay (s)	28.3	0.0	11.4	0.0
Lane LOS	D		B	
Approach Delay (s)	28.3	0.0	0.4	
Approach LOS	D			

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	4	5	1080	9	7	981
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	5	1137	9	7	1033
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2189	1142			1146	
vC1, stage 1 conf vol	1142					
vC2, stage 2 conf vol	1047					
vCu, unblocked vol	2189	1142			1146	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	223	244			609	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	9	1146	7	1033
Volume Left	4	0	7	0
Volume Right	5	9	0	0
cSH	234	1700	609	1700
Volume to Capacity	0.04	0.67	0.01	0.61
Queue Length 95th (m)	1.0	0.0	0.3	0.0
Control Delay (s)	21.0	0.0	11.0	0.0
Lane LOS	C		B	
Approach Delay (s)	21.0	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	8	1239	22	10	987
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	8	1304	23	11	1039
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			329			
pX, platoon unblocked	0.44	0.44			0.44	
vC, conflicting volume	2378	1316			1327	
vC1, stage 1 conf vol	1316					
vC2, stage 2 conf vol	1060					
vCu, unblocked vol	3512	1077			1103	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	93			98	
cM capacity (veh/h)	123	116			275	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	20	1327	11	1039
Volume Left	12	0	11	0
Volume Right	8	23	0	0
cSH	120	1700	275	1700
Volume to Capacity	0.17	0.78	0.04	0.61
Queue Length 95th (m)	4.6	0.0	1.0	0.0
Control Delay (s)	41.0	0.0	18.6	0.0
Lane LOS	E		C	
Approach Delay (s)	41.0	0.0	0.2	
Approach LOS	E			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	1084	2	2	990
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	1141	2	2	1042
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2188	1142			1143	
vC1, stage 1 conf vol	1142					
vC2, stage 2 conf vol	1046					
vCu, unblocked vol	2188	1142			1143	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	224	244			611	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	2	1143	2	1042
Volume Left	1	0	2	0
Volume Right	1	2	0	0
cSH	234	1700	611	1700
Volume to Capacity	0.01	0.67	0.00	0.61
Queue Length 95th (m)	0.2	0.0	0.1	0.0
Control Delay (s)	20.6	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	20.6	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	1	1	1086	1	1	990
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	1143	1	1	1042
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2186	1144			1144	
vC1, stage 1 conf vol	1144					
vC2, stage 2 conf vol	1044					
vCu, unblocked vol	2188	1144			1144	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	224	243			611	

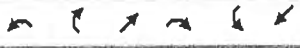
Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	2	1144	1	1042
Volume Left	1	0	1	0
Volume Right	1	1	0	0
cSH	233	1700	611	1700
Volume to Capacity	0.01	0.67	0.00	0.61
Queue Length 95th (m)	0.2	0.0	0.0	0.0
Control Delay (s)	20.8	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	20.8	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1073	90	19	1097	20	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1129	95	20	1155	21	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1224		2372	1177
vC1, stage 1 conf vol					1177	
vC2, stage 2 conf vol					1195	
vCu, unblocked vol			1224		2372	1177
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		89	95
cM capacity (veh/h)			569		197	233

Direction, Lane #	NB 1	SB 1	SB 2	NW 1
Volume Total	1224	20	1155	32
Volume Left	0	20	0	21
Volume Right	95	0	0	11
cSH	1700	569	1700	208
Volume to Capacity	0.72	0.04	0.68	0.15
Queue Length 95th (m)	0.0	0.9	0.0	4.2
Control Delay (s)	0.0	11.6	0.0	25.4
Lane LOS		B		D
Approach Delay (s)	0.0	0.2		25.4
Approach LOS				D

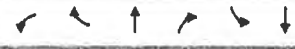
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	3	5	1075	7	5	988
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	5	1132	7	5	1040
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2186	1135			1139	
vC1, stage 1 conf vol	1135					
vC2, stage 2 conf vol	1051					
vCu, unblocked vol	2186	1135			1139	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	224	248			613	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	8	1139	5	1040
Volume Left	3	0	5	0
Volume Right	5	7	0	0
cSH	237	1700	613	1700
Volume to Capacity	0.04	0.67	0.01	0.61
Queue Length 95th (m)	0.9	0.0	0.2	0.0
Control Delay (s)	20.7	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	20.7	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	4	1073	7	5	991
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	4	1129	7	5	1043
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2187	1133			1137	
vC1, stage 1 conf vol	1133					
vC2, stage 2 conf vol	1054					
vCu, unblocked vol	2187	1133			1137	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	224	247			615	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	7	1137	5	1043
Volume Left	3	0	5	0
Volume Right	4	7	0	0
cSH	238	1700	615	1700
Volume to Capacity	0.03	0.67	0.01	0.61
Queue Length 95th (m)	0.8	0.0	0.2	0.0
Control Delay (s)	20.7	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	20.7	0.0	0.1	
Approach LOS	C			

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	66.9%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Volume (veh/h)	8	1101	1083	2	2	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	1159	1140	2	2	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1142				2317	1141
vC1, stage 1 conf vol					1141	
vC2, stage 2 conf vol					1176	
vCu, unblocked vol	1142				2317	1141
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	98
cM capacity (veh/h)	612				206	244

Direction, Lane #	NB 1	NB 2	SB 1	SE 1
Volume Total	8	1159	1142	6
Volume Left	8	0	0	2
Volume Right	0	0	2	4
cSH	612	1700	1700	230
Volume to Capacity	0.01	0.68	0.67	0.03
Queue Length 95th (m)	0.3	0.0	0.0	0.7
Control Delay (s)	11.0	0.0	0.0	21.1
Lane LOS	B			C
Approach Delay (s)	0.1		0.0	21.1
Approach LOS				C

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	67.9%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	2	1	1153	5	1	1082
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	1214	5	1	1139
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2357	1216			1216	
vC1, stage 1 conf vol	1216					
vC2, stage 2 conf vol	1141					
vCu, unblocked vol	2357	1216			1219	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	202	221			572	

Direction, Lane #	WB 1	NE 1	SW 1	SW 2
Volume Total	3	1219	1	1139
Volume Left	2	0	1	0
Volume Right	1	5	0	0
cSH	208	1700	572	1700
Volume to Capacity	0.02	0.72	0.00	0.67
Queue Length 95th (m)	0.4	0.0	0.0	0.0
Control Delay (s)	22.6	0.0	11.3	0.0
Lane LOS	C		B	
Approach Delay (s)	22.6	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	53	26	1108	111	24	1092
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	27	1164	117	25	1149
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2423	1223			1281	
vC1, stage 1 conf vol	1223					
vC2, stage 2 conf vol	1200					
vCu, unblocked vol	2423	1223			1281	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	87			95	
cM capacity (veh/h)	190	219			542	

Direction, Lane #	NW 1	NE 1	SW 1	SW 2
Volume Total	83	1281	25	1149
Volume Left	56	0	25	0
Volume Right	27	117	0	0
cSH	199	1700	542	1700
Volume to Capacity	0.42	0.75	0.05	0.68
Queue Length 95th (m)	15.3	0.0	1.2	0.0
Control Delay (s)	35.8	0.0	12.0	0.0
Lane LOS	E		B	
Approach Delay (s)	35.8	0.0	0.3	
Approach LOS	E			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	14	1002	60	13	935
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	15	1055	63	14	984
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2098	1086			1118	
vC1, stage 1 conf vol	1086					
vC2, stage 2 conf vol	1012					
vCu, unblocked vol	2098	1086			1118	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	94			98	
cM capacity (veh/h)	235	263			625	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	45	1118	14	984
Volume Left	31	0	14	0
Volume Right	15	63	0	0
cSH	243	1700	625	1700
Volume to Capacity	0.19	0.66	0.02	0.58
Queue Length 95th (m)	5.3	0.0	0.5	0.0
Control Delay (s)	23.1	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	23.1	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	1	2	5	1204	1122	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	5	1267	1181	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2459	1182	1182			
vC1, stage 1 conf vol	1182					
vC2, stage 2 conf vol	1278					
vCu, unblocked vol	2459	1182	1182			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	189	231	591			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	3	1273	1182
Volume Left	1	5	0
Volume Right	2	0	1
cSH	215	591	1700
Volume to Capacity	0.01	0.01	0.70
Queue Length 95th (m)	0.4	0.2	0.0
Control Delay (s)	22.0	0.4	0.0
Lane LOS	C	A	
Approach Delay (s)	22.0	0.4	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: River Road W & Beck Street

2026 PM+Imp

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	905	884	3	6	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	953	931	3	6	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)			341			
pX, platoon unblocked	0.58				0.58	0.58
vC, conflicting volume	934				1904	932
vC1, stage 1 conf vol					932	
vC2, stage 2 conf vol					972	
vCu, unblocked vol	527				2193	524
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	97
cM capacity (veh/h)	605				239	322

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	9	953	934	15
Volume Left	9	0	0	6
Volume Right	0	0	3	9
cSH	605	1700	1700	280
Volume to Capacity	0.02	0.56	0.55	0.05
Queue Length 95th (m)	0.4	0.0	0.0	1.3
Control Delay (s)	11.0	0.0	0.0	18.6
Lane LOS	B			C
Approach Delay (s)	0.1		0.0	18.6
Approach LOS				C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: River Road W & Access Road

2026 PM+Imp

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	825	15	86	815	7	21	19	61	5	35	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.89		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1858		1770	1860		1770	1650		1770	1670	
Flt Permitted	0.13	1.00		0.13	1.00		0.66	1.00		0.70	1.00	
Satd. Flow (perm)	249	1858		249	1860		1288	1650		1308	1670	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	868	16	91	858	7	22	20	64	5	37	82
RTOR Reduction (vph)	0	1	0	0	0	0	0	46	0	0	59	0
Lane Group Flow (vph)	59	883	0	91	865	0	22	38	0	5	60	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	29.9	29.9		29.9	29.9		16.1	16.1		16.1	16.1	
Effective Green, g (s)	29.9	29.9		29.9	29.9		16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	128	958		128	959		352	458		363	464	
v/s Ratio Prot		c0.48			0.46			0.02			c0.04	
v/s Ratio Perm	0.24			0.37			0.02			0.00		
v/c Ratio	0.46	0.92		0.71	0.90		0.06	0.08		0.01	0.13	
Uniform Delay, d1	8.9	13.0		10.7	12.7		15.4	15.5		15.2	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	13.9		17.0	11.5		0.3	0.4		0.1	0.6	
Delay (s)	11.5	26.8		27.7	24.2		15.7	15.8		15.3	16.3	
Level of Service	B	C		C	C		B	B		B	B	
Approach Delay (s)		25.9			24.5			15.8			16.2	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	24.2	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.84				
Actuated Cycle Length (s)	58.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
8: River Road W & Westbury Rd

2026 PM+Imp

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Volume (vph)	753	104	69	815	85	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	1863	1583	1770	1863	1705	
Flt Permitted	1.00	1.00	0.22	1.00	0.97	
Satd. Flow (perm)	1863	1583	409	1863	1705	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	793	109	73	858	89	53
RTOR Reduction (vph)	0	18	0	0	28	0
Lane Group Flow (vph)	793	91	73	858	95	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	61.3	61.3	61.3	61.3	26.7	
Effective Green, g (s)	61.3	61.3	61.3	61.3	26.7	
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.27	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1142	970	251	1142	455	
v/s Ratio Prot	0.43			c0.46	c0.06	
v/s Ratio Perm		0.06	0.18			
v/c Ratio	0.69	0.09	0.29	0.75	0.21	
Uniform Delay, d1	13.0	7.9	9.1	13.9	28.5	
Progression Factor	1.00	1.00	0.57	0.93	1.00	
Incremental Delay, d2	1.9	0.0	0.6	2.6	1.0	
Delay (s)	14.9	8.0	5.7	15.4	29.5	
Level of Service	B	A	A	B	C	
Approach Delay (s)	14.1			14.6	29.5	
Approach LOS	B			B	C	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: River Road W & Main Street

2026 PM+Imp

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations		↑↑			↑↑	↱	↰	↰		↰	↱	
Volume (vph)	90	651	16	13	723	337	20	23	9	436	53	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.96		1.00	0.85	
Flt Protected		0.99			1.00	1.00	0.95	0.96		0.95	1.00	
Satd. Flow (prot)		3507			3536	1583	1770	1724		1770	1583	
Flt Permitted		0.64			0.93	1.00	0.95	0.96		0.95	1.00	
Satd. Flow (perm)		2248			3303	1583	1770	1724		1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	685	17	14	761	355	21	24	9	459	56	88
RTOR Reduction (vph)	0	2	0	0	0	217	0	5	0	0	49	0
Lane Group Flow (vph)	0	795	0	0	775	138	21	28	0	459	95	0
Turn Type	Perm			Perm		Perm	Prot				Perm	
Protected Phases		4			8		5	21		61		
Permitted Phases	4			8		8					6	
Actuated Green, G (s)		38.8			38.8	38.8	2.8	49.2		43.4	43.4	
Effective Green, g (s)		38.8			38.8	38.8	2.8	49.2		43.4	43.4	
Actuated g/C Ratio		0.39			0.39	0.39	0.03	0.49		0.43	0.43	
Clearance Time (s)		6.0			6.0	6.0	3.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		872			1282	614	50	848		768	687	
v/s Ratio Prot							c0.01	0.02		c0.26		
v/s Ratio Perm		c0.35			0.23	0.09					0.06	
v/c Ratio		0.91			0.60	0.22	0.42	0.03		0.60	0.14	
Uniform Delay, d1		29.0			24.5	20.5	47.8	13.1		21.6	17.0	
Progression Factor		0.93			0.77	0.42	1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.5			0.6	0.1	5.6	0.1		3.4	0.4	
Delay (s)		38.5			19.4	8.7	53.4	13.2		25.0	17.5	
Level of Service		D			B	A	D	B		C	B	
Approach Delay (s)		38.5			16.0			28.8		23.2		
Approach LOS		D			B			C		C		

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: River Road W & Promenade Mews

2026 PM+Imp

Movement	SBL	SBT	SBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	38	966	39	82	1082	80	94	9	88	31	8	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.94			0.90	
Flt Protected		1.00			1.00			0.97			0.99	
Satd. Flow (prot)		3513			3493			3236			3142	
Flt Permitted		0.84			0.73			0.75			0.84	
Satd. Flow (perm)		2967			2564			2487			2670	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	1020	41	86	1118	84	99	9	72	33	8	83
RTOR Reduction (vph)	0	3	0	0	6	0	0	55	0	0	64	0
Lane Group Flow (vph)	0	1098	0	0	1282	0	0	125	0	0	60	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		64.9			64.9			23.1			23.1	
Effective Green, g (s)		64.9			64.9			23.1			23.1	
Actuated g/C Ratio		0.65			0.65			0.23			0.23	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1926			1664			574			617	
v/s Ratio Prot												
v/s Ratio Perm		0.37			c0.50			c0.05			0.02	
v/c Ratio		0.57			0.77			0.22			0.10	
Uniform Delay, d1		9.8			12.3			31.1			30.2	
Progression Factor		0.77			0.68			1.00			1.00	
Incremental Delay, d2		0.3			2.1			0.8			0.3	
Delay (s)		7.8			10.2			32.0			30.6	
Level of Service		A			B			C			C	
Approach Delay (s)		7.8			10.2			32.0			30.6	
Approach LOS		A			B			C			C	

Intersection Summary				
HCM Average Control Delay	11.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: River Road W & Zoo Park Road

2026 PM+Imp

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Volume (vph)	113	877	122	13	958	39	110	26	6	38	16	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.97		1.00	0.87	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3464			3516		1770	1812		1770	1620	
Flt Permitted		0.65			0.93		0.67	1.00		0.74	1.00	
Satd. Flow (perm)		2257			3278		1256	1812		1370	1620	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	923	128	14	1008	41	116	27	6	38	17	112
RTOR Reduction (vph)	0	11	0	0	3	0	0	5	0	0	86	0
Lane Group Flow (vph)	0	1159	0	0	1060	0	116	28	0	38	43	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		64.9			64.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)		64.9			64.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio		0.65			0.65		0.23	0.23		0.23	0.23	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1465			2127		290	419		316	374	
v/s Ratio Prot								0.02			0.03	
v/s Ratio Perm		c0.51			0.32		c0.09			0.03		
v/c Ratio		0.79			0.50		0.40	0.07		0.12	0.11	
Uniform Delay, d1		12.7			9.1		32.6	30.0		30.4	30.4	
Progression Factor		0.44			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.7			0.2		4.1	0.3		0.8	0.6	
Delay (s)		8.2			9.3		36.7	30.4		31.2	31.0	
Level of Service		A			A		D	C		C	C	
Approach Delay (s)		8.2			9.3			35.3			31.0	
Approach LOS		A			A			D			C	

Intersection Summary				
HCM Average Control Delay	11.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
20: River Road W & Golf Course Rd

2026 PM+imp

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	908	16	3	1080	10	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	954	17	3	1137	11	
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	293					
pX, platoon unblocked			0.65		0.65	0.65
vC, conflicting volume			971		2105	962
vC1, stage 1 conf vol					962	
vC2, stage 2 conf vol					1143	
vCu, unblocked vol			687		2429	675
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	100
cM capacity (veh/h)			591		213	298

Direction, Lane #	EB 1	WB 1	WB 2	NW 1
Volume Total	971	3	1137	12
Volume Left	0	3	0	11
Volume Right	17	0	0	1
cSH	1700	591	1700	218
Volume to Capacity	0.57	0.01	0.67	0.05
Queue Length 95th (m)	0.0	0.1	0.0	1.3
Control Delay (s)	0.0	11.1	0.0	22.4
Lane LOS		B		C
Approach Delay (s)	0.0	0.0		22.4
Approach LOS				C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: River Road W & Theme Park Rd

2026 PM+imp

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	108	761	910	21	21	142
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	114	801	958	22	22	149
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	980				1997	969
vC1, stage 1 conf vol					969	
vC2, stage 2 conf vol					1028	
vCu, unblocked vol	980				1997	969
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	84				90	51
cM capacity (veh/h)	704				227	308

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	114	801	980	172
Volume Left	114	0	0	22
Volume Right	0	0	22	149
cSH	704	1700	1700	294
Volume to Capacity	0.16	0.47	0.58	0.58
Queue Length 95th (m)	4.6	0.0	0.0	27.5
Control Delay (s)	11.1	0.0	0.0	33.0
Lane LOS	B			D
Approach Delay (s)	1.4		0.0	33.0
Approach LOS				D

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

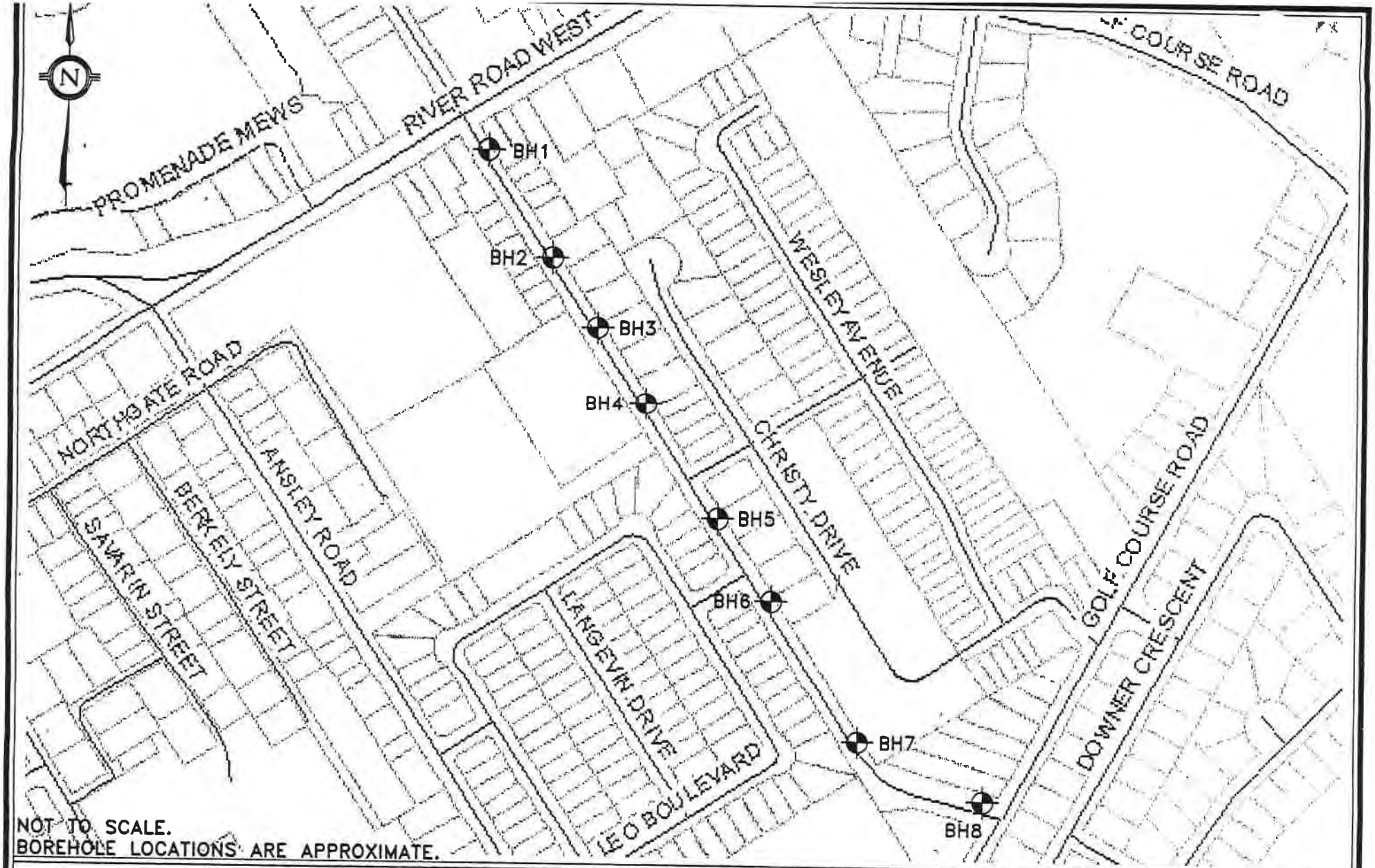
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	689	8	66	787	14	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	725	8	69	828	15	36
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			734		1697	729
vC1, stage 1 conf vol					729	
vC2, stage 2 conf vol					967	
vCu, unblocked vol			734		1697	729
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			92		95	92
cM capacity (veh/h)			871		283	423

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	734	69	828	51
Volume Left	0	69	0	15
Volume Right	8	0	0	36
cSH	1700	871	1700	370
Volume to Capacity	0.43	0.08	0.49	0.14
Queue Length 95th (m)	0.0	2.1	0.0	3.8
Control Delay (s)	0.0	9.5	0.0	16.3
Lane LOS		A		C
Approach Delay (s)	0.0	0.7		16.3
Approach LOS				C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX F

Previous Geotechnical Investigations



MARCH 2009

BOREHOLE LOCATION PLAN

3-09-5004

Terraprobe

FIGURE 2

Terraprobe

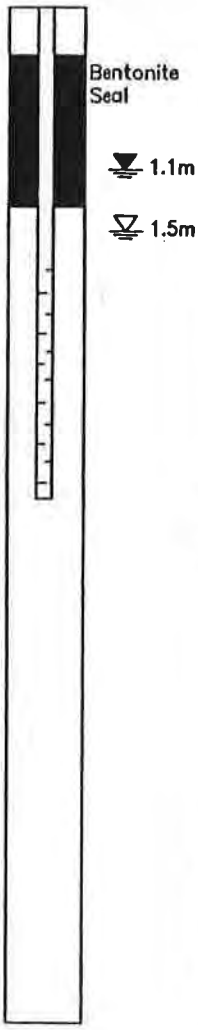
LOG OF BOREHOLE ..1..

PROJECT NAME: Zoo Park Road
PROJECT No.: 3-09-5004
CLIENT: Ainley & Associates Ltd
BORING DATE: February 11, 2009
LOCATION: Wasaga Beach, Ontario
ELEVATION DATUM: Geodetic

BORING METHOD: D50 Crawler-mounted Drill Rig / Solid Stem Augers

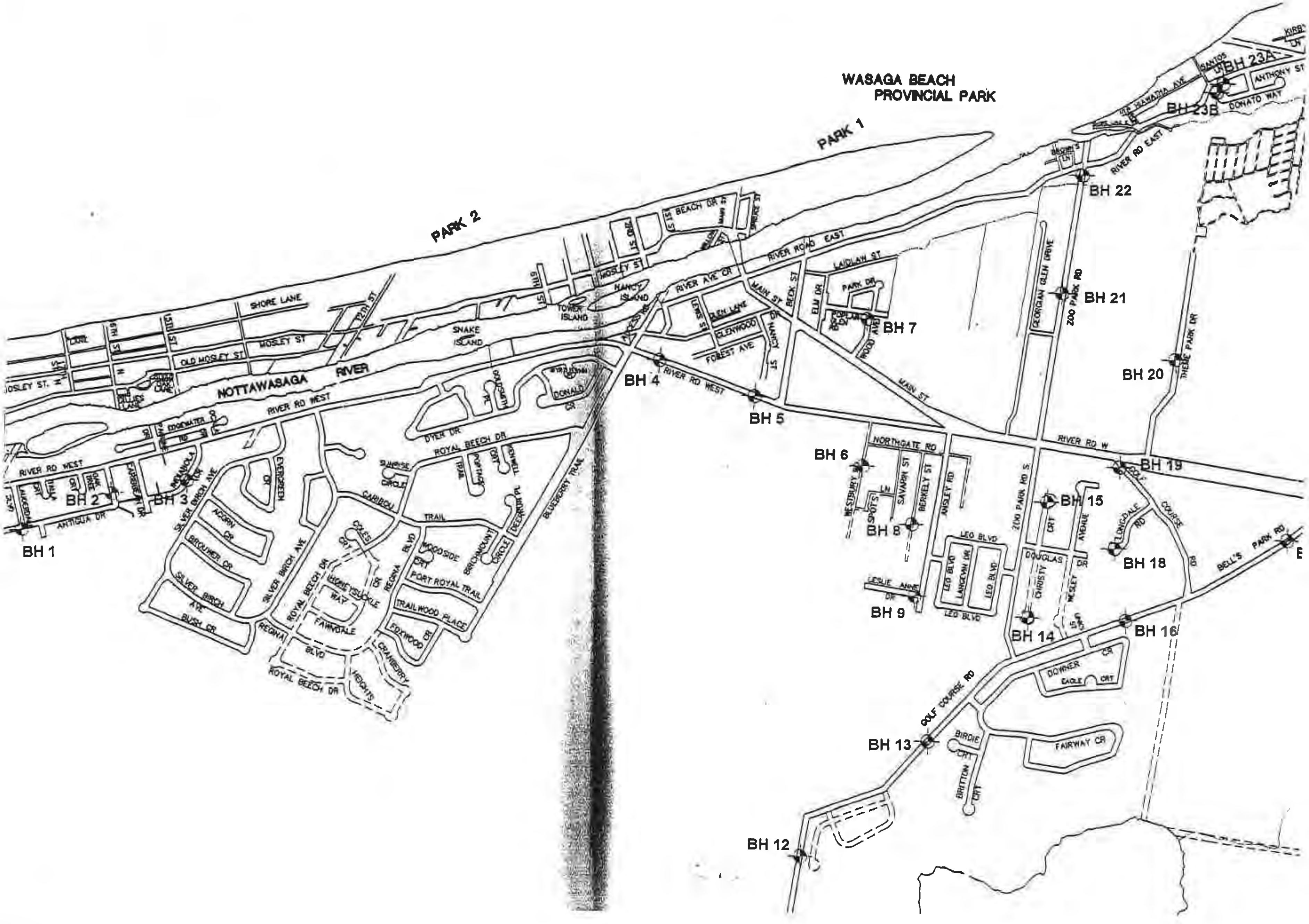
DEPTH SCALE IN METRES	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	"N" VALUE	PENETRATION RESISTANCE PLOT 20 40 60 80 / SHEAR STRENGTH kPa nat.V - + rem.V - ⊕ Q - ● U - ○ 20 40 60 80	WATER CONTENT (%) 10 20 30
	GROUND SURFACE		187.3					
0	75mm - Asphalt 300mm - SAND & GRAVEL, some silt, FILL Brown Loose Moist		0.0	1	AS			
1	SAND, some silt, trace gravel, FILL		185.9	2	SS	7	x	
	Brown to Dark Grey Loose to Compact Wet		1.4	3	SS	5	x	
2	SAND, some silt, trace shells			4	SS	18	x	
3				5	SS	25	x	
4								
5				6	SS	22	x	
6								
				7	SS	21	x	
			180.7					
	End of Borehole		6.6					
7								
8								
9								

INSTALLATION INFORMATION



1. Borehole caved and water level noted at 1.5m upon completion of drilling.

2. Water level on February 19, 2009 measured at 1.1m (elev. 186.2m).


WASAGA BEACH
PROVINCIAL PARK
PARK 1
PARK 2
NOTTAWASAGA RIVER
SNAKE ISLAND
TOWER ISLAND
NANCY ISLAND
RIVER RD WEST
RIVER ROAD EAST
RIVER RD EAST
RIVER RD W
MAIN ST
ZOO PARK RD
ZOO PARK RD S
GEORGIAN GLEN DRIVE
THEME PARK DR
GOLF COURSE RD
BELL'S PARK RD
BLUEBERRY TRAIL
ROYAL BEACH DR
SILVER BIRCH AVE
SHORE LANE
MOSLEY ST
OLD MOSLEY ST
BEACH DR
LAIDLAW ST
BECK ST
NORTHGATE RD
LEO BLVD
FAIRWAY CR
DOWNER CR
BH 1
BH 2
BH 3
BH 4
BH 5
BH 6
BH 7
BH 8
BH 9
BH 12
BH 13
BH 14
BH 15
BH 16
BH 18
BH 19
BH 20
BH 21
BH 22
BH 23A
BH 23B

Terraprobe

LOG OF BOREHOLE ..4..

PROJECT NAME: East End Servicing
PROJECT No.: 02709
CLIENT: Town of Wasaga Beach
BORING DATE: March 11, 2002
LOCATION: Wasaga Beach, Ontario
ELEVATION DATUM: Geodetic

BORING METHOD: D90 Truck-mounted Drill Rig / 108mm Diameter Solid Stem Augers

DEPTH SCALE IN METRES: 0 1 2 3 4 5 6 7 8 9

DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	"N" VALUE	PENETRATION RESISTANCE PLOT (20 40 60 80) / SHEAR STRENGTH kPa (nat.V – +, rem.V – ⊕, Q – ●, U – ○) (20 40 60 80)	WATER CONTENT (%) (10 20 30)	INSTALLATION INFORMATION
GROUND SURFACE		182.2						
Brown Very Dense Dry SAND & GRAVEL, fill		0.0 181.8	1	SS	50/150mm			
Brown Loose to Dense Dry to Wet		0.4						
SAND, medium to fine, trace to some silt, stratified at 1.6m, organics noted at 3 to 3.5m and 4.5 to 5m.			2	SS	7	x		
			3	SS	27	x		
			4	SS	21	x		
			5	SS	11	x		
			6	SS	27	x		
			7	SS	39	x		
		175.6						
End of Borehole		6.6						

1. Borehole caved and water level noted at 1.5m upon completion of drilling.

2. Water level on March 27, 2002 measured at 1.4m (elev.180.8m).

Terraprobe

LOG OF BOREHOLE ..5..

PROJECT NAME: East End Servicing
CLIENT: Town of Wasaga Beach
LOCATION: Wasaga Beach, Ontario

PROJECT No.: 02709
BORING DATE: March 11, 2002
ELEVATION DATUM: Geodetic

BORING METHOD: D90 Truck-mounted Drill Rig / 108mm Diameter Solid Stem Augers

DEPTH SCALE IN METRES

DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	"N" VALUE
GROUND SURFACE		183.1			
Brown Compact Dry SAND & GRAVEL, fill		0.0	1	SS	26
		182.7			
Brown to Grey Compact to Dense Dry to Wet		0.4			
			2	SS	26
SAND, medium to fine, trace to some silt, trace gravel					
			3	SS	25
			4	SS	18
			5	SS	39
			6	SS	37
			7	SS	35
		176.5			
End of Borehole		6.6			

PENETRATION RESISTANCE PLOT
20 40 60 80

SHEAR STRENGTH kPa
nat.V - +
rem.V - ⊕
Q - ●
U - o
20 40 60 80

WATER CONTENT (%)
10 20 30

INSTALLATION INFORMATION

1. Borehole caved and water level noted at 1.2m upon completion of drilling.

2. Water level on March 27, 2002 measured at 1.0m (elev.182.1m).

Terraprobe

LOG OF BOREHOLE ..19..

PROJECT NAME: East End Servicing
CLIENT: Town of Wasaga Beach
LOCATION: Wasaga Beach, Ontario

PROJECT No.: 02709
BORING DATE: March 13, 2002
ELEVATION DATUM: Geodetic

BORING METHOD: D90 Truck-mounted Drill Rig / 108mm Diameter Solid Stem Augers

DEPTH SCALE IN METRES

SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	"N" VALUE	PENETRATION RESISTANCE PLOT (20 40 60 80) / SHEAR STRENGTH kPa (nat.V - +, rem.V - ⊕, Q - ●, U - ○) (20 40 60 80)	WATER CONTENT (%) (10 20 30)	INSTALLATION INFORMATION
GROUND SURFACE		189.3						
150mm – SAND & GRAVEL, fill 10mm – Topsoil Brown Compact to Loose Dry		0.0	1	SS	15	x	○	
SAND, some silt, fill		188.3	2	SS	7	x	○	
75mm – Sandy Topsoil Brown to Grey Loose to Very Dense Dry to Wet		1.0	3	SS	8	x	○	
SAND, fine to medium, trace to some silt, stratified at 5m.			4	SS	15	x	○	
			5	SS	61	x	○	
			6	SS	85	x	○	
		182.7	7	SS	85	x	○	
End of Borehole		6.6						

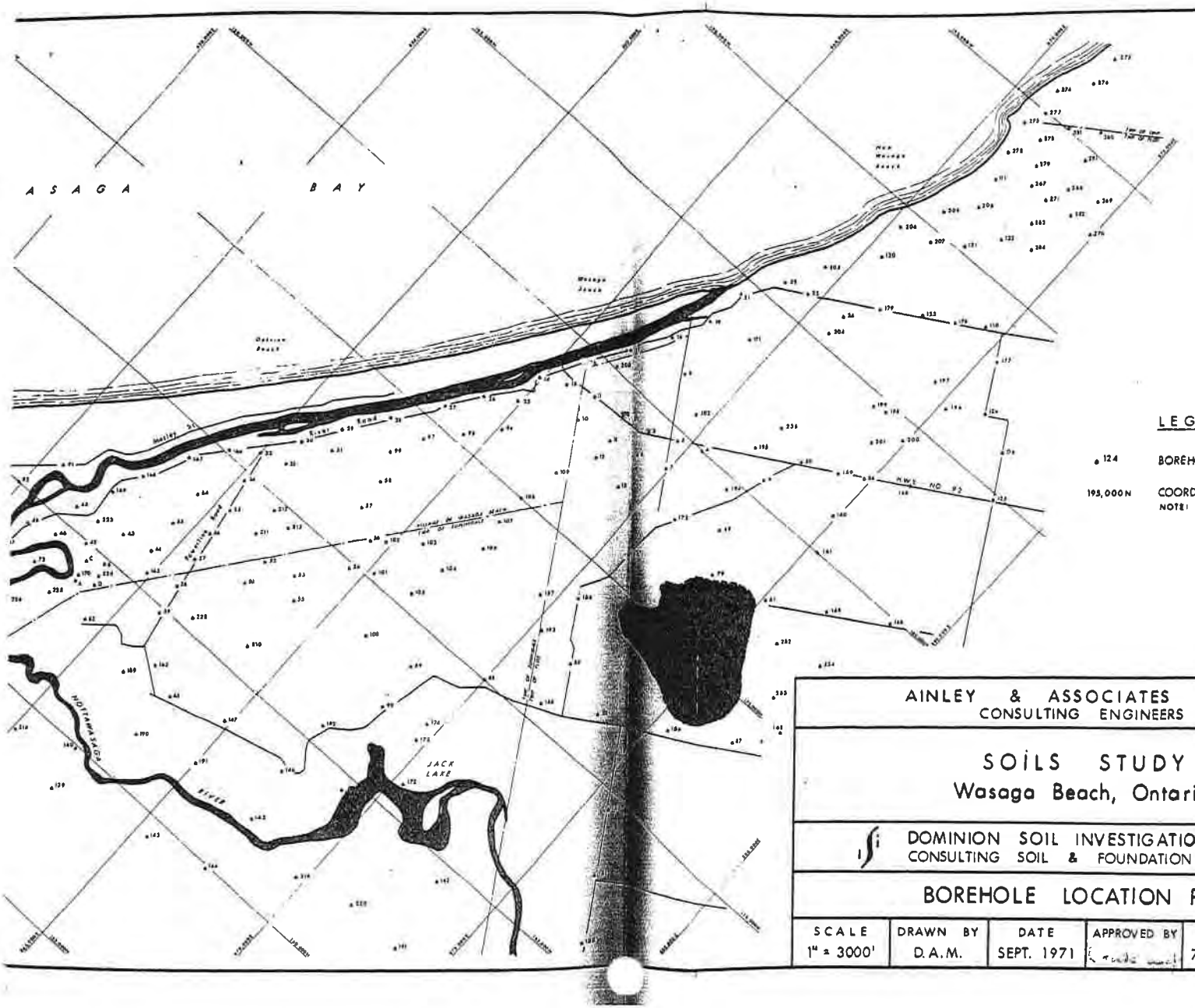
1. Borehole caved and water level noted at 3.0m upon completion of drilling.

2. Standpipe not found on March 27, 2002.

5.2 Groundwater Conditions

The static water levels in the boreholes measured on March 27, 2002 are presented on the borehole logs and are summarized below.

Borehole Number	Ground Surface Elevation (m)	Static Water Level		Borehole Number	Ground Surface Elevation (m)	Static Water Level	
		Depth (m)	Elevation (m)			Depth (m)	Elevation (m)
1	182.9	1.5	181.4	21	183.4	–	–
2	182.4	1.6	180.8	22	181.6	3.7	177.9
3	182.2	1.5	180.7	23A	180.7	2.6	178.1
4	182.2	1.4	180.8	23B	180.5	2.7	177.8
5	183.1	1.0	182.1	24	182.2	2.5	179.7
6	186.6	1.0	185.6	25	183.9	1.3	182.6
7	182.0	0.9	181.1	26	190.8	1.8	189.0
8	191.3	4.5	186.8	27	178.4	0.6	177.8
9	195.6	–	–	28	180.5	1.6	178.9
10	186.1	–	–	29	182.2	2.2	180.0
11	188.4	2.5	185.9	30	179.9	–	–
12	188.8	2.1	186.7	31	181.7	3.1	178.6
13	190.7	4.2	186.5	32	183.8	0.7	183.1
14	197.0	4.4	192.6	33	181.2	1.3	179.9
15	191.1	Dry	–	34	178.1	–	–
16	191.7	4.9	186.8	35	184.7	1.3	183.4
17	193.2	–	–	36	182.8	–	–
18	198.4	Dry	–	37	187.0	1.8	185.2
19	189.3	–	–	38	187.7	2.7	185.0
20	185.4	0.8	184.6	39	189.2	1.0	188.2



AINLEY & ASSOCIATES LIMITED
CONSULTING ENGINEERS

SOILS STUDY
Wasaga Beach, Ontario

DOMINION SOIL INVESTIGATION LIMITED
CONSULTING SOIL & FOUNDATION ENGINEERS

BOREHOLE LOCATION PLAN

SCALE	DRAWN BY	DATE	APPROVED BY	REF. NO.	PLATE
1" = 3000'	D.A.M.	SEPT. 1971		70 - 10 - 9	I

LOGS OF BOREHOLES Nos 1, 2, 3 & 4

CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH

DATE: OCT. 19, 1970

No. 1

GRID: 178,900 N
866,600 E

GROUND ELEVATION: 599

DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES	TESTS
5	W.L. AT 3' OCT. 19, 1970	Grey		1-AS	
		Organic silt & peat layers		1b-AS	
		m w s		2-AS	S
		Greenish grey			
		Grey		3-AS	P
10		FINE SAND TRACE SILT	SP	4-AS	S
15				5-AS	

No. 2

GRID: 179,100 N
867,700 E

GROUND ELEVATION: 601

DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES
5	CAVE-IN AT 9" OCT. 19, 1970	Brown, traces of organic matter		1-AS
		d m w s		2-AS
				3-AS
		Greenish grey		4-AS
		Grey		
10		FINE SAND TRACE SILT	SP	5-AS
15				6-AS

No. 3

GRID: 179,300 N
868,700 E

GROUND ELEVATION: 610

DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES	TESTS
5	CAVE-IN AT 3'-6" OCT. 19, 1970	d m w s		1-AS	
				2-AS	
		Brown FINE SAND TRACE SILT		3-AS	
		Grey			
10			SP	4-AS	
15				5-AS	

No. 4

GRID: 180,000 N
870,400 E

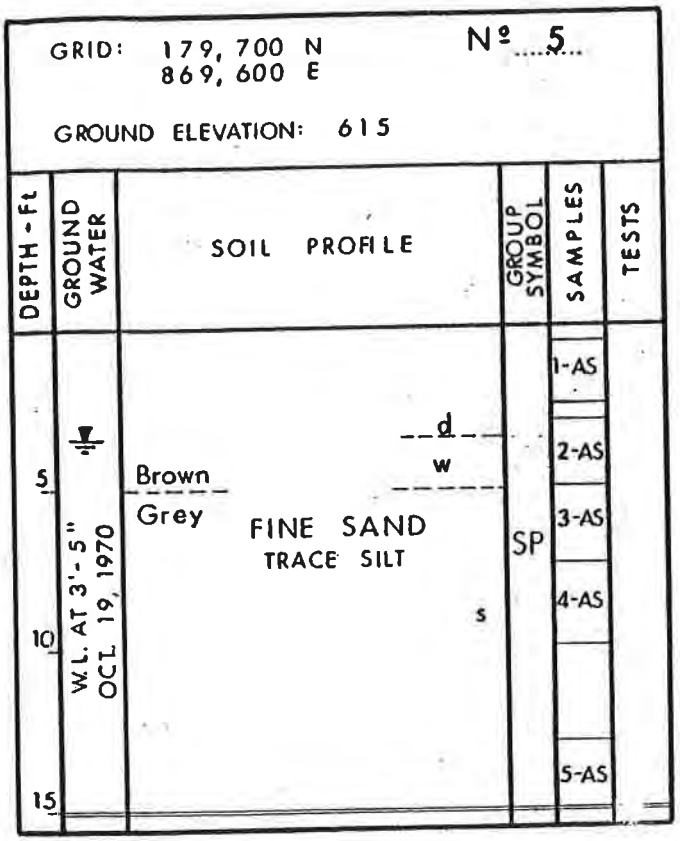
GROUND ELEVATION: 626

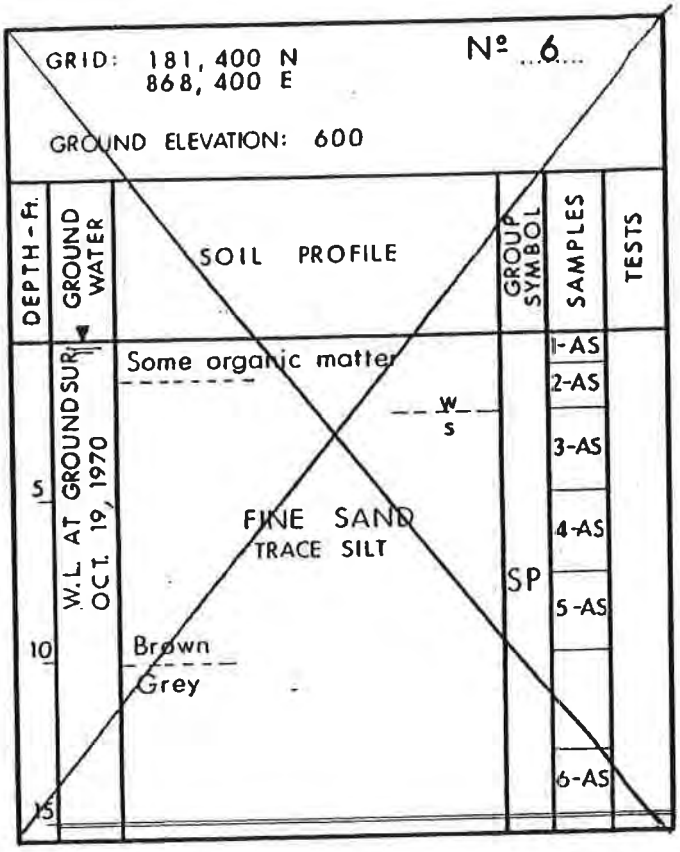
DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES	TESTS
5	CAVE-IN AT 10'-6" OCT. 19, 1970			1-AS	
				2-AS	
		Brown FINE SAND TRACE SILT		3-AS	
10			SP	4-AS	
		d m s			
15				5-AS	

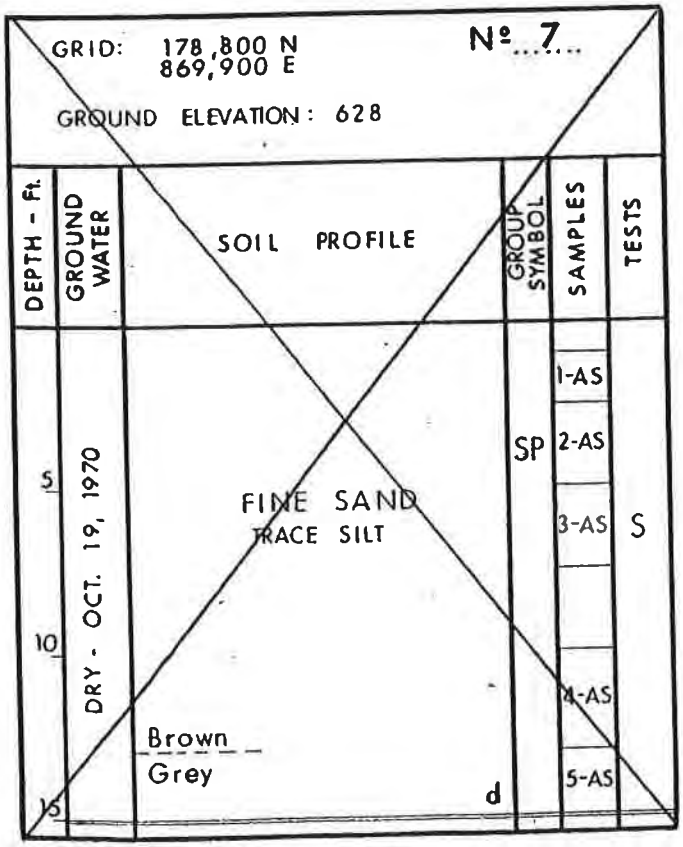
LOGS OF BOREHOLES Nos 5, 6, 7 & 8

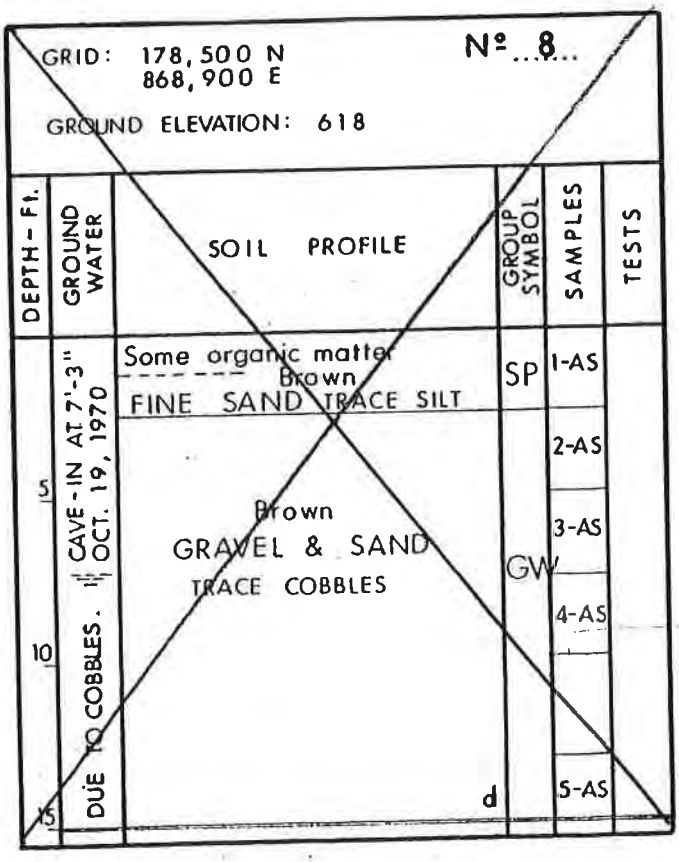
CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH

DATE: OCT. 19, 1970









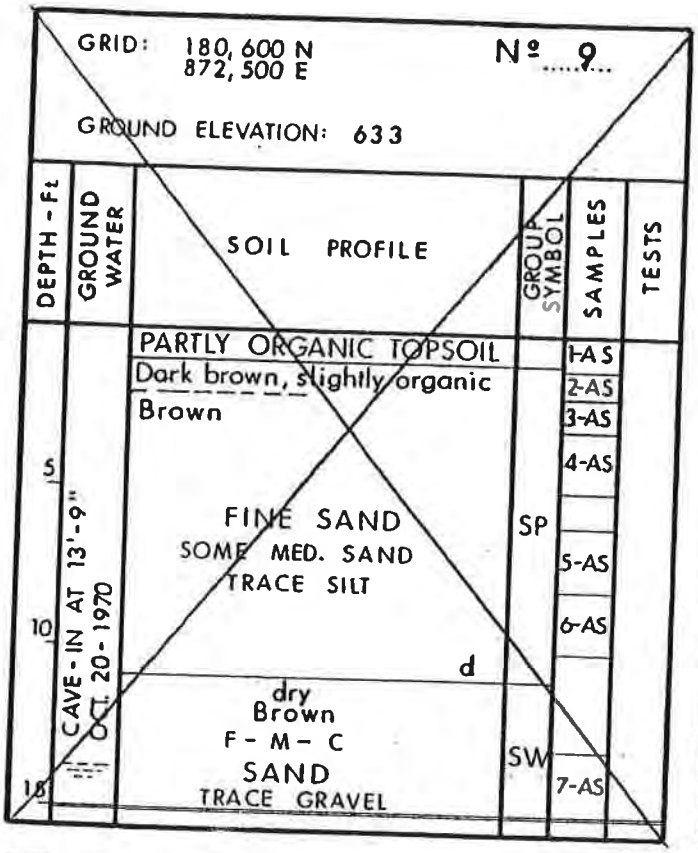
DOMINION SOIL INVESTIGATION LIMITED

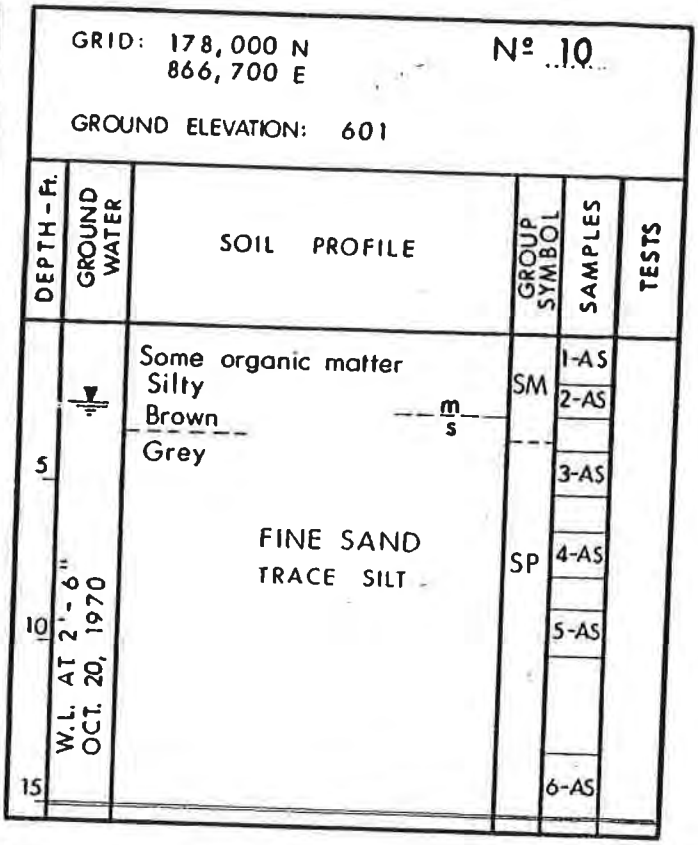
Enclosure Nº 4

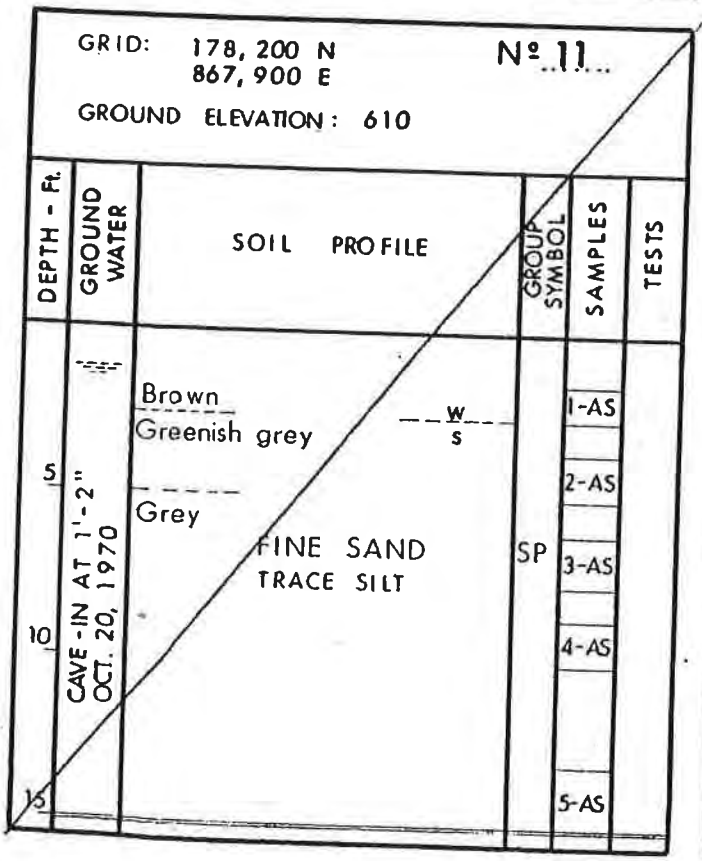
LOGS OF BOREHOLES Nºs 9, 10, 11 & 12

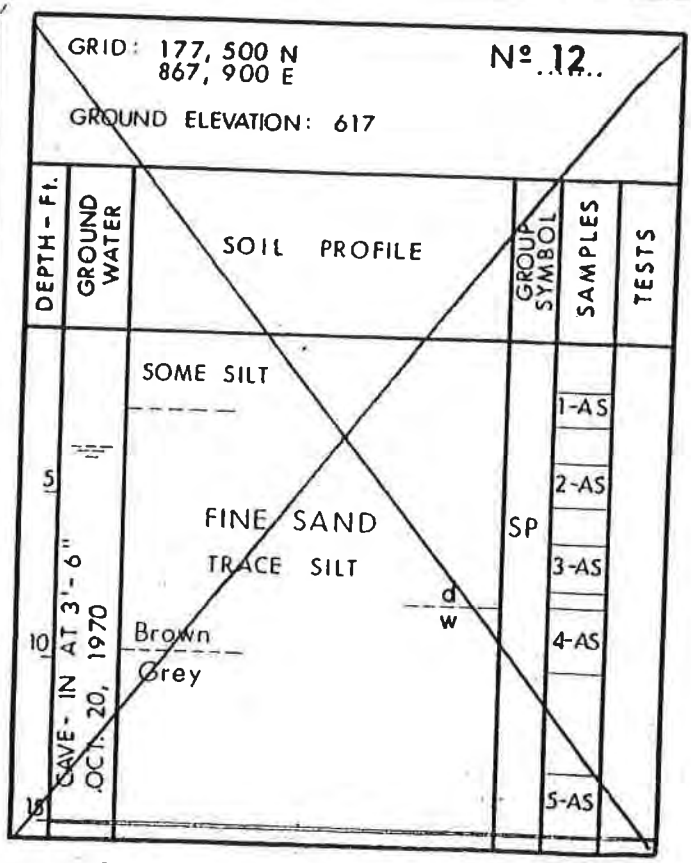
CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH

DATE: OCT. 20, 1970







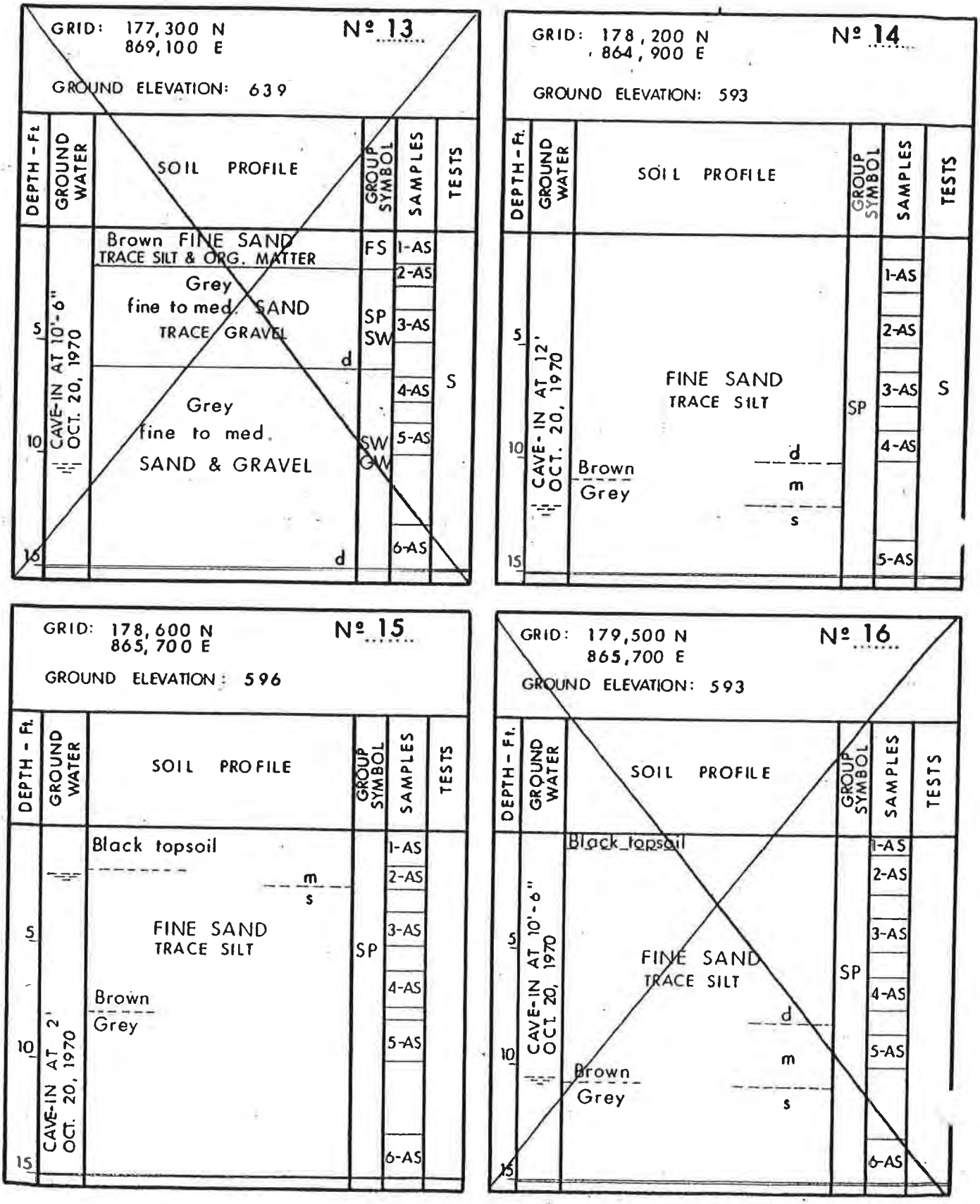


DOMINION SOIL INVESTIGATION LIMITED

LOGS OF BOREHOLES Nos 13, 14, 15 & 16

CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH

DATE: OCT. 20, 1970

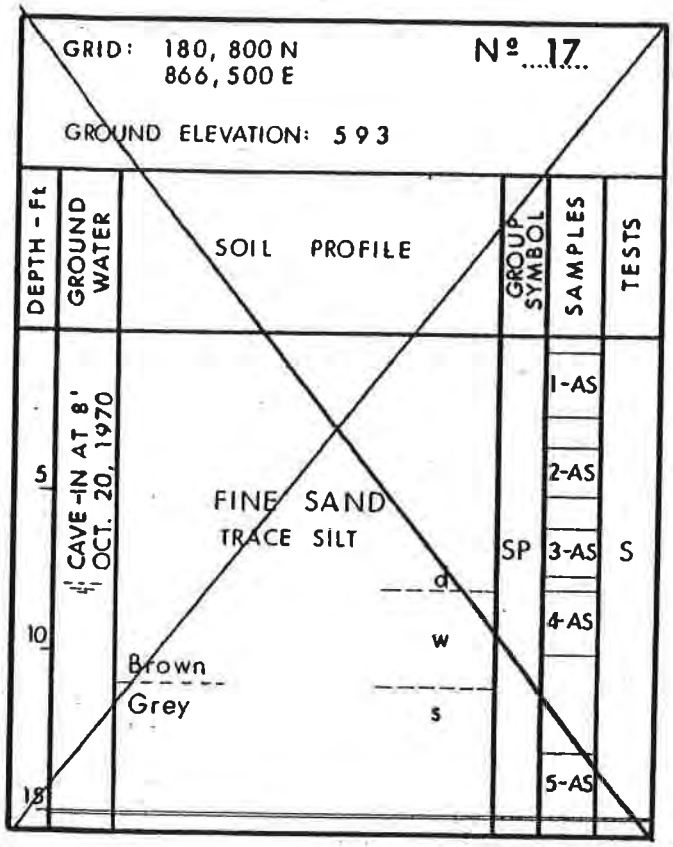


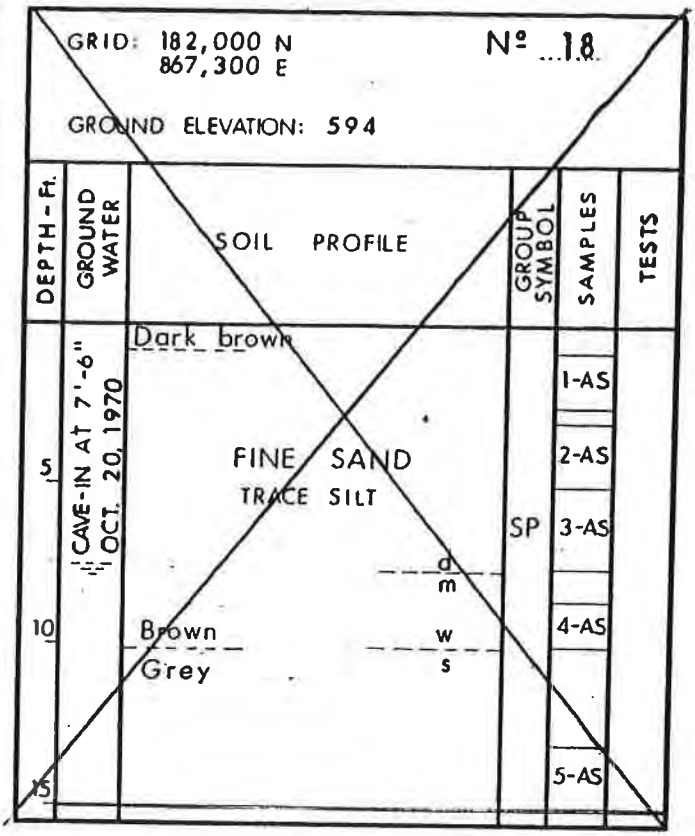
DOMINION SOIL INVESTIGATION LIMITED

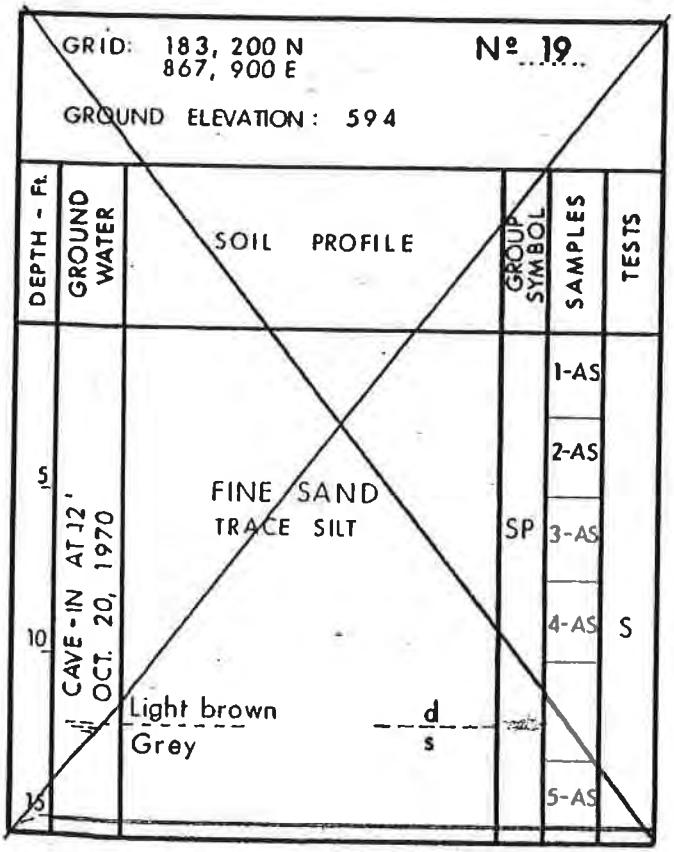
LOGS OF BOREHOLES Nos. 17, 18, 19 & 20

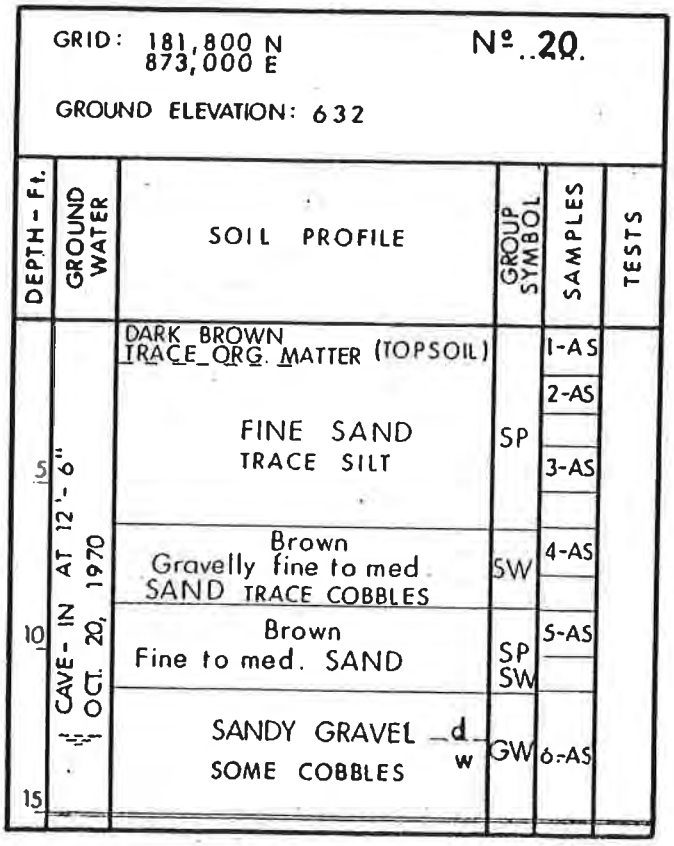
CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH

DATE: OCT. 20, 1970









DOMINION SOIL INVESTIGATION LIMITED

LOGS OF BOREHOLES Nos 25, 26, 27 & 28

CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH

DATE: OCT. 21, 1970

No. 25

GRID: 177, 200 N
864, 900 E

GROUND ELEVATION: 597

DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES	TESTS
0		FILL		1-AS	
5		FINE SAND TRACE SILT d w	SP	2-AS	
	CAVE-IN AT 4'-3" OCT. 21, 1970			3-AS	
10		Brown Grey		4-AS	
15				5-AS	

No. 26

GRID: 176, 600 N
864, 000 E

GROUND ELEVATION: 593

DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES	TESTS
0				1-AS	S
5		Brown Grey FINE SAND TRACE SILT	SP	2-AS	
	CAVE-IN AT 10'-3" OCT. 21, 1970			3-AS	S
10		d m s		4-AS	
15				5-AS	

No. 27

GRID: 175, 600 N
863, 300 E

GROUND ELEVATION: 593

DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES	TESTS
0				1-AS	
5		FINE SAND TRACE SILT	SP	2-AS	
	CAVE-IN AT 10'-2" OCT. 21, 1970			3-AS	
10		Brown Grey d m s		4-AS	
15				5-AS	

No. 28

GRID: 174, 200 N
862, 300 E

GROUND ELEVATION: 593

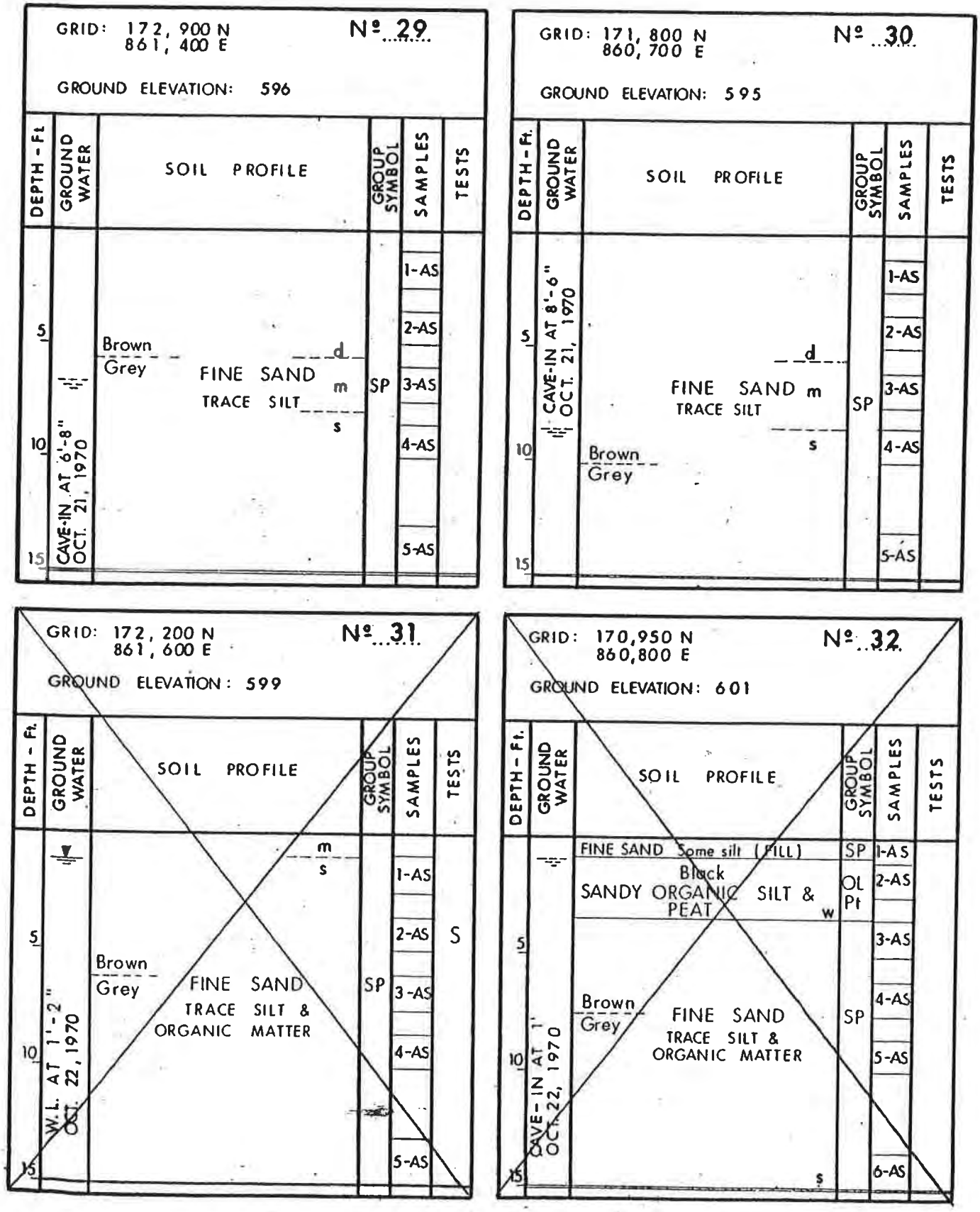
DEPTH - Ft.	GROUND WATER	SOIL PROFILE	GROUP SYMBOL	SAMPLES	TESTS
0		Brown Yellow Brown		1-AS	
5		d Brown Grey FINE SAND m TRACE SILT s	SP	2-AS	
	CAVE-IN AT 4'-1" OCT. 21, 1970			3-AS	
10				4-AS	
15				5-AS	

DOMINION SOIL INVESTIGATION LIMITED

LOGS OF BOREHOLES Nos 29, 30, 31 & 32

CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH

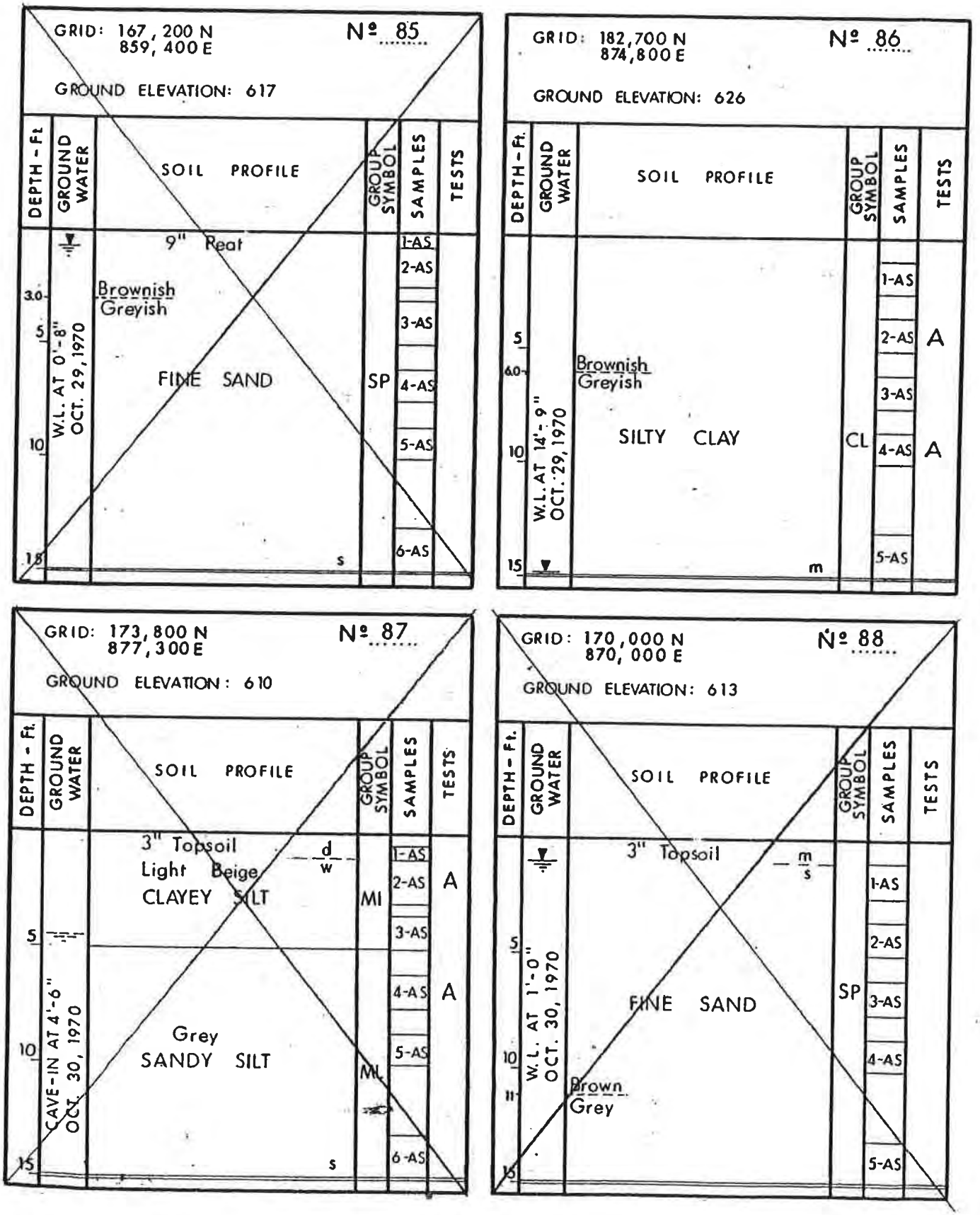
DATE: OCT. 21-22, 1970



DOMINION SOIL INVESTIGATION LIMITED

LOGS OF BOREHOLES Nos 85, 86, 87, & 88

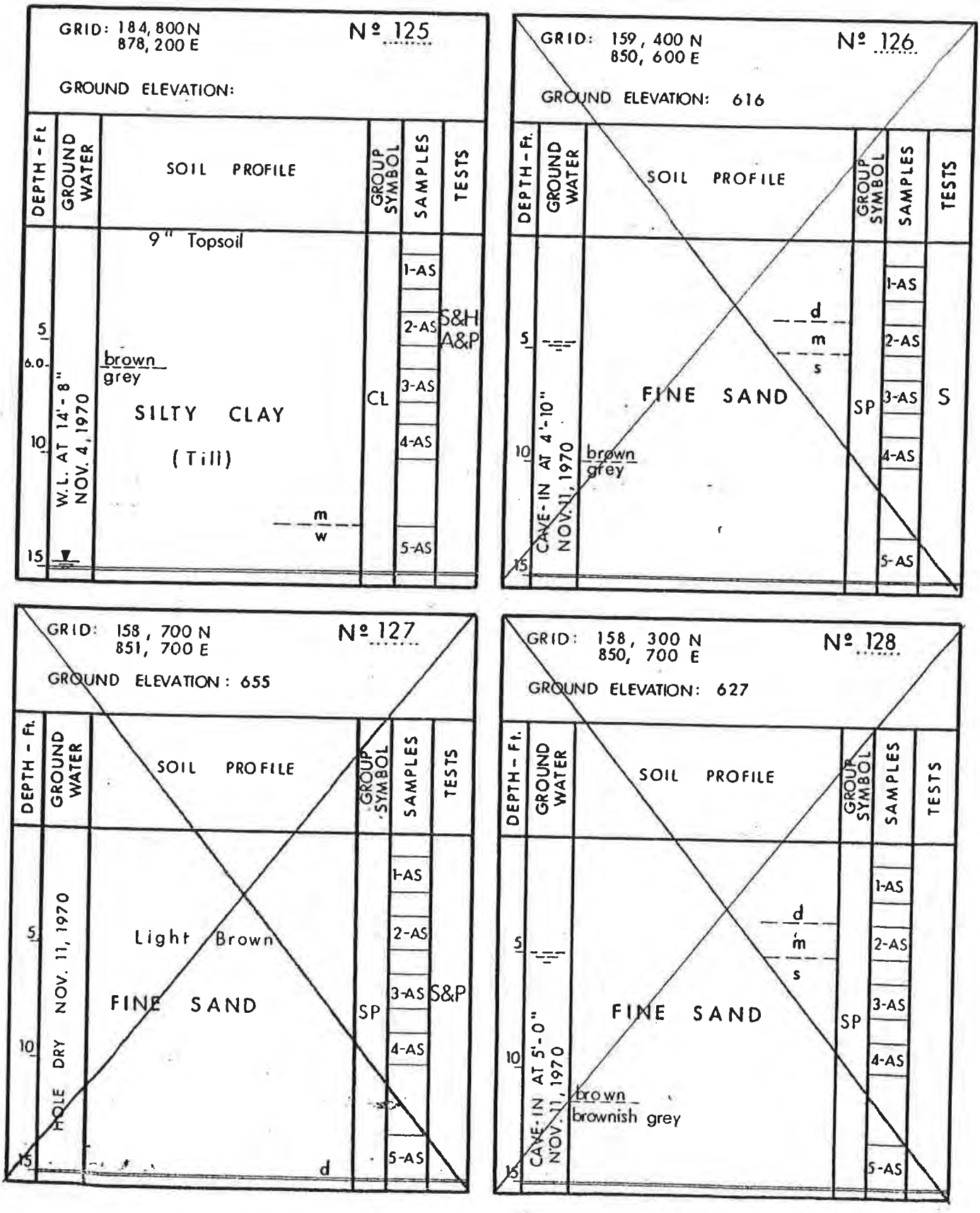
CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH



DOMINION SOIL INVESTIGATION LIMITED

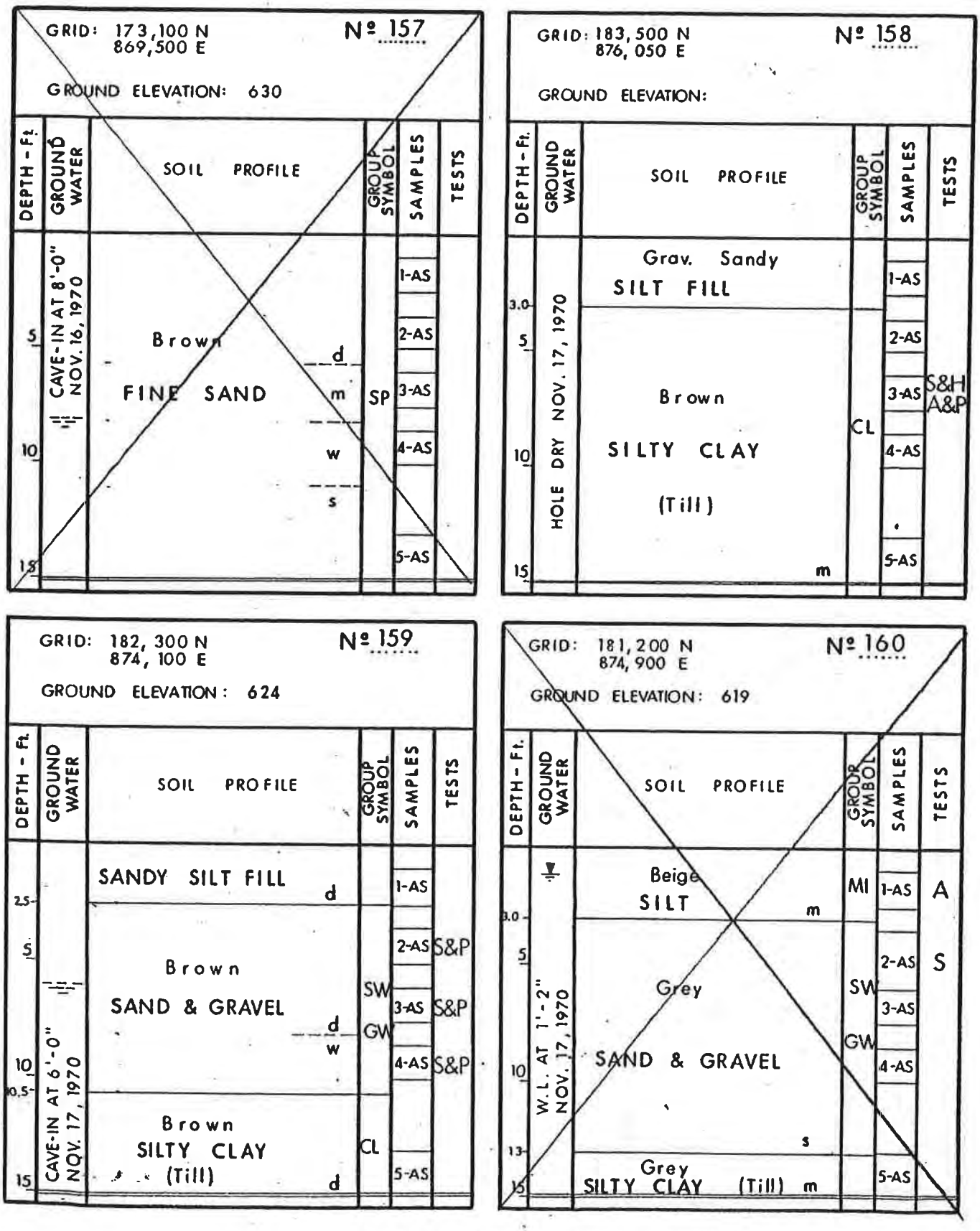
LOGS OF BOREHOLES Nos 125, 126, 127 & 128

CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH



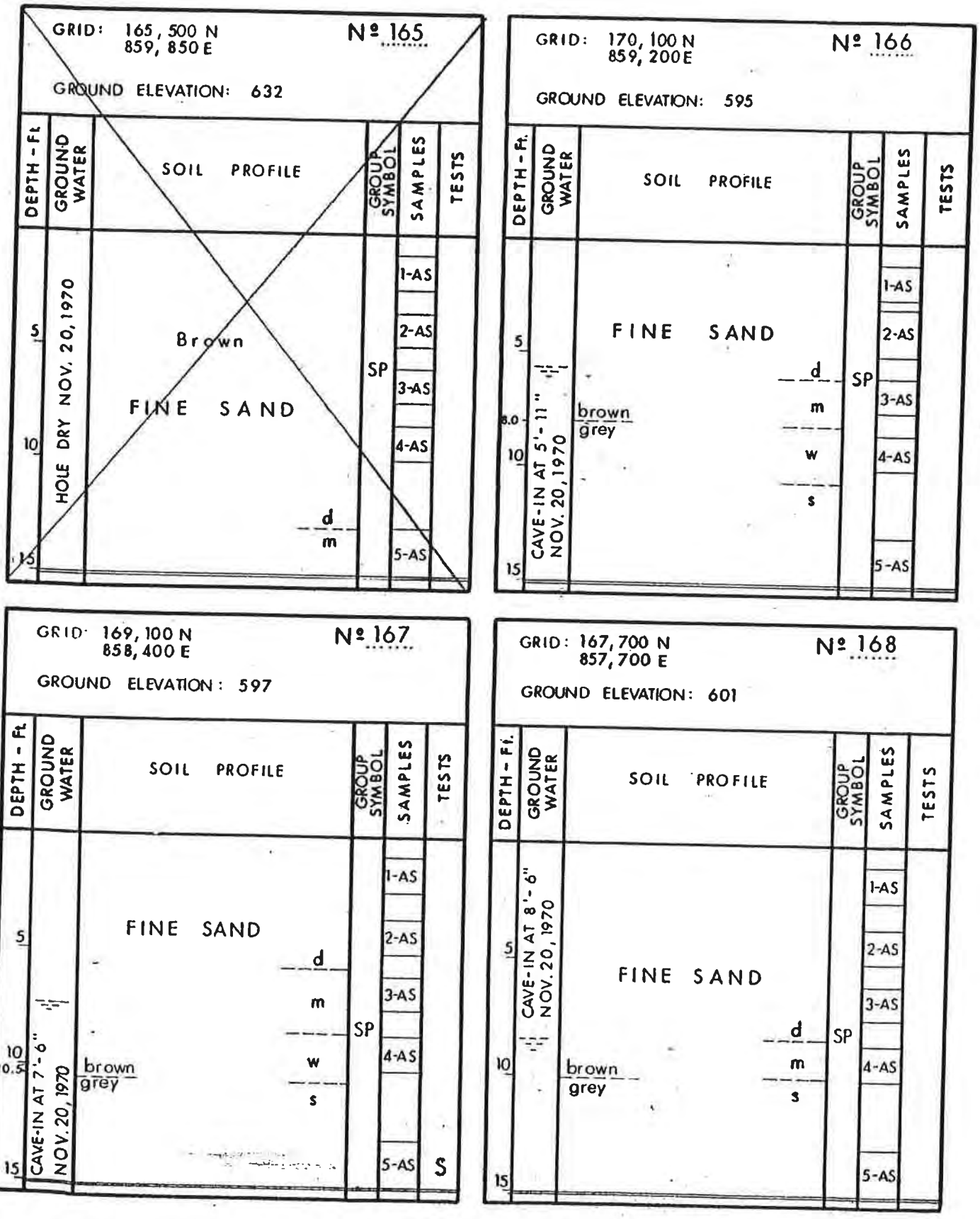
LOGS OF BOREHOLES Nos 157, 158, 159 & 160

CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH



LOGS OF BOREHOLES Nos 165, 166, 167 & 168

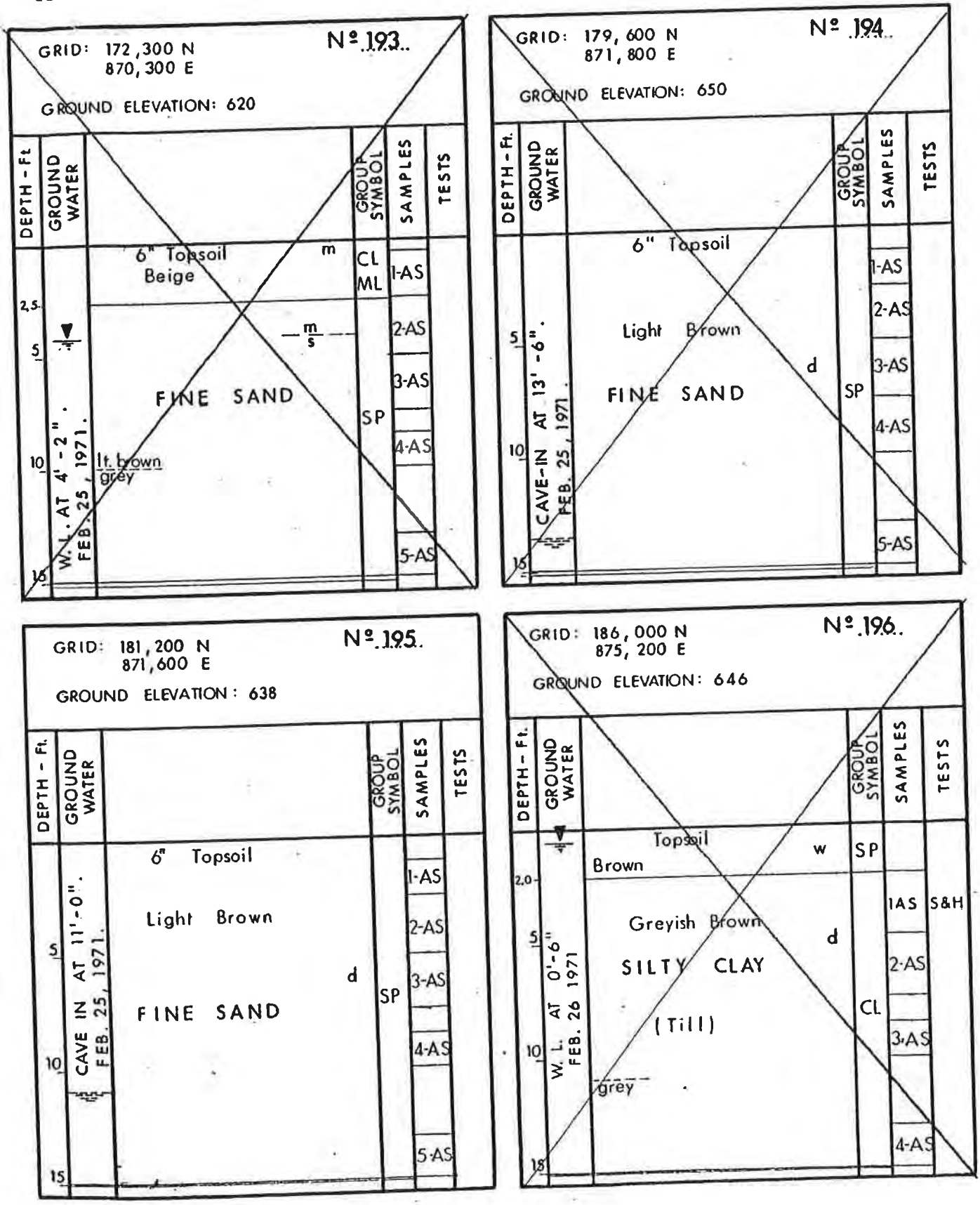
CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH



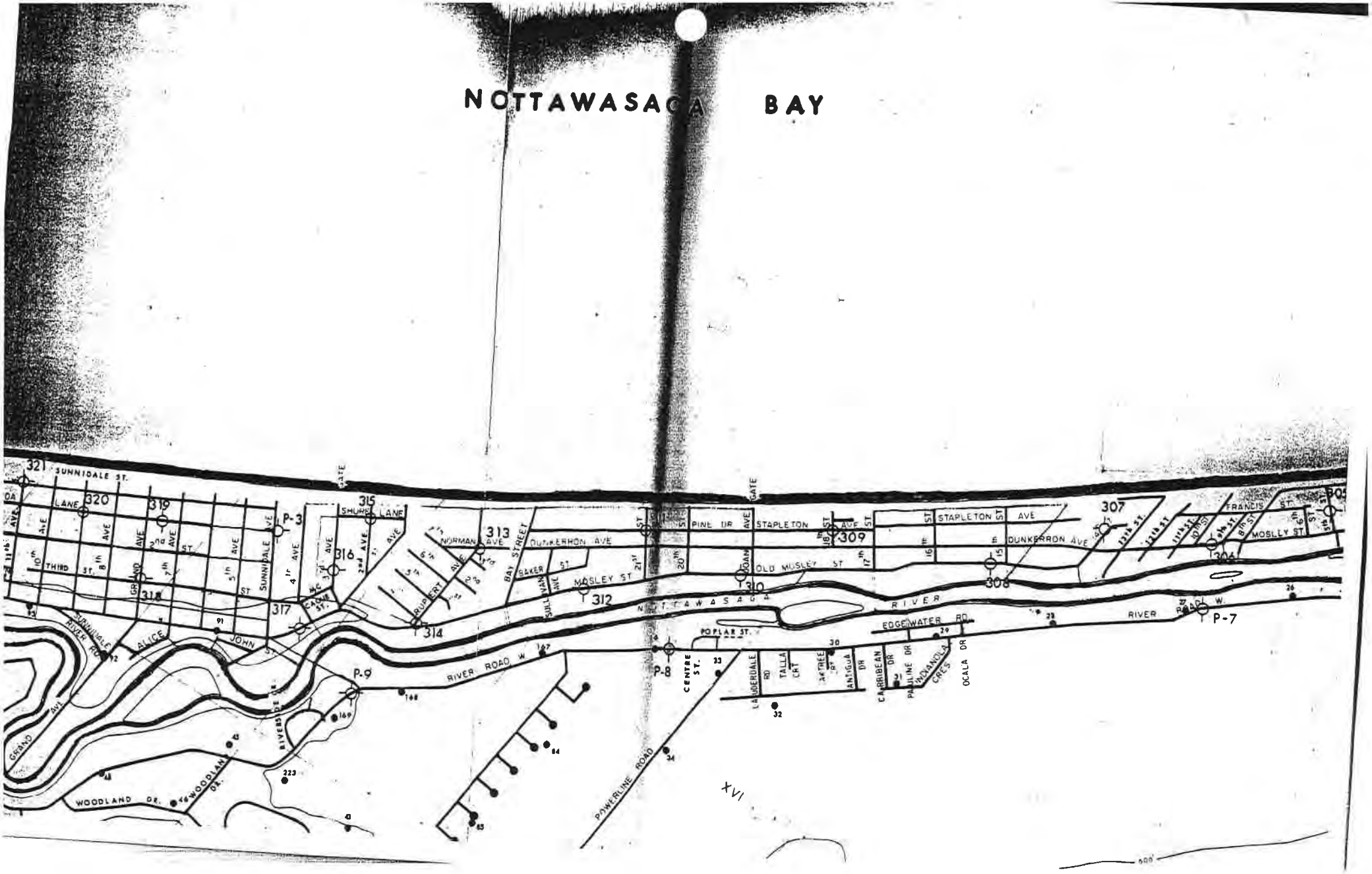
DOMINION SOIL INVESTIGATION LIMITED

LOGS OF BOREHOLES Nos 193, 194, 195 & 196

CLIENT: AINLEY & ASSOCIATES LTD.
PROJECT: SOILS STUDY
LOCATION: WASAGA BEACH



DOMINION SOIL INVESTIGATION LIMITED


NOTTAWASAGA BAY
SUNNIDALE ST.
LANE
320
319
318
317
316
315
313
312
314
310
309
308
307
306
305
P-3
P-7
P-8
P-9
THIRD ST.
SUNNIDALE AVE
4TH AVE
3RD AVE
2ND AVE
1ST AVE
GRACE ST.
EAGLE ST.
SHURIE LANE
NORMAN AVE
RUPERT AVE
BAY STREET
DUNKERRON AVE
BAKER ST.
MOSLEY ST
SULLIVAN AVE
PINE DR
STAPLETON AVE
OLD MOSLEY ST
FRANCIS ST.
SUNNIDALE RIVER RD
ALICE
JOHN
RIVER ROAD W
POPLAR ST.
CENTRE ST.
EDGEWATER RD
RIVER ROAD W
LAMBERDALE RD
TALLA CRT
ANTIGUA DR
CARIBBEAN DR
PAULINE DR
ALEXANDRA CRES
OCALA DR
GRAND AVE
RIVERSIDE DR
WOODLAND DR.
WOODIAN DR.
POWERLINE ROAD
NOTTAWASAGA RIVER
xvi

LOG OF BOREHOLE P-9

Our Reference No. 74-1-7

Page No. 47

CLIENT AINLEY AND ASSOCIATES LTD
PROJECT SEWAGE AND WATER WORKS
LOCATION WASAGA BEACH
DATUM ELEVATION G.S.C.

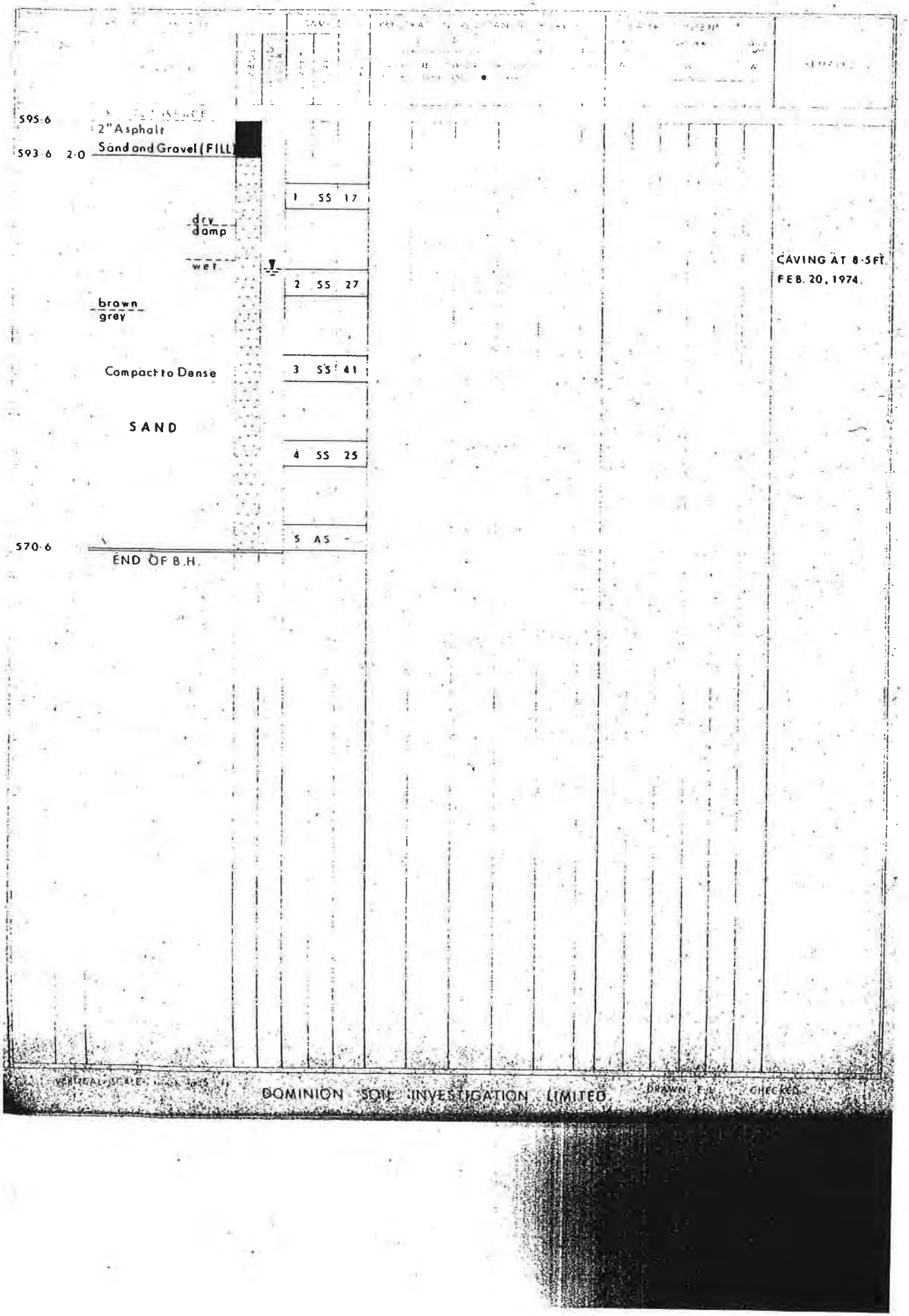
DRILLING DATA
Method AUGERING
Diameter 6 1/2" (H/S)
Date FEB. 20, 1974

ELEV.	DEPTH	DESCRIPTION	STRATA PLOT	GROUND WATER	SAMPLES: NUMBER	TYPE	'N' BLOWS/FT	PENETRATION RESISTANCE Blows/Ft 20 40 60 80 100	UNDRAINED SHEAR STRENGTH psf ○ FIELD VANE TEST ● COMPRESSION TEST	WATER CONTENT % PLASTIC LIMIT W_p	NATURAL W	LIQUID LIMIT W_L	REMARKS
	0	GROUND SURFACE											
	2.0	Sand and Gravel (FILL)			1	SS	20						
	5	dry											
		damp			2	SS	45						
	10	brown grey wet		▼									CAVING AT 11·3 FT FEB. 20, 1974.
	15	Compact to Dense			3	SS	62						
	20	SAND			4	SS	42						
	25	END OF B.H.			5	AS	-						
	30												

VERTICAL SCALE 1" = 5'

DOMINION SOIL INVESTIGATION LIMITED

FEB. 20, 1974


595.6
2" Asphalt
593.6 2.0 Sand and Gravel (FILL)
1 SS 17
dry
damp
wet
2 SS 27
brown
grey
Compact to Dense
3 SS 41
SAND
4 SS 25
5 AS
570.6
END OF B.H.
CAVING AT 8.5FT
FEB. 20, 1974
DOMINION SOIL INVESTIGATION LIMITED

LOG OF BOREHOLE P-7

FEB. 20, 1974

593·0
592·0 1·0 Sand and Gravel (FILL)

Dense SAND

1 SS 30

dry
damp
wet

2 SS 7.7

brown
grey

3 SS 68

silty with depth
occasional cobbles

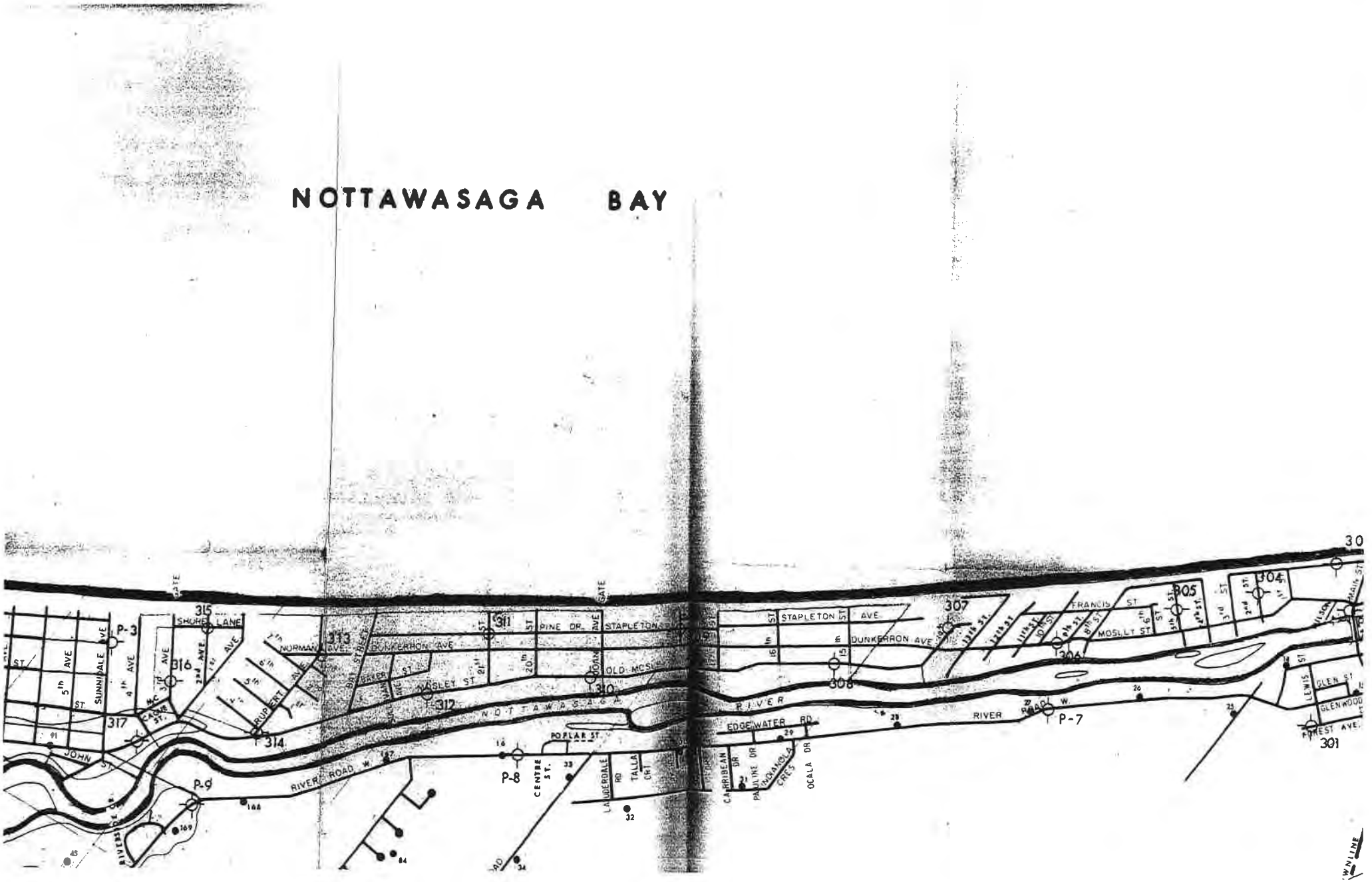
W.L. EL. 585.2 FT. FEB. 20, 1974

4 SS 40

571·0 22·0
Dense
SILTY SAND
with gravel (TILL)
568·0
END OF B.H.

GRAIN SIZE
DISTR.

DOMINION SOIL INVESTIGATION LIMITED


NOTTAWASAGA BAY
315
SHORE LANE
P-3
316
317
313
NORMAN AVE
DUNKERRON AVE
311
PINE DR.
STAPLETON AVE
312
WESLEY ST
OLD MOSLEY
310
314
NOTTAWASAGA
RIVER
POPLAR ST.
P-9
RIVER ROAD W
P-8
CENTRE ST.
LAUDERDALE RD
TALLA CRT
CARIBBEAN DR
PAULINE DR
MACANGOLA CRES
OCALA DR
EDGEWATER RD
307
308
306
305
304
FRANCIS ST
MOSLEY ST
P-7
LEWIS ST
GLEN ST
GLENWOOD
FOREST AVE.
301

LOG OF BOREHOLE 301

Our Reference No. 74-4-7

Enclosure No. 1

CLIENT: AINLEY AND ASSOCIATES LTD.
PROJECT: SEWAGE AND WATER WORKS.
LOCATION: WASAGA, BEACH.
DATUM ELEVATION: G.S.C.

DRILLING DATA
Method: AUGERING
Diameter: 6 1/2" (H/S)
Date: JAN. 24, 1974

ELEVATION Ft.	DEPTH Ft.	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' Blows/Ft.	PENETRATION RESISTANCE Blows/Foot (20 40 60 80 100) / UNDRAINED SHEAR STRENGTH p.s.f. (+ FIELD VANE TEST, ⊕ COMPRESSION TEST)	WATER CONTENT % (PLASTIC LIMIT W_P, NATURAL W, LIQUID LIMIT W_L)	REMARKS
7·4	0	GROUND SURFACE								
		1" Surface Treatment								
4·9	2·5	Sand and Gravel (FILL)								
3·9	3·5	Compact Sand (FILL)		▽ W.L. EL. 594-0' JAN 24, 1974	1	SS	19			
	5	brown grey								
					2	SS	60/6"			
	10	Moist SAND								
					3	SS	64			
2·4	15	END OF B.H.								
	20									

VERTICAL SCALE: 1 inch to 5 feet

DRAWN: F.L. CHECKED:

DOMINION SOIL INVESTIGATION LIMITED

APPENDIX G

Environmental Component

Environmental Impact Assessment Report River Road West Municipal Class EA, Town of Wasaga Beach, County of Simcoe

Prepared For:
Ainley & Associates Ltd.

Prepared By:
Azimuth Environmental
Consulting, Inc.

February 2010

AEC 09-179

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

February 16, 2010

AEC 09-179

Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON
L9Y 4J5

Attention: Mike Neumann, P.Eng. Vice President, Transport Engineering

Re: Environmental Impact Assessment Report for a Municipal Class EA for the proposed River Road West Improvements, Town of Wasaga Beach.

Dear Mr. Neumann:

Azimuth Environmental Consulting (Azimuth) is pleased to submit our Impact Assessment Report for the environmental component of the Municipal Class Environmental Assessment (EA) for the abovementioned proposed road improvements in the Town of Wasaga Beach. This report includes an assessment of the environmental impacts to any environmental features associated with the expansion of the road footprint and the proposed alternatives. The findings of the final Environmental Study Report (ESR) will be incorporated into the Municipal Class EA being prepared by Ainley & Associates Limited.

Please do not hesitate to call if you have any questions regarding this report.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Brad Baker, B.Sc..
Biologist

Matt Stuart, B.Sc.Env.
Aquatic Biologist

85 Bayfield Street, Suite 400, Barrie, Ontario L4M 3A7
telephone: (705) 721-8451 • fax: (705) 721-8926 • info@azimuthenvironmental.com • www.azimuthenvironmental.com

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1.0 INTRODUCTION

Azimuth Environmental Consulting (Azimuth) was retained to provide environmental services for the urbanization of River Road West in the Town of Wasaga Beach from Brillinger Drive to the eastern Town limits and a 30 meter area on both sides of the road (the study area) (Figure 1). This project constitutes a Schedule 'C' undertaking, and is being completed in accordance with the Municipal Class EA process.

This Environmental Study Report (ESR) identifies natural heritage features that occur in the study area and presents an evaluation of two preliminary design concepts for the River Road West urbanization. In addition, appropriate mitigation/restoration measures will be recommended. This report is intended to assist Ainley & Associates Ltd. in the determination of the preferred alternative for the Class EA.

2.0 STUDY APPROACH

Azimuth undertook the following activities for this study:

- Collected background material, including species lists and habitat conditions from involved agencies including, the Ministry of Natural Resources (MNR) and the Nottawasaga Valley Conservation Authority (NVCA);
- Consulted with regulatory agencies (e.g., NVCA) regarding available data, potential constraints, permitting requirements;
- Obtained existing mapping of the site to help identify unique features and environmental conditions;
- Undertook a vegetative survey of all woody vegetation within the municipal road right-of way to assess the study area for the presence of rare species, or habitat suitable to support such species, that are known to occur in the local area;
- Completed an aquatic habitat survey of any potential fish habitat within the River Road West ditches and associated watercourse crossings within the study limits;
- Completed an assessment of the riparian vegetation and vegetation within 30m of the existing road and classify vegetation communities in the general area in accordance with the classification guidelines of the Ecological Land Classification for Southern Ontario;
- Assessed the potential impacts of the recommended preliminary design concepts on environmental features within the study limits and adjacent lands; and
- Developed a mitigation strategy to address the potential environmental impacts.

3.0 PLANNING CONTEXT

3.1 Provincial Planning Policy

The Provincial Policy Statement (PPS) (MMAH, 2005) outlines policies related to natural heritage features (Section 2.1) and water resources (Section 2.2). The Planning Act requires that planning decisions shall be consistent with the PPS.

According to the PPS development and site alteration shall not be permitted in:

- Significant habitat of endangered or threatened species,
- Significant wetlands (in coastal areas or in Ecoregions 5E, 6E and 7E), and
- Significant coastal wetlands.

Similarly, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted within:

- Significant woodlands (south and east of the Canadian Shield),
- Significant valley lands (south and east of the Canadian Shield),
- Significant wildlife habitat, and
- Significant Areas of Natural and Scientific Interest (ANSI).

Furthermore, no development and site alteration will be permitted on lands adjacent to the areas defined above unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated there will be no negative impacts on the natural features and ecological functions.

The term development (as defined in the PPS) is defined as the creation of a new lot, a change in land use or the construction of buildings and structures, requiring approval under the Planning Act, but does not include activities that create or maintain infrastructure authorized under an Environmental Assessment process, as is the case with the recommended River Road West urbanization (MMAH, 2005).

Development and site alteration is not permitted in fish habitat except in accordance with federal and provincial requirements.

The wooded portion of the study area to the east of Blueberry Trail, and the south of River Road West is part of the Wasaga Beach Provincial Park (Appendix A). Two ANSI's associated with the Wasaga Beach Provincial Park also exist in this portion of the study area. The Wasaga Dunes Life Science Area of Natural and Scientific Interest, and the Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest are both within 30 meters of the existing road and associated municipal right-of-way. A

portion of the Wasaga Beach Provincially Significant Wetland also exists within this wooded area to the south of River Road, east of Blueberry Trail (Figure 2 and 3). The easternmost portion of the study area is within the Langman Farm Earth Science ANSI. Current provincial databases do not identify Significant Woodlands or Valley Lands on or adjacent to the study area.

To our knowledge the province has not identified Significant Wildlife Habitat within or adjacent to the study area. The mixed forest community (FOM2-1) at the Powerline Road intersection has been identified as Significant Habitat for a sensitive snake species within NVCA's Sensitive Snake Species Discussion Paper (Featherstone *et al.*, 2005), and identified as potential deer yard (NVCA Correspondence, 2009). The Wasaga Beach Provincial Park at Blueberry Trail (FOM7-2) has also been identified as Significant Habitat for a sensitive snake species within NVCA's Sensitive Snake Species Discussion Paper (Featherstone *et al.*, 2005) and as potential deeryard (Allen *et al.*, 2005, and NVCA Correspondence, 2009).

The Ontario Ministry of Natural Resources' Natural Heritage Information Centre (NHIC) database has documented a number of rare species within the area including Hills Thistle (*Cirsium hilli*), Spotted Wintergreen (*Chimaphila maculate*), a snail (*Vertigo paradoxa*) and Sensitive Species' (EOID 4919) (NHIC, 2009) (Appendix A). Sensitive species record #4919 is for a sensitive snake species that is known to reside within Wasaga Beach Provincial Park.

An information request was forwarded to the MNR regarding the study area. The resulting letter can be found in Appendix A.

3.2 Town of Wasaga Beach

Lands within the study area outside of the road allowance are mainly designated as Residential and Institutional (west of Blueberry Trail) with three areas designated Open Space including the four corners at the Powerline Road/River Road West intersection, an area surrounding a pumping station west of the Blueberry trail intersection, and a large area south of River Road to the east of Blueberry Trail (Figure2)(Schedule A-3 and A-4 Land Use Plan (Appendix B)). Areas east of Beck Street include mostly Commercial land uses including Tourism Commercial, Recreational Commercial, and District Commercial (Figure 3)(Beck Street to Bell's Park Road). Beyond Bell's Park Road to the east the lands are designated as Residential, Rural, Recreational Commercial, and District Commercial (Figure 4) (Schedule A-7 Land Use Plan of the Town of Wasaga Beach's Official Plan (2008) (Appendix B)).

3.3 Nottawasaga Valley Conservation Authority

3.3.1 Ontario Regulation 172/06

The study area includes lands subject to Ontario Regulation 172/06 – "Regulation of Development Interference with Wetlands and Alterations to Shorelines and Watercourses" by the NVCA, associated with the Nottawasaga River and its associated floodplain (Appendix B). Under Regulation 172/06, the NVCA requires that a permit be obtained for any proposed development a regulated area.

An information request was forwarded to the NVCA regarding the study area. The NVCA response to our request can be found in Appendix B.

3.3.2 Town of Wasaga Beach Background Review and Landscape Model

The NVCA's Background Review and Landscape Model identifies the natural heritage features within the Town and includes a landscape scale natural heritage modelling exercise. Based on the results of the background review and model, recommendations were made pertaining to the results of the study including the identification of natural areas that should be considered 'significant'. The purpose of the report was to find a balance between urban development and the protection of natural heritage features. The majority of the study area is currently composed of developed lands (i.e. commercial, residential, lawns and boulevards etc.). However, forest communities reside within the study area to the south of River Road at the Powerline Road intersection (FOM2-1, Figure 2), to the east of Blueberry Trail (i.e. FOM7-2, Figure 3), , and west of the Bell's Park Road intersection to the north of River Road (FOM2-1, Figure 3). The report gave these forest communities scores of 351-400 (Appendix B). The two easternmost wooded areas within the study area are designated as Natural Heritage areas, and the NVCA recommends that 'all previously undesignated habitat blocks scoring greater than 350 within the model be designated as Category 2 Lands. As presented in the Town of Wasaga Beach Natural Heritage System Background Review and Landscape Model, the forest community west of the Bell's Park Road intersection to the north of River Road (FOM2-1) is also identified within the Dune Outlier Study (Featherstone *et al.*, 2005) as an area of parabolic dunes. Furthermore, the study area is not identified as significant in either of the two additional NVCA studies within the Town of Wasaga Beach (i.e. South Bank, and the Dune Conservation and Protection Study, Featherstone *et al.*, 2005).

3.3.3 Sensitive Snake Species Discussion Paper

The mixed forest (FOM2-1, Figure 2) community at the Powerline Road intersection, and the wooded lands east of Blueberry Trail and south of River Road West (Figure 3) within the study area have been identified as significant habitat for a sensitive snake species according to NVCA's Sensitive Snake Species Discussion Paper (Featherstone *et al.*, 2005) . Significant portions of this snake's habitat are associated with large core areas that support the various habitats required to fulfill all life cycle processes of the snake.

The forest communities have been included within this identified area due to their connectivity to adjacent forested habitat and due to the variety (i.e. wetland and upland) of habitat that is present throughout the larger natural heritage feature.

4.0 EXISTING CONDITIONS

4.1 On Site Land Use

For the purposes of this report the limits of the study area include the footprint of the existing River Road West from Brillinger Drive to the eastern Town limits and adjacent lands within 30m of River Road West. Vegetation communities are identified within this area through air photo interpretation, roadside surveys within the road allowance and background information. The recommended River Road West widening study area includes the existing River Road West, adjacent forest and early successional vegetation communities, commercial and residential lands, with maintained lawns and residential properties. A portion of Wasaga Beach Provincial Park resides within the study area to the south of River Road West, and east of Blueberry Trail (Figure 2).

4.2 Adjacent Lands

Adjacent lands, for the purposes of this report, are those lands residing outside of the 30m setback. Lands adjacent to the recommended River Road West urbanization are composed of primarily residential homes and commercial properties within the Town of Wasaga Beach. Forested lands exist adjacent to Powerline Road, within the Wasaga Beach Provincial Park

4.3 Natural Resources

4.3.1 Terrestrial Resources

Vegetation

Natural vegetation communities are composed of a variety of forms including mixed forest and wetland habitat associated with the Wasaga Beach Provincially Significant Wetland. Manicured lawn and scattered trees (remnant forest community and planted specimens) are associated with the commercial and residential developments found within the study area. Ditch areas are also present throughout the study area and include heavily disturbed communities of grassland which include of a large number of non-native species. A vegetation survey was conducted on July 14 and July 27, 2009 to document the vegetation communities that reside within the proposed limit of disturbance. The Ecological Land Classification for Southern Ontario (ELC) (Lee *et al.*, 1998) was used as a general guide to the classification of the vegetation community types within the study area in addition to lands within 30m of the proposed limit of disturbance (Figure 2).

Figures 5, 6, 7 and Table 1 outlines the locations and types of vegetation communities found on the property.

Table 1. ELC Characterization of Vegetation Communities Located	
UNIT	**DESCRIPTION**
MIXED FOREST (FOM)	**Tree cover > 25% coniferous and deciduous tree species**
FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type	Canopy primarily composed of a mixture of White Pine and Red Oak, with Trembling Aspen, Paper Birch, Large-toothed Aspen, and Green Ash. Understorey and groundcover composed of species including Roundleaf Dogwood, Poison Ivy, Bracken Fern, Canada Mayflower and Ground Juniper.
FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type	Canopy primarily composed of a mixture of White Pine, Red Oak, Sugar Maple with Trembling Aspen, Paper Birch, Red Maple and Red Pine. Understorey and groundcover composed of species including Ground Juniper, Poison Ivy, White Sweet-clover, Roundleaf Dogwood, and Bracken Fern.
FOM7-2 -Fresh Moist White Cedar-Hardwood Mixed Forest Type	Canopy primarily composed of a mixture of Red Maple, Red Ash, Eastern Hemlock and White Pine with White Beach, and White Elm. A sub-canopy was primarily composed of White Cedar, Balsam Fir, and Eastern Hemlock. Understorey and groundcover composed of species including Poison Ivy, Bracken Fern, Alternate Leaved Dogwood, Coltsfoot, and Heal-all. Two wetland inclusions are present in the unit corresponding with the mapped PSW. These areas appeared to have more saturated soil conditions which would be representative of the wetland.

None of the vegetation communities are considered to be provincially rare (NHIC, 2009). None of the species observed are considered to be provincially endangered, threatened or of special concern.

There are two known recent (i.e. within 20 years) element of occurrence records (Spotted Wintergreen and Hills Thistle) on file with the Ontario Ministry of Natural Resources' (OMNR) Natural Heritage Information Centre (NHIC) to indicate that the property potentially contains habitat of threatened, or endangered vegetation species (NHIC, 2009) (Appendix A). Spotted Wintergreen (*Chimaphila maculate*) requires sandy habitats in dry-mesic Oak-Pine woods (White, 1998). Hill's Thistle (*Cirsium hillii*) inhabits sand dunes, sandy woods, limestone pavement and open woods in limestone (OMNR, 2000).

Wildlife

Wildlife species utilizing the study area were identified from direct observation and through interpretation of sign (i.e. tracks, scats, vocalizations, etc.) while conducting other surveys (i.e. plant surveys) on the property. Mammals observed or evidence of presence on the property included White-tailed Deer (*Odocoileus virginianus*) Raccoon (*Procyon lotor*) and Eastern Chipmunk (*Tamias striatus*). Fourteen bird species were

observed within the study area including Cedar Waxwing (*Bombycilla cedrorum*), Chipping Sparrow (*Spizella passerina)*, Mourning Dove (*Zenaida macroura)*, Black-capped Chickadee (*Poecile atricapilla)*, Northern Flicker (*Colaptes auratus)*, Great-crested Flycatcher (*Myiarchus crinitus*), Common Grackle (*Quiscalus quiscula*), American Goldfinch (*Carduelis tristis*), Northern Cardinal (*Cardinalis cardinalis*), Blue Jay (*Cyanocitta cristata*), European Starling (*Sturnus vulgaris*), Red-eyed Vireo (*Vireo olivaceus*), House Sparrow (*Passer domesticus*) and American Robin (*Turdus migratorius*). None of the mammals or birds observed are of conservation concern.

According to the Ontario Breeding Bird Atlas Database (OBBAD) 2001-2005 survey (square # 17NK72), there is one provincially rare bird identified within the area, Red-headed Woodpecker (*Melanerpes erythrocephalus)* (Appendix C). The Red-headed Woodpecker has been confirmed as breeding within the area (OBBA, 2008). This bird is ranked as an S3 species according to OMNR's NHIC database. The term S3 indicates that this woodpecker is vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation (NHIC, 2009). This woodpecker will inhabit a variety of treed and non-treed habitats and is commonly found in open deciduous forests with little understorey (often composed of Beech or Oak), wooded swamps, forest edges, groves of dead and dying tress and fields or pasturelands with scattered large-diameter trees (OMNR, 2000, Smith *et al.*, 2000). It prefers xeric woodlands with trees of large circumference of at least 40cm diameter breast height (dbh) and requires 4 hectares for territory (Smith *et al.*, 2000, OMNR 2000). This species can also be found in urban environments such as parks, golf courses, cemeteries and private woodlands (Cadman *et al.*, 2007). It is most often found nesting in dead trees and branches (Smith *et al.*, 2000 and Cadman *et al.*, 2007).

There are no regionally rare birds confirmed as breeding within the area according to the Ontario Breeding Bird Atlas.

Three colonial species, Bank Swallow (*Riparia riparia*), Cliff Swallow (*Petrochelidon pyrrhonota*), and Herring Gull (*Larus argentatus*) have been confirmed to be breeding within the area according to the Ontario Breeding Bird Atlas (Appendix C). Bank Swallow prefers river banks, cliffs and open fields close to water (OMNR, 2000) and is primarily found in erodable soils on vertical or near vertical banks (Garrison, 1999). It can also be found in artificial sites such as sand and gravel pits, along roadsides and in stockpiles of soil or other material where it will excavate its own nest burrows in exposed soils (Cadman *et al.*, 2007). The Cliff Swallow inhabits cliffs and bluffs with nearby open areas but may also build nests on bridges and buildings (Cadman *et al.*, 2007). The Ring-billed Gull nests along the shores of rocky islands, and peninsulas. Potential breeding habitat exists for the Bank Swallow within the sand dunes adjacent to the study area east of Theme Park Drive.

There are two known recent (i.e. within 20 years) element of occurrence records on file with the Ontario Ministry of Natural Resources' (OMNR) Natural Heritage Information Centre (NHIC) to indicate that the property potentially contains habitat of threatened, or endangered wildlife, a sensitive snake species, and *Vertigo paradoxa* (NHIC, 2009) (Appendix A). The sensitive snake species inhabits sandy upland fields, pastures, savannahs, sandy beaches, dry open oak-pine-maple forest with sandy soils (OMNR, 2000). *Vertigo paradoxa* is a terrestrial gastropod (i.e. snail) that prefers forest habitat with a thick organic layer (Anderson, 2004).

Deer yards have been identified within the mixed forest community (FOM2-1) at the Powerline Road intersection and the Wasaga Beach Provincial Park at Blueberry Trail (FOM7-2) (Allen *et al.*, 2005, and NVCA Correspondence, 2009).

Potential anuran amphibian breeding habitat exists within the flowing ditches and low lying areas within the wooded areas adjacent to the road that may contain seasonal standing water in the spring within the study area. Green Frogs (*Rana clamitans*) were observed in various water filled ditches along the length of the study area.

4.3.2 Aquatic Resources

Azimuth's aquatic resources survey included a field investigation of the north and south ditches along the right-of-way (ROW) of the River Road West site limits, centerline culvert crossings running north –south across River Road West, and the review of available background information from the NVCA and MNR.

Available background information was provided by the NVCA and was limited to the indication that a small unnamed watercourse that flows north-south beneath River Road West at the eastern limits of the study area (between Bell Park Rd and Vigo Rd) is classified as an intermittent tributary of Little Marl Creek. There was no other available data on any of the other watercourses/ditches found within the study limits. There are no aquatic species at risk known to be found within the study limits.

Site investigations were completed on July 27, 2009. Within the study limits, five areas of aquatic habitat were flagged. However, for the most part the ROW ditches do not provide aquatic habitat, were dry during the site investigation, lack substrate, and are limited to providing surface drainage during precipitation events and spring freshet. Of the five areas of potential aquatic habitat, one (the intermittent tributary of Little Marl Creek) provides potential direct fish habitat. The other four areas display permanent flow regimes due to potential ground water influence and contributions from adjacent wetland discharge in the Blueberry Trail area, yet they do not host direct fish habitat, and large sections remain within culverts that eventually discharged into the Lower Nottawasaga River. Table 2 provides a summary of the five areas of aquatic habitat found within the site limits. Mapping of these areas can be found in Figures 2, 3 and 4.

Table 2 – Aquatic Habitat Summary

Aquatic Habitat Area #	GPS (Easting, Northing)	Waterbody	Substrate	Vegetation
1	17T 576053 4927185 17T 576111 497326	Unnamed Drainage – Isolated locations within south River Road West (RRW) ROW ditch – Innisbrook Dr. to East side of Glen Eaton Rd.	Muck, Detritus, Silt.	Herbaceous, Watercress, Emergent Aqua Macrophyte.
2	17T 576507 4927867 17T576564 4927938	Unnamed Drainage – south ditch of RRW at Fernbrook Dr, flows east within ditch, crosses Powerline Road, then flows north beneath RRW within a culvert, eventually discharging into the Lower Nottawasaga.	Muck, Detritus, Silt, Gravel	Herbaceous, Watercress, Emergent Aqua Macrophyte, an Cattails.
3	17T 577684 4929531	Unnamed Drainage – channel outlets into the south ditch of RRW from forested area south of RRW, crosses beneath RRW, before discharging into the Lower Nottawasaga.	Muck, Detritus, Silt, Gravel	Herbaceous, Emergent Aqua Macrophyte.
4	17T 578158 4929958 17T 578600 4930120 17T578649 4930180 17T578806 4930243	Unnamed Drainage – Flow originates from the Blueberry Trail Wetland, enters the south ditch of RRW, crosses RRW to flow within north ditch, at Beck St. the flow enters a culvert, crosses RRW and re-enters the south ditch, eventually discharging into a large culvert within south ditch of RRW.	Muck, Detritus, Silt, Gravel	Herbaceous, Watercress, Emergent Aqua Macrophyte, an Cattails
5	17T580904 4931583	Unnamed Tributary of Little Marl Creek – flows south beneath RRW via old box culvert.	Muck, Detritus, Silt.	Cattail, Grass/Sedges

5.0 RECOMMENDED DESIGN ALTERNATIVES

There are two road urbanization design alternatives recommended. A brief summary description of each is provided as follows:

5.1 Concept 1 - 20.0m width

This concept would result in a total road width of 20.0m which would be constructed mainly within the existing ROW. The new road would consist of two 3.5 m curb lanes, one 3.5m center left turn lane, two 1.8 m sidewalks, two 1.5m bike lanes on the road, two 0.5 m barrier curbs, and two 0.95m utility corridors.

The construction limits will be less than 20m except for the option of having a meandering off road bike path/sidewalk. Should this represent a detrimental environmental impact, the trail/sidewalk can be pulled back closer to the road either eliminating or reducing environmental impacts.

5.2 Concept 6 - 25.5m width

This concept would result in a total road width of 25.5m which appears to extend approximately 3m north and south of the existing road ROW for most of River Road West between Brillinger Drive and Ansley Road. The remainder of River Road West east of Ansley Road, where road ROW are in the range of 30 to 60 m, will be constructed within the existing road ROW without property taking. The new road would consist of two 3.5 m center lanes, two 3.5m curb lanes, two 3.0m multi-use paths, two 1.5m boulevards, two 0.5 m barrier curbs, and two 1.0m utility corridors.

It is noted that Concept 1 is recommended for the section of River Road West from Brillinger Drive to Main Street. Concept 6 is recommended for the section of River Road West from Zoo Park Road to the eastern Town limits where sufficient ROW exists. However, for natural environmental impact comparison purpose, both concepts are assumed to be constructed for the entire section of River Road West.

6.0 NATURAL ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Planning Policy

The wooded portion of the study area to the east of Blueberry Trail, and the south of River Road West is part of the Wasaga Beach Provincial Park (Appendix A). Two ANSI's associated with the Wasaga Beach Provincial Park also exist in this portion of the study area. The Wasaga Dunes Life Science Area of Natural and Scientific Interest, and the Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest are both within 30 meters of the existing road and associated municipal ROW. A portion

of the Wasaga Beach Provincially Significant Wetland also exists within this wooded area to the south of River Road West, east of Blueberry Trail (Figure 6). Current provincial databases do not identify Significant Woodlands or Valley Lands on or adjacent to the study area. Both recommended concepts will result in development which extends into the Provincially Significant Wetland and ANSIs described above, however, Concept 1 will remain within the road ROW, and will result in less removal of the identified features.

The eastern most portion of the study area is within the Langman Farm Earth Science ANSI. Neither of the recommended concepts will result in significant alterations to the form or function of this Earth Science ANSI.

Concept 1 will be within the road ROW, and will thus be acceptable with regards to zoning within the Town of Wasaga Beach. Concept 6 will result in the road extending past the ROW on both sides approximately 3m. This will mean that the road ROW will need to be extended into the adjacent land use designations.

Both concepts will result in work within the NVCA Regulation areas, and will thus may require a permit from the NVCA.

6.2 Terrestrial Biology

6.2.1 Vegetation

The footprint for urbanization Concept 1 would not increase beyond the existing road ROW. The footprint for Concept 6 will extend beyond the existing road ROW approximately 3 m in both directions (north/south). The loss of road side vegetation required to permit the development in either concept will have an inconsequential impact on the vegetation communities and the associated natural heritage functions in the adjacent areas. In addition, it is our understanding that the majority of the road expansion will be within ditch areas associated with the road ROW which represents disturbed vegetation communities. We recommend that vegetation removal should be limited to that required for the development.

None of the vegetation communities or vegetation documented within the study area is of federal or provincial conservation concern. No Butternut individuals were observed within the study limits. There are two known recent (i.e. within 20 years) element of occurrence records (Spotted Wintergreen and Hills Thistle) on file with the Ontario Ministry of Natural Resources' (OMNR) Natural Heritage Information Centre (NHIC) to indicate that the property potentially contains habitat of threatened, or endangered vegetation species (NHIC, 2009) (Appendix A). Spotted Wintergreen (*Chimaphila maculate*) requires sandy habitats in dry-mesic Oak-Pine woods (White, 1998). Hill's Thistle (*Cirsium hillii*) inhabits sand dunes, sandy woods, limestone pavement and open

woods in limestone (OMNR, 2000). Neither of these species was identified during the site visits on July 14, and 27, 2009. The habitat present within the Study area is not preferred/suitable habitat for the aforementioned Species at Risk.

6.2.2 Wildlife

There is potential anuran breeding habitat present in flowing ditches and low lying areas within the wooded areas adjacent to the road that may contain seasonal standing water in the springtime within the study area. The removal of the ditches will result in a loss of anuran habitat.

Deer yards have been identified within the mixed forest community (FOM2-1) at the Powerline Road intersection and the Wasaga Beach Provincial Park at Blueberry Trail (FOM7-2) (Allen *et al.*, 2005, and LSRCA Correspondence, 2009). The road urbanization is not expected to directly impact the deer wintering area.

The Wasaga Beach Provincial Park at Blueberry Trail (FOM7-2) has been identified as Significant Habitat for a sensitive snake species within NVCA's Sensitive Snake Species Discussion Paper (Featherstone *et al.*, 2005). However, the function of this habitat is currently compromised by the presence of River Road West, which represents a heavily traveled major road through Wasaga Beach. It is expected to be avoided by this sensitive snake species recognizing their sensitivity to road noise, vibration and other factors as suggested by Rouse (2006) and Cunnington (2006).

There are two known recent (i.e. within 20 years) element of occurrence records on file with the Ontario Ministry of Natural Resources' (OMNR) Natural Heritage Information Centre (NHIC) to indicate that the property potentially contains habitat of threatened, or endangered wildlife, a sensitive snake species, and *Vertigo paradoxa* (NHIC, 2009) (Appendix A). The sensitive snake species is described above. *Vertigo paradoxa* is a terrestrial gastropod (i.e. snail) that prefers forest habitat with a thick organic layer (Anderson, 2004). Habitat which may support *Vertigo paradoxa* may be present within the study area beyond the existing road footprint, however, *Vertigo paradoxa* is not listed in Ontario Regulation 230/08 as an endangered or threatened species, or species of special concern.

6.3 Fisheries and Aquatic Biology

The implementation of either recommended design alternative (Concept 1 & Concept 6), will result in sections of aquatic habitat within the existing ROW being ultimately enclosed (piped). The roadside ditches currently hosting potential habitat (as previously described) recommended for enclosure function as indirect fish habitat that ultimately discharge into the Lower Nottawasaga River. Potential direct fish habitat found within the intermittent tributary of Little Marl Creek will also be enclosed due to the

lengthening/replacement of the existing culvert crossing at River Road West, and the resulting increase in the overall footprint of the structure.

The Federal *Fisheries Act* applies to all projects that occur in or near water that could harmfully alter, disrupt or destroy direct or indirect fish habitat (HADD). The proposed improvements have the potential to harmfully alter approximately 980m^2 of aquatic habitat as a result of the requirement for one culvert extension on the small tributary to Little Marl Creek and the enclosure of the areas of permanently flowing open ditches associated with the implementation of both Concept 1 and 6. This 980m^2 area includes the areas of 1 to 4 as indicated in Table 2 and illustrated in figures 2 to 4.

The following is a list of criteria/recommendations to be considered in the final design of the River Road West road improvements as it relates to the areas of aquatic habitat found within in the study area:

- The tributary of Little Marl Creek and sections of the roadside ditches in the study area are located within areas that are regulated under the jurisdiction of the NVCA (Section 28 of the *Conservation Authorities Act*). In general, any proposed works on these watercourses/ditches must not adversely impact the existing flow regimes of these systems. Prior to undertaking works on these watercourses/ditches, permits are required from NVCA (NVCA, 2009);
- NVCA has an agreement with DFO that allows the NVCA to review proposed works potentially affecting fish habitat in accordance with the Federal *Fisheries Act*, therefore NVCA will be the primary contact for any final proposals to alter the watercourses/ditches;
- DFO's general guidelines for the replacement of culverts/ditches is that they be "like or better" than the existing, and that culverts that have the potential to negatively affect fish habitat upstream or downstream, be redesigned to improve such conditions where possible;
- Based on the continuing advancements in science related to drain/ditch enclosures and implications to aquatic habitat, DFO's position is generally not favorable towards new enclosures of potential fish habitat. Please note that Section 35(1) of the *Fisheries Act* stipulates that "No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction (HADD) of fish habitat. Furthermore, a HADD of fish habitat is prohibited unless authorized by the DFO pursuant to subsection 35(2) of the *Fisheries Act*." In such cases, no such authorizations are issued unless acceptable measures to compensate for the habitat loss are developed and implemented by the proponent. In the event that the ditches are not maintained in their current state within the road improvement area, then an authorization will be required for such works. NVCA is the primary agency contact for works within areas of fish habitat and NVCA regulated lands; and,

- Because new enclosures are recommended, the proponent will potentially be required to apply for a Federal Authorization for Works or Undertakings Affecting Fish Habitat, through the NVCA. As part of the application, the proponent will potentially be required to develop a fish habitat compensation plan that replaces ("no net loss") the habitat lost by the enclosure of the ditches. This plan must be prepared by a qualified fisheries biologist. There is no requirement for DFO to accept a compensation plan to address a proposed HADD of fish habitat. In addition, please be advised that the application for a Federal Authorization will trigger a Canadian Environmental Assessment Act (CEAA) review process. The CEAA process has legislated timelines that must be followed prior to the approval of the authorization (NVCA, 2009).

7.0 CONSTRUCTION MITIGATION

7.1 Timing Restrictions

Work involving the road side ditches and tributary to Marl Creek should not be conducted at times when flows are elevated due to local rain events, storms or seasonal floods. Any works involving the ditches/tributary should be completed 'in the dry', during low water levels, or by means of temporary diversions. Based on the thermal classification, in-water works will not be permitted between March 31st and June 30th of any given year for the culvert works required on the tributary of Little Marl Creek. Ultimately, the NVCA will confirm appropriate timing windows for this project during agency review.

Construction activities involving the removal of vegetation should be restricted from occurring between the beginning of April to the end of July to avoid impacting nesting birds.

7.2 Sediment and Erosion Controls

Diligent application of erosion and sediment control measures will be of the utmost importance for this project recognizing the existing fish habitat located in the "receiving" watercourses (Lower Nottawasaga River/Little Marl Creek). All construction activities occurring in or around the tributary/ditches must be completed using best management practices to minimize the extent of accidental or unavoidable impacts to fish habitat, and alleviate the risk of sediment entering the Lower Nottawasaga River and Little Marl Creek. All sediment controls are to be maintained until vegetation has been re-established to sufficiently stabilize any disturbed soils.

7.3 Culvert/Sewer Design

It is recommended that any proposed new culverts and/or replacement culverts for the tributary crossing are to be installed with a minimum 20% embedment below the existing

channel invert or design bottom of the tributary, and if possible, should provide a similar bottom width as the existing structure. New culverts and replacement culverts must provide for fish passage.

Watercress and permanent summer base flow is present within the previously described ditch locations hosting indirect fish habitat along River Road West, indicating that ground water contributions potentially occur to some degree at this location. The NVCA requires that this contribution be maintained in order to protect the existing water quality, therefore the ditch enclosure (piping) should be perforated to maintain and capture ground water seepage at these locations.

7.4 Site Restoration

All areas disturbed during construction should be restored immediately following the completion of the works. Site restoration should include immediate site stability methods (erosion control blankets, silt fencing), of all excavated and erodible soils to minimize the potential for erosion, combined with a planting plan that utilizes native material deemed acceptable to NVCA.

7.6 Operations

All maintenance activities required during construction must be conducted away from the flowing roadside ditch and the tributary to Little Marl Creek features to protect them from any accidental spillage of deleterious substances that may harm the aquatic environment, both locally and downstream.

7.7 Species at Risk

Due to the potential presence of several species at risk within the study area, the Construction Administrator must ensure that Site Inspectors are informed that these species are an environmental concern. This will affect the way that certain construction activities are carried out (i.e. site clearing timing restrictions, silt/snake fence construction and maintenance, construction material storage and management, etc.). This information would be best conveyed during a pre-construction meeting on-site by a biologist knowledgeable of the species at risk issues. Site Inspectors in turn must ensure that all on-site contractors are informed that species at risk are an issue. Contractors should be instructed to contact the Site Inspector immediately if any species at risk are encountered within the work area. Individuals working on site should ensure that snakes are not harmed during construction or killed by heavy machinery, vehicles or other equipment. All observations of this species should be reported to the Midhurst District MNR Office. In the case of the sensitive snake species, the Site Inspector should then take steps to remove the snake safely from the work area as per the "snake removal" actions described below.

7.7.1 Snake Access

Given that the sensitive snake species are relatively active, moving an average of 100m/day, attempts should be made to prevent access to the construction area by snakes. Silt fencing that could be installed around the construction area within the areas defined as potential snake habitat which would function as a snake barrier fence. Slight modifications to the installation of silt control fences should be made in the interest of excluding snakes from the work site. These include:

- Burying of geotextile fabric vertically into a trench a minimum of 30cm below grade;
- Provision of at least 85cm of geotextile fabric supported vertically above grade;
- Overlap of the geotextile at seams by at least 5cm and tight closure of all seams using wood, plastic or metal strips installed on both sides of the seam and fastened securely together; and
- Regular inspection and prompt repair of silt control/snake fence.

The third and fourth points are particularly important as when snakes encounter a barrier fence, they tend to travel along the fence "nosing" their way along looking for gaps. Therefore, if gaps are not tightly closed, the fence may direct snakes into the work area rather than keep them out. We recommend that construction Site Inspectors check the fence daily.

7.7.2 Construction Materials

Though the sensitive snake species are not known to take refuge under boards, cardboard and other debris (Plumer and Mills 2000) unlike many other snake species that do, as a precaution, we recommend that stockpiled materials and construction waste should be located away from the edges of the work area where any snakes breaching the barrier silt/snake fencing might hide in as cover. Doing so would reduce the chances of snakes hiding in or under construction materials/waste being injured or killed when materials are moved.

7.7.3 Snake Removal

Ontario Parks responds to snake sightings in the Town of Wasaga Beach (Keith Johnson, Ontario Parks, Wasaga Beach Provincial Park, *Personal Communications*). Therefore, on sighting the sensitive snake species, the Park should be contacted (Phone 705 429-2516) as per the information provided in Appendix A.

If snakes are removed from the work area they should be released without delay into forest habitat located adjacent to the site. Release should be directed away from roadways and provides suitable cover for the sensitive snake species.

8.0 CONCLUSIONS

A review of the two Preliminary Design Alternatives indicate that overall neither Concept 1 or 6 would impose significant environmental impacts to the terrestrial and aquatic natural features and functions identified in this report.

Terrestrial environmental impacts are expected to be minor with either of the design concepts, although Concept 1 would be the recommended alternative. Concept 1 will remain within the existing road ROW, and will thus result in very minimal vegetation removal which would appear to include no significant features. Concept 6 will result in removal in some areas of approximately 3 meters of vegetation which would include removal at the Powerline Road intersection (Figure 5) and the removal of vegetation south of River Road West adjacent to Blueberry Trail, should it be constructed in the area. This means that the implementation of Concept 6 would result in a insignificant loss to woodlands identified as habitat for species at risk, deer wintering yards, and which are also included within the Wasaga Beach Provincial Park, the Wasaga Dunes Life Science Area of Natural and Scientific Interest, the Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest and a portion of the Wasaga Beach Provincially Significant Wetland (Figure 6). The implementation of either concept will result in minimal natural vegetation loss within the remainder of the study area as indicated in Figure 7.

Given the current conditions of the indirect fish habitat found within the roadside ditches and the direct fish habitat found within the intermittent tributary of Little Marl Creek, overall the recommended road improvements (for both Concept 1 & Concept 6) do not pose a major threat to the existing form and function of aquatic habitat within the Lower Nottawasaga River Subwatershed. Temporary impacts associated with construction practices are fully mitigable through the effective use of sediment and erosion controls that will maintain the quantity and quality of flows within the tributary of Little Marl Creek at all times. The recommended enclosure of the approximately 980m^2 of indirect (roadside ditch) and direct (Little Marl Creek tributary) fish habitat will potentially result in a HADD, however an appropriate compensation plan (offsite within the watershed) may be developed in consultation with NVCA and DFO that can result in a greater overall "gain", providing increased habitat/water quality than the existing roadside ditch habitat, thus providing an overall improvement to the watershed.

8.1 Recommended Alternative

With respect to the two design concept alternatives discussed, both of the design concepts have the potential to result in minor impacts to the Natural Heritage Features present in the area. For the area from Brillinger Drive to Main Street, given that Concept 1 remains within the existing River Road West ROW and will result in less impact overall, Azimuth recommends that Concept 1 be chosen based on reduced impacts when compared to

Concept 6 in order to reduce vegetation loss and development within other Natural Heritage features present in the Blueberry Trail Area. Beyond Zoo Park Road to the eastern town limits, both Concept 1 and 6 would result in similar minimal impacts, therefore Azimuth recommends either Concept 1 or 6 through this section on the study area.

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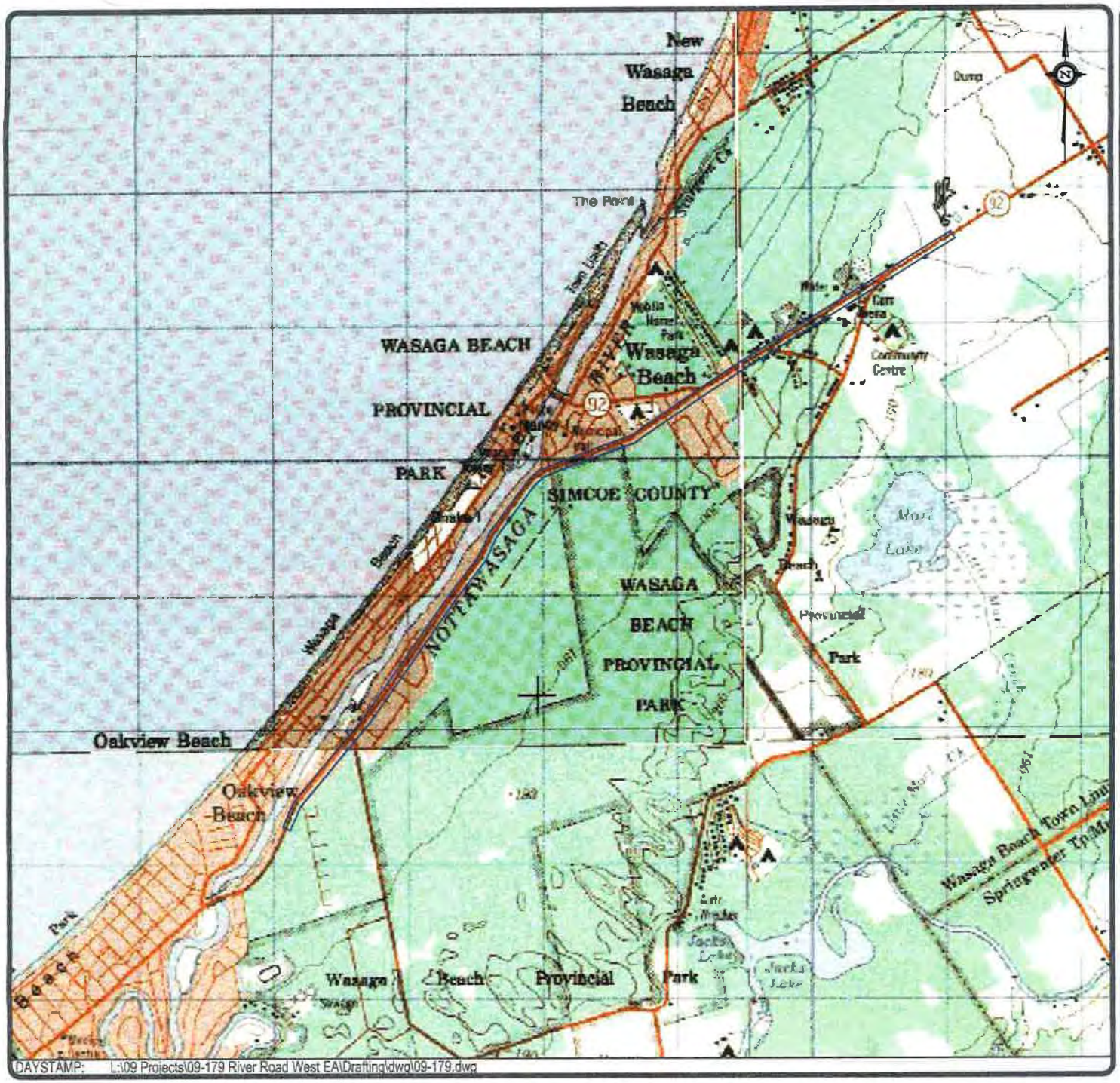
FIGURES



LEGEND:

Study Area

600m 0 1200m

HORIZONTAL SCALE 1: 40,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Regional Map

River Road West
Wasaga Beach, ON

DATE ISSUED: *July 2009*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *09-179*	1
REFERENCE: *Soltmaps Technologies Inc.*	

DAYSTAMP: L:\09 Projects\09-179 River Road West EA\Drafting\dwg\09-179.dwg

LEGEND:

- Study Area
- Wasaga Dunes Life Science ANSI
- Wasaga Beach Provincially Significant Wetland
- Aquatic Habitat (Areas 1-5)
- Vegetation Communities
- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type

150m 0 300m

HORIZONTAL SCALE 1:10,000

DAYSTAMP: L:\09 Projects\09-179 River Road West EA\Drafting\dwg\09-179.dwg

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Existing Conditions

River Road West EA
Wasaga Beach, ON

DATE ISSUED:	July 2009	Figure No. 2
CREATED BY:	JLM	
PROJECT NO.:	09-179	
REFERENCE:	Ainley Group	

DAYSTAMP: L:\09 Projects\09-179 River Road West EA\Drafting\dwg\09-179.dwg

LEGEND:

- Study Area
- Wasaga Blacklands Park Reserve Earth Science ANSI
- Wasaga Dunes Life Science ANSI
- Wasaga Beach Provincially Significant Wetland
- Aquatic Habitat (Areas 1-5)
- Vegetation Communities
- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type

150m 0 300m

HORIZONTAL SCALE 1:10,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Existing Conditions

River Road West EA
Wasaga Beach, ON

DATE ISSUED:	July 2009	Figure No.
CREATED BY:	JLM	3
PROJECT NO.:	09-179	
REFERENCE:	Ainley Group	

LEGEND:

- Study Area
- Langman Farm Earth Science ANSI
- Wasaga Dunes Life Science ANSI
- Wasaga Beach Provincially Significant Wetland
- Aquatic Habitat (Areas 1-5)
- Vegetation Communities
- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type

150m 0 300m

HORIZONTAL SCALE 1:10,000

DAYSTAMP: L:\09 Projects\09-179 River Road West EA\Drafting\dwg\09-179.dwg

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Existing Conditions

River Road West EA
Wasaga Beach, ON

DATE ISSUED:	July 2009	Figure No. 4
CREATED BY:	JLM	
PROJECT NO.:	09-179	
REFERENCE:	Ainley Group	

DAYSTAMP: L:\09 Projects\09-179 River Road West EA\Drafting\dwg\09-179.dwg

LEGEND:

- Study Area
- Wasaga Dunes Life Science ANSI
- (white) Concept 1
- Concept 6
- Vegetation Communities
- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type

37.5m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Proposed Development Concept Limits

River Road West EA
Wasaga Beach, ON

DATE ISSUED:	July 2009	Figure No. 5
CREATED BY:	JLM	
PROJECT NO.:	09-179	
REFERENCE:	Ainley Group	

DAYSTAMP: L:\09 Projects\09-179 River Road West EA\Drafting\dwg\09-179.dwg

LEGEND:

- Study Area
- Wasaga Backlands Park Reserve Earth Science ANSI
- Wasaga Dunes Life Science ANSI
- Wasaga Beach Provincially Significant Wetland
- (white) Concept 1
- Concept 6
- Vegetation Communities
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type

37.5m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Proposed Development Concept Limits

River Road West EA
Wasaga Beach, ON

DATE ISSUED:	July 2009	Figure No.
CREATED BY:	JLM	6
PROJECT NO.:	09-179	
REFERENCE:	Ainley Group	

LEGEND:

- Study Area
- (white) Concept 1
- Concept 6
- Vegetation Communities
- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type

37.5m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Proposed Development Concept Limits

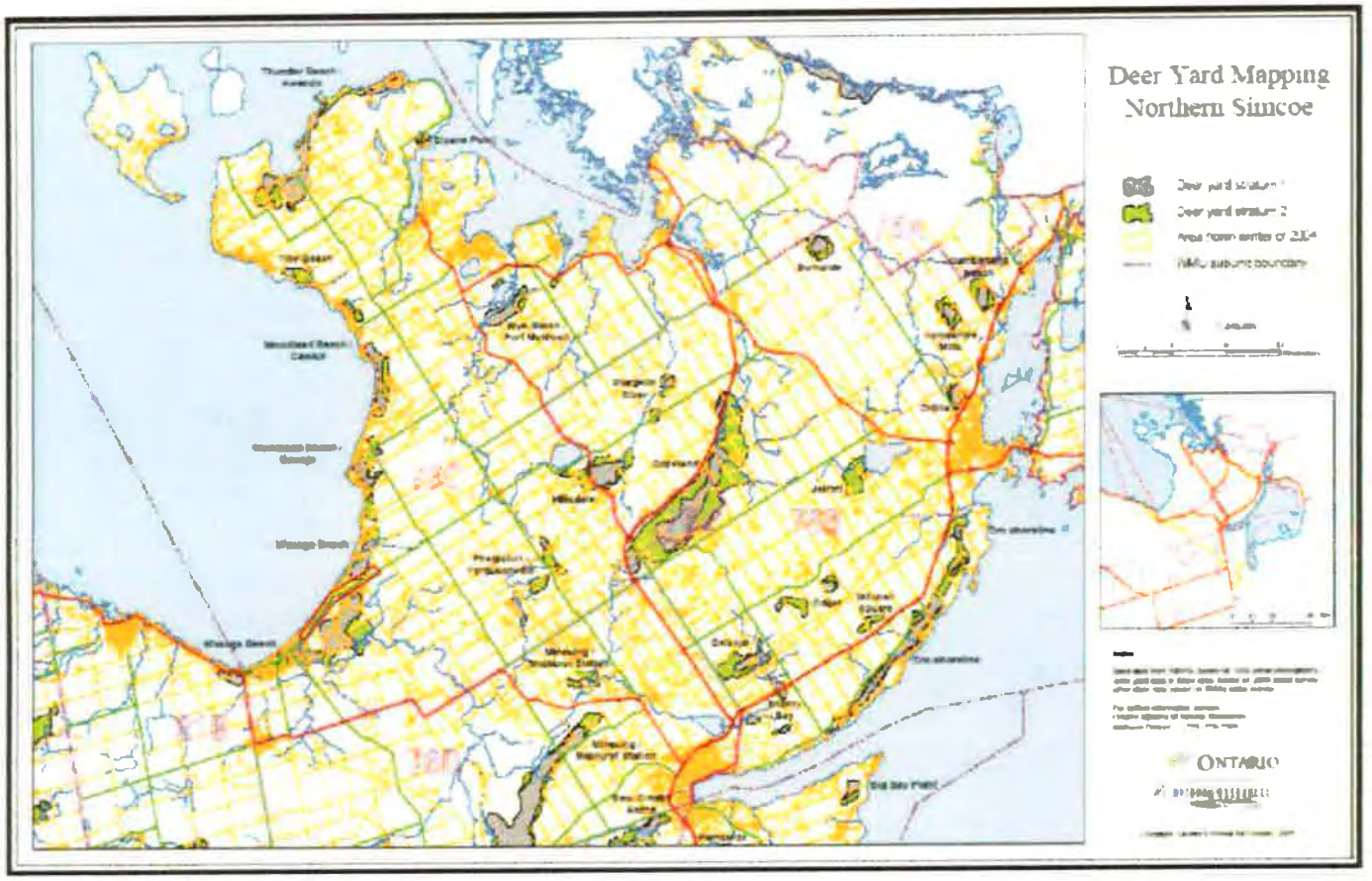
River Road West EA
Wasaga Beach, ON

DATE ISSUED:	July 2009	Figure No.
CREATED BY:	JLM	7
PROJECT NO.:	09-179	
REFERENCE:	Ainley Group	

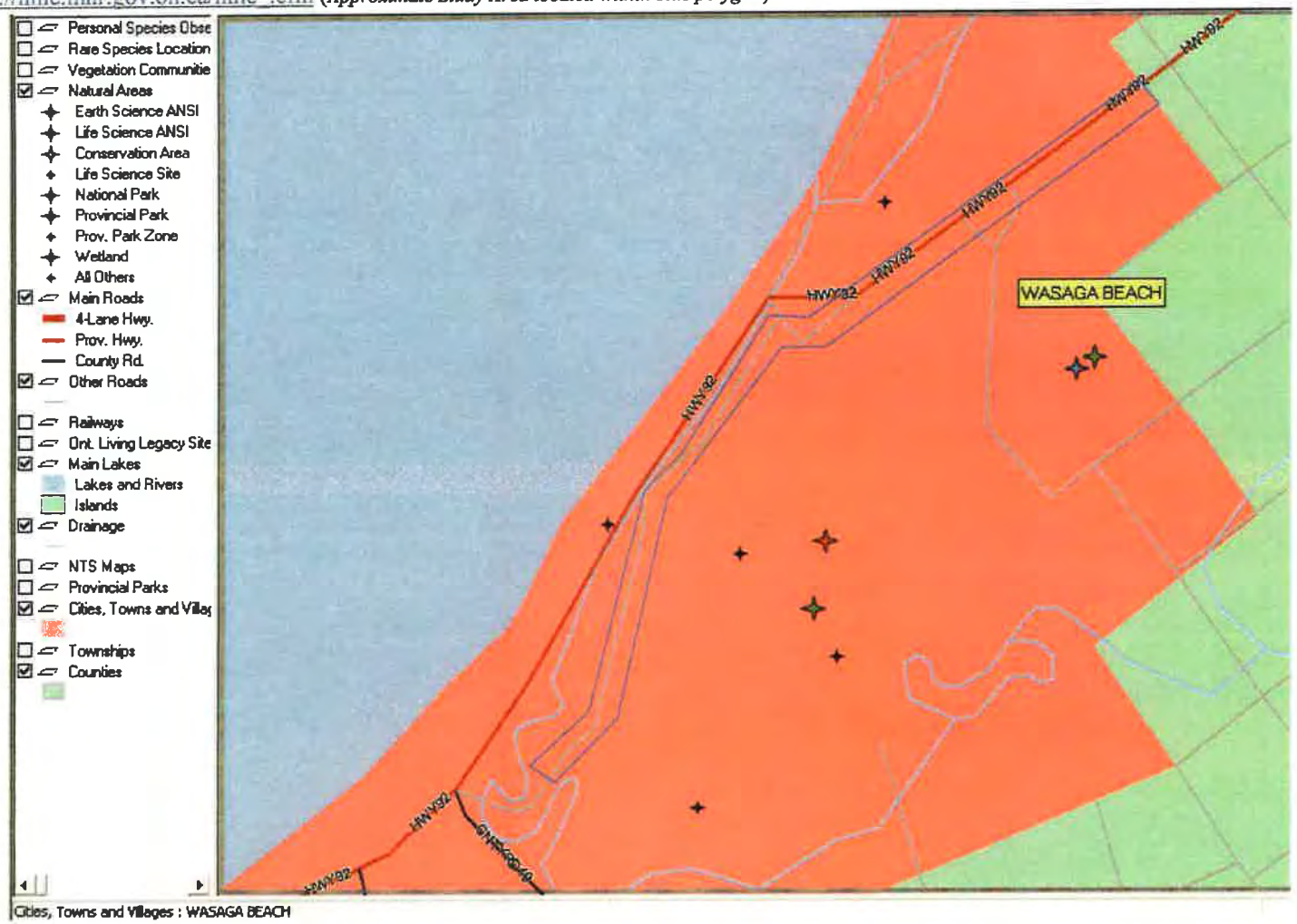
APPENDICES

APPENDIX A

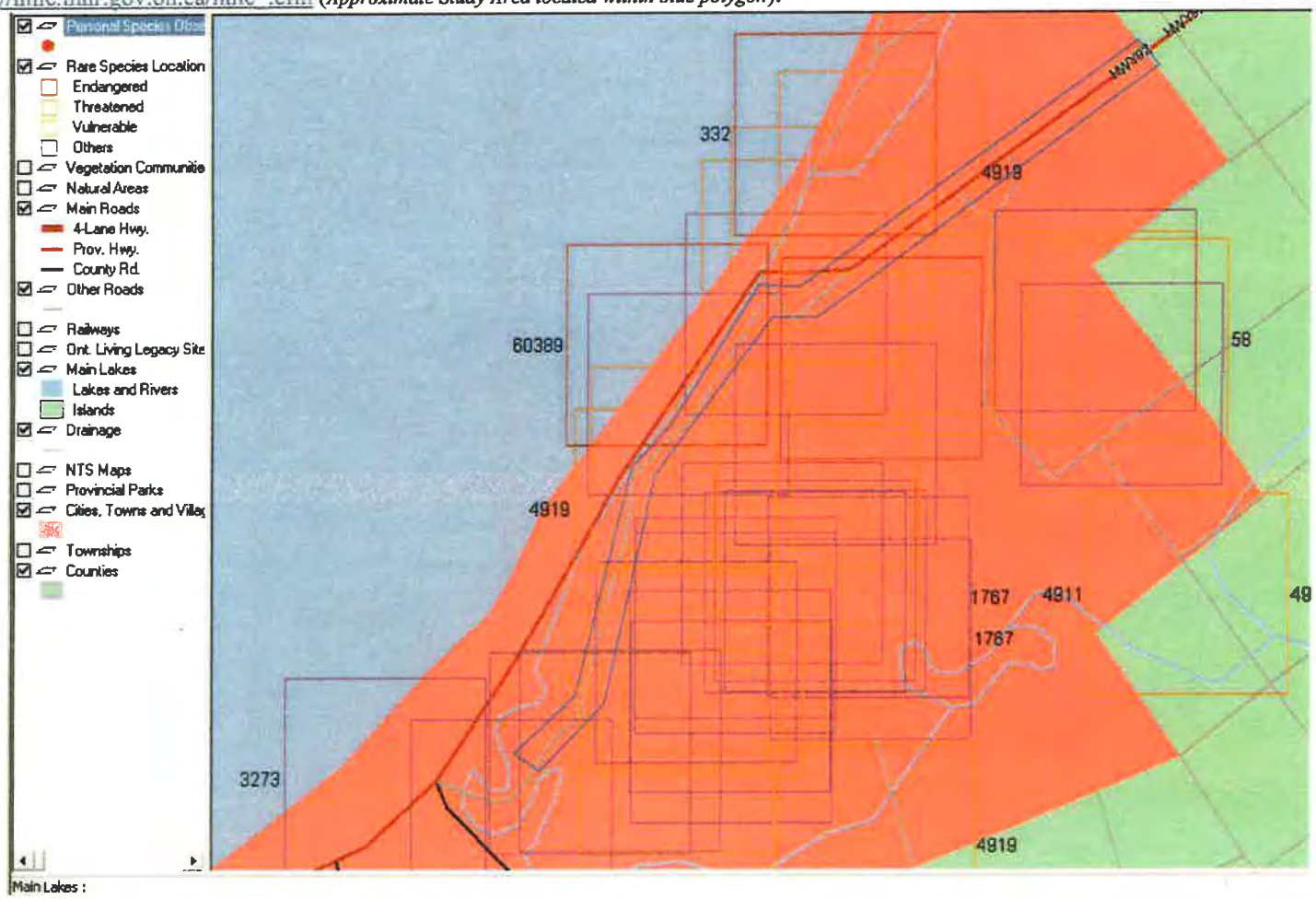
Appendix A: Midhurst District Deer Yard Survey Huronia Area 2004: Deer Yard Mapping Northern Simcoe (2005):
(*Property located within red polygon*).



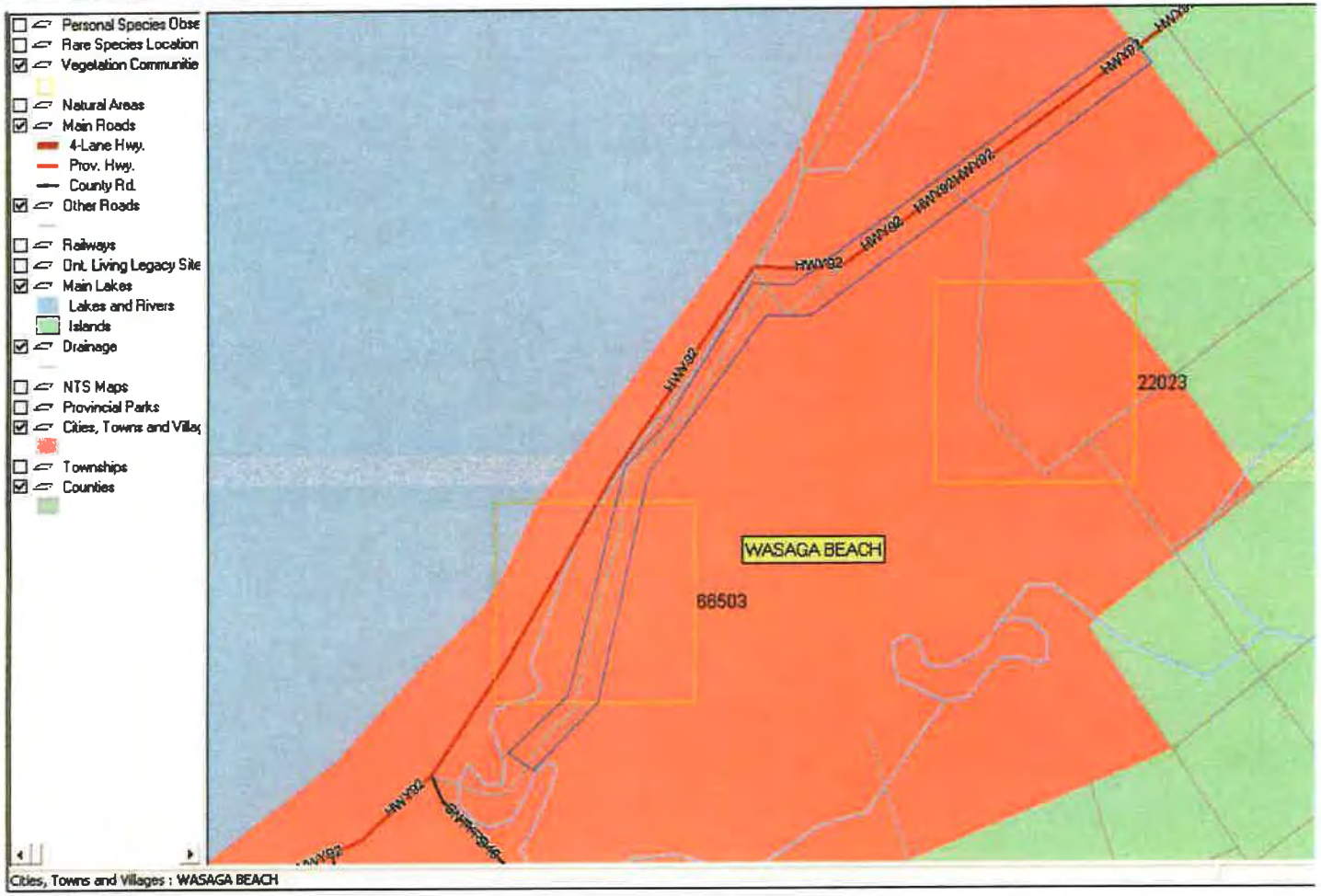
Appendix A: Natural Heritage Information Centre: Natural Areas (Obtained from OMNR's NHIC Website (2009): http://nhic.mnr.gov.on.ca/nhic_.cfm (*Approximate Study Area located within blue polygon*).



Appendix A: Natural Heritage Information Centre: Rare Species Information (Obtained from OMNR's NHIC Website (2009): http://nhic.mnr.gov.on.ca/nhic_.cfm (*Approximate Study Area located within blue polygon*).



Appendix A: Natural Heritage Information Centre: Rare Vegetation Communities (Obtained from OMNR's NHIC Website (2009): http://nhic.mnr.gov.on.ca/nhic_.cfm (*Approximate Study Area located within blue polygon*).



Ontario

Ministry of Natural Resources

Natural Heritage Information Centre

GEOGRAPHIC QUERY REPORT

Please note that this report displays results based on your current level of login access, and the jurisdiction you have access for.

There are 19 element occurrence records in this area that you have public access to. Each occurrence record (EO_ID) may have more than one separate observation associated with it (i.e. more than one row in this table). Coordinates are rounded down to within 1km. Please contact the local MNR district office ecologist if you require more details for these records.

EO_ID	Scientific Name	Common Name	UTM Centroid (rounded)	Srank	MNR	COSEWIC	Date
1767	Cirsium hillii	Hill's Thistle	17 576000 4926000	S3	THR	THR	1998-06-13
1767	Cirsium hillii	Hill's Thistle	17 576000 4926000	S3	THR	THR	1994
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	1998-06-13
1767	Cirsium hillii	Hill's Thistle	17 577000 4926000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	1998-06-13
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	2003
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	2004-08-23
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4928000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 579000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 579000 4927000	S3	THR	THR	1988-09-03
4919	Restricted Classified species		17 577000 4927000				2003-06-07
4919	Restricted Classified species		17 577000 4926000				2003-10-21
4919	Restricted Classified species		17 577000 4926000				2003-09-04
4919	Restricted Classified species		17 577000 4926000				2003-09-04
4919	Restricted Classified		17 577000 4926000				2003-07-08

	species						
4919	Restricted Classified species		17 577000 4928000				2003-07-29
4919	Restricted Classified species		17 577000 4927000				2003-05-28
4919	Restricted Classified species		17 577000 4927000				2003-05-05
4919	Restricted Classified species		17 577000 4929000				2003-06-17
4919	Restricted Classified species		17 577000 4927000				2003-09-29
4919	Restricted Classified species		17 578000 4928000				1989
4919	Restricted Classified species		17 578000 4928000				2003-09-29
4919	Restricted Classified species		17 578000 4930000				2001-10-07
4919	Restricted Classified species		17 579000 4931000				1988
4919	Restricted Classified species		17 579000 4925000				1992-07
4919	Restricted Classified species		17 579000 4931000				2001-09-10
4919	Restricted Classified species		17 579000 4930000				2003-08-29
4919	Restricted Classified species		17 580000 4930000				2003-06-06
5506	Chimaphila maculata	Spotted Wintergreen	17 579000 4929000	S1	END	END	1995
5902	Cyperus houghtonii	Houghton's Umbrella-sedge	17 577000 4926000	S3			1972-10-03
21550	Dendroica discolor	Prairie Warbler	17 577000 4929000	S3S4B	NAR	NAR	1927-06-09
33969	Pterospora andromedea	Giant Pinedrops	17 578000 4930000	S2			1948-07-28
33970	Pterospora andromedea	Giant Pinedrops	17 576000 4926000	S2			1967-05-17
35246	Vertigo paradoxa	Classification Uncertain	17 577000 4926000	S2S3			1995-06-08
60389	Cirsium pitcheri	Pitcher's Thistle	17 577000 4929000	S2	END	END	1936-07-06
91671	Graptemys geographica	Northern Map Turtle	17 575000 4925000	S3	SC	SC	1961-?

1 occurrences selected
Jump To: 1,

Element Occurrence: 1 of 1

EO_ID:

Common Name: Little Bluestem - Long-leaved Reed Grass - Great Lakes Wheat Grass Dune Grassland
Type Grank: G? **Srank:** S2
Centroid: ,, **Accuracy:** 4 **Datum:** NAD27

LOCATIONAL INFORMATION:
Loc. Name: Nat. Area
Map Number: 41A/8
Habitat:

COMMUNITY SPECIFIC INFORMATION:
System: PhysiogType: Size (ha): EORank:

Dominant Species:

Other Species:

Description:

Survey Date: Survey Type:

Top of Page

Number of natural areas selected: 5

OAKVIEW BEACH RIDGES AREA_ID: 4420

Significance	Area Type	Size	Centroid UTM	Map #
	International Biological Program site	223.4 ha	17,577300,4927600	41A/8

Description
6E6; gently to moderately rolling sandland, with old low ride features; well developed mature upland deciduous and mixed forests, and prairie openings (4 communities); very rich temperate biota, with provincially and regionally significant flora; light to medium cutting disturbance, and threat from park use; OMNR-C. [Falls et al. 1990]

Vegetation
Vegetation Summary:
1A17a/1A21: pine - oak rolling sandland dry forest; Pinus resinosa - Pinus strobus - Quercus borealis - Betula papyrifera - Diervilla lonicera - Myrica asplenifolia - Vaccinium angustifolium - Pteridium aquilinum - Gaultheria procumbens - Mitchella repens - Dicranum sp.; F2; well-drained good mulch horizon; 13.0 ha.
1A22: interridge depressional lowland wet forest; Acer rubrum - Betula papyrifera - Populus tremuloides - Ulmus americana - Thuja occidentalis - Abies balsamea - Sambucus pubens - Acer pensylvanicum - Carex spp. - Dryopteris cristata - Coptis trifolia - mosses and liverworts; P1; muck over sand, wet, gleied; 60.7 ha.
1A21: low ridge intermediate mixed forest; Quercus borealis - Populus tremuloides - Pinus strobus - Acer rubrum - Thuja occidentalis - Abies balsamea - Acer pensylvanicum - Taxus canadensis - Mitchella repens - Pteridium aquilinum - Polygala paucifolia - mosses; F2; mottled B horizon (faint); 36.4 ha.
1M21: semiopen grass - lichen sandland prairie; Andropogon scoparius - Pteridium aquilinum - Cladonia rangiferina - mosses - Ceanothus ovatus - Vaccinium angustifolium - Hieracium spp.; F1; thick surface humus layer; 113 ha. [Macdonald 1972]

Representation
Special biological features: This area is one of the last back shore, low ridge sand lands in the Nottawasaga Bay region that remains in a relatively natural regenerative condition. [Macdonald 1972]

Landform
Landscape description: A series of inshore low ridge swells of lacustrine origin backed by a dry sandy upland plain.

Major soils: Brunisols, Gleysols.

Aquatic habitats: Permanent and intermittent swamps.

Special physical features: Low, undulating sand ridges of parallel relict shoreline deposits. [Macdonald 1972]

References

- Falls, J.B., I.D. Macdonald and T.J. Beechey. 1990. Catalogue of IBP/CT Areas in Ontario with an Assessment of their Current Conservation Status. Unpublished report. 94 pp.
- Macdonald, I.D. 1972. International Biological Programme, Checksheet for Region 5, Area 424: Oakview Beach Ridges.

WASAGA BEACH PROVINCIAL PARK NATURE RESERVE ZONES AREA_ID: 1693

Significance	Area Type	Size	Centroid UTM	Map #
Provincial	Life Science ANSI	633.0 ha	17,578000,4927000	41A/8

Description

Vegetation
A striking vegetation pattern of white birch - red maple forest on well drained sandy beach ridge separated by red ash - white cedar swamp forest or dogwood (Cornus stolonifera) - holly (Ilex verticillata) thickets in the intervening wet swales is evident in the beach ridge formation. Behind the raised beaches, the foredunes contain vegetation ranging from open desert associated with blowout through sand prairie grassland, heath and savannah to closed forest. Narrow-leaved New Jersey tea (Ceanothus ovatus) - blueberry (Vaccinium sp.) - huckleberry (Gaylussacia baccata) - lichen heath and open to closed white pine - red pine forest form the major vegetation cover. Moving futher inland, much of the steeply sloping parabolic dunes (the largest and least disturbed in Ontario) are covered with an open to closed forest of red oak - white pine - red pine. [Hanna 1984]

Representation

Landform
The 412 ha proposed Nature Reserve zone (MNR, 1978, Wasaga Beach Provincial Park Recommended Master Plan), a part of Wasaga Backlands Park Reserve, lies inland from Wasaga Beach Provincial Park within a broad meander of the Nottawasaga River. It is part of a provincially significant Great Lakes barrier bar and dune complex composed of active beach and rivermouth spit, raised beaches, transverse, parallel and parabolic dunes, lagoonal sediments and river floodplain. The proposed Nature Reserve zone includes part of a provincially significant raised beach and dune complex; although only a small section of raised beaches occurs within this zone. The proposed adjacent lands (Hanna 1980) contain additional raised beaches. [Hanna 1984]

References

- Bobbette, R.B.W. 1975. Flora and Environment of the Wasaga Beach Community and Provincial Park. Volume I: Major Ecological Units, Species and Areas of Significance, Flora: Lycopodiaceae to Orchidaceae. Prepared for Ontario Ministry of Natural Resources, Huronia District. Manuscript.
- Brunton, D.F. 1989. A Biological Inventory and Evaluation of Wasaga Beach Provincial Park and Adjacent Natural Areas, Simcoe County, Ontario. Ontario Ministry of Natural Resources, Central Region, Richmond Hill. OFER 8905. ix + 186 pp. + maps.
- Carlisle, R.J., D.G. Cuddy and R. Norman. 1972. Wasaga Beach: An Ecological Assessment. Ontario Ministry of Natural Resources, Parks Branch, Toronto.
- Glooschenko, V., B. Parker, L.Coo, R. Kent, C. Wedeles, A. Mason, J. Dawson, D. Herman and P. Smith. 1987. Provincially and Regionally Significant Wetlands in Southern Ontario. OMNR, Wildlife Branch, Toronto. 321 pp.
- Hanna, R. 1984. Life Science Areas of Natural and Scientific Interest in Site District 6-6: A Review and Assessment of Significant Natural Areas in Site District 6-6. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. SR OFER 8409. viii + 79 pp. + maps.

WASAGA BEACH PROVINCIAL PARK **AREA_ID: 3259**

Significance	Area Type	Size	Centroid UTM	Map #
	Provincial Park – Recreational	1529.2 ha	17,578175,4927663	41A/9

Description
Wasaga beach encompasses a complex of beach and dune systems on the shore of Nottawasaga Bay. The main beach is Ca 14km long. There is a large transverse and parabolic dunes system separated from the beach by the town of Wasaga Beach. This area has complex vegetative characteristics. Has elements of riparian forest, young mixed forests, extensive pine and oak-pine forests and a mixture of wetland and ridge intolerant forest vegetation. Barren communities also present.

Vegetation
Botanists have identified twenty-six biological communities within geomorphological system of Wasaga Beach. Of these, twenty-two occure within the boundaries of the dune park. These communities occur in close association with components of the geomorphological system. The raised beaches exhibit a striking pattern of dry vegetation on the ridges and wet bog communities in the swales. The vegetation in the dunes varies from open desert (blowouts) through prairies, prairie heath, and savanah to closed forest cover. Many of the dunes species are native xeric species, pre-adapted colonizers of dry sands. The floodplain and river basin areas contain typical floodplain - meadow and forest species. Only the farmed fields and two pine plantations are major deviations from natural development systems. (OMNR, 1978)

Many of the communities and species now existing I the dunes fields are not common in Ontario, and appear to have held on to this sandy dry area from a period perhaps 4,000 years I the past when climatic conditions were much drier. And while then normal undisturbed succession process (something that almost never happens) would suggest that all of the prairie should now have advanced to full closed forest, botanists suggest that frequent fires (both natural and human origin) have been instrumental in maintaining the vegetative communities of Wasaga Beach I all stages of succession. (OMNR, 1978)

Representation
There are other baymouth bar systems on the Great Lakes. None, however, show the combination of raised beaches, foredunes and parabolic dunes to the extent of Wasaga Beach. There is one other similar set of raised beaches on the Great Lakes near Ipperwash on Lake Huron. It is not under Crown ownership. (OMNR, 1978)

Landform
Wasaga Beach ha the largest known set of parabolic dunes in Ontario. Even compared to other sets of large dunes of different types, these are some of the least disturbed by man's activity. The foredunes (blown out high transverse dunes), 10 to 20 feet high, are not unlike general dune systems anywhere I the Great Lakes. Both the foredunes and parabolic dunes are composed of unconsolidated wind blown sands. If vegetative cover is disturbed, these sands are subject to further movement by the wind. Lagoon sequences, floodplains and the river's edge are not unlike many similar features elsewhere. Their significance lies in their relationship to other features as part of a geomorphological system. (OMNR, 1978)

References

- Anonymous. n.d.. Herbarium Inventory for Wasaga Beach Provincial Park. 9 pp.
- Bobbette, R.S.W. 1975. Flora and Environment of the Wasaga Beach Community and Provincial Park. Volume I: Major Ecological Units, Species and Areas of Significance, Flora: Lycopodiaceae to Orchidaceae. Prepared for Ontario Ministry of Natural Resources, Huronia District. Manuscript.
- Brunton, D.F. 1989. Biological inventory and evaluation of Wasaga Beach Provincial Park and adjacent natural areas, Simcoe County, Ontario. Prepared for Parks and Recreational Areas section, OMNR Richmond Hill.
- Carlisle, R.J., D.G. Cuddy and R. Norman. 1972. Wasaga Beach: An Ecological Assessment. Ontario Ministry of Natural Resources, Parks Branch, Toronto.
- Hanna, R. 1984. Life Science Areas of Natural and Scientific Interest in Site District 6-6: A Review and Assessment of Significant Natural Areas in Site District 6-6. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. SR OFER 8409. viii + 79 pp. + maps.
- Johnston, J. n.d.. Beach Barrier Complexes at Wasaga Beach and Ipperwash, Ontario. Department of Earth Science, University of Waterloo, Waterloo. 1 pp + 2 maps.
- Ontario Ministry of Natural Resources. 1978. Wasaga Beach Provincial Park: Recommended Master Plan. OMNR. 67 pp + map.

WASAGA BEACH **AREA_ID: 156**

Significance	Area Type	Size	Centroid UTM	Map #
	Macrosite	0.0 ha	17,579000,4931000	41A/9

Description

Vegetation
Marl Lake and Jack's Lake represent the last vestiges of large Nippissing - Great Lakes Lagoon that once filled this valley now supporting fen communities around the marl lakes. Along the Nottawasaga River, which runs through this area, is an alluvial floodplain which supports elements of a more southern riparian forest. Young mixed forest occurs on the lagoon flats, Pine and Pine - Oak forests on high parabolic and transverse dune systems and a mixture of alternating wetland and ridge successional forest vegetation on the raised beach system near the lakeshore. Prairie-like grassland vegetation is found in the high dunes and along active beach. Also, examples of desert-like barrens vegetation in sand dune-blow out areas. Wetlands at this site include deciduous swamp forest in wet to very wet depressions. Usually Green and Black Ash with diverse understory. Mixed swamp forest of White Cedar, White Birch, Green Ash and Elm with dense understory occur along Nottawasaga River and near Marl Lake. Coniferous swamp forest occurs on wet to saturated sand areas, generally behind parabolic dunes. White Cedar, Larch, Balsam Fir and Black Spruce dominate. Tree growth is dense and understory sparse. Thicket swamp and wet meadows in swales between dunesalso occur. Marl fen occurs along shore of Marl Lake. Mixed emergent and floating marsh communities in Marl and Jack's Lakes. Shallow marsh along Nottawasaga River. Graminoid fen occurs on organic substrates over marl at Jack's Lake and open shrub fen at Powerline Rd. flats. [OCDC 1992]

Representation

Landform
Area is characterized by limestone bedrock overlain with deep deposits of glacial and lacustrine materials, mainly sands. Contains several distinct landscape units. Active beach is located closest to the bay with a spit that runs along the bay shore. This is backed by broad band of ridge and swale features. Behind this series of raised beaches is large area of rolling, transverse dunes backed by a field of high parabolic dunes. Inland from east wall of the parabolic dunes is a broad expanse of level, silty-sand, lagoon flats. Marl Lake and Jack's Lake represent the last vestiges of large Nippissing-Great Lakes Lagoon that once filled this valley now supporting fen communities around the marl lakes. Along the Nottawasaga River, which runs through this area, is an alluvial floodplain which supports elements of a more southern riparian forest. [OCDC 1992]

References

- Ontario Conservation Data Centre. 1992. Site Basic Record: Wasaga Beach. 3 pp.

WASAGA BEACH- WETLAND **AREA_ID: 7449**

Significance	Area Type	Size	Centroid UTM	Map #

Other	Wetland	249.3 ha	17,580500,4833000	31D/12

Description
A Non-Provincially significant, Coastal wetland complex, made up of 20 individual wetlands, composed of two wetland types (94% swamp and 6% marsh) (Young, 1998).

Vegetation
Dominant Vegetation Forms (Medd, 1994):
97% deciduous trees, 1.5% narrow-leaved emergents, and 1.5% submergents;

Vegetation Communities (Hooper and Kennedy, 1985):
Three Forms
W1: submergents; robust emergents; tall shrubs;
M1: narrow-leaved emergents; ground cover; robust emergents;

Four Forms
M2: narrow-leaved emergents; ground cover; tall shrubs; low shrubs;
S1: deciduous trees; tall shrubs; low shrubs; ground cover;

Five Forms
S2: deciduous trees; tall shrubs; low shrubs; narrow-leaved emergents; ground cover;
S3: deciduous trees; coniferous trees; tall shrubs; low shrubs; ground cover;
S4: deciduous trees; narrow-leaved emergents; submergents; ground cover; broad-leaved emergents;

Six or More Forms
S5: deciduous trees; tall shrubs; low shrubs; narrow-leaved emergents; robust emergents; ground cover;
S6: deciduous trees; coniferous trees; tall shrubs; low shrubs; narrow-leaved emergents; ground cover;
S7: deciduous trees; dead deciduous trees; robust emergents; narrow-leaved emergents; tall shrubs; low shrubs; ground cover;
S8: deciduous trees; dead deciduous trees; coniferous trees; tall shrubs; low shrubs; narrow-leaved emergents; ground cover;

Representation

Landform
Soils (Young, 1998): 50% sand (Tioga series), and 50% humic/ mesic;
Site Type (Young, 1998): 21% isolated and 79% palustrine (permanent or intermittent outflow);

References

- Hooper, G. and D. Kennedy. 1985. Wetland Data Record and Evaluation- Wasaga Beach Wetland. Second Edition. July 22, 23 & 29, 1985. Nottawasaga Valley Conservation Authority. Manuscript. 19 pp + 1 map + 7 pp supplement.
- Medd, T. 1994. Southern Ontario Wetland Evaluation, Data and Scoring Record- Wasaga Beach. Third Edition (May). July 22, 23 & 29, 1985. Desktop Update. Ontario Ministry of Natural Resources. Manuscript. 23 pp.
- Young, T. 1998. Southern Ontario Wetland Evaluation, Data and Scoring Record- Wasaga Beach. Third Edition, August 15, 17 and 18, 1998. Dillon Consulting. Manuscript. 41 pp.

Brad Baker

From: Robinson, Suzanne (MNR) [suzanne.robinson@ontario.ca]
Sent: Friday, July 24, 2009 2:54 PM
To: Brad Baker
Cc: Gormaly, Phil (MNR)
Subject: RE: Municipal Class EA for River Road West Urbanization, Town of Wasaga Beach

Good afternoon Brad

I have reviewed the map and letter that you provided on July 7, 2009 pertaining to the River Road West Urbanization in the Town of Wasaga Beach, County of Simcoe

Our mapping indicates that the following natural heritage features are located within the 30 m of the existing road and right of way.

Wasaga Beech Provincially Significant Wetland
Wasaga Dunes Life Science Area of Natural and Scientific Interest (Provincial),
Wasaga Beach Provincial Park
Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest ANSI (Provincial),
Provincially Significant Wildlife Habitat (Deeryards)

If you require mapping of the natural heritage features you can acquire it from Land Information Ontario (LIO). If you have questions pertaining to LIO and the information available there, you should contact Paul Jurjans, GIS Officer, at (705)725-7564.

Our records also indicate that [redacted] is present in this area and has been observed in the right of way and adjacent lands. [redacted] is listed as a threatened species in Ontario. There are reports of this species crossing River Road West in this area. This species is highly susceptible to road mortality and could potentially be impacted by construction in this area. Under the Endangered Species Act 2007 this species is protected from killing, harming and harassing, as well as possession and trade. Therefore, mitigation measures should be adopted that ensure the protection of this species. A few approaches are as follows:

- All construction and site workers should be informed of the potential for this species to be present, be able to identify it and be aware that it is protected under the ESA 2007. Individuals working on site should ensure that snakes are not harmed during construction or killed by heavy machinery, vehicles or other equipment. All observations of this species should be reported to the Midhurst District Office.
- If silt fencing is present, construction site inspectors should inspect it daily for both the presence of snakes and holes in the material. Rodents and other small mammals will frequently create holes in silt fencing to access an area. Standard grade of silt fencing should also be used at the site. Past experience has shown that reinforced higher quality silt fence can be a hazard to this and other species of snake as they become entangled in the mesh.
- A best practice would be that construction occur outside of the active season for this species (April 15-October 31)

Please note that [redacted] is sought after and can be negatively impacted from the illegal collection and trade. AS a result we request that this species information be kept confidential in reports made available to the public. It is a best practice to refer to these records as a "sensitive species of snake". Other than those individuals that are required to be informed of the presence of this species it is recommended that this information be maintained as confidential.

Should an observation of a species at risk or rare species occur or become known on the site, please report the information to the Natural heritage Information Centre (NHIC) http://nhic.mnr.gov.on.ca/nhic_.cfm or to the Midhurst District office.

Please let me know if you have any questions or if you would like to discuss this information further.

Regards,

Suzanne Robinson
Species at Risk Biologist

From: Brad Baker [mailto:BBaker@Azimuthenvironmental.Com]
Sent: July 7, 2009 1:59 PM
To: Robinson, Suzanne (MNR)
Subject: Municipal Class EA for River Road West Urbanization, Town of Wasaga Beach

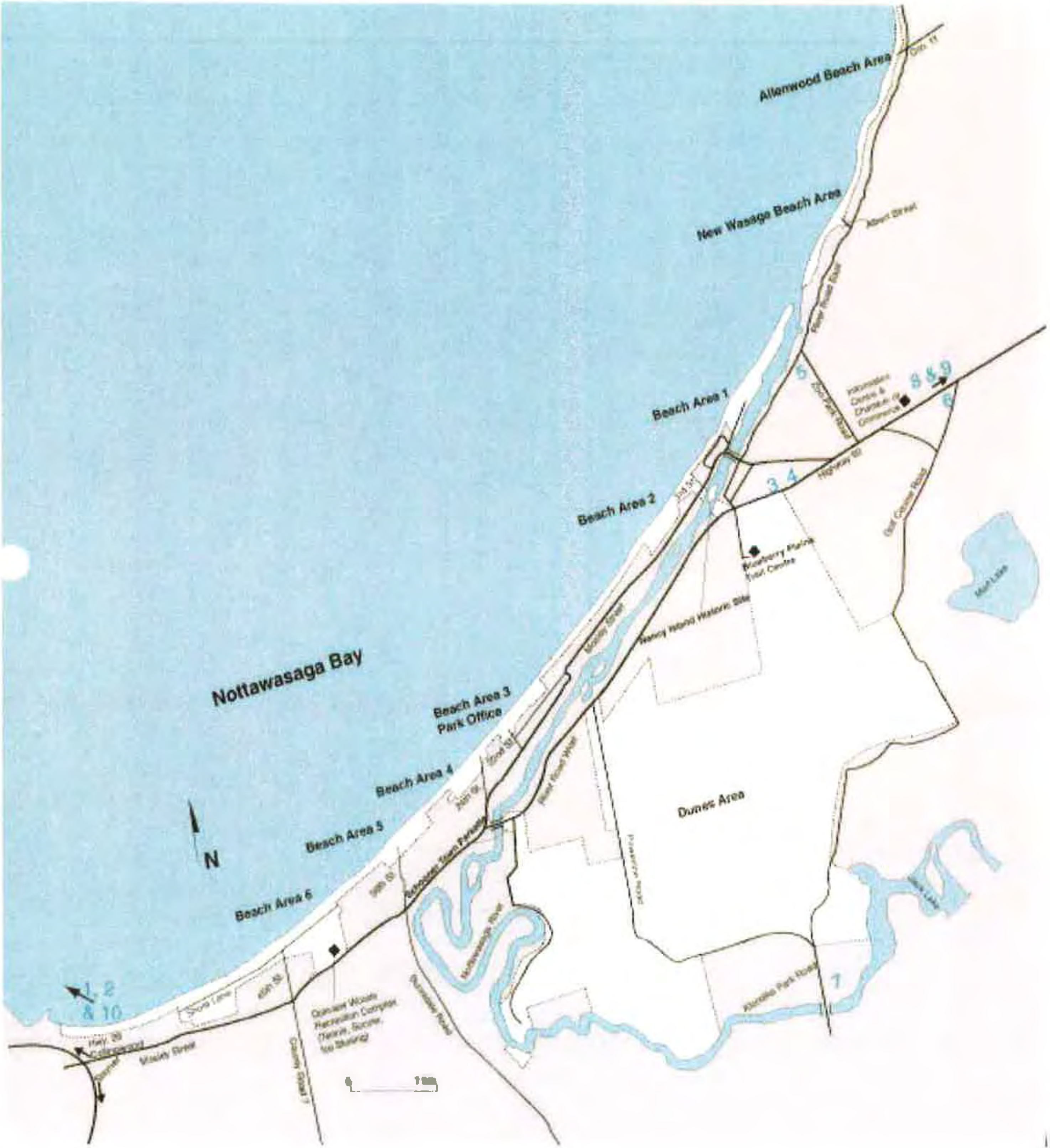
Hello Suzanne,

Please find attached our background information request letter for the abovementioned project. Thank you very much for your attention to this matter. If you have any questions, or require further information, please to not hesitate to call.

Regards,

Brad Baker
Biologist

Azimuth Environmental Consulting, Inc.
229 Mapleview Drive East, Unit 1
Barrie, ON L4N 0W5
(705) 721-8451 fax (705) 721-8926
BBaker@azimuthenvironmental.com


Allenwood Beach Area
New Wasaga Beach Area
Beach Area 1
Beach Area 2
Nottawasaga Bay
Beach Area 3
Park Office
Beach Area 4
Beach Area 5
Beach Area 6
N
Dunes Area
Highway 92
8 & 9
6
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APPENDIX B

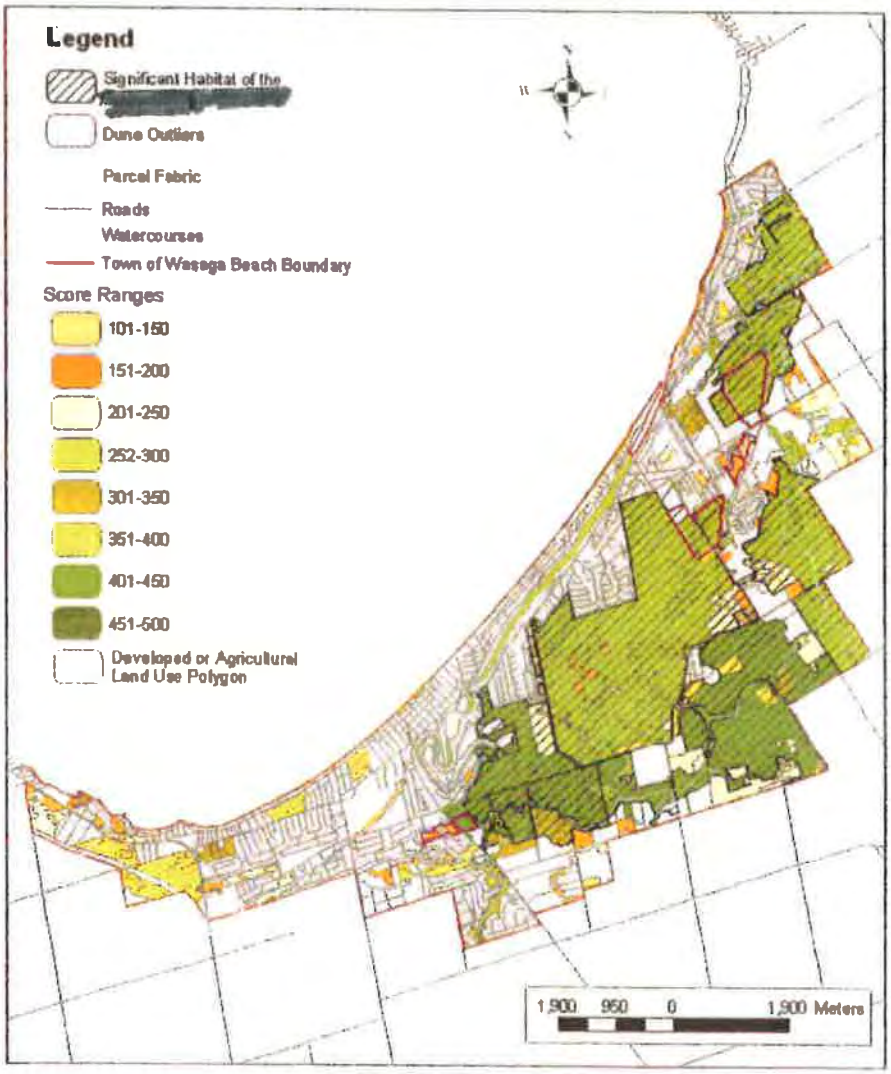


Figure 2: Significant Habitat & Natural Heritage Modeling Scores

Brad Baker

From: Anita Ward [award@nvca.on.ca]
Sent: Wednesday, July 22, 2009 8:08 AM
To: Brad Baker
Subject: Municipal Class Environmental Assessment for the River Road West Urbanization

Good morning Brad,

I apologize for the delay in getting back your requested information regarding the EA, I have determined the following NVCA concerns and gathered the associated background information. As Patti mentioned, this EA covers areas that are regulated by NVCA due to the presence of watercourses and associated hazards; environmental areas; and wetland setback areas.

Our main concern is the preservation of the Provincially Significant Wasaga Beach Wetland Complex located directly south of River Road West and after Blueberry Trail. Currently, River Road is already encroaching into the NVCA regulated 120 metre wetland setback area however, expansion of this road was cause further encroachment into this area ultimately, moving the development as a whole closer to the wetland. More minorly, we also possess concerns over the properties adjacent to the river along River Road West. These properties area regulated entirely or almost entirely by NVCA as floodplain and the expansion of a road will (even if ever so slightly) decrease developable space on these already hazardous properties. Also, please note the flooding hazards do not extend onto the current River Road however, a meanderbelt erosion hazard does extend onto the road at the Powerline Road/River Road intersection as well as a lesser flooding hazard extending onto the road to the east of Bells Park Road (this is lesser because it looks as if it has already been piped).

I have also spoken with our watershed ecologist Dave Featherstone and he has provided me with the following Natural Heritage background information:

The Provincially Significant Wasaga Beach Wetland Complex and its broader associated area supports habitat for the [redacted] (a threatened species); it is part of the Wasaga Beach Provincial Park ANSI (Area of Natural and Scientific Interest); as well as being shown as deer wintering yards (according to MNR mapping). The field areas situated west of Vigo Road support large numbers of white-tailed deer specifically in late winter/early spring. Dave says that the deer are likely dispersing outward fro the large deer wintering yards located north of River Road West. Deer are also very common along the narrow linkage from forest cover along Powerline Road moving northward towards the undeveloped shoreline along the river. They may move in numbers thus, creating a safety concern along the roads. The headwaters of Little Mari Creek arise just upstream of Baywood Golf Course, this is an intermittent watercourse but may support tolerant baitfish such as Brook Sitckleback.

Our engineering department has also voiced concerns over stormwater management and potential raising of the grade of the road. The NVCA hopes that EA will cover these concerns and associated mitigation measures as well as the conservation methods that will be taken to preserve the wetlands and natural heritage of the area.

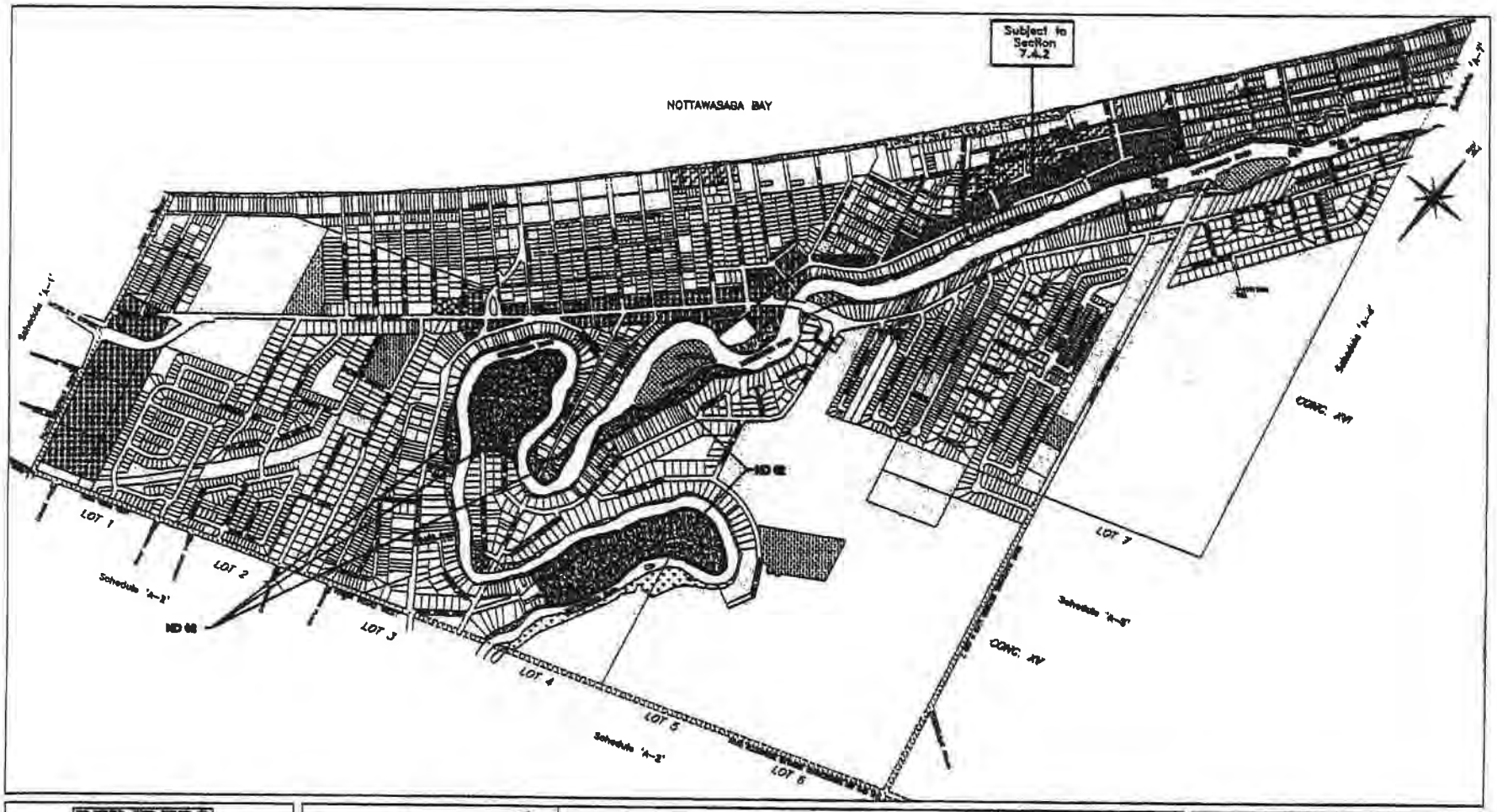
I have not yet had an opportunity to speak with our Fisheries Department but will be sure to provide back information should anything important come up on the subject when we do meet.

Please do not hesitate to contact myself at extension 254 or Patti Young at extension 231.

Regards,

Anita Ward

Anita Ward
Planning Assistant
Nottawasaga Valley Conservation Authority
8195 8th Line
Utopia, ON L0M 1T0
p: (705) 424-1479 ex. 254
f: (705) 424-2115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NOTTAWASAGA BAY
Schedule 'A-1'
Schedule 'A-2'
Schedule 'A-3'
Schedule 'A-4'
Schedule 'A-5'
CONC. XIV
CONC. XV
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
ROAD
REINDERS SOUTHPARK
OFFICE CONSOLIDATION
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LEGEND
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HIGH DENSITY RESIDENTIAL
COUNTRY CLUB COMMUNITY
LOCAL COMMERCIAL
DISTRICT COMMERCIAL
SERVICE COMMERCIAL
TOURIST ACCOMMODATION
TOURIST COMMERCIAL
CAMPGROUND COMMERCIAL
INSTITUTIONAL
RECREATIONAL COMMERCIAL
INDUSTRIAL
SCHEDULE BOUNDARY
OPEN SPACE
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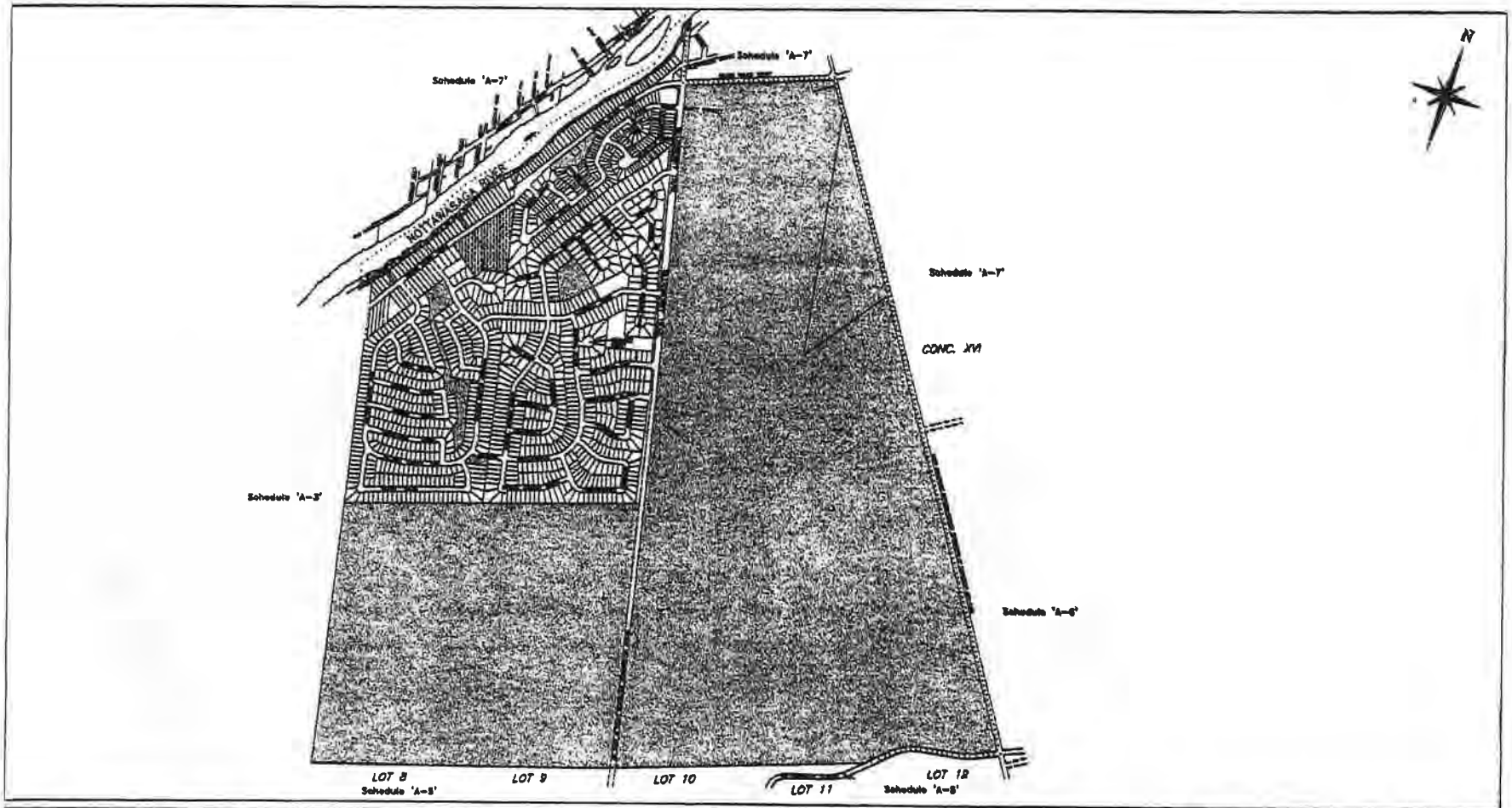
RURAL
NATURAL HERITAGE SYSTEM CATEGORY 1 LANDS
CORPORATE LIMITS OF THE TOWN OF WASAGA BEACH
NON NON DESIGN
TOWN OF
WASAGA BEACH
Schedule 'A-3'
LAND USE PLAN
OFFICIAL PLAN FOR THE TOWN OF WASAGA BEACH



REINDERS SOUTHPARK

OFFICE CONSOLIDATION

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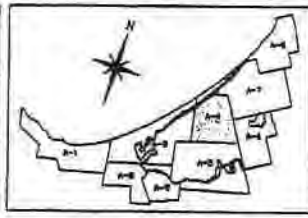

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CORPORATE LIMITS OF THE TOWN OF WASAGA BEACH

TOWN OF

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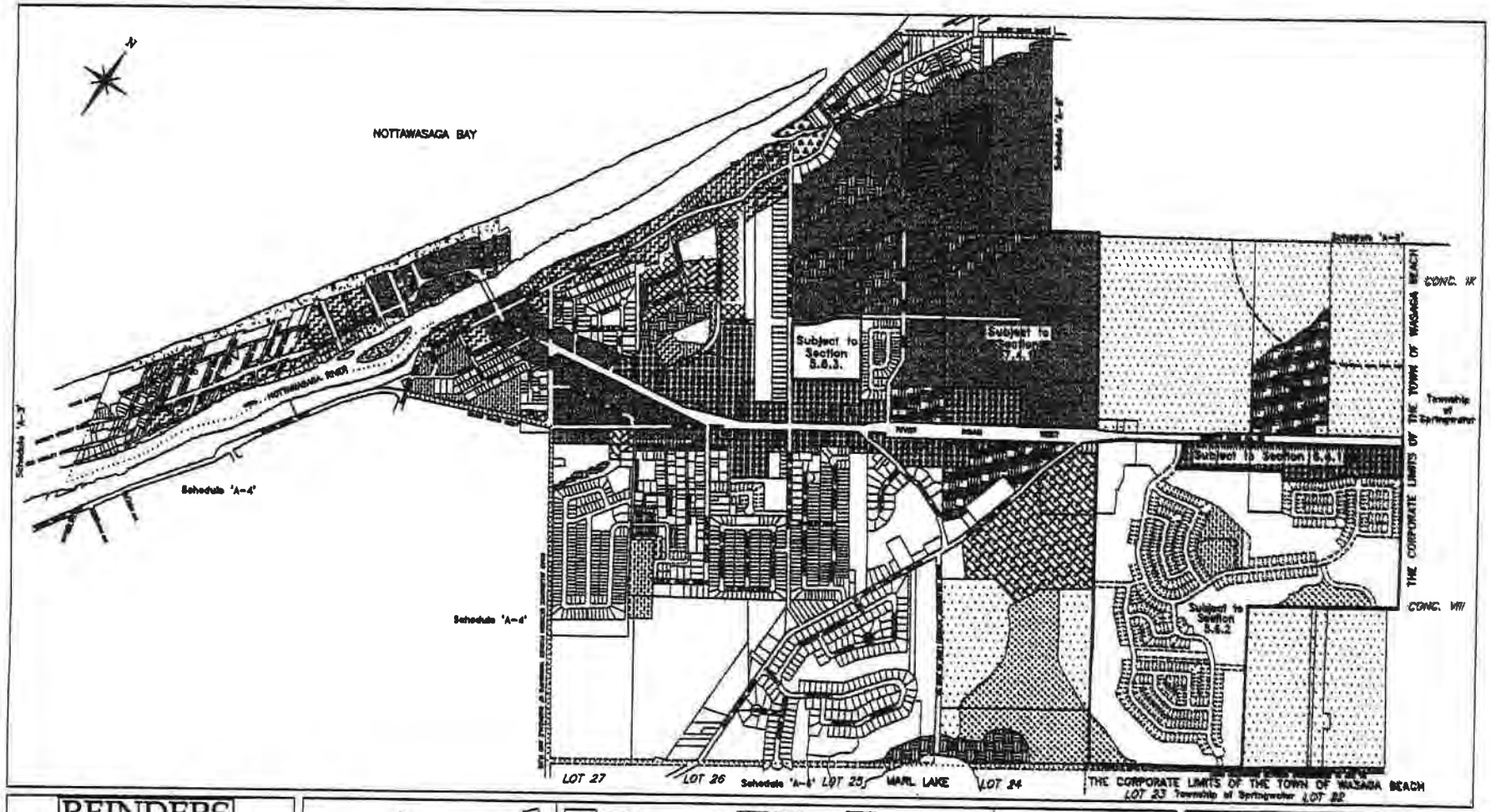
WASAGA Beach

WASAGA BEACH

Schedule 'A-4'

LAND USE PLAN

OFFICIAL PLAN FOR THE TOWN OF WASAGA BEACH



REINDERS SOUTHPARK

OFFICE CONSOLIDATION

1 : 15 000

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LEGEND

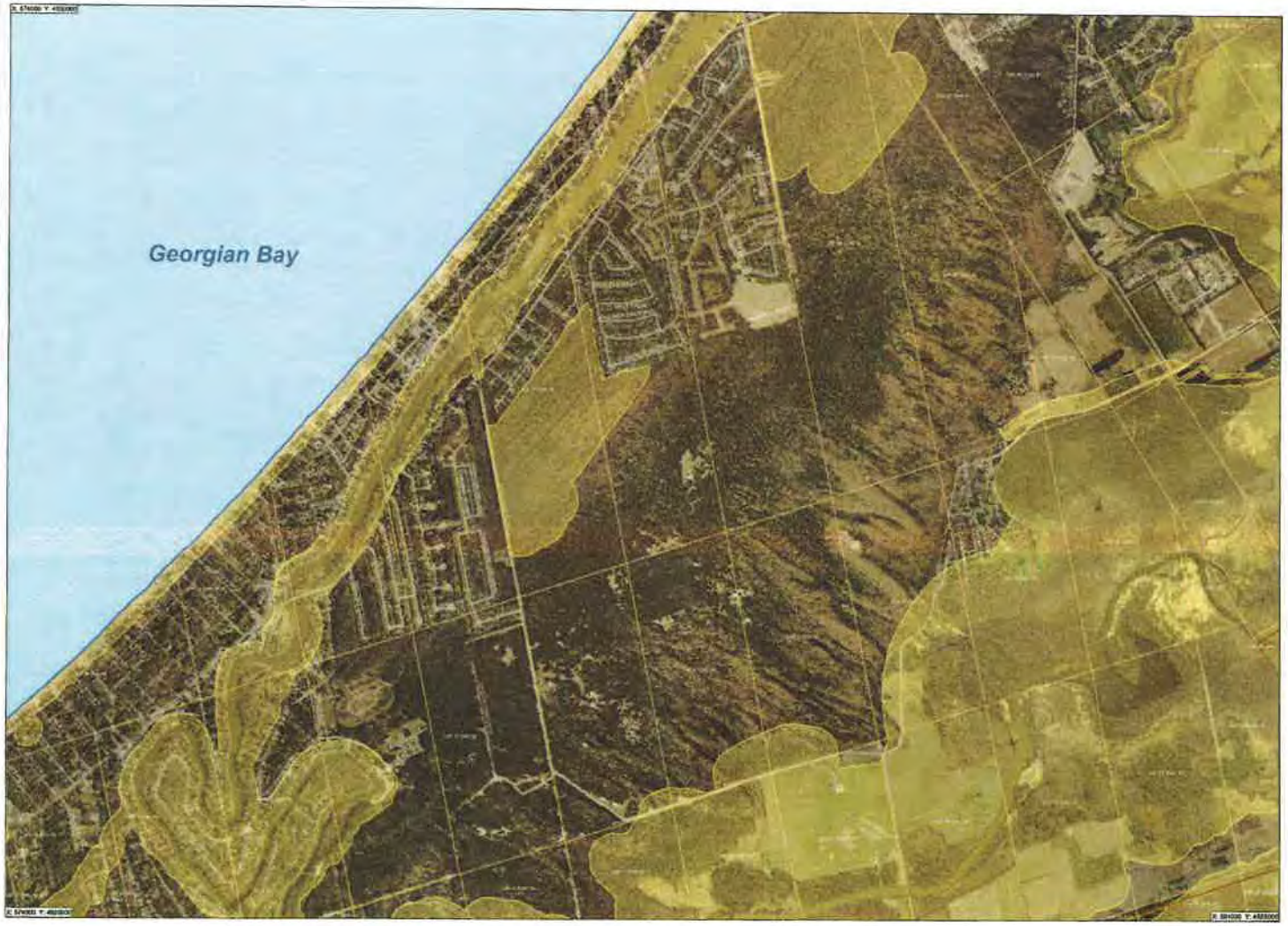
TOWN OF WASAGA Beach

WASAGA BEACH

Schedule 'A-7'

LAND USE PLAN

OFFICIAL PLAN FOR THE TOWN OF WASAGA BEACH



NOTTAWASAGA VALLEY CONSERVATION AUTHORITY
8195 CONCESSION LINE 8
UTOPIA, ONTARIO. L0M 1T0
TELEPHONE: (705) 424-1479
FAX: (705) 424-2115
www.nvca.on.ca

ONTARIO REGULATION 172/06

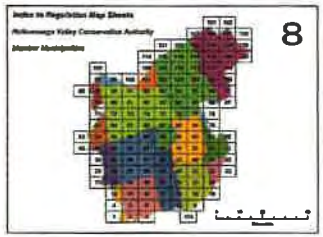
REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES.

(IN CONFORMANCE WITH ONTARIO REGULATION 97/04)

8

LEGEND

- MUNICIPAL BOUNDARY
- NVCA JURISDICTION
- REGULATION LIMIT
- LOT & CONCESSION FABRIC



In case of a conflict, the description of the areas provided in Section 2(1) of Ontario Regulation 172/06 prevails over the information shown on this map. Under Ontario Regulation 172/06 of the Conservation Authorities Act, the Nottawasaga Valley Conservation Authority regulates development in areas defined in Section 2. Subsection 1. The Regulation limit for riverine systems includes the greater (+) of the flood plus limit and the erosion hazard limit, plus an allowance of 15 metres. The Regulation limit for Lake Huron (Georgian Bay) includes the high lake level (176.0 metres GSCD) plus an allowance of 45 metres (some cases, other water related hazards, dynamic beach). Provincially Significant Wetlands have been provided by the Ministry of Natural Resources. All other wetlands were delineated by the NVCA using the Ontario Wetland Evaluation System. The Regulation limit shown on this map includes wetlands greater than 2 hectares plus an allowance of 120 metres in order to identify lands where development could interfere with the function of a wetland. Ontario Regulation 172/06 applies to all wetlands and areas within the flooding hazard limit and erosion hazard limit shown on this map. Karst topography is a landscape created by groundwater dissolving sedimentary rock, such as limestone. This creates landforms such as sinks, karrens, caves and sinkholes. Karst topography is considered to be a natural hazard. Further studies will be required for development proposals within areas where karst topography is suspected.

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Meters

No.	Revision	Date	Drawn
2	REVISED FOLLOWING MUNICIPAL CONSULTATION	Feb 16, 2007	
1	APPROVED, REGULATION NUMBER ADDED	May 4, 2006	May 15, 2006
			GIS DEPT

ONTARIO REGULATION 172/06
REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES.
(IN CONFORMANCE WITH ONTARIO REGULATION 97/04)

February 2007

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LEGEND

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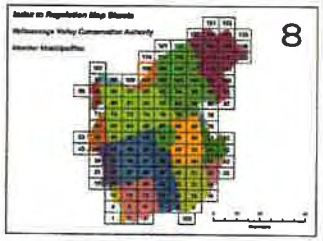

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2	REVISED FOLLOWING MUNICIPAL CONSULTATION	Feb 16, 2007	
1	APPROVED, REGULATION NUMBER ADDED	May 4, 2006	
No.	REVISIONS	Date	

May 15, 2006

GIS DEPT

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REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES. (IN CONFORMANCE WITH ONTARIO REGULATION 97/04)

February 2007

NOTTAWASAGA VALLEY CONSERVATION AUTHORITY
8195 CONCESSION LINE 6
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TELEPHONE: (705) 424-1479
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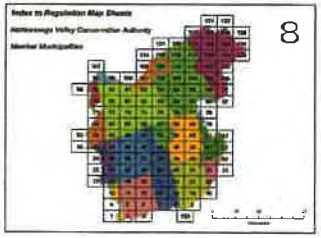

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2	REVISED FOLLOWING MUNICIPAL CONSULTATION	Feb 16, 2007	
1	APPROVED, REGULATION NUMBER ADDED	May 4, 2006	May 13, 2006
			GIS DEPT

ONTARIO REGULATION 172/06

REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES.

(IN CONFORMANCE WITH ONTARIO REGULATION 97/04)

February 2007

APPENDIX C

Square Summary (17NK72)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
31	30	29	90	73	34	34	141	43	74	22	91

Region summary (#13: Simcoe County)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
68	63	65	181	190	2075	850

Target number of point counts in this square: 22 road side, 3 off road (1 in deciduous forest, 1 in coniferous forest, 1 in mixed forest). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%	
	1st	2nd	1st	2nd
Common Loon	P	S	28	52
Pied-billed Grebe			22	32
Double-crest Cormorant §		H	11	27
American Bittern		H	50	44
Least Bittern †			12	23
Great Blue Heron §		H	77	63
Great Egret †			0	1
Green Heron §	H	H	84	70
Black-crown N.-Heron † §			12	9
Yellow-crn N.-Heron †			0	0
Turkey Vulture		T	77	84
Canada Goose		FY	58	96
Trumpeter Swan †			0	43
Wood Duck		P	76	78
Gadwall ‡			6	4
American Wigeon		H	6	12
American Black Duck		H	44	47
Mallard	FY	NE	93	95
Blue-winged Teal	FY	H	79	53
Northern Shoveler			11	10
Northern Pintail		H	14	7
Green-winged Teal		H	0	18
Redhead †		X	3	1
Ring-necked Duck		H	4	21
Lesser Scaup ‡		X	1	1
Hooded Merganser		H	25	30
Common Merganser		H	36	46
Red-breast Merganser		H	9	20
Ruddy Duck †		X	0	1

SPECIES	Code		%	
	1st	2nd	1st	2nd
Osprey		H	42	53
Bald Eagle †		X	0	1
Northern Harrier	H		76	66
Sharp-shinned Hawk	H	H	50	60
Cooper's Hawk		H	17	47
Northern Goshawk		H	15	27
Red-should Hawk †	H	H	17	44
Broad-winged Hawk		NB	58	66
Red-tailed Hawk	H	H	92	81
American Kestrel	CF	H	85	76
Merlin ‡		X	1	21
Peregrine Falcon †		X	0	1
Gray Partridge ‡			0	1
Ring-necked Pheasant			15	10
Ruffed Grouse	FY	H	92	81
Wild Turkey		NU	0	81
Yellow Rail †			3	3
King Rail †			3	3
Virginia Rail		H	38	47
Sora		H	31	43
Common Moorhen			17	12
American Coot			15	12
Coot/Moorhen			0	0
Sandhill Crane ‡			0	21
Killdeer	NU	DD	96	96
Spotted Sandpiper	D	A	95	78
Upland Sandpiper		S	60	38
Common Snipe	H	H	79	61
American Woodcock	H	T	79	72

SPECIES	Code		%	
	1st	2nd	1st	2nd
Ring-billed Gull §		H	6	33
Herring Gull §	NY	H	49	38
Great Black-backed Gull †		X	0	1
Caspian Tern †			1	3
Common Tern §		H	34	23
Forster's Tern † §		X	0	1
Black Tern † §		X	30	21
Rock Dove	P	D	87	84
Mourning Dove	NU	T	96	96
Black-billed Cuckoo	H	NY	58	75
Yellow-billed Cuckoo		H	6	18
Black/Yell-billed Cuckoo			0	18
Eastern Screech-Owl		H	12	49
Great Horned Owl	P	S	74	55
Barred Owl			20	49
Long-eared Owl ‡			3	4
Short-eared Owl †			1	4
North Saw-whet Owl			9	12
Common Nighthawk	NU	T	63	40
Whip-poor-will	H	H	60	38
Chimney Swift		H	63	32
Ruby-thr Hummingbird	T	H	88	96
Belted Kingfisher	CF	T	96	92
Red-head Woodpecker †	D	NY	65	29
Yellow-bellied Sapsucker	S	H	80	96
Downy Woodpecker	D	S	96	96
Hairy Woodpecker	S	NY	96	93
Black-back Woodpecker ‡		X	0	1
Northern Flicker	D	FY	96	96

Ontario Breeding Bird Atlas - Summary Sheet for Square 17NK72 (page 2 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Pileated Woodpecker	T	S	80	93
Olive-sided Flycatcher		H	22	20
Eastern Wood-Pewee	T	NB	96	96
Alder Flycatcher		S	47	76
Willow Flycatcher		NE	42	55
Least Flycatcher	H	D	88	89
Eastern Phoebe	AE	NE	95	96
Gr Crested Flycatcher	D	T	98	96
Eastern Kingbird	NY	T	98	95
Loggerhead Shrike †			15	3
Yellow-throated Vireo ‡		S	30	26
Blue-headed Vireo		FY	9	38
Warbling Vireo	S	T	92	93
Philadelphia Vireo ‡			1	4
Red-eyed Vireo	T	FY	93	96
Blue Jay	CF	FY	96	96
American Crow	N	FY	98	96
Common Raven		P	7	55
Horned Lark	S	S	68	47
Purple Martin	AE	AE	61	27
Tree Swallow	NE	H	98	96
North Rgh-wing Swallow	AE	V	68	56
Bank Swallow §	NE	NU	88	58
Cliff Swallow §	AE	H	82	63
Barn Swallow	NY	NB	96	95
Black-capp Chickadee	NY	AE	96	96
Tufted Titmouse †			1	0
Red-breast Nuthatch	D	T	52	90
White-breast Nuthatch	D	T	87	93

SPECIES	Code		%	
	1st	2nd	1st	2nd
Brown Creeper	H	H	55	60
Carolina Wren ‡			1	6
House Wren		AE	87	95
Winter Wren	H	S	68	95
Sedge Wren			19	20
Marsh Wren			42	33
Golden-crown Kinglet		H	7	21
Ruby-crown Kinglet			6	7
Blue-gr Gnatcatcher ‡		H	14	24
Eastern Bluebird		NY	57	73
Veery	T	S	95	96
Swainson's Thrush		H	14	20
Hermit Thrush	S	T	39	69
Wood Thrush	T	T	90	92
American Robin	NY	NE	98	98
Gray Catbird	S	A	96	96
Northern Mockingbird			6	18
Brown Thrasher	T	NE	96	92
European Starling	AE	CF	98	96
Cedar Waxwing	H	FY	98	96
Blue-winged Warbler		H	4	24
Golden-winged Warbler		H	30	43
Blue/Gold-wing Warbler ‡			0	15
Brewster's Warbler †			0	3
Nashville Warbler	T	S	74	84
Northern Parula		H	12	21
Yellow Warbler	T	NY	98	92
Chestn-sided Warbler	S	S	68	95
Magnolia Warbler		S	20	58

SPECIES	Code		%	
	1st	2nd	1st	2nd
Black-thr Blue Warbler		H	22	63
Yellow-rumped Warbler		T	41	78
Black-thr Green Warbler	S	T	34	90
Blackburnian Warbler		S	28	58
Pine Warbler	S	T	28	80
Kirtland's Warbler †			1	0
Prairie Warbler †			6	9
Bay-breasted Warbler ‡			1	3
Cerulean Warbler †			12	16
Black-white Warbler	CF	T	84	93
American Redstart	H	S	85	90
Ovenbird	T	FY	98	96
North Waterthrush	T	S	61	86
Mourning Warbler	T	S	63	81
Common Yellowthroat	A	S	92	95
Canada Warbler	T	H	46	58
Scarlet Tanager		P	79	86
Eastern Towhee		DD	53	73
Chipping Sparrow	NY	NE	96	96
Clay-colored Sparrow		H	14	36
Field Sparrow	P	T	84	87
Vesper Sparrow	H	T	84	70
Savannah Sparrow	H	A	88	81
Grasshopper Sparrow	T	T	38	41
Song Sparrow	T	NE	98	96
Swamp Sparrow	S	H	84	86
White-throat Sparrow	S	T	95	87
Dark-eyed Junco	H	H	25	21
Northern Cardinal	D	T	66	84

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next page >>

Ontario Breeding Bird Atlas - Summary Sheet for Square 17NK72 (page 3 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Rose-breast Grosbeak	DD	S	95	93
Indigo Bunting	S	S	90	93
Bobolink	S	T	87	83
Red-wing Blackbird	NE	A	96	96
Eastern Meadowlark	T	T	88	83
Western Meadowlark ‡			6	1
Yellow-h Blackbird †			1	0
Rusty Blackbird ‡			1	1
Brewer's Blackbird ‡			3	7
Common Grackle	NY	CF	96	96
Brown-head Cowbird	NE	NE	98	95
Orchard Oriole ‡			0	1
Baltimore Oriole	CF	NY	96	96
Purple Finch		S	66	73
House Finch		S	3	72
Red Crossbill ‡		X	7	1
White-winged Crossbill ‡		X	1	3
Pine Siskin		H	17	18
American Goldfinch	H	D	98	96
Evening Grosbeak		H	15	15
House Sparrow	NY	H	88	75

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #13 (Simcoe County). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17NK72 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #13). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 1/07/2009. An up-to-date version of this sheet is available from http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17NK72

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Environmental Existing Conditions Report
River Road West
Municipal Class EA,
Town of Wasaga Beach, County of Simcoe

Prepared For:
Ainley & Associates Ltd.

Prepared By:
Azimuth Environmental
Consulting, Inc.

August 2009

AEC 09-179

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

August 27, 2009 AEC 09-179

Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON
L9Y 4J5

Attention: Mike Neumann, P.Eng. Vice President, Transport Engineering

Re: Environmental Existing Conditions Report for a Municipal Class EA for the proposed River Road West Improvements, Town of Wasaga Beach.

Dear Mr. Neumann:

Azimuth Environmental Consulting (Azimuth) is pleased to submit our Existing Conditions Report for the environmental component of the Municipal Class Environmental Assessment (EA) for the abovementioned proposed road improvements in the Town of Wasaga Beach. The purpose of this preliminary report is to document the environmental features present within and adjacent to the study area. In a separate updated document, we will present the assessment of the environmental impacts to any environmental features associated with the expansion of the road footprint and the proposed alternatives. The findings of the final Environmental Study Report (ESR) will be incorporated into the Municipal Class EA being prepared by Ainley & Associates Limited.

Please do not hesitate to call if you have any questions regarding this report.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Brad Baker, B.Sc..
Biologist

Matt Stuart, B.Sc.Env.
Aquatic Biologist

229 Mapleview Drive East, Unit 1, Barrie, Ontario L4N 0W5
telephone: (705) 721-8451; fax: (705) 721-8926 info@azimuthenvironmental.com

TABLE OF CONTENTS

List of Figures

List of Appendices

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5.0 PROPOSED ROAD DESIGN ALTERNATIVES

Proposed road design alternatives will be described within the final ESR report.

6.0 IMPACT ASSESSMENT

Completion of the impact assessment requires the examination of road design alternatives. The potential impacts and mitigation strategies for the proposed road widening of River Road West on the natural features and functions identified in this report will be explored and assessed through future study, and will be presented in the final ESR report.

Table 2 – Aquatic Habitat Summary

Aquatic Habitat Area #	GPS (Easting, Northing)	Waterbody	Substrate	Vegetation	Directly Supports Fishery (Y/N)	Type of Fishery Supported	Sensitivity (H,M,L)	Rationale for Sensitivity Ranking/ Comments
1	17T 576053 4927185 17T 576111 497326	Unnamed Drainage – Isolated locations within south River Road West (RRW) ROW ditch – Innisbrook Dr. to East side of Glen Eaton Rd.	Muck, Detritus, Silt.	Herbaceous, Watercress, Emergent Aquatic Macrophyte.	No	Indirect	Low	Indirect aquatic habitat. Presence of Watercress and permanent flow suggests potential ground water influence.
2	17T 576507 4927867 17T576564 4927938	Unnamed Drainage – south ditch of RRW at Fernbrook Dr, flows east within ditch, crosses Powerline Road, then flows north beneath RRW within a culvert, eventually discharging into the Lower Nottawasaga.	Muck, Detritus, Silt, Gravel	Herbaceous, Watercress, Emergent Aquatic Macrophyte, and Cattails.	No	Indirect	Low	Indirect aquatic habitat. Presence of Watercress and permanent 1m wide wetted channel suggests potential ground water influence. Direct discharge into the Lower Nottawasaga River. Fish passage not possible from the Lower Nottawasaga River up into the open ditch at RRW due to length/slope of the existing culvert.
3	17T 577684 4929531	Unnamed Drainage – channel outlets into the south ditch of RRW from forested area south of RRW, crosses beneath RRW, before discharging into the Lower Nottawasaga.	Muck, Detritus, Silt, Gravel	Herbaceous, Emergent Aquatic Macrophyte.	No	Indirect	Low	Intermittent flows, no indication of ground water contribution. Defined channel within 0.75m wide wetted channel. Direct discharge into the Lower Nottawasaga River. Fish passage not possible from the Lower Nottawasaga River up into the channel at RRW due to length/slope of the existing culvert.
4	17T 578158 4929958 17T 578600 4930120 17T578649 4930180 17T578806 4930243	Unnamed Drainage – Flow originates from the Blueberry Trail Wetland, enters the south ditch of RRW, crosses RRW to flow within north ditch, at Beck St. the flow enters a culvert, crosses RRW and re-enters the south ditch, eventually discharging into a large culvert within south ditch of RRW.	Muck, Detritus, Silt, Gravel	Herbaceous, Watercress, Emergent Aquatic Macrophyte, and Cattails	No	Indirect	Medium	Indirect aquatic habitat. Presence of Watercress and permanent 1.5m wide wetted channel suggests potential ground water influence. Watercourse may potentially flow within Provincial Park and Significant Wetland boundary.
5	17T580904 4931583	Unnamed Tributary of Little Marl Creek – flows south beneath RRW via old box culvert.	Muck, Detritus, Silt.	Cattail, Grass/Sedges	Yes	Direct -warm water baitfish.	Low	Intermittent flows, no indication of ground water contribution. Defined channel within 1m wide wetted channel, max depth 0.30m. Common/adaptable baitfish community.

Centre (NHIC) to indicate that the property potentially contains habitat of threatened, or endangered wildlife, a sensitive snake species, and *Vertigo paradoxa* (NHIC, 2009) (Appendix A). The sensitive snake species inhabits sandy upland fields, pastures, savannahs, sandy beaches, dry open oak-pine-maple forest with sandy soils (OMNR, 2000). *Vertigo paradoxa* is a terrestrial gastropod (i.e. snail) that prefers forest habitat with a thick organic layer (Anderson, 2004).

Deer yards have been identified within the mixed forest community (FOM2-1) at the Powerline Road intersection and the Wasaga Beach Provincial Park at Blueberry Trail (FOM7-2) (Allen *et al.*, 2005, and LSRCA Correspondence, 2009).

Potential anuran amphibian breeding habitat exists within the flowing ditches and low lying areas within the wooded areas adjacent to the road that may contain seasonal standing water in the springtime within the study area. Green Frogs (*Rana clamitans*) were observed in various water filled ditches along the length of the study area.

4.3.2 Aquatic Resources

Azimuth's aquatic resources survey included a field investigation of the north and south ditches along the right-of-way (ROW) of the River Road West site limits, centerline culvert crossings running north –south across River Road West, and the review of available background information from the NVCA and MNR.

Available background information was provided by the NVCA and was limited to the indication that a small unnamed watercourse that flows north-south beneath River Road West at the eastern limits of the study area (between Bell Park Rd and Vigo Rd) is classified as an intermittent tributary of Little Marl Creek. There was no other available data on any of the other watercourses/ditches found within the study limits. There are no aquatic Species at Risk known to be found within the site limits.

Site investigations were completed on July 27, 2009. Within the site limits, five (5) areas of aquatic habitat were flagged. However, for the most part the ROW ditches do not provide aquatic habitat, were dry during the site investigation, lack substrate, and are limited to providing surface drainage during precipitation events and spring freshet. Of the five areas of potential aquatic habitat, one (the intermittent tributary of Little Marl Creek) provides potential direct fish habitat. The other four areas display permanent flow regimes due to potential ground water influence and contributions from adjacent wetland discharge in the Blueberry Trail area, yet they do not host direct fish habitat, and large sections remain within culverts that eventually discharged into the Lower Nottawasaga River. Table 2 provides a summary of the five areas of aquatic habitat found within the site limits. Mapping of these areas can be found in Figures 2, 3 and 4.

crested Flycatcher (*Myiarchus crinitus*), Common Grackle (*Quiscalus quiscula*), American Goldfinch (*Carduelis tristis*), Northern Cardinal (*Cardinalis cardinalis*), Blue Jay (*Cyanocitta cristata*), European Starling (*Sturnus vulgaris*), Red-eyed Vireo (*Vireo olivaceus*), House Sparrow (*Passer domesticus*) and American Robin (*Turdus migratorius*). None of the mammals or birds observed are of conservation concern.

According to the Ontario Breeding Bird Atlas Database (OBBAD) 2001-2005 survey (square # 17PK01), there is one provincially rare bird identified within the area, Red-headed Woodpecker (*Melanerpes erythrocephalus)* (Appendix C). The Red-headed Woodpecker has been confirmed as breeding within the area (OBBA, 2008). This bird is ranked as an S3 species according to OMNR's NHIC database. The term S3 indicates that this woodpecker is vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation (NHIC, 2008). This woodpecker will inhabits a variety of treed and non-treed habitats and is commonly found in open deciduous forests with little understorey (often composed of Beech or Oak), wooded swamps, forest edges, groves of dead and dying tress and fields or pasturelands with scattered large-diameter trees (OMNR, 2000, Smith *et al.*, 2000). It prefers xeric woodlands with trees of large circumference of at least 40cm diameter breast height (dbh) and requires 4 hectares for territory (Smith *et al.*, 2000, OMNR 2000). This species can also be found in urban environments such as parks, golf courses, cemeteries and private woodlands (Cadman *et al.*, 2007). It is most often found nesting in dead trees and branches (Smith *et al.*, 2000 and Cadman *et al.*, 2007).

There are no regionally rare birds confirmed as breeding within the area according to the Ontario Breeding Bird Atlas.

Three colonial species, Bank Swallow (*Riparia riparia*), Cliff Swallow (*Petrochelidon pyrrhonota*), and Herring Gull (*Larus argentatus*) have been confirmed to be breeding within the area according to the Ontario Breeding Bird Atlas (Appendix C). Bank Swallow prefers river banks, cliffs and open fields close to water (OMNR, 2000) and is primarily found in erodable soils on vertical or near vertical banks (Garrison, 1999). It can also be found in artificial sites such as sand and gravel pits, along roadsides and in stockpiles of soil or other material where it will excavate its own nest burrows in exposed soils (Cadman *et al.*, 2007). The Cliff Swallow inhabits cliffs and bluffs with nearby open areas but may also build nests on bridges and buildings (Cadman *et al.*, 2007). The Ring-billed Gull nests along the shores of rocky islands, and peninsulas. Potential breeding habitat exists for the Bank Swallow within the sand dunes adjacent to the study area east of Theme Park Drive.

There are two known recent (i.e. within 20 years) element of occurrence records on file with the Ontario Ministry of Natural Resources' (OMNR) Natural Heritage Information

Figure 2 and Table 1 outlines the locations and types of vegetation communities found on the property.

Table 1. ELC Characterization of Vegetation Communities Located	
UNIT	**DESCRIPTION**
MIXED FOREST (FOM)	**Tree cover > 25% coniferous and deciduous tree species**
FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type	Canopy primarily composed of a mixture of White Pine and Red Oak, with Trembling Aspen, Paper Birch, Large-toothed Aspen, and Green Ash. Understorey and groundcover composed of species including Roundleaf Dogwood, Poison Ivy, Bracken Fern, Canada Mayflower and Ground Juniper.
FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type	Canopy primarily composed of a mixture of White Pine, Red Oak, Sugar Maple with Trembling Aspen, Paper Birch, Red Maple and Red Pine. Understorey and groundcover composed of species including Ground Juniper, Poison Ivy, White Sweet-clover, Roundleaf Dogwood, and Bracken Fern.
FOM7-2 -Fresh Moist White Cedar-Hardwood Mixed Forest Type	Canopy primarily composed of a mixture of Red Maple, Red Ash, Eastern Hemlock and White Pine with White Beach, and White Elm. A sub-canopy was primarily composed of White Cedar, Balsam Fir, and Eastern Hemlock. Understorey and groundcover composed of species including Poison Ivy, Bracken Fern, Alternate Leaved Dogwood, Coltsfoot, and Heal-all.

None of the vegetation communities are considered to be provincially rare (NHIC, 2008). None of the species observed are considered to be provincially endangered, threatened or of special concern.

There are two known recent (i.e. within 20 years) element of occurrence records (Spotted Wintergreen and Hills Thistle) on file with the Ontario Ministry of Natural Resources' (OMNR) Natural Heritage Information Centre (NHIC) to indicate that the property potentially contains habitat of threatened, or endangered vegetation species (NHIC, 2008) (Appendix A). Spotted Wintergreen (*Chimaphila maculate*) requires sandy habitats in dry-mesic Oak-Pine woods (White, 1998). Hill's Thistle (*Cirsium hillii*) inhabits sand dunes, sandy woods, limestone pavement and open woods in limestone (OMNR, 2000).

Wildlife

Wildlife species utilizing the study area were identified from direct observation and through interpretation of sign (i.e. tracks, scats, vocalizations, etc.) while conducting other surveys (i.e. plant surveys) on the property. Mammals observed or evidence of presence on the property included White-tailed Deer (*Odocoileus virginianus*) Raccoon (*Procyon lotor*) and Eastern Chipmunk (*Tamias striatus*). Fourteen bird species were observed within the study area including Cedar Waxwing (*Bombycilla cedrorum*), Chipping Sparrow (*Spizella passerina)*, Mourning Dove (*Zenaida macroura)*, Black-capped Chickadee (*Poecile atricapilla)*, Northern Flicker (*Colaptes auratus)*, Great-

The forest communities have been included within this identified area due to their connectivity to adjacent forested habitat and due to the variety (i.e. wetland and upland) of habitat that is present throughout the larger natural heritage feature.

4.0 EXISTING CONDITIONS

4.1 On Site Land Use

For the purposes of this report the limits of the study area include the footprint of the existing River Road West from Brillinger Drive to the Eastern Town Limits and adjacent lands within 30m of River Road West. Vegetation communities are identified within this area through air photo interpretation, roadside surveys within the road allowance and background information. The proposed River Road widening study area includes existing roadway (i.e. River Road West), forest and early successional vegetation communities, commercial and residential lands, with maintained lawns and residential properties. A portion of Wasaga Beach Provincial Park resides within the study area to the south of River Road West, and east of Blueberry Trail (Figure 2).

4.2 Adjacent Lands

Adjacent lands, for the purposes of this report, are those lands residing outside of the 30m setback. Lands adjacent to the proposed River Road West Urbanization are composed of primarily residential homes and commercial properties within the Town of Wasaga Beach. Forested lands exist adjacent to Powerline Road, within the Wasaga Beach Provincial Park

4.3 Natural Resources

4.3.1 Terrestrial Resources

Vegetation

Natural vegetation communities are composed of a variety of forms including mixed forest and wetland habitat associated with the Wasaga Beach Provincially Significant Wetland. Manicured lawn and scattered trees (remnant forest community and planted specimens) are associated with the commercial and residential developments found within the study area. Ditch areas are also present throughout the study area and include heavily disturbed communities of grassland which include of a large number of non-native species. A vegetation survey was conducted on July 14 and July 27, 2009 to document the vegetation communities that reside within the proposed limit of disturbance. The Ecological Land Classification for Southern Ontario (ELC) (Lee *et al.*, 1998) was used as a general guide to the classification of the vegetation community types within the study area in addition to lands within 30m of the proposed limit of disturbance (Figure 2).

3.3 Nottawasaga Valley Conservation Authority

3.3.1 Ontario Regulation 172/06

The study area is located within the jurisdiction of the NVCA. The study area includes lands subject to Ontario Regulation 172/06 – "Regulation of Development Interference with Wetlands and Alterations to Shorelines and Watercourses" by the NVCA, which is associated with the presence of the Nottawasaga River and its associated floodplain (Appendix B). Under Regulation 172/06, the NVCA requires that a permit be obtained for any proposed development within areas regulated under their jurisdiction.

An information request was forwarded to the NVCA regarding the study area. The NVCA response to our request can be found in Appendix B.

3.3.2 Town of Wasaga Beach Background Review and Landscape Model

The NVCA's Background Review and Landscape Model identifies the natural heritage features within the town and includes a landscape scale natural heritage modelling exercise. Based on the results of the background review and model, recommendations were made pertaining to the results of the study including the identification of natural areas that should be considered 'significant'. The purpose of the report was to find a balance between urban development and the protection of natural heritage features. The majority of the study area is currently composed of developed lands (i.e. commercial, residential, lawns and boulevards etc.). However, a forest communities reside within the study area to the south of River Road to the east of Blueberry Trail (i.e. FOM7-2, Figure 3), at the Powerline Intersection (FOM2-1, Figure 2), and east of the Bell's Park Road intersection to the North of River Road (FOM2-1, Figure 4). The report gave these forest communities scores of 351-400 (Appendix B). The two easternmost wooded areas within the study area are designated as Natural Heritage areas, and the NVCA recommends that 'all previously undesignated habitat blocks scoring greater than 350 within the model be designated as Category 2 Lands. The forest community east of the Bell's Park Road intersection to the North of River Road (FOM2-1) is also identified within the Dune Outlier Study as an area of parabolic dunes. The study area is not identified as significant in either of the two additional NVCA studies within the Town of Wasaga Beach (i.e. South Bank, and Dune Conservation and Protection Study) (Featherstone *et al.*, 2005).

3.3.3 Sensitive Snake Species Discussion Paper

The mixed forest (FOM2-1, Figure 2) community at the Powerline Road intersection, and the wooded lands east of Blueberry Trail and South of River Road (Figure 3)within the study area have been identified as significant habitat for a Sensitive Snake Species according to NVCA's Sensitive Snake Species Discussion Paper (Featherstone *et al.*, 2005) . Significant portions of this snake's habitat are associated with large core areas that support the various habitats required to fulfill all life cycle processes of the snake.

The wooded portion of the study area to the east of Blueberry Trail, and the south of River Road West is part of the Wasaga Beach Provincial Park (Appendix A). Two ANSI's associated with the Wasaga Beach Provincial Park also exist in this portion of the study area. The Wasaga Dunes Life Science Area of Natural and Scientific Interest, and the Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest are both within 30 meters of the existing road and associated municipal right-of-way. A portion of the Wasaga Beach Provincially Significant Wetland also exists within this wooded area to the south of River Road, east of Blueberry Trail (Figure 2 and 3). Current provincial databases do not identify significant Woodlands or Valley Lands on or adjacent to the study area.

To our knowledge the province has not identified significant "Wildlife Habitat" within or adjacent to the study area. The mixed forest community (FOM2-1) at the Powerline Road intersection has been identified as Significant Habitat for a Sensitive Snake Species within NVCA's Sensitive Snake Species Discussion Paper (Featherstone *et al.*, 2005), and identified as potential deer yard (NVCA Correspondence, 2009). The Wasaga Beach Provincial Park at Blueberry Trail (FOM7-2) has also been identified as Significant Habitat for a Sensitive Snake Species within NVCA's Sensitive Snake Species Discussion Paper (Featherstone *et al.*, 2005) and as potential deeryard (Allen *et al.*, 2005, and NVCA Correspondence, 2009).

The Ontario Ministry of Natural Resources' Natural Heritage Information Centre (NHIC) database has documented a number of rare species within the area including Hills Thistle (*Cirsium hilli*), Spotted Wintergreen (*Chimaphila maculate*), a snail (*Vertigo paradoxa*) and Sensitive Species' (EOID 4919) (NHIC, 2009) (Appendix A). Sensitive species record #4919 is for a Sensitive Snake Species that is known to reside within Wasaga Beach Provincial Park.

An information request was forwarded to the MNR regarding the study area. The resulting letter can be found in Appendix A.

3.2 Town of Wasaga Beach

Lands within the study area outside of the road allowance are mainly designated as Residential and Institutional (west of Blueberry Trail) with three areas designated Open Space including the four corners at the Powerline intersection, an area surrounding a pumping station west of the Blueberry trail intersection, and a large area south of River Road to the east of Blueberry Trail (Schedule A-3 and A-4 Land Use Plan (Appendix B)). Areas east of Beck Street include mostly Commercial land uses including Tourism Commercial, Recreational Commercial, and District Commercial (Beck Street to Bell's Park Road). Beyond Bell's Park Road to the east the lands are designated as Residential, Rural, Recreational Commercial, and District Commercial (Schedule A-7 Land Use Plan of the Town of Wasaga Beach's Official Plan (2008) (Appendix B)).

- Completed an assessment of the riparian vegetation and vegetation within 30m of the existing road and classify vegetation communities in the general area in accordance with the classification guidelines of the Ecological Land Classification for Southern Ontario.

3.0 PLANNING CONTEXT

3.1 Provincial Planning Policy

The Provincial Policy Statement (PPS) (MMAH, 2005) outlines policies related to natural heritage features (Section 2.1) and water resources (Section 2.2). The Planning Act requires that planning decisions shall be consistent with the PPS.

According to the PPS development and site alteration shall not be permitted in:

- Significant habitat of endangered or threatened species,
- Significant wetlands (in coastal areas or in Ecoregions 5E, 6E and 7E), and
- Significant coastal wetlands.

Similarly, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted within:

- Significant woodlands (south and east of the Canadian Shield),
- Significant valley lands (south and east of the Canadian Shield),
- Significant wildlife habitat, and
- Significant Areas of Natural and Scientific Interest (ANSI)

Furthermore, no development and site alteration will be permitted on lands adjacent to the areas defined above unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated there will be no negative impacts on the natural features and ecological functions.

The term development (as defined in the PPS) is defined as the creation of a new lot, a change in land use or the construction of buildings and structures, requiring approval under the Planning Act, but does not include activities that create or maintain infrastructure authorized under an Environmental Assessment process, as is the case with the proposed River Road West urbanization (MMAH, 2005).

Development and site alteration is not permitted in fish habitat except in accordance with federal and provincial requirements.

1.0 INTRODUCTION

Azimuth Environmental Consulting (Azimuth) was retained to undertake an Existing Conditions Report for the urbanization of River Road West in Wasaga Beach from Brillinger Drive to the eastern Town limits and a 30 m area on both sides of the road (the study area) (Figure 1). Improvements to River Road West may involve widening the roadway between Brillinger Drive and the eastern Town limits the degree of which is to be determined through the examination of several design alternatives as part of a Class Environmental Assessment (EA). This project constitutes a Schedule 'C' undertaking, and is being completed in accordance with the Municipal Class EA process.

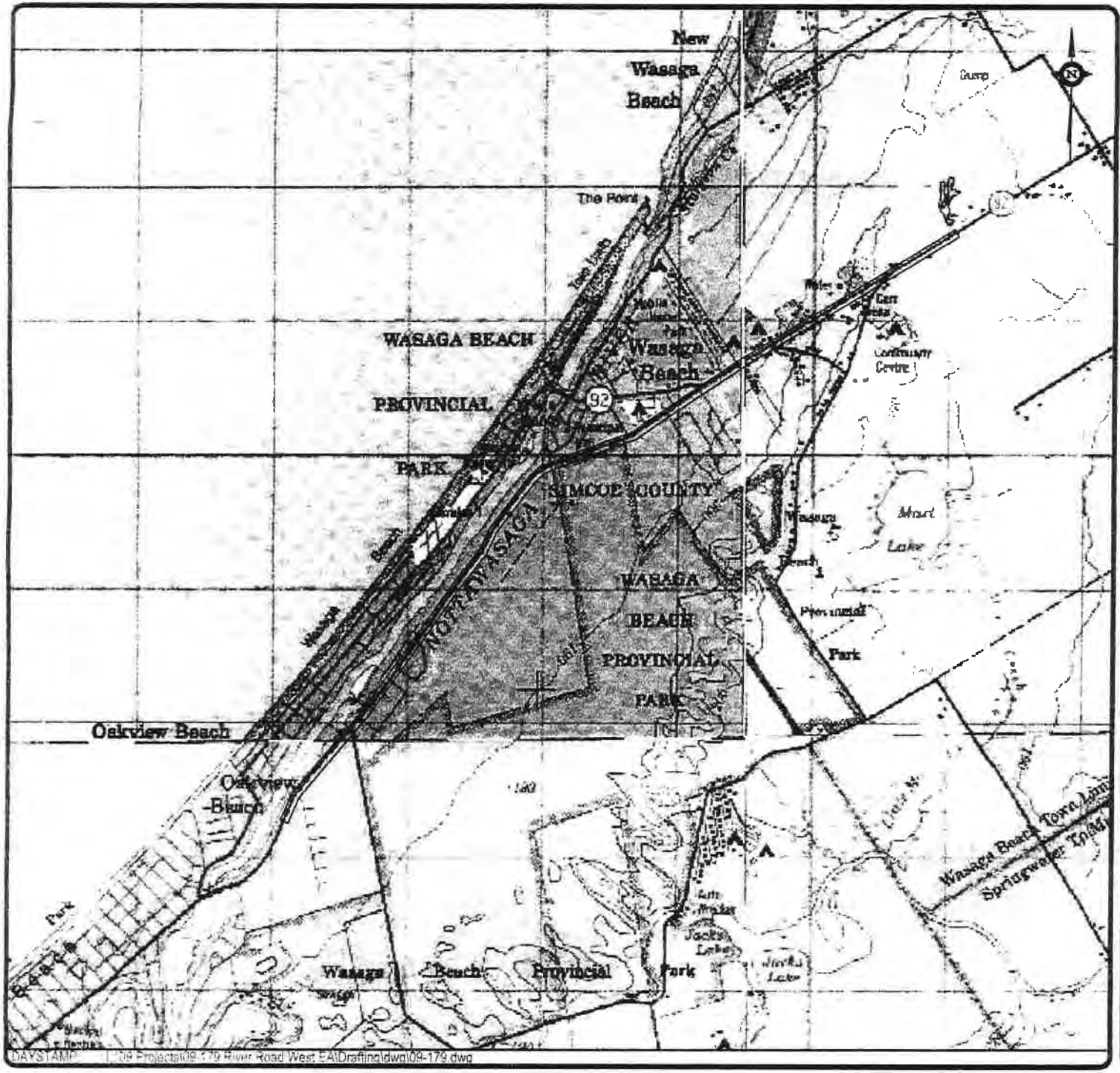
The purpose of this Existing Conditions report is to document the environmental features present within and adjacent to the study area. This report will provide an environmental baseline condition from which to evaluate the implications of the potential road widening alternatives in Phase 2 of the EA, including the evaluation of potential impacts of the various alternative designs on the existing natural features and biological communities present. In addition, appropriate mitigation/restoration measures will be recommended. These findings will be integrated into the final ESR being prepared by Ainley & Associates Ltd.

2.0 STUDY APPROACH

This Existing Conditions report outlines the results of the field visit, background review and represents the existing conditions on site. A full impact assessment will be completed once the proposed design alternatives are examined.

A combination of field investigation and background information research were used to fulfill the objectives of this preliminary Existing Conditions Report. Azimuth undertook the following activities for this study:

- Collected background material, including species lists and habitat conditions from involved agencies including, the MNR and the NVCA;
- Consulted with regulatory agencies (e.g., NVCA) regarding available data, potential constraints, permitting requirements;
- Obtained existing mapping of the site to help identify unique features and environmental conditions;
- Undertook a vegetative survey of all woody vegetation within the municipal right-of way to assess the study area for the presence of rare species, or habitat suitable to support such species, that are known to occur in the local area;
- Completed an aquatic habitat survey of any potential fish habitat within the River Road West ditches and associated watercourse crossings within the study limits; and,



LEGEND

Study Area

600m 0 1200m

HORIZONTAL SCALE 1:40,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Regional Map

River Road West
Wasaga Beach, ON

DATE ISSUED: July 2009	Figure No.
CREATED BY: JLM	
PROJECT NO: 09-179	1
REFERENCE: Softmaps Technologies Inc.	

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LEGEND

- Study Area
- ANSI Earth Science
- ANSI Life Science
- Provincially Significant Wetland
- Aquatic Habitat (Areas 1-5)

Vegetation Communities

- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type

150m 0 300m

HORIZONTAL SCALE 1:10,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC

Environmental Features

River Road West EA
Wasaga Beach, ON

DATE DRAWN	July 2009	Figure No.
DRAWN BY	JLM	2
PROJECT NO.	09-179	
REFERENCE	Ainley Group	

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LEGEND

- Study Area
- ANSI Earth Science
- ANSI Life Science
- Provincially Significant Wetland
- Aquatic Habitat (Areas 1-5)

Vegetation Communities

- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type

150m 0 300m

HORIZONTAL SCALE 1:10,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC

Environmental Features

River Road West EA
Wasaga Beach, ON

DATE ISSUED	July 2009	Figure No.
CREATED BY	JLM	3
PROJECT NO.	09-179	
REFERENCE	Ainley Group	

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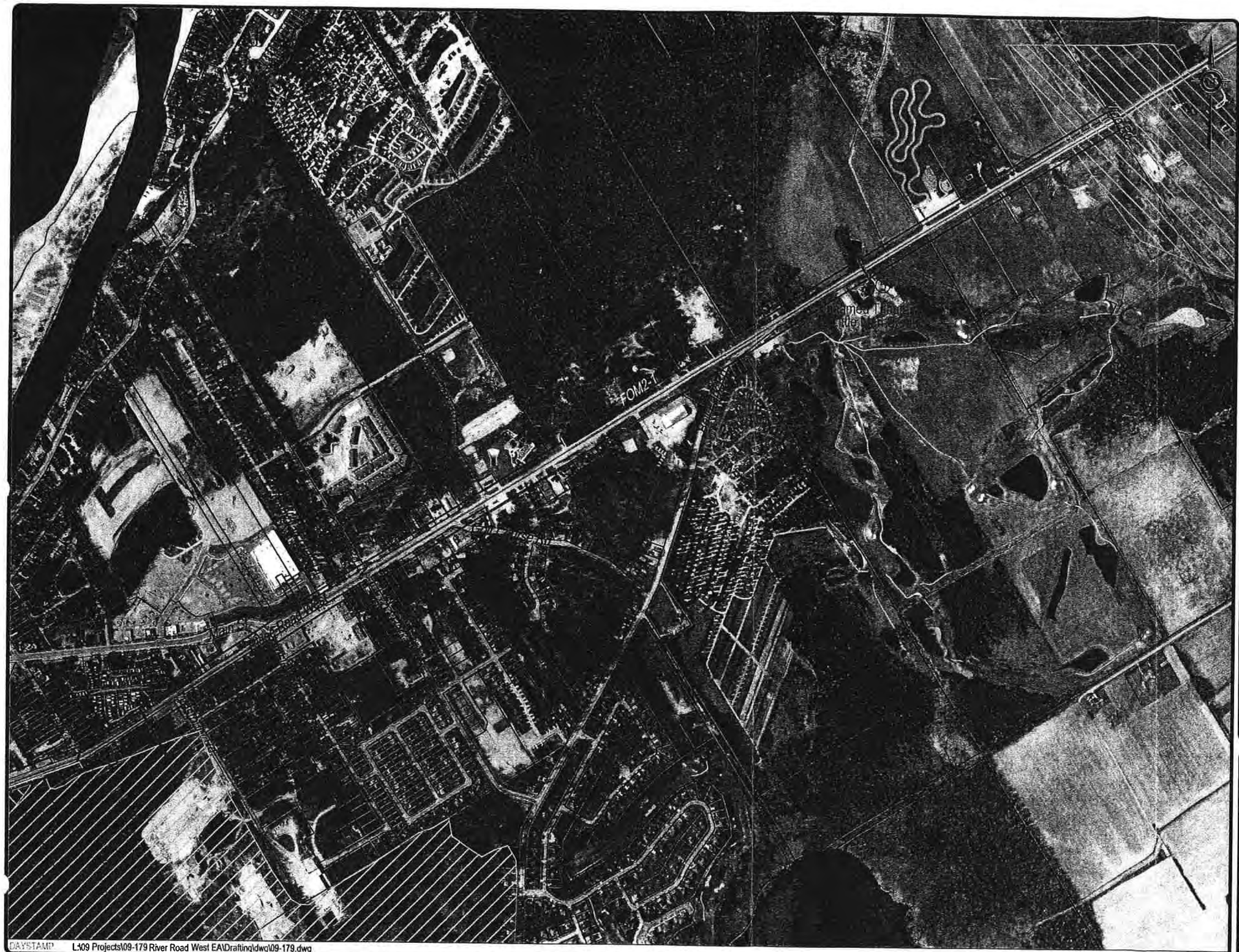

LEGEND

- Study Area
- ANSI Earth Science
- ANSI Life Science
- Provincially Significant Wetland
- Aquatic Habitat (Areas 1-5)

Vegetation Communities

- FOM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- FOM7-2 Fresh-Moist White Cedar-Hardwood Mixed Forest Type

150m 0 300m

HORIZONTAL SCALE 1:10,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

River Road West EA
Wasaga Beach, ON

DATE ISSUED	July 2009	FIGURE
DRAWN BY	JLM	4
PROJECT NO	09-179	
REFERENCE	Ainley Group	

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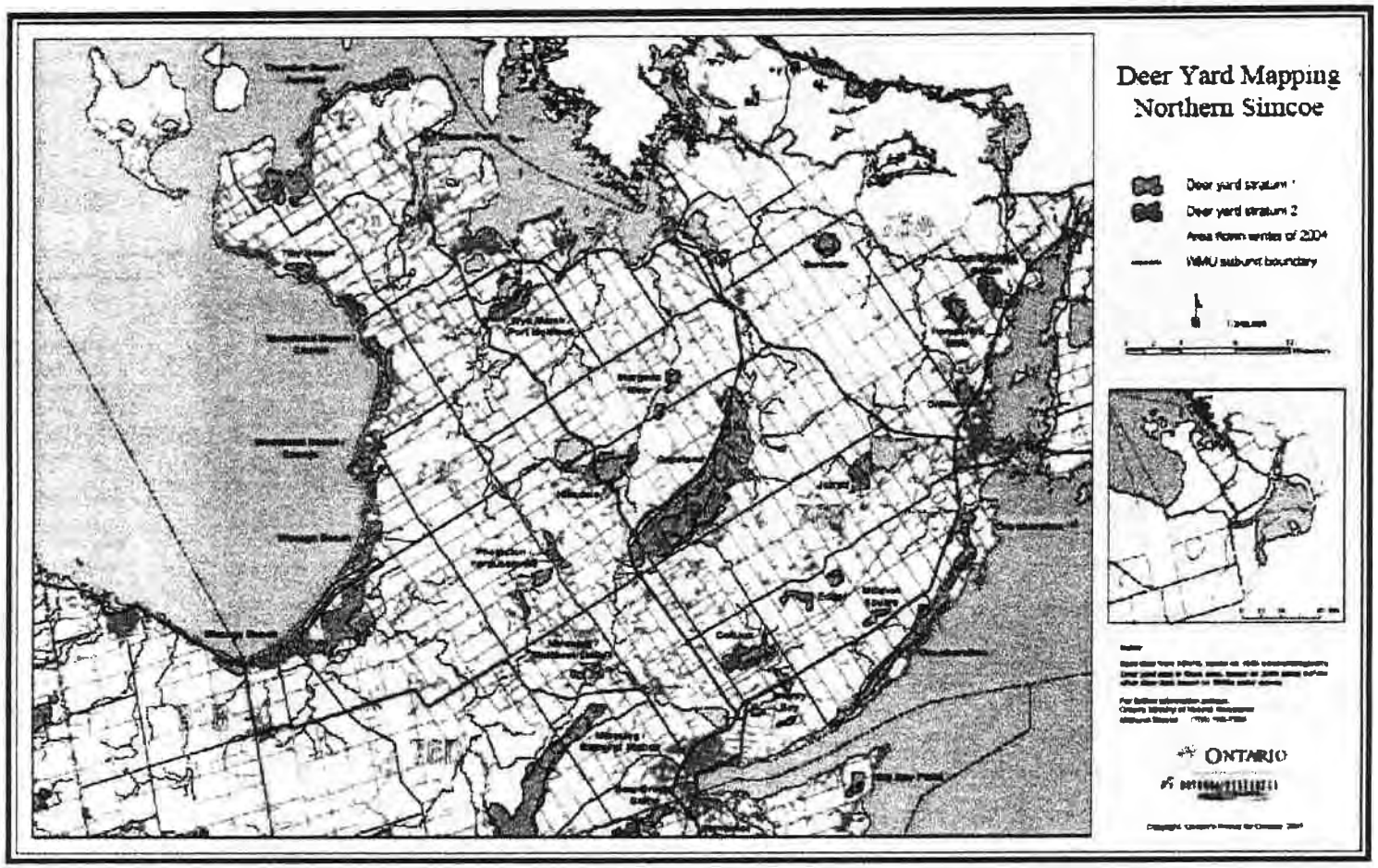
APPENDICES

APPENDIX A

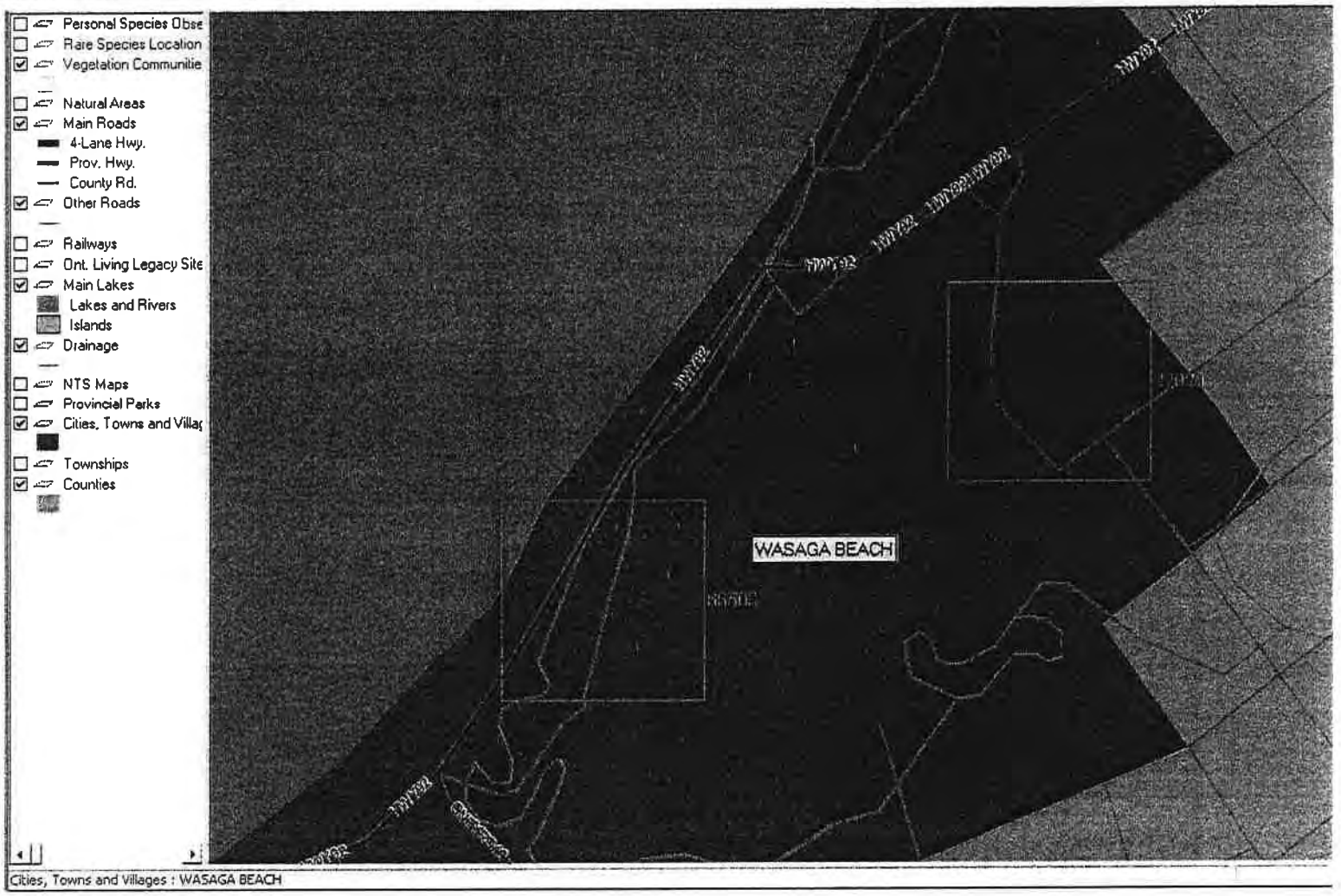
Appendix A: Midhurst District Deer Yard Survey Huronia Area 2004: Deer Yard Mapping Northern Simcoe (2005):
(*Property located within red polygon*).



Appendix A: Natural Heritage Information Centre: Natural Areas (Obtained from OMNR's NHIC Website (2009): http://nhic.mnr.gov.on.ca/nhic_.cfm (*Approximate Study Area located within blue polygon*).

Appendix A: Natural Heritage Information Centre: Rare Species Information (Obtained from OMNR's NHIC Website (2009): http://nhic.mnr.gov.on.ca/nhic_.cfm (*Approximate Study Area located within blue polygon*).

Appendix A: Natural Heritage Information Centre: **Rare Vegetation Communities** (Obtained from OMNR's NHIC Website (2009): http://nhic.mnr.gov.on.ca/nhic_.cfm (*Approximate Study Area located within blue polygon*).



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Herp Atlas
Odonata Atlas
Mailing List
FAQ

Natural Heritage Information Centre

GEOGRAPHIC QUERY REPORT

Please note that this report displays results based on your current level of login access, and the jurisdiction you have access for.

There are 10 element occurrence records in this area that you have public access to. Each occurrence record (EO_ID) may have more than one separate observation associated with it (i.e. more than one row in this table). Coordinates are rounded down to within 1km. Please contact the local MNR district office ecologist if you require more details for these records.

EO_ID	Scientific Name	Common Name	UTM Centroid (rounded)	Srank	MNR	COSEWIC	Date
1767	Cirsium hillii	Hill's Thistle	17 576000 4926000	S3	THR	THR	1998-08-13
1767	Cirsium hillii	Hill's Thistle	17 576000 4926000	S3	THR	THR	1994
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	1998-08-13
1767	Cirsium hillii	Hill's Thistle	17 577000 4926000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	1998-08-13
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	2003
1767	Cirsium hillii	Hill's Thistle	17 577000 4927000	S3	THR	THR	2004-08-23
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 578000 4928000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 579000 4927000	S3	THR	THR	1988-09-03
1767	Cirsium hillii	Hill's Thistle	17 579000 4927000	S3	THR	THR	1988-09-03
4919	Restricted Classified species		17 577000 4927000				2003-06-07
4919	Restricted Classified species		17 577000 4926000				2003-10-21
4919	Restricted Classified species		17 577000 4926000				2003-09-04
4919	Restricted Classified species		17 577000 4926000				2003-09-04
4919	Restricted Classified		17 577000 4926000				2003-07-08

	species						
4919	Restricted Classified species		17 577000 4928000				2003-07-29
4919	Restricted Classified species		17 577000 4927000				2003-05-28
4919	Restricted Classified species		17 577000 4927000				2003-05-05
4919	Restricted Classified species		17 577000 4929000				2003-06-17
4919	Restricted Classified species		17 577000 4927000				2003-09-29
4919	Restricted Classified species		17 578000 4928000				1989
4919	Restricted Classified species		17 578000 4928000				2003-09-29
4919	Restricted Classified species		17 578000 4930000				2001-10-07
4919	Restricted Classified species		17 579000 4931000				1988
4919	Restricted Classified species		17 579000 4925000				1992-07
4919	Restricted Classified species		17 579000 4931000				2001-09-10
4919	Restricted Classified species		17 579000 4930000				2003-08-29
4919	Restricted Classified species		17 580000 4930000				2003-06-06
5506	Chimaphila maculata	Spotted Wintergreen	17 579000 4929000	S1	END	END	1995
5902	Cyperus houghtonii	Houghton's Umbrella-sedge	17 577000 4926000	S3			1972-10-03
21550	Dendroica discolor	Prairie Warbler	17 577000 4929000	S3S4B	NAR	NAR	1927-06-09
33969	Pterospora andromedea	Giant Pinedrops	17 578000 4930000	S2			1948-07-28
33970	Pterospora andromedea	Giant Pinedrops	17 576000 4926000	S2			1967-05-17
35246	Vertigo paradoxa	Classification Uncertain	17 577000 4926000	S2S3			1995-06-08
60389	Cirsium pitcheri	Pitcher's Thistle	17 577000 4929000	S2	END	END	1936-07-06
91671	Graptemys geographica	Northern Map Turtle	17 575000 4925000	S3	SC	SC	1961-?

Vegetation Communities Report

1 occurrences selected
Jump To: 1,

Element Occurrence: 1 of 1

EO_ID:

Common Name: Little Bluestem - Long-leaved Reed Grass - Great Lakes Wheat Grass Dune Grassland
Type **Grank:** G? **Srank:** S2
Centroid: ,, **Accuracy:** 4 **Datum:** NAD27

LOCATIONAL INFORMATION:
Loc. Name: Nat. Area
Map Number: 41A/8
Habitat:

COMMUNITY SPECIFIC INFORMATION:
System: **PhysiogType:** **Size (ha):** **EORank:**

Dominant Species:

Other Species:

Description:

Survey Date: **Survey Type:**

Top of Page

Number of natural areas selected: 5

OAKVIEW BEACH RIDGES **AREA_ID: 4420**

Significance	Area Type	Size	Centroid UTM	Map #
	International Biological Program site	223.4 ha	17,577300,4927600	41A/8

Description
6E6; gently to moderately rolling sandland, with old low ride features; well developed mature upland deciduous and mixed forests, and prairie openings (4 communities); very rich temperate biota, with provincially and regionally significant flora; light to medium cutting disturbance, and threat from park use; OMNR-C. [Falls et al. 1990]

Vegetation
Vegetation Summary:
1A17a/1A21: pine - oak rolling sandland dry forest; Pinus resinosa - Pinus strobus - Quercus borealis - Betula papyrifera - Diervilla lonicera - Myrica asplenifolia - Vaccinium angustifolium - Pteridium aquilinum - Gaultheria procumbens - Mitchella repens - Dicranum sp.; F2; well-drained good mulch horizon; 13.0 ha.
1A22: interridge depressional lowland wet forest; Acer rubrum - Betula papyrifera - Populus tremuloides - Ulmus americana - Thuja occidentalis - Abies balsamea - Sambucus pubens - Acer pensylvanicum - Carex spp. - Dryopteris cristata - Coptis trifolia - mosses and liverworts; P1; muck over sand, wet, gleied; 60.7 ha.
1A21: low ridge intermediate mixed forest; Quercus borealis - Populus tremuloides - Pinus strobus - Acer rubrum - Thuja occidentalis - Abies balsamea - Acer pensylvanicum - Taxus canadensis - Mitchella repens - Pteridium aquilinum - Polygala paucifolia - mosses; F2; mottled B horizon (faint); 36.4 ha.
1M21: semiopen grass - lichen sandland prairie; Andropogon scoparius - Pteridium aquilinum - Cladonia rangiferina - mosses - Ceanothus ovatus - Vaccinium angustifolium - Hieracium spp.; F1; thick surface humus layer; 113 ha. [Macdonald 1972]

Representation
Special biological features: This area is one of the last back shore, low ridge sand lands in the Nottawasaga Bay region that remains in a relatively natural regenerative condition. [Macdonald 1972]

Landform
Landscape description: A series of inshore low ridge swells of lacustrine origin backed by a dry sandy upland plain.

Major soils: Brunisols, Gleysols.

Aquatic habitats: Permanent and intermittent swamps.

Special physical features: Low, undulating sand ridges of parallel relict shoreline deposits. [Macdonald 1972]

References

- Falls, J.B., I.D. Macdonald and T.J. Beechey. 1990. Catalogue of IBP/CT Areas in Ontario with an Assessment of their Current Conservation Status. Unpublished report. 94 pp.
- Macdonald, I.D. 1972. International Biological Programme, Checksheet for Region 5, Area 424: Oakview Beach Ridges.

WASAGA BEACH PROVINCIAL PARK NATURE RESERVE ZONES **AREA_ID: 1693**

Significance	Area Type	Size	Centroid UTM	Map #
Provincial	Life Science ANSI	633.0 ha	17,578000,4927000	41A/8

Description

Vegetation
A striking vegetation pattern of white birch - red maple forest on well drained sandy beach ridge separated by red ash - white cedar swamp forest or dogwood (Cornus stolonifera) - holly (Ilex verticillata) thickets in the intervening wet swales is evident in the beach ridge formation. Behind the raised beaches, the foredunes contain vegetation ranging from open desert associated with blowout through sand prairie grassland, heath and savannah to closed forest. Narrow-leaved New Jersey tea (Ceanothus ovatus) - blueberry (Vaccinium sp.) - huckleberry (Gaylussacia baccata) - lichen heath and open to closed white pine - red pine forest form the major vegetation cover. Moving futher inland, much of the steeply sloping parabolic dunes (the largest and least disturbed in Ontario) are covered with an open to closed forest of red oak - white pine - red pine. [Hanna 1984]

Representation

Landform
The 412 ha proposed Nature Reserve zone (MNR, 1978, Wasaga Beach Provincial Park Recommended Master Plan), a part of Wasaga Backlands Park Reserve, lies inland from Wasaga Beach Provincial Park within a broad meander of the Nottawasaga River. It is part of a provincially significant Great Lakes barrier bar and dune complex composed of active beach and rivermouth spit, raised beaches, transverse, parallel and parabolic dunes, lagoonal sediments and river floodplain. The proposed Nature Reserve zone includes part of a provincially significant raised beach and dune complex; although only a small section of raised beaches occurs within this zone. The proposed adjacent lands (Hanna 1980) contain additional raised beaches. [Hanna 1984]

References

- Bobbette, R.S.W. 1975. Flora and Environment of the Wasaga Beach Community and Provincial Park. Volume I: Major Ecological Units, Species and Areas of Significance, Flora: Lycopodiaceae to Orchidaceae. Prepared for Ontario Ministry of Natural Resources, Huronia District. Manuscript.
- Brunton, D.F. 1989. A Biological Inventory and Evaluation of Wasaga Beach Provincial Park and Adjacent Natural Areas, Simcoe County, Ontario. Ontario Ministry of Natural Resources, Central Region, Richmond Hill. OFER 8905. ix + 166 pp. + maps.
- Carlisle, R.J., D.G. Cuddy and R. Norman. 1972. Wasaga Beach: An Ecological Assessment. Ontario Ministry of Natural Resources, Parks Branch, Toronto.
- Glooschenko, V., B. Parker, L.Coo, R. Kent, C. Wedeles, A. Mason, J. Dawson, D. Herman and P. Smith. 1987. Provincially and Regionally Significant Wetlands in Southern Ontario. OMNR, Wildlife Branch, Toronto. 321 pp.
- Hanna, R. 1984. Life Science Areas of Natural and Scientific Interest in Site District 6-6: A Review and Assessment of Significant Natural Areas in Site District 6-6. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. SR OFER 8409. viii + 79 pp. + maps.

WASAGA BEACH PROVINCIAL PARK **AREA_ID: 3250**

Significance	Area Type	Size	Centroid UTM	Map #
	Provincial Park – Recreational	1529.2 ha	17,578175,4927663	41A/9

Description
Wasaga beach encompasses a complex of beach and dune systems on the shore of Nottawasaga Bay. The main beach is Ca 14km long. There is a large transverse and parabolic dunes system separated from the beach by the town of Wasaga Beach. This area has complex vegetative characteristics. Has elements of riparian forest, young mixed forests, extensive pine and oak-pine forests and a mixture of wetland and ridge intolerant forest vegetation. Barren communities also present.

Vegetation
Botanists have identified twenty-six biological communities within geomorphological system of Wasaga Beach. Of these, twenty-two occure within the boundaries of the dune park. These communities occur in close association with components of the geomorphological system. The raised beaches exhibit a striking pattern of dry vegetation on the ridges and wet bog communities in the swales. The vegetation in the dunes varies from open desert (blowouts) through prairies, prairie heath, and savanah to closed forest cover. Many of the dunes species are native xeric species, pre-adabted colonizers of dry sands. The floodplain and river basin areas contain typical floodplain - meadow and forest species. Only the farmed fields and two pine plantations are major deviations from natural development systems. (OMNR, 1978)

Many of the communities and species now existing I the dunes fields are not common in Ontario, and appear to have held on to this sandy dry area from a period perhaps 4,000 years I the past when climatic conditions were much drier. And while then normal undisturbed succession process (something that almost never happens) would suggest that all of the prairie should now have advanced to full closed forest, botanists suggest that freguent fires (both natural and human origin) have been instrumental in maintaining the vegetative communities of Wasaga Beach I all stages of succession. (OMNR, 1978)

Representation
There are other baymouth bar systems on the Great Lakes. None, however, show the combination of raised beaches, foredunes and parabolic dunes to the extent of Wasaga Beach. There is one other similar set of raised beaches on the Great Lakes near Ipperwash on Lake Huron. It is not under Crown ownership. (OMNR, 1978)

Landform
Wasaga Beach ha the largest known set of parabolic dunes in Ontario. Even compared to other sets of large dunes of different types, these are some of the least disturbed by man's activity. The foredunes (blown out high transverse dunes), 10 to 20 feet high, are not unlike general dune systems anywhere I the Great Lakes. Both the foredunes and parabolic dunes are composed of unconsolidated wind blown sands. If vegetative cover is disturbed, these sands are subject to further movement by the wind. Lagoon sequences, floodplains and the river's edge are not unlike many similar features elsewhere. Their significance lies in their relationship to other features as part of a geomorphological system. (OMNR, 1978)

References

- Anonymous. n.d.. Herbarium Inventory for Wasaga Beach Provincial Park. 9 pp.
- Bobbette, R.S.W. 1975. Flora and Environment of the Wasaga Beach Community and Provincial Park. Volume I: Major Ecological Units, Species and Areas of Significance, Flora: Lycopodiaceae to Orchidaceae. Prepared for Ontario Ministry of Natural Resources, Huronia District. Manuscript.
- Brunton, D.F. 1989. Biological Inventory and evaluation of Wasaga Beach Provincial Park and adjacent natural areas, Simcoe County, Ontario. Prepared for Parks and Recrational Areas section, OMNR Richmond Hill.
- Carlisle, R.J., D.G. Cuddy and R. Norman. 1972. Wasaga Beach: An Ecological Assessment. Ontario Ministry of Natural Resources, Parks Branch, Toronto.
- Hanna, R. 1984. Life Science Areas of Natural and Scientific Interest in Site District 6-6: A Review and Assessment of Significant Natural Areas in Site District 6-6. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. SR OFER 8409. viii + 79 pp. + maps.
- Johnston, J. n.d.. Beach Barrier Complexes at Wasaga Beach and Ipperwash, Ontario. Department of Earth Science, University of Waterloo, Waterloo. 1 pp + 2 maps.
- Ontario Ministry of Natural Resources. 1978. Wasaga Beach Provincial Park: Recommended Master Plan. OMNR. 67 pp + map.

WASAGA BEACH **AREA_ID: 156**

Significance	Area Type	Size	Centroid UTM	Map #
	Macrosite	0.0 ha	17,579000,4931000	41A/9

Description

Vegetation
Marl Lake and Jack's Lake represent the last vestiges of large Nippissing - Great Lakes Lagoon that once filled this valley now supporting fen communities around the marl lakes. Along the Nottawasaga River, which runs through this area, is an alluvial floodplain which supports elements of a more southern riparian forest. Young mixed forest occurs on the lagoon flats, Pine and Pine - Oak forests on high parabolic and transverse dune systems and a mixture of alternating wetland and ridge successional forest vegetation on the raised beach system near the lakeshore. Prairie-like grassland vegetation is found in the high dunes and along active beach. Also, examples of desert-like barrens vegetation in sand dune-blow out areas. Wetlands at this site include deciduous swamp forest in wet to very wet depressions. Usually Green and Black Ash with diverse understory. Mixed swamp forest of White Cedar, White Birch, Green Ash and Elm with dense understory occur along Nottawasaga River and near Marl Lake. Coniferous swamp forest occurs on wet to saturated sand areas, generally behind parabolic dunes. White Cedar, Larch, Balsam Fir and Black Spruce dominate. Tree growth is dense and understory sparse. Thicket swamp and wet meadows in swales between dunesalso occur. Marl fen occurs along shore of Marl Lake. Mixed emergent and floating marsh communities in Marl and Jack's Lakes. Shallow marsh along Nottawasaga River. Graminoid fen occurs on organic substrates over marl at Jack's Lake and open shrub fen at Powerline Rd. flats. [OCDC 1992]

Representation

Landform
Area is characterized by limestone bedrock overlain with deep deposits of glacial and lacustrine materials, mainly sands. Contains several distinct landscape units. Active beach is located closest to the bay with a spit that runs along the bay shore. This is backed by broad band of ridge and swale features. Behind this series of raised beaches is large area of rolling, transverse dunes backed by a field of high parabolic dunes. Inland from east wall of the parabolic dunes is a broad expanse of level, silty-sand, lagoon flats. Marl Lake and Jack's Lake represent the last vestiges of large Nippissing-Great Lakes Lagoon that once filled this valley now supporting fen communities around the marl lakes. Along the Nottawasaga River, which runs through this area, is an alluvial floodplain which supports elements of a more southern riparian forest. [OCDC 1992]

References

- Ontario Conservation Data Centre. 1992. Site Basic Record: Wasaga Beach. 3 pp.

WASAGA BEACH- WETLAND **AREA_ID: 7449**

Significance	Area Type	Size	Centroid UTM	Map #

Other	Wetland	249.3 ha	17,580500,4933000	31D/12

Description
A Non-Provincially significant, Coastal wetland complex, made up of 20 individual wetlands, composed of two wetland types (94% swamp and 6% marsh) (Young, 1998).

Vegetation
Dominant Vegetation Forms (Medd, 1994):
97% deciduous trees, 1.5% narrow-leaved emergents, and 1.5% submergents;

Vegetation Communities (Hooper and Kennedy, 1985):
Three Forms
W1: submergents; robust emergents; tall shrubs;
M1: narrow-leaved emergents; ground cover; robust emergents;

Four Forms
M2: narrow-leaved emergents; ground cover; tall shrubs; low shrubs;
S1: deciduous trees; tall shrubs; low shrubs; ground cover;

Five Forms
S2: deciduous trees; tall shrubs; low shrubs; narrow-leaved emergents; ground cover;
S3: deciduous trees; coniferous trees; tall shrubs; low shrubs; ground cover;
S4: deciduous trees; narrow-leaved emergents; submergents; ground cover; broad-leaved emergents;

Six or More Forms
S5: deciduous trees; tall shrubs; low shrubs; narrow-leaved emergents; robust emergents; ground cover;
S6: deciduous trees; coniferous trees; tall shrubs; low shrubs; narrow-leaved emergents; ground cover;
S7: deciduous trees; dead deciduous trees; robust emergents; narrow-leaved emergents; tall shrubs; low shrubs; ground cover;
S8: deciduous trees; dead deciduous trees; coniferous trees; tall shrubs; low shrubs; narrow-leaved emergents; ground cover;

Representation

Landform
Soils (Young, 1998): 50% sand (Tioga series), and 50% humic/ mesic;
Site Type (Young, 1998): 21% isolated and 79% palustrine (permanent or intermittent outflow);

References

- Hooper, G. and D. Kennedy. 1985. Wetland Data Record and Evaluation- Wasaga Beach Wetland. Second Edition. July 22, 23 & 29, 1985. Nottawasaga Valley Conservation Authority. Manuscript. 19 pp + 1 map + 7 pp supplement.
- Medd, T. 1994. Southern Ontario Wetland Evaluation, Data and Scoring Record- Wasaga Beach. Third Edition (May). July 22, 23 & 29, 1985. Desktop Update. Ontario Ministry of Natural Resources. Manuscript. 23 pp.
- Young, T. 1998. Southern Ontario Wetland Evaluation, Data and Scoring Record- Wasaga Beach. Third Edition, August 15, 17 and 18, 1998. Dillon Consulting. Manuscript. 41 pp.

Brad Baker

From: Robinson, Suzanne (MNR) [suzanne.robinson@ontario.ca]
Sent: Friday, July 24, 2009 2:54 PM
To: Brad Baker
Cc: Gormaly, Phil (MNR)
Subject: RE: Municipal Class EA for River Road West Urbanization, Town of Wasaga Beach

Good afternoon Brad

I have reviewed the map and letter that you provided on July 7, 2009 pertaining to the River Road West Urbanization in the Town of Wasaga Beach, County of Simcoe

Our mapping indicates that the following natural heritage features are located within the 30 m of the existing road and right of way.

Wasaga Beach Provincially Significant Wetland
Wasaga Dunes Life Science Area of Natural and Scientific Interest (Provincial),
Wasaga Beach Provincial Park
Wasaga Backlands Park Reserve Earth Science Area of Natural and Scientific Interest ANSI (Provincial),
Provincially Significant Wildlife Habitat (Deeryards)

If you require mapping of the natural heritage features you can acquire it from Land Information Ontario (LIO). If you have questions pertaining to LIO and the information available there, you should contact Paul Jurjans, GIS Officer, at (705)725-7564.

Our records also indicate that [redacted] is present in this area and has been observed in the right of way and adjacent lands. [redacted] is listed as a threatened species in Ontario. There are reports of this species crossing River Road West in this area. This species is highly susceptible to road mortality and could potentially be impacted by construction in this area. Under the Endangered Species Act 2007 this species is protected from killing, harming and harassing, as well as possession and trade. Therefore, mitigation measures should be adopted that ensure the protection of this species. A few approaches are as follows:

- All construction and site workers should be informed of the potential for this species to be present, be able to identify it and be aware that it is protected under the ESA 2007. Individuals working on site should ensure that snakes are not harmed during construction or killed by heavy machinery, vehicles or other equipment. All observations of this species should be reported to the Midhurst District Office.
- If silt fencing is present, construction site inspectors should inspect it daily for both the presence of snakes and holes in the material. Rodents and other small mammals will frequently create holes in silt fencing to access an area. Standard grade of silt fencing should also be used at the site. Past experience has shown that reinforced higher quality silt fence can be a hazard to this and other species of snake as they become entangled in the mesh.
- A best practice would be that construction occur outside of the active season for this species (April 15-October 31)

Please note that [redacted] is sought after and can be negatively impacted from the illegal collection and trade. AS a result we request that this species information be kept confidential in reports made available to the public. It is a best practice to refer to these records as a "sensitive species of snake". Other than those individuals that are required to be informed of the presence of this species it is recommended that this information be maintained as confidential.

Should an observation of a species at risk or rare species occur or become known on the site, please report the information to the Natural heritage Information Centre (NHIC) http://nhic.mnr.gov.on.ca/nhic_.cfm or to the Midhurst District office.

Please let me know if you have any questions or if you would like to discuss this information further.

Regards,

Suzanne Robinson
Species at Risk Biologist

From: Brad Baker [mailto:BBaker@Azimuthenvironmental.Com]
Sent: July 7, 2009 1:59 PM
To: Robinson, Suzanne (MNR)
Subject: Municipal Class EA for River Road West Urbanization, Town of Wasaga Beach

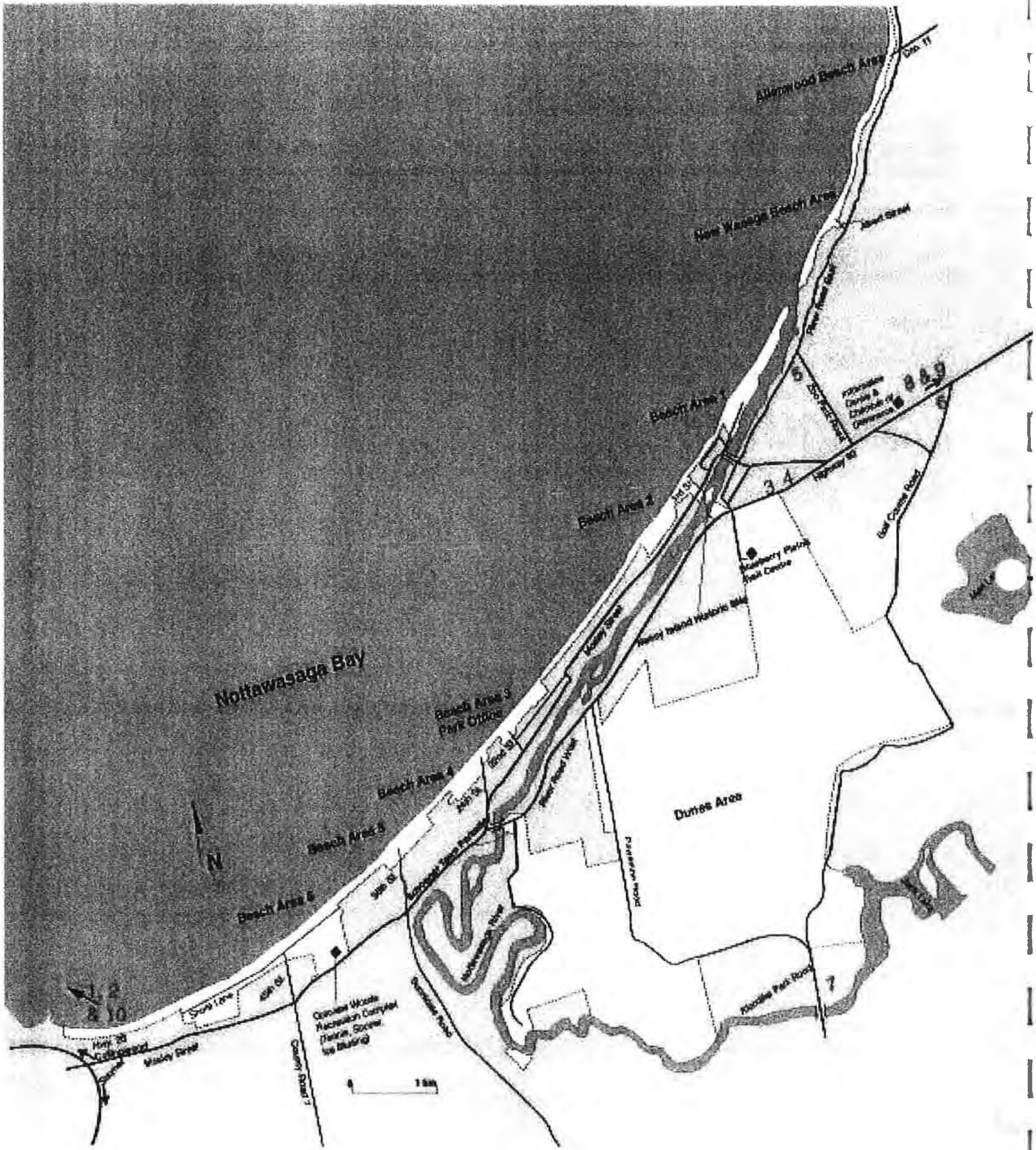
Hello Suzanne,

Please find attached our background information request letter for the abovementioned project. Thank you very much for your attention to this matter. If you have any questions, or require further information, please to not hesitate to call.

Regards,

Brad Baker
Biologist

Azimuth Environmental Consulting, Inc.
229 Mapleview Drive East, Unit 1
Barrie, ON L4N 0W5
(705) 721-8451 fax (705) 721-8926
BBaker@azimuthenvironmental.com


Nottawasaga Bay
Allenwood Beach Area
New Wasaga Beach Area
Beach Area 1
Beach Area 2
Beach Area 3
Park Office
Beach Area 4
Beach Area 5
Beach Area 6
Highway 92
Dunes Area
N
1, 2
& 10
3 4
8 & 9
6
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7

APPENDIX B

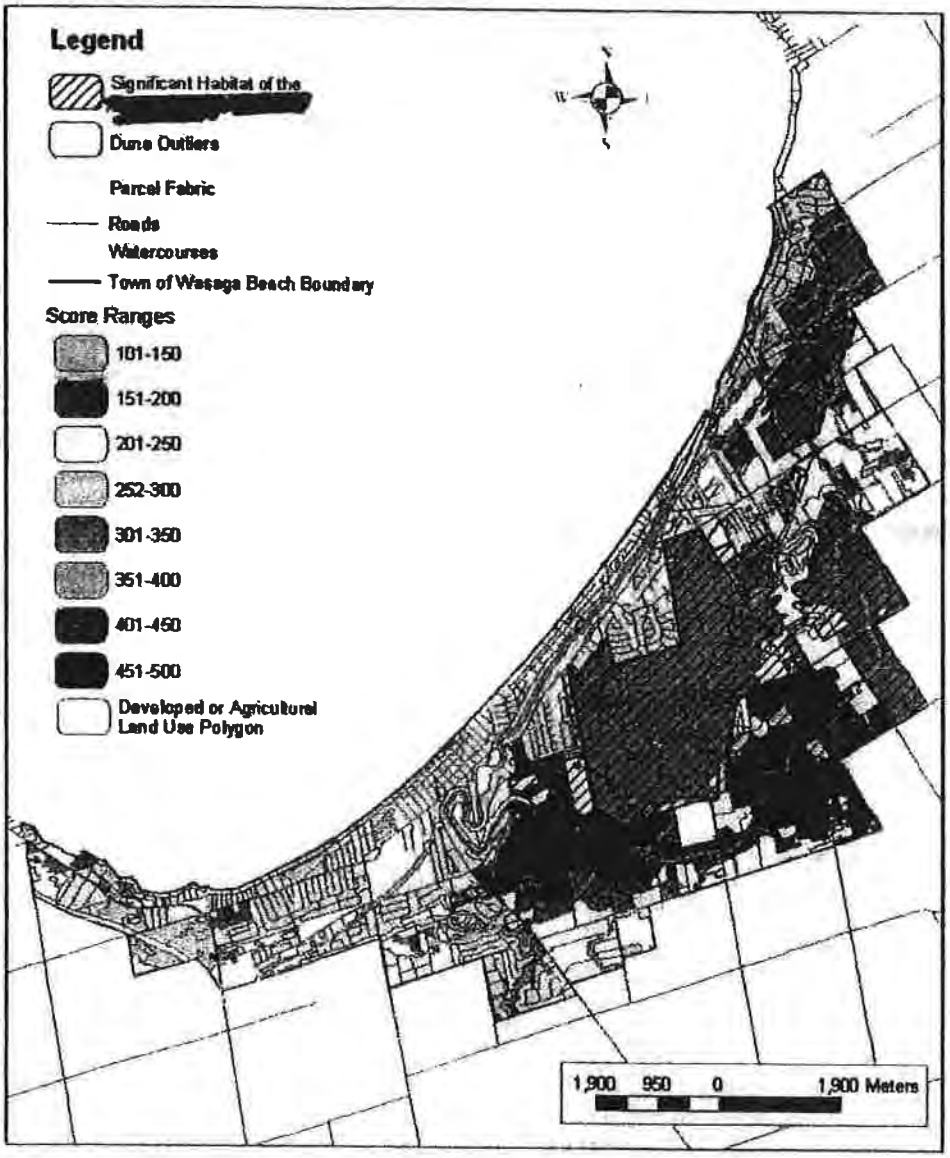


Figure 2: Significant Habitat & Natural Heritage Modeling Scores

Brad Baker

From: Anita Ward [award@nvca.on.ca]
Sent: Wednesday, July 22, 2009 8:08 AM
To: Brad Baker
Subject: Municipal Class Environmental Assessment for the River Road West Urbanization

Good morning Brad,

I apologize for the delay in getting back your requested information regarding the EA, I have determined the following NVCA concerns and gathered the associated background information. As Patti mentioned, this EA covers areas that are regulated by NVCA due to the presence of watercourses and associated hazards; environmental areas; and wetland setback areas.

Our main concern is the preservation of the Provincially Significant Wasaga Beach Wetland Complex located directly south of River Road West and after Blueberry Trail. Currently, River Road is already encroaching into the NVCA regulated 120 metre wetland setback area however, expansion of this road was cause further encroachment into this area ultimately, moving the development as a whole closer to the wetland. More minorly, we also possess concerns over the properties adjacent to the river along River Road West. These properties area regulated entirely or almost entirely by NVCA as floodplain and the expansion of a road will (even if ever so slightly) decrease developable space on these already hazardous properties. Also, please note the flooding hazards do not extend onto the current River Road however, a meanderbelt erosion hazard does extend onto the road at the Powerline Road/River Road intersection as well as a lesser flooding hazard extending onto the road to the east of Bells Park Road (this is lesser because it looks as if it has already been piped).

I have also spoken with our watershed ecologist Dave Featherstone and he has provided me with the following Natural Heritage background information:

The Provincially Significant Wasaga Beach Wetland Complex and its broader associated area supports habitat for the [redacted] (a threatened species); it is part of the Wasaga Beach Provincial Park ANSI (Area of Natural and Scientific Interest); as well as being shown as deer wintering yards (according to MNR mapping). The field areas situated west of Vigo Road support large numbers of white-tailed deer specifically in late winter/early spring. Dave says that the deer are likely dispersing outward fro the large deer wintering yards located north of River Road West. Deer are also very common along the narrow linkage from forest cover along Powerline Road moving northward towards the undeveloped shoreline along the river. They may move in numbers thus, creating a safety concern along the roads. The headwaters of Little Marl Creek arise just upstream of Baywood Golf Course, this is an intermittent watercourse but may support tolerant baitfish such as Brook Sitckleback.

Our engineering department has also voiced concerns over stormwater management and potential raising of the grade of the road. The NVCA hopes that EA will cover these concerns and associated mitigation measures as well as the conservation methods that will be taken to preserve the wetlands and natural heritage of the area.

I have not yet had an opportunity to speak with our Fisheries Department but will be sure to provide back information should anything important come up on the subject when we do meet.

Please do not hesitate to contact myself at extension 254 or Patti Young at extension 231.

Regards,

Anita Ward

Anita Ward
Planning Assistant
Nottawasaga Valley Conservation Authority
8195 8th Line
Utopia, ON L0M 1T0
p: (705) 424-1479 ex. 254
f: (705) 424-2115

Subject to Section 7.4.2

NOTTAWASAGA BAY

Schedule 'A-1'

Schedule 'A-7'

Schedule 'A-4'

Schedule 'A-5'

Schedule 'A-2'

Schedule 'A-2'

MOSLEY STREET

NOTTAWASAGA RIVER

RIVER OAK

POPLAR STREET

ELLIOT LAKE

SPIREA MOSS PARK

ND #2

ND #2

ND #2

LOT 1

LOT 2

LOT 3

LOT 4

LOT 5

LOT 6

LOT 7

CONC. XVI

CONC. XV

ROAD ALLOWANCE BETWEEN CONCESSIONS XIV AND XV

CORDUROY ROAD

REINDERS SOUTHPARK

OFFICE CONSOLIDATION

APRIL, 2008

NOTE: The lot lines depicted on this map are for reference only and may not reflect accurately property boundaries in all instances

1 : 15 000

0 100 250 500 750 1000m

N

A-1 A-2 A-3 A-4 A-5 A-6 A-7 A-8 A-9

LEGEND

- RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COUNTRY CLUB COMMUNITY
- LOCAL COMMERCIAL
- DISTRICT COMMERCIAL
- SERVICE COMMERCIAL
- TOURISM ACCOMODATION
- TOURISM COMMERCIAL
- CAMPGROUND COMMERCIAL
- INSTITUTIONAL
- RECREATIONAL COMMERCIAL
- INDUSTRIAL
- SCHEDULE BOUNDARY
- OPEN SPACE
- ENVIRONMENTAL PROTECTION
- ENVIRONMENTAL PROTECTION FLOOD PROOFING
- RURAL
- NATURAL HERITAGE SYSTEM CATEGORY 1 LANDS
- CORPORATE LIMITS OF THE TOWN OF WASAGA BEACH

ND: NON DECISION

TOWN OF

The Beach is Just the Beginning...

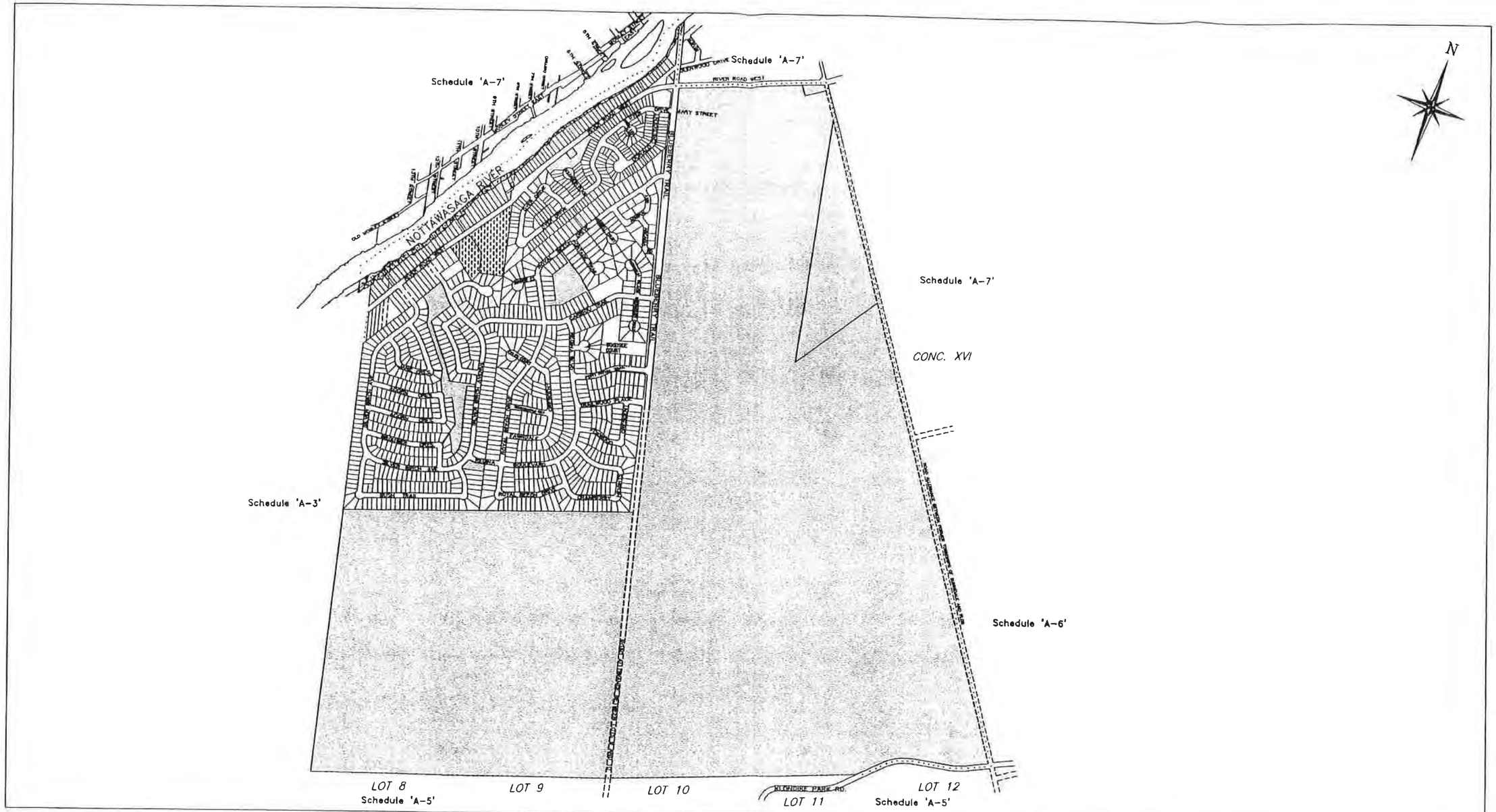
WASAGA Beach

WASAGA BEACH

Schedule 'A-3'

LAND USE PLAN

OFFICIAL PLAN FOR THE TOWN OF WASAGA BEACH



REINDERS SOUTHPARK

OFFICE CONSOLIDATION

APRIL 2008

NOTE: The lot lines depicted on this map are for reference only and may not reflect accurately property boundaries in all instances

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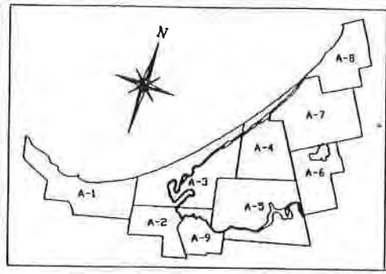

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- HIGH DENSITY RESIDENTIAL
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- DISTRICT COMMERCIAL
- SERVICE COMMERCIAL
- TOURISM ACCOMODATION
- TOURISM COMMERCIAL
- CAMPGROUND COMMERCIAL
- INSTITUTIONAL
- RECREATIONAL COMMERCIAL
- INDUSTRIAL
- SCHEDULE BOUNDARY
- OPEN SPACE
- ENVIRONMENTAL PROTECTION
- ENVIRONMENTAL PROTECTION FLOOD PROOFING
- RURAL
- NATURAL HERITAGE SYSTEM CATEGORY 1 LANDS
- CORPORATE LIMITS OF THE TOWN OF WASAGA BEACH

TOWN OF

The Beach Is Just the Beginning...

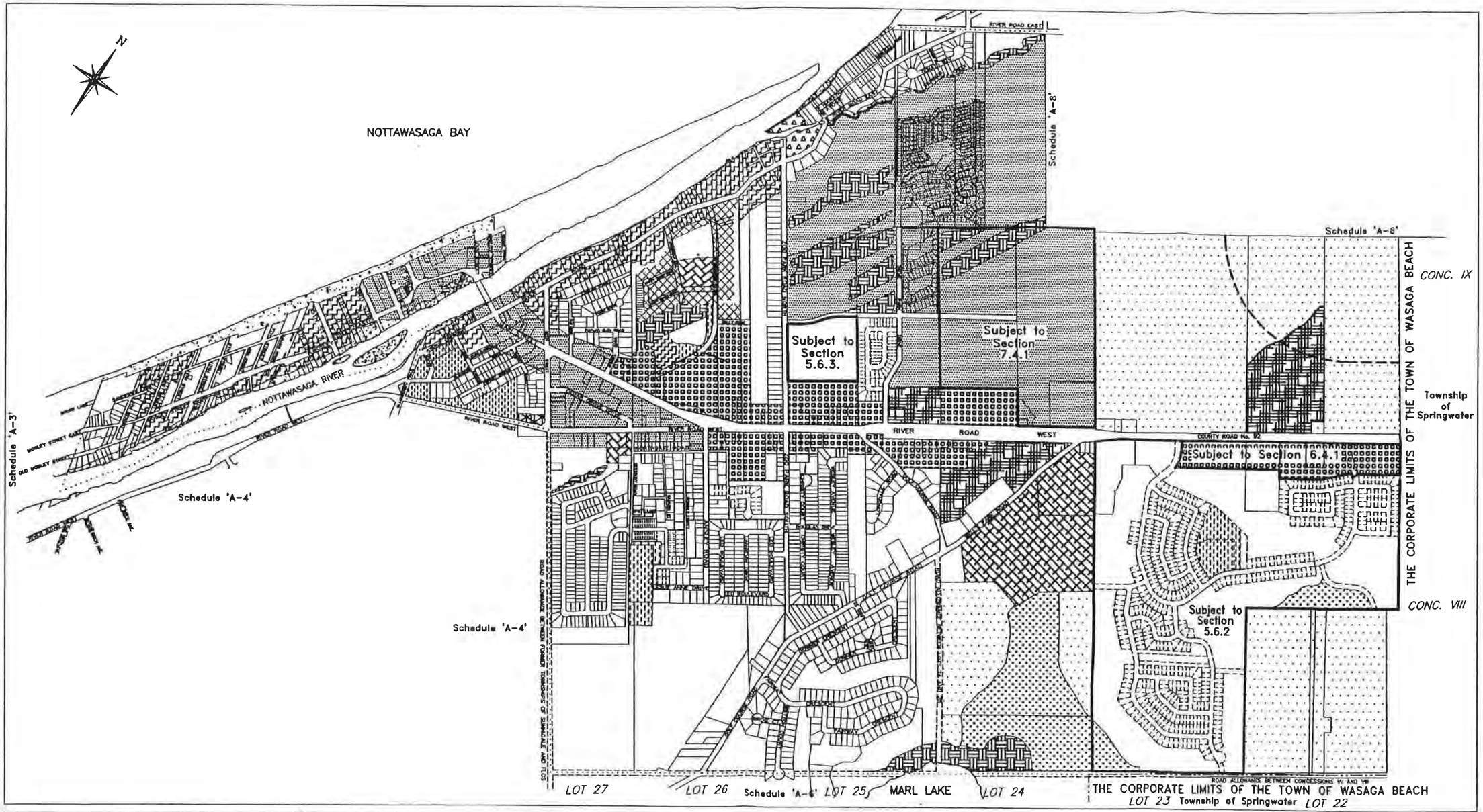
WASAGA Beach

WASAGA BEACH

Schedule 'A-4'

LAND USE PLAN

OFFICIAL PLAN FOR THE TOWN OF WASAGA BEACH



REINDERS SOUTHPARK

OFFICE CONSOLIDATION
APRIL 2008

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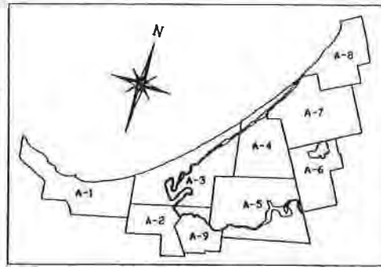

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- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- COUNTRY CLUB COMMUNITY
- LOCAL COMMERCIAL
- DISTRICT COMMERCIAL
- TOURISM ACCOMODATION
- TOURISM COMMERCIAL
- CAMPGROUND COMMERCIAL
- INSTITUTIONAL
- RECREATIONAL COMMERCIAL
- INDUSTRIAL
- SCHEDULE BOUNDARY
- SERVICE COMMERCIAL
- OPEN SPACE
- ENVIRONMENTAL PROTECTION
- ENVIRONMENTAL PROTECTION FLOOD PROOFING
- RURAL
- NATURAL HERITAGE SYSTEM CATEGORY 1 LANDS
- WASTE DISPOSAL ASSESSMENT AREA
- CORPORATE LIMITS OF THE TOWN OF WASAGA BEACH

TOWN OF

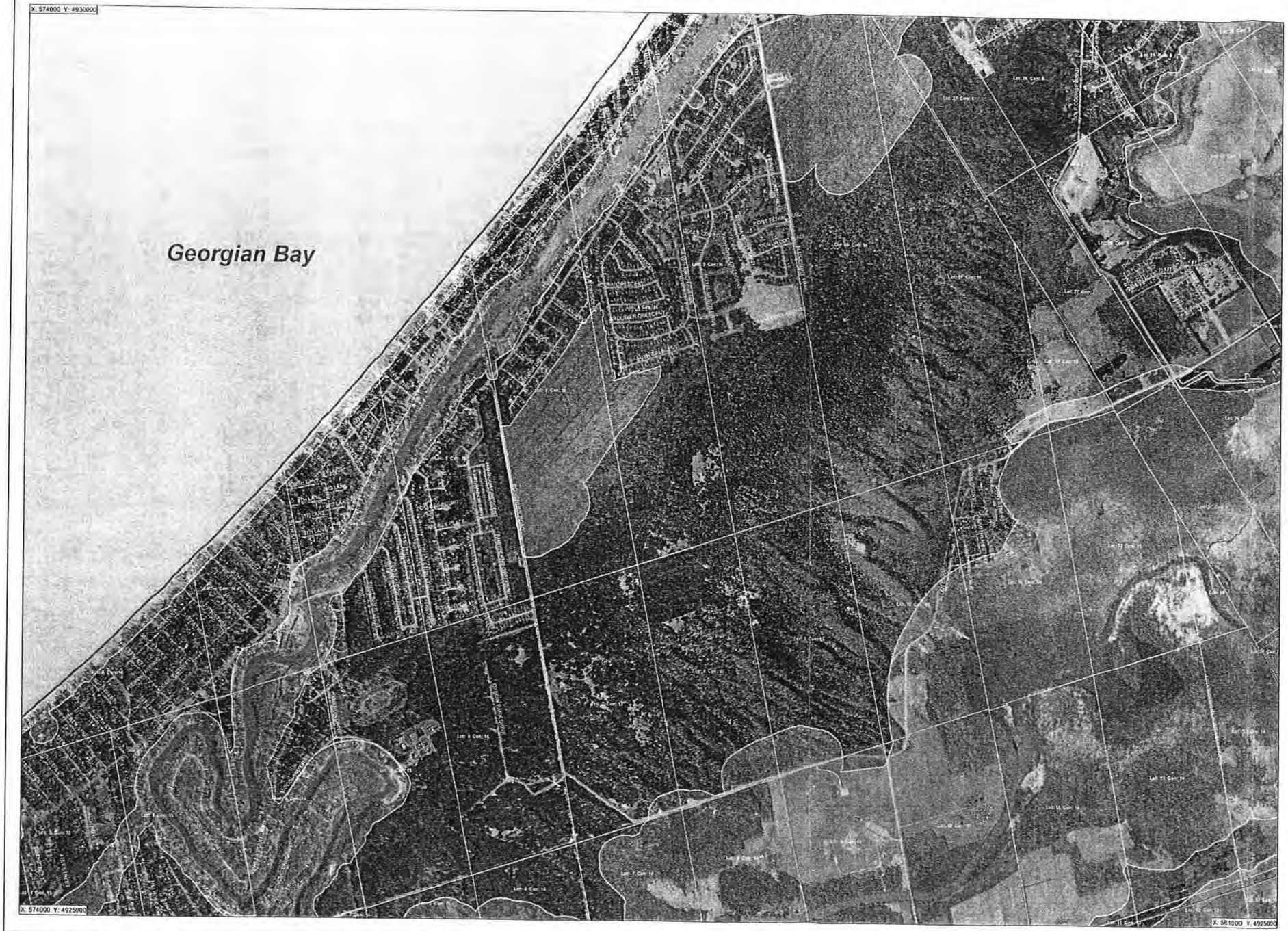
The Beach is Just the Beginning.

WASAGA Beach

WASAGA BEACH

Schedule 'A-7'
LAND USE PLAN

OFFICIAL PLAN FOR THE TOWN OF WASAGA BEACH



NOTTAWASAGA VALLEY CONSERVATION AUTHORITY
8195 CONCESSION LINE 8
UTOPIA, ONTARIO. L0M 1T0
TELEPHONE: (705) 424-1479
FAX: (705) 424-2115
www.nvca.on ca

ONTARIO REGULATION 172/06

REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES.

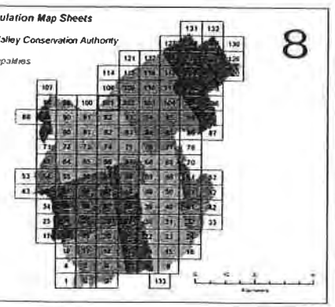
(IN CONFORMANCE WITH ONTARIO REGULATION 97/04)

8

LEGEND

- MUNICIPAL BOUNDARY
- NVCA JURISDICTION
- REGULATION LIMIT
- LOT & CONCESSION FABRIC

Index to Regulation Map Sheets
Nottawasaga Valley Conservation Authority
Member Municipalities



In case of a conflict, the description of the areas provided in Section 2(1) of Ontario Regulation 172/06 prevails over the information shown on this map. Under Ontario Regulation 172/06 of the Conservation Authorities Act, the Nottawasaga Valley Conservation Authority regulates development in areas defined in Section 2. Subsection 1. The Regulation limit for riverine systems includes the greater (>) of the flood plain limit and the erosion hazard limit, plus an allowance of 15 metres. The Regulation limit for Lake Huron (Georgian Bay includes the high lake level (176.0 meters GSCD) plus an allowance of 45 metres (wave uprush, other water related hazards, dynamic beach). Provincially Significant Wetlands have been provided by the Ministry of Natural Resources. All other wetlands were delineated by the NVCA using the Ontario Wetland Evaluation System. The Regulation limit shown on this map includes wetlands greater than 2 hectares plus an allowance of 120 metres in order to identify lands where development could interfere with the function of a wetland. Ontario Regulation 172/06 applies to all wetlands and areas within the flooding hazard limit and erosion hazard limit shown and not shown on this map. Karst topography is a landscape created by groundwater dissolving sedimentary rock, such as limestone. This creates landforms such as shafts, tunnels, caves and sinkholes. Karst topography is considered to be a natural hazard. Further studies will be required for development proposals within areas where karst topography is suspected.

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Meters

NO	REVISIONS	DATE	
2	REVISED FOLLOWING MUNICIPAL CONSULTATION	Feb 16, 2007	
1	APPROVED, REGULATION NUMBER ADDED	May 4, 2006	May 15, 2006
			GIS DEPT

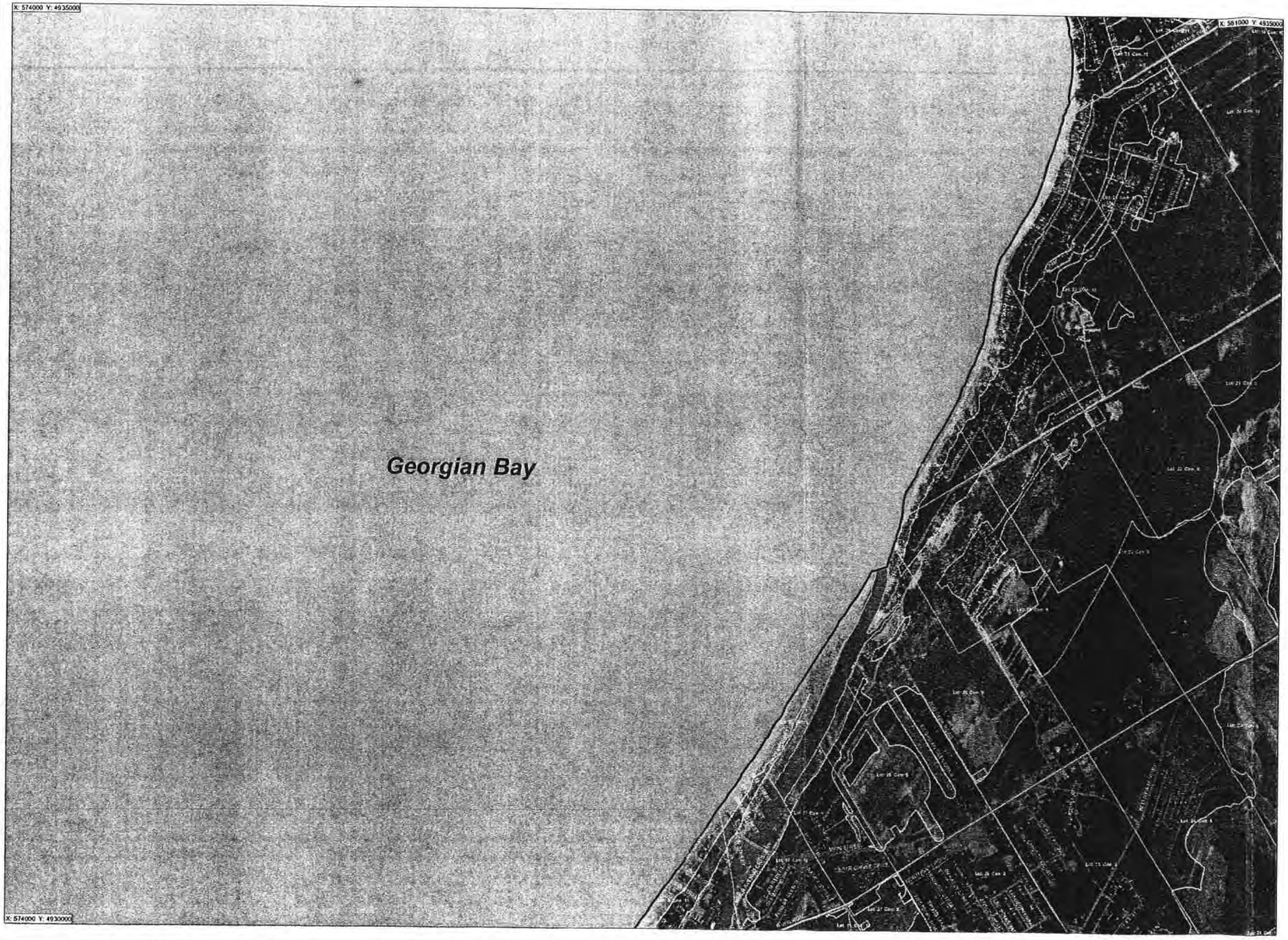
ONTARIO REGULATION 172/06

REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES.
(IN CONFORMANCE WITH ONTARIO REGULATION 97/06)

PLOT DATE: February 2007

FILE: G: NVCA Data\Program Data\GIS Projects\General\Regs

SHEET NO: 101 of 133



NOTTAWASAGA VALLEY CONSERVATION AUTHORITY
8195 CONCESSION LINE 8
UTOPIA, ONTARIO. L0M 1T0
TELEPHONE: (705) 424-1479
FAX: (705) 424-2115
www.nvca.on.ca

ONTARIO REGULATION 172/06

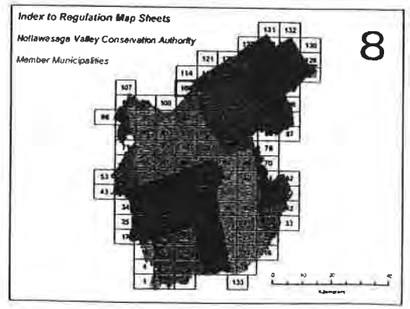
REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES.

(IN CONFORMANCE WITH ONTARIO REGULATION 97/04)

8

LEGEND

- MUNICIPAL BOUNDARY
- NVCA JURISDICTION
- REGULATION LIMIT
- LOT & CONCESSION FABRIC



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NO	REVISIONS	DATE	
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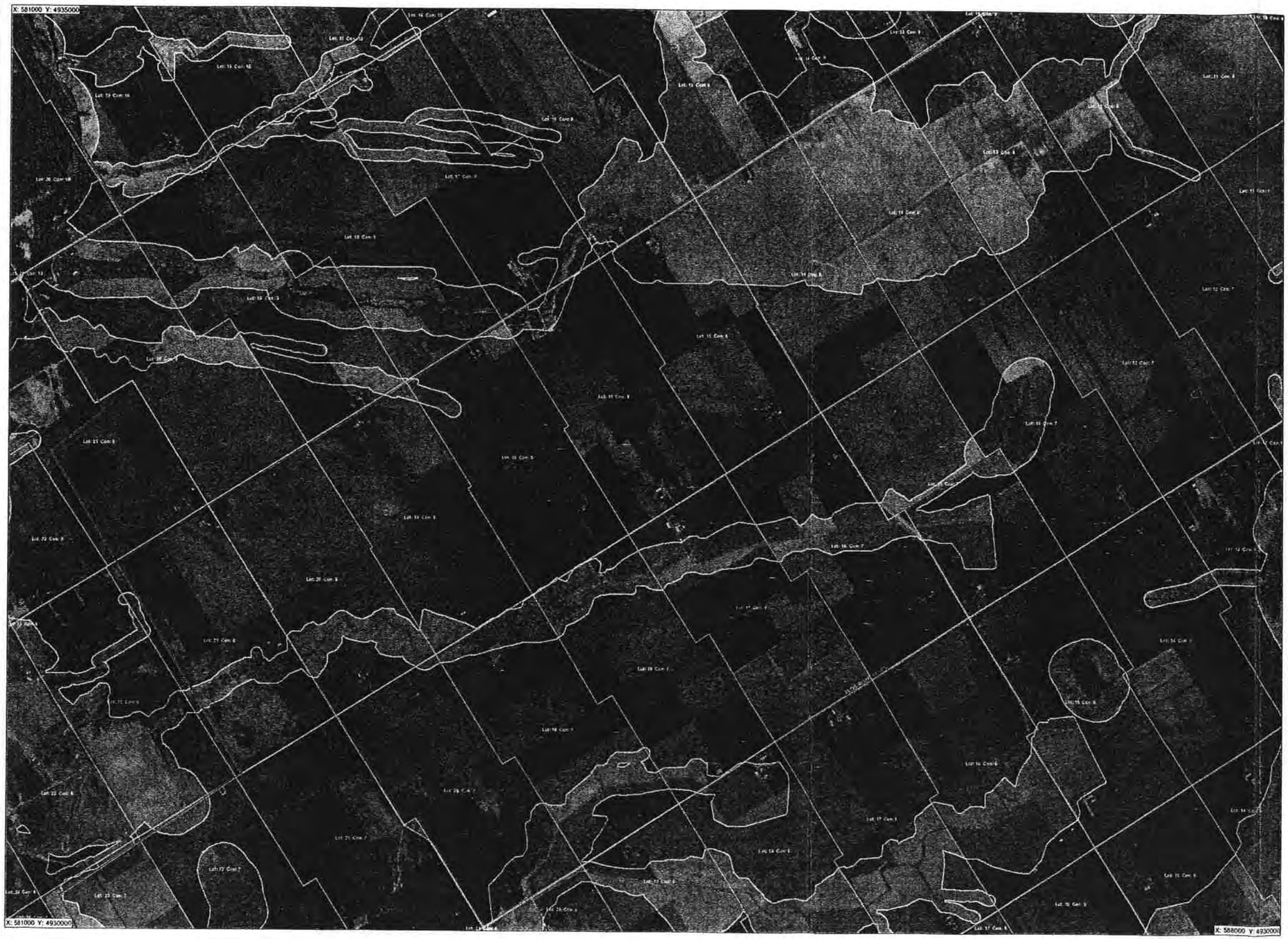
PLOT DATE: February 2007

FILE: G:\NVCA Data\Projects\ DataGIS\Projects\Current\Regs

SHEET NO: 108 of 133



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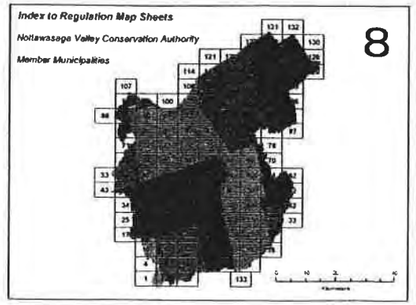

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REGULATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES (IN CONFORMANCE WITH ONTARIO REGULATION 97/06)

PLOT DATE: February 2007

FILE: G:\NVCA Data\Program Data\GIS\Projects\Generic\Regs

SHEET NO. 109 of 133

APPENDIX C

Square Summary (17NK72)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
31	30	29	90	73	34	34	141	43	74	22	91

Region summary (#13: Simcoe County)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
68	63	65	181	190	2075	850

Target number of point counts in this square: 22 road side, 3 off road (1 in deciduous forest, 1 in coniferous forest, 1 in mixed forest). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%	
	1st	2nd	1st	2nd
Common Loon	P	S	28	52
Pied-billed Grebe			22	32
Double-crest Cormorant §		H	11	27
American Bittern		H	50	44
Least Bittern †			12	23
Great Blue Heron §		H	77	63
Great Egret †			0	1
Green Heron §	H	H	84	70
Black-crown N.-Heron † §			12	9
Yellow-crn N.-Heron †			0	0
Turkey Vulture		T	77	84
Canada Goose		FY	58	95
Trumpeter Swan †			0	43
Wood Duck		P	76	78
Gadwall ‡			6	4
American Wigeon		H	6	12
American Black Duck		H	44	47
Mallard	FY	NE	93	95
Blue-winged Teal	FY	H	79	53
Northern Shoveler			11	10
Northern Pintail		H	14	7
Green-winged Teal		H	0	18
Redhead †		X	3	1
Ring-necked Duck		H	4	21
Lesser Scaup ‡		X	1	1
Hooded Merganser		H	25	30
Common Merganser		H	36	46
Red-breast Merganser		H	9	20
Ruddy Duck †		X	0	1

SPECIES	Code		%	
	1st	2nd	1st	2nd
Osprey		H	42	53
Bald Eagle †		X	0	1
Northern Harrier	H		76	66
Sharp-shinned Hawk	H	H	50	60
Cooper's Hawk		H	17	47
Northern Goshawk		H	15	27
Red-should Hawk †	H	H	17	44
Broad-winged Hawk		NB	58	66
Red-tailed Hawk	H	H	92	81
American Kestrel	CF	H	85	76
Merlin ‡		X	1	21
Peregrine Falcon †		X	0	1
Gray Partridge ‡			0	1
Ring-necked Pheasant			15	10
Ruffed Grouse	FY	H	92	81
Wild Turkey		NU	0	81
Yellow Rail †			3	3
King Rail †			3	3
Virginia Rail		H	36	47
Sora		H	31	43
Common Moorhen			17	12
American Coot			15	12
Coot/Moorhen			0	0
Sandhill Crane ‡			0	21
Killdeer	NU	DD	96	96
Spotted Sandpiper	D	A	95	78
Upland Sandpiper		S	60	38
Common Snipe	H	H	79	61
American Woodcock	H	T	79	72

SPECIES	Code		%	
	1st	2nd	1st	2nd
Ring-billed Gull §		H	6	33
Herring Gull §	NY	H	49	38
Great Black-backed Gull †		X	0	1
Caspian Tern †			1	3
Common Tern §		H	34	23
Forster's Tern † §		X	0	1
Black Tern † §		X	30	21
Rock Dove	P	D	87	84
Mourning Dove	NU	T	95	95
Black-billed Cuckoo	H	NY	58	75
Yellow-billed Cuckoo		H	6	18
Black/Yell-billed Cuckoo			0	18
Eastern Screech-Owl		H	12	49
Great Horned Owl	P	S	74	55
Barred Owl			20	49
Long-eared Owl ‡			3	4
Short-eared Owl †			1	4
North Saw-whet Owl			9	12
Common Nighthawk	NU	T	63	40
Whip-poor-will	H	H	60	38
Chimney Swift		H	63	32
Ruby-thr Hummingbird	T	H	88	95
Belted Kingfisher	CF	T	95	92
Red-head Woodpecker †	D	NY	65	29
Yellow-bellied Sapsucker	S	H	80	95
Downy Woodpecker	D	S	95	96
Hairy Woodpecker	S	NY	95	93
Black-back Woodpecker ‡		X	0	1
Northern Flicker	D	FY	98	95

Ontario Breeding Bird Atlas - Summary Sheet for Square 17NK72 (page 2 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Pileated Woodpecker	T	S	80	93
Olive-sided Flycatcher		H	22	20
Eastern Wood-Pewee	T	NB	96	96
Alder Flycatcher		S	47	76
Willow Flycatcher		NE	42	55
Least Flycatcher	H	D	88	89
Eastern Phoebe	AE	NE	95	96
Gr Crested Flycatcher	D	T	98	96
Eastern Kingbird	NY	T	98	95
Loggerhead Shrike †			15	3
Yellow-throated Vireo ‡		S	30	26
Blue-headed Vireo		FY	9	38
Warbling Vireo	S	T	92	93
Philadelphia Vireo ‡			1	4
Red-eyed Vireo	T	FY	93	96
Blue Jay	CF	FY	96	96
American Crow	N	FY	98	96
Common Raven		P	7	55
Horned Lark	S	S	68	47
Purple Martin	AE	AE	61	27
Tree Swallow	NE	H	98	96
North Rgh-wing Swallow	AE	V	68	56
Bank Swallow §	NE	NU	88	58
Cliff Swallow §	AE	H	82	63
Barn Swallow	NY	NB	96	95
Black-capp Chickadee	NY	AE	96	96
Tufted Titmouse †			1	0
Red-breast Nuthatch	D	T	52	90
White-breast Nuthatch	D	T	87	93

SPECIES	Code		%	
	1st	2nd	1st	2nd
Brown Creeper	H	H	55	60
Carolina Wren ‡			1	6
House Wren		AE	87	95
Winter Wren	H	S	68	95
Sedge Wren			19	20
Marsh Wren			42	33
Golden-crown Kinglet		H	7	21
Ruby-crown Kinglet			6	7
Blue-gr Gnatcatcher ‡		H	14	24
Eastern Bluebird		NY	57	73
Veery	T	S	95	96
Swainson's Thrush		H	14	20
Hermit Thrush	S	T	39	69
Wood Thrush	T	T	90	92
American Robin	NY	NE	98	96
Gray Catbird	S	A	98	96
Northern Mockingbird			6	18
Brown Thrasher	T	NE	96	92
European Starling	AE	CF	98	96
Cedar Waxwing	H	FY	98	96
Blue-winged Warbler		H	4	24
Golden-winged Warbler		H	30	43
Blue/Gold-wing Warbler ‡			0	15
Brewster's Warbler †			0	3
Nashville Warbler	T	S	74	84
Northern Parula		H	12	21
Yellow Warbler	T	NY	98	92
Chestn-sided Warbler	S	S	68	95
Magnolia Warbler		S	20	58

SPECIES	Code		%	
	1st	2nd	1st	2nd
Black-thr Blue Warbler		H	22	63
Yellow-rumped Warbler		T	41	78
Black-thr Green Warbler	S	T	34	90
Blackburnian Warbler		S	28	58
Pine Warbler	S	T	26	80
Kirtland's Warbler †			1	0
Prairie Warbler †			6	9
Bay-breasted Warbler ‡			1	3
Cerulean Warbler †			12	16
Black-white Warbler	CF	T	84	93
American Redstart	H	S	85	90
Ovenbird	T	FY	98	96
North Waterthrush	T	S	61	86
Mourning Warbler	T	S	63	81
Common Yellowthroat	A	S	92	95
Canada Warbler	T	H	46	56
Scarlet Tanager		P	79	86
Eastern Towhee		DD	53	73
Chipping Sparrow	NY	NE	96	96
Clay-colored Sparrow		H	14	36
Field Sparrow	P	T	84	87
Vesper Sparrow	H	T	84	70
Savannah Sparrow	H	A	88	81
Grasshopper Sparrow	T	T	38	41
Song Sparrow	T	NE	98	96
Swamp Sparrow	S	H	84	86
White-throat Sparrow	S	T	95	87
Dark-eyed Junco	H	H	25	21
Northern Cardinal	D	T	66	84

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Ontario Breeding Bird Atlas - Summary Sheet for Square 17NK72 (page 3 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Rose-breast Grosbeak	DD	S	95	93
Indigo Bunting	S	S	90	93
Bobolink	S	T	87	83
Red-wing Blackbird	NE	A	96	96
Eastern Meadowlark	T	T	88	83
Western Meadowlark ‡			6	1
Yellow-h Blackbird †			1	0
Rusty Blackbird ‡			1	1
Brewer's Blackbird ‡			3	7
Common Grackle	NY	CF	96	96
Brown-head Cowbird	NE	NE	98	95
Orchard Oriole ‡			0	1
Baltimore Oriole	CF	NY	96	96
Purple Finch		S	66	73
House Finch		S	3	72
Red Crossbill ‡		X	7	1
White-winged Crossbill ‡		X	1	3
Pine Siskin		H	17	18
American Goldfinch	H	D	98	96
Evening Grosbeak		H	15	15
House Sparrow	NY	H	88	75

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #13 (Simcoe County). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17NK72 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #13). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 1/07/2009. An up-to-date version of this sheet is available from http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17NK72

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VOLUME 2 OF 2

File: 109049
September 2010

APPENDIX H

Stage 1 Archaeological Assessment

Archaeological Research Associates Ltd.

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Tel: (705) 526-9518
Fax: (705) 526-4541

Stage 1 Archaeological Assessment
River Road West Urbanization
From Brillinger Drive to Eastern Town Limits
Town of Wasaga Beach
County of Simcoe, Ontario

Prepared for
Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 Fax: (705) 445-0968
&
The Ontario Ministry of Culture

By
P. Hoskins, B.A.
Archaeological Research Associates Ltd.
964 Copperleaf Crescent, Kitchener, ON N2E 3W3
Tel: (519) 835-4427 Fax: (519) 884-8853

Reviewed By
Paul J. Racher, M.A., CAHP
Ontario Ministry of Culture Licence# P-007
Project# P007-200
PIF# P007-200-2009

August 2009

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List of Tables

Executive Summary:

This archaeological assessment was conducted on lands that may be impacted by the proposed urbanization of River Road West in the town of Wasaga Beach, County of Simcoe, Ontario. The intent of this report is to assess the potential for cultural heritage sites, artifacts or features that may be present in areas that are to be impacted by proposed improvements.

The Stage 1 archaeological assessment was conducted in July of 2009 under licence # P007, PIF # P007-200-2009. The study identified one registered multi-component archaeological site in the vicinity of the project area and indicated a high potential that further undocumented archaeological resources might be present there.

Personnel:

Project Director: P.J. Racher, M.A., CAHP, MCL Licence # P-007
Project Manager: P.J. Racher
Background Research: P. Hoskins
Report Preparation: P. Hoskins
Graphics: P. Hoskins

Acknowledgements:

Special thanks for his generous and timely research assistance are extended to Mr. Robert Von Bitter, Archaeological Data Coordinator, Archaeology Unit, Heritage Branch, Ontario Ministry of Culture, Toronto.

1.0 Introduction

Under a contract awarded in June of 2009, **Archaeological Research Associates Ltd. (ARA)** carried out a Stage 1 archaeological assessment of lands to be impacted by the proposed urbanization of River Road West in the town of Wasaga Beach, Simcoe County, Ontario. The Stage 1 archaeological assessment was conducted in July of 2009 under licence # P-007, PIF # P007-200-2009. The work was completed under contract to **Ainley & Associates Limited** as a component of a Class Environmental Assessment (EA) for Provincial Transportation Facilities (2000). The archaeological assessment was conducted in order to:

- Identify any known archaeological sites that might be found near or within the study area.
- If identified, suggest appropriate strategies for the protection and management of these sites.
- Establish the potential for the presence of further, undocumented archaeological resources which may be extant within the study area.

The assessment was conducted in accordance with the provisions of the Ontario Heritage Act (A.S.O. 1990), and the Standards and Guidelines for Archaeological Assessments as formulated by the Ministry of Culture (MC 2006: Unit 1C - D). All records pertaining to the assessment are currently housed in a secure company storage facility located in the Department of Archaeology and Classical Studies at Wilfrid Laurier University.

The Ministry of Culture is asked to review the results and recommendations presented in this report.

2.0 Location

The study area is a 7.8 kilometre long corridor, running along River Road West, between Brillinger Drive and the eastern limits of the Town of Wasaga Beach, Simcoe County, Ontario (see Figures 1-4). It is situated on Lots 4-11, Concession 16 in the former Township of Sunnidale, and Lots 21-27, Concession 9 in the former Township of Flos. The study corridor runs parallel to the Nottawasaga River, a potable and navigable water source, which eventually drains into Nottawasaga Bay, approximately 600 metres to the north.

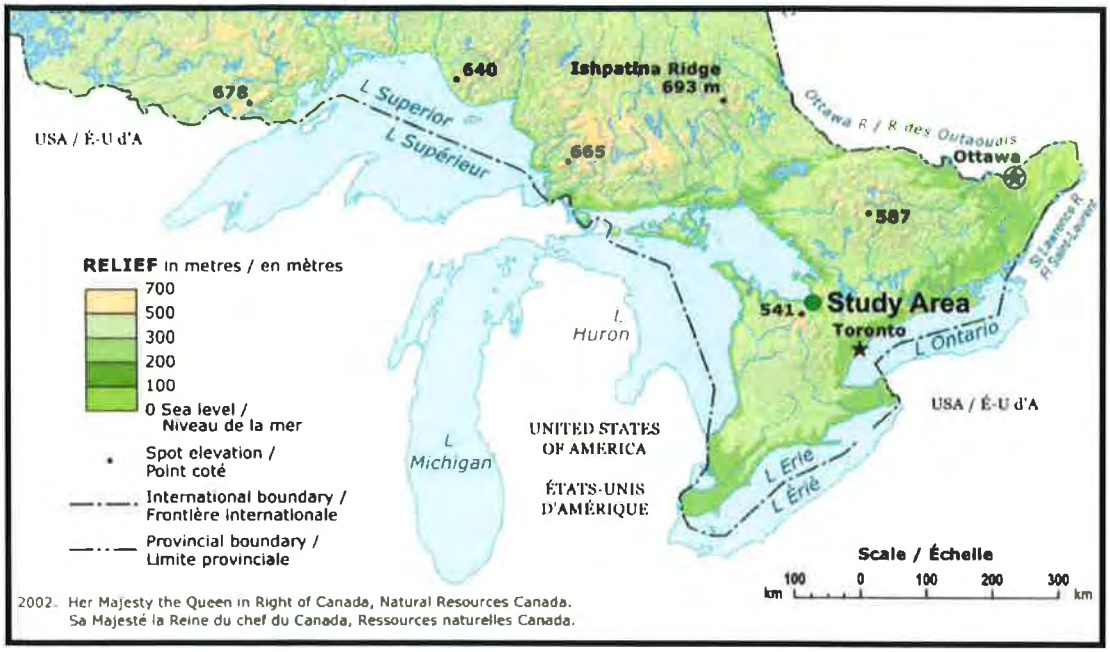

Figure 1: Location of Study Area in the Province of Ontario

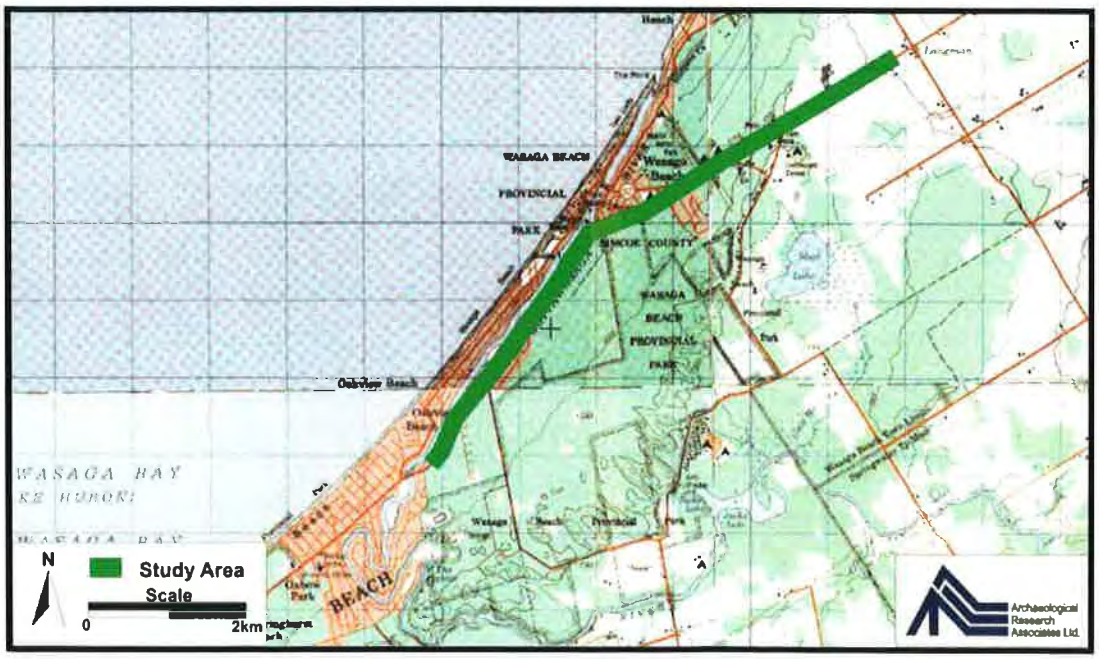

Figure 2: Study Area in the Town of Wasaga Beach

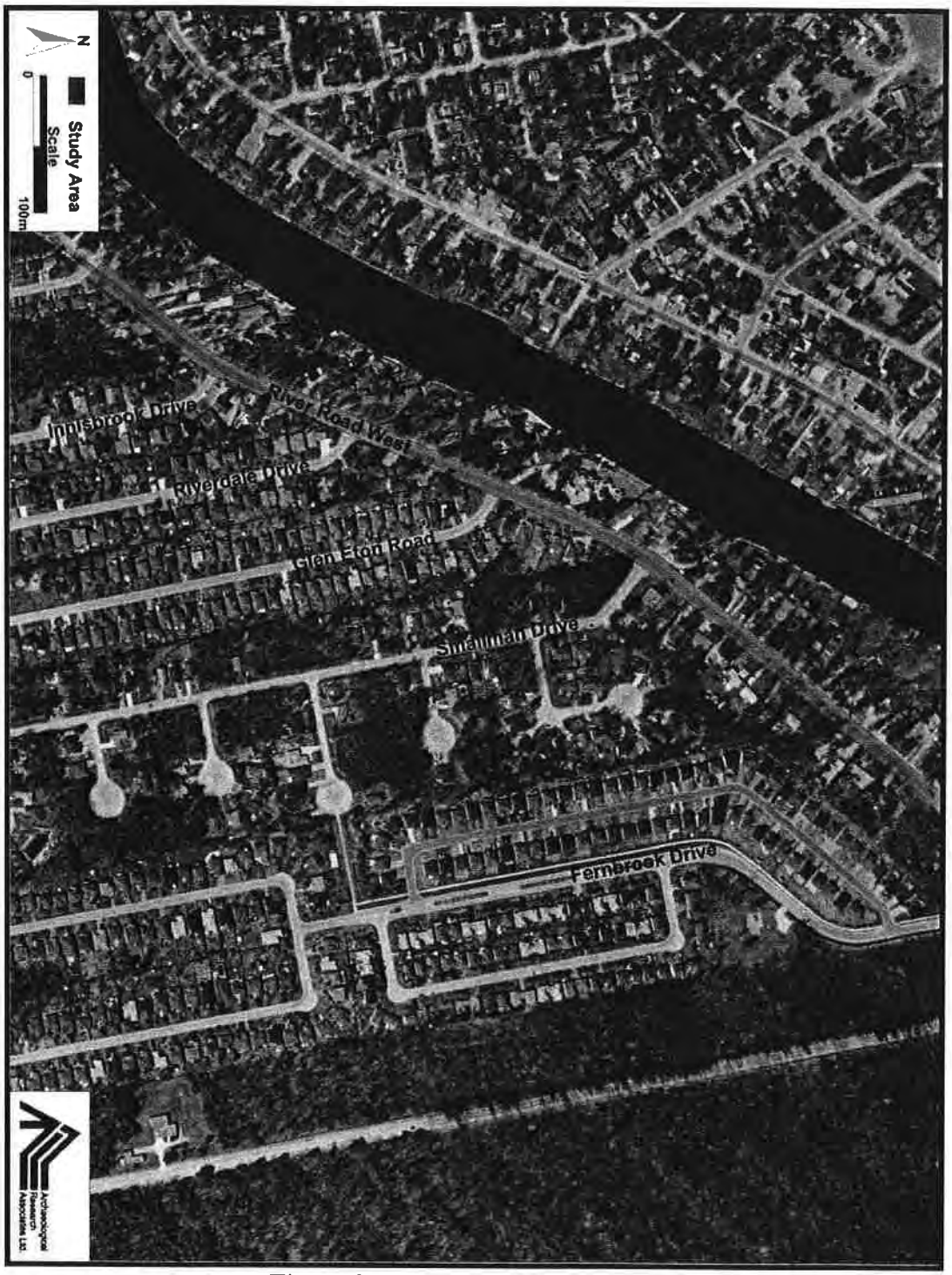

Figure 3a: The Study Area in Detail

Figure 3b: The Study Area in Detail

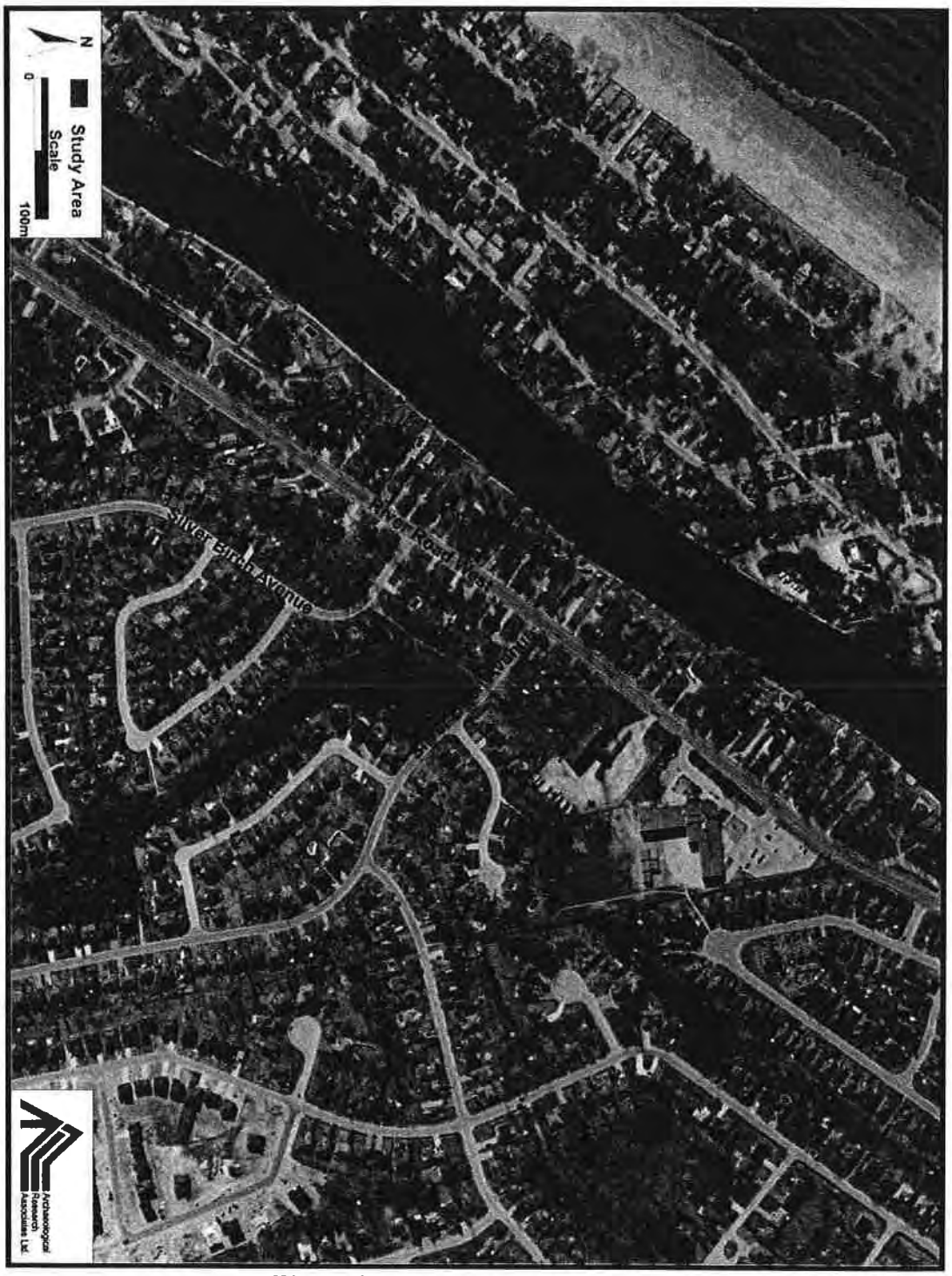

Figure 3c: The Study Area in Detail

Figure 3d: The Study Area in Detail

Figure 3e: The Study Area in Detail

Figure 3f: The Study Area in Detail

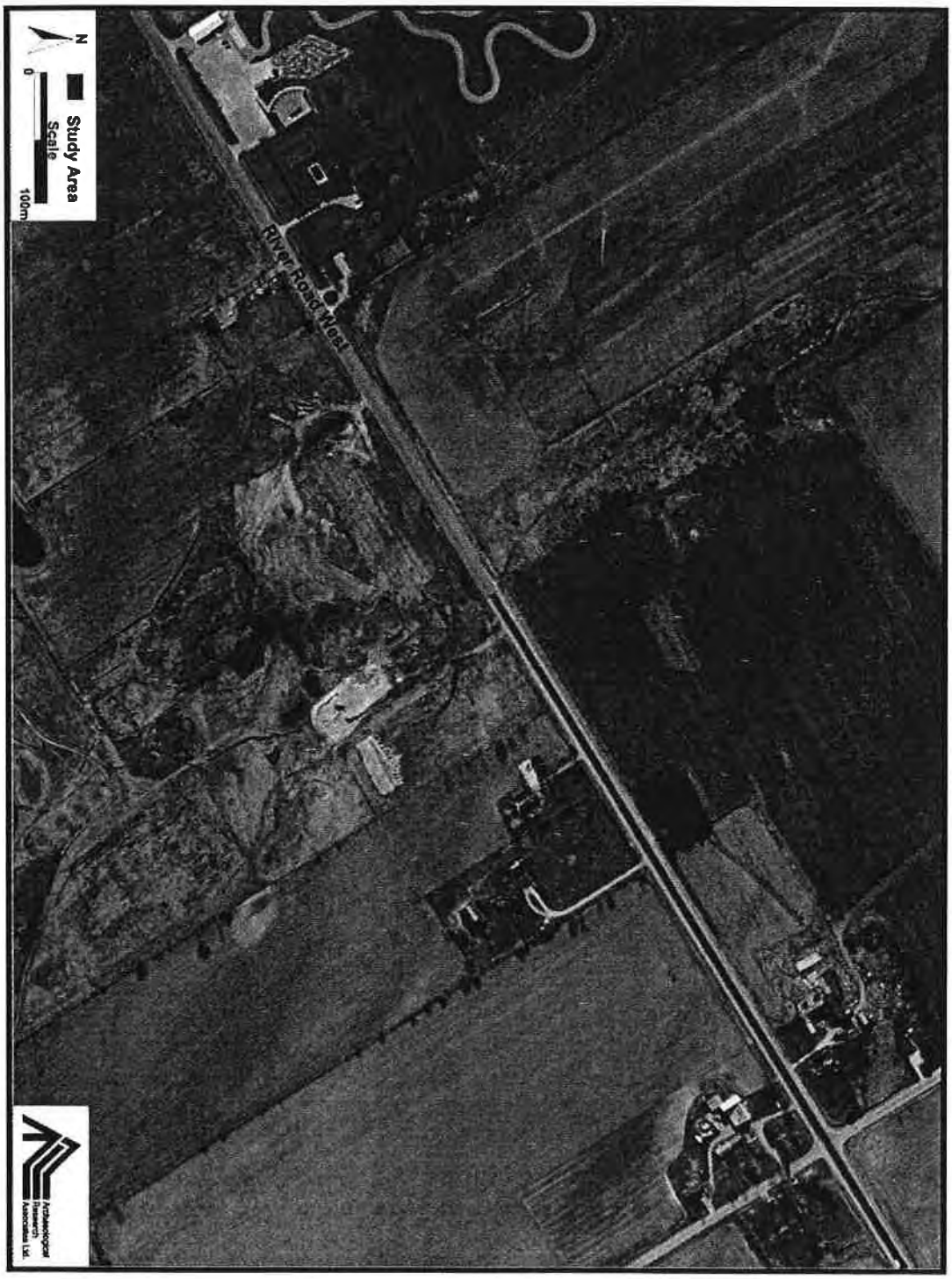

Figure 3g: The Study Area in Detail

3.0 Geography

It has long been understood that environment plays a key role in determining site location, particularly in small societies with non-complex, subsistence-oriented economies. The local environment of the subject property lies within the Great Lakes-St. Lawrence Forest. In this, the transition zone between the southern Deciduous Forest and northern Boreal forest, coniferous species such as eastern white pine, red pine, eastern hemlock and white cedar, mix with deciduous species such as yellow birch, sugar and red maples, basswood, and red oak (MNR 2009).

Physiographically, the study area lies within the Nottawasaga Basin of the Simcoe Lowlands. The basin was once part of the floor of glacial Lake Algonquin. As a result, its surface beds are of deltaic and lacustrine origin. Locally, the study area forms part of Wasaga Beach, a sandy beach extending for six miles along Nottawasaga Bay and backed by sand dunes. These dunes were a barrier for a lagoon around Jack Lake during glacial Lake Nipissing times (Chapman & Putnam 1984:180). Soils in the study area consist of Perth Tioga loamy-sand, Minesing Marly Clay, Sargent Gravelly Sandy Loam, and Lovering Silty Clay Loam (Hoffman, Wicklund, and Richards 1962: North Soil Map).

4.0 Archaeological Potential

The archaeological potential of the study area was assessed using its soils, hydrology and landforms as considerations. Young et al. (1995) note that, "*either the number of streams and/or stream order is always a significant factor in the positive prediction of site presence*" (1995:23). They further note that certain types of landforms, such as moraines, seem to have been favoured by different groups throughout prehistory (Ibid:33). According to several researchers, such as Janusas (1988:1) "*The location of early settlements tended to be dominated by the proximity to reliable and potable water resources.*" Site potential modeling studies (Peters 1986; Pihl 1986) have found that most prehistoric archaeological sites are located within 300 metres of remnant or extant water sources.

While many of these studies do not go into detail as to the basis for this pattern, Young et al. (1995) suggest that the presence of streams is a significant attractor for a host of plant, game, and fish species which in turn encourage human settlement in an area. Conversely, it must be understood that non-habitational sites (eg. burials, lithic quarries, kill sites, etc.) may be located anywhere. Potential modeling appears to break down when it comes to these idiosyncratic sites, many of which have more significance than their habitational counterparts as a result of their relative rarity.

With the development of integrated 'complex' economies in the Historic (or Eur-Canadian) era, settlement tended to become less dependant upon local resource production and

more tied to wider economic networks. As such, proximity to transportation routes became the most significant predictor of site location. In the early Historic era (pre-1850), when transport by water was the norm, sites tended to be situated along major rivers and creeks - the 'highways' of their day. With the opening of the interior of the Province to settlement after about 1850, sites tended to be located along historically-surveyed roads.

Bearing these factors in mind, it is clear that the study area would, in its pristine state, have a high potential for containing pre-Contact sites; largely due to its proximity to the Nottawasaga River, a year-round potable and navigable water source. The study corridor's potential for Historic-era sites is similarly high, due to its proximity to the Nottawasaga River, and its proximity to the historic villages of Hythe and Van Vlack (see Section 6 and Figures 4a and 4b).

5.0 Previous Archaeological Research

An archival search was conducted using the Ontario Ministry of Culture Archaeological Sites Database in order to determine the presence of any registered archaeological sites which might be located on or within a one kilometre radius of the study area. It was found that 15 registered sites lay within these limits (see Table 1).

Table 1: Registered Archaeological Sites within 1 Kilometre of the Study Area

Borden No.	Site Name	Cultural Affiliation	Site Type
BcHa-18	Schoonertown	Historic, British/Canadian, Saugeen, Middle/Late Woodland	Naval depot, campsite
BcHa-20	Wasaga Beach 2	Saugeen, Middle Woodland	Campsite
BcHa-23	Blueberry Field	Saugeen, Middle Woodland	Campsite
BcHa-27	Hitching Post	Saugeen, Middle Woodland	Findspot
BcHa-32	Jacques Rousseau	Saugeen, Middle Woodland	Campsite
BcHa-33	Oxbow	Late Woodland	Findspot
BcHa-37	Racetrack	Saugeen, Middle Woodland	Campsite
BcHa-46	Blueberry Field 2	Undetermined Pre-Contact	Campsite
BcHa-49	Island View Crescent	Middle Woodland	Undetermined
BcHa-51	Oak-Lea	Middle Woodland	Campsite
BcHa-56	Fern Oaks	Iroquoian/Algonkian, Late Woodland	Campsite, Fishing
BdHa-1	Van Vlack	Undetermined Pre-Contact	Undetermined
BdHa-2	Second Street Burial	Undetermined	Burial
BdHa-3	H.M.S. Nancy	Historic, British	Sunken Schooner
BdHa-4	Sandpiper	Undetermined	Destroyed Site

Of these sites, none were found to be within the limits of the study area. However, there are two sites of historical importance close to the study area. BcHa-18, the Schoonertown Site, is

a multi-component site consisting of a middle to late Woodland period Saugeen campsite and a British-Canadian Naval Depot from the early 1800's. Approximately three-quarters of the site was destroyed by the construction of the Schoonertown Bridge, River Road West and nearby cottage developments. BdHa-3, the H.M.S. Nancy Site, is the location of the remains of a Royal Navy schooner that was sunk during the War of 1812. Both sites will be discussed further in the next section.

6.0 Historic Land Use Summary

The Pre-Contact Era

The first settlers in the region were the Paleo-Indian people who arrived after the retreat of the Wisconsin-period Glaciers, approximately 9,000 years B.C.. For the next 1,500 years or so, the Palaeo-Indians lived as hunter-gatherers in the boreal-like landscapes of southern Ontario. Because of the low biotic productivity of this environment, it is believed that human groups ranged over very wide territories in order to live sustainably (Ellis & Deller 1990:52). Traditionally, Palaeo-Indians have been conceptualized as 'big game hunters' who lived on caribou and other Pleistocene megafauna. However, given the poor preservation of these sites (which are mostly understood only from stone tools and debris from their manufacture), much about the lifeways of these people remains unknown (Ibid.:38). In general, the impacts that humans left on their environment at these time were small (less than 200 square metres), ephemeral, and fleeting (Ellis & Deller 1990:51).

Beginning around 8,000 B.C., the biotic productivity of the environment began to increase as the climate warmed and the area was colonized by deciduous forest. As a result, more opportunities arose for the exploitation of both animal and plant food sources. The resulting broad-based economy was the basis for the archaeological cultures that are referred to as 'Archaic'. During this period (roughly 8,000 B.C. – 800 B.C.) there was an explosion in the number and variety of raw materials, tool forms, site types, and the number of sites themselves. Because Archaic sites are more recent than Palaeo-Indian ones, preservation tends to be better. Artifacts composed of bone, shell, and even wood are not unheard of. During the late Archaic period, heavy wood-working tools appear, suggesting that people were building shelters or other objects, such as transportation aids (Ellis et al. 1990:66-67). It is clear from the toolkits that have been unearthed that Archaic peoples had an encyclopaedic understanding of the environment that they inhabited. The number and density of the sites that have been found suggest that the environment was exploited in a successful and sustainable way over a considerable period of time. The success of Archaic lifeways is attested to by clear evidence of steady population increases over time. Eventually, these increases set the stage for the final era of Pre-Contact occupation – the Woodland Period (Ellis et al. 1990:66-67).

The Woodland Period began around 800 B.C. and is characterized by the appearance of pottery. It is believed that hunting and gathering remained the primary subsistence strategy throughout the Early Woodland Period (800 B.C. – 0 A.D.) and well into the Middle Woodland Period (0 A.D. - 500 A.D.) (Spence et al. 1990:167). However, at the Middle to Late Woodland transition, (ca. 400 A.D.) the first rudimentary evidence of maize (corn) horticulture appears. The Grand Banks site, near Cayuga, Ontario, has yielded the earliest evidence of maize horticulture in northeastern North America (Warrick 2000:427).

During the Late Woodland Period (roughly 1,000 A.D. to 1,650 A.D.) maize horticulture allowed for population increases which in turn lead to larger settlement sizes, higher population density, and increased social complexity among the peoples involved. Beginning around 1000 A.D., early Iroquoian peoples were living in small villages comprised of a number of longhouses, producing pottery with decorated incised rims, and using pipes to smoke tobacco. Essentially, the lifeways that were observed by the first Europeans to venture into the area were in place by this time. By A.D. 1450, it is possible to differentiate between the archaeologically-represented groups that would become the Huron and the Neutral of the early Contact period (Ibid.:446). Amongst the Huron, village sizes swelled to as much as 5 hectares, with longhouses sometimes reaching 75 metres in length (Ramsden 1990:378).

Intriguingly, it has been suggested that the size of these villages, along with the necessary croplands to sustain them, may have had some enduring impacts on the landscapes that surrounded them. In particular, there has been a correlation postulated between Pre-Contact era corn fields and modern stands of white pine (Janusas 1987:75). While the studies involved have been far from comprehensive, the notion that depleted corn fields may have taken some time to recover their fertility, and that the natural succession of plants growing on them would be affected, seems logical.

The Contact Period

The first European to venture into what would become Ontario was Etienne Brulé, who was sent by Samuel de Champlain to visit the area and learn the language and customs of the First Nations there. Champlain himself made two trips to Ontario, first in 1613 and later from 1615 to 1616 (Gervais 2004:182). The First Nations encountered by Champlain included the Huron (or Wendat as they called themselves), the Petun (sometimes called the Tobacco Nation), and the Anishnabeg (Algonquin-speaking) group known as the Odawa (or Ottawas). The Huron were concentrated in Simcoe County just northeast of the project lands, while the Petun and Odawa appear to have occupied the lands in Grey County just west of the study area. It is to be expected that all three groups passed through the Wasaga Beach region while using the Nottawasaga River as a transportation route (Fox 1990).

Within 50 years, tensions created by the Fur Trade overflowed into open hostility between the Wendat (Huron) Nation and the League of the Haudenosaunee from New York State (now referred to as the Six Nations Iroquois, though the League contained only Five Nations at this time). By 1650, the Wendat (Huron) had been largely dispersed from their homeland; though remnants of that people remain in Quebec, Michigan, and the southern United States. Many were probably adopted into the nations of the League of the Iroquois (Ramsden 1990:384). At the same time the Petun seem to disappear from history while the Odawa appear to have been pushed north and west to join with neighbouring, and probably related, Anishnabeg peoples.

Eventually, the land tenure vacuum that was created by the dispersal of the Wendat and Neutral Nations allowed Algonkian-speaking Anishnabeg peoples to migrate to southern Ontario by about AD 1700. Europeans called these people the "Mississaugas", mistaking the name of a single clan (the *Ma-se-sau-gee*) for that of the entire group (Smith 2002:107). At this time, Haudensaunee settlements appear to have contracted back into New York state, possibly due to tensions between the League and their Anishnabeg neighbours (Warrick 2005:1).

The Historic Era

Throughout the 1700's and early 1800's, the Mississaugas hunted, fished, gardened and camped in southern Ontario, but the footprint left by these people on the landscape they inhabited was exceedingly light. Archaeological sites dating to this time period are both rare and difficult to detect (Warrick 2005:1). Following the American War of Independence, United Empire Loyalists (UEL's) began to flood into Canada. Settlement was seen as a way of entrenching the British position in Canada and compensating the UEL's for their service in the war. To accomplish this, land was needed. Accordingly, a series of treaties were negotiated with the Mississaugas in which they were eventually dispossessed of more than 2.5 million acres of land in Ontario (Smith 2002:109.).

The area around Wasaga Beach made its first direct appearance in recorded history during the War of 1812. The *H.M.S. Nancy* was a British schooner built at Fort Detroit in 1789. It was built for the fur trade, where it carried goods in exchange for furs. During the War of 1812, it operated as a transport ship, carrying troops and supplies throughout the Great Lakes. In 1813, the *Nancy* was the only British ship remaining in the Upper Great Lakes, as the others had been destroyed. American ships found the *Nancy* hiding at the mouth of the Nottawasaga River. In the battle that ensued, the ship was burned to the waterline. Eventually, silt and sand built up around the hull forming a small island. The remains of the vessel were found by F.J. Conboy in 1925, and the hull was raised in 1928. The Nancy Museum was created that same year (FNIWBP 2009).

Due to the strategic location of the Nottawasaga River, a fort was established along its banks in 1816. It was intended to be the chief military establishment on Lake Huron, although it

only lasted for two years. The site chosen was about four miles from the mouth of the river, in a location known to have been used as a campsite by local First Nations. The facility was dubbed Fort Nottawasaga, or Schoonertown. It was known to be situated adjacent to the existing Schoonertown Bridge. The fort was constructed of logs and artificially-elevated earthworks and was manned by approximately twenty soldiers garrisoned under the command of a Lieutenant Caldwell (Morrison 1997:16). In 1818, the British moved their military establishment to Penetanguishene (Watson 2009). This marked the end of Schoonertown.

The sandy soil of Wasaga made this land unattractive to farmers. The first survey of the area was carried out in the 1820s by John Goessman in Flos Township. In 1826, land in the area was being sold for as little as four shillings an acre. Sunnidale Township was first surveyed in 1833 by William Hawkins. Actual settlement in the area did not begin until much later in the 19th Century (Belden 1890: 17).

While land in the area was unsuitable for farming, it did yield an abundance of trees. The logging industry started in the area in the 1830s, and would continue for the remainder of the century. The Nottawasaga River served as a natural route for timbers to be transported to lumber mills. In 1844, after a number of failures, a plan was conceived to construct a railway to connect Toronto to Georgian Bay. Construction of the first leg connecting Toronto and Barrie began in 1851. In 1852, multiple routes to Georgian Bay were surveyed, two of which led to the mouth of the Nottawasaga River. Plans for a town, to be known as Hythe, were made as the area prepared for the development that the railway would bring. However, the railway went to Collingwood instead, probably due to the superior harbour at that location (FNIWBP 2009). As a result, Hythe was not formally created (Watson 2009).

The area remained a place for small scale fishing and logging through the decades. In 1870, John Van Vlack purchased 69 acres near the Nottawasaga River in Flos Township (Watson 2009). He fished commercially and built a shingles mill. He also operated a general store and became the first postmaster. A small village known as Van Vlack, populated by mill workers and other settlers, grew up around his property. Agricultural development began at the fringes of the region in the 1880s and by 1896 seventy people lived at Van Vlack (FNIWBP 2009).

In Belden's **Simcoe Supplement in Illustrated Atlas of the Dominion of Canada** (1881) (see Figures 4a and 4b), no owners at all were listed on the properties. However, this may reflect the fact that gazetteers and atlas-makers usually only included entries for those landowners who purchased subscriptions to their publications.

It was around this time that the first use of the name *Wasaga Beach* appeared. During the dividing of lots in Sunnidale Township, one of the subdivisions was named Wasaga Beach. It took time for the name to catch on. Throughout the 1890's the area was simply known as the Beach (Watson 2009). The first cottage lots in the area were surveyed in 1907. From then to the 1920's, Wasaga Beach developed into a cottage community. This accelerated with the advent of

the automobile which made the beach one of the most popular resorts in Ontario. Wasaga Beach became a police village in 1940 and was incorporated as a village in 1949. In 1966, the village expanded by annexing Oakview Beach in Sunnidale Township. In 1973, the Town of Wasaga Beach, with expanded boundaries into Sunnidale, Flos, and Nottwasaga Townships, was created by an act of the Ontario Legislature (Elmvale Lance: 1974).

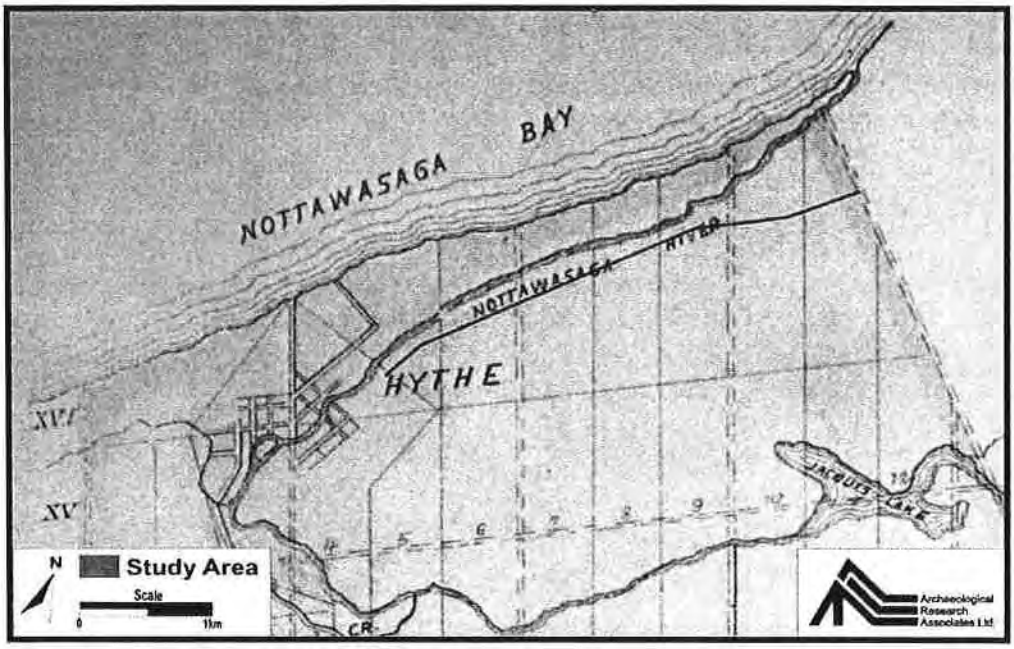

Figure 4a: Belden's 1881 Map of Sunnidale Township Showing the Study Area

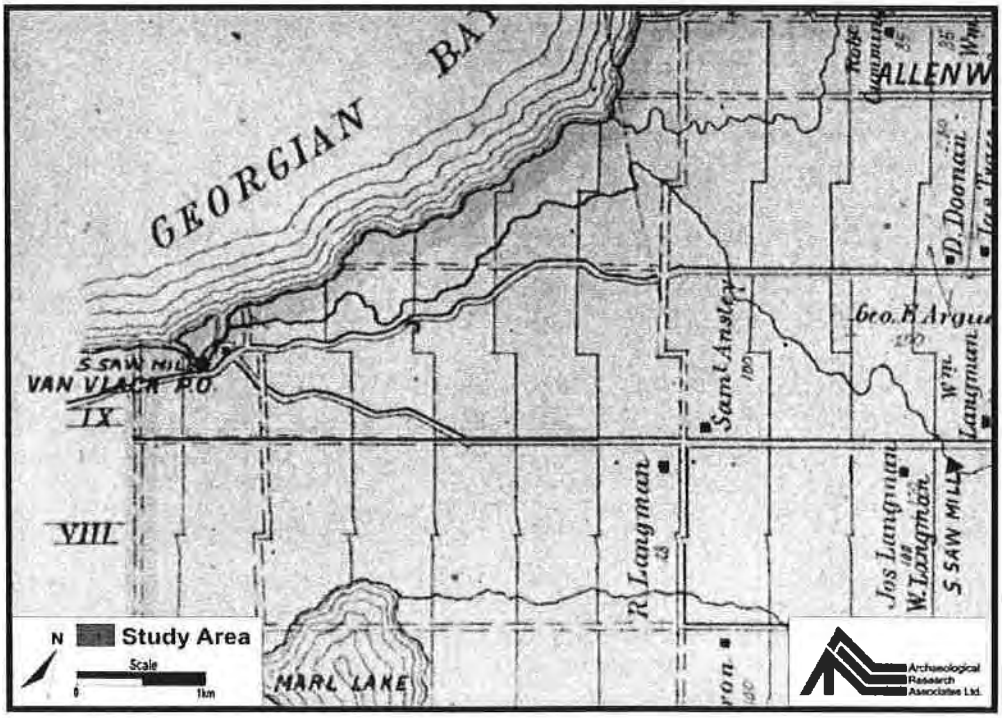

Figure 4b: Belden's 1881 Map of Flos Township Showing the Study Area

7.0 Results and Recommendations

The Stage 1 archaeological assessment of the proposed River Road West urbanization was conducted in July of 2009. While no registered archaeological sites were found within the limits of study area, it is clear that the project lands may have significant archaeological potential. The extent to which that potential has been destroyed by urbanization is unclear. Accordingly, it is recommended that a full Stage 2 archaeological assessment be conducted on all areas to be impacted (either directly or indirectly) by the project.

This report is filed with the Minister of Culture in compliance with Section 65 (1) of the Ontario Heritage Act. The ministry reviews reports to ensure that the licensee has met the terms and conditions of the licence and archaeological resources have been identified and documented according to the standards and guidelines set by the ministry, ensuring the conservation, protection and preservation of the heritage of Ontario. It is recommended that development not proceed before receiving confirmation that the Ministry of Culture has entered the report into the provincial register of reports.

Should previously unknown or un-assessed deeply buried archaeological resources be uncovered during development, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The Proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the Ontario Heritage Act.

Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. All work in the vicinity of the discovery will be suspended immediately. Other government staff may be contacted as appropriate; however, media contact should not be made in regard to the discovery.

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APPENDIX I

Noise Impact Assessment

CLASS ENVIRONMENTAL NOISE IMPACT ASSESSMENT
PROPOSED RIVER ROAD WEST EXPANSION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
TOWN OF WASAGA BEACH

FOR

AINLEY GROUP ASSOCIATES

PREPARED BY

TOBIN COOPER, C.E.T.

CHECKED BY

JOHN E. COULTER, B.A. Sc., P. ENG.

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SEPTEMBER 14, 2009

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1.0 INTRODUCTION

At the request of the Town of Wasaga Beach through Ainley Group Engineers, J. E. Coulter Associates Limited has assessed the anticipated noise impact of the possible improvements to River Road West from Brillinger Drive to Eastern Town Limits, an approximately 7.9km stretch of road (see Appendix A for figures). This study uses the Ministry of Transportation and the Ministry of the Environment protocol as the basis for the noise analysis (Appendix A, Reference 4).

2.0 CRITERIA

In evaluating noise impact, the requirement is to compare the sound levels with and without the "project" at a time 10 years after project completion (2021). The protocol has stipulated that mitigation be considered when the increment in sound levels between the proposed future condition and the future do-nothing condition (based on a 10-year traffic forecast after completion of project) is 5 dB or greater at the affected noise-sensitive receivers. Increases in the sound level of less than 5 dB are considered low, and impacts of less than 3 dB are considered insignificant.

For reference purposes, a 3 dB increase is considered the lower limit of reliably-detected, long term changes in sound. It represents about a 30% increase in overall loudness. A 5 dB increase represents a 50% increase in loudness and a 10 dB increase represents a doubling of loudness.

The following table summarizes the various level of noise impact.

TABLE 1 - NOISE IMPACT DESCRIPTORS

Noise Impact Description	Sound level Increment
Minor Noise Impact	1 to 2 dB
Low Noise Impact	3 to 4 dB
Moderate Noise Impact	5 to 9 dB
Significant Noise Impact	10 dB or more

Traffic increases of 3:1 are required to cause a 5 dB increment in sound levels, all other factors being equal. Changes in alignment, both vertical and horizontal, can also cause changes to the sound levels.

3.0 ROAD TRAFFIC

The following table provides projected current and future AADT (Average Annual Daily Traffic) volumes for various sections of River Road West between Brillinger Drive to Eastern Town Limits (data supplied by Ainley Group Engineering). Correspondence from the Town of Wasaga Beach indicates that the roadway is currently near its maximum AADT capacity of approximately 15,000 vehicles per day. This 15,000 vehicle capacity will be the basis of comparison between "possible project" and "no project" conditions.

TABLE 2 - ROAD TRAFFIC PROJECTIONS

	LAKESHORE ROAD			
	Between Oxbow Park Dr. to Powerline Rd.	Powerline Rd. to Main Street	Main Street to Bell's Park Road	Bell's Park Road to Town Limit
2009 AADT (Recent conditions - No Project)	11,900	9,550	8,000	7,000
2011 AADT (no project)	13,139	10,544	8,833	7,729
2011 AADT (After project completion)	15,275	12,650	12,125	10,350
2021 AADT (10-years without project)	15,275	15,000	15,000	15,000
2021 AADT (10-years after project completion)	25,200	23,200	22,400	19,600
Speed limit (km/h)	50	50	50	70
Truck Percentage	6%	6%	6%	6%

Notes:

1. AADT is Average Annual Daily Traffic volume.
2. For future Yr. 2011 and 2021 no-widening scenario; this is the "null project" condition. The Traffic volumes have been provided by the Town of Wasaga Beach
3. The medium/heavy truck split is assumed to be 50/50.
4. 2011 and 2021 traffic volumes with project completion are provided by Ainley Group on August 13, 2009

4.0 EXISTING CONDITIONS

River Road is presently a 2-lane roadway. The stretch of River Road involved in this study includes mostly residential land uses with portions of parkland and some industrial lands. For the purposes of this study, the noise-sensitive areas are comprised of residential uses exclusively.

All along the route houses are located on both sides of the roadway. The setbacks of the residences are typically set back between 15m to a maximum of 73m from the Centerline of River

Road West. There are a few residential structures that are 10m from the centerline between Brock Street and Cedargrove Drive. Along the study area, there are a number of non residential structures (garages) that are also as close as 10m from the centre line of the roadway. These non-residential structures will not be assessed in this noise report.

5.0 PROJECT DESCRIPTION

The basic scenario for the potential road improvements is a 4-lane configuration (two eastbound and two westbound), with the centreline of the potential widening remaining at its approximate location and not changing for the most part from its current position. The R-O-W is also being reconfigured to incorporate eastbound and westbound on street bike lanes, as well as turning lanes.

6.0 PREDICTED SOUND LEVELS

6.1 Future Traffic Sound Levels

The MOE's *ORNAMENT* noise prediction procedure (*STAMSON version 5.03* computer programme) was used to predict the traffic sound levels. *STAMSON 5.03* uses the daily traffic volumes for the road and basic topographical information for the site in its calculations (see Appendix B). This assessment is based upon drawings and aerial photographs by Ainley Group Engineering, dated May 2009.

Table 3 summarizes the comparison of the sound levels for both proposed and no-improvement or "null" road conditions based on the traffic data in Table 2 for years 2011 and 2021. The future traffic volume on River Road West for the "null" condition assumes the current traffic volumes are projected at a rate of 2.0% to 2011 and 2021.

TABLE 3 - NOISE IMPACT SUMMARY Oxbow Park to Powerline Road						
RECEPTOR	DAYTIME SOUND LEVEL (dB L_{eq})					
	NO PROJECT (Year 2011)	WITH PROJECT (Year 2011)	Noise Impact	NO PROJECT (Year 2021)	WITH PROJECT (Year 2021)	Noise Impact
R1	64.0	65.0	+1.0dB	65.0	67.2	+2 dB

Notes:
1. All sound levels are given in dB L_{eq}.
2. The receiver height is 1.5 m above the grade level at daytime at the building facade.
3. R1 - Receptor is located at the Southeast corner of Glen Eton Road and River Road.

TABLE 4 - NOISE IMPACT SUMMARY Powerline Road to Main Street						
RECEPTORS	DAYTIME SOUND LEVEL (dB L_{eq})					
	NO PROJECT (Year 2011)	WITH PROJECT (Year 2011)	Noise Impact	NO PROJECT (Year 2021)	WITH PROJECT (Year 2021)	Noise Impact
R2	64.0	64.0	+2.0dB	65.0	67.0	+2.0dB

Notes:
1. All sound levels are given in dB L_{eq}.
2. The receiver height is 1.5 m above the grade level at daytime at the building facade.
3. R2 - Southeast corner of Indianola and River Road

TABLE 5 - NOISE IMPACT SUMMARY Main Street to Bell's Park Road						
RECEPTORS	DAYTIME SOUND LEVEL (dB L_{eq})					
	NO PROJECT (Year 2011)	WITH PROJECT (Year 2011)	Noise Impact	NO PROJECT (Year 2021)	WITH PROJECT (Year 2021)	Noise Impact
R3	60.0	62.0	+2.0dB	63.0	64.0	+1.0dB

Notes:
1. All sound levels are given in dB L_{eq}.
2. The receiver height is 1.5 m above the grade level at daytime at the building facade.
3. R3 - 222m South of River Road

TABLE 6 - NOISE IMPACT SUMMARY Bell's Park Road to Town Limit						
RECEPTORS	DAYTIME SOUND LEVEL (dB L_{eq})					
	NO PROJECT (Year 2011)	WITH PROJECT (Year 2011)	Noise Impact	NO PROJECT (Year 2021)	WITH PROJECT (Year 2021)	Noise Impact
R4	62.0	62.0	0.0	64.0	65.0	+1.0dB

Notes:
1. All sound levels are given in dB L_{eq}
2. The receiver height is 1.5 m above the grade level at daytime at the building facade.
3. R4 - Southwest corner of Vigo Road and River Road

6.2 Construction Noise

A review of the project indicated that there are no sections of this roadway construction that will require vibratory compaction or piling. These two operations usually represent the greatest roadway construction noise impact. As neither of these activities will be necessary for the potential road widening, we anticipate a low to moderate impact on the surrounding residences from grinding and paving, pavement breaking and skiving. It is suggested that construction activity be limited to between the hours of 7am to 7pm Monday to Saturday and 7am to 5pm on Sunday and as allowed by the Town of Wasaga Beach in the noise bylaw (By Law-No. 81-7 Sections 2 and 2.1).

7.0 ANALYSIS

The net sound level increments at each receptor, as shown in Table 3 above, have been calculated on the basis of future "null project" and "with project" conditions. The relative traffic volume increase due to the project in place will account for a maximum 2.0 dB increase in the sound levels. This increase is considered to be a minor, resulting in an insignificant noise impact at the points of reception.

8.0 SUMMARY AND CONCLUSIONS

For the year 2011 or the year 2021, in the case of future "project proceeding", the net increase in the sound levels will be approximately 2dB from Oxbow Park Drive to The Town Limit. The potential increment in sound levels attributable to implementation of the project is thus insignificant, and mitigative measures (i.e., acoustic barriers) are not required to satisfy MTO/MOE protocol as the implementation of the project does not increase the sound level by 5 dB or more.

fjcc

APPENDIX A - FIGURES

FIGURE #1

KEY PLAN

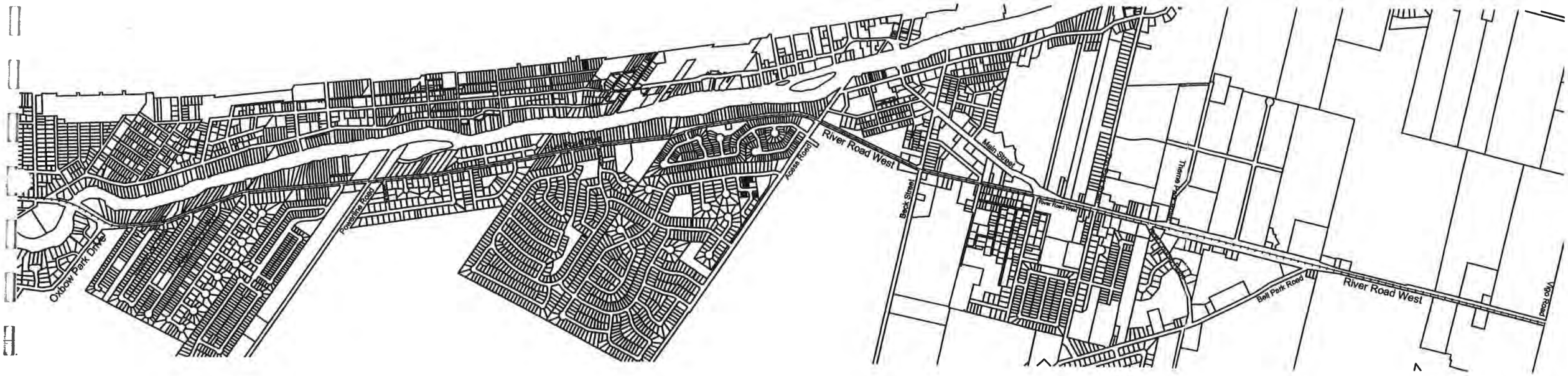


FIGURE #2
SITE PLAN

RIVER ROAD WEST

STA. 0+640

STA. 0+940

PC = 0+759.63

PT = 0+829.99

0+680

0+720

0+760

0+800

0+840

0+880

0+920

INNISBROOK DRIVE

MATCH LINE

STA. 0+940

STA. 1+240

RECEPTOR 1

0+960

1+000

1+040

1+080

1+120

1+160

1+200

PC = 1+196.40

RIVERDALE DRIVE

GLENN ETON ROAD

MATCH LINE

FIGURE #3A
RECEPTOR LOCATION

RIVER ROAD WEST

STA. 2+440

PAULINE DRIVE

STA. 2+740

RECEPTOR 2

2+480

2+520

2+560

2+600

2+640

2+680

2+720

MATCH LINE

CARIBBEAN DRIVE

INDIANOLA DRIVE

MATCH LINE

STA. 2+740

OCALA DRIVE

STA. 3+040

2+760

2+800

2+840

2+880

2+920

2+960

3+000

MATCH LINE

OAK DELL AVENUE

FIGURE #3B

RECEPTOR LOCATION

RIVER ROAD WEST

STA. 6+040

STA. 6+340

6+080

6+120

6+160

6+200

6+240

6+280

6+320

MATCH LINE

RECEPTOR 3

GOLF COURSE ROAD

MATCH LINE

STA. 6+340

THEME PARK DRIVE

STA. 6+640

6+360

6+400

6+440

6+480

6+520

6+560

6+600

MATCH LINE

FIGURE #3C
RECEPTOR LOCATION

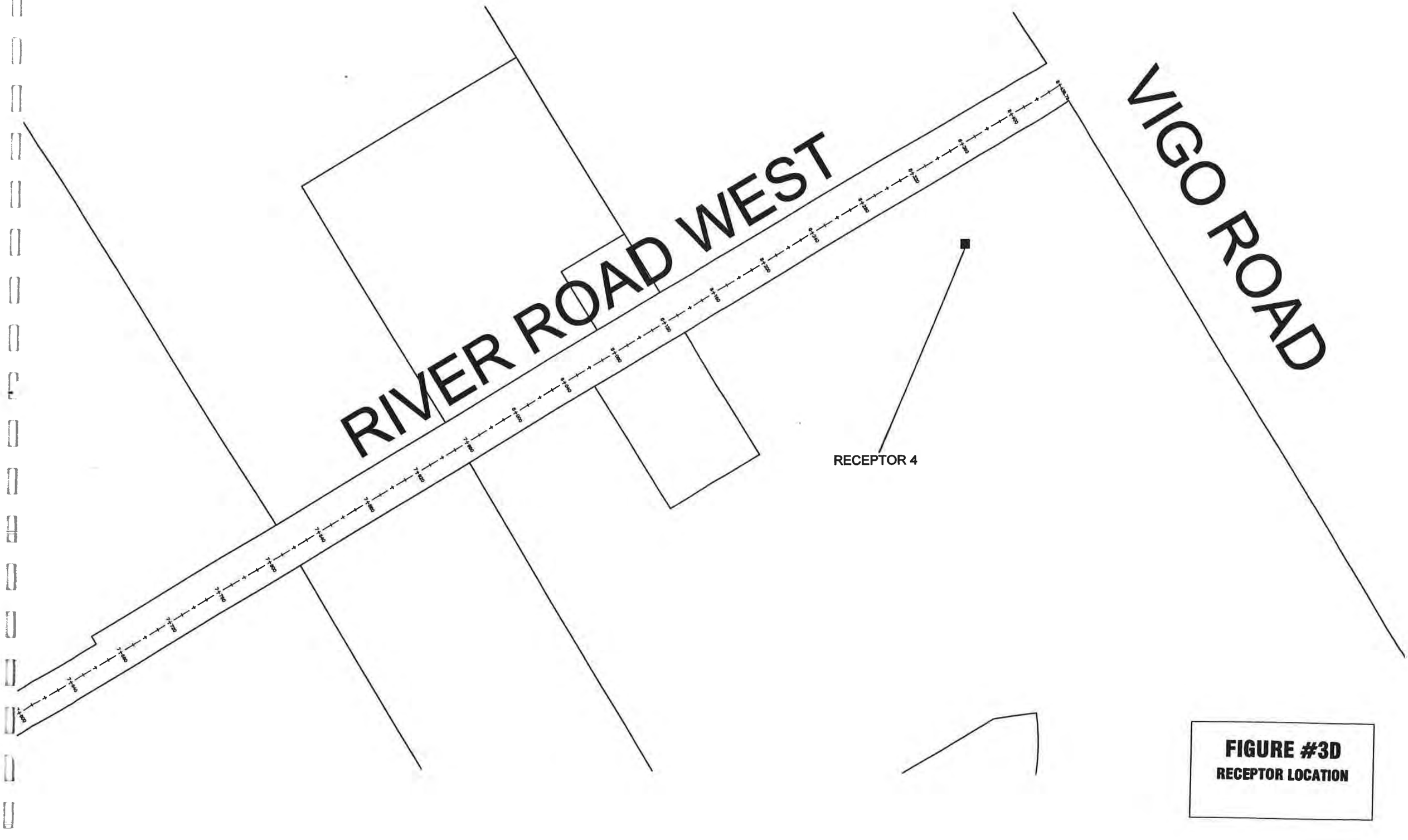


FIGURE #3D
RECEPTOR LOCATION

ACTUAL AND ESTIMATED TRAFFIC VOLUMES

SECTIONS OF RIVER ROAD WEST	ACTUAL AADT		PROJECTED AADT			
	1999	2006	2011	2016	2021	2026
From Oxbow Park Dr to Powerline Rd	9300	11900	15275	19750	25200	32200
From Powerline Rd to Main Street	6750	9550	12650	18200	23200	29600
From Main Street to Bell's Park Rd	6375	8000	12125	17550	22400	28600
From Bell's Park Rd to Town Limit	6000	7000	10350	15375	19600	25000

APPENDIX B - SOUND LEVEL CALCULATIONS

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 22:41:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: obpk11.te Time Period: Day/Night 16/8 hours
Description: Receptor 1 - 2011 No Project

Road data, segment # 1: River Rd. W (day/night)

Car traffic volume	: 10067/1119	veh/TimePeriod *
Medium truck volume	: 321/36	veh/TimePeriod *
Heavy truck volume	: 321/36	veh/TimePeriod *
Posted speed limit	: 50	km/h
Road gradient	: 0	%
Road pavement	: 1	(Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	11900
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: River Rd. W (day/night)

Angle1 Angle2	:	-90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	16.00 / 87.00	m
Receiver height	:	1.50 / 4.50	m
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: River Rd. W (day)

Source height = 1.32 m

ROAD (0.00 + 63.56 + 0.00) = 63.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.48	0.00	-0.47	-1.46	0.00	0.00	0.00	63.56

Segment Leq : 63.56 dBA

Total Leq All Segments: 63.56 dBA

Results segment # 1: River Rd. W (night)

Source height = 1.32 m

ROAD (0.00 + 45.64 + 0.00) = 45.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	58.98	0.00	-12.03	-1.31	0.00	0.00	0.00	45.64

Segment Leq : 45.64 dBA

Total Leq All Segments: 45.64 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.56
(NIGHT): 45.64

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 22:51:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: mstbls11.te Time Period: Day/Night 16/8 hours
Description: Receptor 3 - 2011 No Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume : 7473/830 veh/TimePeriod *
Medium truck volume : 238/26 veh/TimePeriod *
Heavy truck volume : 238/26 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 8833
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 3.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 21.32 / 87.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 60.20 + 0.00) = 60.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	64.19	0.00	-2.53	-1.46	0.00	0.00	0.00	60.20

Segment Leq : 60.20 dBA

Total Leq All Segments: 60.20 dBA

Results segment # 1: River Road W (night)

Source height = 1.31 m

ROAD (0.00 + 44.26 + 0.00) = 44.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	57.60	0.00	-12.03	-1.31	0.00	0.00	0.00	44.26

Segment Leq : 44.26 dBA

Total Leq All Segments: 44.26 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.20
(NIGHT): 44.26

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 22:52:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: blstwn11.te Time Period: Day/Night 16/8 hours
Description: Receptor 4 - 2011 No Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume	:	9667/1074	veh/TimePeriod *
Medium truck volume	:	309/34	veh/TimePeriod *
Heavy truck volume	:	309/34	veh/TimePeriod *
Posted speed limit	:	70 km/h	
Road gradient	:	0 %	
Road pavement	:	1 (Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	10350
Percentage of Annual Growth	:	2.00
Number of Years of Growth	:	5.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2	:	-90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	30.00 / 87.00	m
Receiver height	:	1.50 / 4.50	m
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 61.84 + 0.00) = 61.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.30	0.00	-5.00	-1.46	0.00	0.00	0.00	61.84

Segment Leq : 61.84 dBA

Total Leq All Segments: 61.84 dBA

Results segment # 1: River Road W (night)

Source height = 1.31 m

ROAD (0.00 + 48.40 + 0.00) = 48.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	61.74	0.00	-12.03	-1.31	0.00	0.00	0.00	48.40

Segment Leq : 48.40 dBA

Total Leq All Segments: 48.40 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.84
(NIGHT): 48.40

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 23:01:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: obpk21.te Time Period: Day/Night 16/8 hours
Description: Receptor 1 - 2021 No Project

Road data, segment # 1: 14th Avenue (day/night)

Car traffic volume	: 12690/1410	veh/TimePeriod *
Medium truck volume	: 405/45	veh/TimePeriod *
Heavy truck volume	: 405/45	veh/TimePeriod *
Posted speed limit	: 50 km/h	
Road gradient	: 0 %	
Road pavement	: 1 (Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	: 15000
Percentage of Annual Growth	: 2.00
Number of Years of Growth	: 0.00
Medium Truck % of Total Volume	: 3.00
Heavy Truck % of Total Volume	: 3.00
Day (16 hrs) % of Total Volume	: 90.00

Data for Segment # 1: 14th Avenue (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 15.00 / 87.00	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: 14th Avenue (day)

Source height = 1.32 m

ROAD (0.00 + 65.04 + 0.00) = 65.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	66.49	0.00	0.00	-1.46	0.00	0.00	0.00	65.04

Segment Leq : 65.04 dBA

Total Leq All Segments: 65.04 dBA

Results segment # 1: 14th Avenue (night)

Source height = 1.32 m

ROAD (0.00 + 46.62 + 0.00) = 46.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	59.96	0.00	-12.03	-1.31	0.00	0.00	0.00	46.62

Segment Leq : 46.62 dBA

Total Leq All Segments: 46.62 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.04
(NIGHT): 46.62

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 23:00:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: mstbls21.te Time Period: Day/Night 16/8 hours
Description: Receptor 3 - 2021 No Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume	: 12690/1410	veh/TimePeriod	*
Medium truck volume	: 405/45	veh/TimePeriod	*
Heavy truck volume	: 405/45	veh/TimePeriod	*
Posted speed limit	: 50	km/h	
Road gradient	: 0	%	
Road pavement	: 1	(Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	15000
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	15.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg	
Wood depth	: 0	(No woods.)	
No of house rows	: 0 / 0		
Surface	: 1	(Absorptive ground surface)	
Receiver source distance	: 21.32 / 87.00	m	
Receiver height	: 1.50 / 4.50	m	
Topography	: 1	(Flat/gentle slope; no barrier)	
Reference angle	: 0.00		

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 62.50 + 0.00) = 62.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	66.49	0.00	-2.53	-1.46	0.00	0.00	0.00	62.50

Segment Leq : 62.50 dBA

Total Leq All Segments: 62.50 dBA

Results segment # 1: River Road W (night)

Source height = 1.32 m

ROAD (0.00 + 46.62 + 0.00) = 46.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	59.96	0.00	-12.03	-1.31	0.00	0.00	0.00	46.62

Segment Leq : 46.62 dBA

Total Leq All Segments: 46.62 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.50
(NIGHT): 46.62

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 22:59:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: blstwn21.te Time Period: Day/Night 16/8 hours
Description: Receptor 4 - 2021 No Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume	: 17079/1898	veh/TimePeriod	*
Medium truck volume	: 545/61	veh/TimePeriod	*
Heavy truck volume	: 545/61	veh/TimePeriod	*
Posted speed limit	: 70	km/h	
Road gradient	: 0	%	
Road pavement	: 1	(Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	15000
Percentage of Annual Growth	:	2.00
Number of Years of Growth	:	15.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg	
Wood depth	: 0	(No woods.)	
No of house rows	: 0 / 0		
Surface	: 1	(Absorptive ground surface)	
Receiver source distance	: 30.00 / 40.00	m	
Receiver height	: 1.50 / 4.50	m	
Topography	: 1	(Flat/gentle slope; no barrier)	
Reference angle	: 0.00		

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 64.31 + 0.00) = 64.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.76	0.00	-5.00	-1.46	0.00	0.00	0.00	64.31

Segment Leq : 64.31 dBA

Total Leq All Segments: 64.31 dBA

Results segment # 1: River Road W (night)

Source height = 1.32 m

ROAD (0.00 + 56.23 + 0.00) = 56.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	64.25	0.00	-6.71	-1.31	0.00	0.00	0.00	56.23

Segment Leq : 56.23 dBA

Total Leq All Segments: 56.23 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.31
(NIGHT): 56.23

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 22:53:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: obpk11.te Time Period: Day/Night 16/8 hours
Description: Receptor 1 - 2011 With Project

Road data, segment # 1: 14th Avenue (day/night)

Car traffic volume : 13549/1505 veh/TimePeriod
Medium truck volume : 432/48 veh/TimePeriod
Heavy truck volume : 432/48 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: 14th Avenue (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 87.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: 14th Avenue (day)

Source height = 1.32 m

ROAD (0.00 + 65.32 + 0.00) = 65.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	66.77	0.00	0.00	-1.46	0.00	0.00	0.00	65.32

Segment Leq : 65.32 dBA

Total Leq All Segments: 65.32 dBA

Results segment # 1: 14th Avenue (night)

Source height = 1.32 m

ROAD (0.00 + 46.90 + 0.00) = 46.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	60.24	0.00	-12.03	-1.31	0.00	0.00	0.00	46.90

Segment Leq : 46.90 dBA

Total Leq All Segments: 46.90 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.32
(NIGHT): 46.90

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 22:54:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: mstbls09.te Time Period: Day/Night 16/8 hours
Description: Receptor 3 - 2011 With Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume : 10258/1140 veh/TimePeriod *
Medium truck volume : 327/36 veh/TimePeriod *
Heavy truck volume : 327/36 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 12125
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 3.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 21.32 / 16.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 61.57 + 0.00) = 61.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.57	0.00	-2.53	-1.46	0.00	0.00	0.00	61.57

Segment Leq : 61.57 dBA

Total Leq All Segments: 61.57 dBA

Results segment # 1: River Road W (night)

Source height = 1.31 m

ROAD (0.00 + 57.25 + 0.00) = 57.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	59.00	0.00	-0.44	-1.31	0.00	0.00	0.00	57.25

Segment Leq : 57.25 dBA

Total Leq All Segments: 57.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.57
(NIGHT): 57.25

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 22:55:20
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: blstwn11.te Time Period: Day/Night 16/8 hours
Description: Receptor 4 - 2011 With Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume	:	8756/973	veh/TimePeriod *
Medium truck volume	:	279/31	veh/TimePeriod *
Heavy truck volume	:	279/31	veh/TimePeriod *
Posted speed limit	:	70	km/h
Road gradient	:	0	%
Road pavement	:	1	(Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	10350
Percentage of Annual Growth	:	2.00
Number of Years of Growth	:	0.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2	:	-90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	30.00 / 87.00	m
Receiver height	:	1.50 / 4.50	m
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 61.40 + 0.00) = 61.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.86	0.00	-5.00	-1.46	0.00	0.00	0.00	61.40

Segment Leq : 61.40 dBA

Total Leq All Segments: 61.40 dBA

Results segment # 1: River Road W (night)

Source height = 1.32 m

ROAD (0.00 + 47.99 + 0.00) = 47.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	61.33	0.00	-12.03	-1.31	0.00	0.00	0.00	47.99

Segment Leq : 47.99 dBA

Total Leq All Segments: 47.99 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.40
(NIGHT): 47.99

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 23:02:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: obpk21.te Time Period: Day/Night 16/8 hours
Description: Receptor 1 - 2021 With Project

Road data, segment # 1: 14th Avenue (day/night)

Car traffic volume	: 21319/2369	veh/TimePeriod *
Medium truck volume	: 680/76	veh/TimePeriod *
Heavy truck volume	: 680/76	veh/TimePeriod *
Posted speed limit	: 50	km/h
Road gradient	: 0	%
Road pavement	: 1	(Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	25200
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	-5.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: 14th Avenue (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 15.00 / 87.00	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: 14th Avenue (day)

Source height = 1.32 m

ROAD (0.00 + 67.29 + 0.00) = 67.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.74	0.00	0.00	-1.46	0.00	0.00	0.00	67.29

Segment Leq : 67.29 dBA

Total Leq All Segments: 67.29 dBA

Results segment # 1: 14th Avenue (night)

Source height = 1.32 m

ROAD (0.00 + 48.89 + 0.00) = 48.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	62.23	0.00	-12.03	-1.31	0.00	0.00	0.00	48.89

Segment Leq : 48.89 dBA

Total Leq All Segments: 48.89 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.29
(NIGHT): 48.89

STAMSON 5.0 NORMAL REPORT Date: 14-09-2009 23:04:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: plmst21.te Time Period: Day/Night 16/8 hours
Description: Receptor 2 - 2021 With Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume	: 19627/2181	veh/TimePeriod *
Medium truck volume	: 626/70	veh/TimePeriod *
Heavy truck volume	: 626/70	veh/TimePeriod *
Posted speed limit	: 50	km/h
Road gradient	: 0	%
Road pavement	: 1	(Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	23200
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2	:	-90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	15.00 / 87.00	m
Receiver height	:	1.50 / 4.50	m
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 66.93 + 0.00) = 66.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.38	0.00	0.00	-1.46	0.00	0.00	0.00	66.93

Segment Leq : 66.93 dBA

Total Leq All Segments: 66.93 dBA

Results segment # 1: River Road W (night)

Source height = 1.32 m

ROAD (0.00 + 48.53 + 0.00) = 48.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	61.87	0.00	-12.03	-1.31	0.00	0.00	0.00	48.53

Segment Leq : 48.53 dBA

Total Leq All Segments: 48.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.93
(NIGHT): 48.53

STAMSON 5.0 NORMAL REPORT Date: 15-09-2009 12:06:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: mstbls21.te Time Period: Day/Night 16/8 hours
Description: Receptor 4 - 2021 With Project

Road data, segment # 1: River Road W (day/night)

Car traffic volume	: 18950/2106	veh/TimePeriod *
Medium truck volume	: 605/67	veh/TimePeriod *
Heavy truck volume	: 605/67	veh/TimePeriod *
Posted speed limit	: 50	km/h
Road gradient	: 0	%
Road pavement	: 1	(Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	22400
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
Medium Truck % of Total Volume	:	3.00
Heavy Truck % of Total Volume	:	3.00
Day (16 hrs) % of Total Volume	:	90.00

Data for Segment # 1: River Road W (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 21.32 / 87.00	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: River Road W (day)

Source height = 1.32 m

ROAD (0.00 + 64.24 + 0.00) = 64.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	68.24	0.00	-2.53	-1.46	0.00	0.00	0.00	64.24

Segment Leq : 64.24 dBA

Total Leq All Segments: 64.24 dBA

Results segment # 1: River Road W (night)

Source height = 1.32 m

ROAD (0.00 + 48.35 + 0.00) = 48.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	61.69	0.00	-12.03	-1.31	0.00	0.00	0.00	48.35

Segment Leq : 48.35 dBA

Total Leq All Segments: 48.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.24
(NIGHT): 48.35

APPENDIX C - DEFINITIONS AND GLOSSARY OF TERMS

1 dB CHANGE

For sounds presented to a listener, one immediately following the other, a 1 dB change is the smallest increment which can be reliably detected by most people. If the time delay between presentation of the sounds is more than a few seconds, the change is not reliably detected (i.e. the community is not sensitive to a 1 dB change occurring over 1 year's time). In environmental noise, a 1 dB change occurs with an increase in traffic of 25%.

3 dB CHANGE

An increase in the L_{eq} of 3 dB is reliably detected by most listeners, and is the smallest change considered significant by most planning authorities. It is the smallest change in the overall L_{eq} (all sounds combined) which can be reliably detected by standard noise monitoring techniques. A doubling of traffic in a community will cause a 3 dB change, if traffic is the only major noise source.

5 dB CHANGE

An increase in the overall L_{eq} of 5 dB represents a relatively significant impact in terms of overall L_{eq}, particularly if an area is already at or above daytime L_{eq} of 55.

10 dB CHANGE

A 10 dB increase in overall L_{eq} represents a doubling in the loudness of the sound, and represents a major impact on an urban community especially if the levels are already above 50 L_{eq}.

L_{eq}

L_{eq} is the sound pressure level averaged over the measurement period. It can be considered as the continuous steady sound pressure level which would have the same total acoustic energy as the real fluctuating noise over the same time period.

APPENDIX D - REFERENCES

1. Ministry of the Environment, "Model Municipal Noise Control By-Law, Final Report", August, 1978.

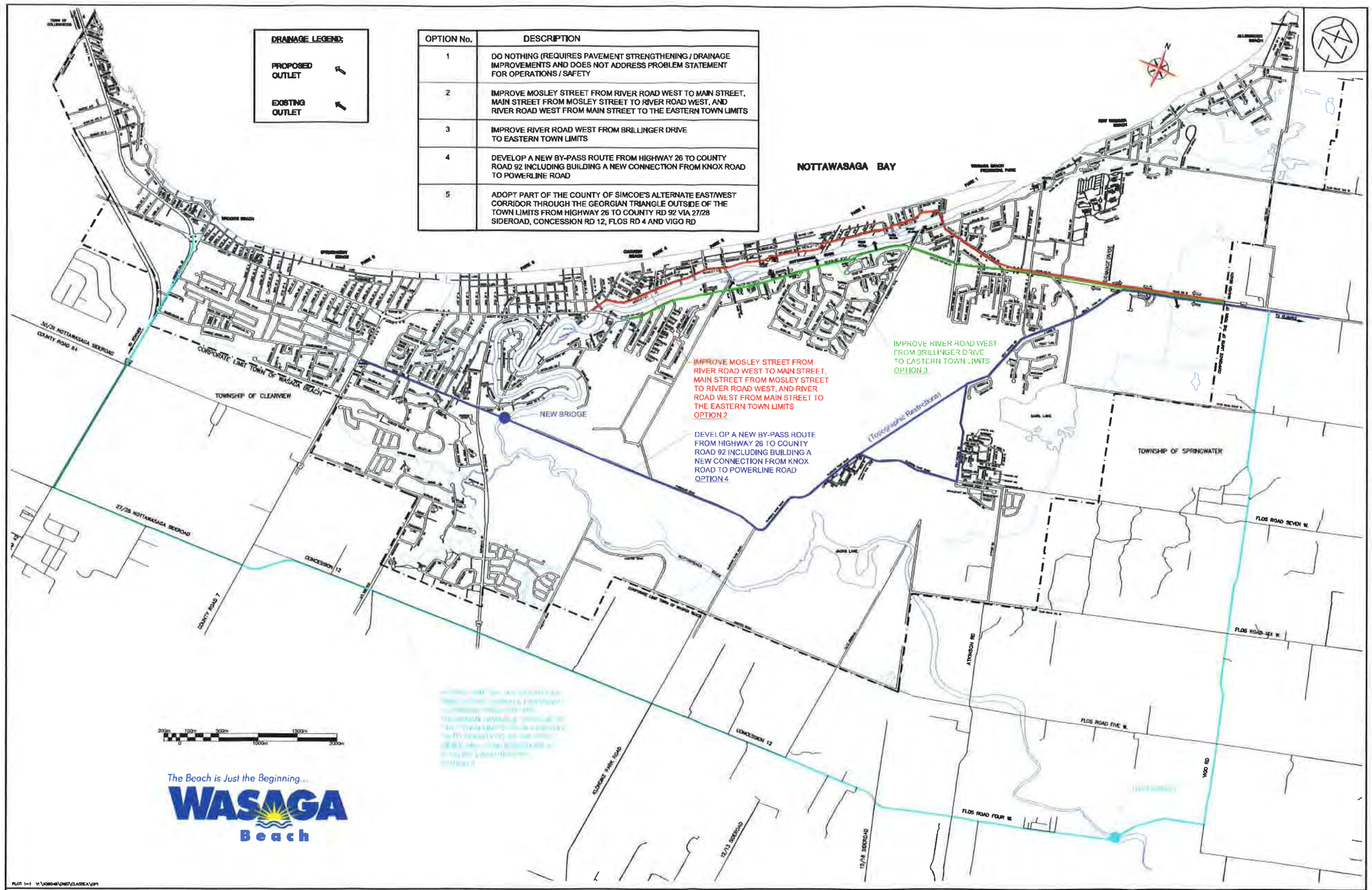
2. Ontario Ministry of the Environment, Environmental Approvals and Land Use Planning Branch, "Guidelines For Road Traffic Noise Assessment", July 1986.

3. Ministry of the Environment's *STAMSON* Computer Programme (Version 5.03).

4. Ministry of Transportation, "Environmental Office Manual- Technical Areas - Noise EO-V-1000-00 Sec 9.3.2.1.4 and 9.3.2.1.5", May, 1992.

APPENDIX J

Drawing No. 109049-OP1



NOTES

NO.	REVISIONS	DATE	INITIAL

Not Valid Unless Signed And Dated

PRELIMINARY

CAUTION: The information contained in this drawing is solely for the intended recipient. Any copying, distribution or use by others without the express written consent of Ainley & Associates Limited, is prohibited. The recipient is responsible for confirming the accuracy and completeness of the information with the originator.

SCALE: AS SHOWN (APPROX.)
DESIGN:
DRAWN: M.E.M.
CHECKED:
DATE: OCT. 2006

TOWN OF WASAGA BEACH
RIVER ROAD WEST
CLASS ENVIRONMENTAL ASSESSMENT

OVERALL PLAN

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No. | DWG. 109049-OP1

APPENDIX K

Cost Estimate for Alternative Options

Option	Description	Total Cost ($)
Option #1	Do Nothing (Requires pavement strengthening/drainage improvements, and does not address problem statement for operations/safety)	$15,903,000.00
Option #2	Improve Mosley St. from River Road West to Main St., Main St. from Mosley St. to River Road West, and River Road West from Main St. to Eastern Town Limits	$25,709,512.00
Option #3	Improve River Road West from Brillinger to Eastern Town Limits	$27,095,400.00
Option#4	Develop a new by-pass route from hwy 26 to county road 92 including building a new connection from Knox Rd to Powerline Rd (actual construction cost to 45th)	$46,406,104.00

Notes & Assumptions:

1 Unit prices for new road lanes, and roadway reconstruction are based on benchmark costs from Mosley Street Urban Renewal Phase II

2 Unit price for bridge widening comes from MTO documented benchmark costs = $1880/m2. This price includes all works associated to the bridge construction excluding Paving and Electrical works.

3 All prices have been adjusted to 2009 dollars.

4 Prices do not include property purchase costs.

5 Prices include estimate of utility relocation costs.

Improve Mosley St. from River Road West to Main St., Main St. from Mosley St. to River Road West, and River Road West from Main St. to Eastern Town Limits

	Distance(Km)/ Bridge Area(m2)	# Ln	Unit Price/km/Ln ($) / Unit Price/m2($)	Total Construction Value ($)	plus 5.00% for EA, Detailed Design Engineering, Approvals ($)
New lanes	7.64	2	$550,000.00	$8,404,000.00	
Reconstruction	7.64	2	$750,000.00	$11,460,000.00	
Bridge Widening (one lane)	605	1	$1,880.00	$1,137,400.00	
Total				$21,001,400.00	$22,681,512.00

Improve River Road West from Brillinger to Eastern Town Limits

	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)	plus 5.00% for EA, Detailed Design Engineering, Approvals ($)
New lanes	7.75	2	$550,000.00	$8,525,000.00	
Reconstruction	7.75	2	$750,000.00	$11,625,000.00	
Total				$20,150,000.00	$21,762,000.00

Hydro pole relocation

	# of poles	Unit Price/pole relocation	Total
Option #2	150	$10,000.00	$1,500,000.00
Option #3	250	$12,500.00	$3,125,000.00

Note:

1 # of poles is the total poles within the right-of-way for entire length of road being considered

Ainley

River Road West Municipal Class EA
Brillinger Drive to Eastern Town Limits
Phase 2 Opinion of Cost

AAL # 109049
Page # 1
Printed On 29/10/2009 10:29

Gas Main Relocation

	Distance(Km)	Unit Price/Km	Total
Option #2	7.64	$150,000.00	$1,146,000.00
Option #3	7.75	$150,000.00	$1,162,500.00
Option #4	11.042	$150,000.00	$1,656,300.00

Bell Line Relocation

	Distance(Km)	Unit Price/Km	Total
Option #2	7.64	$50,000.00	$382,000.00
Option #3	7.75	$50,000.00	$387,500.00
Option #4	11.042	$50,000.00	$552,100.00

Develop a new by-pass route from hwy 26 to county road 92 including building a new connection from Knox Rd to Powerline Rd

	Distance(Km)/ Bridge Area(m2)	# Ln	Unit Price/km/Ln ($) / Unit Price/m2($)	Total Construction Value ($)	plus 5.00% for EA, Detailed Design Engineering, Approvals ($)
New lanes	2.386	4	$550,000.00	$5,249,200.00	
New lanes	11.042	2	$550,000.00	$12,146,200.00	
Reconstruction	11.042	2	$750,000.00	$16,563,000.00	
New Bridge	3705	4	$1,880.00	$6,965,400.00	
Total				$40,923,800.00	$44,197,704.00

Hydro pole relocation

	Distance(Km) (10 poles per Km)	Unit Price/Km	Total
Option #4	11.042	$100,000.00	$1,104,200.00

Do Nothing (Requires pavement strengthening/drainage improvements, and does not address problem statement for operations/safety)

	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)	plus 5.00% for EA, Detailed Design Engineering, Approvals ($)
New lanes	7.75	2	$950,000.00	$14,725,000.00	
Total				$14,725,000.00	$15,903,000.00

APPENDIX L

Evaluation of Alternative Options

Category	Criteria	Option 1 – Do Nothing	Option 2 – Improve Mosley Street	Option 3
Natural Environment	Watercourses /Fisheries	No impacts to fisheries	One watercourse crosses River Road West between Bell's Park Road and the eastern Town limits and directly supports fishery	One watercours between Bell's limits and direc
	Terrestrial Vegetation and Wildlife	No impacts to terrestrial vegetation and wildlife	Potential impact to minimal amount of vegetation due to a possible widening No known ANSI life science and ANSI earth science lands within the area No known wildlife resources within the area	Potential impac due to a possibl Potential impac science lands, A provincially sig Potential to imp sensitive specie
Socio-Economic Environment	Social Impacts to Residents and Businesses	No impact	Higher potential to negatively impact the existing residential area fronting onto the section of Mosley Street	High potential t residential area
	Social Impacts at Social Features	No impact	High potential to negatively impact the small Town environment of Wasaga Beach given this alternative is within the core area of the Town	High potential t Town environm school and libra
	Noise Impacts	No impact	Insignificant increase in noise	Insignificant inc
	Archaeological and Heritage	No impact	No registered archaeological sites found within the study limits	No registered ar the study limits
	Capital Cost	Minimal capital cost	Medium	Medium
	Operating Cost	No additional operating cost	Medium additional operating cost	Medium additio
Technical	Construction, Design, Land Ownership	No construction required	Insufficient right-of-way is provided (right-of-ways on several sections of the road are in the order of 9 to 15 meters) Right-of-way acquisition would be difficult and costly	A minimum of 2 Right-of-ways or in the range of 3
	Impacts on Existing Utilities	No impact	Existing utilities would likely need to be relocated The entire study area is serviced with Municipal water distribution and wastewater collection/treatment systems	Existing utilities Most of the stud water distributio collection/treatm Bell's Park Road
	Operational	Long term vehicular demands cannot be accommodated	Long term vehicular demands may be accommodated, if traffic volumes on River Road West could be diverted to Mosley Street High increase in left turn volumes at the intersections of Mosley Street/River Road West, River Road West/Main Street, Mosley Street/18th Street North, Mosley Street/Old Mosley Street	Long term vehic accommodated No increase in l option

APPENDIX M

Phase 2 PIC # 1

TOWN OF Wasaga Beach

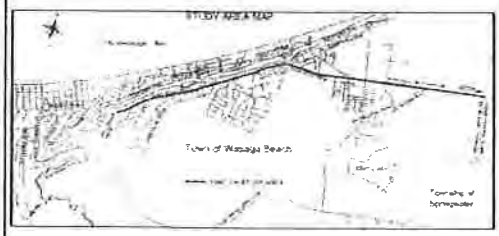
www.wasagabeach.com

NOTICE

Town of Wasaga Beach River Road West Urbanization from Brillinger Drive to Eastern Town Limits Class Environmental Assessment

Notice of Public Information Centre

Further to the Notice of Study Commencement issued May 27, 2009 the Town of Wasaga Beach is continuing to improve efficiency, enhance safety and address drainage and pavement structure deficiencies in the area of River Road West from Brillinger Drive to eastern Town limits. The Study Area is shown on the map provided below.



Five Options (including Do Nothing) have been identified and evaluated. The Options are presented follows:

tion 1 – Do Nothing

- Option 2 – Improve Mosley Street from River Road West to Main Street Main Street from Mosley Street to River Road West and River Road West from Main Street to the Eastern Town Limits
- Option 3 – Improve River Road West From Brillinger Drive to the Eastern Town Limits
- Option 4 – Develop A New By-Pass Route From Highway 26 to County Road 92 Including Building a New Connection from Knox Road to Powerline Road
- Option 5 – Adopt Part of the County of Simcoe's Alternate East/West Corridor Through the Georgian Triangle Outside of the Town from Highway 26 to County Road 92 via 27/28 Nottawasaga Sideroad Concession Road 12 Flos Road 4 and Vigo Road

The Phase 2 Recommended Solution is Option 3. This Project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public information centre is planned to provide further information to the public on the Recommended Solution and to receive input and comment from interested persons. In addition to addressing road capacity, safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town is intending to incorporate recommendations outlined in the Town's Active Transportation Plan Study. This will identify and possibly plan for the integration of active transportation components such as pedestrian, bicycle and public transit.

Public Information Centre

Time: Open House 7:00 pm to 9:00 pm
Date: Thursday October 29, 2009
Location: Wasaga Rec Plex – 1724 Mosley St

Public input and comment on the Recommended Solution will be incorporated into the planning process. Comments will be received until November 13, 2009. A future Public Information Centre will be held to present design options for the recommended solution. A Notice will be issued prior to the future PIC date.

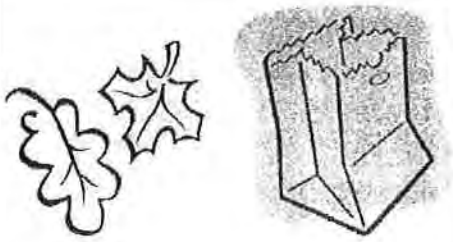
If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Consultant undertaking the study.

This notice issued October 14, 2009

Mr. Jim McIntosh
Director of Public Works
30 Lewis Street
Wasaga Beach, Ontario, L9Z 1A1
Tel: (705) 429-2540
Fax: (705) 429-8226
Email: publicworksdirector@wasagabeach.com

Mr. Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario, L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: neumann@ainleygroup.com/ program

NOTICE



FALL LEAF & YARD WASTE COLLECTION

To ensure your leaves are collected, please have them placed out at the roadside on Monday, November 2nd, 2009. The material must be in kraft paper yard waste bags, unwaxed cardboard boxes, or any rigid open top container.

ACCEPTED MATERIALS

- Plant material
- Leaves
- Grass
- Pumpkins
- Straw bales
- Cornstalks

NOTICES

"2010 Dog Tags"

TAKE NOTICE THAT By-law 2002-03 requires that all dogs within the Town of Wasaga Beach be licenced by FEBRUARY 15th of each calendar year. Any dog licenced after February 15th will be subject to an additional $5.00 fine. The dog tag fees prior to February 15th are as follows:

Spayed/Neutered Dog
$15.00
Non-spayed/Non-neutered Dog
$20.00
Senior Citizen Rate
$10.00/first dog
Full fee/second dog

After February 15th
ADD $5.00 to all tag prices

A copy of your Rabies Vaccination Certificate must be provided when purchasing a dog tag.

By-law 2002-03 further restricts the number of dogs per property to no more than TWO.

Dog tags may be obtained by attending the
By-law and Licencing Department at the Town Office,
30 Lewis Street, Wasaga Beach, Ontario
between 8:30 am and 4:30 pm, Monday through Friday.

WINTER PARKING

Town of Wasaga Beach Parking By-Law #2005-17

Please remember that the Highway Traffice Act and Town of Wasaga Beach By-Laws prohibit the following:

-No Person shall park a vehicle between the hours of 1:00am and 7:00am during the period from November 1 to April 1

-No Person shall park a vehicle in such a manner as to interfere with the clearing of snow

Any vehicle found to be in contravention of the By-Law may be issued a Parking Ticket and towed away at the owner's expense

In addition, the municipality or its employees will not be responsible for any damage done to vehicles parked on Town Road Allowances by the Town's snow removal or sand forces.

Enforcement will commence on November 1, 1009

Your co-operation in this matter is most appreciated
Municipal Law Enforcement Department

WATCH!

Watch this space each week for everything you need to know from the Town of Wasaga Beach

429-3844 MUNICIPAL OFFICES

Administration • 429-3844
Building • 429-1120
By-Law Office & Animal Control • 429-2511
Chamber of Commerce • 429-2247
Planning • 429-3847
Community Development • 429-3847
Community Policing • 429-7369
Fire • 429-5281
Hydro • 429-2517
Library • 429-5481
Parks/Arena Facilities • 429-0412
Public Works • 429-2540
Recreation • 429-3321

Ainley CONSULTING ENGINEERS PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

October 8, 2009

File No. 109049

«Title» «First_Name» «Last_Name», «Title1»
«Agency»
«Address»
«Town», «Postal_Code»

Ref: **Town of Wasaga Beach**
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Public Information Centre

Dear «Title» «Last_Name»:

Further to the Notice of Study Commencement for the above-mentioned Class EA, a copy of which was sent to you in May 2009, the Town of Wasaga Beach is continuing to document a Class EA planning process to improve efficiency, enhance safety, address drainage and pavement structure deficiencies in the area of River Road West from Brillinger Drive to the eastern Town limits. Please see the attached copy of a Notice of Public Information Centre, which will appear in the local newspaper on October 14 and October 21, 2009.

Please contact the undersigned if you have any comments or questions with respect to this Notice.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.

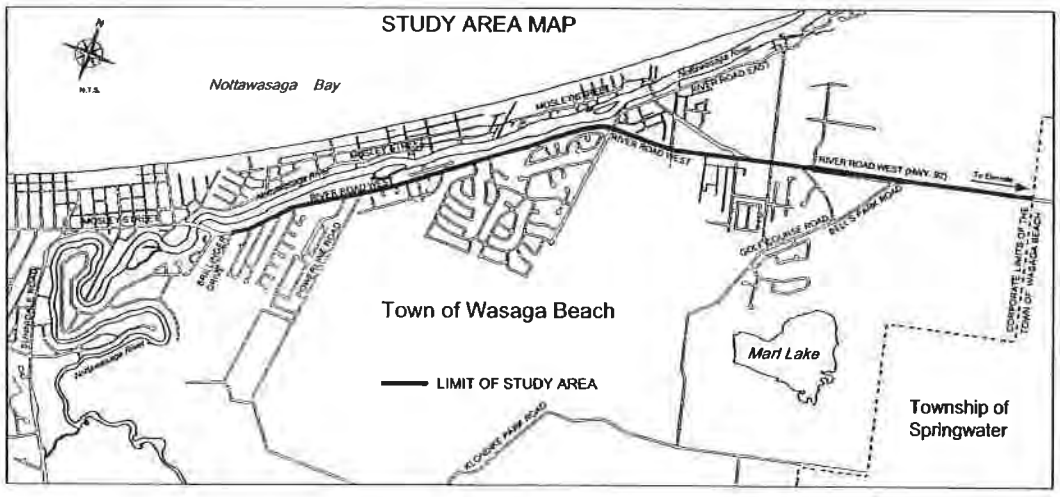
cc: Jim McIntosh, Director of Public Works

T:\109049\109049-Lilly\Correspondence\Letter\review agencies Oct 2009.doc

TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

Further to the Notice of Study Commencement issued May 27, 2009, the Town of Wasaga Beach is continuing to improve efficiency, enhance safety and address drainage and pavement structure deficiencies in the area of River Road West from Brillinger Drive to eastern Town limits. The Study Area is shown on the map provided below.



Five Options (including Do Nothing) have been identified and evaluated. The Options are presented follows:

- Option 1 – Do Nothing
- Option 2 – Improve Mosley Street from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the Eastern Town Limits
- Option 3 – Improve River Road West From Brillinger Drive to the Eastern Town Limits
- Option 4 – Develop A New By-Pass Route From Highway 26 to County Road 92 Including Building a New Connection from Knox Road to Powerline Road

- Option 5 – Adopt Part of the County of Simcoe's Alternate East/West Corridor Through the Georgian Triangle Outside of the Town from Highway 26 to County Road 92 via 27/28 Nottawasaga Sideroad, Concession Road 12, Flos Road 4 and Vigo Road

The Phase 2 Recommended Solution is Option 3. This Project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public information centre is planned to provide further information to the public on the Recommended Solution and to receive input and comment from interested persons. In addition to addressing road capacity, safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town is intending to incorporate recommendations outlined in the Town's Active Transportation Plan Study. This will identify and possibly plan for the integration of active transportation components such as pedestrian, bicycle and public transit.

Public Information Centre

Time:	Open House: 7:00 pm to 9:00 pm
Date:	Thursday October 29, 2009
Location:	Wasaga Rec Plex – 1724 Mosley St.

Public input and comment on the Recommended Solution will be incorporated into the planning process. Comments will be received until November 13, 2009. A future Public Information Centre will be held to present design options for the recommended solution. A Notice will be issued prior to the future PIC date.

If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Consultant undertaking the study.

This notice issued October 14, 2009.

Mr. Jim McIntosh
Director of Public Works
30 Lewis Street
Wasaga Beach, Ontario
L9Z 1A1
Tel: (705) 429-2540
Fax: (705) 429-8226
Email: publicworksdirector@wasagabeach.com

Mr. Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: neumann@ainleygroup.com

RIVER ROAD WEST
CLASS EA
COMMUNICATION LIST

Title	First Nam	Last Name	Title	Agency	Address	Town	Postal Code
Mr.	George	Vadeboncoeur	CAO	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Ray	Kelso	Manager of Planning & Development	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Jim	McIntosh	Director of Public Works	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Mike	McWilliam	Fire Chief	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Wayne	Wilson	CAO	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Glenn	Switzer	Director of Engineering	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Ms.	Petti	Young	Senior Planner	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Graham	Findlay	Area Biologist	Ministry of Natural Resources	2284 Nursery Road	Midhurst, ON	L0L 1X0
Mr.	John	Fisher	Park Superintendent	Wasaga Beach Provincial Park (MNR)	11-22nd Street, North	Wasaga Beach, ON	L9Z 2V9
Mr.	Chris	Hyde	District Manager	Ministry of the Environment	54 Cedar Pointe Drive, Unit 1203	Barrie, ON	L4N 5R7
Ms.	Chunmei	Liu	Environmental Assessment and Planning Coor	Ministry of the Environment	5775 Yonge Street, 8th Floor	North York, ON	M2M 4J1
Mr.	Winston	Wong	Heritage Planner	Ministry of Culture	400 University Aven. 4th Floor	Toronto, ON	M7A 2R9
				Ministry of Labour	400 University Aven.	Toronto, ON	M7A 1T7
Mr.	Paul	Trace	Manager Planning & Technical Services	Wasaga Distribution	950 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Colin	Bonnell	Manager Access Network	Bell Canada	2nd Fl. 136 Bayfield Street	Barrie, ON	L4M 3B1
Mr.	Bernie	Cyr	System Planner	Rogers Cable Systems	1 Sperling Dr., Box 8500	Barrie, ON	L4M 6B8
Ms.	Diedre	Broude	Manager	Enbridge Gas	500 Consumers Rd.	North York, ON	M2J 1P8
Mr.	Luke	Cechetto	Const. (Existing Dev.)	Enbridge Gas	10 Churchill Drive	Barrie, ON	L4N 8Z6
Const.	Mark	Kinney	Community Policing Officer	Ontario Provincial Police	1000 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Wayne	White		Ontario Clean Water Agency	100 Woodland Drive	Wasaga Beach, ON	L9Z 2V4
Mr.	Martin	Rukavina	Advisor	Ministry of Aboriginal Affairs	160 Bloor Street, 9th Floor	Toronto, ON	M7A 2E6
	C.	O'Meara	Bayfield Institute	Dept. of Fisheries & Oceans	867 Lakeshore Road, Box 5050	Burlington, ON	L7R 4A6
	Environment Unit		Re: Environmental Assessment Coordination	Indian & Northern Affairs Canada	25 St. Clair Ave., E., 8th Floor	Toronto, ON	M4T 1M2
			Administrative Office	Chiefs of Ontario	111 Peter Street, Suite 804	Toronto, ON	M5V 2H1
				Metis Nation of Ontario	500 Old St. Patrick St., Unit 3	Ottawa, ON	K1N 9G4
			Trebla Building	Assembly of First Nations	473 Albert St., Suite 810	Ottawa, ON	K1R 5B4
Mr.	Dave	Simpson		Mississaugas of Alderville First Nation	P.O. Box 4	Roseneath, ON	K0K 2X0
			Cedar Point Post Office	Chippewas of Beausoliel First Nation		via Penetanguishene,	L0K 1P0
				Beausoleil First Nation	1 Ogema Street	Christian Island, ON	L0K 1C0
	Karry	Sandy	Barrister/Solicitor, and Coordinator	Williams Treaty First Nations	8 Creswick Court	Barrie, ON	L4M 2J7
				Chippewas of Georgina Island	RR#2, Box 12	Sutton West, ON	L0E 1R0
				Chippewas of Nawash Unceded First Nation	R.R. 5	Wiarton, ON	N0H 2T0
				Moose Deer Point First Nation	P.O. Box 119	Mactier, ON	P0C 1H0
				Mnjikaning First Nation	5884 Rama Road, Suite 200	Rama, ON	L0K 1T0
Ms.	Kelly	LaRocca	Councillor	Mississaugas of Scugog	RR#5, 22521 Island Road	Port Perry, ON	L9L 1B6
				Saugeen First Nation	Highway 21, R.R. #1	Southampton, ON	N0H 2L0
				Curve Lake First Nation	Curve Lake Post Office	Curve Lake, ON	K0L 1R0
				Wahta Mohawk	P.O. Box 327	Bala, ON	P0C 1A0
				Upper Mohawk First Nation c/o Six Nations of t	P.O. Box 5000	Ohsweken, ON	N0A 1MO
Ms.	Wanda	McGonigle		Ojibways of Hiawatha First Nation	RR#2	Keene, ON	K0L 2G0
Mrs.	Heather	Bastien		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Mr.	Luc	Lainé		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Chief	Kris	Nahrgang		Kawartha Nishnawbe First Nation	R.R.#4, General Delivery	Burleigh Falls, ON	K0L 2H0
Chief	Bryan	LaForme		Mississaugas of the New Credit	2789 Mississauga Road, RR#6	Hagersville, ON	N0A 1H0
Mr.	Paul	Racher		Archaeological Research Associates Ltd.	4262 Watson Rd., R.R. #1	Puslinch, ON	N0B 2J0

RIVER ROAD WEST
CLASS EA
COMMUNICATION LIST

Mr.	John	Coulter		J.E.Coulter & Associates	1210 Sheppard Aven.E., Suite 211	North York, ON	M2K 1E3
Mr.	Yurij	Pelech	Senior Planner	EMC Group Limited	7577 Keele Street, Suite 200	Concord, ON	L4K 4X4
Mr.	Jeff	Mark		Mark Engineering	250 Bristol Road	Newmarket, ON	L3Y 7X7

Lilly Chen

From: Mike Neumann [neumann@ainleygroup.com]
Sent: October 23, 2009 9:46 AM
To: Jim McIntosh; Kevin Lalonde; Lilly Chen
Subject: FW: TOWN OF WASAGA BEACH, RIVER RD W URBANIZATION FROM BRILLINGER DR TO EASTERN TOWN LIMITS, CLASS ENVIRONMENTAL ASSESSMENT - EGD #72458

Response from Enbridge below.

Regards,

Mike Neumann, P Eng
Vice-President, Transportation Engineering

Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

neumann@ainleygroup.com
phone (705) 445-3451 ext.145
fax (705) 445-0968
cell (705) 443-1721
www.ainleygroup.com

-----Original Message-----
From: Mike Neumann [mailto:neumann@ainleygroup.com]
Sent: October 23, 2009 9:44 AM
To: Jamie Delaney
Subject: RE: TOWN OF WASAGA BEACH, RIVER RD W URBANIZATION FROM BRILLINGER DR TO EASTERN TOWN LIMITS, CLASS ENVIRONMENTAL ASSESSMENT - EGD #72458

Hi Jamie

Thank you for your response. You are correct about the preliminary nature of the project. We are undertaking the environmental assessment of the work prior to detail design. As part of the project, one of the criteria to consider for planning purposes is cost. We normally carry bench mark costs to complete the evaluations. Can you please provide us with a bench mark cost/m to permit us to complete a pair wise comparison of the options ? We always clearly state that bench mark costs are preliminary and subject to refinement during detail design. We will make our own assumptions of possible conflicts of the options. If you could send something as early as today that would be greatly appreciated since the public meeting for the project is being held next Thursday.

Regards,

Mike Neumann, P.Eng
Vice-President, Transportation Engineering

Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

neumann@ainleygroup.com
phone (705) 445-3451 ext.145
fax (705) 445-0968
cell (705) 443-1721
www.ainleygroup.com

-----Original Message-----
From: Jamie Delaney [mailto:Jamie.Delaney@enbridge.com]
Sent: October 23, 2009 9:27 AM
To: neumann@ainleygroup.com
Subject: Fw: TOWN OF WASAGA BEACH, RIVER RD W URBANIZATION FROM BRILLINGER DR TO EASTERN TOWN LIMITS, CLASS ENVIRONMENTAL ASSESSMENT - EGD #72458

Thank you for your letter informing us of your future planned work Enbridge has buried plant in numerous locations throughout your planned work area Currently the scope of your project is too general to determine if a conflict exists During the engineering design of your project please send us copies of your plans per normal procedure so we may review.

Kind Regards,

Jamie Delaney
Distribution Planning
Enbridge Gas Distribution Inc
500 Consumers Road
4th Floor - Post A2 - VPC
North York, ON
M2J 1P8
Tel# 416-495-6321
866-326-2924
Fax# 416-758-4373
jamie.delaney@enbridge.com

Lilly Chen, M.Sc., P. Eng

From: neumann@ainleygroup com
Sent: November 6, 2009 3:18 PM
To: Jim McIntosh; Kevin Lalonde
Cc: Lilly Chen; Paul Racher
Subject: Fw: River Road West Urbanization from Brillinger Dr to Eastern Town Limits Class EA Wasaga Beach

Fyi

Sent wirelessly from my BlackBerry device on the Bell network
Envoyé sans fil par mon terminal mobile BlackBerry sur le réseau de Bell.

From: "Cifuentes, Alejandro (MCL)" <Alejandro.Cifuentes@ontario.ca>
Date: Fri, 6 Nov 2009 10:13:58 -0500
To: <neumann@ainleygroup.com>
Subject: RE: River Road West Urbanization from Brillinger Dr to Eastern Town Limits Class EA Wasaga Beach

Hello Mike,

Thank you for the information provided. I will make the adequate updates to this file.

Regards,

Alejandro Cifuentes
Heritage Planner
Ministry of Culture
Programs and Services Branch - Culture Services Unit
400 University Avenue, 4th Floor
Toronto, Ontario M7A 2R9
T 416-314-7159
F 416-212-1802
Alejandro.Cifuentes@ontario.ca

From: Mike Neumann [mailto:neumann@ainleygroup.com]
Sent: October 30, 2009 7:03 PM
To: Cifuentes, Alejandro (MCL)
Cc: Paul Racher; publicworksdirector@wasagabeach.com; Kevin Lalonde; Lilly Chen
Subject: RE: River Road West Urbanization from Brillinger Dr to Eastern Town Limits Class EA Wasaga Beach

Hi Alejandro

Thank you for your response to our project notice. Please note that as part of the EA, we engaged the services of an Archaeologist – Archaeological Research Associates Ltd. The Archaeological project director is Paul Racher. They have filed a copy of the Archaeology Report for this project with your Ministry under their license number P007, P007-200-2009. I have copied Paul with this message should you wish to discuss the project with him.

Regards,

Mike Neumann, P.Eng
Vice-President, Transportation Engineering

Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

neumann@ainleygroup.com
phone (705) 445-3451 ext 145
fax (705) 445-0968
cell (705) 443-1721
www.ainleygroup com

-----Original Message-----
From: Cifuentes, Alejandro (MCL) [mailto:Alejandro.Cifuentes@ontario.ca]
Sent: October 30, 2009 1:20 PM
To: neumann@ainleygroup.com
Cc: publicworksdirector@wasagabeach.com
Subject: River Road West Urbanization from Brillinger Dr to Eastern Town Limits Class EA Wasaga Beach

Dear Mr. Neumann

Thank you for your letter with respect to the River Road West Urbanization from Brillinger Dr to Eastern Town Limits Class EA. From your letter, it is my understanding that the project is at an early stage within the Class EA process, however I would like to flag some important information that may apply to this specific project.

As part of the Class Environmental Assessment process, the Ministry of Culture has an interest in the conservation of cultural heritage resources including:

- Archaeological resources;
- Built heritage resources; and
- Cultural heritage landscapes

The Provincial Policy Statement, 2005 issued under the authority of the Planning Act defines "conserved" as "the identification, protection, use and/or management of cultural heritage and archaeological resources in such a way that their heritage values, attributes and integrity are retained. This may be addressed through a conservation plan or heritage impact assessment."

Archaeology:
The site in question has archaeological potential for the following reasons

- a known archaeological site or within 250 meters of a known site
- within 300 meters of a primary water source (lakeshore, river, large creek)
- within 200 meters of a secondary water source (stream, spring, marsh, swamp)

- within 300 meters of a ancient water source (beach ridge, river bed)
- on elevated topography (knolls, drumlins, plateaux)
- on pockets of sandy soil in a clay or rocky area
- on unusual land formations (mounds, caverns, waterfalls)
- extractive area (for food or scarce resources)
- non-aboriginal settlement (monuments, cemeteries)
- historic transportation (road, rail, portage)
- designated property
- local knowledge
- recent disturbance (confirmed extensive and intensive = low potential)
-

An archaeological assessment that conforms to the Ministry of Culture's *Standards and Guidelines for Consultant Archaeologists* is therefore required

Or

The site has low archaeological potential and therefore does not require an archaeological assessment. If, however, deeply buried cultural remains (including human remains) are discovered during construction activities, this office should be notified immediately.

Built Heritage / Cultural Heritage Landscapes:
If the building/structure in question / site in question contains buildings/structures over 40 years old, a Heritage Impact Assessment should be undertaken The Assessment should include the following:

1. Historical research, site analysis and evaluation
2. Identification of the significance and heritage attributes of the property
3. Description of the proposed development / site alteration
4. Measurement of impacts
5. Consideration of alternatives, mitigation and conservation methods
6. Implementation and monitoring schedules
7. Summary statement and conservation recommendations

For more information, refer to Ministry of Culture *InfoSheet #5: Heritage Impact Assessments and Conservation Plans* in the Ontario Heritage Tool Kit at http://www.culture.gov.on.ca/english/heritage/Toolkit/Heritage_PPS_infoSheet.pdf

The Heritage Impact Assessment should be sent to the local municipality and its Municipal Heritage Committee for their review and information as part of the Environmental Assessment process.

Please do not hesitate to contact me if you have any questions.

Best regards,

Alejandro Cifuentes
Heritage Planner
Ministry of Culture
Programs and Services Branch - Culture Services Unit
400 University Avenue, 4th Floor
Toronto, Ontario M7A 2R9
T 416-314-7159
F 416-212-1802
Alejandro.Cifuentes@ontario.ca

The Beach is Just the Beginning

WASAGA Beach

Ainley Group CONSULTING ENGINEERS PLANNERS

WELCOME

Town Of Wasaga Beach

RIVER ROAD WEST
CLASS ENVIRONMENTAL ASSESSMENT
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

PUBLIC INFORMATION CENTRE
OCTOBER 29, 2009

PROBLEM STATEMENT

Based on the Transportation Studies completed between 1999 and 2007 the current annual average daily traffic (AADT) volume reaches the maximum range (12,000 to 15,000 vehicles per day) for a two-lane roadway. Allowing for future growth-related traffic projections based on a 10-year forecast, the Town of Wasaga Beach has identified additional road capacity required to enhance safety in the area of River Road West from Brillinger Drive to the eastern Town limits. The Town also recognizes the need to improve the roadway pavement condition and surface drainage problems in the area. In addition to addressing road capacity, safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that Town is intending to incorporate recommendations outlined in the Town's Active Transportation Plan Study. This will identify and possibly plan for the integration of active transportation components such as pedestrian, bicycle and public transit.

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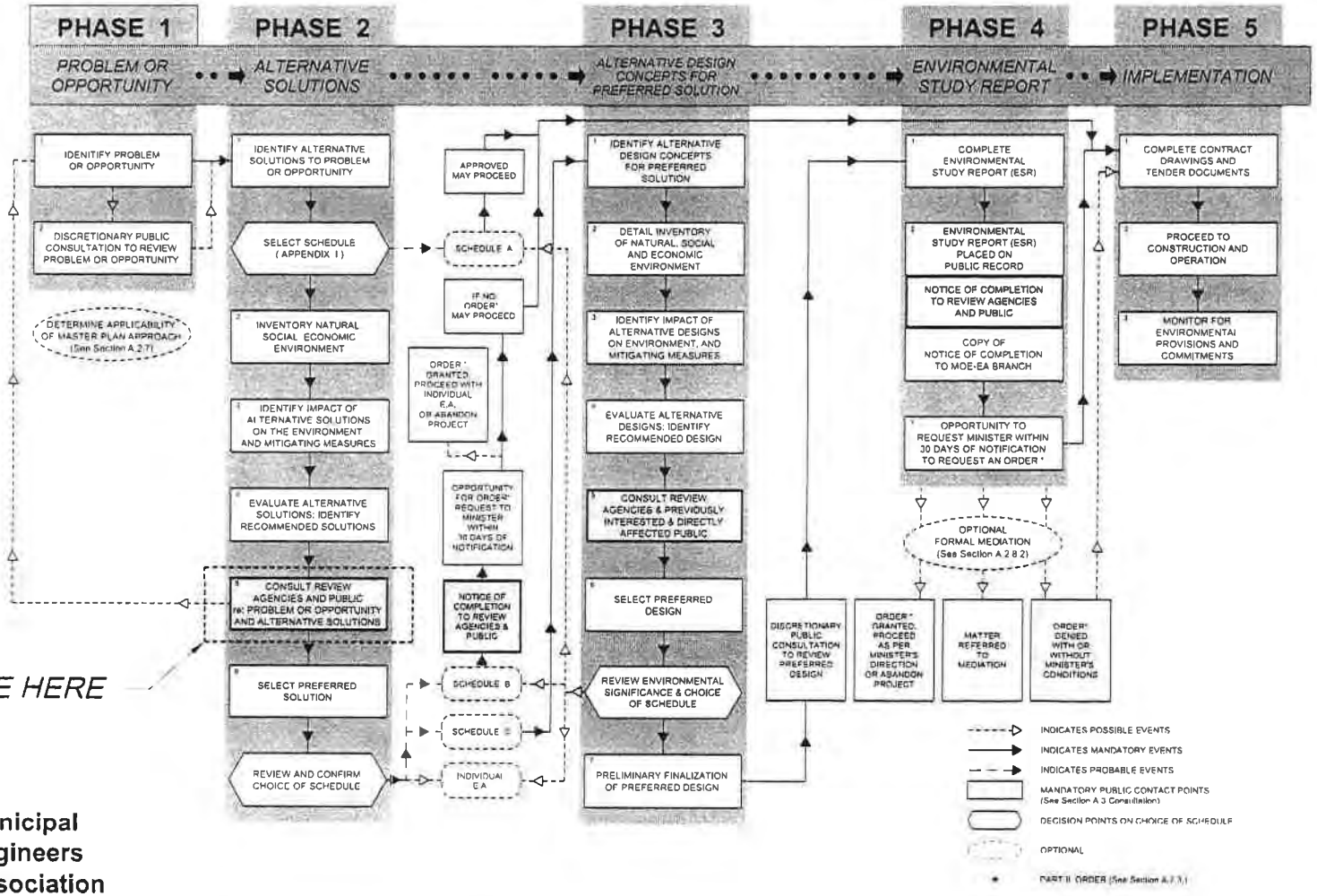
WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

Tinley GROUP CONSULTING ENGINEERS PLANNERS

EXHIBIT A.2 — MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



WE ARE HERE

Municipal Engineers Association

PLATE 3

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WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

Mainley CONSULTING ENGINEERS PLANNERS

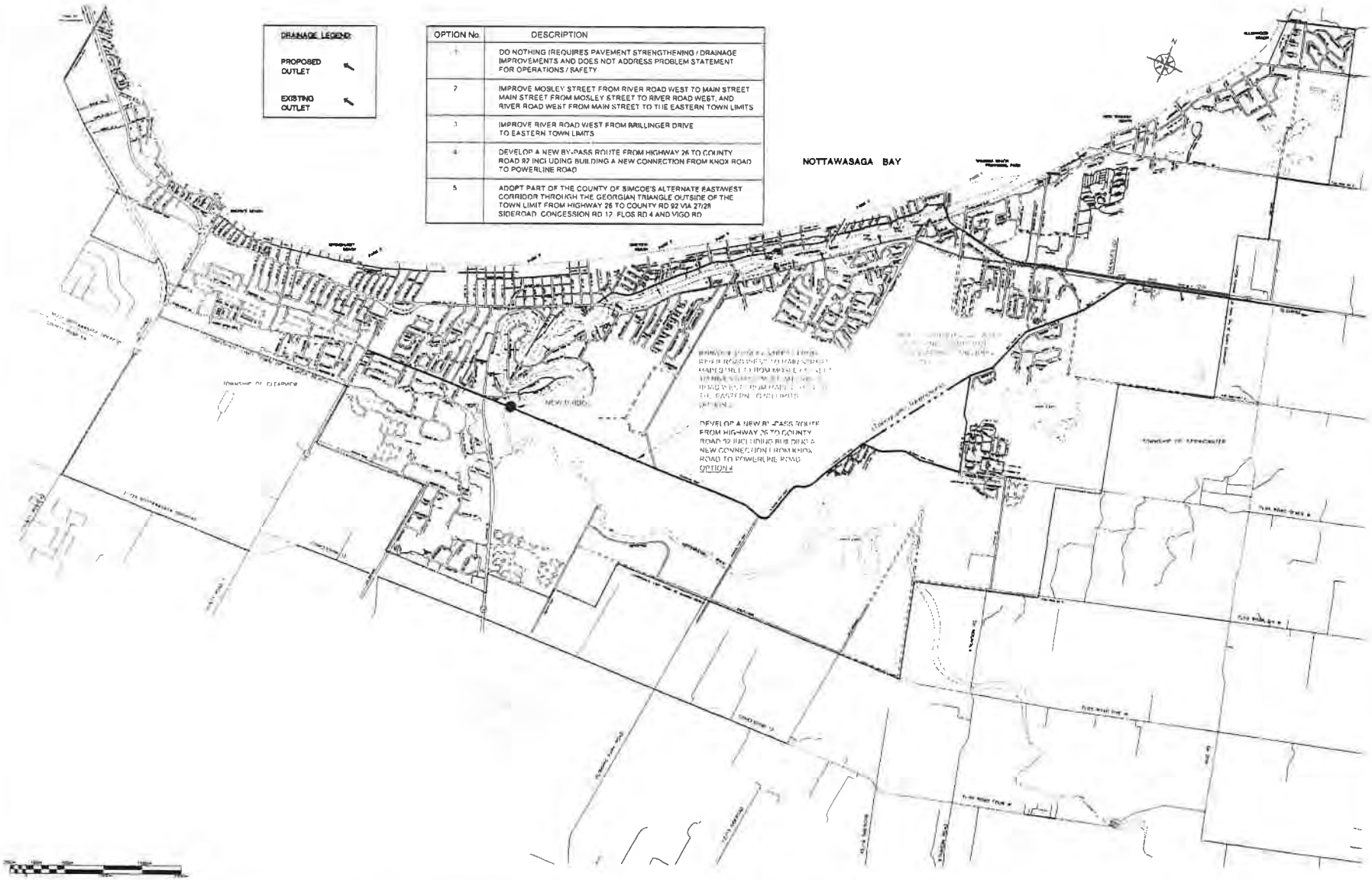

PLATE 4

OPTION 1 - DO NOTHING

DETAILS

- No improvements would be made to the existing River Road West from Brillinger Drive to the eastern Town limits nor to any of the main east-west roadways (Mosley Street or a new by-pass route)

OPPORTUNITIES

- Urbanization Cost

CHALLENGES

- Road capacity, pedestrian safety, drainage and pavement structure deficiencies would remain as problems and would worsen as growth within the Town occurs

FUTURE ASSESSMENT

- No further assessment of this Option is warranted - does not respond to identified problem

The Beach is Just the Beginning
WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

Ainley CONSULTING ENGINEERS PLANNERS

OPTION 2 - IMPROVE MOSLEY STREET FROM RIVER ROAD WEST TO MAIN STREET, MAIN STREET FROM MOSLEY STREET TO RIVER ROAD WEST, AND RIVER ROAD WEST FROM MAIN STREET TO THE EASTERN TOWN LIMITS

DETAILS

- Improve Mosley St. from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the eastern Town limits to accommodate future traffic considering modes of active transportation, and
- Divert some of the traffic on River Road West to Mosley Street.

OPPORTUNITIES

- May improve traffic movement across the "destination" area north of the River, and
- May address traffic congestion problem along River Road West.

CHALLENGES

- Not as effective at moving traffic to Hwy 26 and Airport Rd as Option 3 due to distance from Town's exit points (Powerline Rd., 45th St. and Mosley St. west),
- Traffic projections do not warrant the work - this area is a "destination" point and as such, traffic congestion will be a problem during peak event periods,
- Widening of Mosley St would have a higher impact on residences and businesses,
- Right-of-way acquisition would be difficult and costly, and
- Capital cost is considered to be higher than Option 3.

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WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

Tatham Engineering / Ainley Group — Consulting Engineers Planners

OPTION 3 - IMPROVE RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

DETAILS

- Improve existing River Road West from Brillinger Drive to the eastern Town limits to accommodate existing and future traffic flow considering modes of active transportation in the design

OPPORTUNITIES

- Would improve efficiency, enhance safety and address drainage and pavement structure deficiencies in the area of River Road West from Brillinger Drive to the eastern Town limits,
- Less impact to residents and businesses than Options 2,
- Right-of-ways are in the range of 20 to 60 metres and considered sufficient, and
- Lower capital cost estimate than Option 2 (shortest distance and property acquisition is not required)

CHALLENGES

- Potential to negatively impact the local public school and library,
- Potential to impact resources (including a sensitive species of snake and deeryards), and
- Potential impact to minimal amount of Area of Natural Scientific Interest life science lands, Area of Natural Scientific Interest earth science lands, and significant wetland

RECOMMENDED SOLUTION

- Improve River Road West from Brillinger Drive to the eastern Town limits and consider active transportation measures in the design, and
- Connect to the anticipated River Road West improvements to the west from Mosley St. intersection to Brillinger Drive including Schoonertown Bridge.

PROJECT FINANCING

- Considering the fact that Town growth is the reason for the work, 90% of the cost will be recovered through development charges, and
- The balance of the cost will be paid for either from existing reserve funds or through future Provincial/Federal funding programs.

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

Ainley CONSULTING ENGINEERS PLANNERS

OPTION 4 - DEVELOP A NEW BY-PASS ROUTE FROM HIGHWAY 26 TO COUNTY ROAD 92 INCLUDING BUILDING A NEW CONNECTION FROM KNOX ROAD TO POWERLINE ROAD

DETAILS

- Develop a new by-pass route from Highway 26 along Mosley Street to 45th Street to Knox Road to a new road connection to Powerline Road to Klondike Park Road to Golf Course Road to Bell's Park Road to River Road West and then to County Road 92, and
- Construct 2.4 km new road connection including a new bridge.

OPPORTUNITIES

- Would divert east and west through traffic movement away from River Road West and/or Mosley Street, and

CHALLENGES

- Would not address traffic congestion problem on River Road West, given only 10% of River Road West traffic would use this route,
- Low traffic volume anticipated does not justify the high costs of the construction of this route,
- Property acquisition would be required from MNR lands for 500 metre length of road
- Potential to impact resources (including a sensitive species of snake and deeryards), and
- Potential impact to significant amount of Area of Natural Scientific Interest life science lands, Area of Natural Scientific Interest earth science lands, and
- New road construction will cause permanent impacts to residents.

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

Ainley Group Consulting Engineers Planners

OPTION 5 - ADOPT PART OF THE COUNTY OF SIMCOE'S ALTERNATE EAST/WEST CORRIDOR THROUGH THE GEORGIAN TRIANGLE OUTSIDE OF THE TOWN LIMITS FROM HIGHWAY 26 TO COUNTY RD 92 VIA 27/28 SIDEROAD, CONCESSION RD 12, FLOS RD 4 AND VIGO RD

DETAILS

- Adopt part of the County of Simcoe's alternate east/west corridor through the Georgian Triangle outside of the Town from Highway 26 to County Road 92 via 27/28 Nottawasaga Sideroad, Concession Road 12, Flos Road 4 and Vigo Road;
- Replace the existing single lane Vigo Bridge on Flos Road 4 near Vigo Road; and
- Construct 1.0 km new road (horizontal alignment improvements) for the connection of 27/28 Nottawasaga Sideroad to Concession 12.

OPPORTUNITIES

- Upgrading 27/28 Sideroad to County road standards and replacement of Vigo Bridge are short-term (0 -10 years) improvements listed in the County of Simcoe's Transportation Master Plan, whereas,
- Upgrading the sections of Flos Road 4 and 12 Concession to County road standards are medium term (10 - 20 years) improvements listed in the County of Simcoe's Transportation Master Plan; and
- Would divert east and west through traffic movement away from River Road West and/or Mosley Street.

CHALLENGES

- Would not address traffic congestion problem on River Road West, given only 10% of River Road West traffic would use this route,
- Located entirely outside of the Town's limits and therefore would require municipal agreements with the County of Simcoe and/or the affected municipalities,
- Longest route out of the other options and would be considered more of an alternate east-west route for through Town traffic than for in-Town destinations; and
- Property acquisition would be required for the 1.0 km new road construction for the connection of 27/28 Sideroad to 12 Concession.

The Beach is Just the Beginning
WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS

Ainley CONSULTING ENGINEERS PLANNERS

BACKGROUND INFORMATION AND REPORTS

- Town of Wasaga Beach, Public Works Department, 10 Year Capital Works Forecast Update, 2008 - 2017, Summary Brief, Ainley Group, May 2008),
- Town of Wasaga Beach, 2006 Transportation Study Update, Ainley Group, December 2006, revised April 2007),
- Town of Wasaga Beach, East - West Transportation Route Study, October 2008,
- Environmental Existing Conditions Report, River Road West Municipal Class Environmental Assessment, Azimuth Environmental Inc., August 2009,
- Previously completed Geotechnical investigations - Dominion Soils Investigation Limited and Terraprobe,
- Stage 1 Archaeological Assessment, River Road West Urbanization From Brillinger Drive to Eastern Town Limits, Archaeological Research Associates Ltd., August 2009,
- Noise Impact Assessment, River Road West Urbanization From Brillinger Drive to Eastern Town Limits, J. E. Coulter Associates Limited, August 2009,
- Traffic Analysis for River Road West Class EA, Ainley & Associates Limited, August 2009, revised October 2009,
- Drainage Assessment of the existing River Road West, Ainley & Associates Limited, September 2009, and
- Town of Wasaga Beach, Schoonertown Bridge Class Environmental Assessment, Environmental Study Report, June 2009.

NEXT STEPS - ANTICIPATED SCHEDULE

FALL/WINTER 2009

- Review comments received from Phase 2 PIC
- Select Preferred Solution,
- Finalize Phase 1 and 2 ESR based on comments received as a result of this PIC and selection of Preferred Solution,
- Complete Phase 3 of the Class EA, identifying and evaluating design options (number of lanes, need for sidewalks, need for bike lanes etc.),
- Hold Phase 3 PIC to present design options and Recommended Design to the public,
- Review comments received from Phase 3 PIC, and
- Select Preferred Design.

WINTER 2009-2010

- Finalize Draft ESR (Phase 4) and place Draft ESR on public record for 30 days (publish Notice of Completion), and
- Finalize ESR based on comments received during the 30 day review period.

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

To: **Mike Neumann**

From: **Lilly Chen**

Date: **October 29, 2009**

Ref: **Town of Wasaga Beach – River Road West Class EA**
October 29, 2009 PIC Summary

Copies to **Jim McIntosh – Town of Wasaga Beach**
Kevin Lalonde – Town of Wasaga Beach
Tom Nollert – Ainley And Associates
Larry Young – Ainley And Associates

File: **109049**

A Public Information Center (PIC) was held on October 29, 2009 at the Wasaga Rec Plex from 7:00pm to 9:00pm. Jim McIntosh and Kevin Lalonde represented the Town of Wasaga Beach, and Tom Nollert, Lilly Chen and Mike Neumann represented Ainley Group. Mayor Cal Patterson, councillors George Watson, Nina Bifolchi and Stan Wells also attended the PIC. Seventy-eight members of the public and stakeholders or their representatives signed the PIC attendance sheet although it is estimated that actual attendance was over eighty persons. Further to the public notice and letters sent to the review agencies and interested persons, comments will be received until November 13, 2009. A response to comments will be prepared and issued following the Town's review.

Forty-four comment sheets (including one revised comment sheet) were received during the PIC, whereas six comment sheets were received before and after the PIC. Of these comment sheets, 9 selected Option 3 – Improve River Road West from Brillinger Drive to the eastern Town limits as the preferred solution. 16 of them did not select any options or selected another option, but still would like improvements on the section of River Road West such as a centre turn lane, an additional through lane, sidewalks, bike lanes (paths), traffic lights, resurfacing and storm sewers. Details for the other options selected by the number of comment sheets are provided in Table 1.

As indicated in Table 1, approximately half of the comment sheets are in support of improvements on River Road West, although another option may also be selected.

The most common oral/written comments provided in relation to the project at the PIC are summarized in Table 2.

The general consensus by all attendees was that improvements on River Road West should be considered to improve traffic flow, enhance safety, at the same time, a by-pass route should also be considered to divert by-pass traffic especially trucks away from the core area of the Town. The main questions or comments provided at the meeting were associated with the amount of truck by-pass traffic, a by-pass route, request for more information and pedestrian safety issues.

Table 1 – Summary of Options Selected

Options	Number of Comment Sheets	
	Total	Also would like improvements on River Road West
No Options	12	6
Option 1 – Do Nothing	4	
Option 2 – Improve Mosley Street from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the easterly Town limits	3	3
Option 3 – Improve River Road West from Brillinger Drive to the easterly Town limits	9	9
Option 4 – Develop a new by-pass route from Highway 26 to County Road 92 including building a new connection from Knox Road to Powerline Road	10	4
Option 5 – Adopt part of the County of Simcoe's Alternate east/west corridor through the Georgian Triangle outside of the Town from Highway 26 to County Road 92 via 27/28 Sideroad, Concession 12, Flos Road 4 and Vigo Road	9	3
Options 4 and/or 5	2	
Total	49	25

Table 2 – Most Common Oral/Written Comments and Responses

Comment/Question/ Concern	Response
How many lanes will be on River Road West and will sidewalks and bike lanes/paths be included?	The number of vehicular lanes, sidewalks and bike lanes/paths will be considered in Phase 3 of the Environmental Assessment – Alternative Design Concepts for Preferred Solution, should improving River Road West be selected as the preferred solution. There will be another PIC in Phase 3. The project is in Phase 2 – Alternative Solutions. The purpose of this PIC is to consult with the public and agencies regarding problems or opportunities and present alternative solutions to the problems or opportunities.
Concern about high volumes of truck traffic using River Road West as a connection between County Road 92 and Highway 26. A by-pass route to divert truck traffic away from the core area of the Town should be considered.	A traffic infiltration study conducted in June 2008 indicates that the percentage of truck traffic traveling through River Road West without stopping (within 30 minutes) is in the order of 6% to 8%. In the study, license plates for both trucks and cars were recorded at the east and west ends of the route for a 12-hour period from 6:00 to 18:00 in 15 minute intervals. Should a same license plate be recorded at both ends of the route within a 30 minute period, the vehicle is considered a by-pass vehicle.

Comment/Question/ Concern	Response (continued)
	As the low by-pass volumes may not warrant the high cost of construction for a new by-pass route at this time, the Town's 2008 East-West Transportation Route Study suggested the Town should initiate a traffic volume monitoring program and conduct traffic volume counts at major intersections every 5 years to identify the potential future need of a by-pass route within the Town. The Town's next Transportation Study Update is scheduled for 2011. The need for a by-pass route will be reviewed on an ongoing basis. The need for the by-pass route will likely become evident if an improved River Road West corridor approaches capacity. This would likely occur beyond a 20 year horizon.
More traffic lights on River Road West would slow down and deter bypass traffic.	New traffic light locations will be considered in Phase 3 of the Environmental Assessment, should improving River Road West be selected as the preferred solution.
More information is needed especially regarding future traffic projections and by-pass traffic volumes.	The Town's 2006 Transportation Study Update is available for review on the Town's website link below: http://www.wasagabeach.com/WasagaBeach/docs/Studies/2006%20Transportation%20Study%20Update%20April%2007.pdf Other studies such as the Town's 2008 East-West Transportation Route Study, Traffic Infiltration Study and Traffic Analysis for River Road West from Brillinger Drive to the Eastern Town Limits are available for review upon request.
Widening of River Road West would make the road busier or encourage more truck by-pass traffic on the road.	A traffic analysis for the section of River Road West from Brillinger Drive to the easterly Town limits indicates that there are 17 developments along the road, which are being built or are undergoing planning to be built in the next 20 years. Peak hour trips generated by these developments are in the order of 2200 including both inbound and outbound trips. These volumes can not be accommodated by a by-pass route as their origins or destinations are within the area of River Road West. Even with a by-pass route being built, additional road capacity is required on the section of River Road West.
Let's build for the long term and build another east-west corridor far enough south (option 5) so that 15 years from now we do not have a reoccurrence of our present dilemma.	This route currently exists. Although, the existing Vigo Bridge is a single lane bridge, the County of Simcoe is conducting a Class Environmental Assessment for the replacement of the existing Vigo Bridge. As indicated in Plate 9 of the PIC display board, the County of Simcoe is planning to upgrade the section of 27/28 Sideroad in the next 10 years and to upgrade Concession 12 and Flos Road 4 in the next 20 years. Thus, regardless of whether the Town will improve this route or not, most of this route will be improved in the next 20 years.
The road is not safe for children and pedestrians.	As part of this EA, pedestrian safety issues will be addressed in the next Phase along with active transportation components.

Attachment: PIC Attendance Sheet.

A summary of the written and verbal comments is attached.

T:\109049\109049-Lilly\PIC Material\PIC 1\109049 PIC Summary Oct 29 2009.doc

TOWN OF WASAGA BEACH
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

PUBLIC INFORMATION CENTRE
OCTOBER 29, 2009

SIGN IN SHEET – PLEASE PRINT

NAME	ADDRESS	TELEPHONE NO.	E-MAIL ADDRESS

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

To: **Mike Neumann**

Copies to: **Jim McIntosh – Town of Wasaga Beach**
Kevin Lalonde – Town of Wasaga Beach
Tom Nollert – Ainley And Associates
Larry Young – Ainley And Associates

From: **Lilly Chen**

Date: **October 29, 2009**

Ref: **Town of Wasaga Beach – River Road West Class EA**
October 29, 2009 PIC Summary of Comments

File: **109049**

Written and Verbal comments related to project received before, during and after the PIC are as follows:

1. River Road West should have 3 lanes.
2. 2 lanes should be on River Road West.
3. River Road West must widened to 4 lanes with its present condition it is a disaster in the making.
4. Sidewalks and bike lanes/paths should be provided for safety reasons.
5. To cross the road for mail can take 15 minutes.
6. Walking my grandchildren to Beach Area 4 is taking your life in your hands.
7. Additional traffic would make it harder to exit/enter private residence on River Road West.
8. More traffic lights should be installed to slow down and deter heavy truck traffic or by-pass traffic.
9. Widening the road would require traffic lights every two blocks to allow residents to exit their roads, further slowing traffic which is counter productive.
10. We keep putting up traffic lights at every east end intersection soon we will need 4-way stops instead to keep costs down.
11. It is highly desirable that all wire utilities be placed underground.
12. Storm sewers and curbs should be installed to eliminate all of the water puddles.
13. Speed limits on River Road West should be reduced.
14. Need street lights on River Road West.
15. Need traffic calming measures on River Road West.
16. New pave on River Road West would be nice.
17. The biggest traffic problem is the McDonald's light intersection east and west bound. Why is it a red light at 4 am when there is no another car in sight? Furthermore the intersection is configured incorrectly. The eastbound left turn taper should be a left turn lane, whereas, the eastbound right turn lane should be a right turn taper.
18. Keep costs to taxpayers a minimum.
19. Do not disturb MNR property.
20. Option 2 (Improve Mosley Street) would have less effect on residents.

21. Widening the road would encourage more traffic on the road.
22. Improve River Road West would improve traffic for only a few local cars going east. Both east and west bound traffic has 2 lanes at Schoonertown Bridge. So improve River Road West would not make much difference.
23. We do not want to see River Road West widened to 4 lanes. This is a residential area with a school.
24. More traffic flowing through River Road West school zones is not acceptable.
25. Additional lane(s) would decrease property values.
26. There is no room for snow now. Where will we put another lane of snow?
27. If a 4 lane option is selected, it would put our front porch approximately 1 ft 6" from the road. Snowmobiles, children, bikes etc. would be at greater risk due to lack of response time.
28. 4 lane roads always lead to higher speeds because of the openness. Talk to the OPP over speeds on the newly widened Mosley Street.
29. If the Beach areas 1 and 2 development goes ahead, traffic would increase even more.
30. Tourists, truckers and out-of-towners put no significant amount of money into Wasaga Beach. Therefore, they should not be considered.
31. Heavy traffic on weekends is acceptable to residents.
32. More dollars to maintain the road is not acceptable as this will increase taxes and cause more residents to leave Wasaga Beach due to tax increases.
33. Have never witnessed any back-up of traffic or any access problems even on the busiest long-weekends of the year.
34. Whenever proceeding west on River Road West and want to make a left turn there are always impatient drivers that pass you on the solid white line and not just cars but tractor trailers.
35. During construction on River Road West, emergency vehicles will be hampered greatly because the ambulance depot on Oxbow Park Drive will be at the heart of the construction upheaval.
36. There are fewer vehicles making left turns on River Road West than on Highway 26 between Wasaga Beach and Collingwood.
37. Why Highway 26 has two lanes, while River Road West needs 4 lanes?
38. Houses are built on sand. We can feel the noise and vibrations from heavy trucks at home particularly in the morning from 6:00 am to 6:30 am.
39. Need a by-pass route for trucks and other bypass traffic.
40. Should use "Alternative Route" signs to divert by-pass trucks with fines imposed.
41. Has the Town forgotten the extra pedestrian traffic during the summer months in this very area? By creating a new street and to call it a by-pass would not work.
42. The further south we send traffic to a by-pass route the less the by-pass traffic would want to use it.
43. Golf Course Road/Klondike Park Road is a wandering road through new developments, sports and park areas where many children play their sports. Also the wooded areas have many deer.
44. Let's build for the long term and build another east-west corridor far enough south (out-of-Town by-pass) so that 15 years from now we do not have a reoccurrence of our present dilemma.
45. The best option is #5 (out-of-Town by-pass) as it would allow people and traffic that does not want to shop in Town free to avoid it. Trucking would certainly appreciate it. So would we.
46. Doubt about 10% by-pass traffic volumes. I don't recall ever being polled over or asked if I would

use an alternate route if made available to me. And none of my neighbours have either.

47. More information is needed for review such as by-pass traffic volumes and related studies.
48. Please email copies of the display materials for further consideration.
49. Do not prefer any of the options presented at this time.
50. Building of more housing developments should be slowed down in the west end until the road plan is finished.

T:\109049\109049-Lilly\PIC Material\PIC 1\109049 Summary of Comments Oct 29 2009.doc

Lilly Chen

From: Mike Neumann [neumann@ainleygroup.com]
Sent: October 20, 2009 4:52 PM
To: Lilly Chen
Cc: Kevin Lalonde; Jim McIntosh
Subject: FW: River Road West

Hi Lilly

See public response issued in relation to the PIC below. We can review this at our meeting next week.

Regards,

Mike Neumann, P.Eng
Vice-President, Transportation Engineering

Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

neumann@ainleygroup.com
phone (705) 445-3451 ext.145
fax (705) 445-0968
cell (705) 443-1721
www.ainleygroup.com

-----Original Message-----
From: [redacted] [mailto:[redacted]@sympatico.ca]
Sent: October 20, 2009 12:01 PM
To: publicworksdirector@wasagabeach.com
Cc: neumann@ainleygroup.com
Subject: River Road West

Unfortunately we cannot attend the open house on the 29th October but we would like to comment on the proposed options.
To widen River Road West is simply postponing what must eventually be done and that is to have an alternate route bypassing the central core of the town (option 4). Widening the road would only encourage even more truck traffic through town adding more wear and tear to our infrastructure, and involve a complete reconstruction of the bridge at Schoonertown. It would also require traffic lights every two blocks to allow residents to exit their roads, further slowing traffic which is counter productive.
During these alterations to River Road West emergency vehicles will be hampered greatly not least because the ambulance depot on Oxbow will be at the heart of the construction upheaval.
We would like to be placed on the mailing list to receive project information.

[redacted]
11 Brillinger Drive,
Wasaga Beach, On. L9Z 1L4

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property Owner.

ADDRESS (Including Postal Code & Telephone Number):
1466 River Rd West L9Z 2W5 (705) 812-1677

COMMENTS (Please use the back of this sheet if necessary)
If you were to widen River Rd West to 4 lanes that road would become a highway. With all the residents and the schools I see this as a danger. 4 lanes with sidewalks and bike lanes won't fit, 3 lanes with bike lane and sidewalks might be a better solution however you are still encouraging large amounts of traffic past schools.
Perhaps resurfacing the road and adding sidewalks and traffic lights would work. Less cost, ↑ safety, ↓ speed and ↘

Which option do you prefer?

☐ Option 1 ☒ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

amount of traffic. with lights cars will go around town instead of through town.

Increasing the roads as in option 2 would have less effect on residences. This is a better option for the businesses. Send the traffic towards our businesses not past residential and school area. Also would keep the truckers from driving through town at all hours of the day.

[redacted]

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1246 RIVER RD. W.
429-7087

COMMENTS (Please use the back of this sheet if necessary)

I WOULD LIKE TO EXPRESS THAT I AM DEAD SET AGAINST A 4 LANE HWY. RUNNING THROUGH A STRICELY RESIDENTIAL AREA. NOT TO MENTION THE EXCESS NOISE, SAFETY FOR PEDISTRIANS, CYCLIST, ETC. I HAVE HAD THIS PROPERTY SINCE 1982, AND WISH TO SPEND WHAT TIME I HAVE LEFT WITHOUT THIS IMPROVEMENT WHICH WILL HAVE A PROFOUND CHANGE IN MY LIFE AT THE BEACH.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

MY WIFE AND I HAVE STARTED A PETITION TO STOP THIS 4 LANE HWY FROM HAPPENING, WE HAVE ALREADY FOUND OVER 95% DISAPPROVAL FOR THIS RI[redacted]NI

WE THE RESIDENTS OF RIVER RD. W. ALREADY PAY A HIGHER TAX ASSESSMENT, WHICH RESIDENTS HAVE SAID THEY WILL ALSO FIGHT THE ASSESSMENT FOR THEIR PROPERTIES

I WOULD ALSO LIKE TO COMMENT THAT 4 LANES ROADS ALWAYS LEADS TO HIGHER SPEEDS BECAUSE OF THE OPENNESS, TALK TO THE OPP OVER SPEEDS ON THE NEW MOSLEY ST. WIDENING. NOT TO MENTION THE SCHOOL + CHURCH IN WHICH MANY KIDS ARE WALKING ALONG RIVER RD. W.

WE WOULD LIKE TO KNOW IMMEDIATELY IF THERE IS A DECESION TO WIDEN RIVER RD. W. SO THAT WE CAN ORGANIZE A RALLY AGAINST IT.

Ray Sanders

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property [redacted] Owner.

ADDRESS (Including Postal Code & Telephone Number):
6 GLEN Eton Road. Wasaga Beach, L92-1E6.

COMMENTS (Please use the back of this sheet if necessary) We just moved to W.B. 2yrs. ago. I'm 3rd house in on Glen Eton Rd. From River Road West, I understand my house is built in Sand - Vibrations From Heavy Transport trucks are felt in my home - I certainly, don't want a 4 Lane Road outside my backyard - 150-200' F approx. River Rd to my backdoor. Our home is Fairly New @ 14yrs. old study. I do agree we need sidewalk @ River Rd. West. Last year I called the By-law Officer due to Hy. Trucks with heavy loads Waking me up between 6 & 630am. everyday & wondered if there was a By-law for Heavy Transports (loud noise vibrations take brake coming through Town & was told there wasn't a Bylaw of that

TURN

Which option do you prefer?

☐ Option 1 ☑ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

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River Road West would become 4 Lane this year, anyway! With hearing this news my partner & I were very Disappointed & Worried we'd have invested our money in the wrong place (town/street) & we would have to consider another move maybe, out of Wasaga [redacted]

4 Lane was done - So, we've had a whole year to think about this.

Sidewalk is Defenetely needed fa Safety reasons - even I don't walk River Road West its too risky - especially, when vehicles are 2 feet from me - going 50-70 km per hour! Wow! Lower the spud Limit too!

Safety first! Its Residential area

Bike Lane would be nice too!

I understand Wasaga Beach is up & Growing But, 4 Lane on another Road - not River Road West -

We Love Our Home!

Thanks Kathleen Poole

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

Property Owner.

ADDRESS (Including Postal Code & Telephone Number):

1950 River Rd W.
L9Z 2W2 7054792178.

COMMENTS (Please use the back of this sheet if necessary)

Option 4 would be my choice as majority of RRW. is residential. I would only agree to #3, if trucks could be stopped from using the road. Three lanes only + speed limit controlled. Pedestrian + cyclist's are in danger now. posting RRW as a bypass would I think increase

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☑ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

traffic even more. If the Beach area 1 & 2 development goes ahead. traffic would increase even more & then Mosley St. makes sense but that decision isn't final yet [redacted] to retire here & now with traffic noise I can't even open windows, to cross the road for mail can take 15 min. Walking my grandchildren to Beach Area 4 is taking your life in your hands.

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, (Property Owner), Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

62 FAIRWAY CR W.B. L9Z 1B8 / 429-4935

COMMENTS (Please use the back of this sheet if necessary)

To accommodate By Pass (Trucks, etc) + In town traffic - ① It needs By-Pass from #92 + Vigo Rd / Conc 4 / Conc 12 to Hwy 26 By pass. ② Plus widening from Mosely + River Rd West to Vigo Rd - 3 lanes only to accommodate In town traffic entering + exiting fro Side Streets. ③ "Alternate Route" signs to be adhered to by all trucks not delivering to stores in Town - with fines imposed if trucks found to be going straight thru town to Hwy 26 - to Collingwood.

④ River Rd widening must include sidewalks + cycle paths to promote safety + active transportation

over

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☒ Option 5

plus + Widen River Rd W from Mosely St to Vigo Rd - using 3 LANES.

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

I do not see my suggestion proposed as an "Option" on your choices.

A huge mistake was made from Mosely to ~~Hwy #~~ 45th St by not accommodating cycle paths. Hopefully the same mistake will not be repeated.

If you use Golf Course Rd/Klondike - This is a winding Rd thru new developments + Sports Park area where many children play their sports. Also wooded areas have many deer + many accidents would happen with deer/tired/car collisions. — THink Safety.

Sincerely

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

OWNER

ADDRESS (Including Postal Code & Telephone Number):

773 RIVER RD W. L9Z 2N7 429-7497

COMMENTS (Please use the back of this sheet if necessary)

- WILL PROPERTY VALUE BE AFFECTED
- RIGHT NOW AT OUR END ~~SHOULD~~ THERE IS NO ROOM FOR SNOW. WERE will we put another lane of SNOW. If a 4 lane option is APPROVED IT WILL PUT OUR FRONT PORCH approx 1 ft 6" FROM ROAD. SNOWMOBILES, CHILDREN. BIKES. etc will be at greater RISK Due TO lack of RESPONSE TIME.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☒ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

ARE YOUR PLANS just to make a ~~TRUCK~~ truck run between Hwy 26 & 27. I have noticed ALOT MORE TRANSPORTS ON OUR RDS SINCE EDENVALE BRIDGE closed.
WHERE are the 90% of people stopping IN the beach?
Will the speed limits increase, OR STAY The Same [redacted]
plans ARE TO MAKE IT A Highway BETWEEN 2 EXISTINGS ONES.
LACK of planning in the first place is subdivisions is to blame for this situation today.

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

25 BRILLINGER DR, WASAGA BEACH, L9Z 1K4

429-6303

COMMENTS (Please use the back of this sheet if necessary)

PUBLICATIONS INDICATE A POPULATION of 25-30,000 people here in 10-15 years. The increase in TRAFFIC will certainly require AN ADDITIONAL EAST-WEST TRAFFIC corridor. Widening ALREADY existing roads would (IN MY OPINION) only INTENSIFY our TRAFFIC FLOW problems - especially FOR those RESIDENTS who currently live in the MANY housing developments South of River RD West. Let's build FOR the

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☒ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

long term & build another east-west
corridor far enough south so that 15 years
from now we do not have a
Reoccurance of our present dilema.

Good [redacted] luck!

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER.

ADDRESS (Including Postal Code & Telephone Number):

122 ROYAL BEECH DRIVE

COMMENTS (Please use the back of this sheet if necessary)

I DO NOT AGREE WITH THE RECOMMENDED OPTION OF WIDENING RIVER RD ONLY. I THINK THIS IS SHORT SIGHTED AND WILL DO VERY LITTLE TO REMOVE THE HEAVY FLOW OF TRAFFIC AS THE TOWN EXPANDS. BEFORE YOU KNOW IT YOU'LL NEED TO ADD LIGHTS AT EVERY OTHER CORNER JUST TO GET OUT OF THE SIDE ROADS. IF 2 LANES NOW ARE AT CAPACITY, WHEN WILL THE 4 BE REACHED, AND WHAT ABOUT THE SAFETY ISSUES? HAVE WE LEARNED ANY THING

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☑ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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FROM THE WIDENING OF MOSLEY STREET.

I DON'T BELIEVE IN THE 10% NUMBERS YOU SITE ABOUT USING THE BYPASS, HOW DID YOU GET THESE NUMBERS? I DON'T RECALL EVER BEING POLLED OR ASKED IF I WOULD USE AN ALTERNATE ROUTE IF MADE AVAILABLE TO ME [redacted] AND NONE OF MY NEIGHBOURS HAVE EITHER.

WITH ALL THE PLANNED DEVELOPMENT IN PLACE FOR WASAGA BEACH, HOW MANY RESIDENCES ARE GOING TO BE BUILT NORTH OF RIVER ROAD WEST AS OPPOSED TO SOUTH OF IT?

I HOPE THE TOWN RETHINKS THE OPTION 3 SOLUTION AS THE VIABLE ALTERNATIVE BECAUSE I FEEL IT WON'T BE TOO LONG AFTER THAT, THAT THEY'LL START TALKING ABOUT A BYPASS.

THE TOWN OF
WASAGA BEACH

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1595 River Road West, Wasaga Beach, L9Z 2W4
352-0439

COMMENTS (Please use the back of this sheet if necessary)

If you enlarge River Road, you will have more traffic still and it won't solve your problem.

I moved from a busy & passing street with only 2 lanes and The Strict & Town have lost their beautifull & peaceFull look and purpose of being RESIDENTIAL
There are NO STORES OR BUSINESS ON River Road West

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☒ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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That would bring more MONEY in YOUR POCKETS (Municipality) and again it would loose it's beautifull scene and purpose of Being a RESIDENTIAL TOWN

[redacted]

THE TOWN OF
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RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:
[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER.

ADDRESS (Including Postal Code & Telephone Number):
37 FATIMA COURT, W.B. L9Z 1K9. 429-2406.

COMMENTS (Please use the back of this sheet if necessary)

WE WOULD PREFER THAT RIVER ROAD WEST NOT BE WIDENED. DESPITE THE FACT THAT YOUR STUDY CLAIMS AN INCREASE IN DAILY AVERAGE TRAFFIC ON THIS THOROUGHFARE, WE SEE ABSOLUTELY NO EVIDENCE OF THIS IN FACT. IN TEN YEARS LIVING ON THIS ROAD WE HAVE NEVER WITNESSED ANY BACK-UP OF TRAFFIC OR ANY ACCESS PROBLEMS EVEN ON THE BUSIEST LONG-WEEKENDS OF THE YEAR. WIDENING THIS ROAD WILL INEVITABLY LEAD TO AN INCREASE IN THROUGH TRUCK TRAFFIC FROM TORONTO TO COLLINGWOOD. TRUCKERS PRESENTLY USE BASEFIELD ST TO HWY 26

over →

Which option do you prefer?

☒ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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Fax: (705) 445-0968

AND ON TO COLLINGWOOD. — WITH THE LIKELIHOOD OF RR WEST TRUCKERS WILL DEFINITELY TAKE 400 TO HORSESHOE VALLEY ROAD + ON TO ELMVALE THEN THROUGH WASAGA BEACH TO COLLINGWOOD.

THIS IS AS CRAZY A PROPOSAL AS I'VE SEEN IN THIS TOWN — BIG COST TO TAXPAYERS, BIG BUCKS for Ainley & Associates + [redacted] THE PERMANENT RESIDENTS OF TOWN.

THE TOWN OF
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Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER.

ADDRESS (Including Postal Code & Telephone Number):
1332 RIVER RD W, WASAGA BEACH, ON
L9Z 2W6 429-3245

COMMENTS (Please use the back of this sheet if necessary)

I am NOT in favour of widening roads, building roads to accomodate traffic that has no support financially in our tax base. Toulists, truckers & out of towners put no significant amount of money into Wasaga. Maybe why are you considering these routes More traffic flowing through RRW

→

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Collingwood ON

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Fax: (705) 445-0968

school zones is not acceptable.
Heavy traffic 2 weekends a yr is
acceptable to Residents.
More dollars (I believe $6600/yr to maintain
1 km of road is not acceptable as
this will [redacted] taxes & cause
more residents to [redacted] asaga
due to tax increases.

THE TOWN OF
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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property owner Resident of affected area.

ADDRESS (Including Postal Code & Telephone Number):
39 Glen Eton Rd WASAGA BEACH ON L9Z 1E7
429-1062

COMMENTS (Please use the back of this sheet if necessary)

as a resident on Glen Eton Rd and River Road west as my main road of travel for Pleasure and to and from work. I work in BARRIE (Anne St + Dunlop St) By expanding River Road west to 4 lanes let alone 3. does not help my travel any. if anything will make my travel worse. Councilor Rick ARCHDEKIN. Says it Best we "don't want to see River Road West improved to encourage traffic; I didn't by a house in a Residential Subdivison to see an

OVER ->

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☑ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please forward me a map just like the one on display at information centre Thanks.

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280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

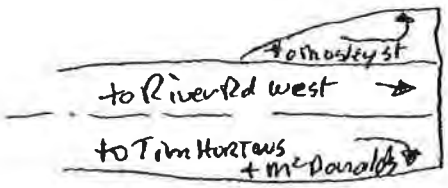
BRIGHTY RISK
39 Glen Eton Rd
WASAGA BEACH ON
L9Z 1E7
7054291062

(1)

an increase in traffic. as far as 4 or 3 lanes. why?

there is less vechicles making left turns off of River Road west than there is on Hwy 26 between Wasaga and Collingwood. as far as traffic studies go than can say what ever you want. Yes Wasaga is growing, there will be an increase in traffic but if vechicles [redacted] traveling through. make them go around. town. Not on the already high travel intown routes. The further south we send traffic the less inclined the through traffic will want to use it - takes more time. we keep putting up traffic lights at every east end intersection soon we will need four ways stops instead. to keep costs down. The only sections of wasaga that have consistent - good - traffic flow is Wilson Corners to 45th st. and. Brillinger Dr - River Rd west to. main st corner. Traffic flow is not a problem. in these two areas. The Biggest traffic PROBLEM is the McDonalds light intersection East + west Bound. For Starters why is it a red light @ 4am when there is not another car in sight. Furthermore the INTERSECTION is laned incorrectly for traffic flow. West to East and to Mosley

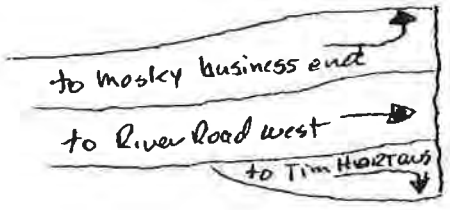
CURRENT



W E

Bad traffic flow causing road rage

should be



W E

Just look at how much more room there is in left hand turn lane just to write THIS MORE.

THE TOWN OF
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RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

Property owner of affected area.

ADDRESS (Including Postal Code & Telephone Number):

39 Glen Eton Rd WASAGA BEACH ON L9Z1E7
4291062.

COMMENTS (Please use the back of this sheet if necessary)

Page #2. over

Which option do you prefer?

25 26 45
Brillinger to East
Knox to town lim Conc 2nd [illegible]

☐ Option 1 ☐ Option 2 ☐ Option 3 ☑ Option 4 ☐ Option 5

Nothing
[illegible]

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

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Fax: (705) 445-0968

(3)

This Information Session was informative but it certainly was not a meeting. I was not provided with any handouts. to take home. However I was told that I could be mailed information that I asked for.

If this traffic problem. Is resulting ~~in~~ in a renewal ~~revamp~~ of River Rd west WHAT other option - route do travelers have now? mosley, 12TH Con., Hwy 26 [redacted] to 92? If we give another route to get from one ~~end~~ to the other maybe this will elivate traffic volume on River Rd west.

option 4 Appears to be the best long term solution for the Town of WASAGA BEACH as a whole. Not just for weekends or Truck route from C'woods to Elmvale.

Yes I agree that improvements have to be made ~~make~~ mosley st + River Road west but option 4 will ~~serve~~ serve our future interests best.

THANKS.

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER.

ADDRESS (Including Postal Code & Telephone Number):

103 GLEN ETON RD., WASAGA BEACH,
L9Z 1E8.

COMMENTS (Please use the back of this sheet if necessary)

OPTION 3 - I FEEL IT IS NECESSARY TO UPGRADE THE AREA OF RIVER RD. WEST FROM THE BRIDGE TO THE EAST END OF TOWN TO HELP WITH THE TRAFFIC FLOW. IF FOUR LANES COULD BE ACCOMODATED WOULD BE BENEFICAL, BUT IF NOT THAN AT LEAST HAVING THREE LANES, (ONE BEING A TURNING LANE) WOULD HELP TO KEEP THE TRAFFIC MOVING. WITH TRAFFIC FLOWING INTO THE SUBDIVISIONS ON THE S/S OF RIVER RD. WEST.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☑ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Collingwood ON

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Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

1415 RIVER RD. W.

WASAGA BEACH. L9Z 2W5 705-429-0670

COMMENTS (Please use the back of this sheet if necessary)

COULD YOU PLEASE EMAIL ME COPIES OF THE DISPLAY MATERIALS FOR FURTHER CONSIDERATION.

lpiazza.wasaga@gmail.com

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

103 GLENWOOD DR, W.B. L9Z 2K5

COMMENTS (Please use the back of this sheet if necessary)

Would it be possible to have the 5 options & map emailed to me for further review.
doris hunter@sympatico.ca
I would like to submit my comments before Nov. 13th.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☑ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

6 GLEN ETON RD WASAGA BEACH L9Z-1E6 429-5123

COMMENTS (Please use the back of this sheet if necessary)

RIVER ROAD WEST BEING A TWO-LANE NOW I FEEL IS FINE. ANYMORE THAN THREE LANE WOULD BE STRETCHING IT. BECAUSE OUR HOUSE IS BUILT ON SAND, THE VIBRATIONS OF TRUCKS IN THE MORNING (6AM 6:30 AM) WAKES US UP. WE'RE 150 TO 300 FEET FROM ~~ROAD~~ RIVER ROAD WEST. REALIZING WE NEED A BYPASS IS CRUCIAL BUT TO DIVERT NON-LOCAL TRAFFIC THRU TOWN WOULD BE BETTER ON THE OUTSKIRTS OF TOWN. NEW PAVE AND SIDEWALKS WOULD BE NICE.

Which option do you prefer?

☐ Option 1 ☒ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
1246 RIVER RD. W.

COMMENTS (Please use the back of this sheet if necessary)
I WOULD LIKE A THIRD "TURNING" LANE ON RIVER RD. W., AND A BYPASS FOR TRUCKS IN PARTICULAR — NOISE IS HORRENDOUS ON RIVER RD. W. I WOULD ALSO LIKE THE "ACTIVE TRANSPORTATION" LANES TO BE MADE SAFER FOR BICYCLISTS & WALKING - ALSO NEEDS TO BE BRIGHTER AT NIGHT — & THE SPEED LIMIT NEEDS TO BE CONTROLLED BETTE (ESPECIALLY TRUCKS).

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

MYSELF, PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

95 EDGEWATER ROAD
L9Z 2W3 (705) 429-6061

COMMENTS (Please use the back of this sheet if necessary)

- REMAIN 2 LANES WITH IMPROVEMENTS
- TRAFFIC CALMING
- BUILD BYPASS

Which option do you prefer?

with reservations

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):
20-54th St / 19 Oaklea

COMMENTS (Please use the back of this sheet if necessary)

It would be useful to have information on the "preferred option" i.e. option #3 and how it supports the Active Transportation Study. At some point I would like to see what is exactly meant by "improvement"

Is info available on the # vehicles which use River Rd W as a "through route" (? 10% seems very low) i.e. Any studies which might be available for review (on town website)

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☑ Option 5

(although option #3 MAY be the preferred one once more info. is available)

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

119 ROYAL BEECH DR.
WASAGA BEACH

COMMENTS (Please use the back of this sheet if necessary)

KEEP COSTS TO TAXPAYERS A MINIMUM.

DO NOT DISTURB MNR PROPERTY.

3 LANE ROAD (TURNING LANE IN MIDDLE)

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☑ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

P. O.

ADDRESS (Including Postal Code & Telephone Number):

62 FAIRWAY CR. W.B. L9Z 1B8 429-4935

COMMENTS (Please use the back of this sheet if necessary)

PROPOSAL 3 APPEARS TO HAVE A LIFE OF 10 YRS. IF SIDEWALKS, STORM SEWERS AND A FULL OR PARTIAL TURNING LANE (3 LANES?) ARE INCLUDED.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☒ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

Owner.

ADDRESS (Including Postal Code & Telephone Number):

49 Bush Cres L9Z-1N1

COMMENTS (Please use the back of this sheet if necessary)

Option 3 -

Improve River Rd West to 3 Lanes
If not 2 Lanes, plus Side Walks &
Bicycl. Lane.
or
Leave it 2 Lanes plus above option

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☑ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

22 BROUWER
W. B.

COMMENTS (Please use the back of this sheet if necessary)

Option 3, 3 lanes with middle lane a passing lane -

Bike lane on south side, sidewalks on both sides.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☒ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
103 GLENWOOD DR

ADDRESS (Including Postal Code & Telephone Number):
AS ABOVE

COMMENTS (Please use the back of this sheet if necessary)
DEAD AGAINST MAKING RIVER RD INTO 4 LANE HWY 92. THIS IS RESIDENTIAL NEIGHBOURHOOD NOT BY PASS FOR COMMERCIAL TRAFFIC WHICH YOU SAY IS ONLY 10% BUT YOUR STUDIES MUST HAVE BEEN DONE BY A BLIND GUY NO 4 LANES BUILD BY PASS TO SOUTH

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

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Thes is my 2ND form the I picked Wrong # option SORRY

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Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
122 Royal Beach DR. W.B L9Z 2N2

COMMENTS (Please use the back of this sheet if necessary)
Should be (# 4) Option (Not) #3 on my first form I filled out.

This option # 4 is the best for all the W. Beach residents and all the summer traffic we have in the summer months.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☒ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

Property Owner

ADDRESS (Including Postal Code & Telephone Number):

145 Fernbrook Dr, Wasaga Beach, ON, L9Z 1G9.
705-444-4012

COMMENTS (Please use the back of this sheet if necessary)

- It is highly desirable that all utilities (wire) be placed underground rather than on numerous, ugly, imposing poles because:
  1. It maintains the natural beauty of this corridor,
  2. To avoid future power outages due to downed hydro wires,
  3. To eliminate numerous obstacles ~~~~ (poles) which can be struck by out of control vehicles
  4. To allow greater space in which to construct a walkway
- The plan must provide a wide walkway/bike path along the route. This path must be protected/divided/set back as much as possible from the roadway.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☒ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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Collingwood ON

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

Property Owner

ADDRESS (Including Postal Code & Telephone Number):

42 Brillinger Dr.
L8Z 1L4

COMMENTS (Please use the back of this sheet if necessary)

It is already very busy for people entering or leaving our street. Clearly, the proposed option would make it much worse.

Others must share this concern. Much more info is needed

Which option do you prefer?

☒ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

1462 RIVER RD WEST L9Z2W5

COMMENTS (Please use the back of this sheet if necessary)

FROM MY PERSPECTIVE, PUTTING IN A CENTRE LANE WITH MORE TRAFFIC LIGHTS WOULD SLOW DOWN AND DEFER BY PASS TRAFFIC, AND KEEP COST TO A MINIMUM

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☒ No

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Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROP OWNER

ADDRESS (Including Postal Code & Telephone Number):

24 DYER DR L9Z 1E2

429 1082

COMMENTS (Please use the back of this sheet if necessary)

I DO NOT WANT A 4 LANE HIGHWAY ON RIVER RD WEST.
AT PRESENT TO MANY AGGREGATE TRUCKS AND OTHER TRC
TRUS USE RIVER RD WEST AS A SHORTCUT. THE OPTION IS TO
HAVE THESE VEHS USE A BY PASS. ALSO BUILDING OF MORE
HOUSEING DEV SHOULD BE SLOWED DOWN IN THE WEST END
UNTIL THE ROAD PLAN IS FINISHED

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

OWNER

ADDRESS (Including Postal Code & Telephone Number):

1336 RIVER ROAD W.

905 271-5322.

COMMENTS (Please use the back of this sheet if necessary)

I cannot believe that creating a highway in a residential area is considered acceptable. If Wasaga is to grow as planned then surely an alternative route is needed.

I do not believe that individuals who currently use River Road west are making stops along the way unless they are visiting friends.

During my career I have written many proposals & have never written one so skewed as this presentation

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☑ ~~Option 4~~ ☑ ~~Option 5~~

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Collingwood ON

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1222 RIVER RD WEST L9Z 2R7

COMMENTS (Please use the back of this sheet if necessary)

MUCH NEEDED TO ALLOW TRAFFIC TO FLOW IN A RESPONSIBLE WAY PUTTING A THIRD LANE FOR LEFT TURNS ALSO MORE TRAFFIC LIGHTS TO BE INSTALLED TO SLOW DOWN HEAVY TRUCK TRAFFIC MAYBE EVEN GET RID OF THEM.
STORM SEWERS SHOULD BE INSTALLED AND CURBS TO ELIMINATE ALL OF THE WATER PUDDLES

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

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☐ Yes ☐ No

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
OWNER

ADDRESS (Including Postal Code & Telephone Number):
53 BUSH CRES. WB.
L9Z 1N1 705-429-5903

COMMENTS (Please use the back of this sheet if necessary)
I HAVE LIVED AT ABOVE ADDRESS FOR 10 YEARS AND RIVER RD W. IS MY MAIN ACCESS TO EAST + WEST WASAGA BEACH. I HAVE NEVER EXPERIENCED ANY MAJOR TRAFFIC DELAYS ON RIVER RD W. THERE IS NO NEED TO WIDEN THIS ROAD FROM TWO LANES. TO DO SO IS A TOTAL WASTE OF TAXPAYER DOLLARS.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☒ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1396 R.R.W. L9Z 1A4

COMMENTS (Please use the back of this sheet if necessary)

ADD A THIRD LANE & CURBS FOR LEFT TURNS ADD STOP LITES AT MOUTH OF ROADWAY CROSSING R.R.W. HOPEFULLY THE STOP LITES WILL DETER TRUCK TRAFFIC.

STORM SEWERS TO RELIEVE FLOODING OF R.R.W.. POSSIBLY A SIDEWALK ON ONE SIDE.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

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☐ Yes ☐ No

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Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

1264 RIVER RD. WEST

WASAGA BEACH L9Z 2W6 429-5763

COMMENTS (Please use the back of this sheet if necessary)

OPTION FOR THE BY-PASS IS THE OPTIMUM SOLUTION. WIDENING RIVER RD. W. TO A 4 LANE STREET WOULD CAUSE THIS ROAD TO BE A LARGER TRUCK ROUTE THAN IT ALREADY IS. AS A RESIDENT ON RIVER ROAD, I CONSTANTLY WITNESS SPEEDING CARS + TRUCKS. PERHAPS A TURNING LANE WOULD HELP CONGESTION, BUT A 4 LANE WOULD TURN A LOVELY STREET INTO A HIGHWAY.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☒ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

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THE TOWN OF
WASAGA BEACH

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
710 Melrose ave L9Z-2T1 - 705.429.3621

COMMENTS (Please use the back of this sheet if necessary)

no 4 lane on River Rd.
no-no - extension of Knox Rd.

Bicicle lane and side walk on River Rd and a turnig lane.

Best thing bypass on 12 line.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☒ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property Owner

ADDRESS (Including Postal Code & Telephone Number):
1264 River Rd. West
W.B. L9Z 2W6 429-5763.

COMMENTS (Please use the back of this sheet if necessary)

DO (NOT) WANT RIVER RD. W. TO BECOME A 4 LANE (HIGHWAY) — TRUCKS & CARS ARE NOW (BLASTING) DOWN RRW AT EXCESSIVE SPEEDS !! CAN YOU IMAGINE WHAT WOULD HAPPEN IF IT BECAME 4 LANES? I CAN!!
I WANT OPTION 4 WITHOUT A DOUBT !!!
TRANSPORT TRUCKS AS IT IS TODAY SHOULD (NOT) BE ALLOWED UNDER (ANY) CIRCUMSTANCES ON RRW. !!!!
Concerned !!

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☒ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

42 INNISBROOK Dr.
Wasaga Beach

COMMENTS (Please use the back of this sheet if necessary)

We do not need 4 Lanes. We need 3 Lanes with a Centre Lane for a turning Line.

Stop ahh Big TRUCK for comeing through
only for the ones that Servicе the town Business

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No Send your reply to the Newpaper

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Resp. Owners

ADDRESS (Including Postal Code & Telephone Number):
1250 N. Road Unit 21. 429-7800
137 VeroBeach Blvd N. York Ont. M9M 1R2.
416-742-4894.

COMMENTS (Please use the back of this sheet if necessary)
From the options I saw tonight it appears to us that after owning property in Wasaga for over 60 years that the best option is #5 as it would allow people & traffic who do not want to stop en route are free to avoid it. Trucking would certainly appreciate it. It would use

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☑ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

38 INNISBROOK DR. WASAGA BEACH ONT. L9Z-1G2
705-429-2865

COMMENTS (Please use the back of this sheet if necessary)

I do not prefer any of the options presented at this time.

I believe we only need 3 lanes, one either way and a centre lane to be used for left hand turns this would leave room for bicycle lanes and walking lanes. The only problem we have is the traffic being stop for people making left hand turns.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☒ No

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

38 INNISBROOK DRIVE WASAGA BEACH ON L9Z 1G2

705- 429-2865

COMMENTS (Please use the back of this sheet if necessary)

I do not prefer any of the options presented at this time

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☒ No

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

Property Owner

ADDRESS (Including Postal Code & Telephone Number):

15 Goldsmith Place L9Z 1E4
429-4013 patriciaferguson@rogers.com

COMMENTS (Please use the back of this sheet if necessary)

- disappointed - thought we were coming to a meeting where someone was ~~going~~ going to talk to us & go thru the various options - could have read all this at home
Option 3 - but there was no indication of how many lanes the road would be, 3 would be better than 4 w/ designated safe bicycle lanes and proper sidewalks for pedestrians.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☒ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

If by e-mail, not w/ mailed notice – ☒ Yes ☐ No. (Could the notice be put in our local paper?)

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

15 GOLDSMITH PLACE W.O. L9Z 1E4

705-429-4013

COMMENTS (Please use the back of this sheet if necessary)

WIDENING OF R.R. WEST WOULD BE OK IF MOVED TO 3 LANES - ONE BEING A LEFT TURN LANE: IF 4 LANES - SIDEWALKS & A BICYCLE LANE WOULD BE REQUIRED FOR SAFETY AS THIS IS A BUSY PEDESTRIAN / BICYCLE USE ROAD:

4 LANES WOULD BE VERY NOISY FOR HOMEOWNERS ALONG THIS ROUTE AS TRAFFIC SPEEDS WOULD INCREASE AS IT HAS ON MOSLEY WEST - IRRESPECTIVE OF POSTED SPEED LIMITS - CROSSING THE ROAD AT SCHOOLS & CROSS ROADS BY FOOT WOULD BE DANGEROUS.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☒ Option 3 ☐ Option 4 ☐ Option 5

SUGGEST OPTION 4 MAYBE BEST KEEP ~~ALL~~ OPTION

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
122 Royal Beach Dr. W. B. L9Z2N2

COMMENTS (Please use the back of this sheet if necessary)
I vote for option #3 I feel it will serve the whole town best.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☒ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
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280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

95 SILVER BIRCH AVE

COMMENTS (Please use the back of this sheet if necessary)

PLEASE SEE ATTACHED

Which option do you prefer? (FOUR LANES)

☐ Option 1 ☐ Option 2 ☑ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

PUBLIC MEETING WIDENING OF RIVER ROAD WEST

Thurs the 29 of October 2009 7pm

River road west must be widened to four lanes with its present condition it Is a disaster in the making and for the following reasons.

I have been cut off at numerous times while proceeding West across the Schoonertown Bridge and with that said this Bridge has to be widened to four lanes which would make mores sence then widening the Main Street Bridge.

With Mosley Street now at four lanes Schoonertown Bridge to to 45 th street it would be common sense to widen River Road West to four lanes. One can only guess that Mosley street 45 street to Hwy 26
Will be widened to four lanes otherwise why was it done in the first place.

Whenever I am proceeding West on River Road West and want to make a left turn there are always impatient drivers that pass you on the solid white line and not just cars but tractor trailers.This in itself is creating possible deaths of residents on foot entering that very area where cars and trucks drive on.

When you say an option is to widen the Main Street Bridge and
And creating an entirely new street is not a good idea.Has the Town forgotten the extra pedestrian traffic during the summer months in this very area.By creating a new street and to call it a By Pass would not work.A by Pass is always before you get into a Town or City not inside as you make it Look like.

[redacted]

[redacted] @

When River Road west is widened to four lanes a sidewalk will have to be constructed on both sides for pedestrians that is a must for safety.
I say this for a good reason during the summer and fall garage sales are in full swing on both north and south sides of River Road West this again is a disaster in the making by allowing cars to park this impedes pedestrian traffic and also what people seem to forget when this happens and vehicles are parked on both sides it impedes the right of way for Emergency Vehicles fire trucks.police cars and ambulances when one must pull over and give The right of way.

I know you will say this will increase through traffic but that is something we have to live with.From looking at the various county roads has any thought Been given to Concession 12 which of course runs East to West.This would make an ideal by pass for Wasaga Beach and at the same time hook up with Hwy 26 which of course is now under construction.When this widening of four lanes takes place and I hope it does then the speed signs have to be reduced to 40 through town oh yes I know everyone drives 10 and over I do it myself then vehicles will be traveling at 50 as the signs states now.

With what I have mentioned previously and because it has to be within our Municipality There is an alternative to look at Freethy Road, Morgan Road and Power Line Road.These Streets are within the Corporate Town Limits and by also creating a new road East through the following roads 12/13 Side Road Sunnydale,Atkinson Road,vigro Road,Crossland Road #29 and then eventually to Hwy 27 by doing this it will also create a by pass for our neighbors to the East of us Elmvale.

[redacted]
95 Silver Birch Avenue
Wasaga Beach

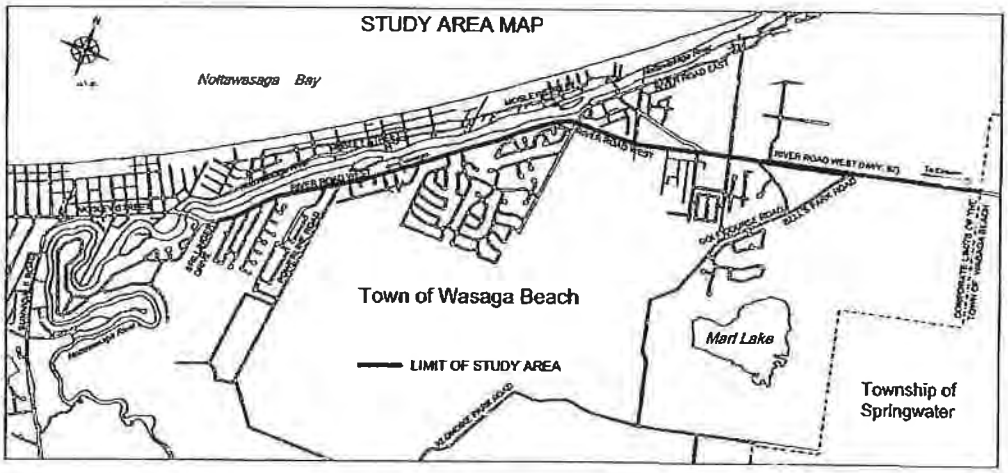
[redacted]

TO	SEEN
MA	
LC	
MFM	
FILE NO. 109049	

TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

Further to the Notice of Study Commencement issued May 27, 2009, the Town of Wasaga Beach is continuing to improve efficiency, enhance safety and address drainage and pavement structure deficiencies in the area of River Road West from Brillinger Drive to eastern Town limits. The Study Area is shown on the map provided below.



Five Options (including Do Nothing) have been identified and evaluated. The Options are presented follows:

- Option 1 – Do Nothing
- Option 2 – Improve Mosley Street from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the Eastern Town Limits
- Option 3 – Improve River Road West From Brillinger Drive to the Eastern Town Limits
- Option 4 – Develop A New By-Pass Route From Highway 26 to County Road 92 Including Building a New Connection from Knox Road to Powerline Road

GO WITH OPTION 4 OR 5, 3 WILL IMPROVE TRAFFIC FOR ONLY A FEW LOCAL CARS GOING EAST BETWEEN W. TRAFFIC HAS 2 LANE SCOONER TOWN RIDGE SO 3 WILL NOT MAKE MUCH DIFFERENCE

[redacted] 7094 River Rd W [redacted]

TO	SEEN
MN	
NEM	
LC	

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

FILE NO. 109049

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property Owner

ADDRESS (Including Postal Code & Telephone Number):
1180 River Road West
Wasaga Beach, ON, L9Z 2W7 429-2775

COMMENTS (Please use the back of this sheet if necessary)
We do not want to see River Rd. West widened to 4 lanes. This is a residential area with a school This road is far too busy with truck traffic using this route as a short cut through the beach to places such as Owen Sound. There should be a by-pass. There should be a centre turning lane on River Rd. West with sidewalks on each side. There should be no ditches

(over)

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☒ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

NOV 0 2 2009

THE TOWN OF
...ASSOC. LTD. WASAGA BEACH

TO	SEEN
MN	
MEM	
LC	
FILE NO.	
109049	

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):
1332 RIVER RD WEST - WASAGA BEACH ON L9Z 2W6
705-429-3245

COMMENTS (Please use the back of this sheet if necessary)

- WE ARE BEING TOLD THAT TRAFFIC VOLUMES HAVE DECREASED.
- WHY ADD ADDITIONAL LANE(S) IF VOLUMES DECREASING
- WHY ADD ADDITIONAL LANE(S) THAT PASS A SCHOOL.
- ADDITIONAL LANE(S) WOULD DECREASE PROPERTY VALUES.
- BAN COMMERCIAL VEHICLES FROM USING ROAD UNLESS MAKING LOCAL DELIVERIES
- ADDITIONAL TRAFFIC WOULD MAKE IT HARDER TO EXIT/ENTER PRIVATE RESIDENCE ON RRW.

Which option do you prefer?

☒ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 446-3451 Ext. 145
Fax: (705) 446-0968

TO | SEEN
MH
LC

FILE NO.
109049

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted] – [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1142 RIVER RD W WASAGA BE L9Z 2W7

COMMENTS (Please use the back of this sheet if necessary)

SEE ATTACHED

Which option do you prefer?

☑ Option 1 ☐ Option 2 ☐ Option 3 ☑ Option 4 ☐ Option 5

AT THIS TIME — INVESTIGATE FURTHER

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

Leave River Road West as is for the time being and investigate option 4 further. Through commercial traffic has decreased due to the fact we have gone from 3 to 13 stoplights. Also, the predicted population growth has been reduced.

We don't want 4 lanes on River Road West, which is prime residential and waterfront property. A third lane would address left turns only and doesn't ease volume issues.

Being realistic it is only a short wait for a break in traffic for left hand turning because of the lights along River Road West.

TO	SEEN
LC	

FILE NO. 109049

NOV 12 2009

& ASSOC. LTD.

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property Owner

ADDRESS (Including Postal Code & Telephone Number):
226 Golf Course Rd
Wasaga Beach L9Z 1S6 705 429-2479

COMMENTS (Please use the back of this sheet if necessary)

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☒ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☒ No

Lilly Chen, M.Sc., P. Eng.

From: Lilly Chen, M.Sc., P. Eng. [chen@ainleygroup.com]
Sent: October 30, 2009 3:55 PM
To: '[redacted]@sympatico.ca'
Cc: 'neumann@ainleygroup.com'
Subject: River Road West EA - PIC Display Materials

Hi [redacted],

Thank you for coming to the Public Information Centre. Attached are the display materials you requested.

Regards,

Lilly Chen, M.Sc., P.Eng.
Senior Transportation Engineer

Ainley Group
550 Welham Road
Barrie, Ontario, L4N 8Z7
chen@ainleygroup.com
Tel: (705) 726-3371
Fax: (705) 726-4391

Lilly Chen, M.Sc., P. Eng.

From: Lilly Chen, M.Sc., P. Eng. [chen@ainleygroup.com]
Sent: October 30, 2009 4:03 PM
To: '[redacted]ga@gmail.com'
Cc: 'neumann@ainleygroup.com'
Subject: River Road West EA - PIC Display Materials

Hi [redacted],

Thank you for coming to the Public Information Centre. Attached are the display materials you requested.

Regards,

Lilly Chen, M.Sc., P.Eng.
Senior Transportation Engineer

Ainley GROUP
550 Welham Road
Barrie, Ontario, L4N 8Z7
chen@ainleygroup.com
Tel: (705) 726-3371
Fax: (705) 726-4391

Lilly Chen, M.Sc., P. Eng.

From: Lilly Chen, M.Sc., P. Eng. [chen@ainleygroup.com]
Sent: October 30, 2009 5:01 PM
To: '[redacted]@sympatico.ca'
Cc: 'neumann@ainleygroup.com'; 'Kevin Lalonde'; 'Jim McIntosh'
Subject: River Road West EA - PIC Display Materials

Hi [redacted]

Thank you for coming to the Public Information Centre. Attached is the map you requested.

Regards,

Lilly Chen, M.Sc., P.Eng.
Senior Transportation Engineer

Ainley Group
550 Welham Road
Barrie, Ontario, L4N 8Z7
chen@ainleygroup.com
Tel: (705) 726-3371
Fax: (705) 726-4391

Lilly Chen, M.Sc., P. Eng.

From: Tom Nollert [nollert@ainleygroup.com]
Sent: November 6, 2009 9:20 AM
To: [redacted]
Cc: Kevin Lalonde; Mike Neumann; Lilly Chen
Subject: Re: River Road contact change - 109049

[redacted]

Further to your request to receive the information presented at the Town of Wasaga Beach PIC, please go to the Town web site link below for direct access to the material.

http://www.wasagabeach.com/WasagaBeach/docs/Dashboard/Whats_New/PIC%20102909.pdf

Also I would encourage you to look on the Town's web site for other related studies which may be of interest.

In the meantime should you have any further questions or require additional information please don't hesitate to contact us.

Regards,

Tom Nollert, CET.
Senior Technologist

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 156
Cell: (705) 443-4863

----- Original Message -----
From: "[redacted]" <[redacted]sympatico.ca>
To: <nollert@ainleygroup.com>
Sent: Friday, October 30, 2009 9:13 AM
Subject: River Road contact change

> Tom W. Nollert, Senior Technologist ... Please change my contact email
> I
> gave you last evening to (jamesl_smith@sympatico.ca). ... I would
> appreciate receiving the River Road improvement information you can
> provide. Thank you for listening to my point of view. .... Cheers, Jim
> Smith, 95 Edgewater Road, Wasaga Beach ON L9Z 2W3 (705) 429 6061
>

Lilly Chen, M.Sc., P. Eng.

From: Tom Nollert [nollert@ainleygroup.com]
Sent: November 6, 2009 11:09 AM
To: [redacted]@sympatico.ca
Cc: Kevin Lalonde; Mike Neumann; Lilly Chen
Subject: River Raod West PIC Information - 109047

[redacted]

Further to your request to receive the information presented at the Town of Wasaga Beach PIC, please go to the Town web site link below for direct access to the material.

http://www.wasagabeach.com/WasagaBeach/docs/Dashboard/Whats_New/PIC%20102909.pdf

Also I would encourage you to look on the Town's web site for other related studies which may be of interest.

In the meantime should you have any further questions or require additional information please don't hesitate to contact us.

Regards,

Tom Nollert, CET.
Senior Technologist

www.ainleygroup.com
Tel: (705) 445-3451 Ext. 156
Cell: (705) 443-4863

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, Ontario L9Y 4J5
Tel: (705) 445-3451 • Fax: (705) 445-0968
E-mail: collingwood@ainleygroup.com

November 6, 2009

File No. 109049

Mr. [redacted]
28 Brillinger Drive
Wasaga Beach, Ontario
L9Z 1L4

COPY

Ref: **Town of Wasaga Beach**
Class Environmental Assessment
River Road West

Dear Mr. [redacted]

Further to your request, we enclose the information presented at the Public Information Centre for the above noted project.

In the meantime, should you have any further questions or require additional information please do not hesitate to contact us.

Yours truly

AINLEY & ASSOCIATES LIMITED

T. Nollert, CET

TN/tk/S:\109049\Correspondence\Letter\2009-11-06-TN-01.doc
Encl.
Cc: Mr. Kevin Lalonde, Public Works Engineer
Mike Neumann, Ainley Group
Lily Chen, Ainley Group

November 26, 2009 File No. 109049

«Title» «First_Name» «Last_Name»
«Address»
«Town»
«Postal_Code»

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment

Dear «Title» «Last_Name»:

As Project Managers for the River Road West Class Environmental Assessment (EA), we are responding to your comments regarding the alternative solutions (options) provided in the Public Information Centre dated October 29, 2009. Given the number of comment sheets (50 in total including one revised comment sheet) we received, we have included your response with the general response to most comments provided by the public in this letter. We believe that you would be interested in the response offered to other members of the public. Included below is a summary of the comments and our response:

1. Comment/Concern:
How many lanes will be on River Road West and will sidewalks and bike lanes/paths be included?

1. Answer:
The number of vehicular lanes, sidewalks and bike lanes/paths will be considered in Phase 3 of the Environmental Assessment – Alternative Design Concepts for Preferred Solution, should improving River Road West be selected as the preferred solution. There will be another PIC in Phase 3.

The project is in Phase 2 – Alternative Solutions. The purpose of this PIC is to consult with the public and agencies regarding problems or opportunities and present alternative solutions to the problems or opportunities.

2. Comment/Concern:
Currently a high volume of truck traffic is using River Road West as a connection between County Road 92 and Highway 26. A by-pass route to divert truck traffic away from the core area of the Town should be considered.

2. Answer:
A traffic infiltration study conducted in June 2008 indicates that the percentage of truck traffic traveling through River Road West without stopping (within 30 minutes) is in the order of 6% to 8%. In the study, license plates for both trucks and cars were recorded at the east and west ends of the route for a 12-hour period from 6:00 to 18:00 in 15 minute intervals. Should a same license plate be recorded at both ends of the route within a 30 minute period, the vehicle is considered a by-pass vehicle.

As the low by-pass volumes may not warrant the high cost of construction for a new by-pass route at this time, the Town's 2008 East-West Transportation Route Study suggested the Town should initiate a traffic volume monitoring program and conduct traffic volume counts at major intersections every 5 years to identify the potential future need of a by-pass route within the Town. The Town's next Transportation Study Update is scheduled for 2011. The need for a by-pass route will be reviewed on an ongoing basis. The need for the by-pass route will likely become evident if an improved River Road West corridor approaches capacity. This would likely occur beyond a 20 year horizon.

3. Comment/Concern:
More traffic lights on River Road West would slow down and deter by-pass traffic.

3. Answer:
New traffic light locations will be considered in Phase 3 of the Environmental Assessment, should improving River Road West be selected as the preferred solution.

4. Comment/Concern:
More information is needed especially regarding future traffic projections and by-pass traffic volumes.

4. Answer:
The Town's 2006 Transportation Study Update is available for review from the Town's website www.wasagabeach.com under the tag "Studies" and the link "2006 Traffic Impact Study and Addendum".

Other studies such as the Town's 2008 East-West Transportation Route Study, Traffic Infiltration Study and Traffic Analysis for River Road West from Brillinger Drive to the Eastern Town Limits are available for review upon request.

5. Comment/Concern:
Widening of River Road West would make the road busier or encourage more truck by-pass traffic on the road.

5. Answer:
A traffic analysis for the section of River Road West from Brillinger Drive to the easterly Town limits indicates that there are 17 developments along the road, which are being built or are undergoing planning to be built in the next 20 years. Weekday PM peak hour trips generated by these developments are in the order of 2200 including both inbound and outbound trips. These volumes can not be accommodated by a by-pass route as their origins or destinations are within the area of River Road West. Even with a by-pass route being built, additional road capacity is required on the section of River Road West.

6. Comment/Concern:
Let's build for the long term and build another east-west corridor far enough south (option 5) so that 15 years from now we do not have a reoccurrence of our present dilemma.

6. Answer:
This route (out of Town by-pass) currently exists. Although, the existing Vigo Bridge is a single lane bridge, the County of Simcoe is conducting a Class Environmental Assessment for the replacement of the existing Vigo Bridge. As indicated in Plate 9 of the PIC display board, the County of Simcoe is planning to upgrade the section of 27/28 Sideroad in the next 10 years and to upgrade Concession 12 and Flos Road 4 in the next 20 years. Thus, regardless of whether the Town will improve this route or not, most of this route will be improved in the next 20 years.

7. Comment/Concern:
The road is not safe for children and pedestrians.

7. Answer:
As part of this EA, pedestrian safety issues will be addressed in the next Phase along with active transportation components.

In addition to the above information, several written responses did include a preference to which options should be selected. Included below, we provide a table outlining a summary of the preferred choices:

Options	Number of Comment Sheets	
	Total	Also would like improvements on River Road West
No Options	12	6
Option 1 – Do Nothing	4	
Option 2 – Improve Mosley Street from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the easterly Town limits	3	3
Option 3 – Improve River Road West from Brillinger Drive to the easterly Town limits	9	9
Option 4 – Develop a new by-pass route from Highway 26 to County Road 92 including building a new connection from Knox Road to Powerline Road	10	4
Option 5 – Adopt part of the County of Simcoe's Alternate east/west corridor through the Georgian Triangle outside of the Town from Highway 26 to County Road 92 via 27/28 Sideroad, Concession 12, Flos Road 4 and Vigo Road	9	3
Options 4 and/or 5	2	
Total	49	25

We wish to thank you for your interest in this Class EA and we encourage you to continue to provide comments as the planning proceeds. There will be another Public Information Centre in Phase 3. A Notice of Public Information Centre will be published in the local newspaper and on the Town's website. We are continuing to document the Class EA planning process to address road capacity, pedestrian safety, drainage and pavement structure deficiency issues and to incorporate Active Transportation. As the EA continues for the area of River Road West from Brillinger Drive to the easterly Town limits, we will include you on our contact list to keep you informed as the study proceeds.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Jim McIntosh, Director of Public Works, Town of Wasaga Beach
Kevin Lalonde, Public Works Engineer, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group

T:\109049\109049-Lilly\Correspondence\Letter\Response Letters\PIC 1 response letter Nov 26 2009.doc

Lilly Chen

From: Mike Neumann [neumann@ainleygroup.com]
Sent: December 21, 2009 5:47 PM
To: Kevin Lalonde; Jim McIntosh
Cc: Lilly Chen
Subject: RR West Phone call from [redacted]

Hi Jim and Kevin

[redacted] called me today regarding the RR West EA study and inquired on the status. I advised that we are moving towards the Phase 3 PIC, which could be held as early as end of Jan or beginning of Feb/2010. [redacted] is gathering signatures for a petition, which will be sent to the Town shortly apparently. It will say that they do not support anything in the way of 4 lanes without bike lanes. He questioned what would be presented at the PIC subject to Town approval since he will be down south for the winter during the next few months. I advised that we are required to receive endorsement from Town staff and committee although at the moment we are recommending 3 lanes with bike lanes and sidewalks although wide enough to go to 4 lanes in the future if required. I advised that everything has a life expectancy and the recommended option has an expectancy of about 20 years depending on background growth, development growth etc. At some point in the future (beyond 20 years), if the roadway approaches capacity, it will be necessary to seek another east/west arterial. I advised that it is not feasible to introduce a new route at this time since most of the traffic is local traffic. [redacted] understood. I also offered that we would keep him informed and on the contact list and advised that PIC information can be found on the Town's web page. We will also send [redacted] a copy of the PIC response issued to various persons that had questions separately. This generally summarizes my conversation with [redacted]

Regards,

Mike Neumann, P.Eng
Vice-President, Transportation Engineering

Ainley Group
289 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

neumann@ainleygroup.com
phone (705) 445-3451 ext.145
fax (705) 445-0968
cell (705) 443-1721
www.ainleygroup.com

APPENDIX N

Minutes of Meetings

Report of the Town of Wasaga Beach **PUBLIC WORKS COMMITTEE** meeting held Wednesday, November 18, 2009, at 8:30 a.m. at the Classroom.

PRESENT:	R. Archdekin	Councillor
	N. Bifolchi	Councillor, Chair
	D. Foster	Deputy Mayor
	S. Wells	Councillor
	G. Vadeboncoeur	C.A.O.
	J. McIntosh	Public Works Director
	S. Chapman	Recording Secretary

1. CALL TO ORDER:

Councillor Bifolchi called the meeting to order at 8:30 a.m.

2. DISCLOSURE OF PECUNIARY INTEREST:

None.

3. DEPUTATIONS/PRESENTATIONS/PETITIONS:

a) **Mr. Pincivero from Ainley & Associates attending meeting to provide Engineer's Report on Capital Works Project Status Report.**

Mr. Pincivero briefly outlined the Project Status Report dated November 13th, 2009 as follows; He stated with reference to the 40th Street South Project, they are anticipating to pave today and the grading and placement of sidewalks is expected to be done the week of November 26th, 2009. He then spoke with regard to the Zoo Park Road South Reconstruction/Storm Sewer/Forcemain Project. He indicated that the surface course asphalt is expected to be done by this week. He spoke to the 57th Street/Shore Lane Drainage Improvements Project noting that the oil grit separator unit was installed on November 10th and pointed out that the Contractor has been working on Saturdays to maintain their construction schedule. Mr. Pincivero then spoke with regard to the 45th Street Reconstruction Project. He stated that the base coat of asphalt has now been placed on 45th Street and on the side streets Ferndale Drive and Wilson's Gate.

Mr. Pincivero then spoke with regards to the Design Projects; He stated the Robinson Road SWM Pond and Robinson Road Servicing Project Public meeting that was scheduled for November 21st, 2009 has been rescheduled for a later date, the date is still not determined.

Mr. Neumann stated he wants to send out response letters to those individuals that responded with their comments, advising them of other comments that were also addressed by other individuals. He further stated that he will be bringing forward a recommendation to Committee for further discussion.

Mr. Neumann then identified the most common comments mentioned and his responses to those comments. Councillor Bifolchi then inquired if Committee will be getting a copy of all the information received? Mr. Neumann stated he has prepared a Draft at this time and he did not include any of the comments with his Memo Report, due to the Freedom of Information Act.

Councillor Wells inquired if only one half of one percent of the population of Wasaga Beach has responded to this Public Information Session, his question is in terms of comments received, how is a decision determined based on this information and is it a valid decision? He stated there are always going to be individuals that stated that they did not know or hear about it afterwards.

Councillor Wells then spoke with regard to the Truck Traffic Study. He stated it was mentioned that 6-8% was through traffic and out of the total was 3% truck traffic. Mr. Neumann agreed. Councillor Wells stated this number is consistent with the Report that was conducted back in 1999. Mr. Neumann stated the new study recently done, we recommended going through a consultant for this information and data. He stated they recorded data from both ends of town, whereas the prior study done was more visible. Mr. Lalonde stated the newest report actually has truck traffic recorded. Mr. McIntosh stated the 1999 Report provided only percentages and not actual numbers.

Councillor Archdekin stated it is interesting that only eighty people attended the Public Information Center. He agrees to Mr. Neumann responding back to the individuals as he has described. He stated anyway we can reach out to people is great. He stated he likes the idea that this is moving forward to another meeting. He stated we are going through a process here and he is happy with the way it is being handled. Mr. Neumann stated in terms of percentage turn out at the Public Information Center, they have had less people attend other Public Information Centers. He stated they consult and provide the opportunity for the public to attend. He stated a traceable process must be conducted, which is what they are doing.

Mr. Neumann stated they wish to proceed with advertising for the Study, but now that it is getting closer to Christmas holidays, he wondered if it would be better to proceed with this at the next meeting in January.

PUBLIC WORKS COMMITTEE

REPORT

Held Thursday, August 26, 2010 at 8:30 a.m.
In the Classroom, Town Hall

PRESENT:	N. Bifolchi	Councillor/Chair
	C. Patterson	Mayor
	D. Foster	Deputy Mayor
	R. Archdekin	Councillor
	C. Gray	Councillor
	G. Watson	Councillor
	G. Vadeboncoeur	Chief Administrative Officer
	K. Lalonde	Acting Director of Public Works
	S. Chapman	Recording Secretary
ABSENT:	S. Wells	Councillor

1. CALL TO ORDER

Councillor Bifolchi called the meeting to order at 8:33 a.m.

2. DISCLOSURE OF PECUNIARY INTEREST

Councillor Gray and Councillor Watson declared a disclosure of pecuniary interest with respect to item 3. b) regarding the Marina shoreline retaining wall construction and cost recovery options as it pertains to a family member.

Councillor Bifolchi advised Committee that she is requesting to change the order of the Agenda to discuss item 3. d) after item 3. a). She mentioned that Councillor Wells is not present for this meeting and has some concerns with the River Road West Class Environmental Assessment that needs to be addressed in detail.

3. DELEGATIONS/PRESENTATIONS

a) Mr. Larry Young from Ainley & Associates attending meeting to provide an update with regards to the status of the Capital Works Projects.

Mr. Young briefly reported on the status of the Capital Works Projects to date.

He stated that the majority of the construction projects that were ongoing are at near end completion. He stated these construction projects are now under maintenance warranty, he then identified those projects as outlined in his report.

Mr. Young then spoke to the design projects that they are anticipating going to construction shortly. Deputy Mayor Foster then entered the meeting. He stated the Robinson Road SWM Pond and Robinson Road Servicing Project there were separate meetings held with MNR, including Mayor Patterson and Mr. Vadeboncoeur and a later meeting with Public Works and Ainley and Associates regarding the outfall along Mosley Street. He mentioned that as a result of that meeting, it was indicated that and easement or land acquisition could be made through an MNR Administrative Amendment. He further stated that MNR staff would prepare the required documentation with input from Town staff and Ainley & Associates as required. He stated Mr. Tom Nollert is following up with MNR as to the status of this documentation and timing of this.

Mr. Young then spoke to the Trillium Creek Flow Containment Berm Project. He stated following a tree inventory that was conducted, they found two butternut trees within close proximity to the proposed berm. He stated butternut trees are considered a Species at Risk and therefore require special attention and mitigation measures. He indicated that a health assessment has been carried out and forwarded to the MNR and are awaiting follow-up from the MNR to discuss mitigation options.

Mr. Young then spoke to the 71st Street Drainage Outlet Canal Project. He stated they were requested to look at repairing the outlet, including the undermined area where it spills out to the bay, which needs to be cleaned up. He brought to Committee's attention that they are still awaiting N.V.C.A. and DFO approval before this work can commence.

Mr. Young advised Committee that the Schoonertown Bridge Widening Design Project will be discussed later on in the Agenda as well as the River Road West Schedule 'C' Environmental Assessment Project.

Mr. Young stated at the last Public Works Committee meeting there was discussion on the MTO Highway 26 New Alignment Project. He stated subsequent to that discussion, there was assistance from the Mayor and Council on this matter. Mayor Patterson stated he has since forwarded a letter to the Minister of Transportation, Honourable Kathleen Wynne addressing the Town of Wasaga Beach's concerns and asked for a meeting with the Ministry of Transportation as soon as possible. Mayor Patterson stated he is hoping to hear back from them before the next Public Works Committee meeting. Mr. Young advised Committee that the Ministry of Transportation has allowed permission for the Town of Wasaga Beach to proceed with the geotechnical investigation, in association with municipal service crossing work that needs to be done.

Mr. Lalonde then spoke to the Mosley Street, Phase II Project. He stated the Contractor has offered the Town of Wasaga Beach a credit for this Project and to leave the deficiencies as is. Mr. Lalonde stated he will be meeting with Mr. Tom Nollert and the Contractor on this and will be bringing forward to the next Public Works Committee meeting options to bring this to an end. Councillor Watson inquired if this was in regard to the manhole deficiencies? Mr. Lalonde stated that is the main issue; however, additional minor deficiencies remain outstanding.

Councillor Bifolchi inquired about the Robinson Road Servicing Project and if a meeting can be scheduled for the fall to notify the residents on the status of this project. Mr. Young suggested giving the residents an update on the status of the project by sending them a letter. He stated the expectation is to move forward with the construction of the pond at this time. Mr. Young suggested not scheduling a meeting at this time, until completion of the detail design and phasing is addressed and the costs for servicing still has to be established. Mr. Young stated direction is required on detail design before they can move forward. Discussion then ensued with respect to two items that were previously discussed at the public meeting involving fill having to be brought in and reviewing possible changes to the lot fabric. Mr. Vadeboncoeur stated costs were unknown at the time of the meeting. He stated the residents need to be aware of why this fill needs to be placed as this is key information. It was suggested that the Planning Department should be made aware of this so they may assess this. Mr. Lalonde stated he was not sure if they have done anything with this. Mr. Young suggested that Mr. Kelso be given direction to look into this. Councillor Bifolchi stated the residents need to know that this needs to be done. Councillor Archdekin suggested preparing an Interim Report on the status of this project to date. Mayor Patterson stated he has not had as many inquiries as in the past.

Discussion then ensued as to why this area is so much more complicated in developing then the Zancor Development that was done years ago along 58th Street South. Councillor Watson stated when Zancor Development put in servicing, they did not have to raise the land and this is in the same vicinity as Robinson Road. Councillor Bifolchi stated requirements are much different now. Mr. Young stated this is a low lying area and they need to establish grade for this area and establish downhill grade out of this area. He stated the overland flows need to get to the pond and it is a concern in this area, whereas in the Zancor Development it was not a concern. Councillor Bifolchi requested that we go ahead with preparing a letter and moving forward on this. Mr. Lalonde stated that a letter report will be prepared and suggested having it placed on the website as well.

Councillor Bifolchi then inquired about a Tour of the Trillium Creek Berm. Mr. Lalonde stated he will follow up on this Tour this afternoon to arrange a date and time. Deputy Mayor Foster inquired if the Tour can be set up for sometime after 4:30 p.m. preferably.

Mayor Patterson stated the Bay Colony Residents have been asking when the tour is taking place and if they can be notified of this. Mr. Lalonde stated he will notify Mr. Pratt once a date and time has been scheduled.

MOVED BY R. ARCHDEKIN
SECONDED BY C. GRAY RESOLUTION NO. 2010-08-01

RESOLVED THAT the Public Works Committee does hereby receive the Ainley and Associates Engineer's Report on Capital Works Projects, as information.

CARRIED

Councillor Bifolchi then asked Committee to move to item 3. d).

d) Mr. Mike Neumann from Ainley & Associates attending meeting to present the 'Draft' Environmental Study Report (ESR) for River Road West Class Environmental Assessment.

Councillor Bifolchi stated that Councillor Wells is not present for today's meeting and has addressed concerns with respect to the River Road West Class Environmental Assessment and the fact that Council as a whole has not had an opportunity to discuss this.

Mayor Patterson stated he met with Councillor Wells with respect to an ongoing discussion on the engineering aspects of the Schoonertown Bridge and the River Road West Class Environmental Assessment beyond Brillinger Drive. He advised Councillor Wells that he would pass his information on for further discussion by Committee. A drawing was then circulated to Committee outlining Councillor Wells concerns for the bridge design and also included an alternative design option for River Road West.

Mr. Lalonde then spoke with regard to the sketch provided, which included the preferred design alternative for the widening of Schoonertown Bridge, including four lanes of traffic, two paved shoulders and 1.8m concrete sidewalks. He mentioned that the Schoonertown Bridge project underwent a Schedule 'C' Class Environmental Assessment planning process, similar to that which we are currently undergoing for River Road West Urbanization. The Class EA for the bridge was initiated in 2008, with the Environmental Study Report filed with the Ministry in August 2009. Consistent with the problem statement for River Road West, the Schoonertown Bridge underwent an EA planning process to address traffic congestion in the area of the bridge. There were two public meetings held and the public was provided the opportunity to comment on this. He then clarified that the 1.0m bike lane as noted on the sketch should be identified as a paved shoulder due to it's width of 1.0m; as this lane will not be marked as a bike lane. Bike lanes require a minimum 1.5 metres.

He stated the wider curb line and paved shoulder is for safety purposes, to allow more room for cyclists and provide greater separation from pedestrians on the sidewalk to vehicles and trucks travelling along the curb lane. He stated the sidewalks are 1.8 metres wide due to the fact that they are abutting the curb along a major arterial road. He pointed out that we have ample right-of-way to accommodate this cross-section and agreed that this design alternative was appropriate, recognizing that a bridge structure could last upwards of 50 to 100 years and we need to construct this to accommodate long term traffic projections.

Mr. Lalonde then spoke with regard to the preferred design alternative for River Road West Class Environmental Assessment. He stated the transition from bike lanes (River Road West) to no bike lanes (Schoonertown Bridge) will take place at the controlled signalized intersection at Oxbow Park Drive, as this was considered the safest location for the transition as opposed to the Riverbend intersection at Mosley Street. He agreed that the bridge cross-section does not conform with the existing Mosley Street widening, nor River Road West to the east because these areas are limited to 20 metre right-of-ways; whereby Schoonertown Bridge has a right-of-way width of approx. 30-40 metres. He then spoke to the future traffic capacity and the four lane cross section. He stated they considered three lanes for the bridge, but it was recommended that four lanes be considered to accommodate future traffic projections. Similarly, the widened shoulder can also be accommodated for increased safety. Mr. Neumann further commented that the costs for future expansion, if we only accommodated a reduced cross-section at this time, would be considerably greater.

With respect to the alternate River Road West design alternative, as identified on the sketch from Councillor Wells, Mr. Lalonde noted that this is Concept #3 from the current design alternatives that have been considered as part of the River Road West EA. He stated they looked at this concept but it was not brought forward due to the fact that there is no flexibility, should future expansion to 4 lanes be considered once the 3 lane section exceeds capacity. Discussion then ensued with respect to the projected traffic volumes and growth rates that suggest that a 3 lane section could meet or exceed capacity in 2026. At this time, widening should be considered. He stated the cost for a 3 lane concept with no flexibility to expand to 4 lanes is approximately $12 to $15 million dollars; whereas cost for a 3 lane concept with flexibility to expand to 4 lanes is $1 million, including pavement resurfacing and line painting. Mayor Patterson then inquired if the County of Simcoe 12th Concession by-pass has been taken into consideration for future widening in 2026? Mr. Neumann stated that the forecast for 2026 takes into account the by-pass route which would divert traffic to that route when congested. Mr. Lalonde stated that the Town of Wasaga Beach Transportation Study is updated every 5 years to confirm traffic projections, including traffic volumes projected for 2026.

Councillor Bifolchi stated Councillor Wells has indicated that we have not approved the preferred option and that we have only received it as information only. She stated there was input at Committee of the Whole and stated there were seven options which increased to nine. She stated she would like to continue moving forward with this project. Mr. Lalonde commented the Class Environmental Assessment for the bridge has been completed and filed with the Ministry; and further noted that the detail design was based on this design alternative and is currently 90-95% complete. He stated if any changes were to be made to the bridge section, they would have to go back and reopen the Environmental Study Report and prepare an addendum, which would require public consultation. With regards to the River Road West Class EA, Mr. Lalonde indicated that there would be additional engineering costs, associated with meeting preparation, presentation, etc. to defer this project another month. Councillor Bifolchi pointed out that this option was included as Concept 3 and this concept was discussed. Kevin agreed. Mr. Lalonde then stated that the design of the first phase of River Road West from Brillinger Drive to Powerline Road was slated for this year; however, the EA process has been extended to accommodate the 3rd Public Meeting. He further noted that the design costs will move into next year's budget. Mr. Lalonde stated that this phase of River Road West design will be subject to a Request for Proposal for Engineering Services, as this exceeds the fee threshold for engineering services provided by the Ainley Group. Mayor Patterson then left the meeting.

Deputy Mayor Foster then asked Mr. Lalonde if he had seen the information provided by Mr. Mickevicius with respect to the cross section and the break between the road and the bike lanes. Mr. Lalonde stated he does not recall seeing any information on this. Mr. Neumann stated there are ways of handling this by pavement texturing or they have islands with landscaping. Deputy Mayor Foster stated he is not in favour of having to expropriate land. He pointed out that the rumble strips have not been good either. But he did address the concern for yard sales along River Road West and people parking on the bike lanes. He stated this is something that has to be taken into consideration and addressed as this forces cyclists out into traffic and we would be putting the public at risk. Mr. Lalonde stated that bikeway design guidelines will be followed according to the Transportation Association of Canada (TAC) specifications, where there will be designated symbols placed and sign notification every so many metres advising the public that these are designated bike lanes. He further indicated that they will be lined 1.5 metres wide with a solid edge line delineating this area. Councillor Watson stated he is not in favour of any expropriation. Mr. Lalonde stated he does not foresee any expropriation that needs to be done; however this will be confirmed at detail design for River Road West once horizontal alignments have been reviewed. Mr. Lalonde stated he received only one comment from the third PIC meeting from a property owner along River Road West where his property has limited set back from the right-of-way, which requires him to park his vehicle within the right-of-way.

He stated that with the urbanization of River Road West, there will no longer be an area for this resident to park within the right-of-way and the resident will have to use the existing garage or explore alternate opportunities to park on the property, perhaps on the west side of the dwelling. Mr. Lalonde noted that staff will continue to work with this property owner as part of detail design. Councillor Watson suggested that the Planning Department should be addressing larger setbacks along these types of roads rather than 20 feet.

Councillor Bifolchi mentioned she was in favour of the proposed design alternative and recommended that we proceed with the filing of the ESR. She then asked if other members were in favour and they unanimously agreed. It was then;

MOVED BY C. GRAY
SECONDED BY R. ARCHDEKIN RESOLUTION NO. 2010-08-02

RESOLVED THAT the Public Works Committee does hereby recommend to Council that Ainley & Associates finalize the Enivornmental Study Report (ESR) for the River Road West Class Environmental Assessment; and

FURTHER THAT the Notice of Completion be published and the ESR be filed with the Ministry of the Environment.

CARRIED

b) Mr. Larry Young from Ainley & Associates attending meeting to provide an update with respect to the Marina shoreline retaining wall construction and cost recovery options.

Councillor Gray and Councillor Watson then declared a conflict of interest with respect to this topic, as it relates to a family member. They then left the meeting.

Councillor Archdekin stated he believes this topic is bordering on an in-camera discussion, as it deals with what we may have to do with the property. Mr. Vadeboncoeur stated he will let Committee know if this needs to go in-camera.

Mr. Lalonde stated that the attached report is a follow-up to last month's Public Works Committee meeting and Mr. Young has prepared a detailed Report on options for construction. Mr. Young stated further to the last Public Works Committee meeting held July 22nd, 2010, at that time there were concerns expressed to Committee regarding the condition of the existing Nottawasaga River shoreline retaining wall that abuts private property adjacent to the Schoonertown Bridge project. Mr. Young mentioned that Councillor Wells had pointed out at that time that the property is currently held in estate, but it is up for sale. Mr. Young then identified the property on a drawing.

APPENDIX O

Cost Estimate for Design Options

Ainley

River Road West Municipal Class EA
Brillinger Drive to Eastern Town Limits
Phase 3 Opinion of Costs Concept Comparative

AAL # 109049
Page # 1
Printed On 20/01/2010 10:09

Concept	Description	Total Cost ($)
Concept #1	3 Lanes with 2 Sidewalks and 2 Bike Lanes	$30,064,000
Concept #2	3 Lanes with 1 Sidewalk and 1 Multi Use Path	$24,675,673
Concept #3	3 Lanes with 2 Multi Use Paths	$25,522,591
Concept #4	4 Lanes with 1 Sidewalk and 1 Multi Use Path	$32,317,274
Concept #5	4 Lanes with 2 Multi Use Paths	$32,800,641
Concept #6	4 Lanes with 2 Multi Use Paths and 2 Boulevards	$32,800,641
Concept #7	3 Lanes with 2 Sidewalks and 1 Bike Lane	$29,624,575
Concept #8	4 Lanes with two Sidewalks	$30,064,000
Concept #9	4 Lanes with two Sidewalks and one Bike Lane	$30,563,968

Notes & Assumptions:

1. Unit prices for new road lanes, and roadway reconstruction are based on benchmark costs from Mosley Street Urban Renewal Phase II
2. All prices have been adjusted to 2009 dollars.
3. Prices do not include property purchase costs.
4. Prices include estimate of utility relocation costs.

Concept #1

	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	2	$550,000.00	$8,525,000.00
Reconstruction	7.75	2	$750,000.00	$11,625,000.00
20% Contingency				$4,030,000.00
5% EA, ENG				$1,209,000.00
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total				$30,064,000.00

4,700,000

Concept #2				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	1	$548,000.00	$4,247,000.00
Reconstruction	7.75	2	$750,100.00	$11,626,550.00
20% Contingency				$3,174,710.00
5% EA, ENG				$952,413.00
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total				$24,675,673.00

Concept #3				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	1	$572,650.00	$4,438,037.50
Reconstruction	7.75	2	$781,140.00	$12,107,670.00
20% Contingency				$3,309,141.50
5% EA, ENG				$992,742.45
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total				$25,522,591.45

Concept #4				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	2	$574,075.00	$8,898,162.50
Reconstruction	7.75	2	$841,300.00	$13,040,150.00
20% Contingency				$4,387,662.50
5% EA, ENG				$1,316,298.75
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total				$32,317,273.75

Concept #5				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	2	$598,825.00	$9,281,787.50
Reconstruction	7.75	2	$841,300.00	$13,040,150.00
20% Contingency				$4,464,387.50
5% EA, ENG				$1,339,316.25
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total				$32,800,641.25

Concept #6				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	2	$598,825.00	$9,281,787.50
Reconstruction	7.75	2	$841,300.00	$13,040,150.00
20% Contingency				$4,464,387.50
5% EA, ENG				$1,339,316.25
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00

Total				$32,800,641.25

Concept #7				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	2	$539,550.00	$8,363,025.00
Reconstruction	7.75	2	$737,950.00	$11,438,225.00
20% Contingency				$3,960,250.00
5% EA, ENG				$1,188,075.00
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total				$29,624,575.00

Concept #8				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	2	$550,000.00	$8,525,000.00
Reconstruction	7.75	2	$750,000.00	$11,625,000.00
20% Contingency				$4,030,000.00
5% EA, ENG				$1,209,000.00
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total				$30,064,000.00

Concept #9				
	Distance(Km)	# Ln	Unit Price/km/Ln ($)	Total Construction Value ($)
New lanes	7.75	2	$565,550.00	$8,766,025.00
Reconstruction	7.75	2	$760,050.00	$11,780,775.00
20% Contingency				$4,109,360.00
5% EA, ENG				$1,232,808.00
Gas Relocate				$1,162,500.00
Bell Relocate				$387,500.00
Hydro Relocate				$3,125,000.00
Total			-	$30,563,968.00

Hydro pole relocation			
	# of poles	**Unit Price/pole relocation**	**Total**
Option #2	150	$10,000.00	$1,500,000.00
Option #3	250	$12,500.00	$3,125,000.00

Note:

1 # of poles is the total poles within the right-of-way for entire length of road being considered

Gas Main Relocation			
	Distance(Km)	**Unit Price/Km**	**Total**
Option #2	7.64	$150,000.00	$1,146,000.00
Option #3	7.75	$150,000.00	$1,162,500.00
Option #4	11.042	$150,000.00	$1,656,300.00

Bell Line Relocation			
	Distance(Km)	**Unit Price/Km**	**Total**
Option #2	7.64	$50,000.00	$382,000.00
Option #3	7.75	$50,000.00	$387,500.00
Option #4	11.042	$50,000.00	$552,100.00

APPENDIX P

Phase 3 PIC # 2

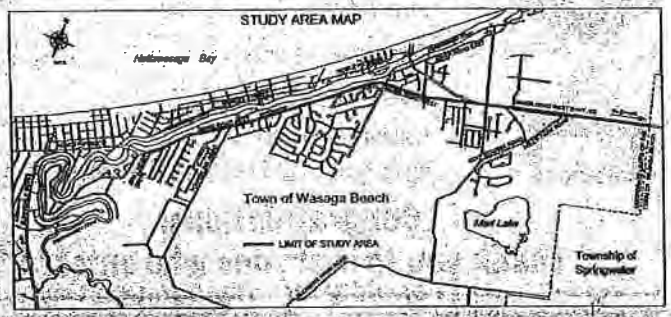
MM/109049

TOWN OF Wasaga Beach
www.wasagabeach.com

NOTICE

TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT
NOTICE OF PUBLIC INFORMATION CENTRE No. 2

Further to the Public Information Centre held on October 29, 2009, the Town of Wasaga Beach is continuing the planning process to improve efficiency, enhance safety and address drainage and pavement structure deficiency in the area of River Road West from Brillinger Drive to the eastern Town limits. Nine Design Concepts for the improvements of River Road West from Brillinger Drive to the eastern Town limits have been identified and evaluated. The Design Concepts included consideration of the number of traffic lanes, the need for sidewalks and/or bicycle lanes or the provision of shared "Multi-Use Pathways". The study location is identified in the key map below:



The Design Concepts are as follows:

- Concept 1 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Sidewalks and 2 Bike Lanes
- Concept 2 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 1 Sidewalk and 1 Multi Use Path
- Concept 3 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Multi Use Paths
- Concept 4 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 1Sidewalk and 1 Multi Use Path
- Concept 5 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths
- Concept 6 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths and 2 Boulevards
- Concept 7 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 1 Sidewalk and 1 Bike Lane
- Concept 8 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks
- Concept 9 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks and 1 Bike Lane

The Phase 3 Recommended Design Concepts are Concept 1 from Brillinger Drive to Main Street and Concept 6 from Zoo Park Road to the eastern Town limits. The Recommended Design Concepts also includes the provision of traffic signals at the intersections of River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Road and Bell's Park Road.

This Project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public information centre (PIC No. 2) is planned to provide further information to the public on the Recommended Design Concepts and to receive input and comment from interested persons. In addition to addressing road capacity, pedestrian safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town has completed the Active Transportation Plan Study and intends to integrate the active transportation components such as pedestrian sidewalks, bicycle lanes, multi-use pathways and public transit into the plan.

Public Information Centre
Time: Open House: 6:30 pm to 8:30 pm
Date: Thursday February 18, 2010
Location: Wasaga Rec Plex – 1724 Mosley St.

Public input and comment on the Recommended Design concepts will be incorporated into the planning process. Comments will be received until Friday March 5, 2010. Subject to comments received as a result of this Notice, the Town plans to instruct the consultant to proceed with the planning for the project. An Environmental Study Report (ESR) will be prepared and placed on the public record for a minimum 30 day review period at the completion of the study.

If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Consultant undertaking the study.

This notice issued February 10, 2010

Mr. Jim McIntosh
Director of Public Works
30 Lewis Street
Wasaga Beach, Ontario
L9Z 1A1
Tel: (705) 429-2540
Fax: (705) 429-8226
Email: publicworksdirector@wasagabeach.com

Mr. Mike Neumann, P.Eng.
Vice-President, Transportation Engineering
Aintey & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0988
Email: neumann@ainleygroup.com

Wasaga Sun
Feb 17/2010

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario L4N 8Z7
Tel: (705) 726-3371 • Fax: (705) 726-4391
E-mail: barrie@ainleygroup.com

February 3, 2010

File No. 109049

Mr. George Vadeboncoeur, CAO
Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, ON, L9Z 1A1

Ref: **Town of Wasaga Beach**
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Public Information Centre

Dear Mr. Vadeboncoeur:

Further to the Phase 2 Public Information Centre (PIC) which was held on October 29, 2009, the Town of Wasaga Beach is continuing to document a Class EA planning process to improve efficiency, enhance safety, address drainage and pavement structure deficiency issues in the area of River Road West from Brillinger Drive to the eastern Town limits. Please see the attached copy of a Notice of Public Information Centre, which will appear in the local newspaper on February 10 and February 17, 2010.

Please contact the undersigned if you have any comments or questions with respect to this Notice.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.

cc: Jim McIntosh, Director of Public Works

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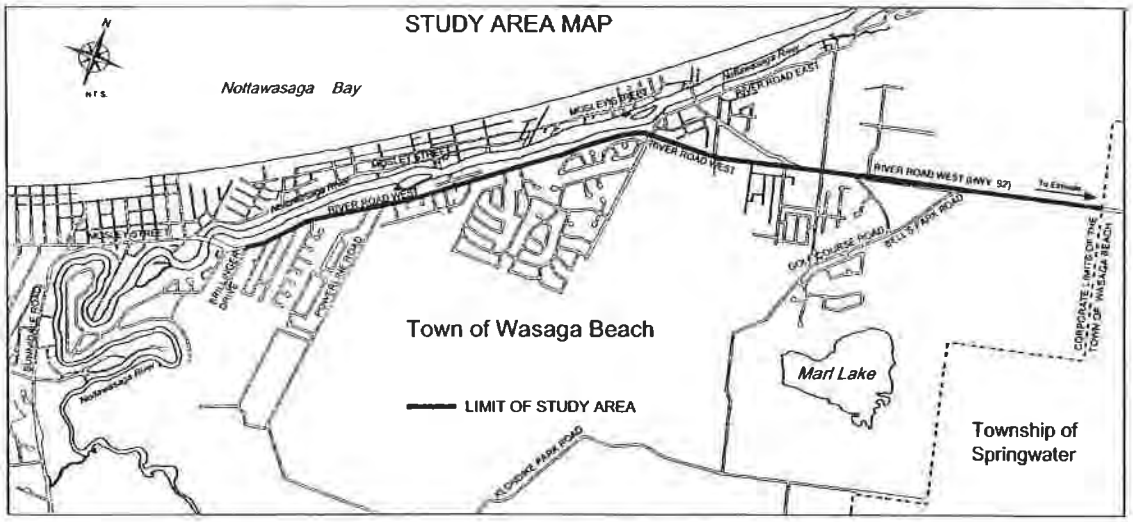
TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE No. 2

Further to the Public Information Centre held on October 29, 2009, the Town of Wasaga Beach is continuing the planning process to improve efficiency, enhance safety and address drainage and pavement structure deficiency in the area of River Road West from Brillinger Drive to the eastern Town limits. Nine Design Concepts for the improvements of River Road West from Brillinger Drive to the eastern Town limits have been identified and evaluated. The Design Concepts included consideration of the number of traffic lanes, the need for sidewalks and/or bicycle lanes or the provision of shared "Multi-Use Pathways". The study location is identified in the key map below:



The Design Concepts are as follows:

- Concept 1 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Sidewalks and 2 Bike Lanes
- Concept 2 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 1 Sidewalk and 1 Multi Use Path
- Concept 3 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Multi Use Paths
- Concept 4 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 1 Sidewalk and 1 Multi Use Path
- Concept 5 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths
- Concept 6 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths and 2 Boulevards
- Concept 7 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Sidewalks and 1 Bike Lane
- Concept 8 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks
- Concept 9 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks and 1 Bike Lane

The Phase 3 Recommended Design Concepts are Concept 1 from Brillinger Drive to Main Street and Concept 6 from Zoo Park Road to the eastern Town limits. The Recommended Design Concepts also includes the provision of traffic signals at the intersections of River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Road and Bell's Park Road.

This Project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public information centre (PIC No. 2) is planned to provide further information to the public on the Recommended Design Concepts and to receive input and comment from interested persons. In addition to addressing road capacity, pedestrian safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town has completed the Active Transportation Plan Study and intends to integrate the active transportation components such as pedestrian sidewalks, bicycle lanes, multi-use pathways and public transit into the plan.

Public Information Centre

Time:	Open House: 6:30 pm to 8:30 pm
Date:	Thursday February 18, 2010
Location:	Wasaga Rec Plex – 1724 Mosley St.

Public input and comment on the Recommended Design concepts will be incorporated into the planning process. Comments will be received until Friday March 5, 2010. Subject to comments received as a result of this Notice, the Town plans to instruct the consultant to proceed with the planning for the project. An Environmental Study Report (ESR) will be prepared and placed on the public record for a minimum 30 day review period at the completion of the study.

If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Consultant undertaking the study.

This notice issued February 10, 2010.

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Fax: (705) 445-0968
Email: neumann@ainleygroup.com

RIVER F. WEST
CLASS EA
COMMUNICATION LIST

Title	First Name	Last Name	Title	Agency	Address	Town	Postal Code
Mr.	George	Vadeboncoeur	CAO	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Ray	Kelso	Manager of Planning & Development	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Jim	McIntosh	Director of Public Works	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Mike	McWilliam	Fire Chief	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Wayne	Wilson	CAO	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Glenn	Switzer	Director of Engineering	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Ms.	Patti	Young	Senior Planner	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Graham	Findlay	Area Biologist	Ministry of Natural Resources	2284 Nursery Road	Midhurst, ON	L0L 1X0
Mr.	John	Fisher	Park Superintendent	Wasaga Beach Provincial Park (MNR)	11-22nd Street, North	Wasaga Beach, ON	L9Z 2V9
Mr.	Chris	Hyde	District Manager	Ministry of the Environment	54 Cedar Pointe Drive, Unit 1203	Barrie, ON	L4N 5R7
Ms.	Chunmei	Liu	Environmental Assessment and Planning Coordinator	Ministry of the Environment	5775 Yonge Street, 8th Floor	North York, ON	M2M 4J1
Mr.	Winston	Wong	Heritage Planner	Ministry of Culture	400 University Ave. 4th Floor	Toronto, ON	M7A 2R9
Mr.	Alejandro	Cifuentes	Heritage Planner	Ministry of Culture	400 University Ave. 4th Floor	Toronto, ON	M7A 2R9
Sir/Madam				Ministry of Labour	1201 Wilson Ave, Building E, 2nd Floor	Downsview, ON	M3M 1J8
Mr.	Paul	Trace	Manager Planning & Technical Services	Wasaga Distribution	950 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Colin	Bonnell	Manager Access Network	Bell Canada	2nd Fl. 136 Bayfield Street	Barrie, ON	L4M 3B1
Mr.	Bernie	Cyr	System Planner	Rogers Cable Systems	1 Sperling Dr., Box 8500	Barrie, ON	L4M 6B8
Ms.	Diedre	Broude	Manager	Enbridge Gas	500 Consumers Rd.	North York, ON	M2J 1P8
Mr.	Luke	Cechetto	Const. (Existing Dev.)	Enbridge Gas	10 Churchill Drive	Barrie, ON	L4N 8Z6
Const.	Mark	Kinney	Community Policing Officer	Ontario Provincial Police	1000 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Wayne	White		Ontario Clean Water Agency	100 Woodland Drive	Wasaga Beach, ON	L9Z 2V4
Mr.	Martin	Rukavina	Advisor	Ministry of Aboriginal Affairs	160 Bloor Street, 9th Floor	Toronto, ON	M7A 2E6
	C.	O'Meara	Bayfield Institute	Dept. of Fisheries & Oceans	867 Lakeshore Road, Box 5050	Burlington, ON	L7R 4A6
Sir/Madam	Environment Unit		Re: Environmental Assessment Coordination	Indian & Northern Affairs Canada	25 St. Clair Ave., E., 8th Floor	Toronto, ON	M4T 1M2
Sir/Madam			Administrative Office	Chiefs of Ontario	111 Peter Street, Suite 804	Toronto, ON	M5V 2H1
Sir/Madam				Metis Nation of Ontario	500 Old St. Patrick St., Unit 3	Ottawa, ON	K1N 9G4
Sir/Madam			Trebla Building	Assembly of First Nations	473 Albert St., Suite 810	Ottawa, ON	K1R 5B4
Mr.	Dave	Simpson		Mississaugas of Alderville First Nation	P.O. Box 4	Roseneath, ON	K0K 2X0
Sir/Madam			Cedar Point Post Office	Chippewas of Beausollel First Nation		via Penetanguishene, ON	L0K 1P0
Sir/Madam				Beausoleil First Nation	1 Ogema Street	Christian Island, ON	L0K 1C0
Karry	Karry	Sandy	Barrister/Solicitor, and Coordinator	Williams Treaty First Nations	8 Creswick Court	Barrie, ON	L4M 2J7
Sir/Madam				Chippewas of Georgina Island	RR#2, Box 12	Sutton West, ON	L0E 1R0
Sir/Madam				Chippewas of Nawash Unceded First Nation	R.R. 5	Wiarton, ON	N0H 2T0
Sir/Madam				Moose Deer Point First Nation	P.O. Box 119	Mactier, ON	P0C 1H0
Sir/Madam				Mnjikaning First Nation	5884 Rama Road, Suite 200	Rama, ON	L0K 1T0
Ms.	Kelly	LaRocca	Councillor	Mississaugas of Scugog	RR#5, 22521 Island Road	Port Perry, ON	L9L 1B6
Sir/Madam				Saugeen First Nation	Highway 21, R.R. #1	Southampton, ON	N0H 2L0
Sir/Madam				Curve Lake First Nation	Curve Lake Post Office	Curve Lake, ON	K0L 1R0
Sir/Madam				Wahta Mohawk	P.O. Box 327	Bala, ON	P0C 1A0
Sir/Madam				Upper Mohawk First Nation c/o Six Nations of the Grand	P.O. Box 5000	Ohsweken, ON	N0A 1MO
Ms.	Wanda	McGonigle		Ojibways of Hiawatha First Nation	RR#2	Keene, ON	K0L 2G0
Mrs.	Heather	Bastien		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Mr.	Luc	Lainé		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Chief	Kris	Nahrgang		Kawartha Nishnawbe First Nation	R.R.#4, General Delivery	Burleigh Falls, ON	K0L 2H0
Chief	Bryan	LaForme		Mississaugas of the New Credit	2789 Mississauga Road, RR#6	Hagersville, ON	N0A 1H0

RIVER) WEST
CLASS EA
COMMUNICATION LIST

Mr.	Paul	Racher		Archaeological Research Associates Ltd	4456 Cedar Springs Road R.R. #1	Burlington, ON	L7R 3X4
Mr.	John	Coulter		J.E.Coulter & Associates	1210 Sheppard Aven.E., Suite 211	North York, ON	M2K 1E3
Mr.	Yurij	Pelech	Senior Planner	EMC Group Limited	7577 Keele Street, Suite 200	Concord, ON	L4K 4X4
Mr	Jeff	Mark		Mark Engineering	250 Bristol Road	Newmarket, ON	L3Y 7X7

The Beach is Just the Beginning

WASAGA Beach

Ainley CONSULTING ENGINEERS PLANNERS

WELCOME

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT
PHASE 3
PUBLIC INFORMATION CENTRE
FEBRUARY 18, 2010

PLATE 1

The Beach is Just the Beginning.
WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

PROBLEM STATEMENT

Based on the Transportation Studies completed between 1999 and 2007 the current annual average daily traffic (AADT) volume reaches the maximum range (12,000 to 15,000 vehicles per day) for a two-lane roadway. Allowing for future growth-related traffic projections based on a 10-year forecast, the Town of Wasaga Beach has identified additional road capacity required to enhance safety in the area of River Road West from Brillinger Drive to the eastern Town limits. The Town also recognizes the need to improve the roadway pavement condition and surface drainage problems in the area. In addition to addressing road capacity, safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town is intending to incorporate recommendations outlined in the Town's Active Transportation Plan Study. This will identify and possibly plan for the integration of active transportation components such as pedestrian, bicycle and public transit.

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WASAGA Beach

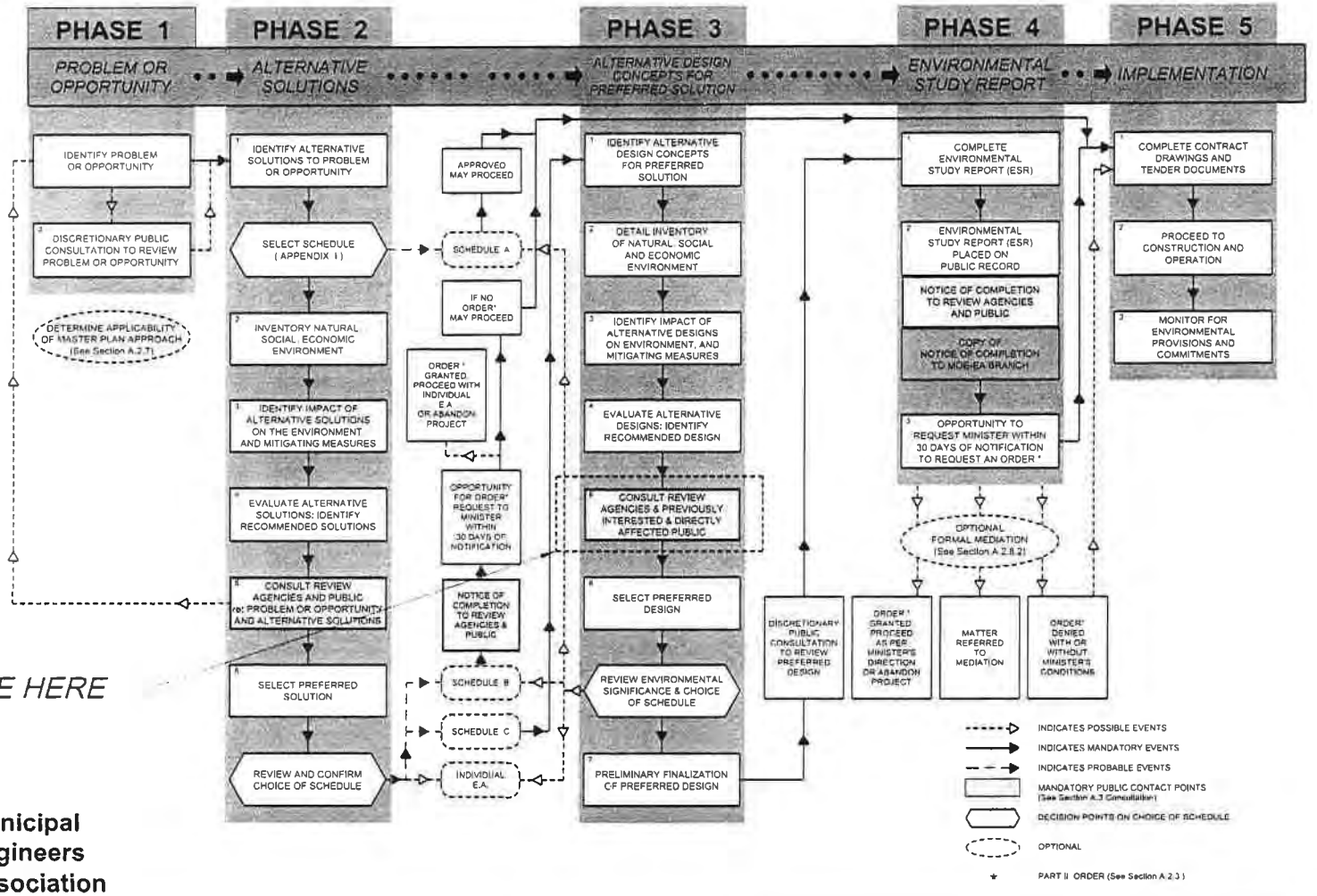
Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

EXHIBIT A.2 — MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



WE ARE HERE

Municipal Engineers Association

PLATE 3

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WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

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ALTERNATIVE SOLUTIONS DEVELOPED AND PRESENTED AT THE 1st PUBLIC INFORMATION CENTRE

The following alternative solutions were presented at the 1st Public Information Centre:

1. Do nothing

2. Improve Mosley Street from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the eastern Town limits

3. Improve River Road West from Brillinger Drive to the eastern Town limits

4. Develop a new by-pass route from Highway 26 to County Road 92 including building a new connection from Knox Road to Powerline Road

5. Adopt part of the Simcoe County's Alternate East/West Corridor through the Georgian Triangle Outside of the Town of Wasaga Beach from Highway 26 to County Road 92 via 27/28 Nottawasaga Sideroad, Concession Road 12, Flos Road 4 and Vigo Road

Alternative solution 3 was chosen as the technically preferred solution

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WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

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IN TOWN BY-PASS ROUTE CONSIDERATION

Bypass Routes Comparison				
City/Town	**Wasaga Beach**	**Collingwood**	**Paris**	**Shelburne**
Road/Highway	River Road West	First Street (Highway 26)	Grand River Street	Main Street (Highway 10)
Current AADT	7,400 – 12,200 (2009)	30,000 (2005)	unknown	Over 17,800 (2006)
Future AADT	16, 100 – 23,900 (2026)	40,000 – 44,000 (2015)	unknown	unknown
% Total Bypass Volumes	5 %	Over 30 %	unknown	44 – 54 %
% Truck Bypass Volumes	6 – 8 %	unknown	53%	64%
Right-of-Way Width	20 m	30 m	30 m	unknown
Existing Number of Lanes	2 (one lane in each direction)	4 (two lanes in each direction)	3 (two lanes northbound, one lane southbound)	4 (two lanes in each direction)
Future Number of Lanes	To be determined	5 (two lanes in each direction and a two-way left turn lane)	unknown	unknown
Will Active Transportation be accommodated?	Yes	Yes, 3 m Multi use trail on the north side and 1.5 m sidewalk on the south side	unknown	unknown
Bypass Warranted?	"No" at this time	Yes (by MTO and the County of Simcoe)	Yes (by the County of Brant)	Yes (by MTO)
When the bypass will be implemented	Unkwnown	In 15 to 20 years	2011 to 2021	unknown

(FIRST STREET) DATA DERIVED FROM "ENVIRONMENTAL STUDY REPORT FIRST STREET AND HURON STREET (HIGHWAY 26), RECONSTRUCTION AND INFRASTRUCTURE IMPROVEMENTS, TOWN OF COLLINGWOOD" R.J. BURNSIDE AUGUST 2006

(GRAND RIVER STREET) DATA DERIVED FROM "COUNTY OF BRANT, TRUCK ROUTE STUDY" TSH JUNE 2004 AND "COUNTY OF BRANT, TRANSPORTATION MASTER PLAN" IBI DECEMBER 2008

(MAIN STREET HIGHWAY 10) DATA DERIVED FROM "HIGHWAY 10 BYPASS FINALLY IN THE WORKS" ORANGEVILLE CITIZEN AUGUST 7, 2008

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WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

ALTERNATIVE DESIGNS

CONCEPT #	DESCRIPTION	ROW WIDTH REQUIREMENT (m)	ESTIMATED COST
1	1- 3.5 m centre left turn lane[1], 2 - 3.5 m curb lanes 2 – 1.8 m sidewalks, 2 – 1.5 m bike lanes 2 – 0.5 m barrier curbs 2 – 0.95 m utility corridors	20.0	$30,100,000
2	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 1 – 1.8 m sidewalk; 1 – 3 m multi-use path 2 – 0.5 m barrier curbs 2 – 1.6 m utility corridors	20.0	$24,700,000
3	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 2 – 3 m multi-use paths 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	20.0	$25,500,000
4	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 1 – 1.8 m sidewalk, 1 – 3 m multi-use path 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	21.3	$32,300,000
5	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 3 m multi-use paths 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	22.5	$32,800,000
6	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 3 m multi-use paths, 2 – 1.5 m boulevards 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	25.5	$33,000,000
7	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 2 – 1.8 m sidewalks, 1 – 1.5 m bike lane 2 – 0.5 m barrier curbs 2 – 1.45 m utility corridors	20.0	$29,600,000
8	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 1.8 m sidewalks 2 – 0.5 m barrier curbs 2 – 0.95 m utility corridors	20.0	$30,100,000
9	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 1.8 m sidewalks, 1 – 1.5 m bike lane 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	21.6	$30,600,000

[1] Less than desirable lane width is provided in order to fit the design to the existing ROW

Alternative Designs were developed based on:

- 3 lanes could accommodate future 2026 traffic volumes
- 4 lanes would be needed in 2026 and beyond
- 4 lane road will be painted and used as 3 lane road before 2026
- Sidewalks and/or multi-use paths/bike lanes should be included to facilitate active transportation
- a 1.0 m utility corridor is required on both sides within the ROW beside the property line to facilitate street lights, gas, Bell and other utility lines

Notes:

1. Unit prices for new road lanes and roadway construction are based on benchmark costs form Wasaga Beach projects.
2. All prices have been adjusted to 2009 dollars.
3. Prices do not include property purchase costs.
4. Prices include estimates of utility relocation costs which is $4,700,000 for each concept.

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WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

EVALUATION OF ALTERNATIVE DESIGNS

Criteria		Alternative Designs								
		Concept 1 – 3 Lanes with 2 Sidewalks and 2 Bike Lanes	**Concept 2 – 3 Lanes with 1 Sidewalk and 1 Multi Use Path**	**Concept 3 – 3 Lanes with 2 Multi Use Paths**	**Concept 4 – 4 Lanes with 1 Sidewalk and 1 Multi Use Path**	**Concept 5 – 4 Lanes with 2 Multi Use Paths**	**Concept 6 – 4 Lanes with 2 Multi Use Paths and 2 Boulevards**	**Concept 7 – 3 Lanes with 2 Sidewalks and 1 Bike Lane**	**Concept 8 – 4 Lanes with 2 Sidewalks**	**Concept 9 – 4 Lanes with 2 Sidewalks and 1 Bike Lane**
Terrestrial Vegetation		Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland
Capital Cost		Higher	Lower	Lower	Higher	Higher	Higher	Lower	Higher	Higher
Operating Cost		Higher	Lower	Lower	Higher	Higher	Higher	Lower	Higher	Higher
Construction, Design, Land Ownership		The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition would be required in 2026.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.
Operational	**Future Capacity**	Longer term (beyond 20 years) vehicular demands could be accommodated if the road would be remarked as a 4 lane road in 2026 and beyond. In this case, additional right-of-way would be required to facilitate active transportation.	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Longer term (beyond 20 years) vehicular demands could be accommodated.
	Flexibility	The road could be used as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.
	Pedestrian Safety	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Longer distance for pedestrians to cross the road. Provides a minimum of 1.5 m permanent boulevard to separate pedestrian traffic from vehicular traffic.	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles. Provides only a single one-way bike lane.	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles Provides no bike lanes/paths in 2026 and beyond	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles Provides only a single one-way bike lane in 2026 and beyond
	Future Public Transportation	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus lanes/bay area.	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.

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WASAGA Beach

Town Of Wasaga Beach

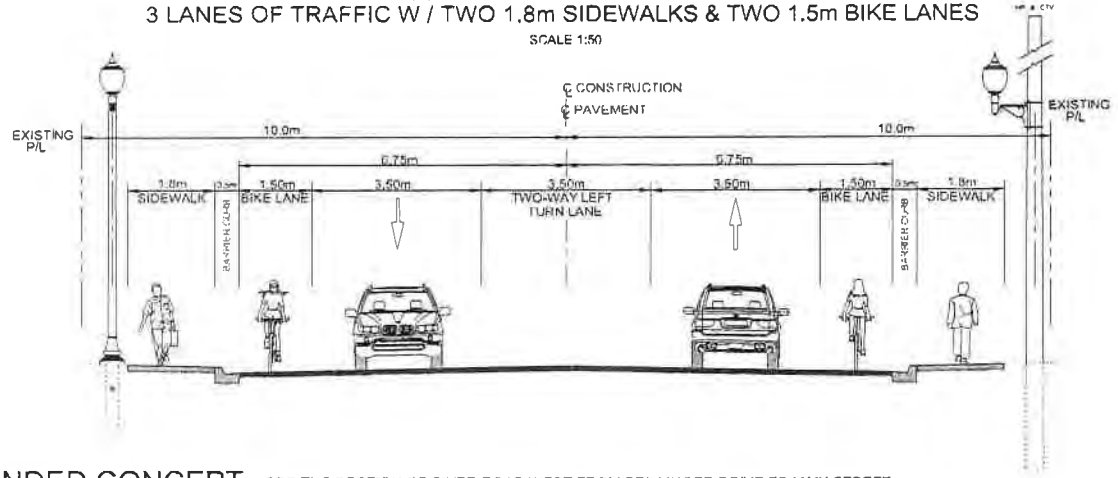
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT #1 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS & TWO 1.5m BIKE LANES

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026 IF REMARKING THE ROAD TO 4 LANES.
FLEXIBILITY	USED AS 3 LANE ROAD BEFORE 2026 AND 4 LANE IN 2026 AND BEYOND
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026.
FUTURE PUBLIC TRANSPORTATION	SHOULD THE ROAD BE REMARKED TO HAVE 4 LANES, OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA.
COST ($ 30 100,000)	THE FIFTH HIGHEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION. ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES.
RIGHT OF WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026 AND BEYOND

RECOMMENDED CONCEPT FOR THE SECTION OF RIVER ROAD WEST FROM BRILLINGER DRIVE TO MAIN STREET

CONCEPT #1 - 2026 AND BEYOND (EXISITNG MOSLEY STREET)
4 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS

SCALE 1:50

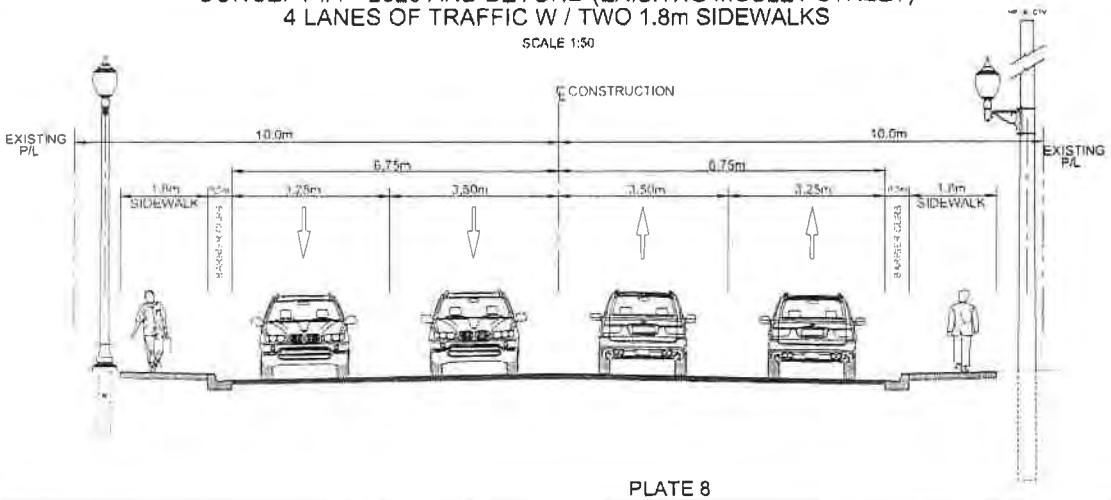


PLATE 8

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

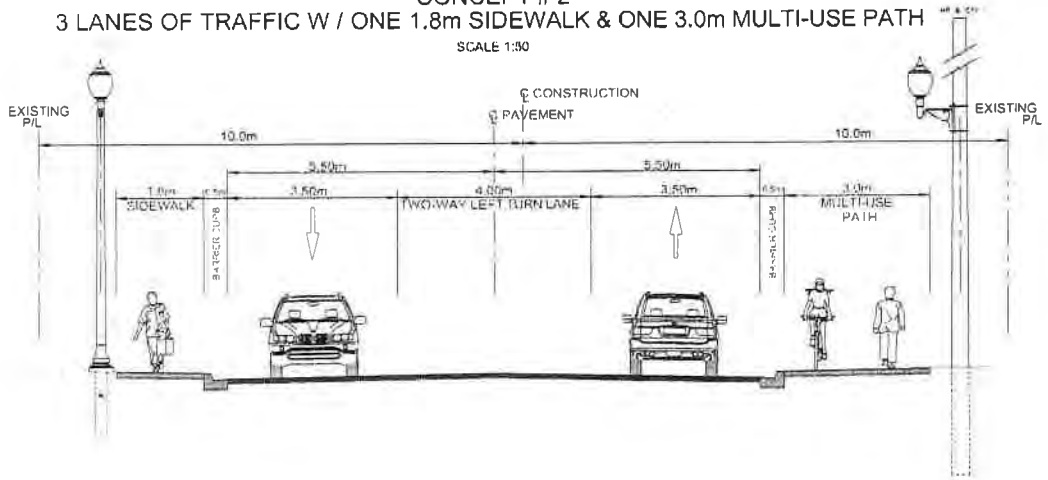
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT # 2
3 LANES OF TRAFFIC W / ONE 1.8m SIDEWALK & ONE 3.0m MULTI-USE PATH

SCALE 1:50



OPPORTUNITIES

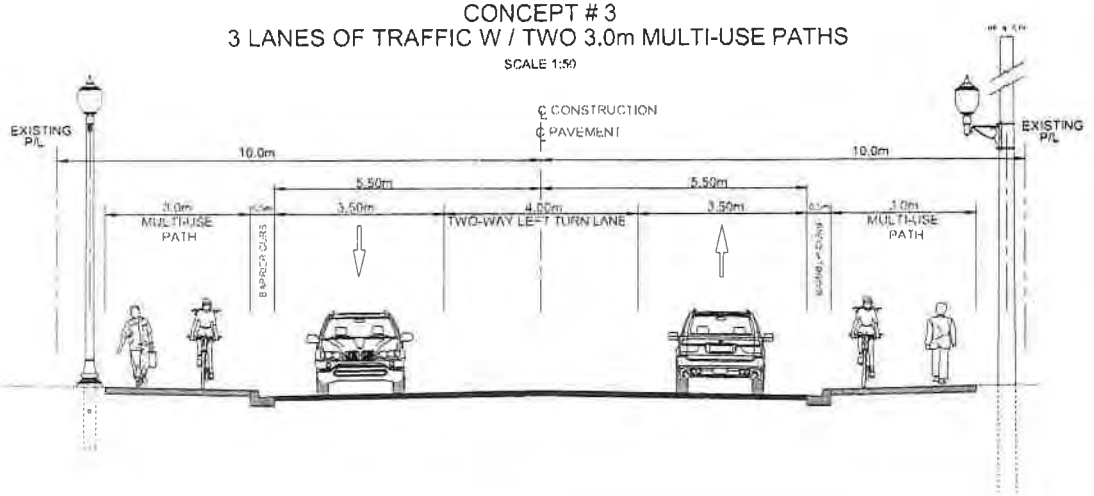
CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEFORE 2026
PEDESTRIAN SAFETY	SHORTER DISTANCE FOR PEDESTRIANS TO CROSS
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026.
COST ($ 24 700,000)	THE LOWEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

CHALLENGES

CAPACITY	ADDITIONAL CAPACITY WOULD BE REQUIRED IN 2026 AND BEYOND.
FLEXIBILITY	WIDENING WILL BE REQUIRED IN 2026.
PEDESTRIAN SAFETY	LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES.
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026
FUTURE PUBLIC TRANSPORTATION	NO ROOM FOR BUS LANES/BAY AREA WHEN A BUS STOPS TO LOAD OR UNLOAD RIDERS, ALL TRAFFIC BEHIND HAS TO STOP.

CONCEPT # 3
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEFORE 2026
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026.
PEDESTRIAN SAFETY	SHORTER DISTANCE FOR PEDESTRIANS TO CROSS
COST ($ 25,500,000)	THE SECOND LOWEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

CHALLENGES

CAPACITY	ADDITIONAL CAPACITY WOULD BE REQUIRED IN 2026 AND BEYOND.
FLEXIBILITY	WIDENING WILL BE REQUIRED IN 2026.
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026
PEDESTRIAN SAFETY	LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES.
FUTURE PUBLIC TRANSPORTATION	NO ROOM FOR BUS LANES/BAY AREA WHEN A BUS STOPS TO LOAD OR UNLOAD RIDERS, ALL TRAFFIC BEHIND HAS TO STOP

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

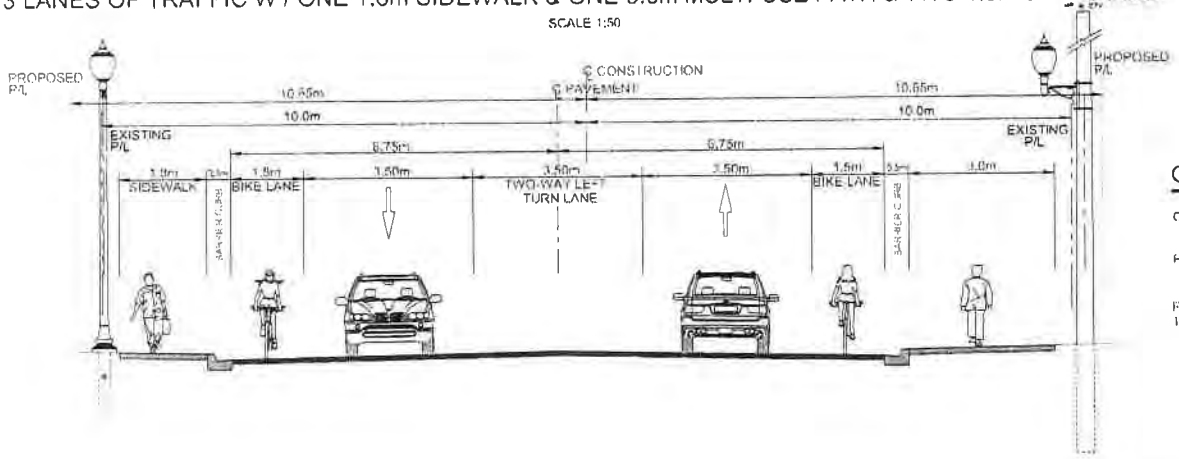
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Tinley CONSULTING ENGINEERS PLANNERS

CONCEPT #4 - BEFORE 2026
3 LANES OF TRAFFIC W / ONE 1.8m SIDEWALK & ONE 3.0m MULTI-USE PATH & TWO 1.5m BIKE LANES

SCALE 1:50

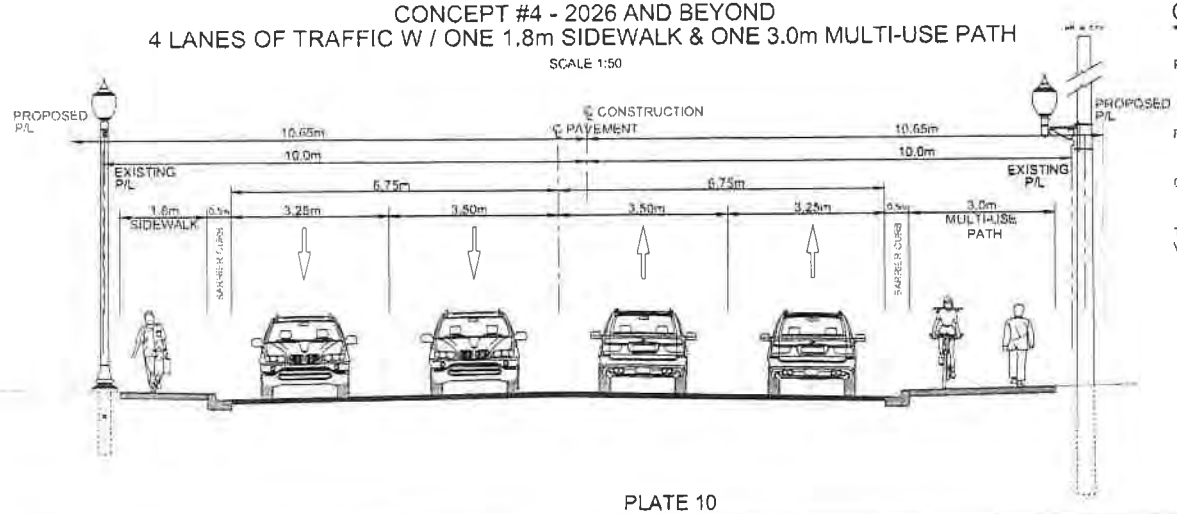


OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026.
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD BEFORE 2026 4 LANE IN 2026 AND BEYOND
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND.

CONCEPT #4 - 2026 AND BEYOND
4 LANES OF TRAFFIC W / ONE 1.8m SIDEWALK & ONE 3.0m MULTI-USE PATH

SCALE 1:50



CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES.
RIGHT-OF-WAY	EXCEEDS THE EXISTING RIGHT-OF-WAY LIMITS.
COST ($ 32 300.00)	THE THIRD HIGHEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION. ANSI LIFE SCIENCE LANDS ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

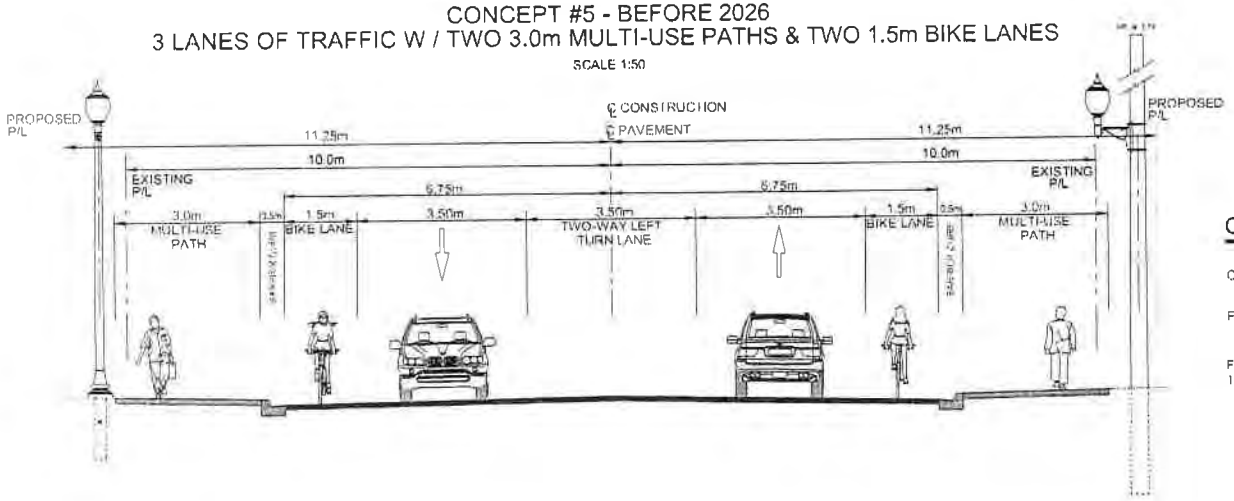
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Minley CONSULTING ENGINEERS PLANNERS

CONCEPT #5 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO 1.5m BIKE LANES

SCALE 1:50

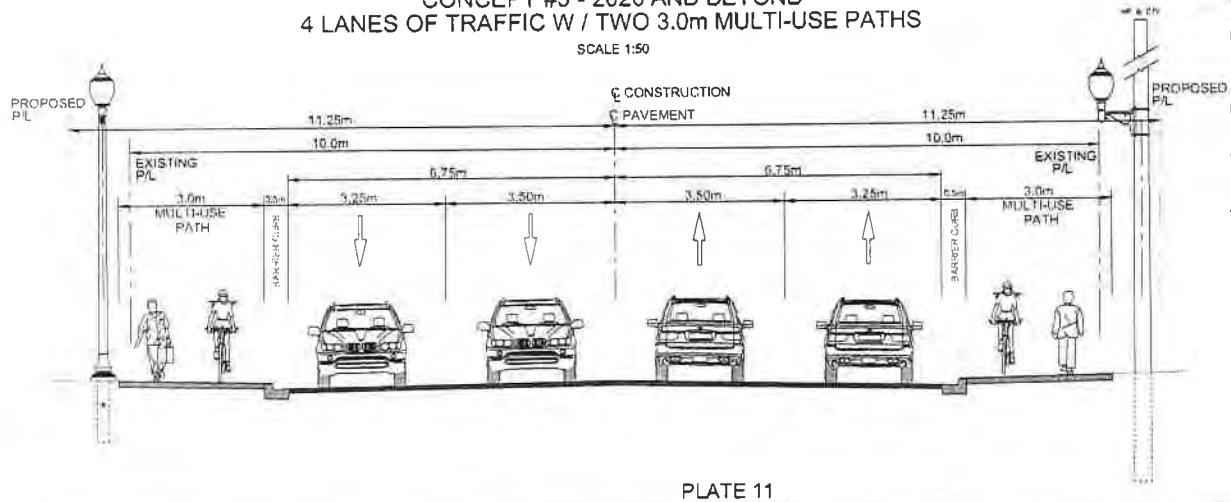


OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD BEFORE 2026 4 LANE IN 2026 AND BEYOND
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND

CONCEPT #5 - 2026 AND BEYOND
4 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS

SCALE 1:50



CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES
RIGHT-OF-WAY	EXCEEDS THE EXISTING RIGHT-OF-WAY LIMITS
COST ($ 32,800,000)	THE SECOND HIGHEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

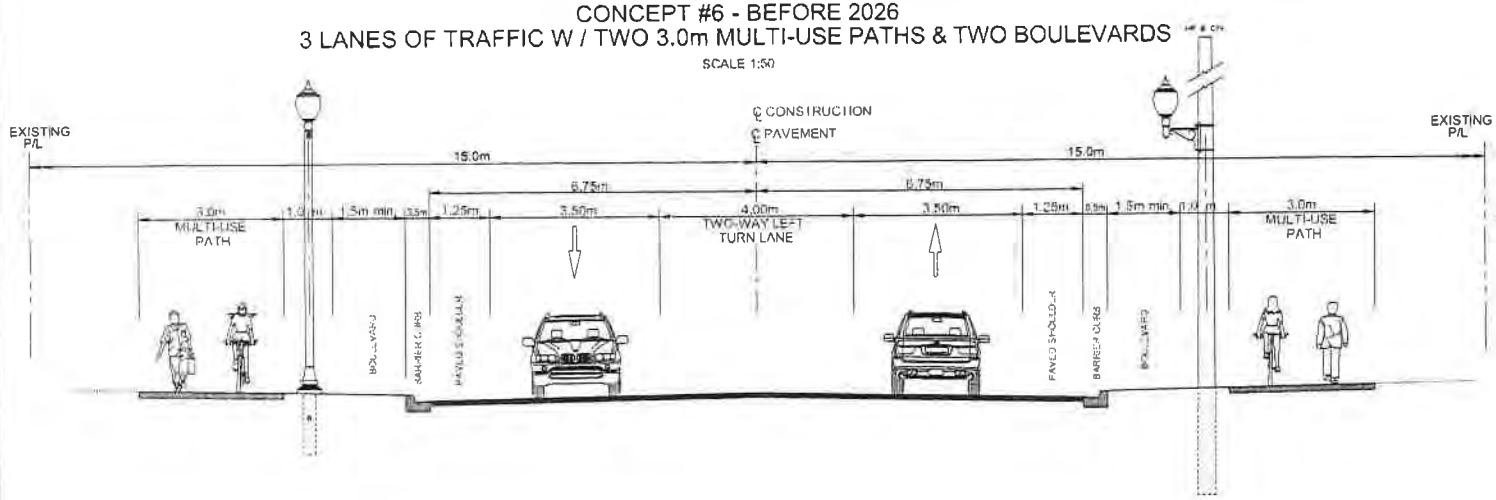
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Tinley CONSULTING ENGINEERS PLANNERS

CONCEPT #6 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO BOULEVARDS

SCALE 1:50

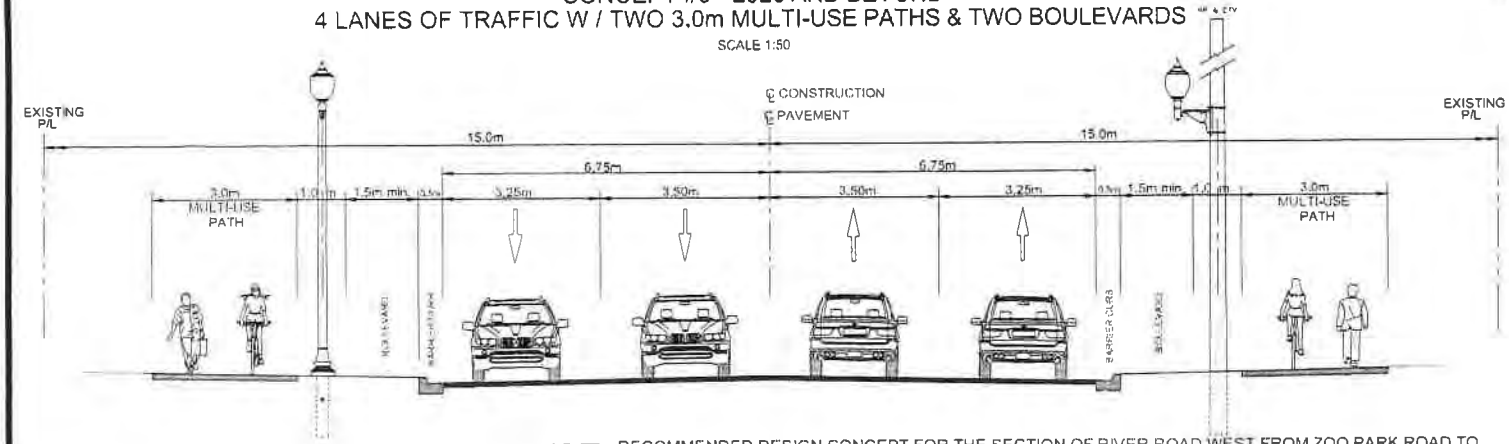


OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD BEFORE 2026 4 LANE IN 2026 AND BEYOND.
PEDESTRIAN SAFETY	PROVIDE 1.5 M PERMANENT BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS FOR THE SECTION FROM ZOO PARK RD TO THE EASTERN TOWN LIMITS.
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND

CONCEPT #6 - 2026 AND BEYOND
4 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO BOULEVARDS

SCALE 1:50



CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS
RIGHT-OF-WAY	EXCEEDS THE EXISTING 20.0m RIGHT-OF-WAY LIMITS FOR THE SECTION FROM BRILLINGER DRIVE TO MAIN ST.
COST ($ 33,000,000)	THE HIGHEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION. ANSI LIFE SCIENCE LANDS ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

RECOMMENDED DESIGN CONCEPT

RECOMMENDED DESIGN CONCEPT FOR THE SECTION OF RIVER ROAD WEST FROM ZOO PARK ROAD TO THE EASTERN TOWN LIMITS WHERE THE EXISTING RIGHT-OF-WAYS ARE IN THE RANGE OF 30 TO 60 METRES

PLATE 12

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

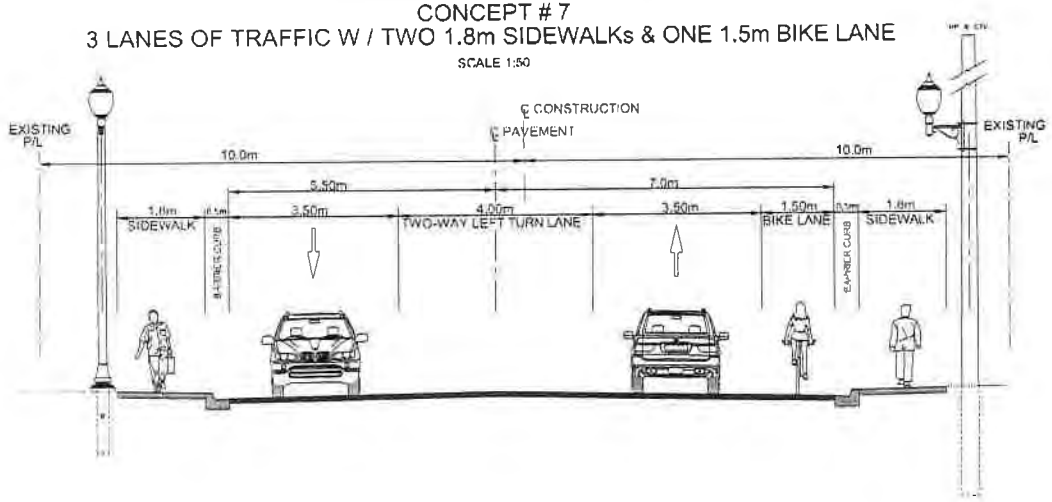
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT # 7
3 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKs & ONE 1.5m BIKE LANE

SCALE 1:50



OPPORTUNITIES

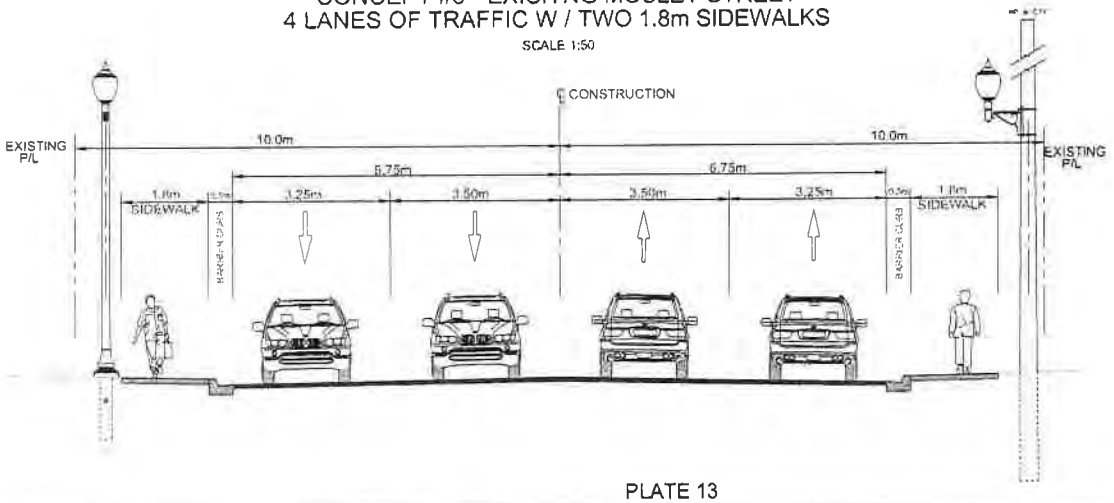
CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEFORE 2026.
PEDESTRIAN SAFETY	SHORTER DISTANCE FOR PEDESTRIANS TO CROSS
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026
COST ($ 29 600 000)	THE THIRD LOWEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

CHALLENGES

CAPACITY	ADDITIONAL CAPACITY WOULD BE REQUIRED IN 2026 AND BEYOND.
FLEXIBILITY	WIDENING MAY BE REQUIRED IN 2026
PEDESTRIAN SAFETY	LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES. ONLY ONE ONE-WAY BIKE LANE IS PROVIDED.
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026.
FUTURE PUBLIC TRANSPORTATION	NO ROOM FOR BUS LANES/BAY AREA WHEN A BUS STOPS TO LOAD OR UNLOAD RIDERS. ALL TRAFFIC BEHIND HAS TO STOP.

CONCEPT #8 - EXISITNG MOSLEY STREET
4 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026.
FLEXIBILITY	PAINTED AND USED AS L LANE ROAD WITH BIKE LANES BEFORE 2026. 4 LANE IN 2026 AND BEYOND
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS.
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND.
COST ($ 30 100,000)	THE FIFTH HIGHEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026 AND BEYOND TO FACILITATE BICYCLE TRAFFIC
ACTIVE TRANSPORTATION	LACK OF BIKE LANES/MULTI-USE PATHWAYS IN 2026 AND BEYOND

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WASAGA Beach

Town Of Wasaga Beach

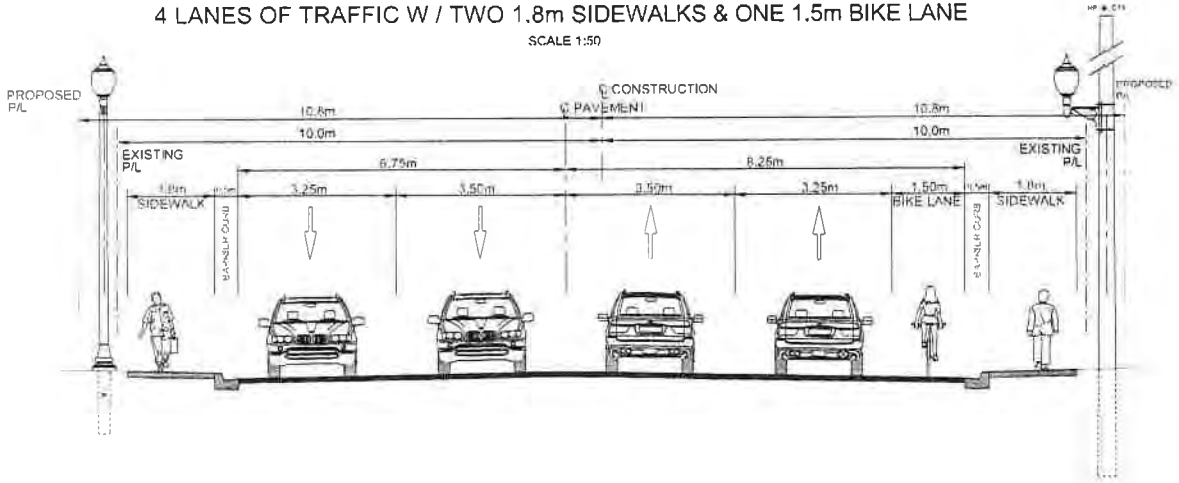
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT #9
4 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS & ONE 1.5m BIKE LANE

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026.
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD WITH BIKE LANES BEFORE 2026 4 LANE IN 2026 AND BEYOND.
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES. ONLY ONE ONE-WAY BIKE LANE IS PROVIDED IN 2026 AND BEYOND.
RIGHT-OF-WAY	EXCEEDS THE EXISTING RIGTH-OF-WAY LIMITS.
COST ($ 30,600,000)	THE FOURTH HIGHEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

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WASAGA Beach

Town Of Wasaga Beach

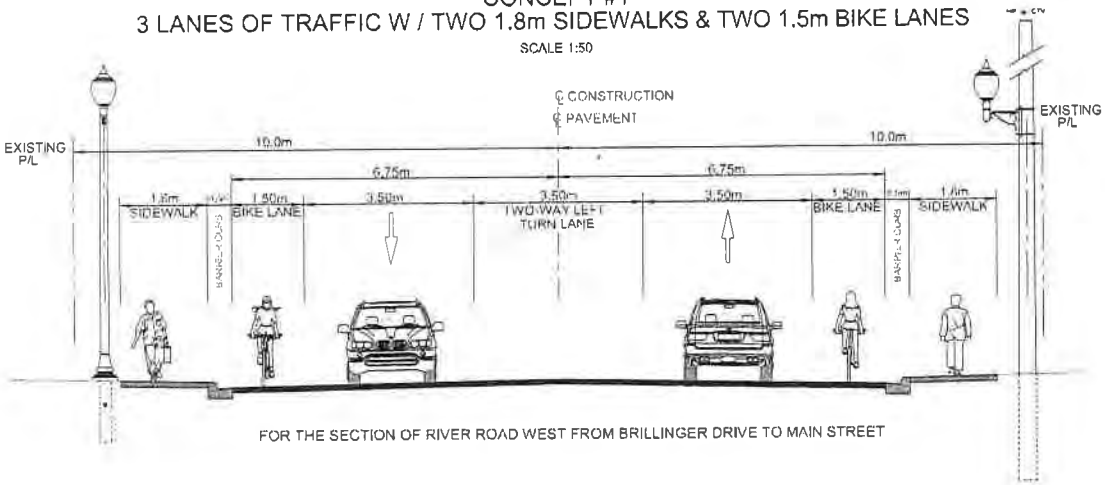
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RECOMMENDED DESIGN

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONCEPT #1
3 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS & TWO 1.5m BIKE LANES

SCALE 1:50



FOR THE SECTION OF RIVER ROAD WEST FROM BRILLINGER DRIVE TO MAIN STREET

RECOMMENDED DESIGN WAS DEVELOPED BASED ON:

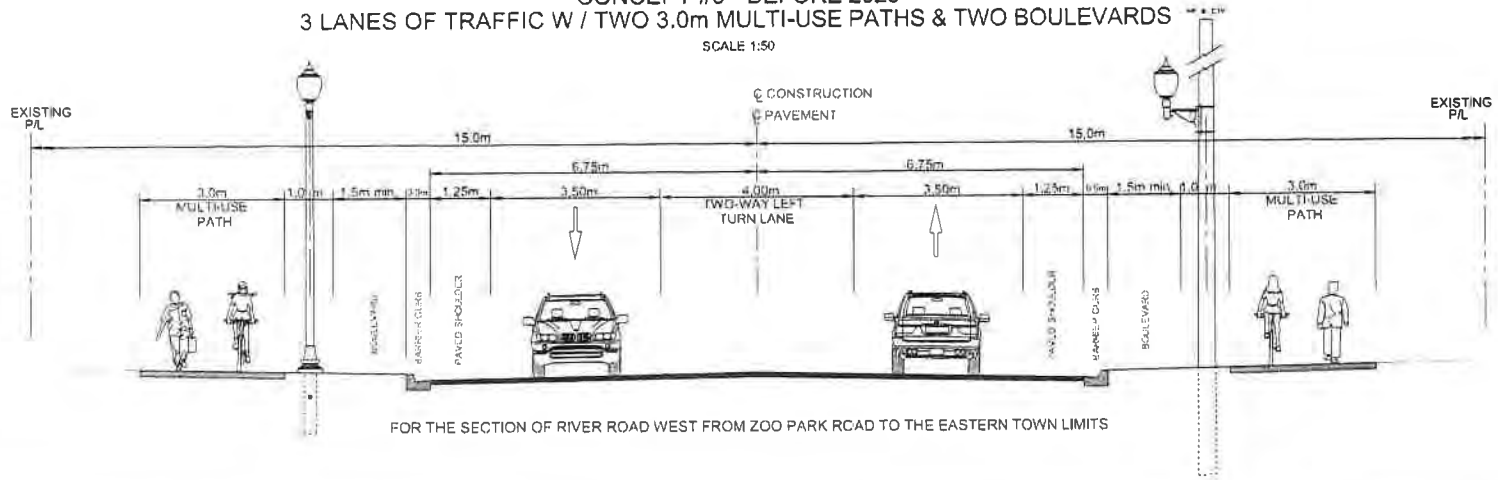
- SELECTED DESIGN CONCEPTS (CROSS-SECTION) SHOULD BE FEASIBLE FOR CONSTRUCTION WITHOUT THE NEED TO OBTAIN LARGE SECTIONS OF PRIVATE PROPERTY BEYOND THE ROAD ALLOWANCE BEFORE 2026
- THE FLEXIBILITY TO MEET THE FUTURE LONGER TERM (2026 AND BEYOND) VEHICULAR DEMANDS
- THE FLEXIBILITY TO MEET THE FUTURE PUBLIC TRANSPORTATION NEEDS AS IDENTIFIED IN THE TOWN'S OFFICIAL PLAN
- TO PROVIDE SAFE PEDESTRIAN CROSSING OPPORTUNITIES

RECOMMENDED DESIGN:

- CONCEPT 1 FROM BRILLINGER DRIVE TO MAIN STREET (20 M EXISTING ROW)
- CONCEPT 6 FROM ZOO PARK ROAD TO THE EASTERN TOWN LIMITS (30 TO 60 M EXISTING ROW)
- A TRAFFIC SIGNAL AT THE INTERSECTIONS OF RIVER ROAD WEST WITH POWERLINE ROAD, SILVER BIRCH AVENUE (EASTERLY INTERSECTION), THEME PARK ROAD AND BELL'S PARK ROAD

CONCEPT #6 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO BOULEVARDS

SCALE 1:50



FOR THE SECTION OF RIVER ROAD WEST FROM ZOO PARK ROAD TO THE EASTERN TOWN LIMITS

PLATE 15

NEXT STEPS - ANTICIPATED SCHEDULE

Winter/Spring 2010

- Review and respond to comments received from Phase 3 PIC
- Select Preferred Design Option
- Finalize Draft ESR and place Draft ESR on Public record for 30 days (publish Notice of Completion), and
- Finalize ESR based on comments received during the 30 day review period

PROJECT FINANCING

- Considering the fact that Town growth is the reason for the work, 90% of the cost will be recovered through development charges, and
- The balance of the cost will be paid from either existing reserve funds or future Provincial/Federal funding programs.

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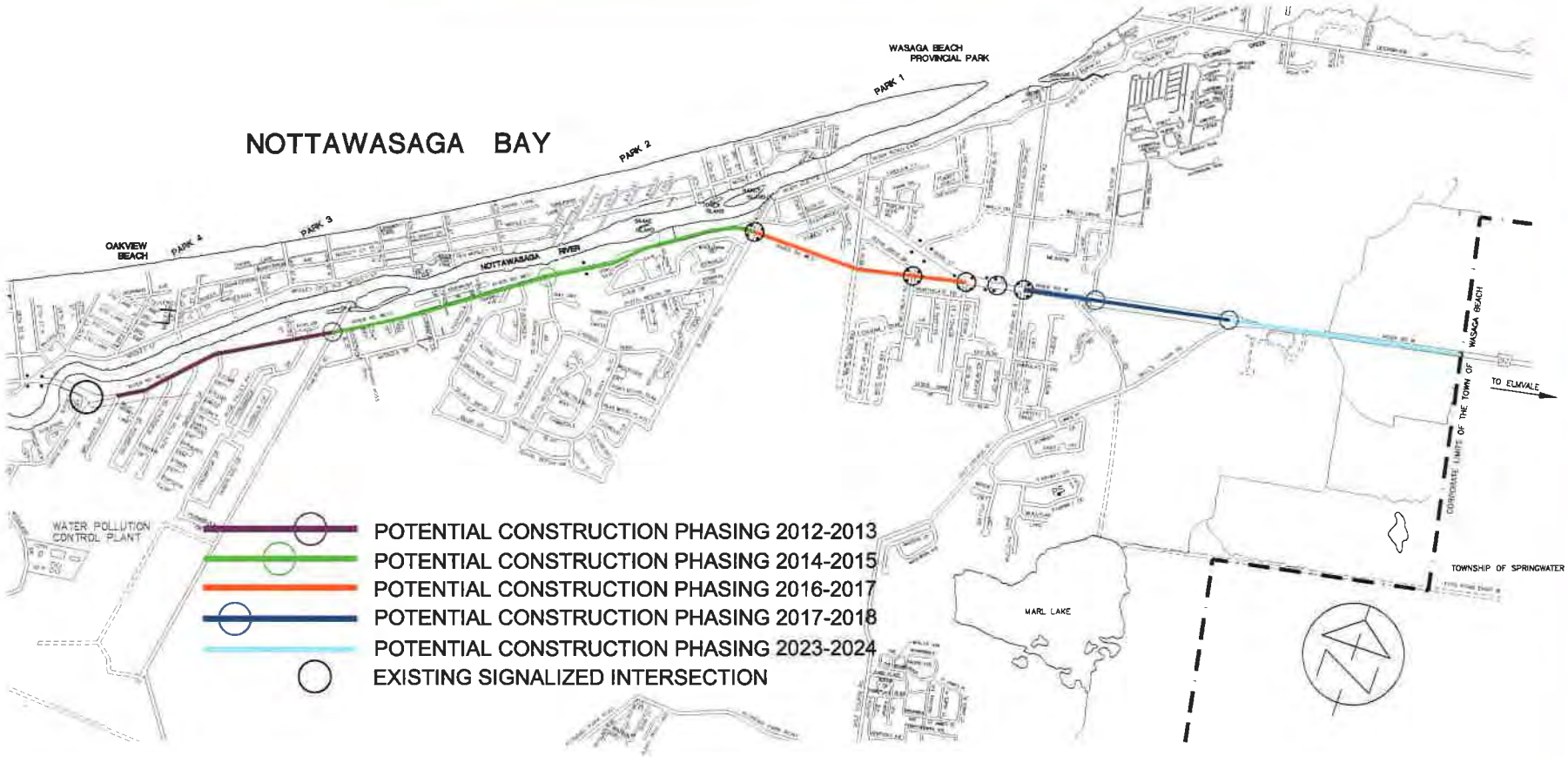
Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

TIMING OF IMPROVEMENTS



NOTES: THE ABOVE IS BASED ON 10 YEAR FORECAST BUT IS SUBJECT TO TOWN FUNDING RESTRICTIONS AND OTHER NECESSARY APPROVALS.

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

To: **Jim McIntosh**

From: **Lilly Chen**

Date: **March 10, 2010**

Copies to: **Kevin Lalonde – Town of Wasaga Beach**
Mike Neumann – Ainley And Associates
Tom Nollert – Ainley And Associates
Larry Young – Ainley And Associates

Ref: **Town of Wasaga Beach – River Road West Class EA** File: **109049**
February 18, 2010 PIC Summary

A Public Information Center (PIC) was held on February 18, 2010 at the Wasaga Rec Plex from 6:30pm to 8:30pm. Jim McIntosh and Kevin Lalonde represented staff from the Town of Wasaga Beach, and Mike Neumann, Lilly Chen and Larry Young represented Ainley Group. Deputy Mayor David Foster, Councillors Rick Archdekin, Nina Bifolchi and Stan Wells also attended the PIC. Thirty-eight members of the public and stakeholders or their representatives signed the PIC attendance sheet although it is estimated that actual attendance was over forty persons. Further to the public notice and letters sent to the review agencies and interested persons, comments were received until March 5, 2010. A response to comments will be prepared and issued following the Town's review.

Eighteen comment sheets were received during the PIC. Of these comment sheets, 6 selected Concept 1 and/or Concept 6 – the recommended concepts as the preferred design. 5 of them selected Concept 2 – 3 lanes with 1 multi use path and 1 sidewalk. Details for the concepts selected by the number of comment sheets are provided in Table 1.

During the PIC, more people supported the recommended design, however, did not fill out a comment sheet. We were advised by these people that they thought they did not need to fill out a comment sheet, only if they had a different opinion. The most common oral/written comments provided in relation to the project at the PIC are summarized in Table 2.

The general consensus by all attendees was that River Road West should have 3 lanes (1 lane in each direction plus a centre turn lane) with sidewalks/bike lanes/paths to improve traffic flow, to enhance safety, and to accommodate active transportation. The main concerns or questions or comments provided at the meeting were associated with the pavement marking and signing for the bike lanes, separation between pedestrians/bicyclists and vehicles, and a future by-pass consideration.

Before the PIC, a comment appeared on the February 17, 2010 Wasaga Sun newspaper. The person felt that only minimal left or right turns are on River Road West and the existing traffic volumes at the westerly intersection of River Road West with Silver Birch Avenue are higher than the easterly intersection. He suggested that the Town should improve Mosley Street to accommodate traffic flow and provide bike lanes on River Road West.

After the PIC on March 4, 2010, a petition with 75 signatures from the residents in the area was received. The petition supports 3 lanes with 1 bike lane and 1 or 2 sidewalks and opposes the recommended 3 lanes with 2 bike lanes and 2 sidewalks because of the possibility of a future 4 lane conversion. Responses to the petition are summarized in Table 3.

Table 1 – Summary of Concepts Selected During the PIC

Options	Number of Comment Sheets
No concepts	3
Concept 1 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 2 bike lanes	3
Concept 2 – 3 lanes (1 lane in each direction plus a centre turn lane) with 1 sidewalk and 1 multi use path	4
Concept 3 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 multi use paths	3
Concept 6 – 4 lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 multi use paths and 2 boulevards	2
Concept 7 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 1 bike lane	1
Concepts 2 and 3	1
Concepts 1 and 6	1
Total	18

Table 2 – Most Common Oral/Written Comments and Responses

Comment/Question/ Concern	Response
I would prefer 3 lanes instead of 4 lanes on River Road West.	A 3 lane cross-section on River Road West is recommended before 2026 given the high density of driveways along the road. However, to accommodate future increased traffic volumes and future public transportation (bus lanes/bays), 4 lanes will be needed in 2026 and beyond. It is noted that costs will be much higher if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated. It is also noted that even if a by-pass is built to divert some of the traffic volumes away from River Road West and 3 lanes are sufficient in 2026 and beyond, a wider (4 lane) asphalt platform may be needed to accommodate future bus lane/bay areas. Should the road be remarked to have 4 lanes in the future, slightly longer delays will occur for vehicles exiting from minor side streets and driveways turning onto River Road West. However, the traffic volumes on most of these driveways are relatively light, such as 1 or 2 trips per day, the expected delays should be in an acceptable range. Peak hour volumes on most of the unsignalized sidestreets are in the order of 2 to 65 vehicles in 2026, although, operational details at these locations should be reviewed before 2026, significant high delays are not expected.
The staging plan for River Road West construction identified the section from Brillinger Drive to Blueberry Trail as being constructed as one phase commencing in 2011. This section should	The possible phasing is suggested based on traffic volume projections and traffic operation needs only. The actual phasing is subject to the Town's funding restrictions, priorities and other necessary approvals and, thus, may not necessarily be the same as the one recommended.

Comment/Question/ Concern	Response
be divided into 2 phases. Why does Phase 2 (from Blueberry Trail to Main Street) take so long (2016)?	
I would like to have the bike lane above a curb to separate bicyclists from vehicular traffic.	Given the traffic volumes on the road, a wider (2.0 m) bike lane is considered desirable. However, only 1.5 m bike lane width fits the existing 20 m right-of-way. The 1.5 m bike lane width is still acceptable based on engineering standards. In addition, the speed limit on the section of River Road West from Brillinger Drive to Main Street does not warrant an off-road bike path.
Concern about the big trucks traveling through Town at night.	There is currently no traffic count data for the period from 6:00 pm to 6:00 am for the section of River Road West. The Town is planning to conduct an ATR (Automatic Traffic Recording) count on the road in the spring when the snow has melted. The ATR count will include night time truck volumes. A night time traffic infiltration study (origin and destination study) is not considered practical given that it may not be possible for a surveyor to read a license plate from a moving vehicle at night. Should the truck volumes be determined as high at night, the Town may wish to restrict truck traffic on the road during the night hours through by-laws and enforcement.
I would like to see a by-pass from Highway 26 to County Road 92 including the corridor from Knox Road to Powerline Road built in the very near future.	The Town is going to conduct another traffic infiltration study this year. Should the study results reveal that the percentage of by-pass traffic or truck traffic is high (i.e. over 30% or over 40% for trucks, currently 5% for overall traffic and 6% - 8% for truck traffic), a by-pass is approaching warrants and can be considered sooner. However, based on the current data, this may occur in the future beyond 2026. It is noted that Simcoe County's alternate east/west corridor through the Georgian Triangle will be built in the next 20 years. The Town may be able to divert some of the by-pass traffic to this corridor.
Please ensure the bike lanes are clearly marked as such.	The bike lanes will be marked in accordance with the latest guidelines in the industry (such as Transportation Association of Canada's *Manual of Uniform Traffic Control Devices for Canada* and *Bikeway Traffic Control Guidelines for Canada*). There will be a painted solid line between the bike lane and vehicular lane and bike symbols and signage.

Table 3 – Responses to the Comments in the Petition

Comment/Question/ Concern	Response
I am a homeowner on River Road West and I oppose the Town's recommendation to change River Road West from 2 lanes to 3 lanes because of the possibility of	We understand your concern. However, it is identified in the Town's Official Plan that River Road West from Mosley Street to Main Street is an arterial road whereas Mosley Street from River Road West to Main Street is a collector road. The Town's Official Plan has the following policies for arterial roads: "Section 16.2.8.1. Arterial roads should be designed primarily to facilitate traffic movements between major land use activity areas in the Town. Section 16.2.8.2. In maintaining the traffic carrying function of arterial roads, the

Comment/Question/ Concern	Response
changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road.	following policies shall apply: a) The appropriate rights-of-way shall be provided which will facilitate the future provision of public transportation; b) Appropriate rights-of-way shall be provided for full channelization of arterial intersections; c) Frontage, land use, entrances, exits, and curb use shall be controlled; d) In existing built-up areas, remedial approaches to minimize the number of intersections with arterial roads shall be investigated." Based on the traffic analysis for the section of River Road West, 3 lanes would be sufficient to accommodate future traffic volumes before 2026, 4 lanes will be needed in 2026 and beyond. Although, building a by-pass or utilizing a by-pass corridor to be created by the County of Simcoe may divert some traffic volumes away from River Road West thereby not requiring changing the road to 4 lanes and removing the bike lanes, increases in peak hour development traffic volumes are expected to be in the order of 2200 vehicles (including both inbound and outbound trips) in the area in the next 20 years. In addition, 4 lanes may be needed to accommodate future bus lane/bay areas. It is noted that costs will be much higher if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated.
We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.	1 bike lane allows only one-way bicycle traffic travel on it. For the bicyclists returning or traveling from another direction, they will have to use other routes or be forced to pass each other by moving into the traffic lanes. The 1.8 m sidewalk is not wide enough for a bicyclist to walk with his/her bike when combined with other pedestrian traffic. Thus, for safety reasons, a single one-way bike lane is not recommended. Sidewalks or multi-use paths have to be provided on both sides of the road to facilitate pedestrians. Given the traffic volumes on the road, pedestrians should only across the road at a signalized intersection under a protected pedestrian signal phase. If the road is only constructed to have 3 lanes with no flexibility to be remarked to 4 lanes, the Town may need to consider to build a by-pass route before 2026 which could more than double the current project construction costs or to revise the Official Plan to improve Mosley Street from River Road West to Main Street. Either one will need to obtain large sections of MNR property or private property beyond the road allowance. It is noted that the Town is continuing with a traffic volume monitoring program including conducting traffic volume counts at major intersections every 5 years to identify the potential future need of a by-pass route within the Town. The need for a by-pass route will be reviewed on an ongoing basis.

Attachments:

1. PIC Attendance Sheet
2. A summary of the written and verbal comments
3. A received petition

T:\109049\109049-Lilly\PIC Material\PIC 2\109049 PIC Summary March 10 2010.doc

TOWN OF WASAGA BEACH
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

PHASE 3 PUBLIC INFORMATION CENTRE
FEBRUARY 18, 2010

SIGN IN SHEET – PLEASE PRINT

NAME	ADDRESS	TELEPHONE NO.	E-MAIL ADDRESS

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

MEMORANDUM

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

To: **Mike Neumann**

Copies to: **Jim McIntosh – Town of Wasaga Beach**
Kevin Lalonde – Town of Wasaga Beach
Tom Nollert – Ainley And Associates
Larry Young – Ainley And Associates

From: **Lilly Chen**

Date: **February 18, 2010**

Ref: **Town of Wasaga Beach – River Road West Class EA**
February 18, 2010 PIC Summary of Comments

File: **109049**

Written and Verbal comments related to project received during and after the PIC are as follows:

1. I would like to see a by-pass from Highway 26 to County Road 92 including the corridor from Knox Road to Powerline Road built in the very near future.
2. We do not need a road asphalt 4 lanes wide, we want 3 lanes, 1 sidewalk and bike lane (Concept 2). It is not fair holding this review when 49 River Road West property owners are summer residents and approximately another 50 weekend vacationers. We need more time to look at an alternate route.
3. Concept 1 is excellent. I am an avid cyclist (member of Wasaga Beach Cycling Club) and there view bike lanes as a major safety feature. Also paths for pedestrians are equally significant. Centre turn lane is a real safety feature which eliminates many reasons to jam in brakes and maintains traffic flow. Why does phase 2, in red, take so long?
4. Concepts 2 and 3 are similar except for multi-use paths. I think it is imperative that pedestrian and bicycle traffic be kept away from vehicular movements as much as possible for safety reasons.
5. Concept 1 looks good. I would like to have the bike trail above a curb, also, with better signing it will work.
6. Somewhat concerned that if traffic lights are not synchronized that the load of moving traffic is lost. Lights have a greater tendency to stop movement than the other. Additional money spent now will be as an investment for the future. 3 lanes will allow traffic to flow.
7. (I suggest a) noise barrier berm at where between the OPP station and Wasaga Distribution on the north side of River Road West. Also on the Wasaga Distribution property, a berm should be at the west end of the property along the fence line. This would also reduce noise from the future planned fire department.
8. I would prefer 3 lanes, 1 bike lane and 1 sidewalk (Concept 2). I think it would be too easy to turn the recommended rendition into 4 lanes by merely taking out the bike lanes. I think we need to make better use of Mosley Street. The traffic is basically nil no that road. It does not take any longer to go through Town via Mosley. The traffic noise is already very bad on River Road West. It is a residential street. Not like Mosley where it works very well because of lack of residential.
9. Drawings show "existing" signal intersection at Oxbow – there is none – when will it be addressed? It should be part of this project.
10. Our property is directly across from Birchview. Wouldn't it make sense to have maximum width

(Concept 6) with curbed sidewalks/paths in the school zone? The rest of River Road West doesn't have to be as wide.

11. Minimize costs – sidewalk a definite (concept 2).
12. Control or enforce speed limit on the road.
13. Limit night use of River Road West by large transport trucks.
14. I support Concept 1 – the recommended design. Please ensure the bike lanes are clearly marked as such.
15. Very good presentation.
16. I am opposed to any change like the ones presented. This has more than made me question my faith and trust in the Town and our representatives. (Concept 3 was selected.)
17. Moving ahead with any work on River Road West does not take into account the age factor of the majority of residents here and their ability to pay more taxes which will inevitably happen to maintain any new construction that happens. This road work will in no way improve our tax base and that is too bad. Improving Mosley to hasted traffic would improve tourist traffic and thereby bring more tourist dollars to our region.
18. The Town has done lots of projects in recent years that are forward thinking and widely recognized. We need to stay at the forefront of environmental and active transportation. We need to discourage driving and encourage active forms of transportation and provide the infrastructure for active transportation. In 20 years, a large portion of the Town will be south of the river and can utilize the Simcoe County by-pass. 3 lanes of traffic plus large multi use paths on each side will provide adequate roadway and turning capacity while allowing for growth of active transportation and healthy lifestyles. The boulevard will also create safe distance between vehicular traffic and pedestrians, cyclists, etc. I have witnessed people being clipped by rear-view mirrors of trucks while walking on the sidewalks on Mosley Street in front of the Rec Plex. These sidewalks are too close to the roadway for safe walking of more than 2 people abreast. (Concept 6 was selected.)

T:\109049\109049-Lilly\PIC Material\PIC 2\109049 Summary of Comments Feb 18 2010.doc

MW/109049

Transportation upgrades could be made elsewhere

YOUR OPINION

Editor:

My wife and I have lived in Silver Birch Estates for 16 years.

River Road West is our only route to everywhere. No matter the time of day there are very few right or left turn activities even at intersections such as Power Line Road.

The greatest difficulty for us in exiting the west Silver Birch entrance is the delay on doing so. The east entrance has much less exiting volume. To us spending some of that money is better spent fixing Mosley as the route to the Beach to improve summer traffic flow and to improve bike lanes on River Road West.

John Pursel,
Wasaga Beach

Wasaga Sun
Feb 17/2010

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

23 BROWER CRES.

WASAGA BEACH, ON L9Z 1L8 705-422-1653

COMMENTS (Please use the back of this sheet if necessary)

WOULD LIKE TO SEE A BY-PASS FROM HWY 26 to COUNTY ROAD 92 INCLUDING THE CORRIDOR FROM KNOX RD TO POWER LINE RD BUILT IN THE VERY NEAR FUTURE AS WELL

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1246 RIVER RD. W.
705- 429-7087.

COMMENTS (Please use the back of this sheet if necessary)

FOR GOD SAKE HAVE SOME COMPASION FOR THE RIVER RD. RESIDENTS, WE DO NOT NEED A ROAD ASPHALET 4 LANES WIDE, 3 LANES, 1 SIDEWALK AND BIKE LANE. IT IS NOT FAIR MOCKING THESE REVIEW WHEN 49 RIVER RD PROPERTY ARE SUMMER RESIDENT APROX ANOTHER 50 WEEKEND VACATIONERS, PLUS WE FEEL WE NEED MORE TIME TO LOOK AT AN ALTERNATIVE ROUTE

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

Mr. [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

43 MARTYN DR WASAGA BEACH L9Z 1N6

705 422 0538

COMMENTS (Please use the back of this sheet if necessary)

CONCEPT #1 IS EXCELLENT,
I AM AN AVID CYCLIST (MEMBER OF WASAGA CYCLING CLUB) AND THERE VIEW BIKE LANES AS A MAJOR SAFETY FEATURE. ALSO PATHS FOR PEDESTRIANS ARE EQUALLY IMPORTANT, HIGH USE LIGHTS THAT MAKE IT A REAL SAFETY FEATURE WHICH ELIMINATES MANY REASONS TO TAKE THE BACKS AND MOUNTAINS TRAFFIC FLOW. (WHY DOES PHASE 2, WORD, TAKE SO LONG?)

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

5 BIRCHMOUNT CIR. WB, L9Z 1H8 705-352-0108

COMMENTS (Please use the back of this sheet if necessary)

2 & 3 ARE SIMILAR EXCEPT FOR MULTI-USE PATHS. I THINK IT IS IMPERATIVE THAT PEDESTRIAN & CYCLE TRAFFIC BE KEPT AWAY FROM VEHICULAR MOVEMENTS AS MUCH AS POSSIBLE FOR SAFETY REASONS.

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☑ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
210 MELROSE AVE W.B. 429.3621
L9Z-2T1

COMMENTS (Please use the back of this sheet if necessary)
That concept look good.
I would have like to have the Bick trail above a curb. also. but that all the way you have. with better signing it will work ✓

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

63 Glen Eton Rd L9Z 1E7 705-429-8394

COMMENTS (Please use the back of this sheet if necessary)

Some what concerned that if traffic lights are not syncronized that the loss of moving traffic is lost. Lights have a greater tendancy to stop movement than the other. Additional money spent now will be as an investment for the future.

3 lanes will allow traffic to flow!!

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☑ Concept 7 ☐ Concept 8 ☐ Concept 9

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☑ Yes ☐ No

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THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

65 FOREST AVE

COMMENTS (Please use the back of this sheet if necessary)

NOISE BARRIAR BERM AT THE BATWEEN THE OPP STATION AND WASAGA DISTRIBUTION ON THE NORTH SIDE OF RIVER RD W.
ALSO ON THE WASAGA DISTRIBUTION PROPERTY A BERM AT THE WEST END OF THE PROPERTY ALONG THE FENCE LINE. THIS WOULD ALSO REDUCE NOISE FROM THE FUTURE PLANNED FIRE DEPARTMENT.

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1246 RIVER RD. W.

COMMENTS (Please use the back of this sheet if necessary)

I WOULD PREFER 3 LANES, 1 BICYCLE LANE & 1 SIDEWALK. I THINK IT WOULD BE TOO EASY TO TURN THE RECOMMENDED RENDITION INTO 4 LANES BY MERELY TAKING OUT THE BICYCLE LANES. I THINK WE NEED TO MAKE BETTER USE OF MOSLEY ST. THE TRAFFIC IS BASICALLY NIL ON THAT ROAD. IT DOES NOT TAKE ANY LONGER TO GO THROUGH TOWN VIA MOSLEY. THE TRAFFIC NOISE IS ALREADY VERY BAD ON RIVER RD W. – IT'S A RESIDENTIAL ST. – NOT LIKE MOSLEY WHERE IT WORKS VERY WELL BECAUSE OF LACK OF RESIDENTIAL.

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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☑ Yes ☐ No

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THE TOWN OF WASAGA BEACH

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

property owner

ADDRESS (Including Postal Code & Telephone Number):

1316 River Road West
Wasaga Beach L9Z 2W6 705.429.0581

COMMENTS (Please use the back of this sheet if necessary)

- drawings show "existing" signal intersection at Oxbow – there is none – when will it be addressed? – should be part of this project.
- our property is directly across from Birch view. (concept #6) Wouldn't it make sense to have maximum width with curbed sidewalks/paths in the school zone? The rest of R.R.W. does not have to be as wide

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☑ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
RESIDENT

ADDRESS (Including Postal Code & Telephone Number):
2005 RIVER RD. WEST WASAGA BEACH
L9Z 2W1 705-352-0558

COMMENTS (Please use the back of this sheet if necessary)
- MINIMIZE COSTS – SIDEWALK A DEFINITE
- CONTROL OR ENFORCE SPEED LIMIT ON ROAD
- LIMIT NIGHT USE OF RIVER RD W BY LARGE TRANSPORT TRUCKS

Which design concept do you prefer?

☐ Concept 1 ☒ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

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Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
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THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

20 - 54th St WB

COMMENTS (Please use the back of this sheet if necessary)

I support Concept #1 - The recommended design

- the comment = please ensure that the bicycle lanes are clearly marked as such

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
1828 River Road West, L9Z 2X5 429-5121

COMMENTS (Please use the back of this sheet if necessary)
Very good presentation.

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☒ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

(SELF) OWNER.

ADDRESS (Including Postal Code & Telephone Number):

6 GLENETOW RD. L9Z 1E6

429-5123

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☑ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
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280 Pretty River Parkway
Collingwood ON L9Y 4J5

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THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

self (owner).

ADDRESS (Including Postal Code & Telephone Number):

6 Glen Eton Rd. Wasaga Beach ONT. L9Z-1E6.
429-5123

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☑ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
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THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted] - REPRESENTED BY [redacted]

REPRESENTING (Agency, Municipality, (Property Owner) Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1639 RIVER ROAD WEST
WASAGA BEACH L9Z 2S3 429-2621

COMMENTS (Please use the back of this sheet if necessary)

I AM OPPOSED TO ANY CHANGE LIKE THE ONES PRESENTED.
THIS HAS MORE THEN MADE ME QUESTION MY FAITH & TRUST IN THE TOWN AND OUR REPRESENTATIVES.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☑ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer? Does it really matter? - You've already decided!

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): Property Owner

ADDRESS (Including Postal Code & Telephone Number):

1332 River, RW L9Z 2W6.
429-3245

COMMENTS (Please use the back of this sheet if necessary)

MOVING AHEAD WITH ANY WORK ON RRW DOES NOT TAKE INTO ACCOUNT THE AGE FACTOR OF THE MAJORITY OF RESIDENCE HERE AND THEIR ABILITY TO PAY MORE TAXES WHICH WILL INEVITABLY HAPPEN TO MAINTAIN ANY NEW CONSTRUCTION THAT HAPPENS. THIS ROAD WORK WILL IN NO WAY IMPROVE OUR TAX BASE & THAT IS TOO BAD. IMPROVING MOSLEY TO HASTEN TRAFFIC WOULD IMPROVE TOURIST

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

TRAFFIC AND THEREBY BRING MORE TOURIST DOLLARS TO OUR REGION.

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #2 – Thursday, February 18, 2010
6:30 p.m. to 8:30 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property Owner / Healthy Community Network

ADDRESS (Including Postal Code & Telephone Number):
75-39th St. N. L9Z 2A3 429-4936

COMMENTS (Please use the back of this sheet if necessary)

The town has done lots of projects in recent years that are forward-thinking and widely recognized. We need to stay at the forefront of environmental & active transportation. We need to discourage driving & encourage active forms of transportation & provide the infrastructure for A.T. In 20 years, a large portion of town will be south of the river and can utilize the Simcoe Cnty by-pass 3 lanes of traffic plus large multi-use paths on each side will provide adequate roadway & turning capacity while allowing for growth of A.T. & healthy lifestyles. The boulevard will also create safe distance between

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☒ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, March 5, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

vehicular traffic & pedestrians, cyclists, etc. I have witnessed people being clipped by rear-view mirrors of trucks while walking on the sidewalks on Mosely St. in front of the RecPlex. These sidewalks are too close to the roadway for safe walking of more than 2 people abreast.

[redacted]

TO	SEEN
MN	
LC	
FILE NO.	
109049	

Ainley GROUP CONSULTING ENGINEERS PLANNERS

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario L4N 8Z7
Tel: (705) 726-3371 • Fax: (705) 726-4391
E-mail: barrie@ainleygroup.com

February 3, 2010

File No. 109049

[redacted]
1246 River Road West
Wasaga Beach, ON, L9Z 2W6

Ref: **Town of Wasaga Beach**
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment
Notice of Public Information Centre

[redacted]

Further to the Phase 2 Public Information Centre (PIC) which was held on October 29, 2009, the Town of Wasaga Beach is continuing to document a Class EA planning process to improve efficiency, enhance safety, address drainage and pavement structure deficiency issues in the area of River Road West from Brillinger Drive to the eastern Town limits. Please see the attached copy of a Notice of Public Information Centre, which will appear in the local newspaper on February 10 and February 17, 2010.

Please contact the undersigned if you have any comments or questions with respect to this Notice.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.

RECEIVED
MAR – 4 2010
AINLEY & ASSOC. LTD.

cc: Jim McIntosh, Director of Public Works

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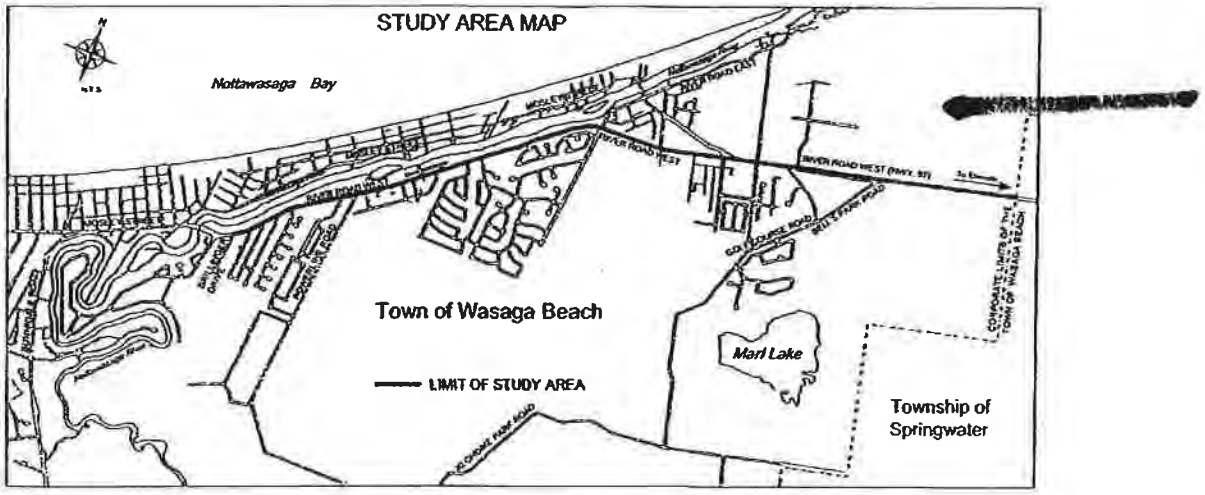
NOTE:
PETITION AGAINST PROPOSED ROAD WIDENING ON RIVER RD. W.

TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE No. 2

Further to the Public Information Centre held on October 29, 2009, the Town of Wasaga Beach is continuing the planning process to improve efficiency, enhance safety and address drainage and pavement structure deficiency in the area of River Road West from Brillinger Drive to the eastern Town limits. Nine Design Concepts for the improvements of River Road West from Brillinger Drive to the eastern Town limits have been identified and evaluated. The Design Concepts included consideration of the number of traffic lanes, the need for sidewalks and/or bicycle lanes or the provision of shared "Multi-Use Pathways". The study location is identified in the key map below:



The Design Concepts are as follows:

- Concept 1 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Sidewalks and 2 Bike Lanes
- Concept 2 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 1 Sidewalk and 1 Multi Use Path
- Concept 3 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Multi Use Paths
- Concept 4 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 1 Sidewalk and 1 Multi Use Path
- Concept 5 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths
- Concept 6 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths and 2 Boulevards
- Concept 7 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 1 Sidewalk and 1 Bike Lane
- Concept 8 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks
- Concept 9 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks and 1 Bike Lane

The Phase 3 Recommended Design Concepts are Concept 1 from Brillinger Drive to Main Street and Concept 6 from Zoo Park Road to the eastern Town limits. The Recommended Design Concepts also includes the provision of traffic signals at the intersections of River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Road and Bell's Park Road.

This Project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public information centre (PIC No. 2) is planned to provide further information to the public on the Recommended Design Concepts and to receive input and comment from interested persons. In addition to addressing road capacity, pedestrian safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town has completed the Active Transportation Plan Study and intends to integrate the active transportation components such as pedestrian sidewalks, bicycle lanes, multi-use pathways and public transit into the plan.

Public Information Centre

Time:	Open House: 6:30 pm to 8:30 pm
Date:	Thursday February 18, 2010
Location:	Wasaga Rec Plex – 1724 Mosley St.

Public input and comment on the Recommended Design concepts will be incorporated into the planning process. Comments will be received until Friday March 5, 2010. Subject to comments received as a result of this Notice, the Town plans to instruct the consultant to proceed with the planning for the project. An Environmental Study Report (ESR) will be prepared and placed on the public record for a minimum 30 day review period at the completion of the study.

If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Consultant undertaking the study.

This notice issued February 10, 2010.

Mr. Jim McIntosh
Director of Public Works
30 Lewis Street
Wasaga Beach, Ontario
L9Z 1A1
Tel: (705) 429-2540
Fax: (705) 429-8226
Email: publicworksdirector@wasagabeach.com

Mr. Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: neumann@ainleygroup.com

Date March 2, 2010. Collectors, [redacted]
1246 River Rd.W.--------Ph#. 429-7087

Note: To the Readers

These are side notes of what respondents had to say and the facts of the petition you are holding. We found that 49 driveways were not cleared on River Rd. W., meaning that they are either summer residents or snow birds. We also were to find out from many neighbors that the ones we could not get hold of were sometime weekend winter residents and are not available during the week. This allows Ainley to conduct their information meeting when at least 33% of the River Rd. W. residents are not here to attend these information meetings.

We find it unfair that theTown and Ainley Consultants are pushing ahead at an alarming rate during these winter months to start the undertaking of the widening of the road which will affect so many residents.

There was a 99% response against the widening of the road to 4 lanes initially and also a 99% response against 3 lanes with 2 bike lanes, which could possibly allow the Town to turn River Rd. W. into 4 lanes at any time very easily. Everybody on the Petition, however, were against 4 lanes and the possibility of 4 lanes no matter how River Rd. W. is configured but were in favour of sidewalks.

We also were able to talk to a professional appraiser who indicated that as soon as a 3-lane road is changed to 4 lanes they lower the value of any property they are appraising.

We the signed residents of the petition are respectfully asking this Council to re-consider their actions in this matter, and to have some compassion for the peace and tranquility of the residents who live on River Rd. W. and who, on average, pay higher taxes than most parts of the Town. We do not want River Rd. W. (highly residential) to become another Mosley St., (highly commercial).

This petition is just what we have been able to gather over the winter months that shows the disapproval of the Ainley Consultants recommendation. We will continue to solicit signatures from those residents we were unable to contact over the next couple of months as they return to the beach, or when they are at home.

PETITION

Ainley consultant's River Rd. W. recommendation:

Change River Rd. W. from Brillinger Dr. to the eastern town limits from 2 lanes to 3 lanes, 2 bicycle paths, 2 sidewalks

I am a homeowner on River Rd. W. in Wasaga Beach and I oppose the Town's recommendation to change River Rd. W. from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road. This would the have the appearance of the Mosley St. expansion. We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

NAME	ADDRESS	PH#/ E-mail
	1164 River Rd W	Retech@rogers.com
	1950 River Rd W	S. Howard voyager.com
	1979 RR West	
	1960 River West	
	2 Glen Lion	
	1860 River Rd. W	
	1852 RIVER RD W.	
	1892 River Rd. W.	
	1914 River Rd	uwiebe@yahoo.c.
	1836 River Rd. W.	
	1826 RIVER RD WEST	
	[illegible] River Rd West	
	1156 RIVER ROAD	

PETITION

Ainley consultant's River Rd. W. recommendation:

Change River Rd. W. from Brillinger Dr. to the eastern town limits from 2 lanes to 3 lanes, 2 bicycle paths, 2 sidewalks

I am a homeowner on River Rd. W. in Wasaga Beach and I oppose the Town's recommendation to change River Rd. W. from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road. This would the have the appearance of the Mosley St. expansion. We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

NAME	ADDRESS	PH#/ E-mail
	1927 River Rd W.	
	1921 River Rd W.	
	[illegible] River Rd W	[illegible]
	1915 River Rd W	422 7181
	1915 River Rd W.	422 7181
	1833 River Road West	429-9532.
	1883 River Rd. West	429-9532
	1865 River Rd West.	
	1865 River Rd West	
	1859 River Rd.	
	1859 River Rd West	
	1853 River Rd West	
	1827 River Rd W	

NAME	ADDRESS
	1142 River Rd W.
	1130 River Rd W
	1264 River Rd West
	1265 River Rd West
	1304 River Rd W
	1312 River Road West
	1312 River Rd West
	1350 River Rd West
	1355 River Rd W
	1448 River Rd W
	1246 River Rd. W.

NAME	ADDRESS
	1094 RIVER RD WEST
	1094 RIVER RD. WEST
	1090 " " "
	1444 River Road West.
	1958 River Rd W.
	16 Fairway Cres
	~~1649 Prince~~
	24 FAIRWAY
	33 Fairway Cres
	33 Fairway Cres
	28 ~~Britton Cr~~
	52 Fairway Cres
	1280 RIVER RD WEST
	1280 River Road West
	~~1254 River Rd W~~
	1254 River Rd W.
	1700 River Rd W.
	1700 River Rd W.
	34 Fairway
	34 Fairway

NAME	ADDRESS
	129 [illegible]
	1553 RRW
	1561 RRW
	1569 RRW
	1583 RRW
	2005 RRW
	1C3 [illegible]
	22 [illegible]
	11 [illegible]
	65 FOREST AVE
	53 BUSH CR

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario L4N 8Z7
Tel: (705) 726-3371 • Fax: (705) 726-4391
E-mail: barrie@ainleygroup.com

April 23, 2010

File No. 109049

[redacted]
23 Brouwer Cres
Town of Wasaga Beach, Ontario
L9Z 1L8

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment

Dear Resident:

As Project Managers for the River Road West Class Environmental Assessment (EA), we are responding to your comments regarding the alternative design concepts provided in the Public Information Centre dated February 18, 2010. Given the number of comment sheets (18) we received, we have included your response with the general response to most comments provided by the public in this letter. We believe that you would be interested in the response offered to other members of the public. Included below is a summary of the comments and our response:

1. Comment/Concern:
I would prefer 3 lanes instead of 4 lanes on River Road West.

1. Answer/Response:
A 3 lane cross-section on River Road West is recommended before 2026 given the high density of driveways along the road. However, to accommodate future increased traffic volumes and future public transportation (bus lanes/bays), 4 lanes will be needed in 2026 and beyond. It is noted that costs will be much higher if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated. It is also noted that even if a by-pass is built to divert some of the traffic volumes away from River Road West and 3 lanes are sufficient in 2026 and beyond, a wider (4 lane) asphalt platform may be needed to accommodate future bus lane/bay areas.

Should the road be remarked to have 4 lanes in the future, slightly longer delays will occur for vehicles exiting from minor side streets and driveways turning onto River Road West. However, the traffic volumes on most of these driveways are relatively light, such as 1 or 2 trips per day, the expected delays should be in an acceptable range. Peak hour volumes on most of the unsignalized side streets are in the order of 2 to 65 vehicles in 2026, although, operational details at these locations should be reviewed before 2026, significant high delays are not expected.

2. Comment/Concern:
The staging plan for River Road West construction identified the section from Brillinger Drive to Blueberry Trail as being constructed as one phase commencing in 2011. This section should be divided into 2 phases. Why does Phase 2 (from Blueberry Trail to Main Street) take so long (2016)?

2. Answer/Response:
The possible phasing is suggested based on traffic volume projections and traffic operation needs only. The actual phasing is subject to the Town's funding restrictions, priorities and other necessary approvals and, thus, may not necessarily be the same as the one recommended.

3. Comment/Concern:
I would like to have the bike lane above a curb to separate bicyclists from vehicular traffic.

3. Answer/Response:
Given the traffic volumes on the road, a wider (2.0 m) bike lane is considered desirable. However, only 1.5 m bike lane width fits the existing 20 m right-of-way. A width in excess of 20 m would require purchase of property for the project which is considered a major negative impact. The 1.5 m bike lane width is still acceptable based on engineering standards. In addition, the speed limit on the section of River Road West from Brillinger Drive to Main Street does not warrant an off-road bike path.

4. Comment/Concern:
Concern about the big trucks traveling through Town at night.

4. Answer:
There is currently no traffic count data for the period from 6:00 pm to 6:00 am for the section of River Road West. The Town is planning to conduct an ATR (Automatic Traffic Recording) count on the road in the spring when the snow has melted. The ATR count will include night time truck volumes. A night time traffic infiltration study (origin and destination study) is not considered practical given that it may not be possible for a surveyor to read a license plate from a moving vehicle at night. Should the truck volumes be determined as high at night, the Town may wish to restrict truck traffic on the road during the night hours through by-laws and enforcement.

5. Comment/Concern:
I would like to see a by-pass from Highway 26 to County Road 92 including the corridor from Knox Road to Powerline Road built in the very near future.

5. Answer:
The Town is going to conduct another traffic infiltration study this year. Should the study results reveal that the percentage of by-pass traffic or truck traffic is high (i.e. over 30% or over 40% for trucks, currently 5% for overall traffic and 6% - 8% for truck traffic), a by-pass is approaching warrants and can be considered sooner. However, based on the current data, this may occur in the future beyond 2026.

It is noted that Simcoe County's alternate east/west corridor through the Georgian Triangle will be built in the next 20 years. The Town may be able to divert some of the by-pass traffic to this corridor.

6. Comment/Concern:
Please ensure the bike lanes are clearly marked as such.

6. Answer:
The bike lanes will be marked in accordance with the latest guidelines in the industry (such as Transportation Association of Canada's *Manual of Uniform Traffic Control Devices for Canada* and *Bikeway Traffic Control Guidelines for Canada*). There will be a painted solid line between the bike lane and vehicular lane and bike symbols and signage.

In addition to the above information, several written responses did include a preference to which concepts should be selected. Included below, we provide a table outlining a summary of the preferred choices:

Concepts	Number of Comment Sheets
No concepts	3
Concept 1 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 2 bike lanes	3
Concept 2 – 3 lanes (1 lane in each direction plus a centre turn lane) with 1 sidewalk and 1 multi use path	4
Concept 3 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 multi use paths	3
Concept 6 – 4 lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 multi use paths and 2 boulevards	2
Concept 7 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 1 bike lane	1
Concepts 2 and 3	1
Concepts 1 and 6	1
Total	18

We wish to thank you for your interest in this Class EA and we encourage you to continue to provide comments as the planning proceeds. An additional Public Information Centre (the third Public Information Centre) will be held on Saturday June 26, 2010. A Notice of Public Information Centre will be published in the local newspaper and on the Town's website. We are continuing to document the Class EA planning process to address road capacity, pedestrian safety, drainage and pavement structure deficiency issues and to incorporate Active Transportation. As the EA continues for the area of River Road West from Brillinger Drive to the easterly Town limits, we will include you on our contact list to keep you informed as the study proceeds.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Jim McIntosh, Director of Public Works, Town of Wasaga Beach
Kevin Lalonde, Public Works Engineer, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group

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Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario L4N 8Z7
Tel: (705) 726-3371 • Fax: (705) 726-4391
E-mail: barrie@ainleygroup.com

April 23, 2010

File No. 109049

[redacted]
44 LIO AVE
WOODBRIDGE, ON
L4H1R8

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment

Dear Resident:

As Project Managers for the River Road West Class Environmental Assessment (EA), we are responding to your petition regarding the recommended design concepts provided in the Public Information Centre dated February 18, 2010. Included below is a summary of the petition comments and our response:

1. Comment/Concern:
I am a homeowner on River Road West and I oppose the Town's recommendation to change River Road West from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road.

1. Answer/Response:
We understand your concern. Based on the traffic analysis for the section of River Road West, 3 lanes would be sufficient to accommodate future traffic volumes before 2026, 4 lanes will be needed in 2026 and beyond. Although building a by-pass or utilizing a by-pass corridor to be created by the County of Simcoe may divert some traffic volumes away from River Road West, thereby, not requiring changing the road to 4 lanes and removing the bike lanes, increases in peak hour development traffic volumes are expected to be in the order of 2200 vehicles (including both inbound and outbound trips) in the area in the next 20 years. In addition, 4 lanes may be needed to accommodate future bus lane/bay areas.

It is noted that costs will be much higher if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated.

In addition, it is identified in the Town's Official Plan that River Road West from Mosley Street to Main Street is an arterial road whereas Mosley Street from River Road West to Main Street is a collector road. The Town's Official Plan has the following policies for arterial roads:

"Section 16.2.8.1. Arterial roads should be designed primarily to facilitate traffic movements between major land use activity areas in the Town.
Section 16.2.8.2. In maintaining the traffic carrying function of arterial roads, the following policies shall apply:

a) The appropriate rights-of-way shall be provided which will facilitate the future provision of public transportation;

b) Appropriate rights-of-way shall be provided for full channelization of arterial intersections;

c) Frontage, land use, entrances, exits, and curb use shall be controlled;

d) in existing built-up areas, remedial approaches to minimize the number of intersections with arterial roads shall be investigated."

2. Comment/Concern:
We are in favour of 3 lanes and 1 bike lane, which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

2. Answer/Response:
1 bike lane allows only one-way bicycle traffic travel on it. For the bicyclists returning or traveling from another direction, they will have to use other routes or be forced to pass each other by moving into the traffic lanes. The 1.8 m sidewalk is not wide enough for a bicyclist to walk with his/her bike when combined with other pedestrian traffic. Thus, for safety reasons, a single one-way bike lane is not recommended.

Sidewalks or multi-use paths have to be provided on both sides of the road to facilitate pedestrians. Given the traffic volumes on the road, pedestrians should only cross the road at a signalized intersection under a protected pedestrian signal phase.

If the road is only constructed to have 3 lanes with no flexibility to be remarked to 4 lanes, the Town may need to consider to build a by-pass route before 2026, which could more than double the current project construction costs or to revise the Official Plan to improve Mosley Street from River Road West to Main Street. Either option will need to obtain large sections of MNR property or private property beyond the road allowance.

It is noted that the Town is continuing with a traffic volume monitoring program including conducting traffic volume counts at major intersections every 5 years to identify the potential future need of a by-pass route within the Town. The need for a by-pass route will be reviewed on an ongoing basis.

We wish to thank you for your interest in this Class EA and we encourage you to continue to provide comments as the planning proceeds. An additional Public Information Centre (the third Public Information Centre) will be held on Saturday June 26, 2010. A Notice of Public Information Centre will be published in the local newspaper and on the Town's website. We are continuing to document the Class EA planning process to address road capacity, pedestrian safety, drainage and

pavement structure deficiency issues and to incorporate Active Transportation. As the EA continues for the area of River Road West from Brillinger Drive to the easterly Town limits, we will include you on our contact list to keep you informed as the study proceeds.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Jim McIntosh, Director of Public Works, Town of Wasaga Beach
Kevin Lalonde, Public Works Engineer, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group

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APPENDIX Q

Evaluation of Design Concepts

Category	Criteria		Weightings %	Alternative Designs																			
				Concept 1 – 3 Lanes with 2 Sidewalks and 2 Bike Lanes			Concept 2 – 3 Lanes with 1 Sidewalk and 1 Multi Use Path			Concept 3 – 3 Lanes with 2 Multi Use Paths			Concept 4 – 4 Lanes with 1 Sidewalk and 1 Multi Use Path			Concept 5 – 4 Lanes with 2 Multi Use Paths			Concept 6 – 4 Lanes with 2 Multi Use Paths and 2 Boulevards		
				Scale	Ranking		Scale	Ranking		Scale	Ranking		Scale	Ranking		Scale	Ranking		Scale	Ranking	
Natural Environment	Watercourses/Fisheries		15	0.6	9	One watercourse crosses the existing road allowance at the far east end of the section of the road and directly supports fisheries																
	Terrestrial Vegetation and Wildlife		15	0.6	9	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	0.6	9	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	0.6	9	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	0.7	10.5	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	0.7	10.5	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	0.7	10.5	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland
	Sub-total		30		18			18			18			19.5			19.5			19.5	
Socio-Economic Environment	Social Impacts to Residents and Businesses		7.5	0.7	5	High potential to negatively impact the existing residential area fronting on River Road West																
	Social Impacts at Social Features		2	0.7	1	High potential to negatively impact the small Town environment of Wasaga Beach, local public school and library																
	Noise Impacts		5	0.6	3	Insignificant increase in noise																
	Archaeological and Heritage		5	0.5	2.5	No registered archaeological sites found within the study limits																
	Capital Cost		7.5	0.7	5.3	Higher	0.6	4.5	Lower	0.6	4.5	Lower	0.7	5.3	Higher	0.7	5.3	Higher	0.7	5.3	Higher
	Operating Cost		3	0.7	2.1	Higher	0.6	1.8	Lower	0.6	1.8	Lower	0.7	2.1	Higher	0.7	2.1	Higher	0.7	2.1	Higher
	Sub-total		30		18.9			17.8			17.8			18.9			18.9			18.9	
Technical	Construction, Design, Land Ownership		5	0.5	2.5	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition would be required in 2026.	0.5	2.5	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	0.5	2.5	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	0.8	4	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	0.8	4	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	0.8	4	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.
	Pavement and Drainage Conditions		5	0	0	Deteriorating pavement and drainage conditions will be addressed																
	Impacts on Existing Utilities		5	0.8	4	Existing utilities would likely need to be relocated. Most of the study area is serviced with Municipal water distribution and wastewater collection/treatment systems except the area from Bell's Park Road to the easterly Town limits.																
	Operational	Future Capacity	10	0	0	Longer term (beyond 20 years) vehicular demands could be accommodated if the road would be remarked as a 4 lane road in 2026 and beyond. In this case, additional right-of-way would be required to facilitate active transportation.	0.2	2	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	0.2	2	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	0	0	Longer term (beyond 20 years) vehicular demands could be accommodated.	0	0	Longer term (beyond 20 years) vehicular demands could be accommodated.	0	0	Longer term (beyond 20 years) vehicular demands could be accommodated.
		Flexibility	5	0	0	The road could be used as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	0.8	4	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	0.8	4	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	0	0	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	0	0	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	0	0	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.
		Pedestrian Safety	5	0.4	2	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	0.1	0.5	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	0.1	0.5	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	0.4	2	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles in 2026 and beyond.	0.4	2	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles in 2026 and beyond.	0.3	1.5	Longer distance for pedestrians to cross the road. Provide a minimum of 1.5 m permanent boulevard to separate pedestrian traffic from vehicular traffic.
		Future Public Transportation	5	0.3	1.5	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	0.8	4	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus bays.	0.8	4	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus bays.	0.3	1.5	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	0.3	1.5	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	0.3	1.5	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.
	Sub-total		40		10.5			17			17			11.5			11.5			11	
Total			100		46.9			52.8			52.8			49.9			49.9			49.4	

Rating Scale
0 – Significant Positive Impact, 0.5 – No Impact, 1 – Significant Negative Impact.

Ranking = Scale x Weighting

Grey out area – same scale/ranking applied to all six cncepts

Category	Criteria		Weightings %	Alternative Designs																				
				Concept 7 – 3 Lanes with 2 Sidewalks and 1 Bike Lane			Concept 8 – 4 Lanes with 2 Sidewalks			Concept 9 – 4 Lanes with 2 Sidewalks and 1 Bike Lane													
				Scale	Ranking		Scale	Ranking		Scale	Ranking												
Natural Environment	Watercourses/Fisheries		15	0.6	9	One watercourse crosses the existing road allowance at the far east end of the section of the road and directly supports fisheries																		
	Terrestrial Vegetation and Wildlife		15	0.6	9	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	0.6	9	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	0.7	10.5	Slighthly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland											
	Sub-total		30		18			18			19.5												
Socio-Economic Environment	Social Impacts to Residents and Businesses		7.5	0.7	5	High potential to negatively impact the existing residential area fronting on River Road West																		
	Social Impacts at Social Features		2	0.7	1	High potential to negatively impact the small Town environment of Wasaga Beach, local public school and library																		
	Noise Impacts		5	0.6	3	Insignificant increase in noise																		
	Archaeological and Heritage		5	0.5	2.5	No registered archaeological sites found within the study limits																		
	Capital Cost		7.5	0.7	5.3	Lower	0.6	4.5	Higher	0.6	4.5	Higher												
	Operating Cost		3	0.7	2.1	Lower	0.6	1.8	Higher	0.6	1.8	Higher												
	Sub-total		30		17.8			18.9			18.9													
Technical	Construction, Design, Land Ownership		5	0.5	2.5	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	0.5	2.5	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	0.8	4	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.											
	Pavement and Drainage Conditions		5	0	0	Deteriorating pavement and drainage conditions will be addressed																		
	Impacts on Existing Utilities		5	0.8	4	Existing utilities would likely need to be relocated. Most of the study area is serviced with Municipal water distribution and wastewater collection/treatment systems except the area from Bell's Park Road to the easterly Town limits.																		
	Operational	Future Capacity	10	0.2	2	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	0	0	Longer term (beyond 20 years) vehicular demands could be accommodated.	0	0	Longer term (beyond 20 years) vehicular demands could be accommodated.												
		Flexibility	5	0.8	4	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	0	0	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	0	0	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.												
		Pedestrian Safety	5	0.7	3.5	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles. Provides only a single one-way bike lane	0.4	2	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles. Provides no bike lanes/paths in 2026 and beyond	0.8	4	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles. Provides only a single one-way bike lane in 2026 and beyond												
		Future Public Transportation	5	0.8	4	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus bays.	0.3	1.5	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	0.3	1.5	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.												
	Sub-total		40		20			10			13.5													
Total			100		55.8			46.9			51.9													

Rating Scale
0 – Significant Positive Impact, 0.5 – No Impact, 1 – Significant Negative Impact.

Ranking = Scale x Weighting

Grey out area – same scale/ranking applied to all six cncepts

APPENDIX R

2010 Infiltration Study Report and ATR Count Data

ONTARIO TRAFFIC, INC.

TRAFFIC MONITORING SERVICES

- ***Project Name:*** Wasaga Beach Traffic Infiltration Study
- ***Performed For:*** Ainley Group
- ***Date Performed:*** May 2010

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, Ontario, Canada
L3Y 3E3

Tel: (905) 898-7711
Fax: (905) 898-3664
Email: oti@ontario-traffic.com
Web Page: www.ontario-traffic.com

PURPOSE:

A Traffic Infiltration Study was conducted at 2 survey stations in the Town of Wasaga Beach. This was to determine infiltration and layover trips.

STUDY METHODOLOGY:

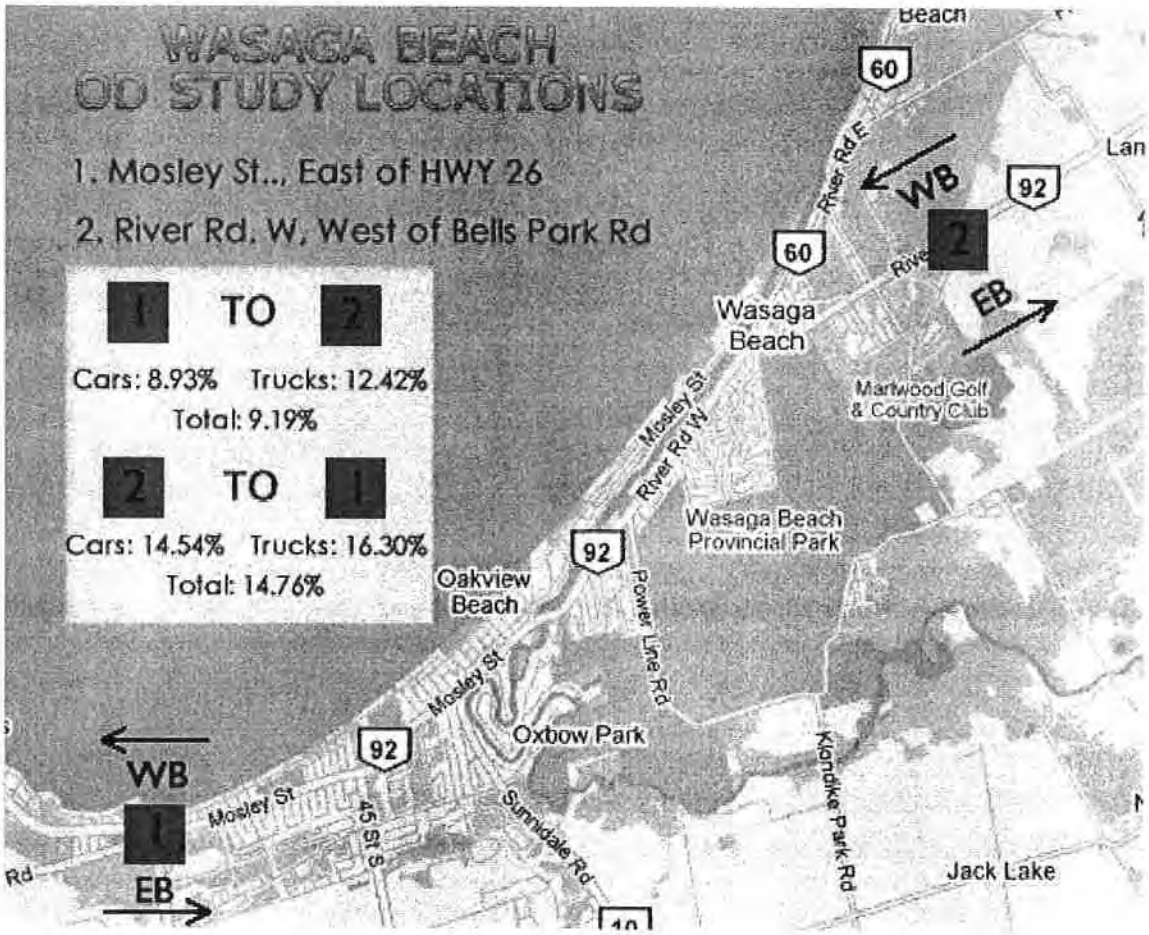
The data was collected by capturing vehicle license plates at two (2) survey stations. The first station was located at Mosley Street just east of Highway 26. The second station was located at River Road west of Belles Park Road.

At each station there was a crew of four (4) surveyors where two (2) surveyors were responsible for recording the EB traffic and the other two (2) surveyors were responsible for capturing the WB traffic. The data was collected with the use of laptop computers.

The survey hours were 06:00-18:00 (continuous). Each vehicle was parked on the shoulder and was setup with orange cones and revolving lights (conformance to MTO Book 7 guidelines).

SUMMARY OF STUDY RESULTS:

The results indicate that for both the eastbound and westbound directions the trip purpose is roughly equally divided between trips that are strictly cut-thru and trips whereby drivers stop in town. Study results are presented in the following pages.


WASAGA BEACH
OD STUDY LOCATIONS
1. Mosley St.., East of HWY 26
2. River Rd. W, West of Bells Park Rd
1 TO 2
Cars: 8.93% Trucks: 12.42%
Total: 9.19%
2 TO 1
Cars: 14.54% Trucks: 16.30%
Total: 14.76%
WB
EB
Wasaga Beach
Oakview Beach
Oxbow Park
Wasaga Beach Provincial Park
Marlwood Golf & Country Club
Jack Lake
River Rd E
River Rd W
Mosley St
Power Line Rd
Sunnidale Rd
Klondike Park Rd
45 St S
60
92

CARS		Totals	Travel Time Period					Totals	% Match of
		Mosley St	0-15 (min)	15-30 (min)	30-45 (min)	45-60 (min)	>60 (min)	River Rd	Location 1
6:00 AM	6:15 AM	28	0	1	0	1	1	7	10.71%
6:15 AM	6:30 AM	17	0	0	1	0	1	32	11.76%
6:30 AM	6:45 AM	34	0	2	0	0	2	16	11.76%
6:45 AM	7:00 AM	34	1	1	2	0	0	16	11.76%
7:00 AM	7:15 AM	49	0	0	0	2	3	21	10.20%
7:15 AM	7:30 AM	46	3	2	0	1	2	30	17.39%
7:30 AM	7:45 AM	57	3	4	1	0	5	18	22.81%
7:45 AM	8:00 AM	62	0	1	1	0	6	38	12.90%
8:00 AM	8:15 AM	88	1	3	0	0	3	38	7.95%
8:15 AM	8:30 AM	91	2	4	0	0	4	31	10.99%
8:30 AM	8:45 AM	119	2	6	2	0	2	31	10.08%
8:45 AM	9:00 AM	87	5	2	2	1	6	30	18.39%
9:00 AM	9:15 AM	70	2	1	0	2	3	36	11.43%
9:15 AM	9:30 AM	81	0	4	0	0	5	28	11.11%
9:30 AM	9:45 AM	84	1	2	1	0	4	37	9.52%
9:45 AM	10:00 AM	68	0	1	0	1	1	38	4.41%
10:00 AM	10:15 AM	68	3	1	0	0	6	33	14.71%
10:15 AM	10:30 AM	74	0	3	0	0	3	43	8.11%
10:30 AM	10:45 AM	67	2	2	0	0	3	41	10.45%
10:45 AM	11:00 AM	83	1	4	1	1	4	49	13.25%
11:00 AM	11:15 AM	63	2	2	0	0	5	38	14.29%
11:15 AM	11:30 AM	73	2	2	0	1	2	41	9.59%
11:30 AM	11:45 AM	79	0	4	0	1	3	42	10.13%
11:45 AM	12:00 PM	85	2	1	2	0	3	45	9.41%
12:00 PM	12:15 PM	76	1	3	1	1	5	32	14.47%
12:15 PM	12:30 PM	75	5	1	0	0	4	34	13.33%
12:30 PM	12:45 PM	80	2	0	0	0	2	36	5.00%
12:45 PM	1:00 PM	95	0	1	1	0	4	25	6.32%
1:00 PM	1:15 PM	40	4	0	2	0	1	40	17.50%
1:15 PM	1:30 PM	99	4	0	2	2	3	45	11.11%
1:30 PM	1:45 PM	91	1	2	0	1	7	44	12.09%
1:45 PM	2:00 PM	110	3	3	1	0	6	40	11.82%
2:00 PM	2:15 PM	81	0	1	4	2	4	49	13.58%
2:15 PM	2:30 PM	80	2	2	0	1	3	32	10.00%
2:30 PM	2:45 PM	80	1	0	2	1	1	33	6.25%
2:45 PM	3:00 PM	91	1	2	1	0	2	23	6.59%
3:00 PM	3:15 PM	109	0	3	3	0	6	44	11.01%
3:15 PM	3:30 PM	118	3	1	1	1	2	40	6.78%
3:30 PM	3:45 PM	114	0	4	0	2	2	36	7.02%
3:45 PM	4:00 PM	134	1	7	2	1	1	36	8.96%
4:00 PM	4:15 PM	105	0	6	0	2	0	30	7.62%
4:15 PM	4:30 PM	125	2	5	0	0	0	44	5.60%
4:30 PM	4:45 PM	114	0	4	0	0	1	47	4.39%
4:45 PM	5:00 PM	127	0	6	0	0	0	45	4.72%
5:00 PM	5:15 PM	139	1	7	1	0	0	34	6.47%
5:15 PM	5:30 PM	146	0	1	0	0	0	38	0.68%
5:30 PM	5:45 PM	145	1	0	0	0	0	45	0.69%
5:45 PM	6:00 PM	124	1	0	0	0	0	30	0.81%
	Totals	4077	65	111	34	24	130	1674	
	Percent		1.59%	2.72%	0.83%	0.59%	3.19%		
	Total Matching		8.93%						

TRUCKS		Totals	Travel Time Period					Totals	% Match of
		Mosley St	0-15 (min)	15-30 (min)	30-45 (min)	45-60 (min)	>60 (min)	River Rd	Location 1
6:00 AM	6:15 AM	2	0	0	0	0	0	1	0.00%
6:15 AM	6:30 AM	2	0	0	0	0	0	2	0.00%
6:30 AM	6:45 AM	1	0	0	0	0	0	3	0.00%
6:45 AM	7:00 AM	4	0	0	1	0	0	1	25.00%
7:00 AM	7:15 AM	5	0	0	0	0	0	2	0.00%
7:15 AM	7:30 AM	3	0	1	0	0	0	6	33.33%
7:30 AM	7:45 AM	6	0	0	0	0	1	4	16.67%
7:45 AM	8:00 AM	7	1	0	1	0	0	3	28.57%
8:00 AM	8:15 AM	5	0	0	0	0	1	8	20.00%
8:15 AM	8:30 AM	5	0	0	0	0	0	6	0.00%
8:30 AM	8:45 AM	8	1	0	0	0	0	7	12.50%
8:45 AM	9:00 AM	11	0	1	0	0	2	4	27.27%
9:00 AM	9:15 AM	6	1	1	0	0	0	2	33.33%
9:15 AM	9:30 AM	8	1	1	0	0	0	4	25.00%
9:30 AM	9:45 AM	6	1	0	0	0	0	1	16.67%
9:45 AM	10:00 AM	4	0	0	0	0	1	2	25.00%
10:00 AM	10:15 AM	5	0	0	0	0	1	3	20.00%
10:15 AM	10:30 AM	1	0	0	0	0	0	1	0.00%
10:30 AM	10:45 AM	6	0	0	0	0	0	0	0.00%
10:45 AM	11:00 AM	4	0	0	1	0	0	1	25.00%
11:00 AM	11:15 AM	3	1	0	0	0	0	3	33.33%
11:15 AM	11:30 AM	7	0	0	0	0	0	0	0.00%
11:30 AM	11:45 AM	5	0	0	0	0	0	1	0.00%
11:45 AM	12:00 PM	8	0	0	0	0	0	1	0.00%
12:00 PM	12:15 PM	9	0	0	0	0	1	3	11.11%
12:15 PM	12:30 PM	7	0	0	0	0	1	4	14.29%
12:30 PM	12:45 PM	4	0	1	0	0	0	3	25.00%
12:45 PM	1:00 PM	5	1	0	0	0	0	2	20.00%
1:00 PM	1:15 PM	10	0	1	0	0	0	2	10.00%
1:15 PM	1:30 PM	12	0	1	0	0	0	5	8.33%
1:30 PM	1:45 PM	8	0	0	0	0	2	2	25.00%
1:45 PM	2:00 PM	7	0	2	0	1	0	6	42.86%
2:00 PM	2:15 PM	12	1	1	0	0	0	3	16.67%
2:15 PM	2:30 PM	6	0	0	0	0	1	2	16.67%
2:30 PM	2:45 PM	6	0	0	0	0	0	2	0.00%
2:45 PM	3:00 PM	5	0	1	0	0	0	4	20.00%
3:00 PM	3:15 PM	8	0	0	0	0	0	2	0.00%
3:15 PM	3:30 PM	6	0	0	0	1	0	7	16.67%
3:30 PM	3:45 PM	7	2	1	0	0	0	3	42.86%
3:45 PM	4:00 PM	13	0	1	0	0	0	2	7.69%
4:00 PM	4:15 PM	11	0	0	0	0	0	1	0.00%
4:15 PM	4:30 PM	8	0	1	0	0	0	5	12.50%
4:30 PM	4:45 PM	11	0	0	0	0	0	1	0.00%
4:45 PM	5:00 PM	10	0	0	1	0	0	2	10.00%
5:00 PM	5:15 PM	12	0	0	0	0	0	3	0.00%
5:15 PM	5:30 PM	6	0	0	0	0	0	1	0.00%
5:30 PM	5:45 PM	13	0	0	0	0	0	2	0.00%
5:45 PM	6:00 PM	14	0	0	0	0	0	2	0.00%
	Totals	330	10	14	4	2	11	134	
	Percent		3.03%	4.24%	1.21%	0.61%	3.33%		
	Total Matching		12.42%						

7.27%

TOTAL		Totals	Travel Time Period					Totals	% Match of
		Mosley St	0-15 (min)	15-30 (min)	30-45 (min)	45-60 (min)	>60 (min)	River Rd	Location 1
6:00 AM	6:15 AM	30	0	1	0	1	1	8	10.00%
6:15 AM	6:30 AM	19	0	0	1	0	1	34	10.53%
6:30 AM	6:45 AM	35	0	2	0	0	2	19	11.43%
6:45 AM	7:00 AM	38	1	1	3	0	0	17	13.16%
7:00 AM	7:15 AM	54	0	0	0	2	3	23	9.26%
7:15 AM	7:30 AM	49	3	3	0	1	2	36	18.37%
7:30 AM	7:45 AM	63	3	4	1	0	6	22	22.22%
7:45 AM	8:00 AM	69	1	1	2	0	6	41	14.49%
8:00 AM	8:15 AM	93	1	3	0	0	4	46	8.60%
8:15 AM	8:30 AM	96	2	4	0	0	4	37	10.42%
8:30 AM	8:45 AM	127	3	6	2	0	2	38	10.24%
8:45 AM	9:00 AM	98	5	3	2	1	8	34	19.39%
9:00 AM	9:15 AM	76	3	2	0	2	3	38	13.16%
9:15 AM	9:30 AM	89	1	5	0	0	5	32	12.36%
9:30 AM	9:45 AM	90	2	2	1	0	4	38	10.00%
9:45 AM	10:00 AM	72	0	1	0	1	2	40	5.56%
10:00 AM	10:15 AM	73	3	1	0	0	7	36	15.07%
10:15 AM	10:30 AM	75	0	3	0	0	3	44	8.00%
10:30 AM	10:45 AM	73	2	2	0	0	3	41	9.59%
10:45 AM	11:00 AM	87	1	4	2	1	4	50	13.79%
11:00 AM	11:15 AM	66	3	2	0	0	5	41	15.15%
11:15 AM	11:30 AM	80	2	2	0	1	2	41	8.75%
11:30 AM	11:45 AM	84	0	4	0	1	3	43	9.52%
11:45 AM	12:00 PM	93	2	1	2	0	3	46	8.60%
12:00 PM	12:15 PM	85	1	3	1	1	6	35	14.12%
12:15 PM	12:30 PM	82	5	1	0	0	5	38	13.41%
12:30 PM	12:45 PM	84	2	1	0	0	2	39	5.95%
12:45 PM	1:00 PM	100	1	1	1	0	4	27	7.00%
1:00 PM	1:15 PM	50	4	1	2	0	1	42	16.00%
1:15 PM	1:30 PM	111	4	1	2	2	3	50	10.81%
1:30 PM	1:45 PM	99	1	2	0	1	9	46	13.13%
1:45 PM	2:00 PM	117	3	5	1	1	6	46	13.68%
2:00 PM	2:15 PM	93	1	2	4	2	4	52	13.98%
2:15 PM	2:30 PM	86	2	2	0	1	4	34	10.47%
2:30 PM	2:45 PM	86	1	0	2	1	1	35	5.81%
2:45 PM	3:00 PM	96	1	3	1	0	2	27	7.29%
3:00 PM	3:15 PM	117	0	3	3	0	6	46	10.26%
3:15 PM	3:30 PM	124	3	1	1	2	2	47	7.26%
3:30 PM	3:45 PM	121	2	5	0	2	2	39	9.09%
3:45 PM	4:00 PM	147	1	8	2	1	1	38	8.84%
4:00 PM	4:15 PM	116	0	6	0	2	0	31	6.90%
4:15 PM	4:30 PM	133	2	6	0	0	0	49	6.02%
4:30 PM	4:45 PM	125	0	4	0	0	1	48	4.00%
4:45 PM	5:00 PM	137	0	6	1	0	0	47	5.11%
5:00 PM	5:15 PM	151	1	7	1	0	0	37	5.96%
5:15 PM	5:30 PM	152	0	1	0	0	0	39	0.66%
5:30 PM	5:45 PM	158	1	0	0	0	0	47	0.63%
5:45 PM	6:00 PM	138	1	0	0	0	0	32	0.72%
	Totals	4407	75	125	38	26	141	1808	
	Percent		1.70%	2.84%	0.86%	0.59%	3.20%		
	Total Matching		9.19%						

4.54%

CARS		Totals	Travel Time Period					Totals	% Match of
		River Rd	0-15 (min)	15-30 (min)	30-45 (min)	45-60 (min)	>60 (min)	Mosley St	Location 1
6:00 AM	6:15 AM	7	0	0	0	0	0	22	0.00%
6:15 AM	6:30 AM	13	0	0	0	0	1	46	7.69%
6:30 AM	6:45 AM	12	1	0	0	0	0	69	8.33%
6:45 AM	7:00 AM	19	1	0	0	0	2	57	15.79%
7:00 AM	7:15 AM	21	5	0	0	0	1	67	28.57%
7:15 AM	7:30 AM	30	9	0	0	0	1	84	33.33%
7:30 AM	7:45 AM	24	3	1	0	0	1	98	20.83%
7:45 AM	8:00 AM	42	9	1	1	0	2	119	30.95%
8:00 AM	8:15 AM	19	2	0	0	0	1	131	15.79%
8:15 AM	8:30 AM	30	1	1	1	0	0	103	10.00%
8:30 AM	8:45 AM	34	2	0	0	0	1	111	8.82%
8:45 AM	9:00 AM	41	0	0	1	1	7	90	21.95%
9:00 AM	9:15 AM	34	6	1	0	0	1	79	23.53%
9:15 AM	9:30 AM	20	1	0	0	0	3	103	20.00%
9:30 AM	9:45 AM	27	2	0	0	1	2	100	18.52%
9:45 AM	10:00 AM	36	5	3	1	0	3	86	33.33%
10:00 AM	10:15 AM	35	3	0	2	0	3	84	22.86%
10:15 AM	10:30 AM	37	3	1	0	0	4	90	21.62%
10:30 AM	10:45 AM	34	3	0	0	0	2	91	14.71%
10:45 AM	11:00 AM	29	3	0	0	0	0	74	10.34%
11:00 AM	11:15 AM	32	4	0	1	0	3	92	25.00%
11:15 AM	11:30 AM	21	2	1	0	0	3	93	28.57%
11:30 AM	11:45 AM	37	0	0	0	0	4	95	10.81%
11:45 AM	12:00 PM	23	3	1	0	0	0	76	17.39%
12:00 PM	12:15 PM	47	6	2	0	1	1	77	21.28%
12:15 PM	12:30 PM	42	4	0	1	0	6	87	26.19%
12:30 PM	12:45 PM	25	1	0	0	0	1	89	8.00%
12:45 PM	1:00 PM	30	3	1	0	0	4	77	26.67%
1:00 PM	1:15 PM	28	2	1	0	0	0	89	10.71%
1:15 PM	1:30 PM	42	2	3	1	0	1	104	16.67%
1:30 PM	1:45 PM	31	0	0	0	0	0	89	0.00%
1:45 PM	2:00 PM	32	0	0	0	0	1	85	3.13%
2:00 PM	2:15 PM	35	2	0	1	0	2	70	14.29%
2:15 PM	2:30 PM	42	5	0	0	0	0	63	11.90%
2:30 PM	2:45 PM	37	1	0	0	0	3	104	10.81%
2:45 PM	3:00 PM	34	0	0	0	1	0	75	2.94%
3:00 PM	3:15 PM	34	0	0	0	0	3	77	8.82%
3:15 PM	3:30 PM	47	2	1	0	0	0	76	6.38%
3:30 PM	3:45 PM	42	2	0	0	0	0	103	4.76%
3:45 PM	4:00 PM	11	0	0	0	0	0	78	0.00%
4:00 PM	4:15 PM	23	1	0	0	0	0	93	4.35%
4:15 PM	4:30 PM	47	3	3	0	0	0	83	12.77%
4:30 PM	4:45 PM	49	3	1	0	0	0	80	8.16%
4:45 PM	5:00 PM	40	3	0	0	0	2	78	12.50%
5:00 PM	5:15 PM	55	3	1	2	0	0	87	10.91%
5:15 PM	5:30 PM	55	4	1	1	0	0	77	10.91%
5:30 PM	5:45 PM	61	4	0	0	0	0	83	6.56%
5:45 PM	6:00 PM	43	1	0	0	0	0	60	2.33%
	Totals	1582	120	24	13	4	69	4022	
	Percent		7.59%	1.52%	0.82%	0.25%	4.36%		
	Total Matching		14.54%						

9.11%

TRUCKS		Totals	Travel Time Period					Totals	% Match of
		River Rd	0-15 (min)	15-30 (min)	30-45 (min)	45-60 (min)	>60 (min)	Mosley St	Location 1
6:00 AM	6:15 AM	2	0	0	0	0	0	6	0.00%
6:15 AM	6:30 AM	3	0	1	0	0	0	2	33.33%
6:30 AM	6:45 AM	2	0	0	0	0	0	5	0.00%
6:45 AM	7:00 AM	0	0	0	0	0	0	4	0.00%
7:00 AM	7:15 AM	1	0	0	0	0	0	3	0.00%
7:15 AM	7:30 AM	3	0	0	0	1	0	5	33.33%
7:30 AM	7:45 AM	1	0	0	0	0	0	4	0.00%
7:45 AM	8:00 AM	2	0	0	0	0	0	7	0.00%
8:00 AM	8:15 AM	2	1	0	0	0	0	12	50.00%
8:15 AM	8:30 AM	0	0	0	0	0	0	14	0.00%
8:30 AM	8:45 AM	1	0	0	0	0	0	11	0.00%
8:45 AM	9:00 AM	2	0	0	0	0	0	13	0.00%
9:00 AM	9:15 AM	4	0	0	1	0	0	8	25.00%
9:15 AM	9:30 AM	1	0	0	0	0	0	10	0.00%
9:30 AM	9:45 AM	3	0	0	0	1	1	6	66.67%
9:45 AM	10:00 AM	2	0	0	0	0	0	7	0.00%
10:00 AM	10:15 AM	1	0	0	0	0	0	4	0.00%
10:15 AM	10:30 AM	5	0	1	0	0	1	5	40.00%
10:30 AM	10:45 AM	3	0	0	0	0	0	10	0.00%
10:45 AM	11:00 AM	4	0	0	0	0	0	8	0.00%
11:00 AM	11:15 AM	4	0	0	0	0	0	7	0.00%
11:15 AM	11:30 AM	6	0	0	0	0	0	11	0.00%
11:30 AM	11:45 AM	2	1	0	0	0	0	5	50.00%
11:45 AM	12:00 PM	4	1	0	0	0	0	6	25.00%
12:00 PM	12:15 PM	7	0	1	1	1	0	7	42.86%
12:15 PM	12:30 PM	3	0	0	0	0	0	4	0.00%
12:30 PM	12:45 PM	8	0	0	0	0	0	5	0.00%
12:45 PM	1:00 PM	6	0	0	0	0	0	8	0.00%
1:00 PM	1:15 PM	4	0	0	0	0	0	10	0.00%
1:15 PM	1:30 PM	7	0	0	0	0	2	11	28.57%
1:30 PM	1:45 PM	5	0	0	0	0	0	7	0.00%
1:45 PM	2:00 PM	5	0	0	0	0	0	6	0.00%
2:00 PM	2:15 PM	3	0	0	0	0	0	8	0.00%
2:15 PM	2:30 PM	7	1	0	0	0	0	5	14.29%
2:30 PM	2:45 PM	11	0	2	0	0	1	7	27.27%
2:45 PM	3:00 PM	8	0	2	0	0	0	10	25.00%
3:00 PM	3:15 PM	7	0	1	0	0	1	9	28.57%
3:15 PM	3:30 PM	10	0	0	0	0	0	13	0.00%
3:30 PM	3:45 PM	13	2	1	0	0	0	11	23.08%
3:45 PM	4:00 PM	11	0	1	0	0	0	5	9.09%
4:00 PM	4:15 PM	8	1	1	0	0	1	14	37.50%
4:15 PM	4:30 PM	10	0	0	0	1	1	15	20.00%
4:30 PM	4:45 PM	7	0	0	0	0	0	11	0.00%
4:45 PM	5:00 PM	5	1	0	0	0	0	12	20.00%
5:00 PM	5:15 PM	8	1	1	0	0	0	7	25.00%
5:15 PM	5:30 PM	8	0	0	0	0	0	14	0.00%
5:30 PM	5:45 PM	4	0	0	1	0	1	8	50.00%
5:45 PM	6:00 PM	6	0	0	0	0	0	6	0.00%
	Totals	227	9	12	3	4	9	380	
	Percent		3.96%	5.29%	1.32%	1.76%	3.96%		
	Total Matching		16.30%						

9.25%

TOTAL		Totals	Travel Time Period					Totals	% Match of
		River Rd	0-15 (min)	15-30 (min)	30-45 (min)	45-60 (min)	>60 (min)	Mosley St	Location 1
6:00 AM	6:15 AM	9	0	0	0	0	0	28	0.00%
6:15 AM	6:30 AM	16	0	1	0	0	1	48	12.50%
6:30 AM	6:45 AM	14	1	0	0	0	0	74	7.14%
6:45 AM	7:00 AM	19	1	0	0	0	2	61	15.79%
7:00 AM	7:15 AM	22	5	0	0	0	1	70	27.27%
7:15 AM	7:30 AM	33	9	0	0	1	1	89	33.33%
7:30 AM	7:45 AM	25	3	1	0	0	1	102	20.00%
7:45 AM	8:00 AM	44	9	1	1	0	2	126	29.55%
8:00 AM	8:15 AM	21	3	0	0	0	1	143	19.05%
8:15 AM	8:30 AM	30	1	1	1	0	0	117	10.00%
8:30 AM	8:45 AM	35	2	0	0	0	1	122	8.57%
8:45 AM	9:00 AM	43	0	0	1	1	7	103	20.93%
9:00 AM	9:15 AM	38	6	1	1	0	1	87	23.68%
9:15 AM	9:30 AM	21	1	0	0	0	3	113	19.05%
9:30 AM	9:45 AM	30	2	0	0	2	3	106	23.33%
9:45 AM	10:00 AM	38	5	3	1	0	3	93	31.58%
10:00 AM	10:15 AM	36	3	0	2	0	3	88	22.22%
10:15 AM	10:30 AM	42	3	2	0	0	5	95	23.81%
10:30 AM	10:45 AM	37	3	0	0	0	2	101	13.51%
10:45 AM	11:00 AM	33	3	0	0	0	0	82	9.09%
11:00 AM	11:15 AM	36	4	0	1	0	3	99	22.22%
11:15 AM	11:30 AM	27	2	1	0	0	3	104	22.22%
11:30 AM	11:45 AM	39	1	0	0	0	4	100	12.82%
11:45 AM	12:00 PM	27	4	1	0	0	0	82	18.52%
12:00 PM	12:15 PM	54	6	3	1	2	1	84	24.07%
12:15 PM	12:30 PM	45	4	0	1	0	6	91	24.44%
12:30 PM	12:45 PM	33	1	0	0	0	1	94	6.06%
12:45 PM	1:00 PM	36	3	1	0	0	4	85	22.22%
1:00 PM	1:15 PM	32	2	1	0	0	0	99	9.38%
1:15 PM	1:30 PM	49	2	3	1	0	3	115	18.37%
1:30 PM	1:45 PM	36	0	0	0	0	0	96	0.00%
1:45 PM	2:00 PM	37	0	0	0	0	1	91	2.70%
2:00 PM	2:15 PM	38	2	0	1	0	2	78	13.16%
2:15 PM	2:30 PM	49	6	0	0	0	0	68	12.24%
2:30 PM	2:45 PM	48	1	2	0	0	4	111	14.58%
2:45 PM	3:00 PM	42	0	2	0	1	0	85	7.14%
3:00 PM	3:15 PM	41	0	1	0	0	4	86	12.20%
3:15 PM	3:30 PM	57	2	1	0	0	0	89	5.26%
3:30 PM	3:45 PM	55	4	1	0	0	0	114	9.09%
3:45 PM	4:00 PM	22	0	1	0	0	0	83	4.55%
4:00 PM	4:15 PM	31	2	1	0	0	1	107	12.90%
4:15 PM	4:30 PM	57	3	3	0	1	1	98	14.04%
4:30 PM	4:45 PM	56	3	1	0	0	0	91	7.14%
4:45 PM	5:00 PM	45	4	0	0	0	2	90	13.33%
5:00 PM	5:15 PM	63	4	2	2	0	0	94	12.70%
5:15 PM	5:30 PM	63	4	1	1	0	0	91	9.52%
5:30 PM	5:45 PM	65	4	0	1	0	1	91	9.23%
5:45 PM	6:00 PM	49	1	0	0	0	0	66	2.04%
	Totals	1809	129	36	16	8	78	4402	
	Percent		7.13%	1.99%	0.88%	0.44%	4.31%		
	Total Matching		14.76%						

9.12%

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/14/10	0	14	14	0	0	1	0	0	0	0	0	0	0	29
01:00	0	9	12	0	0	0	0	0	0	0	0	0	0	21
02:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
03:00	0	6	3	0	0	0	0	0	1	0	0	0	0	10
04:00	0	10	3	0	2	0	0	0	1	0	0	0	0	16
05:00	0	27	24	0	1	0	0	1	5	0	0	0	0	58
06:00	0	51	61	0	1	3	0	3	0	0	6	0	0	125
07:00	0	96	79	**5**	2	3	**1**	3	4	0	10	**1**	0	204
08:00	0	185	96	5	7	3	1	6	**8**	0	22	1	0	334
09:00	0	194	127	3	5	**5**	0	6	2	0	18	0	0	360
10:00	0	225	**142**	0	6	2	0	**8**	5	0	21	0	0	409
11:00	0	**255**	137	2	**8**	2	0	7	8	0	**28**	0	0	**447**
12 PM	0	224	187	3	3	3	0	9	7	0	23	0	0	459
13:00	0	230	156	1	4	2	1	8	**10**	0	18	2	0	432
14:00	0	275	169	2	2	4	**3**	9	6	0	13	0	0	483
15:00	0	272	194	**7**	2	1	0	14	5	0	23	**3**	0	521
16:00	0	279	202	7	**5**	0	0	12	10	0	**32**	1	0	548
17:00	0	**285**	**206**	1	1	1	1	**17**	10	0	27	2	0	**551**
18:00	0	232	155	0	1	1	0	10	8	0	19	0	0	426
19:00	0	210	138	0	4	0	1	3	3	0	13	2	0	374
20:00	0	165	88	0	1	0	0	4	2	0	4	0	0	264
21:00	0	170	119	0	1	0	0	2	1	0	6	0	0	299
22:00	0	89	52	0	0	0	0	0	1	0	4	0	0	146
23:00	0	53	28	0	0	0	1	2	1	0	0	0	0	85
Day Total	0	3560	2394	36	56	31	9	124	98	0	287	12	0	6607
Percent	0.0%	53.9%	36.2%	0.5%	0.8%	0.5%	0.1%	1.9%	1.5%	0.0%	4.3%	0.2%	0.0%	
AM Peak		11:00	10:00	07:00	11:00	09:00	07:00	10:00	08:00		11:00	07:00		11:00
Vol.		255	142	5	8	5	1	8	8		28	1		447
PM Peak		17:00	17:00	15:00	16:00	14:00	14:00	17:00	13:00		16:00	15:00		17:00
Vol.		285	206	7	5	4	3	17	10		32	3		551

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/15/10	0	45	24	0	0	0	0	1	0	0	0	0	0	70
01:00	0	17	17	0	0	0	0	0	1	0	0	0	0	35
02:00	0	14	9	0	0	0	0	0	0	0	0	0	0	23
03:00	0	7	6	0	0	0	0	0	0	0	0	0	0	13
04:00	0	14	7	0	0	0	0	0	0	0	0	0	0	21
05:00	0	15	20	0	0	0	0	2	0	0	0	0	0	37
06:00	0	28	25	0	0	1	0	1	0	0	0	0	0	55
07:00	0	81	80	0	**4**	0	0	1	2	0	4	0	0	172
08:00	0	168	108	0	1	1	**1**	2	5	0	**26**	0	0	312
09:00	0	208	146	**3**	1	**2**	0	9	6	0	19	2	0	396
10:00	0	271	156	0	4	0	0	14	8	0	20	2	0	475
11:00	0	**273**	**224**	0	4	2	0	**18**	**13**	0	26	**3**	0	**563**
12 PM	0	280	150	**1**	3	2	**1**	**18**	**13**	0	**31**	2	0	501
13:00	0	**313**	164	0	3	1	0	11	8	0	19	1	0	**520**
14:00	0	293	133	1	5	**4**	0	15	9	0	22	**4**	0	486
15:00	0	256	**177**	1	**6**	0	0	10	8	0	23	**2**	0	483
16:00	0	248	155	0	2	0	0	2	5	0	17	2	0	431
17:00	0	249	132	0	3	0	0	7	1	0	22	0	0	414
18:00	0	172	128	0	3	0	0	5	6	0	17	0	0	331
19:00	0	164	116	0	1	0	0	4	4	0	7	0	0	296
20:00	0	127	89	0	0	0	0	5	1	0	1	0	0	223
21:00	0	117	108	0	0	0	0	1	1	0	4	0	0	231
22:00	0	64	54	0	1	1	0	1	1	0	3	1	0	126
23:00	0	60	40	0	1	1	0	0	0	0	2	0	0	104
Day Total	0	3484	2268	6	42	15	2	127	92	0	263	19	0	6318
Percent	0.0%	55.1%	35.9%	0.1%	0.7%	0.2%	0.0%	2.0%	1.5%	0.0%	4.2%	0.3%	0.0%	
AM Peak		11:00	11:00	09:00	07:00	09:00	08:00	11:00	11:00		08:00	11:00		11:00
Vol.		273	224	3	4	2	1	18	13		26	3		563
PM Peak		13:00	15:00	12:00	15:00	14:00	12:00	12:00	12:00		12:00	14:00		13:00
Vol.		313	177	1	6	4	1	18	13		31	4		520

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/16/10	0	33	24	0	0	0	0	1	0	0	0	0	0	58
01:00	0	24	16	0	1	0	0	0	0	0	0	0	0	41
02:00	0	16	10	0	0	0	0	0	0	0	0	0	0	26
03:00	0	10	10	0	0	1	0	0	0	0	0	0	0	21
04:00	0	2	10	0	1	0	0	0	0	0	0	0	0	13
05:00	0	10	4	0	0	0	0	1	0	0	0	0	0	15
06:00	0	21	21	0	0	0	0	1	0	0	0	0	0	43
07:00	0	46	50	1	1	0	0	2	1	0	0	0	0	101
08:00	0	85	62	1	2	0	0	6	1	0	7	0	0	164
09:00	0	163	112	0	1	3	0	9	2	0	16	0	0	306
10:00	0	246	152	0	4	1	0	11	6	0	16	1	0	437
11:00	0	224	147	0	2	1	0	7	7	0	22	3	0	413
12 PM	0	301	129	0	1	0	0	11	11	0	26	3	0	482
13:00	0	283	131	0	2	0	0	19	3	0	23	0	0	461
14:00	0	267	113	0	3	0	1	5	3	0	18	3	0	413
15:00	0	256	140	0	2	1	0	7	4	1	21	1	0	433
16:00	0	234	150	0	1	0	0	7	6	0	22	0	0	420
17:00	0	208	120	1	3	0	0	9	2	0	15	0	0	358
18:00	0	168	106	0	1	0	0	8	2	0	10	0	0	295
19:00	0	142	62	0	1	0	2	2	0	0	4	1	0	214
20:00	0	108	80	0	1	0	0	4	0	0	7	0	0	200
21:00	0	92	53	0	0	0	0	2	0	0	0	0	0	147
22:00	0	57	31	0	0	0	0	1	0	0	0	0	0	89
23:00	0	31	26	0	1	0	0	0	0	0	1	0	0	59
Day Total	0	3027	1759	3	28	7	3	113	48	1	208	12	0	5209
Percent	0.0%	58.1%	33.8%	0.1%	0.5%	0.1%	0.1%	2.2%	0.9%	0.0%	4.0%	0.2%	0.0%	
AM Peak		10:00	10:00	07:00	10:00	09:00		10:00	11:00		11:00	11:00		10:00
Vol.		246	152	1	4	3		11	7		22	3		437
PM Peak		12:00	16:00	17:00	14:00	15:00	19:00	13:00	12:00	15:00	12:00	12:00		12:00
Vol.		301	150	1	3	1	2	19	11	1	26	3		482

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/17/10	0	14	16	0	0	0	0	0	0	0	0	0	0	30
01:00	0	5	4	0	0	0	0	0	0	0	0	0	0	9
02:00	0	5	6	0	0	0	0	0	0	0	0	0	0	11
03:00	0	5	5	0	0	0	0	0	0	0	0	0	0	10
04:00	0	7	7	0	1	1	0	0	0	0	0	0	0	16
05:00	0	27	21	0	0	0	1	0	2	0	1	0	0	52
06:00	0	46	64	0	2	1	0	3	1	0	3	0	0	120
07:00	0	99	115	**5**	2	**6**	0	2	4	0	14	0	0	247
08:00	0	159	112	3	1	2	0	**7**	7	0	12	2	0	305
09:00	0	174	104	4	5	3	0	6	7	0	19	**4**	0	326
10:00	0	213	**137**	3	3	2	**2**	2	5	**1**	**24**	3	0	395
11:00	0	**236**	123	0	**6**	2	1	7	**9**	0	16	2	0	**402**
12 PM	0	227	142	0	**4**	3	0	6	**10**	0	17	2	0	411
13:00	0	226	109	**3**	3	2	1	12	7	0	**28**	2	0	393
14:00	0	191	60	0	1	2	1	16	2	0	10	1	0	284
15:00	0	199	89	1	0	**4**	2	11	6	0	12	**4**	0	328
16:00	0	244	75	2	3	0	**3**	**17**	4	0	10	4	0	362
17:00	0	**273**	**193**	1	2	3	0	13	9	0	21	3	0	**518**
18:00	0	241	162	1	0	3	0	10	5	0	11	0	0	433
19:00	0	193	119	0	0	0	0	1	3	0	9	1	0	326
20:00	0	132	86	1	1	0	0	0	2	0	4	0	0	226
21:00	0	133	72	0	1	0	1	4	1	0	3	0	0	215
22:00	0	46	29	0	0	0	0	2	0	0	3	2	0	82
23:00	0	39	21	0	0	1	0	0	0	0	0	0	0	61
Day Total	0	3134	1871	24	35	35	12	119	84	1	217	30	0	5562
Percent	0.0%	56.3%	33.6%	0.4%	0.6%	0.6%	0.2%	2.1%	1.5%	0.0%	3.9%	0.5%	0.0%	
AM Peak		11:00	10:00	07:00	11:00	07:00	10:00	08:00	11:00	10:00	10:00	09:00		11:00
Vol.		236	137	5	6	6	2	7	9	1	24	4		402
PM Peak		17:00	17:00	13:00	12:00	15:00	16:00	16:00	12:00		13:00	15:00		17:00
Vol.		273	193	3	4	4	3	17	10		28	4		518

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/18/10	0	20	4	0	0	0	0	0	0	0	0	0	0	24
01:00	0	4	12	0	0	0	0	0	0	0	0	0	0	16
02:00	0	1	5	1	0	0	0	0	0	0	0	0	0	7
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	6	6	0	1	0	0	0	0	0	0	0	0	13
05:00	0	24	19	1	1	0	0	0	1	0	0	0	0	46
06:00	0	55	55	1	3	1	3	3	2	0	4	0	0	127
07:00	0	95	110	3	4	8	0	8	2	0	14	2	0	246
08:00	0	197	141	4	6	7	1	9	2	1	23	3	0	394
09:00	0	187	137	6	8	3	1	7	3	0	19	1	0	372
10:00	0	227	136	1	5	4	1	7	12	0	24	0	0	417
11:00	0	238	120	4	5	3	0	11	9	0	17	2	0	409
12 PM	0	196	65	0	1	3	0	15	2	0	9	2	0	293
13:00	0	151	44	0	2	0	1	11	2	0	8	1	0	220
14:00	0	155	58	1	0	3	1	13	4	0	14	1	0	250
15:00	0	239	144	5	4	5	0	4	7	0	28	0	0	436
16:00	0	305	161	4	1	1	2	13	8	0	33	3	0	531
17:00	0	288	183	2	0	3	0	14	3	1	24	0	0	518
18:00	0	226	160	2	2	0	0	11	5	0	22	1	0	429
19:00	0	140	116	0	4	0	0	4	5	0	8	0	0	277
20:00	0	137	85	0	0	0	0	0	2	0	8	0	0	232
21:00	0	130	84	0	0	1	0	1	4	0	5	0	0	225
22:00	0	65	32	0	0	0	0	0	0	0	1	0	0	98
23:00	0	35	18	0	0	1	0	1	0	0	0	0	0	55
Day Total	0	3127	1896	35	47	43	10	132	73	2	261	16	0	5642
Percent	0.0%	55.4%	33.6%	0.6%	0.8%	0.8%	0.2%	2.3%	1.3%	0.0%	4.6%	0.3%	0.0%	
AM Peak		11:00	08:00	09:00	09:00	07:00	06:00	11:00	10:00	08:00	10:00	08:00		10:00
Vol.		238	141	6	8	8	3	11	12	1	24	3		417
PM Peak		16:00	17:00	15:00	15:00	15:00	16:00	12:00	16:00	17:00	16:00	16:00		16:00
Vol.		305	183	5	4	5	2	15	8	1	33	3		531

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/19/10	0	25	13	0	0	0	0	1	0	0	0	0	0	39
01:00	0	6	6	0	0	0	0	0	0	0	0	0	0	12
02:00	0	8	7	0	0	0	0	0	0	0	0	0	0	15
03:00	0	1	1	0	0	1	0	0	0	0	0	0	0	3
04:00	0	7	4	0	2	0	0	0	0	0	0	0	0	13
05:00	0	32	16	0	1	0	0	0	0	0	0	0	0	49
06:00	0	46	62	0	3	4	1	1	2	0	2	0	0	121
07:00	0	104	96	6	4	3	1	8	3	0	10	0	0	235
08:00	0	176	122	5	2	3	1	7	9	0	18	0	0	343
09:00	0	211	166	5	8	8	1	11	7	0	21	1	0	439
10:00	0	216	94	2	3	9	3	10	8	0	15	3	0	363
11:00	0	200	79	0	1	2	1	22	4	0	16	4	0	329
12 PM	0	227	114	0	2	4	0	18	8	0	15	3	0	391
13:00	0	73	44	0	1	1	1	9	2	0	4	4	0	139
14:00	0	258	124	1	5	5	0	10	3	0	20	2	0	428
15:00	0	252	151	5	4	4	1	11	7	0	24	1	0	460
16:00	0	290	169	3	4	2	2	12	4	0	27	4	0	517
17:00	0	291	167	1	1	1	0	5	7	0	26	0	0	499
18:00	0	232	143	0	2	1	0	7	5	0	20	0	0	410
19:00	0	159	123	0	1	0	0	10	3	0	12	1	0	309
20:00	0	170	82	0	0	1	0	4	3	0	13	0	0	273
21:00	0	167	70	0	1	0	0	1	1	0	7	0	0	247
22:00	0	68	39	0	1	0	0	0	1	0	2	0	0	111
23:00	0	41	30	0	0	0	0	2	0	0	1	0	0	74
Day Total	0	3260	1922	28	46	49	12	149	77	0	253	23	0	5819
Percent	0.0%	56.0%	33.0%	0.5%	0.8%	0.8%	0.2%	2.6%	1.3%	0.0%	4.3%	0.4%	0.0%	
AM Peak		10:00	09:00	07:00	09:00	10:00	10:00	11:00	08:00		09:00	11:00		09:00
Vol.		216	166	6	8	9	3	22	9		21	4		439
PM Peak		17:00	16:00	15:00	14:00	14:00	16:00	12:00	12:00		16:00	13:00		16:00
Vol.		291	169	5	5	5	2	18	8		27	4		517

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/20/10	0	15	5	0	1	0	0	0	0	0	0	0	0	21
01:00	0	8	8	0	0	1	0	0	0	0	0	0	0	17
02:00	0	5	8	0	0	0	0	0	0	0	0	0	0	13
03:00	0	6	6	0	0	0	0	0	0	0	0	0	0	12
04:00	0	4	4	0	1	0	0	0	0	0	1	0	0	10
05:00	0	30	26	1	0	0	0	1	1	0	0	0	0	59
06:00	0	66	64	1	3	2	0	1	3	0	4	0	0	144
07:00	0	102	98	**5**	2	1	0	6	**6**	0	12	1	0	233
08:00	0	155	**140**	3	3	**5**	**1**	9	6	**1**	**30**	0	0	353
09:00	0	**212**	115	4	4	3	1	5	2	0	23	**2**	0	**371**
10:00	0	190	82	1	**5**	2	1	12	3	0	8	2	0	306
11:00	0	196	58	1	2	3	0	**14**	6	0	13	1	0	294
12 PM	0	124	77	0	1	2	**3**	9	3	0	7	2	0	228
13:00	0	99	43	0	1	2	0	11	5	0	2	2	0	165
14:00	0	206	68	1	1	2	0	16	3	0	7	3	0	307
15:00	0	267	131	**4**	**3**	**4**	0	**17**	8	0	19	1	0	454
16:00	0	321	168	3	3	1	1	17	8	0	25	**4**	0	551
17:00	0	**326**	**197**	1	3	2	0	14	6	0	**28**	1	0	**578**
18:00	0	254	180	1	3	1	1	8	**10**	0	13	0	0	471
19:00	0	205	124	0	0	1	0	7	3	0	14	0	0	354
20:00	0	173	118	0	1	1	0	6	6	0	9	1	0	315
21:00	0	139	83	0	0	0	0	0	1	0	3	2	0	228
22:00	0	86	47	0	0	0	0	0	0	0	7	0	0	140
23:00	0	40	37	0	0	0	0	2	0	0	2	0	0	81
Day Total	0	3229	1887	26	37	33	8	155	80	1	227	22	0	5705
Percent	0.0%	56.6%	33.1%	0.5%	0.6%	0.6%	0.1%	2.7%	1.4%	0.0%	4.0%	0.4%	0.0%	
AM Peak		09:00	08:00	07:00	10:00	08:00	08:00	11:00	07:00	08:00	08:00	09:00		09:00
Vol.		212	140	5	5	5	1	14	6	1	30	2		371
PM Peak		17:00	17:00	15:00	15:00	15:00	12:00	15:00	18:00		17:00	16:00		17:00
Vol.		326	197	4	3	4	3	17	10		28	4		578
Grand Total	0	22821	13997	158	291	213	56	919	552	5	1716	134	0	40862
Percent	0.0%	55.8%	34.3%	0.4%	0.7%	0.5%	0.1%	2.2%	1.4%	0.0%	4.2%	0.3%	0.0%	

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/14/10	0	25	2	1	0	0	0	0	0	0	0	0	0	28
01:00	0	11	2	0	0	0	0	0	1	0	0	0	0	14
02:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
03:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
04:00	0	25	5	0	0	1	0	1	0	0	0	0	0	32
05:00	0	70	11	0	0	0	0	1	0	0	0	0	0	82
06:00	0	156	41	0	1	3	0	0	2	0	3	0	0	206
07:00	0	253	81	1	6	0	0	5	3	0	10	1	0	360
08:00	0	377	65	0	11	5	0	11	3	0	16	1	0	489
09:00	0	271	64	0	1	1	1	14	3	0	16	0	0	371
10:00	0	305	54	0	1	8	2	16	4	0	21	2	0	413
11:00	0	326	53	0	3	2	2	11	0	1	20	1	0	419
12 PM	0	309	57	0	3	2	0	16	2	0	16	1	0	406
13:00	0	297	55	0	4	2	1	18	2	0	19	0	0	398
14:00	0	285	49	0	9	5	1	13	4	0	21	3	0	390
15:00	0	299	60	0	4	1	0	15	2	0	28	2	0	411
16:00	0	287	59	0	4	1	2	17	3	0	26	2	0	401
17:00	0	326	60	0	0	0	0	19	1	0	30	1	0	437
18:00	0	259	46	1	0	0	2	7	6	0	17	0	0	338
19:00	0	208	41	0	0	1	0	7	3	0	10	0	0	270
20:00	0	169	38	0	0	0	0	8	0	0	5	0	0	220
21:00	0	122	22	0	0	0	0	4	0	0	8	0	0	156
22:00	0	108	13	0	0	0	0	1	1	0	2	0	0	125
23:00	0	64	11	0	0	0	0	0	0	0	1	0	0	76
Day Total	0	4571	893	3	47	32	11	184	40	1	269	14	0	6065
Percent	0.0%	75.4%	14.7%	0.0%	0.8%	0.5%	0.2%	3.0%	0.7%	0.0%	4.4%	0.2%	0.0%	
AM Peak		08:00	07:00	00:00	08:00	10:00	10:00	10:00	10:00	11:00	10:00	10:00		08:00
Vol.		377	81	1	11	8	2	16	4	1	21	2		489
PM Peak		17:00	15:00	18:00	14:00	14:00	16:00	17:00	18:00		17:00	14:00		17:00
Vol.		326	60	1	9	5	2	19	6		30	3		437

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/15/10	0	42	3	**1**	0	0	0	2	1	0	0	0	0	49
01:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
02:00	0	14	4	0	0	0	0	0	0	0	0	0	0	18
03:00	0	19	1	0	0	0	0	0	1	0	0	0	0	21
04:00	0	17	2	0	0	0	0	0	0	0	0	0	0	19
05:00	0	45	6	0	0	0	0	0	0	0	0	0	0	51
06:00	0	102	11	0	1	1	0	1	0	0	2	1	0	119
07:00	0	198	42	0	2	0	0	1	1	0	4	0	0	248
08:00	0	300	55	0	2	1	1	15	1	0	15	1	0	391
09:00	0	314	**60**	0	2	**4**	0	9	1	0	18	1	0	409
10:00	0	292	57	0	2	1	**2**	17	2	0	**32**	1	0	406
11:00	0	**327**	43	0	**4**	3	2	**27**	**3**	0	27	**5**	0	**441**
12 PM	0	**318**	51	0	0	1	2	16	2	0	**24**	3	0	**417**
13:00	0	298	48	0	1	**2**	**3**	**24**	2	**1**	24	2	0	405
14:00	0	315	38	0	**2**	2	2	13	**10**	0	23	**6**	0	411
15:00	0	283	**56**	0	**2**	0	0	14	2	0	21	1	0	379
16:00	0	264	50	0	2	1	1	9	0	1	18	0	0	346
17:00	0	291	53	**1**	1	0	0	7	1	0	19	1	0	374
18:00	0	235	29	1	1	0	1	4	0	0	17	0	0	288
19:00	0	173	31	0	0	0	2	7	0	0	8	0	0	221
20:00	0	176	30	1	0	1	0	8	0	0	8	0	0	224
21:00	0	117	13	0	0	1	0	3	0	0	3	0	0	137
22:00	0	89	22	0	0	0	0	5	0	0	1	0	0	117
23:00	0	53	8	0	0	0	0	0	1	0	0	0	0	62
Day Total	0	4300	714	4	22	18	16	182	28	2	264	22	0	5572
Percent	0.0%	77.2%	12.8%	0.1%	0.4%	0.3%	0.3%	3.3%	0.5%	0.0%	4.7%	0.4%	0.0%	
AM Peak		11:00	09:00	00:00	11:00	09:00	10:00	11:00	11:00		10:00	11:00		11:00
Vol.		327	60	1	4	4	2	27	3		32	5		441
PM Peak		12:00	15:00	17:00	14:00	13:00	13:00	13:00	14:00	13:00	12:00	14:00		12:00
Vol.		318	56	1	2	2	3	24	10	1	24	6		417

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/16/10	0	46	5	0	0	0	0	0	0	0	0	0	0	51
01:00	0	37	4	0	0	0	0	0	0	0	0	0	0	41
02:00	0	18	0	0	0	0	0	0	0	0	0	0	0	18
03:00	0	18	3	0	0	0	0	0	0	0	0	0	0	21
04:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
05:00	0	28	6	0	0	0	0	0	0	0	1	0	0	35
06:00	0	77	5	0	0	0	0	0	0	0	0	0	0	82
07:00	0	92	28	0	2	0	0	3	0	0	1	0	0	126
08:00	0	188	32	0	2	0	0	5	1	0	4	0	0	232
09:00	0	247	51	0	1	0	0	10	1	0	7	0	0	317
10:00	0	306	70	1	2	2	0	11	0	0	27	1	0	420
11:00	0	324	48	0	4	1	1	20	0	0	20	1	0	419
12 PM	0	327	52	0	1	2	2	18	3	0	17	1	0	423
13:00	0	290	58	0	2	0	2	19	2	0	28	5	0	406
14:00	0	277	48	0	2	0	0	16	4	0	19	0	0	366
15:00	0	296	39	0	2	0	3	16	1	0	18	0	0	375
16:00	0	270	41	0	1	0	0	6	1	0	19	1	0	339
17:00	0	255	43	1	1	0	3	9	3	0	13	0	0	328
18:00	0	218	54	0	2	0	0	5	0	0	10	0	0	289
19:00	0	183	43	0	0	0	0	5	0	0	6	0	0	237
20:00	0	160	30	0	1	1	1	7	0	0	4	0	0	204
21:00	0	122	27	0	0	0	0	2	0	0	2	0	0	153
22:00	0	82	13	0	1	0	0	0	0	0	0	0	0	96
23:00	0	26	4	0	0	0	0	0	0	0	1	0	0	31
Day Total	0	3897	705	2	24	6	12	152	16	0	197	9	0	5020
Percent	0.0%	77.6%	14.0%	0.0%	0.5%	0.1%	0.2%	3.0%	0.3%	0.0%	3.9%	0.2%	0.0%	
AM Peak		11:00	10:00	10:00	11:00	10:00	11:00	11:00	08:00		10:00	10:00		10:00
Vol.		324	70	1	4	2	1	20	1		27	1		420
PM Peak		12:00	13:00	17:00	13:00	12:00	15:00	13:00	14:00		13:00	13:00		12:00
Vol.		327	58	1	2	2	3	19	4		28	5		423

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/17/10	0	13	3	0	0	0	0	0	1	0	0	0	0	17
01:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
04:00	0	24	6	0	0	0	0	0	1	0	0	0	0	31
05:00	0	75	15	0	0	4	0	0	0	0	1	0	0	95
06:00	0	178	56	0	0	3	0	0	0	0	5	0	0	242
07:00	0	294	85	1	11	0	0	4	1	0	9	2	0	407
08:00	0	338	81	0	10	6	0	12	0	0	18	1	0	466
09:00	0	320	63	0	4	4	0	12	2	0	15	0	0	420
10:00	0	277	50	0	2	2	0	11	5	0	16	0	0	363
11:00	0	286	53	2	2	4	3	12	0	0	19	2	0	383
12 PM	0	263	46	0	3	2	2	7	5	0	20	2	0	350
13:00	0	245	43	0	3	2	1	12	3	0	13	1	0	323
14:00	0	259	39	1	7	6	0	10	3	0	7	3	0	335
15:00	0	250	46	1	6	5	5	23	5	0	10	5	0	356
16:00	0	245	38	1	4	4	0	13	8	0	15	4	0	332
17:00	0	251	45	0	2	0	3	14	5	0	24	4	0	348
18:00	0	233	40	0	3	0	1	9	1	0	23	0	0	310
19:00	0	187	30	0	0	0	0	5	1	0	15	0	0	238
20:00	0	174	39	0	0	0	0	4	0	0	4	0	0	221
21:00	0	120	18	0	1	0	1	1	0	0	6	0	0	147
22:00	0	85	17	0	0	0	0	1	0	0	1	1	0	105
23:00	0	38	6	0	0	1	0	0	0	0	0	0	0	45
Day Total	0	4185	823	6	58	43	16	150	41	0	221	25	0	5568
Percent	0.0%	75.2%	14.8%	0.1%	1.0%	0.8%	0.3%	2.7%	0.7%	0.0%	4.0%	0.4%	0.0%	
AM Peak		08:00	07:00	11:00	07:00	08:00	11:00	08:00	10:00		11:00	07:00		08:00
Vol.		338	85	2	11	6	3	12	5		19	2		466
PM Peak		12:00	12:00	14:00	14:00	14:00	15:00	15:00	16:00		17:00	15:00		15:00
Vol.		263	46	1	7	6	5	23	8		24	5		356

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/18/10	0	13	0	0	0	0	0	0	1	0	0	0	0	14
01:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
02:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
03:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
04:00	0	26	6	0	1	0	0	1	0	0	0	0	0	34
05:00	0	71	13	0	0	2	0	1	1	0	0	0	0	88
06:00	0	177	60	0	2	1	0	3	1	0	7	0	0	251
07:00	0	268	**86**	**1**	**7**	2	0	**15**	0	0	11	1	0	391
08:00	0	**340**	76	0	6	4	1	12	2	0	**23**	**3**	0	**467**
09:00	0	307	67	0	5	7	**2**	6	1	0	23	1	0	419
10:00	0	308	48	1	5	**9**	0	4	**4**	0	23	1	0	403
11:00	0	221	49	0	1	8	1	7	0	0	18	2	0	307
12 PM	0	230	41	0	6	3	1	12	2	0	6	**6**	0	307
13:00	0	199	32	0	5	**5**	1	7	**3**	0	6	0	0	258
14:00	0	254	46	0	**8**	3	0	8	2	0	5	2	0	328
15:00	0	**286**	40	**2**	5	2	1	**15**	1	0	19	4	0	**375**
16:00	0	273	51	0	4	3	**2**	13	0	0	21	1	0	368
17:00	0	255	**55**	0	2	3	0	14	2	0	**28**	1	0	360
18:00	0	239	52	0	0	0	2	13	0	0	17	0	0	323
19:00	0	207	47	0	0	0	0	7	1	0	7	1	0	270
20:00	0	172	26	1	0	0	0	0	1	0	4	0	0	204
21:00	0	122	28	0	0	0	0	2	0	0	4	0	0	156
22:00	0	75	14	0	0	0	1	0	0	0	3	0	0	93
23:00	0	35	5	0	0	0	0	0	1	0	0	0	0	41
Day Total	0	4099	848	5	57	52	12	140	23	0	225	23	0	5484
Percent	0.0%	74.7%	15.5%	0.1%	1.0%	0.9%	0.2%	2.6%	0.4%	0.0%	4.1%	0.4%	0.0%	
AM Peak		08:00	07:00	07:00	07:00	10:00	09:00	07:00	10:00		08:00	08:00		08:00
Vol.		340	86	1	7	9	2	15	4		23	3		467
PM Peak		15:00	17:00	15:00	14:00	13:00	16:00	15:00	13:00		17:00	12:00		15:00
Vol.		286	55	2	8	5	2	15	3		28	6		375

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/19/10	0	19	1	0	0	0	0	0	0	0	0	0	0	20
01:00	0	5	2	0	0	0	0	0	1	0	0	0	0	8
02:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
03:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
04:00	0	30	5	0	0	0	0	1	0	0	0	0	0	36
05:00	0	74	14	0	0	0	0	1	0	0	1	0	0	90
06:00	0	190	63	0	1	2	0	1	1	0	4	0	0	262
07:00	0	275	81	1	13	2	0	14	3	0	13	1	0	403
08:00	0	361	92	0	10	4	0	17	3	0	17	0	0	504
09:00	0	294	66	0	4	4	1	12	3	0	13	1	0	398
10:00	0	273	53	1	3	8	2	14	5	0	20	6	0	385
11:00	0	231	46	0	2	4	1	18	2	0	7	0	0	311
12 PM	0	291	44	2	1	3	3	10	1	0	12	1	0	368
13:00	0	145	48	0	5	3	1	8	1	0	5	0	0	216
14:00	0	239	51	1	6	9	0	11	1	0	13	1	0	332
15:00	0	266	57	0	4	6	4	17	3	0	21	3	0	381
16:00	0	281	64	0	8	3	4	14	2	0	25	2	0	403
17:00	0	274	64	1	1	3	0	18	3	0	26	0	0	390
18:00	0	237	58	0	1	2	1	16	0	0	14	1	0	330
19:00	0	221	46	0	1	1	0	10	2	0	13	0	0	294
20:00	0	191	31	0	0	0	0	2	0	0	7	0	0	231
21:00	0	116	25	0	1	1	0	1	0	0	3	0	0	147
22:00	0	79	11	0	0	0	0	1	0	0	3	0	0	94
23:00	0	30	3	1	0	0	0	0	0	0	0	0	0	34
Day Total	0	4147	928	7	61	55	17	186	31	0	217	16	0	5665
Percent	0.0%	73.2%	16.4%	0.1%	1.1%	1.0%	0.3%	3.3%	0.5%	0.0%	3.8%	0.3%	0.0%	
AM Peak		08:00	08:00	07:00	07:00	10:00	10:00	11:00	10:00		10:00	10:00		08:00
Vol.		361	92	1	13	8	2	18	5		20	6		504
PM Peak		12:00	16:00	12:00	16:00	14:00	15:00	17:00	15:00		17:00	15:00		16:00
Vol.		291	64	2	8	9	4	18	3		26	3		403

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/20/10	0	14	3	0	0	0	0	0	2	0	0	0	0	19
01:00	0	14	2	0	0	0	0	0	1	0	0	0	0	17
02:00	0	6	3	0	0	0	0	0	0	0	0	0	0	9
03:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
04:00	0	29	6	0	0	0	0	0	0	0	0	0	0	35
05:00	0	64	12	0	1	1	0	2	0	0	2	0	0	82
06:00	0	168	57	0	1	3	1	2	0	0	3	1	0	236
07:00	0	285	**98**	**1**	**10**	4	1	9	2	0	8	0	0	418
08:00	0	**355**	73	0	8	4	1	**14**	2	0	**27**	0	0	**484**
09:00	0	346	69	0	2	**5**	1	12	4	0	23	**5**	0	467
10:00	0	275	48	1	4	3	**6**	13	**7**	0	12	5	0	374
11:00	0	237	40	0	2	3	1	13	6	0	8	1	0	311
12 PM	0	191	26	0	2	1	0	9	0	0	9	2	0	240
13:00	0	169	38	0	**8**	**6**	1	18	3	0	4	1	0	248
14:00	0	228	44	**4**	5	6	2	14	2	0	10	**5**	0	320
15:00	0	249	**51**	0	6	6	**4**	**25**	0	0	**24**	1	0	366
16:00	0	263	45	0	8	1	1	17	**5**	0	19	2	0	361
17:00	0	**275**	51	0	0	4	1	23	1	0	23	2	0	**380**
18:00	0	253	47	1	2	0	0	5	2	0	13	4	0	327
19:00	0	220	37	0	1	0	2	13	0	0	8	0	0	281
20:00	0	198	36	1	0	0	0	3	0	0	7	0	0	245
21:00	0	143	**22**	0	1	0	0	3	0	0	3	2	0	174
22:00	0	119	17	0	0	0	0	0	1	0	1	0	0	138
23:00	0	50	6	0	0	0	0	2	0	0	0	0	0	58
Day Total	0	4169	832	8	61	47	22	197	38	0	204	31	0	5609
Percent	0.0%	74.3%	14.8%	0.1%	1.1%	0.8%	0.4%	3.5%	0.7%	0.0%	3.6%	0.6%	0.0%	
AM Peak		08:00	07:00	07:00	07:00	09:00	10:00	08:00	10:00		08:00	09:00		08:00
Vol.		355	98	1	10	5	6	14	7		27	5		484
PM Peak		17:00	15:00	14:00	13:00	13:00	15:00	15:00	16:00		15:00	14:00		17:00
Vol.		275	51	4	8	6	4	25	5		24	5		380
Grand Total	0	29368	5743	35	330	253	106	1191	217	3	1597	140	0	38983
Percent	0.0%	75.3%	14.7%	0.1%	0.8%	0.6%	0.3%	3.1%	0.6%	0.0%	4.1%	0.4%	0.0%	

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/14/10	0	39	16	1	0	1	0	0	0	0	0	0	0	57
01:00	0	20	14	0	0	0	0	0	1	0	0	0	0	35
02:00	0	9	4	0	0	0	0	0	0	0	0	0	0	13
03:00	0	20	5	0	0	0	0	0	1	0	0	0	0	26
04:00	0	35	8	0	2	1	0	1	1	0	0	0	0	48
05:00	0	97	35	0	1	0	0	2	5	0	0	0	0	140
06:00	0	207	102	0	2	6	0	3	2	0	9	0	0	331
07:00	0	349	160	**6**	8	3	1	8	7	0	20	**2**	0	564
08:00	0	562	161	5	**18**	8	1	17	**11**	0	38	2	0	823
09:00	0	465	191	3	6	6	1	20	5	0	34	0	0	731
10:00	0	530	**196**	0	7	**10**	**2**	**24**	9	0	42	2	0	822
11:00	0	**581**	190	2	11	4	2	18	8	**1**	**48**	1	0	**866**
12 PM	0	533	244	3	6	5	0	25	9	0	39	1	0	865
13:00	0	527	211	1	8	4	2	26	12	0	37	2	0	830
14:00	0	560	218	2	**11**	**9**	**4**	22	10	0	34	3	0	873
15:00	0	571	254	**7**	6	2	0	29	7	0	51	**5**	0	932
16:00	0	566	261	7	9	1	2	29	13	0	**58**	3	0	949
17:00	0	**611**	**266**	1	1	1	1	**36**	11	0	57	3	0	**988**
18:00	0	491	201	1	1	1	2	17	**14**	0	36	0	0	764
19:00	0	418	179	0	4	1	1	10	6	0	23	2	0	644
20:00	0	334	126	0	1	0	0	12	2	0	9	0	0	484
21:00	0	292	141	0	1	0	0	6	1	0	14	0	0	455
22:00	0	197	65	0	0	0	0	1	2	0	6	0	0	271
23:00	0	117	39	0	0	0	1	2	1	0	1	0	0	161
Day Total	0	8131	3287	39	103	63	20	308	138	1	556	26	0	12672
Percent	0.0%	64.2%	25.9%	0.3%	0.8%	0.5%	0.2%	2.4%	1.1%	0.0%	4.4%	0.2%	0.0%	
AM Peak		11:00	10:00	07:00	08:00	10:00	10:00	10:00	08:00	11:00	11:00	07:00		11:00
Vol.		581	196	6	18	10	2	24	11	1	48	2		866
PM Peak		17:00	17:00	15:00	14:00	14:00	14:00	17:00	18:00		16:00	15:00		17:00
Vol.		611	266	7	11	9	4	36	14		58	5		988

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/15/10	0	87	27	1	0	0	0	3	1	0	0	0	0	119
01:00	0	35	18	0	0	0	0	0	1	0	0	0	0	54
02:00	0	28	13	0	0	0	0	0	0	0	0	0	0	41
03:00	0	26	7	0	0	0	0	0	1	0	0	0	0	34
04:00	0	31	9	0	0	0	0	0	0	0	0	0	0	40
05:00	0	60	26	0	0	0	0	2	0	0	0	0	0	88
06:00	0	130	36	0	1	2	0	2	0	0	2	1	0	174
07:00	0	279	122	0	6	0	0	2	3	0	8	0	0	420
08:00	0	468	163	0	3	2	2	17	6	0	41	1	0	703
09:00	0	522	206	3	3	6	0	18	7	0	37	3	0	805
10:00	0	563	213	0	6	1	2	31	10	0	52	3	0	881
11:00	0	600	267	0	8	5	2	45	16	0	53	8	0	1004
12 PM	0	598	201	1	3	3	3	34	15	0	55	5	0	918
13:00	0	611	212	0	4	3	3	35	10	1	43	3	0	925
14:00	0	608	171	1	7	6	2	28	19	0	45	10	0	897
15:00	0	539	233	1	8	0	0	24	10	0	44	3	0	862
16:00	0	512	205	0	4	1	1	11	5	1	35	2	0	777
17:00	0	540	185	1	4	0	0	14	2	0	41	1	0	788
18:00	0	407	157	1	4	0	1	9	6	0	34	0	0	619
19:00	0	337	147	0	1	0	2	11	4	0	15	0	0	517
20:00	0	303	119	1	0	1	0	13	1	0	9	0	0	447
21:00	0	234	121	0	0	1	0	4	1	0	7	0	0	368
22:00	0	153	76	0	1	1	0	6	1	0	4	1	0	243
23:00	0	113	48	0	1	1	0	0	1	0	2	0	0	166
Day Total	0	7784	2982	10	64	33	18	309	120	2	527	41	0	11890
Percent	0.0%	65.5%	25.1%	0.1%	0.5%	0.3%	0.2%	2.6%	1.0%	0.0%	4.4%	0.3%	0.0%	
AM Peak		11:00	11:00	09:00	11:00	09:00	08:00	11:00	11:00		11:00	11:00		11:00
Vol.		600	267	3	8	6	2	45	16		53	8		1004
PM Peak		13:00	15:00	12:00	15:00	14:00	12:00	13:00	14:00	13:00	12:00	14:00		13:00
Vol.		611	233	1	8	6	3	35	19	1	55	10		925

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/16/10	0	79	29	0	0	0	0	1	0	0	0	0	0	109
01:00	0	61	20	0	1	0	0	0	0	0	0	0	0	82
02:00	0	34	10	0	0	0	0	0	0	0	0	0	0	44
03:00	0	28	13	0	0	1	0	0	0	0	0	0	0	42
04:00	0	12	11	0	1	0	0	0	0	0	0	0	0	24
05:00	0	38	10	0	0	0	0	1	0	0	1	0	0	50
06:00	0	98	26	0	0	0	0	1	0	0	0	0	0	125
07:00	0	138	78	1	3	0	0	5	1	0	1	0	0	227
08:00	0	273	94	1	4	0	0	11	2	0	11	0	0	396
09:00	0	410	163	0	2	3	0	19	3	0	23	0	0	623
10:00	0	552	222	1	6	3	0	22	6	0	43	2	0	857
11:00	0	548	195	0	6	2	1	27	7	0	42	4	0	832
12 PM	0	628	181	0	2	2	2	29	14	0	43	4	0	905
13:00	0	573	189	0	4	0	2	38	5	0	51	5	0	867
14:00	0	544	161	0	5	0	1	21	7	0	37	3	0	779
15:00	0	552	179	0	4	1	3	23	5	1	39	1	0	808
16:00	0	504	191	0	2	0	0	13	7	0	41	1	0	759
17:00	0	463	163	2	4	0	3	18	5	0	28	0	0	686
18:00	0	386	160	0	3	0	0	13	2	0	20	0	0	584
19:00	0	325	105	0	1	0	2	7	0	0	10	1	0	451
20:00	0	268	110	0	2	1	1	11	0	0	11	0	0	404
21:00	0	214	80	0	0	0	0	4	0	0	2	0	0	300
22:00	0	139	44	0	1	0	0	1	0	0	0	0	0	185
23:00	0	57	30	0	1	0	0	0	0	0	2	0	0	90
Day Total	0	6924	2464	5	52	13	15	265	64	1	405	21	0	10229
Percent	0.0%	67.7%	24.1%	0.0%	0.5%	0.1%	0.1%	2.6%	0.6%	0.0%	4.0%	0.2%	0.0%	
AM Peak		10:00	10:00	07:00	10:00	09:00	11:00	11:00	11:00		10:00	11:00		10:00
Vol.		552	222	1	6	3	1	27	7		43	4		857
PM Peak		12:00	16:00	17:00	14:00	12:00	15:00	13:00	12:00	15:00	13:00	13:00		12:00
Vol.		628	191	2	5	2	3	38	14	1	51	5		905

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/17/10	0	27	19	0	0	0	0	0	1	0	0	0	0	47
01:00	0	18	5	0	0	0	0	0	0	0	0	0	0	23
02:00	0	13	7	0	0	0	0	0	0	0	0	0	0	20
03:00	0	14	7	0	0	0	0	0	0	0	0	0	0	21
04:00	0	31	13	0	1	1	0	0	1	0	0	0	0	47
05:00	0	102	36	0	0	4	1	0	2	0	2	0	0	147
06:00	0	224	120	0	2	4	0	3	1	0	8	0	0	362
07:00	0	393	200	6	13	6	0	6	5	0	23	2	0	654
08:00	0	497	193	3	11	8	0	19	7	0	30	3	0	771
09:00	0	494	167	4	9	7	0	18	9	0	34	4	0	746
10:00	0	490	187	3	5	4	2	13	10	1	40	3	0	758
11:00	0	522	176	2	8	6	4	19	9	0	35	4	0	785
12 PM	0	490	188	0	7	5	2	13	15	0	37	4	0	761
13:00	0	471	152	3	6	4	2	24	10	0	41	3	0	716
14:00	0	450	99	1	8	8	1	26	5	0	17	4	0	619
15:00	0	449	135	2	6	9	7	34	11	0	22	9	0	684
16:00	0	489	113	3	7	4	3	30	12	0	25	8	0	694
17:00	0	524	238	1	4	3	3	27	14	0	45	7	0	866
18:00	0	474	202	1	3	3	1	19	6	0	34	0	0	743
19:00	0	380	149	0	0	0	0	6	4	0	24	1	0	564
20:00	0	306	125	1	1	0	0	4	2	0	8	0	0	447
21:00	0	253	90	0	2	0	2	5	1	0	9	0	0	362
22:00	0	131	46	0	0	0	0	3	0	0	4	3	0	187
23:00	0	77	27	0	0	2	0	0	0	0	0	0	0	106
Day Total	0	7319	2694	30	93	78	28	269	125	1	438	55	0	11130
Percent	0.0%	65.8%	24.2%	0.3%	0.8%	0.7%	0.3%	2.4%	1.1%	0.0%	3.9%	0.5%	0.0%	
AM Peak		11:00	07:00	07:00	07:00	08:00	11:00	08:00	10:00	10:00	10:00	09:00		11:00
Vol.		522	200	6	13	8	4	19	10	1	40	4		785
PM Peak		17:00	17:00	13:00	14:00	15:00	15:00	15:00	12:00		17:00	15:00		17:00
Vol.		524	238	3	8	9	7	34	15		45	9		866

Ontario Traffic, Inc.
17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/18/10	0	33	4	0	0	0	0	0	1	0	0	0	0	38
01:00	0	9	14	0	0	0	0	0	0	0	0	0	0	23
02:00	0	6	8	1	0	0	0	0	0	0	0	0	0	15
03:00	0	17	2	0	0	0	0	0	0	0	0	0	0	19
04:00	0	32	12	0	2	0	0	1	0	0	0	0	0	47
05:00	0	95	32	1	1	2	0	1	2	0	0	0	0	134
06:00	0	232	115	1	5	2	**3**	6	3	0	11	0	0	378
07:00	0	363	196	4	11	10	0	**23**	2	0	25	3	0	637
08:00	0	**537**	**217**	4	12	11	2	21	4	**1**	46	**6**	0	**861**
09:00	0	494	204	**6**	**13**	10	3	13	4	0	42	2	0	791
10:00	0	535	184	2	10	**13**	1	11	**16**	0	**47**	1	0	820
11:00	0	459	169	4	6	11	1	18	9	0	35	4	0	716
12 PM	0	426	106	0	7	6	1	27	4	0	15	**8**	0	600
13:00	0	350	76	0	7	5	2	18	5	0	14	1	0	478
14:00	0	409	104	1	8	6	1	21	6	0	19	3	0	578
15:00	0	525	184	**7**	**9**	**7**	1	19	**8**	0	47	4	0	811
16:00	0	**578**	212	4	5	4	**4**	26	8	0	**54**	4	0	**899**
17:00	0	543	**238**	2	2	6	0	**28**	5	**1**	52	1	0	878
18:00	0	465	212	2	2	0	2	24	5	0	39	1	0	752
19:00	0	347	163	0	4	0	0	11	6	0	15	1	0	547
20:00	0	309	111	1	0	0	0	0	3	0	12	0	0	436
21:00	0	252	112	0	0	1	0	3	4	0	9	0	0	381
22:00	0	140	46	0	0	0	1	0	0	0	4	0	0	191
23:00	0	70	23	0	0	1	0	1	1	0	0	0	0	96
Day Total	0	7226	2744	40	104	95	22	272	96	2	486	39	0	11126
Percent	0.0%	64.9%	24.7%	0.4%	0.9%	0.9%	0.2%	2.4%	0.9%	0.0%	4.4%	0.4%	0.0%	
AM Peak		08:00	08:00	09:00	09:00	10:00	06:00	07:00	10:00	08:00	10:00	08:00		08:00
Vol.		537	217	6	13	13	3	23	16	1	47	6		861
PM Peak		16:00	17:00	15:00	15:00	15:00	16:00	17:00	15:00	17:00	16:00	12:00		16:00
Vol.		578	238	7	9	7	4	28	8	1	54	8		899

Ontario Traffic, Inc.

17705 Leslie Street, Unit 6
Newmarket, ON, Canada L3Y 3E3
905-898-7711

Site Code: 1
Station ID: I16
River Road W between
Brillinger Drive & Powerline Road
Latitude: 0' 0.000 Undefined

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/19/10	0	44	14	0	0	0	0	1	0	0	0	0	0	59
01:00	0	11	8	0	0	0	0	0	1	0	0	0	0	20
02:00	0	18	9	0	0	0	0	0	0	0	0	0	0	27
03:00	0	16	2	0	0	1	0	0	0	0	0	0	0	19
04:00	0	37	9	0	2	0	0	1	0	0	0	0	0	49
05:00	0	106	30	0	1	0	0	1	0	0	1	0	0	139
06:00	0	236	125	0	4	6	1	2	3	0	6	0	0	383
07:00	0	379	177	7	17	5	1	22	6	0	23	1	0	638
08:00	0	537	214	5	12	7	1	24	12	0	35	0	0	847
09:00	0	505	232	5	12	12	2	23	10	0	34	2	0	837
10:00	0	489	147	3	6	17	5	24	13	0	35	9	0	748
11:00	0	431	125	0	3	6	2	40	6	0	23	4	0	640
12 PM	0	518	158	2	3	7	3	28	9	0	27	4	0	759
13:00	0	218	92	0	6	4	2	17	3	0	9	4	0	355
14:00	0	497	175	2	11	14	0	21	4	0	33	3	0	760
15:00	0	518	208	5	8	10	5	28	10	0	45	4	0	841
16:00	0	571	233	3	12	5	6	26	6	0	52	6	0	920
17:00	0	565	231	2	2	4	0	23	10	0	52	0	0	889
18:00	0	469	201	0	3	3	1	23	5	0	34	1	0	740
19:00	0	380	169	0	2	1	0	20	5	0	25	1	0	603
20:00	0	361	113	0	0	1	0	6	3	0	20	0	0	504
21:00	0	283	95	0	2	1	0	2	1	0	10	0	0	394
22:00	0	147	50	0	1	0	0	1	1	0	5	0	0	205
23:00	0	71	33	1	0	0	0	2	0	0	1	0	0	108
Day Total	0	7407	2850	35	107	104	29	335	108	0	470	39	0	11484
Percent	0.0%	64.5%	24.8%	0.3%	0.9%	0.9%	0.3%	2.9%	0.9%	0.0%	4.1%	0.3%	0.0%	
AM Peak		08:00	09:00	07:00	07:00	10:00	10:00	11:00	10:00		08:00	10:00		08:00
Vol.		537	232	7	17	17	5	40	13		35	9		847
PM Peak		16:00	16:00	15:00	16:00	14:00	16:00	12:00	15:00		16:00	16:00		16:00
Vol.		571	233	5	12	14	6	28	10		52	6		920

Ontario Traffic, Inc.

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905-898-7711

Site Code: 1
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River Road W between
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Latitude: 0' 0.000 Undefined

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/20/10	0	29	8	0	1	0	0	0	2	0	0	0	0	40
01:00	0	22	10	0	0	1	0	0	1	0	0	0	0	34
02:00	0	11	11	0	0	0	0	0	0	0	0	0	0	22
03:00	0	24	7	0	0	0	0	0	0	0	0	0	0	31
04:00	0	33	10	0	1	0	0	0	0	0	1	0	0	45
05:00	0	94	38	1	1	1	0	3	1	0	2	0	0	141
06:00	0	234	121	1	4	5	1	3	3	0	7	1	0	380
07:00	0	387	196	6	12	5	1	15	8	0	20	1	0	651
08:00	0	510	213	3	11	9	2	23	8	1	57	0	0	837
09:00	0	558	184	4	6	8	2	17	6	0	46	7	0	838
10:00	0	465	130	2	9	5	7	25	10	0	20	7	0	680
11:00	0	433	98	1	4	6	1	27	12	0	21	2	0	605
12 PM	0	315	103	0	3	3	3	18	3	0	16	4	0	468
13:00	0	268	81	0	9	8	1	29	8	0	6	3	0	413
14:00	0	434	112	5	6	8	2	30	5	0	17	8	0	627
15:00	0	516	182	4	9	10	4	42	8	0	43	2	0	820
16:00	0	584	213	3	11	2	2	34	13	0	44	6	0	912
17:00	0	601	248	1	3	6	1	37	7	0	51	3	0	958
18:00	0	507	227	2	5	1	1	13	12	0	26	4	0	798
19:00	0	425	161	0	1	1	2	20	3	0	22	0	0	635
20:00	0	371	154	1	1	1	0	9	6	0	16	1	0	560
21:00	0	282	105	0	1	0	0	3	1	0	6	4	0	402
22:00	0	205	64	0	0	0	0	0	1	0	8	0	0	278
23:00	0	90	43	0	0	0	0	4	0	0	2	0	0	139
Day Total	0	7398	2719	34	98	80	30	352	118	1	431	53	0	11314
Percent	0.0%	65.4%	24.0%	0.3%	0.9%	0.7%	0.3%	3.1%	1.0%	0.0%	3.8%	0.5%	0.0%	
AM Peak		09:00	08:00	07:00	07:00	08:00	10:00	11:00	11:00	08:00	08:00	09:00		09:00
Vol.		558	213	6	12	9	7	27	12	1	57	7		838
PM Peak		17:00	17:00	14:00	16:00	15:00	15:00	15:00	16:00		17:00	14:00		17:00
Vol.		601	248	5	11	10	4	42	13		51	8		958
Grand Total	0	52189	19740	193	621	466	162	2110	769	8	3313	274	0	79845
Percent	0.0%	65.4%	24.7%	0.2%	0.8%	0.6%	0.2%	2.6%	1.0%	0.0%	4.1%	0.3%	0.0%	

APPENDIX S

Phase 3 PIC # 3

TOWN OF Wasaga Beach

www.wasagabeach.com

NOTICE NOTICE NOTICE

PUBLIC NOTICE
2010 Water-Wastewater Rate Study Update

Council has indicated its commitment to review the metered water and sewer surcharge rates after the first year of implementation. Please be advised that the Town has engaged the services of Watson Economists Ltd. to prepare an update to the Water-Wastewater Rate Study that was done in December 2008.

In order to do a proper update it was necessary to have one full year of metered water billing. We started the metered billing on April 1, 2009 and the first year has just finished

We anticipate receiving the study results in June 2010. Please check this page in the coming weeks for further information regarding the Public Meeting to present the results.

Lynn Morton, Treasurer

REQUEST FOR PROPOSAL FOR AUDIT SERVICES

The Corporation of the Town of Wasaga Beach is inviting auditing/accounting firms to submit a proposal for auditing services. The Request for Proposal document may be obtained at the Municipal Office from Monday to Friday between the hours of 8:30 am and 4:30 pm or on the Town's website at www.wasagabeach.com. The 2008 Financial Reports are also available on the website under Treasury/Tax/Water or at the Municipal Office. All interested parties are asked to submit their proposal to the undersigned on or before Friday, July 30, 2010.

Lynn Morton, Treasurer 705-429-3844 Ext. 2244

Town of Wasaga Beach, 30 Lewis Street,
Wasaga Beach, ON L9Z 1A1

MEETINGS

COMMITTEE MEETINGS
In order of meeting date

General Government
June 10th at 2:30 p.m.

Development Committee
June 23rd at 1:30pm

Public Works Commitee
June 24th at 8:30 a.m.

Council
2nd & 4th
Tuesday

RIVER ROAD WEST URBANIZATION FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE No. 3

Further to the Public Information Centre held on February 18, 2010, the Town of Wasaga Beach would like to hold a third Public Information Centre to provide an additional opportunity for the public to provide comments. The Town of Wasaga Beach is continuing the planning process to improve efficiency, enhance safety and address drainage and pavement structure deficiency in the area of River Road West from Brillinger Drive to the eastern Town limits. Nine Design Concepts for the improvements of River Road West from Brillinger Drive to the eastern Town limits have been identified and evaluated. The Design Concepts included consideration of the number of traffic lanes, the need for sidewalks and/or bicycle lanes or the provision of shared "Multi-Use Pathways". The study location is identified in the key map below:

The Design Concepts are as follows:

- Concept 1 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Sidewalks and 2 Bike Lanes
- Concept 2 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 1 Sidewalk and 1 Multi Use Path
- Concept 3 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Multi Use Paths
- Concept 4 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 1 Sidewalk and 1 Multi Use Path
- Concept 5 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths
- Concept 6 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Multi Use Paths and 2 Boulevards
- Concept 7 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Sidewalks and 1 Bike Lane
- Concept 8 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks
- Concept 9 – 4 Lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 Sidewalks and 1 Bike Lane

The Phase 3 Recommended Design Concepts are Concept 1 from Brillinger Drive to Main Street and Concept 6 from Zoo Park Road to the eastern Town limits. The Recommended Design Concepts also includes the provision of traffic signals at the intersections of River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Road and Bell's Park Road.

This Project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public information centre (PIC No 3) is planned to provide further information to the public on the Recommended Design Concepts and to receive input and comment from interested persons. In addition to addressing road capacity, pedestrian safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town has completed the Active Transportation Plan Study and intends to integrate the active transportation components such as pedestrian sidewalks, bicycle lanes, multi-use pathways and public transit into the plan

Public Information Centre
Time: Open House: 10:00 am to 12:00 pm
Date: Saturday June 26, 2010
Location: Wasaga Rec Plex – 1724 Mosley St.

Public input and comment on the Recommended Design concepts will be incorporated into the planning process. Comments will be received until Friday July 9, 2010. Subject to comments received as a result of this Notice, the Town plans to instruct the consultant to proceed with the planning for the project. An Environmental Study Report (ESR) will be prepared and placed on the public record for a minimum 30 day review period at the completion of the study.

If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Consultant undertaking the study.

This notice issued June 9, 2010.

Mr Jim McIntosh
Director of Public Works
30 Lewis Street, Wasaga Beach, ON, L9Z 1A1
Tel: (705) 429-2540 Fax: (705) 429-8226
Email: publicworksdirector@wasagabeach com

Mr. Mike Neumann, P. Eng
Vice-President, Transportation Engineering
Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON, L9Y 4J5
Phone: (705) 445-3451 Fax: (705) 445-0968
Email: neumann@ainleygroup com

429-3844 MUNICIPAL OFFICES

Administration • 429-3844
Building • 429-1120
By-Law Office & Animal Control • 429-2511
Chamber of Commerce • 429-2247
Planning • 429-3847

Community Development • 429-3847
Community Policing • 429-7569
Fire • 429-5281
Hydro • 429-2517

Library • 429-5481
Parks/Arena Facilities • 429-0412
Public Works • 429-2540
Recreation • 429-3321

LLC

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario L4N 8Z7
Tel: (705) 726-3371 • Fax: (705) 726-4391
E-mail: barrie@ainleygroup.com

June 2, 2010

File No. 109049

Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, ON
L9Z 1A1

Attn: **Mr. George Vadeboncoeur**
CAO

Ref: **Town of Wasaga Beach**
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment, Notice of Public Information Centre

Dear Mr. Vadeboncoeur:

Further to the Public Information Centre (PIC) #2 which was held on February 18, 2010, the Town of Wasaga Beach would like to hold a third PIC to provide an additional opportunity for the public to provide comments. The Town of Wasaga Beach is continuing to document a Class EA planning process to improve efficiency, enhance safety, address drainage and pavement structure deficiency issues in the area of River Road West from Brillinger Drive to the eastern Town limits. Please see the attached copy of a Notice of Public Information Centre, which will appear in the local newspaper on June 9, June 16 and June 23, 2010.

Please contact the undersigned if you have any comments or questions with respect to this Notice.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.

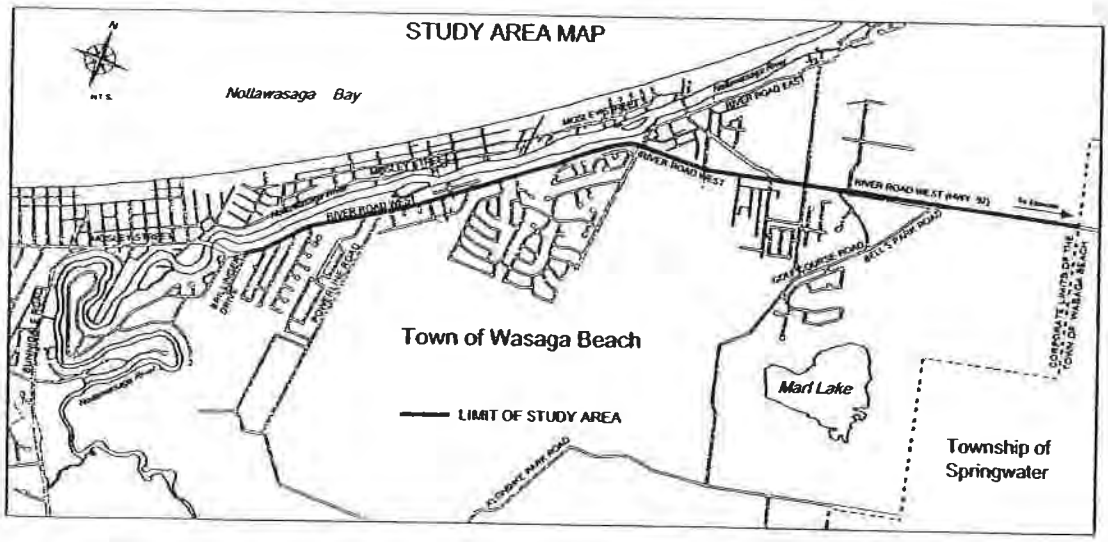
cc: Jim McIntosh, Director of Public Works

T:\109049\109049 Lilly\Correspondence\Letter review agencies-merge letter- June 2010.doc

TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE No. 3

Further to the Public Information Centre held on February 18, 2010, the Town of Wasaga Beach would like to hold a third Public Information Centre to provide an additional opportunity for the public to provide comments. The Town of Wasaga Beach is continuing the planning process to improve efficiency, enhance safety and address drainage and pavement structure deficiency in the area of River Road West from Brillinger Drive to the eastern Town limits. Nine Design Concepts for the improvements of River Road West from Brillinger Drive to the eastern Town limits have been identified and evaluated. The Design Concepts included consideration of the number of traffic lanes, the need for sidewalks and/or bicycle lanes or the provision of shared "Multi-Use Pathways". The study location is identified in the key map below:



The Design Concepts are as follows:

- Concept 1 – 3 Lanes (1 lane in each direction plus a centre turn lane) with 2 Sidewalks and 2 Bike Lanes
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The Phase 3 Recommended Design Concepts are Concept 1 from Brillinger Drive to Main Street and Concept 6 from Zoo Park Road to the eastern Town limits. The Recommended Design Concepts also includes the provision of traffic signals at the intersections of River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Road and Bell's Park Road.

This Project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public information centre (PIC No. 3) is planned to provide further information to the public on the Recommended Design Concepts and to receive input and comment from interested persons. In addition to addressing road capacity, pedestrian safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town has completed the Active Transportation Plan Study and intends to integrate the active transportation components such as pedestrian sidewalks, bicycle lanes, multi-use pathways and public transit into the plan.

Public Information Centre

Time:	Open House: 10:00 am to 12:00 pm
Date:	Saturday June 26, 2010
Location:	Wasaga Rec Plex – 1724 Mosley St.

Public input and comment on the Recommended Design concepts will be incorporated into the planning process. Comments will be received until Friday July 9, 2010. Subject to comments received as a result of this Notice, the Town plans to instruct the consultant to proceed with the planning for the project. An Environmental Study Report (ESR) will be prepared and placed on the public record for a minimum 30 day review period at the completion of the study.

If you have any comments or questions, or if you would like to be placed on the mailing list to receive project information, please contact the Consultant undertaking the study.

This notice issued June 9, 2010.

Mr. Jim McIntosh
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Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: neumann@ainleygroup.com

RIVER ROAD WEST
CLASS EA
COMMUNICATION LIST

Title	First Name	Last Name	Title	Agency	Address	Town	Postal Code
Mr.	George	Vadeboncoeur	CAO	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Ray	Kelso	Manager of Planning & Development	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Jim	McIntosh	Director of Public Works	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Mike	McWilliam	Fire Chief	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Wayne	Wilson	CAO	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Glenn	Switzer	Director of Engineering	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Ms.	Patti	Young	Senior Planner	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Graham	Findlay	Area Biologist	Ministry of Natural Resources	2284 Nursery Road	Midhurst, ON	L0L 1X0
Mr.	John	Fisher	Park Superintendent	Wasaga Beach Provincial Park (MNR)	11-22nd Street, North	Wasaga Beach, ON	L9Z 2V9
Mr.	Chris	Hyde	District Manager	Ministry of the Environment	54 Cedar Pointe Drive, Unit 1203	Barrie, ON	L4N 5R7
Ms.	Chunmei	Liu	Environmental Assessment and Planning Coordinator	Ministry of the Environment	5775 Yonge Street, 8th Floor	North York, ON	M2M 4J1
Mr.	Winston	Wong	Heritage Planner	Ministry of Culture	400 University Ave. 4th Floor	Toronto, ON	M7A 2R9
Mr.	Alejandro	Cifuentes	Heritage Planner	Ministry of Culture	400 University Ave. 4th Floor	Toronto, ON	M7A 2R9
Sir/Madam				Ministry of Labour	1201 Wilson Ave, Building E, 2nd Floor	Downsview, ON	M3M 1J8
Mr.	Paul	Trace	Manager Planning & Technical Services	Wasaga Distribution	950 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Colin	Bonnell	Manager Access Network	Bell Canada	2nd Fl. 136 Bayfield Street	Barrie, ON	L4M 3B1
Mr.	Bernie	Cyr	System Planner	Rogers Cable Systems	1 Sperling Dr., Box 8500	Barrie, ON	L4M 6B8
Ms.	Diedre	Broude	Manager	Enbridge Gas	500 Consumers Rd.	North York, ON	M2J 1P8
Mr.	Luke	Cechetto	Const. (Existing Dev.)	Enbridge Gas	10 Churchill Drive	Barrie, ON	L4N 8Z6
Const	Mark	Kinney	Community Policing Officer	Ontario Provincial Police	1000 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Wayne	White		Ontario Clean Water Agency	100 Woodland Drive	Wasaga Beach, ON	L9Z 2V4
Mr.	Martin	Rukavina	Advisor	Ministry of Aboriginal Affairs	160 Bloor Street, 9th Floor	Toronto, ON	M7A 2E6
	C.	O'Meara		Dept. of Fisheries & Oceans	Bayfield Institute, 867 Lakeshore Road, Box 5050	Burlington, ON	L7R 4A6
Sir/Madam	Environment Unit				Re: Environmental Assessment Coordination, 25 St. Clair Ave., E., 8th Floor		
Sir/Madam				Indian & Northern Affairs Canada		Toronto, ON	M4T 1M2
Sir/Madam				Chiefs of Ontario	Administration Office, 111 Peter Street, Suite 804	Toronto, ON	M5V 2H1
Sir/Madam				Metis Nation of Ontario	500 Old St. Patrick St., Unit 3	Ottawa, ON	K1N 9G4
Mr.	Dave	Simpson		Assembly of First Nations	Trebla Building, 473 Albert St., Suite 810	Ottawa, ON	K1R 5B4
Sir/Madam				Mississaugas of Alderville First Nation	P O. Box 4	Roseneath, ON	K0K 2X0
Sir/Madam				Chippewas of Beausoliel First Nation	Cedar Point Post Office	via Penetanguishene, ON	L0K 1P0
Karry	Karry	Sandy	Barrister/Solicitor, and Coordinator	Beausoleil First Nation	1 Ogema Street	Christian Island, ON	L0K 1C0
Sir/Madam				W illiams Treaty First Nations	8 Creswick Court	Barrie, ON	L4M 2J7
Sir/Madam				Chippewas of Georgina Island	RR#2, Box 12	Sutton West, ON	L0E 1R0
Sir/Madam				Chippewas of Nawash Unceded First Nation	R.R. 5	Wiarton, ON	N0H 2T0
Sir/Madam				Moose Deer Point First Nation	P.O. Box 119	Mactier, ON	P0C 1H0
				Mnjikaning First Nation	5884 Rama Road, Suite 200	Rama, ON	L0K 1T0

RIVER R[illegible]D WEST
CLASS EA
COMMUNICATION LIST

Ms.	Kelly	LaRocca	Councillor	Mississaugas of Scugog	RR#5, 22521 Island Road	Port Perry, ON	L9L 1B6
Sir/Madam				Saugeen First Nation	Highway 21, R.R. #1	Southampton, ON	N0H 2L0
Sir/Madam				Curve Lake First Nation	Curve Lake Post Office	Curve Lake, ON	K0L 1R0
Sir/Madam				Wahta Mohawk	P.O. Box 327	Bala, ON	P0C 1A0
Ms.	Wanda	McGonigle		Upper Mohawk First Nation c/o Six Nations of the Grand River	P.O. Box 5000	Ohsweken, ON	N0A 1MO
Mrs.	Heather	Bastien		Ojibways of Hiawatha First Nation	RR#2	Keene, ON	K0L 2G0
Mr.	Luc	Lainé		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Chief	Kris	Nahrgang		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Chief	Bryan	LaForme		Kawartha Nishnawbe First Nation	R.R.#4, General Delivery	Burleigh Falls, ON	K0L 2H0
Mr.	Paul	Racher		Mississaugas of the New Credit	2789 Mississauga Road, RR#6	Hagersville, ON	N0A 1H0
Mr.	John	Coulter		Archaeological Research Associates Ltd.	4456 Cedar Springs Road R.R. #1	Burlington, ON	L7R 3X4
Mr.	Yurij	Pelech	Senior Planner	J.E.Coulter & Associates	1210 Sheppard Aven.E., Suite 211	North York, ON	M2K 1E3
Mr.	Jeff	Mark		EMC Group Limited	7577 Keele Street, Suite 200	Concord, ON	L4K 4X4
				Mark Engineering	250 Bristol Road	Newmarket, ON	L3Y 7X7

The Beach is Just the Beginning

WASAGA Beach

Ainley CONSULTING ENGINEERS PLANNERS

WELCOME

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT
PHASE 3
PUBLIC INFORMATION CENTRE (PIC) #3
JUNE 26, 2010

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

PROBLEM STATEMENT

Based on the Transportation Studies completed between 1999 and 2007 the current annual average daily traffic (AADT) volume reaches the maximum range (12,000 to 15,000 vehicles per day) for a two-lane roadway. Allowing for future growth-related traffic projections based on a 10-year forecast, the Town of Wasaga Beach has identified additional road capacity required to enhance safety in the area of River Road West from Brillinger Drive to the eastern Town limits. The Town also recognizes the need to improve the roadway pavement condition and surface drainage problems in the area. In addition to addressing road capacity, safety, drainage and pavement structure deficiency issues, this Class EA planning process will recognize the fact that the Town is intending to incorporate recommendations outlined in the Town's Active Transportation Plan Study. This will identify and possibly plan for the integration of active transportation components such as pedestrian, bicycle and public transit.

The Beach is Just the Beginning

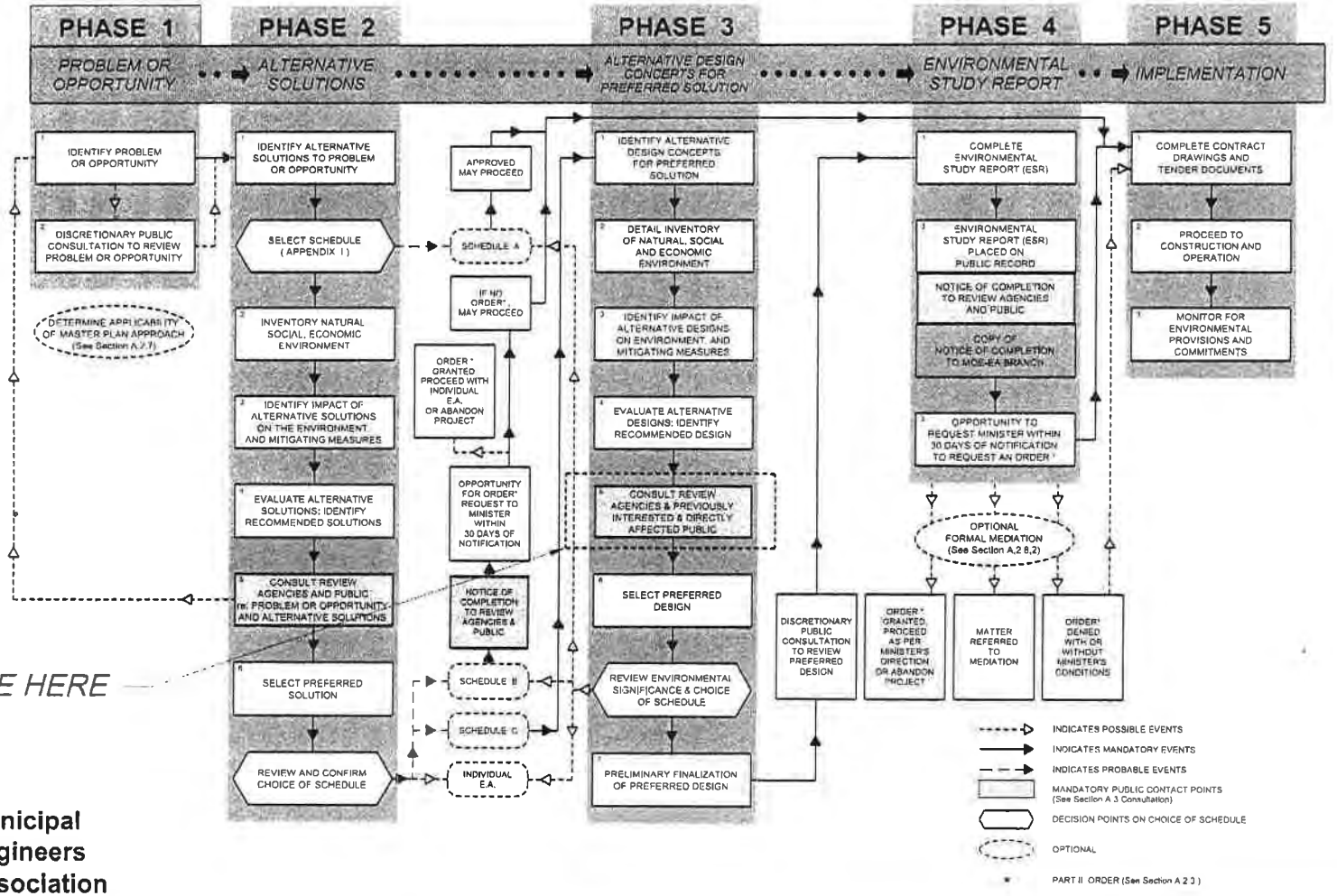
Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

EXHIBIT A.2 — MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



Municipal Engineers Association

PLATE 3

The Beach is Just the Beginning ...
WASAGA Beach

Town Of Wasaga Beach
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

ALTERNATIVE SOLUTIONS DEVELOPED AND PRESENTED AT THE 1st PUBLIC INFORMATION CENTRE

The following alternative solutions were presented at the 1st Public Information Centre:

1. Do nothing

2. Improve Mosley Street from River Road West to Main Street, Main Street from Mosley Street to River Road West and River Road West from Main Street to the eastern Town limits

3. Improve River Road West from Brillinger Drive to the eastern Town limits

4. Develop a new by-pass route from Highway 26 to County Road 92 including building a new connection from Knox Road to Powerline Road

5. Adopt part of the Simcoe County's Alternate East/West Corridor through the Georgian Triangle Outside of the Town of Wasaga Beach from Highway 26 to County Road 92 via 27/28 Nottawasaga Sideroad, Concession Road 12, Flos Road 4 and Vigo Road

Alternative solution 3 was chosen as the technically preferred solution

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Tinley CONSULTING ENGINEERS PLANNERS

TOWN BY-PASS ROUTE CONSIDERATION

Bypass Route Warrant Comparison				
City/Town	**Wasaga Beach**	**Collingwood**	**Paris**	**Shelburne**
Road/Highway	River Road West	First Street (Highway 26)	Grand River Street	Main Street (Highway 10)
Current AADT	7,400 – 12,200 (2009)	30,000 (2005)	unknown	Over 17,800 (2006)
Future AADT	16, 100 – 23,900 (2026)	40,000 – 44,000 (2015)	unknown	unknown
% Total Bypass Volumes	5 – 9 % (2010)	Over 30 %	unknown	44 – 54 %
% Truck Bypass Volumes	7 – 9 % (2010)	unknown	53%	64%
Right-of-Way Width	20 m	30 m	30 m	unknown
Existing Number of Lanes	2 (one lane in each direction)	4 (two lanes in each direction)	3 (two northbound lanes, one southbound lane)	4 (two lanes in each direction)
Future Number of Lanes	To be determined	5 (two lanes in each direction and a two-way left turn lane)	unknown	unknown
Will Active Transportation be accommodated?	Yes	Yes, 3 m Multi use trail on the north side and 1.5 m sidewalk on the south side	unknown	unknown
Is a bypass Warranted?	"No" at this time	Yes (by MTO and the County of Simcoe)	Yes (by the County of Brant)	Yes (by MTO)
When will the bypass be implemented?	unknown	In 15 to 20 years	2011 to 2021	unknown

NOTES

1. "FIRST STREET" DATA DERIVED FROM "ENVIRONMENTAL STUDY REPORT, FIRST STREET AND HURON STREET (HIGHWAY 26) RECONSTRUCTION AND INFRASTRUCTURE IMPROVEMENTS, TOWN OF COLLINGWOOD" BY LAURIKSOE AUGUST 2006
2. "GRAND RIVER STREET" DATA DERIVED FROM "COUNTY OF BRANT, TRUCK ROUTE STUDY" TSH, JUNE 2004 AND "COUNTY OF BRANT, TRANSPORTATION MASTER PLAN" IBI DECEMBER 2009
3. "MAIN STREET (HIGHWAY 10) DATA DERIVED FROM "HIGHWAY 10 BYPASS FINALLY IN THE WORKS" ORANGEVILLE CITIZEN AUGUST 7, 2008

The Beach is Just the Beginning...
WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

2010 INFILTRATION STUDY RESULTS

Direction	Vehicle	% Bypass Vehicles (Travel Time <=30 minutes)	
		2008 Study	2010 Study
From Mosley East of Hwy 26 to River Rd W. West of Bell's Park Rd	Cars	4.66%	4.31%
	Trucks	6.49%	7.27%
	Total	4.81%	4.54%
From River Rd W. West of Bell's Park Rd to Mosley East of Hwy 26	Cars	10.17%	9.11%
	Trucks	7.88%	9.25%
	Total	8.88%	9.12%

Notes:

1. The 2010 Infiltration Study was carried out on Tuesday, May 4, 2010.
2. In all cases, bypass volumes are under 10% in 2010.
3. Based on bypass route warrants in other municipalities, the percents of total bypass volumes are in the range of 30% to 50% and the percents of truck bypass volumes are in the order of 50% to 60%. As such, the current bypass volumes in Wasaga Beach do not warrant a bypass.
4. Based on the percent of truck bypass growth rate of 0.685% per year from 2008 to 2010 (if considered to be more critical than the percent of total bypass growth rate), the percent of truck bypass volume will warrant a bypass in approximately 70 years.

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

2010 ATR (Automatic Traffic Recording) COUNT SUMMARY

Direction	ADT	% Trucks				Number of Trucks			
		One Day	6am - 6pm[2]	6pm - 6am[2]	10pm - 6am[2]	One Day	6am - 6pm	6pm - 6am	10pm - 6am
EB[1]	5837	9.90%	11.31%	5.85%	4.17%	578	489	89	14
WB	5569	9.93%	11.09%	6.05%	2.98%	553	475	78	10
Total	11406	9.91%	11.20%	5.94%	3.57%	1131	964	167	24

Notes:

1. ADT - Average Daily Traffic. EB - Eastbound. WB - Westbound.
2. The period from 6am to 6pm corresponds to the period during which the Infiltration Study was conducted. For the period from 6pm to 6am, the Town had no traffic data previously. The period of 10pm to 6am was selected, based on night time period when most residents assumed to be asleep.
3. ATR data was collected from May 14 to May 20 inclusive in 2010 at a location between Brillinger Drive and Powerline Road.
4. The average daily percent of truck volumes is 9.91%.
5. The average daytime (6am to 6pm) percent of truck volumes is 11.2% which is almost twice of the night time one (5.94%).
6. The average percent of truck volumes is further reduced to 3.57% for the period of 10pm to 6am.
7. On average, there are 24 trucks on the section of River Road West during the period of 10pm to 6am. This translates to 3 trucks per hour.

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WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Ainley CONSULTING ENGINEERS PLANNERS

ALTERNATIVE DESIGNS

CONCEPT #	DESCRIPTION	ROW WIDTH REQUIREMENT (m)	ESTIMATED COST
1	1- 3.5 m centre left turn lane[1], 2 - 3.5 m curb lanes 2 – 1.8 m sidewalks, 2 – 1.5 m bike lanes 2 – 0.5 m barrier curbs 2 – 0.95 m utility corridors	20.0	$30,100,000
2	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 1 – 1.8 m sidewalk; 1 – 3 m multi-use path 2 – 0.5 m barrier curbs 2 – 1.6 m utility corridors	20.0	$24,700,000
3	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 2 – 3 m multi-use paths 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	20.0	$25,500,000
4	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 1 – 1.8 m sidewalk, 1 – 3 m multi-use path 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	21.3	$32,300,000
5	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 3 m multi-use paths 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	22.5	$32,800,000
6	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 3 m multi-use paths, 2 – 1.5 m boulevards 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	25.5	$33,000,000
7	1 – 4.0 m centre left turn lane, 2 - 3.5 m curb lanes 2 – 1.8 m sidewalks, 1 – 1.5 m bike lane 2 – 0.5 m barrier curbs 2 – 1.45 m utility corridors	20.0	$29,600,000
8	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 1.8 m sidewalks 2 – 0.5 m barrier curbs 2 – 0.95 m utility corridors	20.0	$30,100,000
9	2 - 3.5 m centre lanes, 2 – 3.25 m curb lanes 2 – 1.8 m sidewalks, 1 – 1.5 m bike lane 2 – 0.5 m barrier curbs 2 – 1.0 m utility corridors	21.6	$30,600,000

[1] Less than desirable lane width is provided in order to fit the design to the existing ROW.

Alternative Designs were developed based on:

- 3 lanes could accommodate future 2026 traffic volumes
- 4 lanes would be needed in 2026 and beyond
- 4 lane road will be painted and used as 3 lane road before 2026
- Sidewalks and/or multi-use paths/bike lanes should be included to facilitate active transportation
- a 1.0 m utility corridor is required on both sides within the ROW beside the property line to facilitate street lights, gas, Bell and other utility lines

Notes:

1. Unit prices for new road lanes and roadway construction are based on benchmark costs from Wasaga Beach projects.
2. Prices do not include property purchase costs.
3. Prices include estimates of utility relocation costs which is $4,700,000 for each concept.
4. All estimates are in 2010 dollars.

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EVALUATION OF ALTERNATIVE DESIGNS

Criteria		Alternative Designs								
		Concept 1 – 3 Lanes with 2 Sidewalks and 2 Bike Lanes	Concept 2 – 3 Lanes with 1 Sidewalk and 1 Multi Use Path	Concept 3 – 3 Lanes with 2 Multi Use Paths	Concept 4 – 4 Lanes with 1 Sidewalk and 1 Multi Use Path	Concept 5 – 4 Lanes with 2 Multi Use Paths	Concept 6 – 4 Lanes with 2 Multi Use Paths and 2 Boulevards	Concept 7– 3 Lanes with 2 Sidewalks and 1 Bike Lane	Concept 8 – 4 Lanes with 2 Sidewalks	Concept 9 – 4 Lanes with 2 Sidewalks and 1 Bike Lane
Terrestrial Vegetation		Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Less impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland	Slightly higher impact to vegetation, ANSI life science lands, ANSI earth science lands and provincially significant wetland
Capital Cost		Higher	Lower	Lower	Higher	Higher	Higher	Lower	Higher	Higher
Operating Cost		Higher	Lower	Lower	Higher	Higher	Higher	Lower	Higher	Higher
Construction, Design, Land Ownership		The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition would be required in 2026.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width is within the existing right-of-way limits. However, Right-of-way acquisition may be required in 2026.	The required right-of-way width exceeds the existing right-of-way limits. Right-of-way acquisition would be required.
Operational	Future Capacity	Longer term (beyond 20 years) vehicular demands could be accommodated if the road would be remarked as a 4 lane road in 2026 and beyond. In this case, additional right-of-way would be required to facilitate active transportation.	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Long term (2026) vehicular demands could be accommodated. Additional capacity may be required in 2026 and beyond.	Longer term (beyond 20 years) vehicular demands could be accommodated.	Longer term (beyond 20 years) vehicular demands could be accommodated.
	Flexibility	The road could be used as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	Lack of flexibility to accommodate longer term (2026 and beyond) vehicular demands.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.	The road would be marked as a 3 lane road before 2026 and 4 lane in 2026 and beyond.
	Pedestrian Safety	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles.	Longer distance for pedestrians to cross the road. Provides a minimum of 1.5 m permanent boulevard to separate pedestrian traffic from vehicular traffic.	Shorter distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles. Provides only a single one-way bike lane.	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles. Provides no bike lanes/paths in 2026 and beyond.	Longer distance for pedestrians to cross the road. Lack of boulevard separation between pedestrians and vehicles. Provides only a single one-way bike lane in 2026 and beyond.
	Future Public Transportation	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus lanes/bay area.	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Insufficient pavement width is provided to facilitate the future provision of public transportation such as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.	Sufficient pavement width may be provided to facilitate the future provision of public transportation, should the outside lanes be used as bus lanes/bay area.

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WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
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FLEXIBILITY CONSIDERATION

CONCEPTS	3 LANES WITH NO FLEXIBILITY TO EXPAND IN THE FUTURE	3 LANES WITH FLEXIBILITY TO EXPAND TO 4 LANES IN 2026
COST TO BUILD	$24.7 TO 29.6 MILLION	$30.1 TO 33 MILLION
WHAT NEEDS TO BE DONE IN 2026?	WIDEN THE ROAD TO 4 LANES	RE-PAINT THE ROAD AND DIVERT BIKE TRAFFIC
COST IN 2026	$12 TO 15 MILLION	$1,000,000 [1]
TOTAL COST	$36.7 TO 44.6 MILLION	$31.1 TO 34 MILLION

Note:
1. Estimate of cost includes pavement resurfacing.
2. All estimates are in 2010 dollars.

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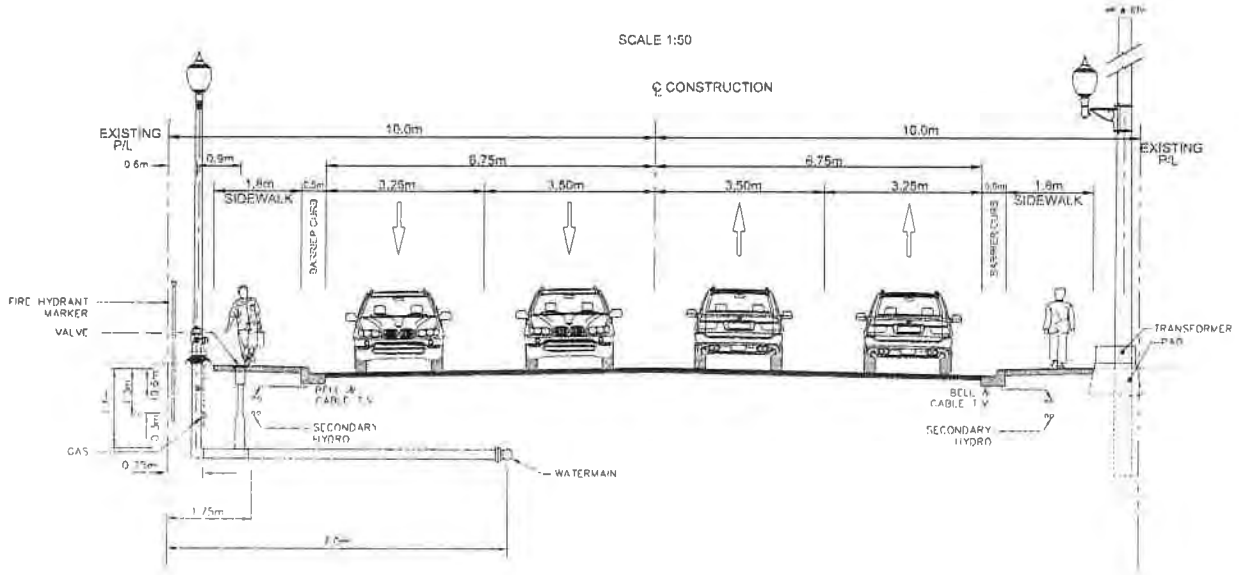
Ainley CONSULTING ENGINEERS PLANNERS

ALTERNATIVE DESIGN SHOWING OTHER UTILITIES

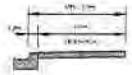
ALTERNATIVE DESIGN SHOWING OTHER UTILITIES

SCALE 1:50



NOTES:

1. MINIMUM WIDTH HAS BEEN USED FOR SIDEWALKS, VEHICULAR LANES AND BARRIER CURBS IN ACCORDANCE WITH MTO AND TAC (TRANSPORTATION ASSOCIATION OF CANADA) STANDARDS.
2. HYDRANTS AND WATERMAINS ARE TO BE ON OPPOSITE SIDES OF THE ROAD FROM ELECTRICAL TRANSFORMERS
3. ALL UTILITIES SHALL BE PLACED UNDERGROUND EXCEPT FOR THE STREET LIGHTS, FIRE HYDRANTS, AND ELECTRICAL TRANSFORMERS.



NOTES:

- AS PER TAC (TRANSPORTATION ASSOCIATION OF CANADA) *GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS* , THE MINIMUM SIDEWALK WIDTH IS 1.5M
- WHERE SIDEWALKS ARE PLACED DIRECTLY AGAINST THE CURB, THE SIDEWALK WIDTH IS INCREASED BY MINIMUM OF 0.5M FOR MAJOR ROADS AS PER THE TAC MANUAL
- THIS ADDITIONAL WIDTH PROVIDES FOR STREET HARDWARE PLACEMENT AND ALLOWS THE PROXIMITY OF MOVING TRAFFIC OR OPENING DOORS OF PARKED CARS
- THE 2.0M MINIMUM SIDEWALK WIDTH IS MEASURED FROM THE FACE OF THE CURB TO THE FAR EDGE OF THE SIDEWALK AS PER THE TAC MANUAL
- THE 1.8M SIDEWALK WIDTH USED IS MEASURED FROM THE BACK OF THE CURB TO THE FAR EDGE OF THE SIDEWALK
- THE DISTANCE BETWEEN THE FACE OF THE CURB AND THE BACK OF THE CURB IS 0.2M
- THEREFORE, THE 1.8M SIDEWALK WIDTH MEETS THE MINIMUM REQUIREMENTS

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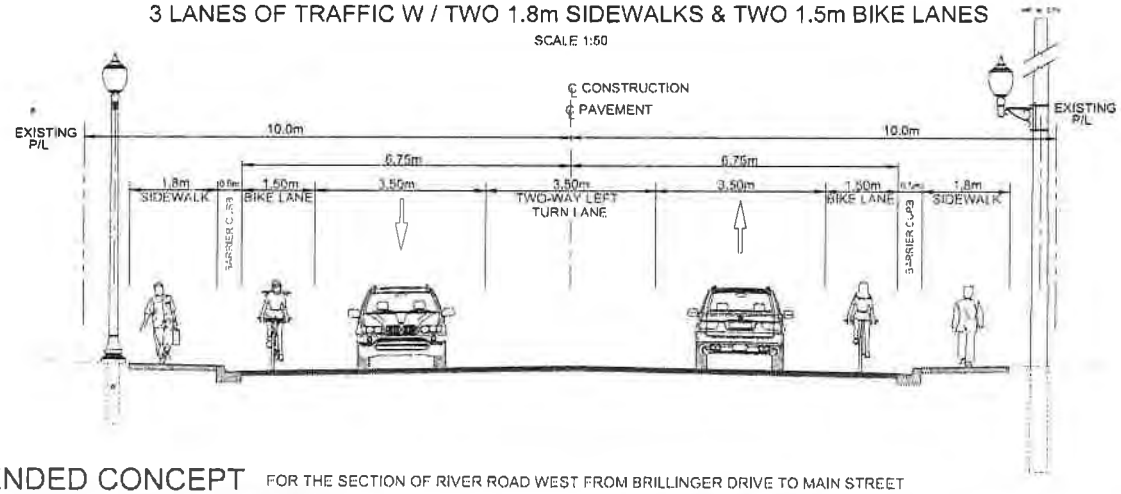
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT #1 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS & TWO 1.5m BIKE LANES

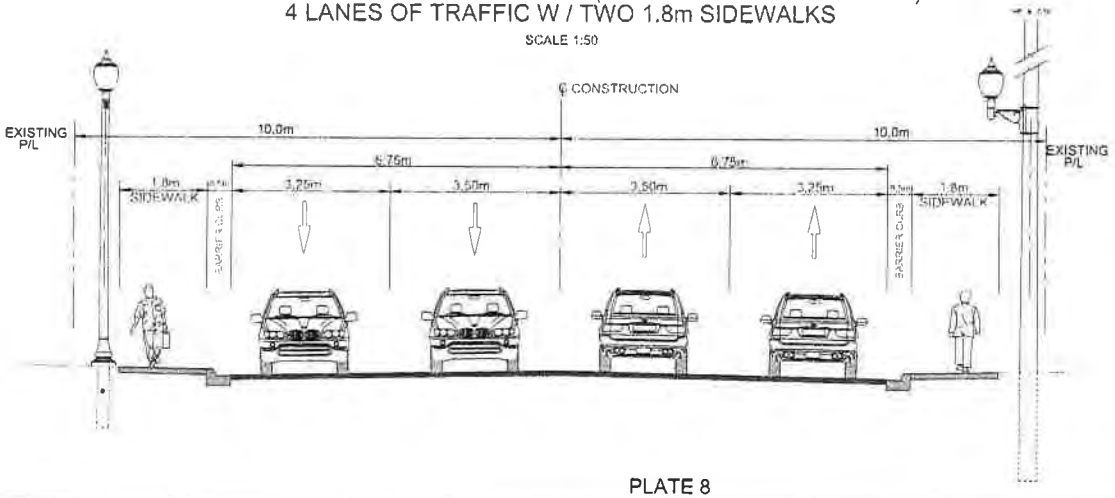
SCALE 1:50



RECOMMENDED CONCEPT FOR THE SECTION OF RIVER ROAD WEST FROM BRILLINGER DRIVE TO MAIN STREET

CONCEPT #1 - 2026 AND BEYOND (EXISITNG MOSLEY STREET)
4 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026 IF REMARKING THE ROAD TO 4 LANES.
FLEXIBILITY	USED AS 3 LANE ROAD BEFORE 2026 AND 4 LANE IN 2026 AND BEYOND.
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026
FUTURE PUBLIC TRANSPORTATION	SHOULD THE ROAD BE REMARKED TO HAVE 4 LANES, OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA.
COST ($ 30,100,000)	THE FIFTH HIGHEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026 AND BEYOND

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RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

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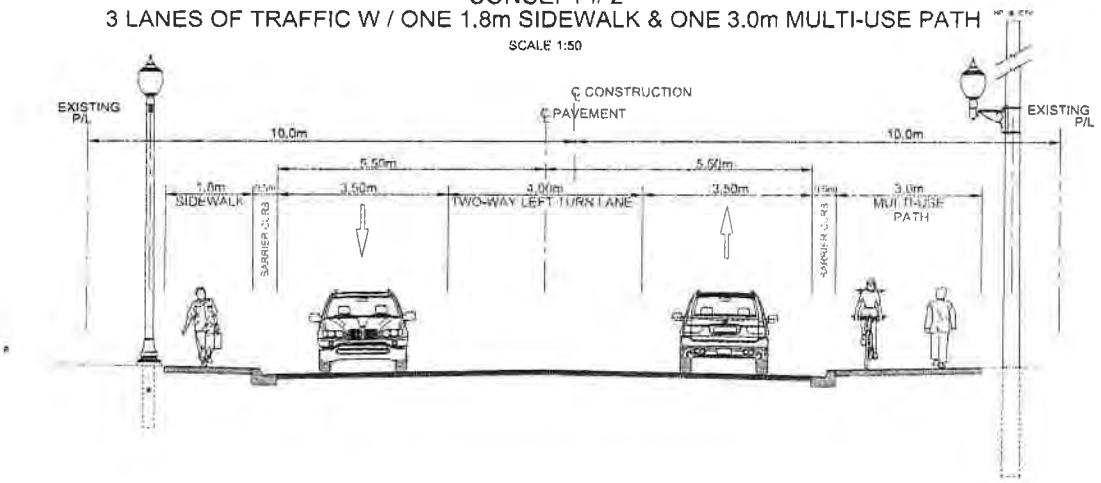
CONCEPT # 2
3 LANES OF TRAFFIC W / ONE 1.8m SIDEWALK & ONE 3.0m MULTI-USE PATH

SCALE 1:50



OPPORTUNITIES

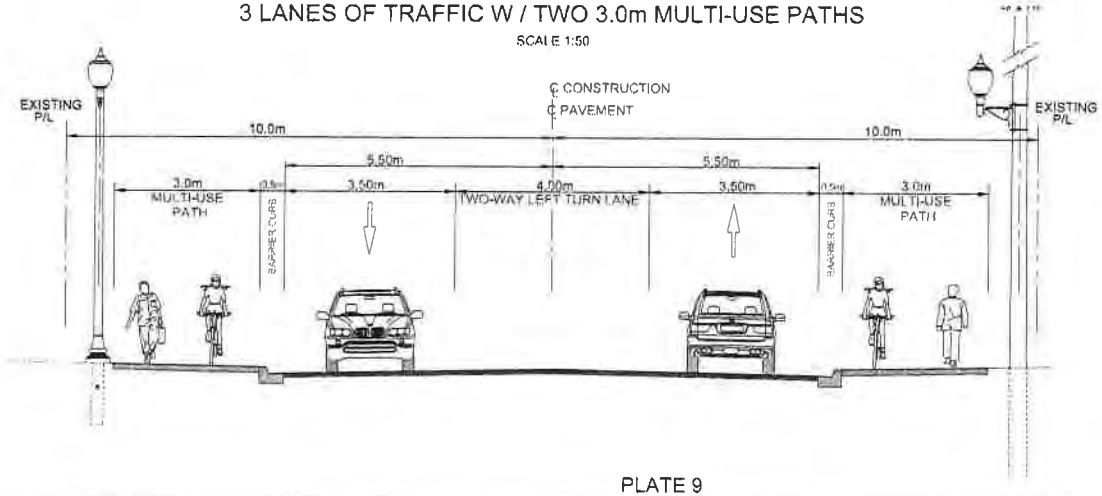
CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEFORE 2026
PEDESTRIAN SAFETY	SHORTER DISTANCE FOR PEDESTRIANS TO CROSS.
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026.
COST ($ 24,700,000)	THE LOWEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

CHALLENGES

CAPACITY	ADDITIONAL CAPACITY WOULD BE REQUIRED IN 2026 AND BEYOND.
FLEXIBILITY	WIDENING WILL BE REQUIRED IN 2026
PEDESTRIAN SAFETY	LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES.
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026.
FUTURE PUBLIC TRANSPORTATION	NO ROOM FOR BUS LANES/BAY AREA WHEN A BUS STOPS TO LOAD OR UNLOAD RIDERS, ALL TRAFFIC BEHIND HAS TO STOP.

CONCEPT # 3
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEFORE 2026
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026.
PEDESTRIAN SAFETY	SHORTER DISTANCE FOR PEDESTRIANS TO CROSS
COST ($ 25,500,000)	THE SECOND LOWEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

CHALLENGES

CAPACITY	ADDITIONAL CAPACITY WOULD BE REQUIRED IN 2026 AND BEYOND.
FLEXIBILITY	WIDENING WILL BE REQUIRED IN 2026
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026.
PEDESTRIAN SAFETY	LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES
FUTURE PUBLIC TRANSPORTATION	NO ROOM FOR BUS LANES/BAY AREA WHEN A BUS STOPS TO LOAD OR UNLOAD RIDERS, ALL TRAFFIC BEHIND HAS TO STOP

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WASAGA Beach

Town Of Wasaga Beach

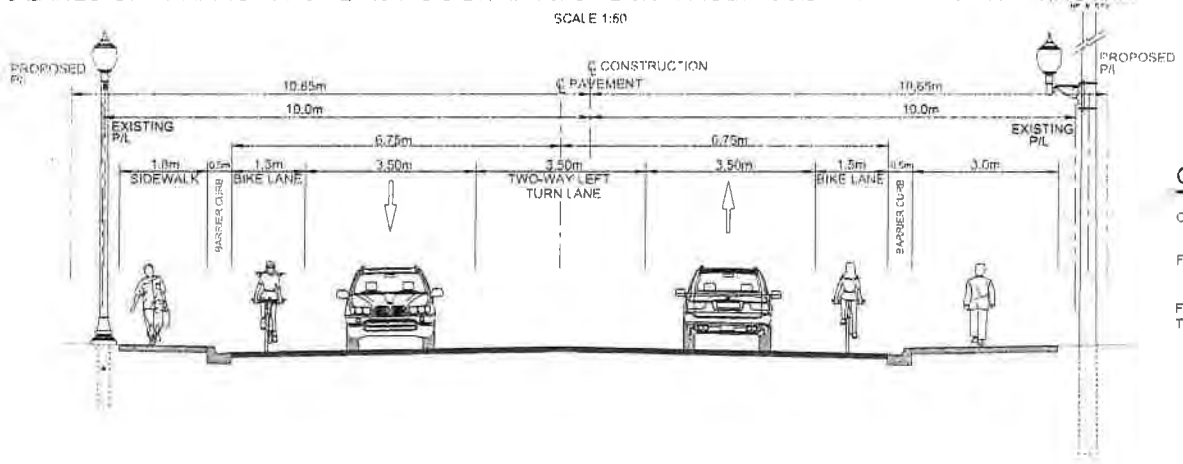
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT #4 - BEFORE 2026
3 LANES OF TRAFFIC W / ONE 1.8m SIDEWALK & ONE 3.0m MULTI-USE PATH & TWO 1.5m BIKE LANES

SCALE 1:50

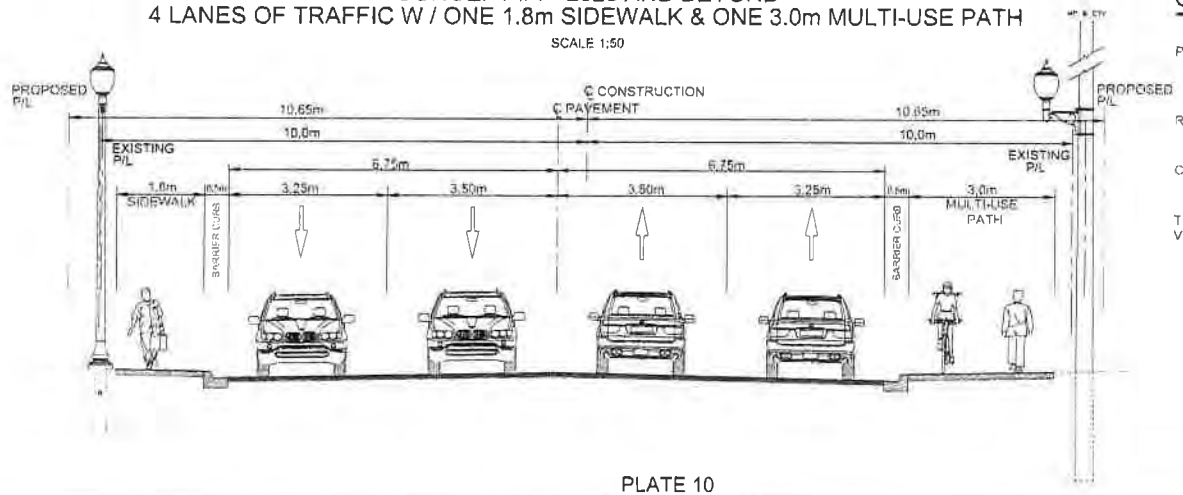


OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD BEFORE 2026 4 LANE IN 2026 AND BEYOND.
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND.

CONCEPT #4 - 2026 AND BEYOND
4 LANES OF TRAFFIC W / ONE 1.8m SIDEWALK & ONE 3.0m MULTI-USE PATH

SCALE 1:50



CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES.
RIGHT-OF-WAY	EXCEEDS THE EXISTING RIGHT-OF-WAY LIMITS.
COST ($ 32,300,00)	THE THIRD HIGHEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

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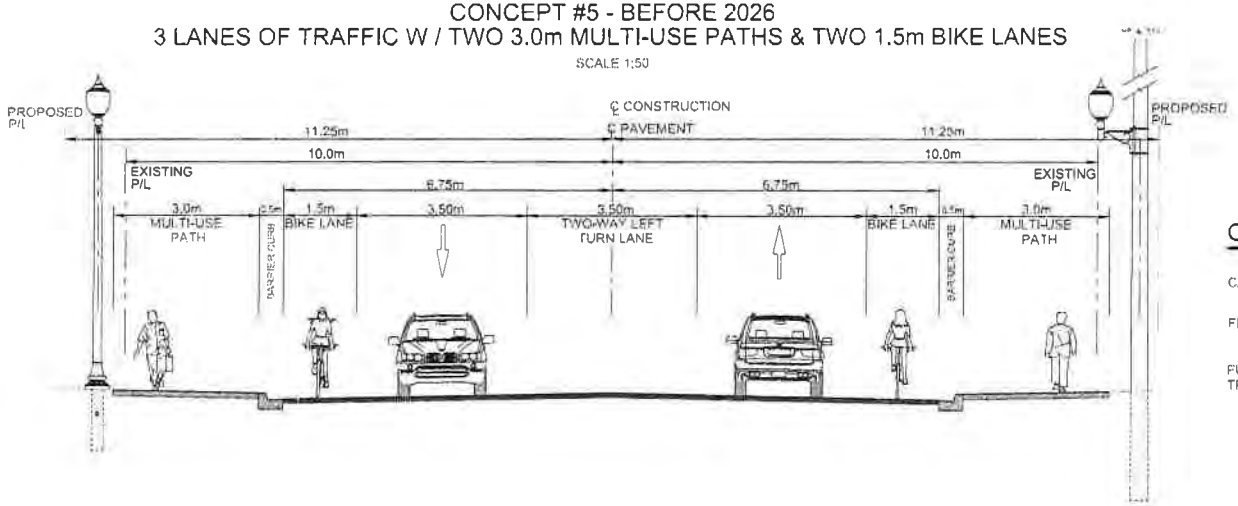
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

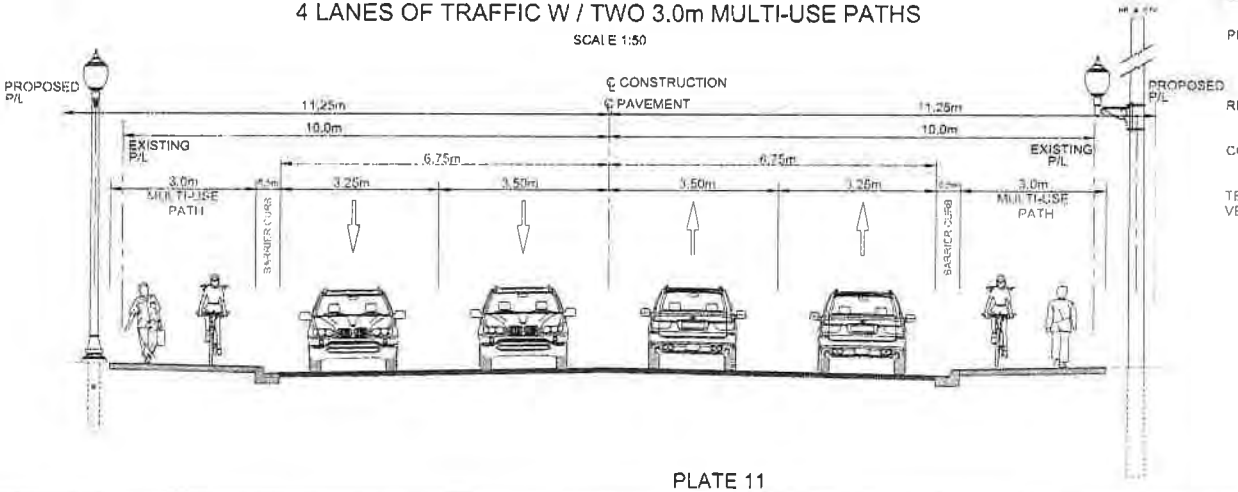
CONCEPT #5 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO 1.5m BIKE LANES

SCALE 1:50



CONCEPT #5 - 2026 AND BEYOND
4 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD BEFORE 2026 4 LANE IN 2026 AND BEYOND
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES
RIGHT-OF-WAY	EXCEEDS THE EXISTING RIGHT-OF-WAY LIMITS
COST ($ 32 800 000)	THE SECOND HIGHEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

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WASAGA Beach

Town Of Wasaga Beach

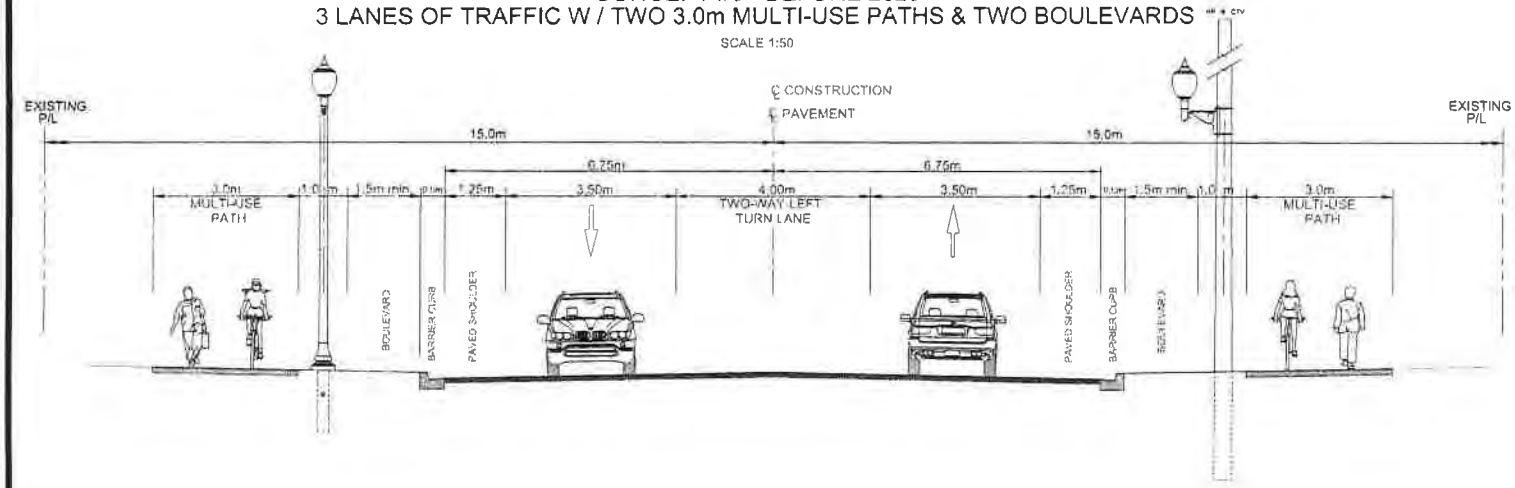
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Tinley CONSULTING ENGINEERS PLANNERS

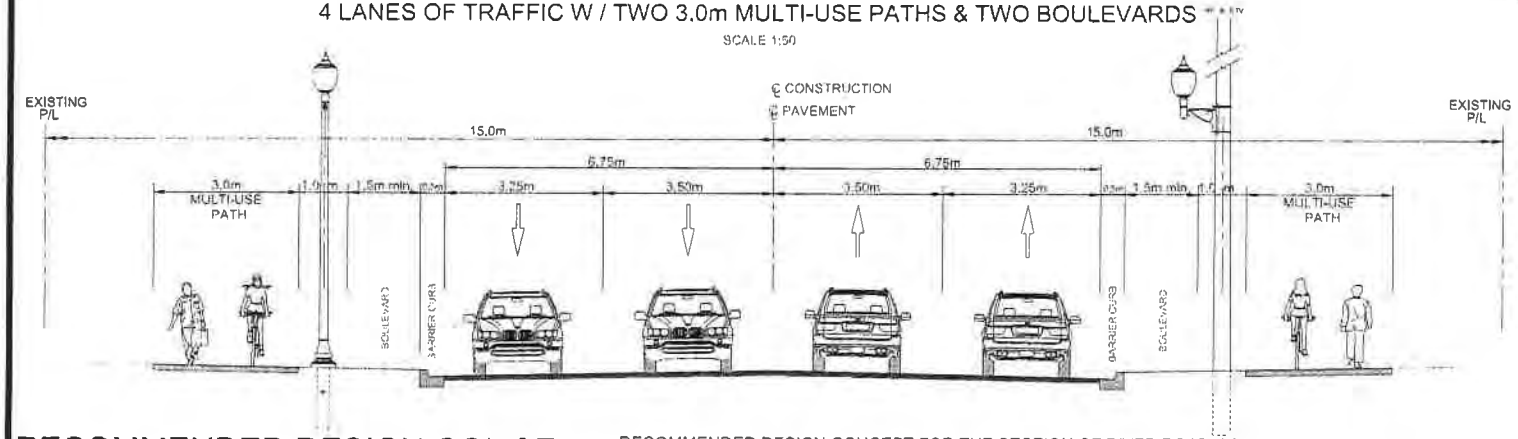
CONCEPT #6 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO BOULEVARDS

SCALE 1:50



CONCEPT #6 - 2026 AND BEYOND
4 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO BOULEVARDS

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD BEFORE 2026 4 LANE IN 2026 AND BEYOND.
PEDESTRIAN SAFETY	PROVIDE 1.6 M PERMANENT BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES.
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS FOR THE SECTION FROM ZOO PARK RD TO THE EASTERN TOWN LIMITS.
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND.

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS
RIGHT-OF-WAY	EXCEEDS THE EXISTING 20.0m RIGHT-OF-WAY LIMITS FOR THE SECTION FROM BRILLINGER DRIVE TO MAIN ST.
COST ($ 33,000,000)	THE HIGHEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION. ANSI LIFE SCIENCE LANDS ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

RECOMMENDED DESIGN CONCEPT

RECOMMENDED DESIGN CONCEPT FOR THE SECTION OF RIVER ROAD WEST FROM ZOO PARK ROAD TO THE EASTERN TOWN LIMITS WHERE THE EXISTING RIGHT-OF-WAYS ARE IN THE RANGE OF 30 TO 60 METRES

PLATE 12

The Beach is Just the Beginning .

WASAGA Beach

Town Of Wasaga Beach

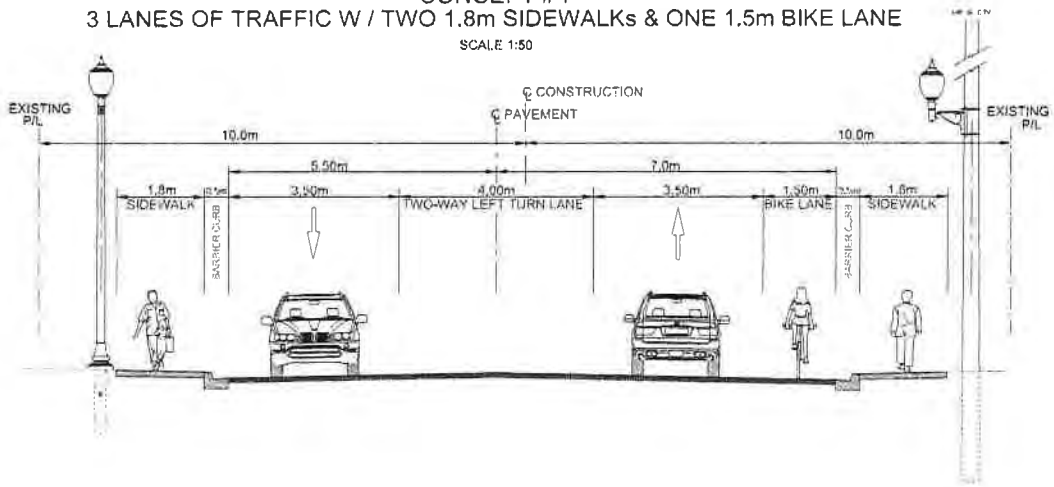
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT # 7
3 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKs & ONE 1.5m BIKE LANE

SCALE 1:50



OPPORTUNITIES

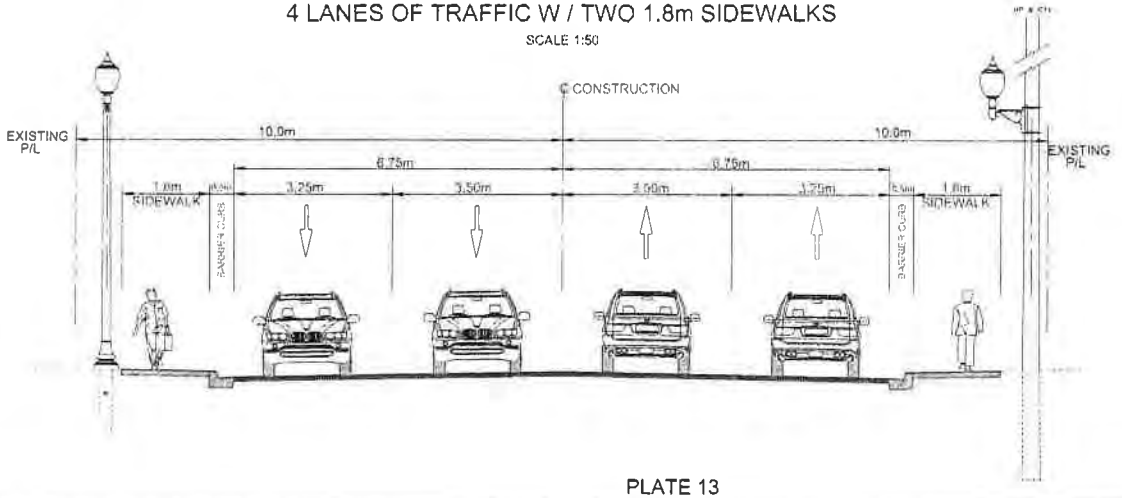
CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEFORE 2026
PEDESTRIAN SAFETY	SHORTER DISTANCE FOR PEDESTRIANS TO CROSS.
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS BEFORE 2026.
COST ($ 29,800,000)	THE THIRD LOWEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

CHALLENGES

CAPACITY	ADDITIONAL CAPACITY WOULD BE REQUIRED IN 2026 AND BEYOND.
FLEXIBILITY	WIDENING MAY BE REQUIRED IN 2026.
PEDESTRIAN SAFETY	LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES. ONLY ONE ONE-WAY BIKE LANE IS PROVIDED
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026
FUTURE PUBLIC TRANSPORTATION	NO ROOM FOR BUS LANES/BAY AREA WHEN A BUS STOPS TO LOAD OR UNLOAD RIDERS, ALL TRAFFIC BEHIND HAS TO STOP.

CONCEPT #8 - EXISITNG MOSLEY STREET
4 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026,
FLEXIBILITY	PAINTED AND USED AS 1 LANE ROAD WITH BIKE LANES BEFORE 2026. 4 LANE IN 2026 AND BEYOND.
RIGHT-OF-WAY	WITHIN THE EXISTING RIGHT-OF-WAY LIMITS
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND.
COST ($ 30,100,000)	THE FIFTH HIGHEST OF THE NINE CONCEPTS
TERRESTRIAL VEGETATION	LESS IMPACT TO VEGETATION ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND.

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES
RIGHT-OF-WAY	RIGHT-OF-WAY ACQUISITION MAY BE REQUIRED IN 2026 AND BEYOND TO FACILITATE BICYCLE TRAFFIC.
ACTIVE TRANSPORTATION	LACK OF BIKE LANES/MULTI-USE PATHWAYS IN 2026 AND BEYOND.

The Beach is Just the Beginning...

WASAGA Beach

Town Of Wasaga Beach

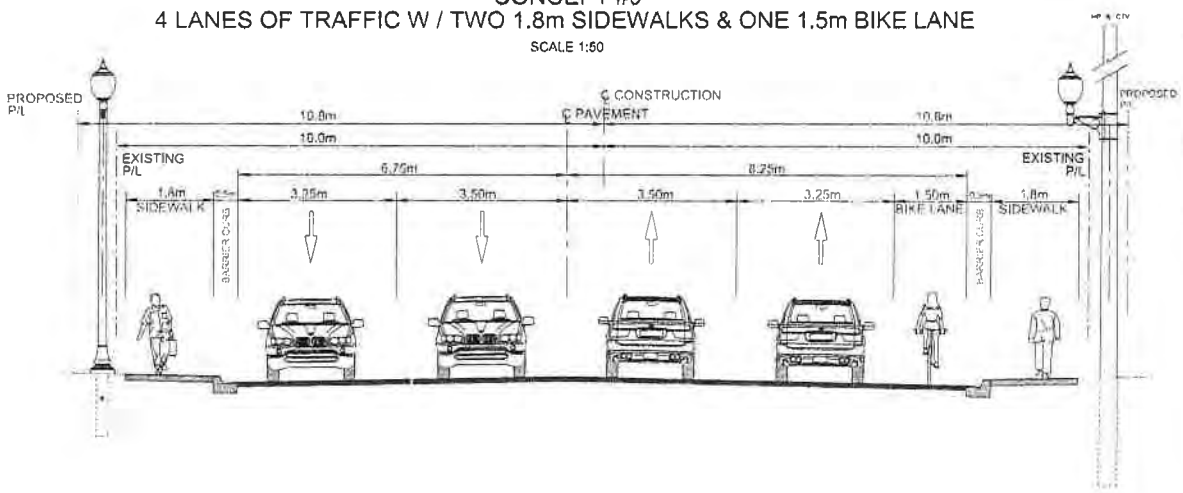
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE DESIGNS

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT #9
4 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS & ONE 1.5m BIKE LANE

SCALE 1:50



OPPORTUNITIES

CAPACITY	MEETS EXPECTED TRAFFIC VOLUME NEEDS BEYOND 2026
FLEXIBILITY	PAINTED AND USED AS 3 LANE ROAD WITH BIKE LANES BEFORE 2026, 4 LANE IN 2026 AND BEYOND.
FUTURE PUBLIC TRANSPORTATION	OUTSIDE LANES COULD BE USED AS BUS LANES/BAY AREA IN 2026 AND BEYOND

CHALLENGES

PEDESTRIAN SAFETY	LONGER DISTANCE FOR PEDESTRIANS TO CROSS. LACK OF BOULEVARD TO SEPARATE PEDESTRIANS FROM VEHICLES. ONLY ONE ONE-WAY BIKE LANE IS PROVIDED IN 2026 AND BEYOND
RIGHT-OF-WAY	EXCEEDS THE EXISTING RIGTH-OF-WAY LIMITS
COST ($ 30 600 000)	THE FOURTH HIGHEST OF THE NINE CONCEPTS.
TERRESTRIAL VEGETATION	SLIGHTLY HIGHER IMPACT TO VEGETATION, ANSI LIFE SCIENCE LANDS, ANSI EARTH SCIENCE LANDS AND PROVINCIALLY SIGNIFICANT WETLAND

The Beach is Just the Beginning

WASAGA Beach

Town Of Wasaga Beach

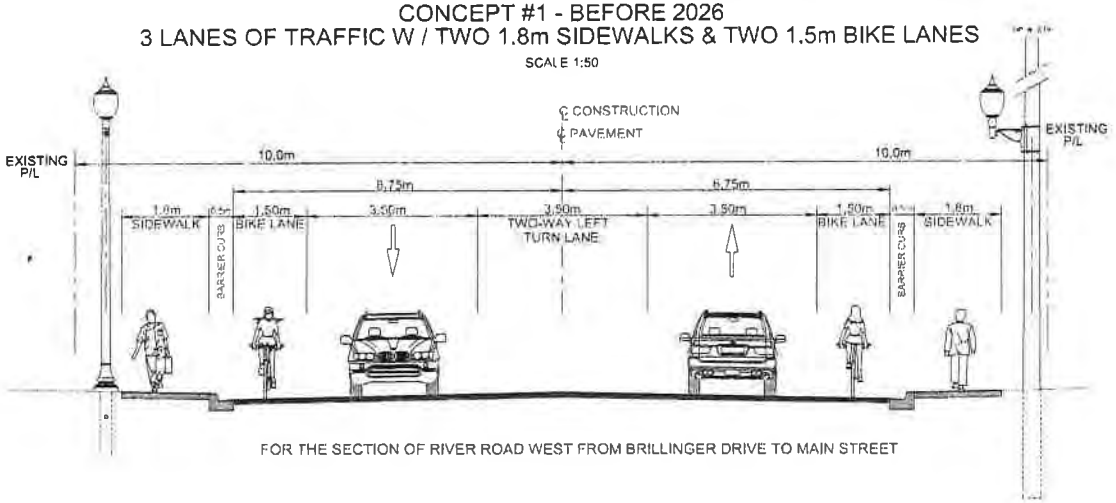
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RECOMMENDED DESIGN

Ainley CONSULTING ENGINEERS PLANNERS

CONCEPT #1 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 1.8m SIDEWALKS & TWO 1.5m BIKE LANES

SCALE 1:50



FOR THE SECTION OF RIVER ROAD WEST FROM BRILLINGER DRIVE TO MAIN STREET

RECOMMENDED DESIGN WAS DEVELOPED BASED ON:

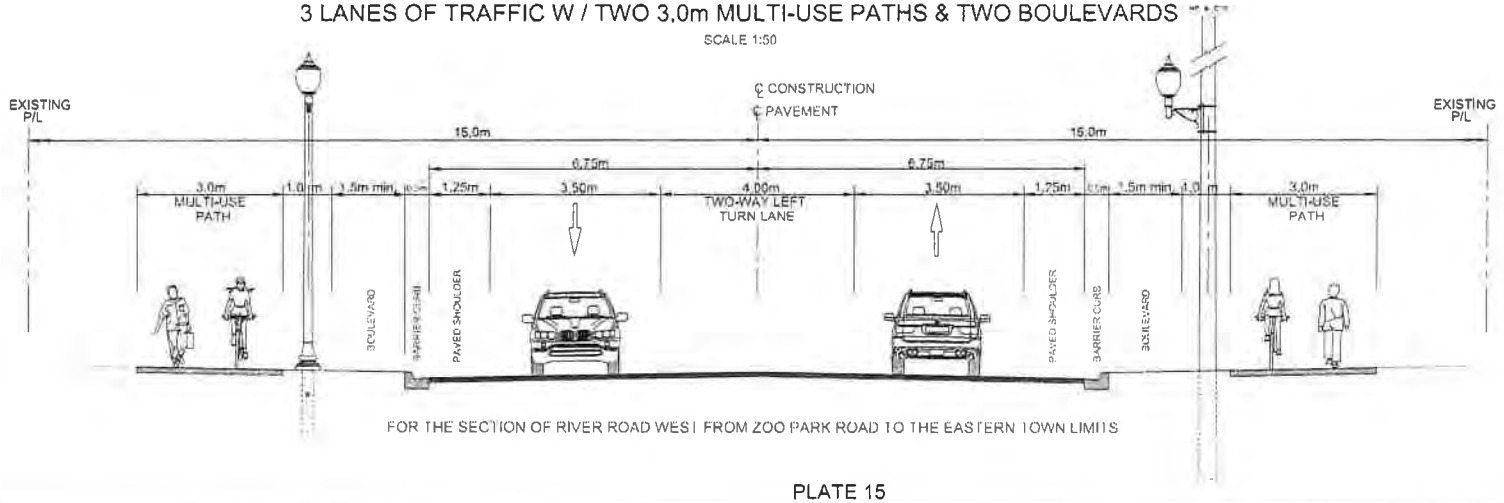
- SELECTED DESIGN CONCEPTS (CROSS-SECTION) SHOULD BE FEASIBLE FOR CONSTRUCTION WITHOUT THE NEED TO OBTAIN LARGE SECTIONS OF PRIVATE PROPERTY BEYOND THE ROAD ALLOWANCE BEFORE 2026
- THE FLEXIBILITY TO MEET THE FUTURE LONGER TERM (2026 AND BEYOND) VEHICULAR DEMANDS
- THE FLEXIBILITY TO MEET THE FUTURE PUBLIC TRANSPORTATION NEEDS AS IDENTIFIED IN THE TOWN'S OFFICIAL PLAN
- TO PROVIDE SAFE PEDESTRIAN CROSSING OPPORTUNITIES

RECOMMENDED DESIGN:

- CONCEPT 1 FROM BRILLINGER DRIVE TO MAIN STREET (20 M EXISTING ROW)
- CONCEPT 6 FROM ZOO PARK ROAD TO THE EASTERN TOWN LIMITS (30 TO 60 M EXISTING ROW)
- A TRAFFIC SIGNAL AT THE INTERSECTIONS OF RIVER ROAD WEST WITH POWERLINE ROAD, SILVER BIRCH AVENUE (EASTERLY INTERSECTION), THEME PARK ROAD AND BELL'S PARK ROAD

CONCEPT #6 - BEFORE 2026
3 LANES OF TRAFFIC W / TWO 3.0m MULTI-USE PATHS & TWO BOULEVARDS

SCALE 1:50



FOR THE SECTION OF RIVER ROAD WEST FROM ZOO PARK ROAD TO THE EASTERN TOWN LIMITS

PLATE 15

NEXT STEPS - ANTICIPATED SCHEDULE

Summer 2010

- Review and respond to comments received from Phase 3 PIC #3
- Select Preferred Design Option
- Finalize Draft Environmental Study Report (ESR) and place Draft ESR on Public record for 30 days
- (publish Notice of Completion), and
  Finalize ESR based on comments received during the 30 day review period

PROJECT FINANCING

- Considering the fact that Town growth is the reason for the work, 90% of the cost will be recovered through development charges, and
- The balance of the cost will be paid from either existing reserve funds or future Provincial/Federal funding programs.

The Beach is Just the Beginning...

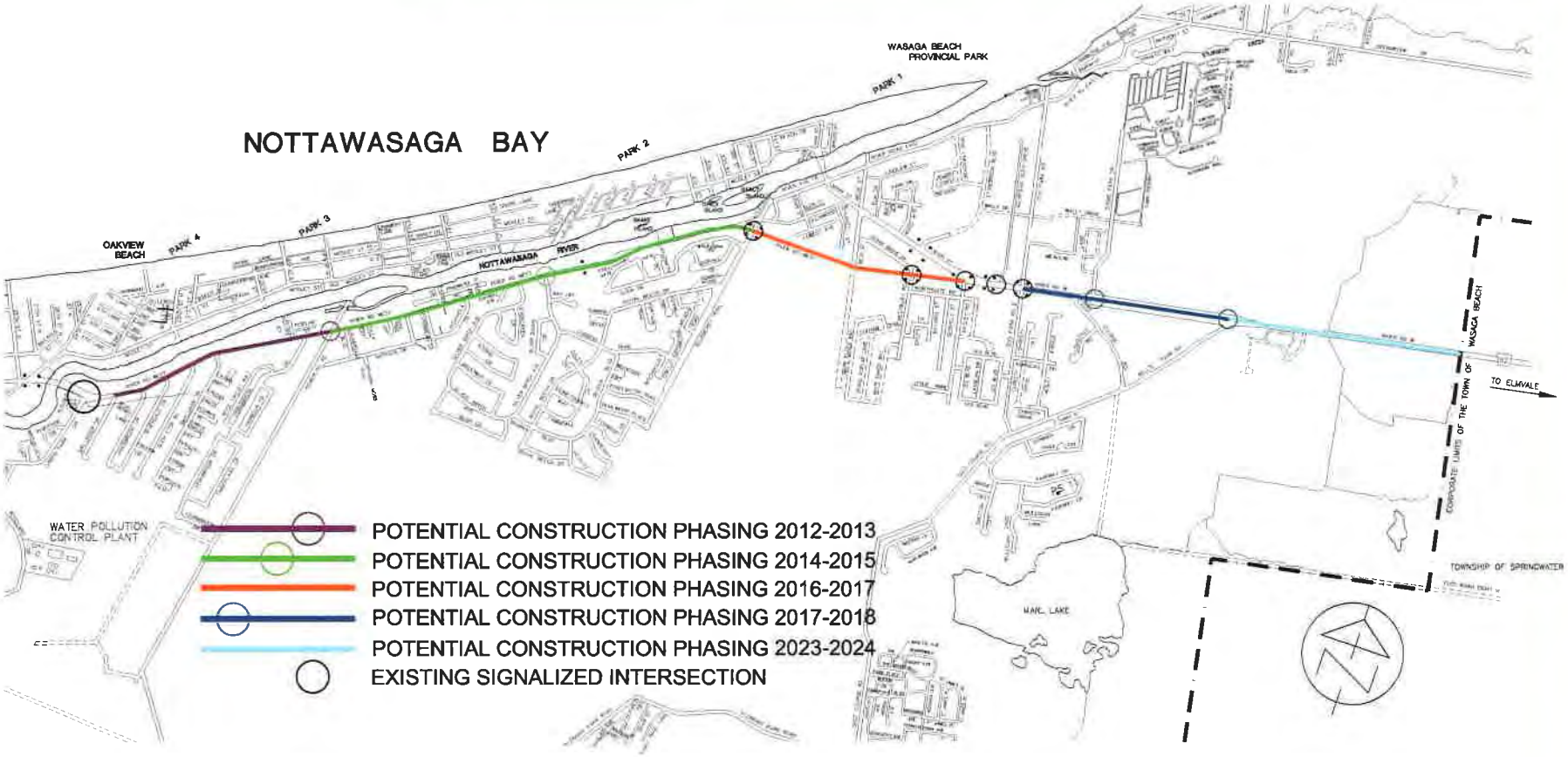
WASAGA Beach

Town Of Wasaga Beach

RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Mainley CONSULTING ENGINEERS PLANNERS

TIMING OF IMPROVEMENTS



NOTES: THE ABOVE IS BASED ON 10 YEAR FORECAST BUT IS SUBJECT TO TOWN FUNDING RESTRICTIONS AND OTHER NECESSARY APPROVALS

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

To: **Kevin Lalonde**

Copies to: **Mike Neumann – Ainley And Associates**
Tom Nollert – Ainley And Associates
Larry Young – Ainley And Associates

From: **Lilly Chen**

Date: **July 12, 2010**

Ref: **Town of Wasaga Beach – River Road West Class EA** File: **109049**
June 26, 2010 PIC #3 Summary

A third Public Information Center (PIC #3) was held on June 26, 2010 at the Wasaga Rec Plex from 10:00am to 12:00pm. Kevin Lalonde represented staff from the Town of Wasaga Beach, and Mike Neumann, Lilly Chen and Larry Young represented Ainley Group. Mayor Cal Patterson, Deputy Mayor David Foster, Councillors Rick Archdekin, Nina Bifolchi, Connie Gray, Stan Wells and George Watson also attended the PIC. One hundred and eleven (111) members of the public and stakeholders or their representatives signed the PIC attendance sheet although it is estimated that actual attendance was over one hundred and twenty (120) persons. Further to the public notice and letters sent to the review agencies, interested persons, and property owners along the road, comments were received until July 9, 2010. A response to comments will be prepared and issued following the Town's review.

Fifty-nine (59) comment sheets were received (67 persons provided written comments as 8 couples provided their comments on one comment sheet) during the PIC. Before and after the PIC, two (2) letters and five (5) comment sheets were received. Of these 74 persons' comments/letters, 28 selected Concept 1 and/or Concept 6 – the recommended concepts as the preferred design. 11 of them selected Concept 2 – 3 lanes with 1 multi use path and 1 sidewalk. Details for the concepts selected by the number of persons/letters are provided in Table 1.

As indicated in Table 1, over half of the persons/letters (41) selected a 3 lane with the flexibility to expand to 4 lanes or a 4 lane concept (Concepts 1, 4, 6, 8 and/or 9). It is noted that the Simcoe County District School Board selected Concept 1 from Brillinger Drive to Main Street and Concept 9 from Zoo Park Road to the eastern Town limits. Given that an elementary school is proposed on the lands to the east of Bells Park Road, they preferred sidewalks over multi-use paths in the area. The most common oral/written comments provided in relation to the project at the PIC are summarized in Table 2.

The general consensus by all attendees was that River Road West should have 3 lanes (1 lane in each direction plus a centre turn lane) with sidewalks/bike lanes/paths to improve traffic flow, to enhance safety, and to accommodate active transportation, and should have the flexibility to expand to 4 lanes in the future when needed. The main concerns or questions or comments provided at the meeting were associated with future 4 lanes, heavy truck volumes (along with noise and vibration), safeness of multi-use path (without separation between pedestrians and bicyclists), sidewalks/bike lanes needs and a future by-pass consideration, etc.

In addition to the first portion of a petition received on March 4, 2010, a second portion of the petition was submitted to the Council for the June 8, 2010 Council Meeting. In total, the petition contains 231 signatures from 185 addresses. The petition supports 3 lanes with 1 bike lane and 1 or 2 sidewalks and opposes the recommended 3 lanes with 2 bike lanes and 2 sidewalks because of the possibility of a

future 4 lane conversion. Responses to the petition are summarized in Table 3. As the petition has not been changed since March 4, 2010, the responses remain the same.

Table 1 – Summary of Concepts Selected in the Period of the PIC #3

Concepts	Number of Persons/Letters
No concepts	10
Concept 1 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 2 bike lanes	20
Concept 2 – 3 lanes (1 lane in each direction plus a centre turn lane) with 1 sidewalk and 1 multi use path	11
Concept 3 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 multi use paths	7
Concept 4 – 4 lanes (2 lane in each direction painted and used as 3 lanes up to 2026) with 1 sidewalk and 1 multi use path	4
Concept 6 – 4 lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 multi use paths and 2 boulevards	7
Concept 7 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 1 bike lane	4
Concept 8 – 4 lanes (2 lane in each direction painted and used as 3 lanes up to 2026) with 2 sidewalks	2
Concept 9 – 4 lanes (2 lane in each direction painted and used as 3 lanes up to 2026) with 2 sidewalks and 1 bike lane	1
Concepts 1 and 6	1
Concepts 1 and 7	2
Concepts 1 and 9	1
Concepts 3 and 7	1
4 lanes	2
Flexibility	1
Total	74

Table 2 – Most Common Oral/Written Comments and Responses

Comment/Question/ Concern	Response
I do not want to see 4 lanes of traffic, not now, not in the future. The 4 lanes will make it impossible to exit our driveway.	A 3 lane cross-section on River Road West is recommended before 2026 given the high density of driveways along the road. However, to accommodate future increased traffic volumes and future public transportation (bus lanes/bays), 4 lanes will be needed in 2026 and beyond. It is noted that costs will be much higher if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated. It is also noted that even if a by-pass is built to divert some of the traffic volumes away from River Road West and 3 lanes are sufficient in 2026 and beyond, a wider (4 lane) asphalt platform may be needed to accommodate future bus lane/bay areas. Future growth was projected based on new developments in the area of River Road West and general growth in the Town of Wasaga Beach (i.e. population growth and development growth in other areas of the Town). As people have to use River Road West to access the Town's municipal office, the library, the beach areas, the community recreation centre, and Wal-Mart, etc., it is inevitable

Comment/Question/ Concern	Response
	that more traffic will be on River Road West in the future. Should the road be remarked to have 4 lanes in the future, slightly longer delays will occur for vehicles exiting from minor side streets and driveways turning onto River Road West. However, the traffic volumes on most of these driveways are relatively light, such as 1 or 2 trips per day, the expected delays should be in an acceptable range. Peak hour volumes on most of the unsignalized sidestreets are in the order of 2 to 65 vehicles in 2026, although, operational details at these locations should be reviewed before 2026, significantly high delays are not expected.
Do the 4 lanes now – good for 25/30 years. Very happy with present 4 lanes on Mosley Street and 45th Street.	To facilitate bicycle traffic and to provide bike lanes, the Town would prefer to implement these aspects as outlined in the Active Transportation plan for the section of River Road West from Brilliger Drive to Main Street until traffic volumes warrant a 4 lane road, given that the potential construction phasing are within the next 5 years. Depending on the future traffic volumes, for the section of River Road West from Bell's Park Road to the eastern Town limits, 4 lanes may be constructed without repainting a 3 lane scenario given that the potential construction phasing for this section of the road is 2023 – 2024.
Pedestrian traffic is almost not existent. Bike lanes are not necessary – not enough traffic.	Traffic counts conducted in July 2009 indicated that pedestrian volumes along the section of River Road West are in the range of 0 to 26 persons per hour during the peak hours with the highest near Oxbow Park Road and the lowest at Bell's Park Road. Although, pedestrian traffic is considered light, sidewalks are recommended on both sides of the road to accommodate pedestrian traffic for safety purposes. In the future, there may be more pedestrian traffic as we promote active transportation and potentially reduce the use of automobiles. Similarly, bike lanes are suggested to provide an alternative mode of transportation other than the automobile.
I don't think we need any multi-use paths. Bike path should be on the road side, not the sidewalk. We need to separate pedestrians from bikes.	Given the limited right-of-way (20 m) on the section of River Road West from Brillinger Drive to Main Street, only sidewalks can be accommodated with on-street bike lanes limited to a 3 lane scenario. For the section of River Road West from Zoo Park Road to the eastern Town limits, the road right-of-ways are wider (in the range of 30 to 60 m). Thus, multi-use paths are suggested to facilitate both pedestrian and bicycle traffic. The 3.0 m in width multi-use path was selected in accordance with the Transportation Association of Canada *Geometric Design Guide for Canadian Roads*.
There should be a by-law restriction regarding heavy loads, trucks etc.	The Town's current ATR (Automatic Traffic Recording) count data indicates that truck volumes on the section of River Road West between Brilliger Drive and Powerline Road are in the order of 3 trucks per hour during the period of 10:00 pm to 6:00 am. As a result, night time truck volumes are not considered high. However, given the number of residential units in the area, the Town may consider to restrict truck traffic on the road during the period of 10:00 pm to 6:00 am through by-laws and enforcement.
What plans in the use of buffers or for	J.E. Coulter Associates Limited, an acoustics and vibration consulting engineering diagnostics and design company, conducted a Class Environmental

Comment/Question/ Concern	Response
privacy are being developed to deal with noise and vibration issues? Noise measurements were taken in September 2009 – a low traffic noise month – try June/July on a sunny weekend.	Noise Impact Assessment for the project. The report concluded that the net increase in the sound levels will be approximately 2dB from Oxbow Park Drive to the eastern Town limits. The report states that the potential increment in sound levels attributable to implementation of the project is insignificant, and mitigative measures (i.e. acoustic barriers) are not required to satisfy MTO/MOE protocol as the implementation of the project does not increase the sound level by 5dB or more. The report was dated September 2009. However, the analysis was based on the AADT (Annual Average Daily Traffic) data. The AADT data provided to J.E. Coulter was higher than the actual AADT data as at that time recent traffic count data was not available. Thus, the actual noise impacts are less and the analysis presents the results of the highest possible impact.
I don't understand why we can't have a by-pass around Town or a continuation of the Highway 26 re-alignment.	The Town's 2010 traffic infiltration study indicates that the percents of total by-pass volumes are in the order of 5% to 9%, whereas the percents of truck by-pass volumes are in the range of 7% – 9%. Based on a review of by-pass route warrants in other municipalities, the percents of total by-pass volumes are in the range of 30% to 50% and the percents of truck by-pass volumes are in the order of 50% to 60% when these options are implemented to address traffic congestion problems. As such, the current percents of by-pass volumes on the east-west route do not warrant a by-pass. Based on the percent of truck by-pass growth rate of 0.685% per year from 2008 to 2010 (more critical than the percent of total by-pass growth rate), the percent of truck by-pass volumes will warrant a by-pass in approximately 70 years. It is noted that Simcoe County's alternate east/west corridor through the Georgian Triangle will be built in the next 20 years. The Town may be able to divert some of the by-pass traffic to this corridor which connects with the Highway 26 re-alignment.
Canada Post mail boxes are located on the opposite side of the road and will be difficult and unsafe to access when crossing 3 or 4 lanes of traffic.	The Town will work with Canada Post at the detail design stage and would prefer to relocate mail boxes to the same side as the houses are located, so that residents can walk to access their mail boxes without crossing the road.

Table 3 – Responses to the Comments in the Petition

Comment/Question/ Concern	Response
I am a homeowner on River Road West and I oppose the Town's recommendation to change River Road West from 2 lanes to 3 lanes because of	We understand your concern. However, it is identified in the Town's Official Plan that River Road West from Mosley Street to Main Street is an arterial road whereas Mosley Street from River Road West to Main Street is a collector road. The Town's Official Plan has the following policies for arterial roads: "Section 16.2.8.1. Arterial roads should be designed primarily to facilitate traffic movements between major land use activity areas in the Town.

Comment/Question/ Concern	Response
the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road.	Section 16.2.8.2. In maintaining the traffic carrying function of arterial roads, the following policies shall apply: a) The appropriate rights-of-way shall be provided which will facilitate the future provision of public transportation; b) Appropriate rights-of-way shall be provided for full channelization of arterial intersections; c) Frontage, land use, entrances, exits, and curb use shall be controlled; d) In existing built-up areas, remedial approaches to minimize the number of intersections with arterial roads shall be investigated." Based on the traffic analysis for the section of River Road West, 3 lanes would be sufficient to accommodate future traffic volumes before 2026, 4 lanes will be needed in 2026 and beyond. Although, building a by-pass or utilizing a by-pass corridor to be created by the County of Simcoe may divert some traffic volumes away from River Road West thereby not requiring changing the road to 4 lanes and removing the bike lanes, increases in peak hour development traffic volumes are expected to be in the order of 2200 vehicles (including both inbound and outbound trips) in the area in the next 20 years. These traffic volumes can not be accommodated through a by-pass. In addition, 4 lanes may be needed to accommodate future bus lane/bay areas. It is noted that costs will be much higher if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated.
We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.	1 bike lane allows only one-way bicycle traffic on it. For the bicyclists returning or traveling from another direction, they will have to use other routes or be forced to pass each other by moving into the traffic lanes. The 1.8 m sidewalk is not wide enough for a bicyclist to walk with his/her bike when combined with other pedestrian traffic. Thus, for safety reasons, a single one-way bike lane is not recommended. Sidewalks or multi-use paths have to be provided on both sides of the road to facilitate pedestrians. Given the traffic volumes on the road, pedestrians should only across the road at a signalized intersection under a protected pedestrian signal phase.

Attachments:

1. PIC Attendance Sheet
2. A summary of the written and verbal comments
3. A received petition

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TOWN OF WASAGA BEACH
RIVER ROAD WEST
FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

PUBLIC INFORMATION CENTRE #3
JUNE 26, 2010

SIGN IN SHEET – PLEASE PRINT

NAME	ADDRESS	TELEPHONE NO.	E-MAIL ADDRESS

Ainley GROUP CONSULTING ENGINEERS PLANNERS

MEMORANDUM

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y 4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

To: **Kevin Lalonde**

Copies to: **Mike Neumann – Ainley And Associates**
Tom Nollert – Ainley And Associates
Larry Young – Ainley And Associates

From: **Lilly Chen**

Date: **July 12, 2010**

Ref: **Town of Wasaga Beach – River Road West Class EA**
June 28, 2010 PIC Summary of Comments

File: **109049**

Written and Verbal comments related to project received during and after the PIC are as follows:

1. I look forward to a traffic light on River Road West at Silver Birch and Powerline Road.
2. I support Concept 6 (with multi-use paths, boulevards and 4 lanes). This would address issues of water, accessibility, Tourism/economics, active alternatives and emergency/safety routes.
3. Traffic light at Fernbrook is better than Powerline or maybe we should synchronize both lights.
4. I am asking for a traffic light, a cement pad with a "Bus Stop" shelter (for school children) at Innisbrook Drive on River Road West.
5. Signals required at the entrance of all subdivisions with increased traffic. Residents will soon not be able to get out (eg. Yesterday morning June 25, I waited for 40 cars/trucks).
6. It is essential to improve pedestrian traffic with proper bike lanes and sidewalks.
7. I don't think we need any multi-use paths. Bike path should be on the road side, not the sidewalk. Need to separate pedestrians from bikes.
8. The draft plan of subdivision on the lands to the east of Bells Park Road contains a proposed elementary school site. Sidewalks are preferred over multi-use paths in this area.
9. I like to see the sidewalk on the south side and the multi use path on the north side.
10. Being a bike rider I think that the inclusion of dedicated lanes for bicycles is the key.
11. Pedestrian traffic is (almost) not existent.
12. Bike lanes are not necessary – not enough traffic.
13. We need to remember we live in Wasaga Beach, so I believe bike lanes to be used 3-4 months of the year would not be feasible, as we would not use these during the winter months. 4 lanes with 2 sidewalks would be sufficient. Another concern I have is with regards to electric bikes, will we then need lanes for them as well?
14. It is safer to have boulevard but less favourable impact on residential properties, vegetation, bird and wildlife.
15. Three lanes would create safer traffic flows and turning in and out of driveways and side streets.
16. I feel that putting a 4 lane road will greatly lower my property value.
17. I am opposed to any infringement on my property. If bike path sidewalk is closer to my property line and/or grading is required, I would like to see a noise reduction fence/high fence installed along the back of my property.
18. At this time I am concerned about the 4 lanes, but I agree it is better to plan for future growth now. Believe ii is important to have public input when it is time to go to 4 lanes.
19. I do not want to see 4 lanes of traffic, not now, not in the future.

20. The 4 lanes will make it impossible to exit our driveway.
21. I am in favour of Plates 6, 7, 7-1 and 7-2 description for Concept 8 (1st choice) or Concept 4. Do the 4 lanes now – good for 25/30 years. Very happy with present 4 lanes on Mosley Street and 45th Street. Concept 8 is slightly more expensive now, but more flexible with no revisions needed later.
22. Need to accommodate bus stops without blocking through traffic.
23. I support 4 lanes.
24. 3 lanes vs. 4 lanes – I am totally in favour of 4 lanes as we would need to redo 3 lanes to 4 in another 10-15 years.
25. Do not alter River Road West, concentrate on the bypass (27-28 Sideroad, 12 Concession).
26. Canada Post mail boxes are located on opposite side of road and will be difficult and unsafe to access when crossing 3 or 4 lanes of traffic.
27. Prefer a bypass.
28. I don't understand why we can't have a by-pass around Town or a continuation of the Highway 26 re-alignment.
29. Stop the big trucks driving by between 8am and 9am when the school bus picks up the children. They should do deliveries early morning between 12am and 6 or 7am.
30. What plans in the use of buffers or for privacy are being developed to deal with noise and vibration issues?
31. Noise assessment was undertaken in September 2009 – a low traffic noise month. Should try June/July on a sunny weekend.
32. My house has Dyer in front River Road in back. I have privacy issue, noise issues, vibration issue all with existing traffic especially "trucking". With the existing situation as well as the possibility of road expansion of River Road West, what is being considered prior to this widening in regards to noise, vibration, and privacy?
33. There should be a by-law restriction regarding heavy loads, trucking etc.
34. What will be done with current structures in the way of this development – who will move them?
35. As soon as possible drainage from roadside should be completed.
36. Need greater speed controls. Some drivers treat it as a freeway now.

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Simcoe County District School Board

1170 Highway 26 West
Midhurst, Ontario
L0L 1X0

Phone: (705) 728-7570
Fax: (705) 728-2265
www.scdsb.on.ca

TO	SEEN
MK	
~~JH~~	
~~PH~~	
LLC	
FILE NO.	
~~109049~~	
109049	

June 16, 2010

Mr. Mike Neumann, P.Eng.
Vice-President, Transportation Engineering
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, ON L9Y 4J5

Dear Mr. Neumann:

RE: Class EA, River Road West Urbanization, Town of Wasaga Beach

Thank you for notifying the Simcoe County District School Board of the Public Information Centre being held with respect to the Class EA for the River Road West Urbanization project.

Planning staff encourage municipal improvements which provide students with safe walking routes to school. We support the implementation of Design Concept 1 from Brillinger Drive to Main Street which includes sidewalks on both sides of River Road West as well as two bike lanes. While Concept 6 from Zoo Park Road to the eastern Town limits is an improvement upon existing conditions, our preference is for Concept 9 to be implemented in this area. The draft plan of subdivision on the lands to the east of Bells Park Road contains a proposed elementary school site. Sidewalks are preferred over multi-use paths in this area.

Changes to intersections and temporary road closures will impact the transportation of students attending Board schools. Please add Erica Thomas, Transportation Officer, Simcoe County Student Transportation Consortium, 566 Bryne Dr., Barrie, L4N 9P6 to the mailing list for any updates on this project.

Sincerely,

Janet Porter-Jay, BA, MCIP, RPP
Senior Planner

cc. Erica Thomas, Transportation Officer, SCSTC

#109049

[redacted]
2094 River Rd. W.
Wasaga Beach ON L9Z2V8
Canada
Phone: 705-429-5659
Email: bobalong@toast.net

Mr. Neumann, P. Eng
Ainsey & Assoc. Ltd.
560 Wellham Rd
Barrie ON L4N 8Z7

Re: RR W rebuild Brillinger to ETL

Dear Mr. Neumann:

I can't attend the meet June 29th so have the following comments regarding the best Concept in my opinion.

I select Concept 3 which gives a choice for bike riders or pedestrians to use either side of the path on either side of the road. (which they would likely do regardless of the designation) I occasionally ride a bike and have no problems sharing with pedestrians. In Florida where I have spent a good number of winters they have bike and pedestrian paths on a large number of streets and most pay no attention to which is which.

Regarding the 2 lanes with a centre turn lane I think that is more than adequate for River Rd W. for the foreseeable future. Number 12 highway on the East side of Orillia is the main route down the east side of Lake Simcoe and only has 2 lanes. That traffic must far exceed RRW. So with the center turn lane 2 should be more than adequate.

We do not want to turn this into another highway 400 which was 4 lanes at the start. It would just encourage more truck traffic.

We have trouble getting out of our driveway now.

Sincerely,

[redacted]

cc. Mr. Jim McIntosh, Director Wasaga Public Works

THE TOWN OF
WASAGA BEACH

TO	SEEN
MN	
LC	

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:
[redacted]

RECEIVED
JUN 29 2010
AINLEY & ASSOC. LTD.

FILE NO. 109049

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
OWNER

ADDRESS (Including Postal Code & Telephone Number):
1402 RIVER RD WEST 705-429-6241
44 LIO AVE. WOODBRIDGE ONT L4H-1R8 905-893-3243

COMMENTS (Please use the back of this sheet if necessary)

WE DO NOT want or require in my opinion a 4 LANE HWY

We would be happy with a decision to leave River RD West as a: 2 LANE ROAD

- ADD LEFT HAND TURN LANES where necessary
- ADD SIDEWALK ON ONE SIDE OF ROAD ONLY, to accomadate schools & church
- ADD BIKE LANES if possible

Please see over ⇒

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☑ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

Considering other Jurisdictions such as HWY 27 which travels through many towns, I question whether any thought to 4 LANES on River Rd West is credible. There is never any back up of traffic on RRW,

I would like to see Council work on the by pass solution, this 4.5km stretch of road is made up of strictly residential properties. We have enough large trucks traveling on this road, it cause major noise problems, safety issues (there is a constant finding of metal and other debris that seems to fall off these trucks and land on the road).

Consider that the area homes are owned by a large number of seniors and retirees, and having to make a left hand turn out of their driveways is cause for concern for them and for regular folks.

Consider buses (school) with children who are getting on & off, with 2 lanes its easy to see that bus, with 4 Lanes and a truck the possibility of someone attempting to pass and hurt someone is greatly enhanced.

PLEASE, I URGE YOU to Consider the CITIZENS OF THIS AREA FIRST & FOREMOST before Council VOTES.

Thanks

JUN 29 2010

AINLEY & ASSOCIATES

TO	SEEN
MN	
LC	

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

FILE NO 109049

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property Owner

ADDRESS (Including Postal Code & Telephone Number):
1264 River Rd W. Wasaga Beach, ON L9Z 2W6
705-429-5763

COMMENTS (Please use the back of this sheet if necessary)
A centre lane for turns is totally necessary! The amount of traffic, especially in the summer, makes this an obvious choice! We do NOT need sidewalks & multi use paths on BOTH sides - ONE SIDE only will more than suffice!! My main concern is the vehicular traffic (especially HUGE trucks) speeding - it occurs all the time now, and will only get worse!!

Which design concept do you prefer?

☐ Concept 1 ☒ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

TO | SEEN
MA
LC

RECEIVED
JUL 6 2010
AINLEY & ASSOC. LTD.

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted] 109049

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

88 RIVER RD. WEST, 101 RIVER RD. WEST (PRIVATE HOMES) 162 RIVER RD. WEST (WASAGA GO KARTS) CON 8 PT. LOT 22, ROBSTAD INVESTMENTS LTD.

ADDRESS (Including Postal Code & Telephone Number):

322-2594, 322-6902

COMMENTS (Please use the back of this sheet if necessary)

CONCEPT #6 WOULD BE FINE IF IT WAS LEFT AS ONLY 3 LANES, NOT 4.

I THINK IT WOULD BE VERY DIFFICULT & RATHER DANGEROUS IF MY CUSTOMERS FROM THE GO-KART TRACK HAD TO NEGOTIATE 4 LANES OF TRAFFIC ENTERING & LEAVING THE GO-KART TRACK. A CENTRE TURNING LANE WOULD MAKE IT MUCH EASIER & SAFER FOR THEM.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☑ Concept 6 UP TO 2026

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
1430 River Rd W - Wasaga Beach, Ont. L9Z 2W5
705-429-4636

COMMENTS (Please use the back of this sheet if necessary)

I understand improvements are required for River Rd. - My choice is Concept 8 (same as Mosley Str. from River Bend Plaza to 45th Str.) We need to remember we live in Wasaga Beach, so I believe bikes lanes to be used 3-4 months of the year would not be feasible, as we would not use these during the winter months. 4 lanes with 2 sidewalks would be sufficient.
Another concern I have is with regards to electric bikes, will we then need lanes for them as well..??
3 lanes vs. 4 lanes - I am totally in favour of 4 lanes as we would need to redo 3 lanes to 4 in another 10-15 years. As for the speed limit - it should remain the same as it is currently - 50 km.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☒ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5
Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

TO	SEEN
MK	

FILE NO. 109049

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER ON RIVER ROAD W.

ADDRESS (Including Postal Code & Telephone Number):
82 DECARIE CIRCLE, ETOBICOKE, ON M9B 3L4

COMMENTS (Please use the back of this sheet if necessary)

See attached.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

If there are improvements to be made on the River Road West I am opposed to having a third lane of traffic as part of the solution.

Right now the nature of the community is that of a rural town where the pace is unhurried. People, probably a majority, have chosen to live here, escaping city life. To change would alter the lifestyle of the Beach and destroy neighbourhoods. One cannot easily cross three lanes to talk to neighbours across the road or open a mailbox. The change to a wider Mosley street which has already been accomplished was through a commercial area unlike the River Road West. One of the first rules of building or saving a community is NOT to divide with a throughway. A wider road would be just that – a way for those going through to Collingwood or Elmvale. We can remember the Stop the Spadina Expressway campaign, opposition which saved neighbourhoods and serves as a good example to follow.

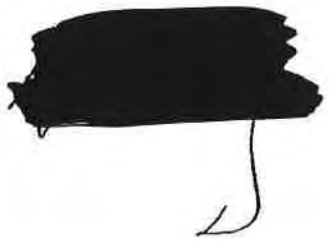
To move traffic and please those in a hurry, what is needed is a By Pass. Although this is a county matter there is some progress and the Wasaga Beach Council should be supporting this movement at the county level and urging all haste in its implementation. Another worthwhile proposal which is aired at times is a fee on trucks coming through the Beach.

Surveys apparently show that most traffic is local. Has anyone noticed the signs that will mean dramatic change in local traffic? First, fuel costs are increasing. Secondly, cars will be smaller. Thirdly, public transportation will be more important (as the Council has recognized). These signs suggest less traffic. Detroit, the automobile centre of the world, is bulldozing sections of the city to convert to urban farming. Why is Wasaga Beach planning for greater car use?

We have all seen slow traffic after a crowd has made use of the beach on a day of beautiful weather. This compares to rush hour traffic in other centres. Such centres should be so lucky as to have only five or six weekends of heavy traffic.

The point should be made that in the parks pedestrians and bicyclers (including me) share one path. Why would the River Road be different when there is less use of this type than in the parks. In addition, a curb would be a hazard for a bicycle crowded off by a swerving car or by the need to move to the side for an ambulance or police car

I suggest that the Council seriously reconsider their apparent determination to have three unwanted and unnecessary lanes of traffic.



THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property Owner

ADDRESS (Including Postal Code & Telephone Number):
1959 River Road West L9Z 2W2

COMMENTS (Please use the back of this sheet if necessary)
The four lanes will make it impossible to exit our drive way
Noise pollution will be worse than it is
No safety
Devalue our homes
Taxes for what we don't want
Improve Hwy 26 to four lanes and link up with Collingwood By Pass. Use feeder lanes to access beaches. This will stop commercial trucks from using a residential road

Which design concept do you prefer? If I have to:

☐ Concept 1 ☒ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):
56 ROSE VALLEY WAY L9Z 3C4
429-8315

COMMENTS (Please use the back of this sheet if necessary)
I AM FOR CONCEPT # 2 FOR 24.7 million. THIS PROVIDES A SIDEWALK FOR SAFETY AS WELL AS A MULTI-USE PATH. I DO NOT WANT EVER TO SEE 4 LANES ON RIVER RD W. THERE ARE ENOUGH TRUCKS NOW BUT IF THEY HAD 4 LANES, CB TALK WOULD SPREAD QUICKLY AND RIVER RD W. WOULD BECOME A DANGEROUS TRUCK HIGHWAY

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

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10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

1246 RIVER RD W.

ADDRESS (Including Postal Code & Telephone Number):

1246 RIVER RD. W.
L9Z-2W8

COMMENTS (Please use the back of this sheet if necessary)

WE FEEL YOUR CONCEPT #1 IS TOTALY WRONG FOR RESIDENTS, CONSIDERING THE PETITION EXPRESSED THAT VIEW, WE FEEL A BY-PASS IS WHAT IS NECESSARY. YOU ARE RUINING THE PEACE & TRANGUILITY OF THIS RESIDENTIAL AREA.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☒ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
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THE TOWN OF WASAGA BEACH

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
28 KNOX RD WEST WASAGA BEACH ONT
L9Z 2T7

COMMENTS (Please use the back of this sheet if necessary)
Copy of Plate 4 PIC October 29 2009

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

P.O

ADDRESS (Including Postal Code & Telephone Number):

76 WHITE SANDS WAY, [redacted] L9Z 0E1

429-7979

COMMENTS (Please use the back of this sheet if necessary)

LONG RANGE COSTS - SUGGEST DIFFERENCE (OR ADDTIONAL COSTS) ARE SMALL, SPREAD OVER 10+ YEARS. - 4 LANES VS 3 LANES. TRANSIT & ENVIORNMENT WOULD SUGGEST THAT BIKE (+ELEC) WILL BE IN MUCH MORE USE 10+ YEARS DOWN THE ROAD. 4 LANES WILL REQUIRE SOME EXPROPRIATION OF PRIVATE PROPERTY, THIS MIGHT HELP TO CLEAN UP SOME OF THE OLD PROPERTIES CLOSE TO THE ROADWAY.

Which design concept do you prefer? 1ST

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☑ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☑ 2ND Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted] [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

38 Timberland Crs L9Z 1G7 429 6746

COMMENTS (Please use the back of this sheet if necessary)

SIGNALS REQUIRED AT THE ENTRANCE OF ALL SUBDIVISIONS WITH INCREASED TRAFFIC, RESIDENTS WILL SOON NOT BE ABLE TO GET OUT. E.G. YESTERDAY AM JULY 25 I WAITED FOR 40 CARS/TRUCKS.

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): Property Owner

ADDRESS (Including Postal Code & Telephone Number):
1844 River Road West, Wasaga Beach ON
Home: 83 Thistle Ridge Dr. Woodbridge, Ont. L4L 3K3.
416-743-0444 (H) 905-265-0444

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☑ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Collingwood ON L9Y 4J5

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THE TOWN OF
WASAGA BEACH

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CLASS ENVIRONMENTAL ASSESSMENT

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

98 Royal Beach Drive, L9Z 1M5

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☒ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
OWNER

ADDRESS (Including Postal Code & Telephone Number):
UNIT 302 16 WESTBURY RD.

COMMENTS (Please use the back of this sheet if necessary)

① AS SOON AS POSSIBLE DRAINAGE FROM ROADSIDE SHOULD BE COMPLETED.

② HOW IS IT ENVISAGED TO REDUCE NOISE WHICH WILL RESULT IN GREATER TRAFFIC I.E: SOUND BARRIES

③ GREATER SPEED CONTROLS SOME DRIVERS TREAT IT AS A FREEWAY NOW.

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

22 DYER DRIVE

WB L9Z 1E1

COMMENTS (Please use the back of this sheet if necessary)

* I am opposed to any infringement on my property
* If bike path sidewalk is closer to my property line and/or grading is required I would like to see a noise reduction fence / high fence installed along the back of my property.

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 2nd Choice. ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☑ Concept 7 1st choice. ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
1860 River Road West

COMMENTS (Please use the back of this sheet if necessary)
- Canada Post Mail Boxes are located on opposite side of Road and will be difficult and unsafe to access when crossing three/four lanes of traffic.
- Why widen River Road which will invite higher traffic and increase volumes.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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COMMENT SHEET

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NAME OF RESPONDENT: [redacted] ema[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): # 429532.

ADDRESS (Including Postal Code & Telephone Number):
1883 River Rd. West

COMMENTS (Please use the back of this sheet if necessary)
I'm a mother of 2 small Children and feel that yes this road is busy. very busy. I'm Concern for their safty and our safty. Yes we need sidewalks but I feel extending these roads will Increase the traffic flow. If we need to extend these roads I've Chosen concept #2. The design includes sidewalks and a centre lane to turn.

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): [redacted]

ADDRESS (Including Postal Code & Telephone Number):

43 MARTYR DR
WASAGA BEACH L9Z 1N6

COMMENTS (Please use the back of this sheet if necessary)

SAFER BUS SHELTERS
TRAFFIC FLOW WILL BE MORE MANAGEABLE
SAFER FOR CYCLISTS & PEDESTRIANS

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): [redacted]

ADDRESS (Including Postal Code & Telephone Number):

1142 River Rd W

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☒ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
CARRUTHERS + DAVIDSON FUNERAL HOME

ADDRESS (Including Postal Code & Telephone Number):
509 RIVER ROAD WEST
W. BEACH L9Z 2X2

COMMENTS (Please use the back of this sheet if necessary)
MAPPING PRESENTED IS INCORRECT.
NORTH BOUNDARY OF 509 R/W EXTENDS
TO MIDDLE OF BERM.

SPOKE WITH LILLY GLEN.

4 LANES EAST BOUNDARY TO MAIN ST.
3 LANES MAIN TO [illegible] THEN BACK.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
68 ROYAL BEECH DR L9Z 1H3

COMMENTS (Please use the back of this sheet if necessary)
HOW WILL THE COST BE IF WE DO NOT COMPLETE THIS PROJECT 4 LANES + SIDEWALKS + STORM SEWERS RIGHT NOW. IF WE DO PARTIAL CONCEPTS + IN 10-15 YRS WE RIP UP THE EXISTING CONCEPT THE COST WE BE TREMENDOUS

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☑ Concept 9

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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, (Property Owner), Tenant, etc.):

24 Brouwer Cr.

ADDRESS (Including Postal Code & Telephone Number):

W. B. L9Z-1L8

429-7360

COMMENTS (Please use the back of this sheet if necessary)

I suggest concept 2. with the side walk on the South scale and multi-use on the North scale. After 2026 a bypass might be justified and widening might not be necessary.

Which design concept do you prefer?

☐ Concept 1 ☒ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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Public Information Centre #3 – Saturday, June 26; 2010
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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

24 Brouwer Cres. W.B.
L9Z-1L8 429-7360

COMMENTS (Please use the back of this sheet if necessary)

I like to see the sidewalk on the south side and the multi use path on the north side
Most likely by 2026 a by pass is justified

Which design concept do you prefer?

☐ Concept 1 ☒ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

45 CRANBERRY HEIGHTS
WASAGA BEACH L9Z 1M9

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

15 SILVERSANDS CRES., WASAGA BEACH, ON L9Z1P8 705-429-7204

COMMENTS (Please use the back of this sheet if necessary)

THERE ARE BENEFITS TO EACH CONCEPT.
THE KEY ELEMENT I THINK IS POSITIONING OF THE CURBS SUCH THAT RECONSTRUCTION IS NOT NEEDED IF CONDITIONS CHANGE, WE DO NOT WANT TO RE DO THIS IN 10-15 YEARS
PAINTING WHITE LINES IS EASY.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

56 Caribou Trail. 705-422-1116.
Wasaga Beach.

COMMENTS (Please use the back of this sheet if necessary)

I agree with your recommendation!
Do think it will serve Wasaga Beach well!

Look forward to having a stop light at Silver Birch & River Road West!

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1700 River Rd W.
Wasaga Beach

COMMENTS (Please use the back of this sheet if necessary)

it is essential to improve pedestrian traffic with proper bike lanes & sidewalks - three lanes would create safer traffic flows & turning in & out of driveways & side streets

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER.

ADDRESS (Including Postal Code & Telephone Number):

1332 RIVER RD W L9Z 2W6 429-3245

COMMENTS (Please use the back of this sheet if necessary)

DO NOT ALTER RIVER RD W
CONCENTRATE ON THE BY-PASS (27-28 SIDEROAD) 12 GW =

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

property owner

ADDRESS (Including Postal Code & Telephone Number):

1700 River Rd W

Wasaga L9Z 2S2

COMMENTS (Please use the back of this sheet if necessary)

We need to promote the healthy options so need 2 bike lanes 2 sidewalks less studies the 3 lane allows people to cross more easily Especially our children + seniors have difficulty when there are more lanes. Also large trucks will be encouraged by the extra space We are residential + should not encourage our River Rd + Mosley to become the preferred route of out of town traffic

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

1174 RIVER ROAD WEST 4/22-1961 (416-990-2443)

COMMENTS (Please use the back of this sheet if necessary)

I HAVE SPENT ALOT OF MONEY BUILDING MY HOUSE ON R.R.W. AND I FEEL THAT PUTTING A 4 LANE ROAD WILL GREATLY LOWER MY PROPERTY VALUE. ~~RIVER~~ RIVER ROAD IS A RESIDENTIAL Road and I AM SURE THERE MUST BE OTHER ALTERNATIVES TO MOVE TRAFFIC LIKE BUILDING A Bypass FURTHER SOUTH. I ~~AM~~ AM NOT IN FAVOR OF ANY OF THE OPTIONS.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): [redacted]

ADDRESS (Including Postal Code & Telephone Number):

15 Bush Cres L9Z 1M3

COMMENTS (Please use the back of this sheet if necessary)

Should have Traffic Lights installed at one entrance to Silver Birch Ave.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☒ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Property owner

ADDRESS (Including Postal Code & Telephone Number):
78 Azures Pl WB L9Z1K9 352-4668

COMMENTS (Please use the back of this sheet if necessary)

2, 3, 7, 8 are the options that "may" require additional roads, but not until 2026.
I believe these are the options least likely to be divisive and disruptive. Although I personally would support the recommended option 2, 3, 7, and 8 may be more palatable.
Kudos to council and the consultant for significant effort to address the concerns of all.

Which design concept do you prefer?

☐ Concept 1 ☒ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): Property Owner

ADDRESS (Including Postal Code & Telephone Number):
49 Bush Cres
Wasaga Beach Ont

COMMENTS (Please use the back of this sheet if necessary)

Concept #3

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☑ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

34 DYER DR. L9Z-1E2 429-2716

COMMENTS (Please use the back of this sheet if necessary)

I don't think we need any multi-use lanes! Bike path should be on the road side, Not the sidewalk.
Where do you think your going to get the room for a boulevard?? Not from My yard!

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

175 58th St South L9Z 1N9 429-4223

COMMENTS (Please use the back of this sheet if necessary)

Being a bike rider I think that the inclusion of dedicated lanes for bicycles is Key. The current set up is bad. The stretch of Mosely from 45th St. to Schoolertown is an example of thoughtless backwards thinking. It is ugly and only helps people who are driving right through. Wasaga Beach was a town with a great "feel" 10 years ago. Concept 1 I think will be Functional, pleasing in appearence and safe. All (4 lane) roadways in the Beach should be retro fitted to concept 1

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): Property Owner

ADDRESS (Including Postal Code & Telephone Number):

1647 RIVER ROAD WEST L9Z 2S3

429.2935

COMMENTS (Please use the back of this sheet if necessary)

1) I DO NOT WANT TO SEE 4 LANES OF TRAFFIC, NOT NOW, NOT FUTURE

2) I PREFER CONCEPT #3 BUT COULD LIVE WITH CONCEPT # 2 WITH SIDEWALK & MULTI USE PATH INSTEAD OF 2 MULTI-USE PATHS AS #3

3) ASSIDE FROM ROAD WIDENING, WE NEED ACCESS BY WAY OF TRAFFIC LIGHTS AT POWERLINE / SILVER BIRCH AT LEAST.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☒ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):
1914 RIVER ROAD WEST
705-429-4203 L9Z 2W2

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

47 TIMBERLAND CRES

COMMENTS (Please use the back of this sheet if necessary)

(1) I AM IN FAVOUR OF PLATE 6, 7, 7-1, 7-2 DESCRIPTION FOR CONCEPT #8 (1ST CHOICE) OR CONCEPT #4. DO THE 4 LANES NOW - GOOD FOR 25/30 YRS. VERY HAPPY WITH PRESENT 4 LANES ON MOLESEY & 45TH. ~~BIKE LANES~~

(2) BIKE LANES NOT NECESSARY - NOT ENOUGH TRAFFIC

(3) CONCEPT # 8 IS SLIGHTLY MORE COST NOW BUT MORE FLEXABILITY & NO REVISION NEEDED LATER.

(4) TRAFFIC LITES @ FERNBROOK BETTER THAN POWERLINE. OR MAYBE SYNONIZE DUAL LITES.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☑ (2) Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☑ (1) Concept 8 ☐ Concept 9

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROP OWNER

ADDRESS (Including Postal Code & Telephone Number):
21 SUNNIDALE RD N., W.B. L9Z 2B7
429-2166

COMMENTS (Please use the back of this sheet if necessary)

- NEED TO SEPERATE PEDESTRIAN FROM BIKES.
- CURRENTLY AN ISSUE ON MOSLEY FROM 45TH ST TO BRIDGE
- NEED TO ACCOMODATE BUS STOPS WITHOUT BLOCKING THROUGH TRAFFIC.

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☒ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

21 SUNNIDALE RD. NORTH, W.B. L9Z 2B7
705-429-2166

COMMENTS (Please use the back of this sheet if necessary)

- PREFER SEPARATE SIDEWALKS & BIKE LANES
- SAFER TO HAVE BOULEVARD BUT LESS FAVOURABLE IMPACT ON RESIDENTIAL PROPERTIES & VEGETATION & BIRD & WILDLIFE
- PREFER BYPASS
- PREFER CONCEPT #1

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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COMMENT SHEET

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NAME OF RESPONDENT:
RON. CAICCO [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER.

ADDRESS (Including Postal Code & Telephone Number):
1388 + 1384 RIVER ROAD WEST
SEND ALL INFO
2120 TENOGA DR
MISSISSAUGA ONTARIO
L5H-3K2

COMMENTS (Please use the back of this sheet if necessary)
WASAGA BEACH NEEDS A BYPASS FOR TRUCK TRAFFIC
THIS PROPOSAL FOR A 4½ KM. IS INSANE NO OTHER
AREA OUTSIDE WASAGA HAS PERMITTED THIS! BECAUSE
THERE IS 50% GRANT MONEY AVAILABLE IT IS BEING
RAMED THROUGH. CONCEPT 2 AND NOTHING BEYOND.

Which design concept do you prefer?

☐ Concept 1 ☑ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, ~~Tenant~~, etc.):

ADDRESS (Including Postal Code & Telephone Number):
1462 RIVER RD WEST L9Z2W5 429 3206

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

11 BRITTON CT.

COMMENTS (Please use the back of this sheet if necessary)

- SUPPORTS 4 LANES
- CONCERNED ABOUT SNOW STORAGE AND WHERE IT WILL BE PUT.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

1814 RIVER RD W
WASAGA ONT L9Z 2X5

COMMENTS (Please use the back of this sheet if necessary)

GOOD IDEA. 3 LANES ONLY SO WE DON'T LOOK LIKE 401!
HOPE IT WILL HELP SLOW DOWN HOT RODS

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT:

[redacted] [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

Property owner

ADDRESS (Including Postal Code & Telephone Number):

1805 River Rd West

L9Z 2X5

COMMENTS (Please use the back of this sheet if necessary)

At this time I am concerned about the 4 lanes, but I agree it is better to plan for future growth now. Believe it is important to have public input when it is time to go to 4 lanes

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted] [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

65 FOREST AVE.
WASAGA BEACH.

COMMENTS (Please use the back of this sheet if necessary)

SCHOONER TOWN BRIDGE SHOULD NOT BE WIDENED BEYOND THE WIDTH OF THE PROPOSED HIGHWAY. THIS WILL STOP THE TEMPTATION OF A FUTURE COUNCIL TO CONSTRUCT AN EVEN WIDER ROAD.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

TENANT

ADDRESS (Including Postal Code & Telephone Number):

1639 RIVER ROAD W 429-2621

COMMENTS (Please use the back of this sheet if necessary)

BASED ON THE MAP CONCEPT WHY IS THIS PROPERTY LOSING MORE FRONTAGE THEN THE PROPERTY ACROSS THE STREET? THE HOME AT 1639 IS MUCH CLOSER TO THE ROAD THEN THE PROPERTY ACROSS THE STREET.

I SEE THE NEED FOR THREE LANES ON THIS ROAD. I DO NOT SEE THE NEED FOR FOUR. I BELIEVE WITH FOUR WASACH WILL BECOME NOTHING MORE THEN A BY-PASS TOWN.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☑ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

OWNER

ADDRESS (Including Postal Code & Telephone Number):

150 3RD AVE SHELBURNE ONT L0N1S1

519 925 3436

COMMENTS (Please use the back of this sheet if necessary)

DO NOT BELIEVE THE NEED OF FOUR LANES AS THIS WILL MAKE RIVER ROAD AS A BYPASS FOR ALL TRAFFIC. CONCEPT 3 WILL BE ADEQUATE FOR WALKING BIKING AND TRAFFIC.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☒ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):
35 FAWNDALE CRES.
422-0347

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Owner

ADDRESS (Including Postal Code & Telephone Number):
20 Brillinger Dr., Wasaga Beach, ON L9Z 1L4

705-429-8350

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☑ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

11 BRILLINGER DR. WASAGA BEACH, L9Z 1C4

COMMENTS (Please use the back of this sheet if necessary)

We are concerned re (A) Noise measurements were taken in Sept/09 - a low traffic noise month - try June/July on a sunny weekend
(B) Truck traffic using new road as a short-cut.
(C) Emergency services while construction in process.
(D) Pedestrian traffic is (almost) non existent.
(E) Bike traffic is minimal.
No need for dual bike lanes

Which design concept do you prefer?

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

175 58th St. South

ADDRESS (Including Postal Code & Telephone Number):

COMMENTS (Please use the back of this sheet if necessary)

Which design concept do you prefer?

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):
1402 RIVER RD WEST
705 429-6241.

COMMENTS (Please use the back of this sheet if necessary)

- WE NEED A BY PASS TO GET THE TRUCK MOVEMENT OFF RIVER RD W. - THAT WOULD MAKE FOR A SAFER "RESIDENTIAL" ROAD.
- WHAT WILL BE DONE WITH CURRENT STRUCTURES IN THE WAY OF THIS DEVELOPMENT - WHO WILL MOVE THEM??
- IF WE DON'T GET THE BY PASS AND TRUCKS START USING THIS NEW ROAD WE WILL HAVE A MAJOR HIGHWAY RUNNING THROUGH OUR SO CALLED "RESIDENTIAL" AREA.!!

Which design concept do you prefer?

☒ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

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NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
WASAGA BEACH

ADDRESS (Including Postal Code & Telephone Number):
1953 River Road West, L9Z 2W2

COMMENTS (Please use the back of this sheet if necessary)

STOP THE BIG TRUCKS DRIVING BY between 8:00 and 9:00 AM when the school bus picks up the children. they should do deliveries early morning between 12:00 AM – 6 or 7:00 AM

Which design concept do you prefer?

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Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): Property Owner

ADDRESS (Including Postal Code & Telephone Number):

1246 RIVER RD. W.
L9Z 2W8

COMMENTS (Please use the back of this sheet if necessary)

I AM OPPOSED TO THE POSSIBILITY OF RIVER RD. W. EVER BECOMING 4 LANES. I DON'T UNDERSTAND WHY WE CAN'T HAVE A BYPASS AROUND TOWN OR A CONTINUATION OF THE HWY 26 RE-ALIGNMENT. RIVER RD. W. IS RESIDENTIAL.. AND TRAFFIC IS BAD. WE NEED A BYPASS (LIKE COLLINGWOOD HAS 1ST ST. – TOTALLY COMMERCIAL – THE RESIDENTS ARE NOT AFFECTED – PRETTY RIVER PARKWAY (HURON ST.) IS PERFECT FOR DEFLECTING TRAFFIC.) THE PEOPLE WHO LIVE ON RIVER RD W.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☑ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☑ Concept 7 ☐ Concept 8 ☐ Concept 9

I DO WANT 3 LANES, 2 BIKE LANES 2 SIDEWALKS, IF AINLEY COULD RECONFIGURE SO THERE IS NO POSSIBILITY OF 4 LANES IN THE FUTURE THAT WOULD BE MY WISH.

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

42 INNISBROOK DR.

ADDRESS (Including Postal Code & Telephone Number):

Wasaga Beach. Ont. L9Z 1G2 1-705-429-6133

COMMENTS (Please use the back of this sheet if necessary)

IN the busy time of morning, Noon, 3:15-6:15pm, the traffic is very heavy and we sit at the corner for 10-15mins to get on to River Road West. The school bus stops for the children. The children stand on the road where the traffic is coming out. So I'm asking for "Lights" and a Cement Pad with a "Bus Stop" Shelter. Hopefully this will help some of the problems on INNISBROOK Dr. I hope this will help traffic with Riverdale and Glenedn. as they don't seen

over

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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IN 2026 WON'T WANT 4 LANES EITHER. PLEASE RECONSIDER A BYPASS. I KNOW RIVER RD. W. IS AN "ARTERY" BUT AN ARTERY SHOULDN'T BE ON A RESIDENTIAL STREET. ~~ROCHE~~ NOISE IS ALREADY SO BAD YOU CAN'T KEEP YOUR WINDOWS OPEN. IT'S DANGEROUS NOW BACKING OUT ONTO RIW — 4 LANES WOULD ONLY MAKE [redacted] WORSE.

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

PROPERTY OWNER

ADDRESS (Including Postal Code & Telephone Number):

191 DYER DRIVE L9Z 1L9

COMMENTS (Please use the back of this sheet if necessary)

SEVERAL CONCERNS -

MY HOUSE HAS DYER IN FRONT RIVER ROAD IN BACK - I HAVE PRIVACY ISSUE, NOISE ISSUES, VIBRATION ISSUE ALL WITH EXISTING TRAFFIC - ESPECIALY "TRUCKING" WITH. THE EXISTING SITUATION AS WELL AS THE POSSIBILITY OF ROAD EXPANSION OF RIVER ROAD WEST. WHAT IS BEING CONSIDERED PRIOR TO THIS DEVELOPMENT IN REGARDS TO NOISE, VIBRATION, AND PRIVACY.

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to: SUBMITTED JUNE 26TH AT REC PLEX CENTRE.

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

(OVER)

to be as bad. Maybe there could be a bus stop at Smallmen so its would be better for the bus. The 3 Lanes sounds ok for now.

HE TOWN OF
ASAGA BEACH

LINGER DRIVE TO EASTERLY TOWN LIMITS
ONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

OWNER

ADDRESS (Including Postal Code & Telephone Number):

65 Forest Ave

Wasaga Beach ON L9Z 2K4

COMMENTS (Please use the back of this sheet if necessary)

THE ONLY PROPER SOLUTION IS A BI PASS. I'M not quite sure why the people were not given this option

To have a 3 or 4 Lane highway through a residential area with a ~~Sch~~ School is just stupid.

- No letter Of explanation will never convince me that any of these are suitable

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9 [None] of the Above

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

LOAD RESTRICTIONS - REGARDING NOISE VIBRATION
TOWN BY-LAW - 81-7 STATES:
PEOPLE HAVE A RIGHT TO AND SHOULD BE ENSURED AN ENVIRONMENT FREE OF UNUSUAL, UNNECESSARY OR EXCESSIVE SOUND OR VIBRATION WHICH MAY DEGRADE THE QUALITY AND TRANQUILITY OF LIFE.
" IS THIS BEING ENFORCE ? "

- SEVERAL OF US ON DYER, BETWEEN BIRCHVIEW DUNES P.S. AND BLUEBERRY TRAIL HAVE STREETS INFRONT AS WELL AS IN BACK. WE ARE FROM MY OBSERVATION THE ONLY RESIDENCE WHO HAVE THIS SITUATION. ON RIVERROAD WEST. OVER THE 5yr living ON DYER THE NOISE, VIBRATION, AND PRIVACY, HAVE INCREASED, HAVE BEEN A REAL CONCERN FOR ME. WHAT IS THE PRE PLAN FOR DEALING WITH THESE ISSUES IF ANY EXPATION IS TO TAKE PLACE, WHEN IS THE TOWN GOING TO INFORCE BY LAW(S) REGARDING NOISE, VIBRATION AND PRIVACY. OR DEVELOP NEW ONES TO IMPROVE THE QUALITY OF LIFE FOR RESIDENTS SUCH AS MYSELF.
WHAT PLANS IN THE USE OF BUFFERS OR FOR PRIVACY ARE BEING DEVELOPED TO DEAL WITH THESE ISSUES
I WANT TO HEAR FROM YOU. REGARDING MY CONCERNS OF ABOVE.

VINCENT MILLER
191 DYER DRIVE
L9Z 1L9

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
1332 River Rd W, Wasaga Beach ON, L9Z 2W6.

COMMENTS (Please use the back of this sheet if necessary)

MY SUGGESTION IS THAT THE TOWN OF WB. FULLY SUPPORT THE COUNTY IN THEIR EFFORTS TO BRING THE DATE OF THE SOUTHERN BYPASS FORWARD TO ALLEVIATE THE NEED FOR ANY CHANGE TO RIVER RD W.
CHANGES WILL HAVE AN IMPACT ON PROPERTY VALUES IN A NEGATIVE MANOR. IMPACT ON RESIDENTS HAS NOT BEEN CONSIDERED

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968
E-mail: neumann@ainleygroup.com

If throughway traffic is to continue through River Rd. west, you will be unable to keep residents safe.

The By-Pass will take care of future growth and traffic.

The By Pass is "inevitable" whether we do the work on River Rd. west or not.

Lets save the money & look to doing work once.

"By Pass"

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):
Wasaga Beach

ADDRESS (Including Postal Code & Telephone Number):
1323 Mosley St. Wasaga Beach L9Z 2C9

COMMENTS (Please use the back of this sheet if necessary)

I feel A. "By Pass" needs to be done. Only option.

Sidewalks & Pedestrian cross ways with actuated lights along Bur. Rd. W.

*

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

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AND CYCLISTS SHARING THE LANE WHICH WILL HAPPEN.

THERE SHOULD BE A BYLAW RESTRICTION REGARDING HEAVY LOADS, TRUCKS [redacted]

I DON'T WANT FOUR LANES OF CARS. WE ARE TRYING TO GET PEOPLE OUT OF CARS!

THE TOWN OF
WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT:

[redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

4 AISLYNN CRT. WASAGA BEACH
(705) 422-1251

COMMENTS (Please use the back of this sheet if necessary)

CONCEPT #1 IS THE ONLY SAFE CONCEPT THERE IS FOR EVERYONE. PEDESTRIANS NEED THEIR SIDEWALKS (EACH SIDE) AND CYCLISTS NEED A BIKE LANE (EACH DIRECTION!) THE MULTI-USE LANES CAN BE DANGEROUS HAVING PEDESTRIANS

Which design concept do you prefer?

☑ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

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280 Pretty River Parkway
Collingwood ON L9Y 4J5

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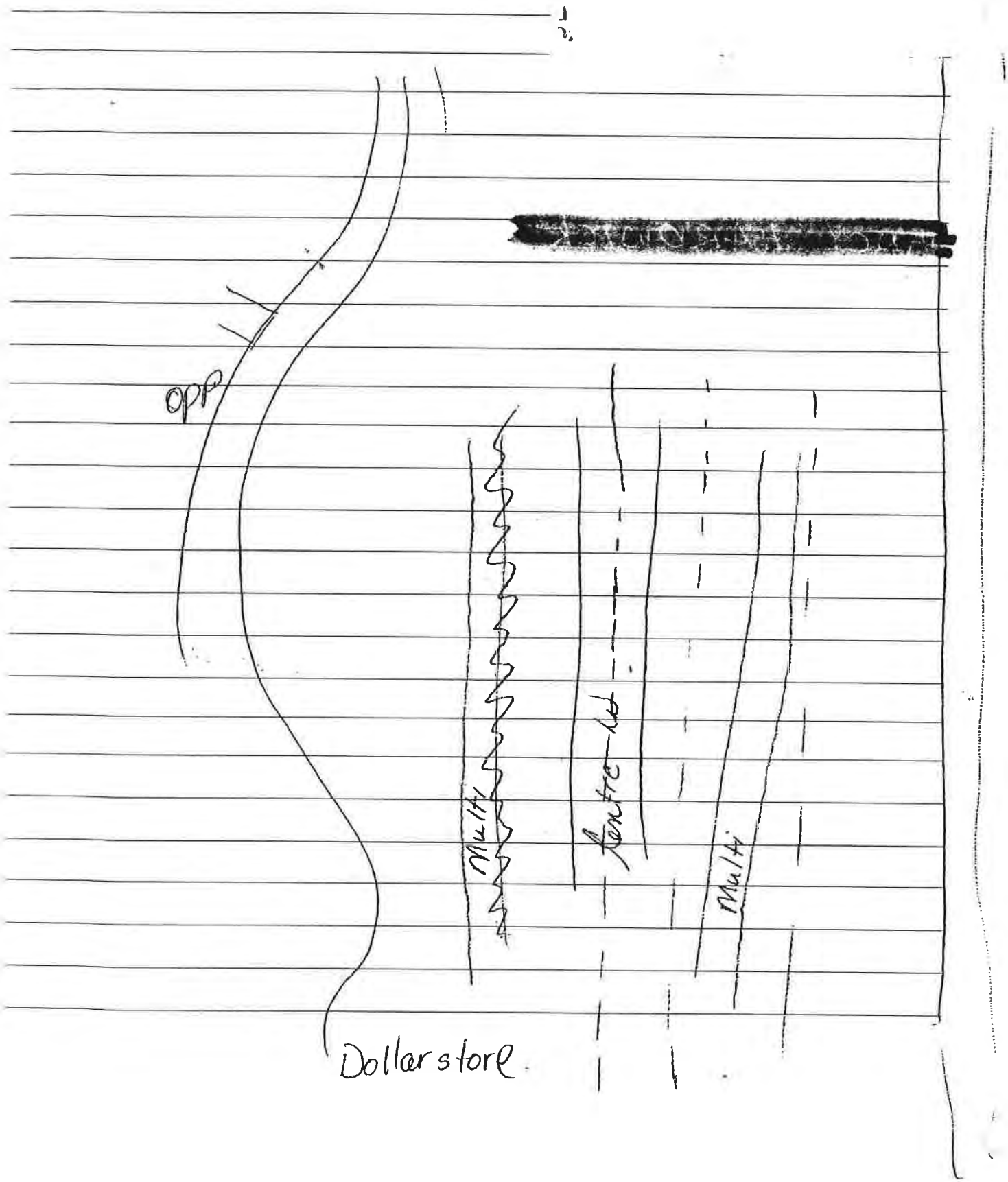
opp
Multi
Centre
Multi
Dollar store

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.): [redacted]

ADDRESS (Including Postal Code & Telephone Number):

1190 R.R. West. Mailing address: 29 Orkney Cres., TORONTO M9A 2T4 416 233-8272.

COMMENTS (Please use the back of this sheet if necessary)

Why not wait for completion of Bypass route and this will better determine the needs of River Rd. West. Definitely NOT in favour of 4 lanes on R.R.W.

I would refer not to choose any of the concepts but if I ~~have to~~ Had to, Concept #2.

Which design concept do you prefer? see above comments.

☐ Concept 1 ☑ Concept 2 * ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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A PUBLIC MEETING ON A SAT. BEFORE PART TIME RES LEAVE THE AREA IS REQUIRED TO HEAR & ANSWER THE CONCERNS OF RESIDENTS ON RRW.

[redacted]

LARRY SAID

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
10:00 a.m. to 12:00 p.m. – Wasaga Rec Plex

HEALTY COMMUNITY NETWORK

WEB SITE

COMMENT SHEET

WETLAND TECHNOLOGY

Please print all responses.

NAME OF RESPONDENT:

[redacted] (HCN)

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

OWNER + HCN - MEMBER

ADDRESS (Including Postal Code & Telephone Number):

88 MELROSE AVE - L9Z-2S8

705- 429- 7803

COMMENTS (Please use the back of this sheet if necessary)

C-6 - REVISED → ① M-U - BOTH N+S

- ② BOULEVARD - B N+S
- ③ CURB - N+S
- ④ 2 HOV LANES - EXTERIOR LANES
- ⑤ 2 SINGLE USE

EP. →

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☒ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☒ Yes ☐ No

Please submit this comment sheet by **Friday, July 9, 2010** to:

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Ainlye Assoc. Clearly has a bias here and obviously wants the job. To have the comments directed to Ainley is absurd as they will slant the comments and may even veto some comments.

[redacted]

Comments should have been sent to the Township.

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

Public Information Centre #3 – Saturday, June 26, 2010
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COMMENT SHEET

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, Property Owner, Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):

193 DYER DR WASAGA BEACH

COMMENTS (Please use the back of this sheet if necessary)

IN MY OPINION AND MANY OTHER THERE SHOULD BE A STOP TO TRUCK THRU TRAFFIC BY WAY OF WEIGHT WEIGHT RESTRICTION AND TIME OF DAY USE TO LOCAL DELIVERIES THUS ALLEVIATING A LOT OF NOISE. BYPASS WOULD ALLEVIATE A LOT OF PEOPLE USING OUR RESIDENTIAL STREET TO GET THRU TOWN TO OTHER DESTINATION. NO MORE THAN 2 LANES WITH CENTRE TURN LANE. 1 SIDWALK WITH BIKE LANE 4 LANES AND

Which design concept do you prefer?

☐ Concept 1 ☐ Concept 2 ☐ Concept 3 ☐ Concept 4 ☐ Concept 5 ☐ Concept 6

☐ Concept 7 ☐ Concept 8 ☐ Concept 9

Do you wish to be informed of the publication of the Notice of Study Completion?

☑ Yes ☐ No

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① MULT-USE – SELF EXPLAINED
– INCREASED SAFETY + ENCOURAGEMENT

② BOULEVARD – INCORPORATE ALL PLANT SYSTEMS USED FOR "WETLAND TECHNOLOGY" WHICH WOULD CLEAN POPULATED WATER FLOW FROM ASPHALTS
REDUCED COST OF STM.
(ASK SCOTT MARTIN + DAVE FEATHERSTONE)

③ CURB – TO INCREASE SAFETY TO ① or ② ++ HAVE WATER FLOW INTO ② AS A SYSTEM TREATMENT

④ 2 HOV LANES – USED FOR 2+ PASSENGER
– EMERGENCY + PUBLIC TRANSIT + TAXI SERVICE
– ACCOMATES TOURISM

⑤ SINGLE + TURN LANES – FOR THROUGH TO ACCOMADATE BUSINESS

FUNDS – GOES WITH – GROWTH PLAN
– GREEN STEP
– OP'S FED + PROV'S.

$ – CAN BE ACCESSED BECAUSE IT DOES!

THIS THEN WOULD ADDRESS ISSUES OF:
– WATER
– ACCESIBILITY
– TOURISM / ECONOMICS
– ACTIVE ALTERNATIVES
– EMERGENCY / SAFETY ROUTES.

OTHER FACITYES WILL END UP NEEDING NOISE BARRIERS WHICH GENERALLY OPEN UP OPPORTUNITYS FOR GRAFFITI ARTISTS WHICH WILL REQUIRE MAINTENACE FOR CLEANING RESULTING IN INCREASED COSTS TO "TAXPAYERS" THERE IS NOT ENOUGH FOOT AND BICYCLE TRAFFIC TO NEED ON BOTH SIDES

Date: May, 15, 2010 Collectors: [redacted]

1246 River Rd. W.· PH# 429-7087

Note: To the Readers.

This is the second part to the original petition we submitted on March,2,2010 and the first part as well. I was at the public meeting back in March and had asked our Mayor and Town Council if we could attach a second part to the Petition to show that the residents are against any four lane road configuration on River Rd. W. from Brillinger Dr. to Main St.

This was done on the basis that Ainley Consultants had said there was no real interest in this project at the Information Meeting. We feel the Petition speaks for itself. We are late in submitting it because there are still many residents that either are cottagers or away and who we still have not been able to contact about this subject. However, we feel it prudent at this time to turn in the petition.

The real contentious issue is the very real possibility of turning River Rd. W. into 4 lanes easily if the recommended configuration is put into effect. We understand it is the intention that this would not occur until 2026, but we fear good intentions sometimes go awry and could happen before that time. Even if this did not happen until 2026, we know a huge majority of the people living on River Rd. W. and streets backing onto River Rd. W. would not want 4 lanes even then. Amongst the many reasons why residents do not want 4 lanes is that the noise of cars and especially trucks can only be worse by then, and this is a "residential" street where peace and tranquility should be considered above all else. As it stands right now you can't open your windows (especially at night) on the River Rd. W. side because of the noise pollution from trucks and cars and sometimes police cars and ambulances. Vacationers come up to get away from the noise of trucks and cars. For some it's quieter to live in the City. Some who have built beautiful new homes said if they had known there was the possibility of 4 lanes they would not have built their homes.

We understand that unless you live on River Rd. W. this Petition will mean very little, but to the people who do it speaks volumes. We would like to ask members of Council and Public Works and Ainley Consultants how they would feel about the possibility of 4 lanes in front of their houses. We ask that you consider another 3-lane option with bike lanes and sidewalks that will not be turned into 4 lanes. We feel if the time comes when the traffic and population is such that a faster way of getting through town is warranted, that a bypass should be considered (Collingwood has Pretty River Parkway and 1st St. and now the new 26 Hwy. Realignment is underway).

Wasaga Beach is a wonderful place to live and vacation. We are blessed to have a beach and a community that is second to none and we have the friendliest and most genuine people living and vacationing here. All the people we talked to were so happy we were doing this Petition and thanked us sincerely for speaking for them. After the news article came out I was getting hugs at Probus meetings from members I hadn't even met yet, and "thumbs up" from people who lived on River Rd. W.

Having said all that, we would like to thank Mayor Patterson, Town Council and the Public Works Dept. for your fairness in allowing us to continue on with our Petition and for having another Public Information Meeting on June 26th , which was not originally scheduled and which is a Saturday, so working people and week-enders will be able to attend as well. Having lived in "The Beach" for three years now and getting to know so many wonderful people, we would not expect anything less than this very considerate act.

PETITION

Ainley consultant's River Rd. W. recommendation:

Change River Rd. W. from Brillinger Dr. to the eastern town limits from 2 lanes to 3 lanes, 2 bicycle paths, 2 sidewalks

I am a homeowner on River Rd. W. in Wasaga Beach and I oppose the Town's recommendation to change River Rd. W. from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road. This would the have the appearance of the Mosley St. expansion. We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

NAME	ADDRESS	PH#/ E-mail
	1230 River Rd W	
	12 Dyer Dr. W.B	
	16 Dyer Dr.	
	25 Lisbon Crt	
	25 Lisbon Crt.	
	86 Fairway Cres	
	18 Dyer Drive	
	18 Dyer Drive	
	20 Dyer Drive	
	26 Dyer Dr	
	26 Dyer Dr	
	28 Dyer Dr	
	32 Dyer Dr	
	32 Dyer Dr	
	30 Dyer Dr	

PETITION

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NAME	ADDRESS	PH#/ E-mail
	Cottage 1218 River Rd. W Home - 11 Obermeyer Dr - Kit.	barbobermeyer1@hotmail.com - 519-894-9926
	9212 RIVER RD WEST WB. L9Z 2W7	
	1272 RIVER RD. W.	
	1290 RIVER RD W	
	1826 RIVER RD W	
	2005 RIVER RD. W.	
	1174 R.R.W.	

PETITION

I am a homeowner on River Rd. W. in Wasaga Beach and I oppose the Town's recommendation to change River Rd. W. from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road. This would the have the appearance of the Mosley St. expansion. We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

NAME	ADDRESS	PH#/ E-mail
	1162 River Rd W	
	1388 River Road West	
	1420 River Road West	
	1434 River Rd. W.	
	1469 River Rd W	
	1415 River Rd W	
	1460 River Rd W	
	1466 River Rd. W	
	1770 River Rd W	
	1509 River Rd W	
	[redacted]	
	1796 River Rd W R	
	2 Brillinger Dr	
	2045 River Rd W.	
	2064 River Rd W.	
	1481 River Rd W	
	1481 River Rd W	

PETITION

I am a homeowner on River Rd. W. in Wasaga Beach and I oppose the Town's recommendation to change River Rd. W. from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road. This would the have the appearance of the Mosley St. expansion. We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

NAME	ADDRESS	PH#/ E-mail
	1519 River Rd W	
	1565 RIVER RD W	
	1568 River Rd. W.	
	1568 River Rd. W.	
	83 Edgewater Rd.	
	1586 River Rd W.	
	3 Caribbean Drive	
	3 Caribbean Drive	
	4 Antigua Drive	
	1805 RRW	
	1959 River Rd. West	frankenquevos @sympatico.ca
	1959 R.R West	"
	1993 R R West	
	1248 River Rd W.	
	95 EDGEWATER RD	
	1381 River Rd. W.	
	176 SILVER BIRCH	

PETITION

Ainley consultant's River Rd. W. recommendation:

Change River Rd. W. from Brillinger Dr. to the eastern town limits from 2 lanes to 3 lanes, 2 bicycle paths, 2 sidewalks

I am a homeowner on River Rd. W. in Wasaga Beach and I oppose the Town's recommendation to change River Rd. W. from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road. This would the have the appearance of the Mosley St. expansion. We are in favour of 3 lanes and 1 bike lane which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

NAME	ADDRESS	PH#/ E-mail
	1194 River Rd West.	
	1170 River Rd W.	
	1166 River Rd West	
	1166 River Rd W.	
	R4 DYER DR.	
	1122 River Rd W	
	1118 River Rd West.	
	1222 River Rd W	
	1369 River Rd W.	
	1387 River Rd W.	
	1395 River Rd. W.	
	1452 River Rd W	
	1443 River Rd W	
	1463 River Rd W	
	1490 River Rd W	

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NAME	ADDRESS	PH#/ E-mail
	1198 River Rd. W.	
	1154 River Rd. West	No 4 lanes wants status quo
	#1294 River River Road W	
	1/2 Coriban Tr	Wasaga Beach
	1294 River Road	
	1294 River Rd. W.	
	" "	"
	" "	"
	" "	"
	1375 River Rd.	
	1375 River Rd.	
	1399 " "	
	1399 " "	
	1456 " "	
	~~1467~~ " "	

it

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NAME	ADDRESS	PH#/ E-mail
	1687 River Rd West	705 352 1112
	1647 RIVER ROAD WEST	429-2935
	1679 River R.W.	794-7756
	1800 RIVER R.W.	429-6568
	1794	
	X 1814 River Rd. W. (Hand-over written)	
	1808 River Rd W	
	1840 River Rd. W.	mtyson@trebnet.com
	1844 River Rd. W.	
	1856 River Rd W.	705-429-4386
	1927 River Road West	
	2. Riverdale Dr.	429 7322
	1987 River Rd W	429-4113
	191 DYER DR	705-812-0581
	1250 River Rd. W.	

PETITION

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NAME	ADDRESS	PH#/ E-mail
	1559 River Rd west	705 730 0727
	1196 River Rd West	416 233 8272
	1560 " "	1705-429-6400
	71 Edgewater Dr.	429-0011
	1086 River Rd West	429-7368
	1598 RIVER RD WEST	429 6085
	1604 R.R.W	352-05-?.?
	1622 River Rd West	
	1660 River Rd.	
	10 Lauderdale Blvd	429-6067
	13 Oak Tree Crt.	
	11 Oak Tree Crt.	
	1639 River Road West	429-2621
	1785 River Road West	429 6017 443 1149
	1809 River Rd W	416-829-2598
	1831 River Rd West	
	1841 River Rd W	

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NAME	ADDRESS	PH#/ E-mail
	1877 River Rd West	
	1889 " " "	
	1902 " " "	
	1902 " "	
	1947 " " "	
	1966 " " "	
	1921 " " "	
	1933 R. RD. WEST	
	1994 " " "	
	1994 " " "	
	1994 RIVER RD WEST	
	1994 River Road West	
	1994 River Rd W	
	1994 River Rd W.	
	1994 River Rd. W.	

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NAME	ADDRESS	PH#/ E-mail
	905 River Rd west	
	1600 RIVER RD. W.	
	12 ANTIGUA DR.	
	1789 RIVER RD W	
	185 Dyer Drive	
	183 Dyer Drive	
	181 Dyer Drive	
	177 Dyer Dr.	
	175 Dyer Dr.	
	171 Dyer Dr	
	173 Dyer DR	
	1246 Mosley St. Apt. 3.b	
	815 River Road West	
	1354 R R WEST	
	1341 RR west	

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NAME	ADDRESS	PH#/ E-mail
	2019 River Rd west	
	2019 River Rd west.	
	2 Innisbrook Dr.	
	2030 River Rd west	
	2014 River Rd W.	
	2022 RIVER RD W	
	2026 RIVER RD W	
	187 Deer Dr.	
	1204 River Road West.	
	20 MULLIGAN LANE #12	
	40 Mulligan #304	

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NAME	ADDRESS	PH#/ E-mail
	1493 - River Rd West	
	1535 River Rd West	
	1670 River Rd. W.	
	1760 River Rd. W.	
	1793 " " "	
	1793 " " "	
	1996 River Rd	
	891 River Rd # 18	

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NAME	ADDRESS	PH#/ E-mail
	1927 River Road West	
	1927 River Rd W.	
	1921 River Rd W	422-1931
	1915 River Rd W	422-7181
	1915 River Rd. W.	422-7181
	1883 River Road West	429-9532
	1883 River Rd. West	429-9532
	1865 River Rd. West.	
	1865 River Rd West.	
	1859 River Rd W.	
	1859 W River Rd west	
	1853 River Rd West	
	1837 River Rd. W.	

NAME	ADDRESS
	1094 RIVER RD WEST
	1094 RIVER RD. WEST.
	1090 " " "
	1444 River Road West.
	1958 River Rd W.
	16 Fairway Cres
	~~1649 Prince~~
	24 FAIRWAY
	33 Fairway Cres
	33 Fairway Cres.
	28 Britton Crt
	52 Fairway Cres.
	1280 RIVER RD WEST
	1280 River Road West
	~~1254 River Rd W~~
	1254 River Rd W.
	~~1700 River Rd W.~~
	~~1700 River Rd W.~~
	34 Fairway
	34 Fairway

NAME	ADDRESS
	1150 River Rd W Wasaga Beach
	~~1142 River Rd W~~
	1142 River Rd. W.
	1130 River Rd. W
	1264 River Rd West.
	1268 RIVER RD WEST
	1304 River Rd W.
	~~1308 River Rd W~~
	1312 River Road West
	1312 River Rd West.
	1350 River Rd West
	1350 River Rd. West
	1376 R.R.W.
	1396 River Rd. W
	1358 River Rd W
	1402 River Rd W
	1442 River Rd W
	1416 River RR W
	1246 River Rd. W.

NAME [illegible]

ADDRESS

P4#

1234 River Rd W
1553 RRW
1561 RRW.
1569 RRW
1583 RRW
2005 RRW.
103 [illegible] Drive
232 [illegible]
71 Edgewater Rd
65 Forest Ave
53 Bush Cr

June 29, 2009 File No. 109049

[redacted]
28 Knox Road West
Wasaga Beach, Ontario
L9Z 2T7

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment

Dear Ms. [redacted]

Per your request, enclosed is the PIC #1 display board Plate 4.

Should you have any further questions or require additional information please do not hesitate to contact us.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Lilly Chen, P. Eng.
Senior Transportation Engineer
Encl.

cc: Kevin Lalonde, Acting Director of Public Works, Town of Wasaga Beach
Mike Neumann, Vice-President, Transportation Engineering, Ainley Group

T:\109049\109049-Lilly\Correspondence\Letter\Response Letters\[redacted]letter June 29 2010.doc

Lilly Chen

From: Mike Neumann [neumann@ainleygroup.com]
Sent: June 4, 2010 5:33 PM
To: [redacted]
Cc: Kevin Lalonde; Jim McIntosh; Lilly Chen
Subject: RE: River Road West Urbanization

Hi [redacted]

This River Road West EA actually begins east of Oxbox and extends to the east Town limits.

We completed another EA (schedule C) a couple of years ago for the Schoonertown Bridge. The limits of that project include this intersection. The project has now proceeded to detail design and we are expecting to tender the contract this year. It includes widening the bridge over the Nottawasaga River to 4 lanes and will involve reconstructing the intersection of Oxbow including providing traffic signals.

The current EA for which you may have received a notice, includes options to continue with the 4 lane widening or 3 lane widening as alternative design options (there are also some other options that were reviewed). The public meeting planned for June 26 is the third public meeting for the study.

I trust this provides the answers to the questions that you have. If you should have any other questions, please do not hesitate to contact me.

Regards,

Mike Neumann, P.Eng
Vice-President, Transportation Engineering

Ainley Group
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5

neumann@ainleygroup.com
phone (705) 445-3451 ext.145
fax (705) 445-0968
cell (705) 443-1721
www.ainleygroup.com

-----Original Message-----
From: [redacted] [mailto:[redacted]s@IBIGroup.com]
Sent: June 4, 2010 3:14 PM
To: neumann@ainleygroup.com
Subject: River Road West Urbanization

Mike:

Please provide me with information on the project. I am interested in the proposed cross sections and

their limits as I have a property on Oxbow Park Drive.

Is the study also looking at sight lines at existing intersecting streets.

Has any work been done on the Oxbow Park/ River Road intertesection?

Thanks

[redacted] P. Eng.
Senior Project Manager

IBI Group
30 International Boulevard
Toronto ON M9W 5P3 Canada

tel 416 679 1930
fax 416 675 4620
cell 416 357 6756
email Imants.Hausmanis@IBIGroup.com
web http://www.ibigroup.com

Lilly Chen

From: Lilly Chen [chen@ainleygroup.com]
Sent: June 10, 2010 5:30 PM
To: 'neumann@ainleygroup.com'
Subject: RE: RR West EA Inquiry

Hi Mike,

I have called [redacted]

She prefers "do nothing" and asked why "do nothing" option is not on the notice. I told her that we have looked at that option in the first PIC on October 29, 2009 along with other options.

She signed the petition, but she said sidewalk is not needed because she had hardly seen anybody walking on RRW. I said some people want active transportation, if sidewalks are built, there may be people walking on them.

She did not think the level of growth would warrant a widening of the road. I asked her to come to the June 26th PIC to look at the development growth in the area and the traffic analysis.

She asked what if someone had built something on the road right-of-way when the road is widened. I said probably it will have to be removed.

She also said traffic is not a problem. I said even if traffic is not a problem, drainage issues need to be addressed. She responded that drainage is not a problem on her side of the road (near the River).

She would like to know the timing of construction on her section of the road (near the School). I said I did not know the exact timing, but probably not in the next 3 years and the section of Oxbow Park to Powerline will be built first.

She had a concern about people speeding on the road and delivery trucks in the morning.

I thanked her comments and told her that I will bring all the information to the PIC.

Regards,

Lilly

-----Original Message-----
From: neumann@ainleygroup.com [mailto:neumann@ainleygroup.com]
Sent: June 10, 2010 3:19 PM
To: Lilly Chen
Subject: RR West EA Inquiry

Hi Lilly

Received a call from a [redacted] (1120 RRWest) yesterday. She has apparently just moved from TO. She would like to be placed on the mailing list. Her number is 429-7933. She had some questions. Can you please give her a call since I am still in the hearing.

Thanks
Sent wirelessly from my BlackBerry device on the Bell network. Envoyé sans fil par mon terminal mobile BlackBerry sur le réseau de Bell.

L. Chew

Ainley GROUP CONSULTING ENGINEERS PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, Ontario L9Y 4J5
Tel: (705) 445-3451 • Fax: (705) 445-0968
E-mail: collingwood@ainleygroup.com

August 3, 2010

File No. 109049

This letter sent to the attached list.

COPY

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment

Dear Resident:

As Project Managers for the River Road West Class Environmental Assessment (EA), we are responding to your comments regarding the alternative design concepts provided in the Public Information Centre dated June 26, 2010. Given the number of persons' comments/letters (74) we received, we have included your response with the general response to most comments provided by the public in this letter. We believe that you would be interested in the response offered to other members of the public. Included below is a summary of the comments and our response:

1. Comment/Concern:
I do not want to see 4 lanes of traffic, not now, not in the future. The 4 lanes will make it impossible to exit our driveway.

1. Answer/Response:
A 3 lane cross-section on River Road West is recommended before 2026 given the high density of driveways along the road. However, to accommodate future increased traffic volumes and future public transportation (bus lanes/bays), 4 lanes will be needed in 2026 and beyond. It is noted that costs will be much higher ($11 to $14 million more) if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated. It is also noted that even if a by-pass is built to divert some of the traffic volumes away from River Road West and 3 lanes are sufficient in 2026 and beyond, some asphalt platform widening may be needed to accommodate future bus lane/bay areas.

Future growth was projected based on new developments in the area of River Road West and general growth in the Town of Wasaga Beach (i.e. population growth and development growth in other areas of the Town). As people have to use River Road West to access the Town's municipal office, the library, the beach areas, the community recreation centre, and Wal-Mart, etc., it is inevitable that more traffic will be on River Road West in the future.

Should the road be remarked to have 4 lanes in the future, slightly longer delays will occur for vehicles exiting from minor side streets and driveways turning onto River Road West. However, the traffic volumes on most of these driveways are relatively light, such as 1 or 2 trips per day, the expected delays should be in an acceptable range. Peak hour volumes on most of the unsignalized side streets are in the order of 2 to 65 vehicles in 2026, although, operational details at these locations should be reviewed before 2026, significantly high delays are not expected.

2. Comment/Concern:
Do the 4 lanes now – good for 25/30 years. Very happy with present 4 lanes on Mosley Street and 45th Street.

2. Answer/Response:
To facilitate bicycle traffic and to provide bike lanes, the Town would prefer to implement these aspects as outlined in the Active Transportation plan for the section of River Road West from Brilliger Drive to Main Street until traffic volumes warrant a 4 lane road, given that the potential construction phasing are within the next 5 years.

Depending on the future traffic volumes, for the section of River Road West from Bell's Park Road to the eastern Town limits, 4 lanes may be constructed without repainting a 3 lane scenario given that the potential construction phasing for this section of the road is 2023 – 2024.

3. Comment/Concern:
Pedestrian traffic is almost not existent. Bike lanes are not necessary – not enough traffic.

3. Answer/Response:
Traffic counts conducted in July 2009 indicated that pedestrian volumes along the section of River Road West are in the range of 0 to 26 persons per hour during the peak hours with the highest near Oxbow Park Road and the lowest at Bell's Park Road. Although, pedestrian traffic is considered light, sidewalks are recommended on both sides of the road to accommodate pedestrian traffic for safety purposes. In the future, there may be more pedestrian traffic as we promote active transportation and potentially reduce the use of automobiles.

Similarly, bike lanes are suggested to provide an alternative mode of transportation other than the automobile.

4. Comment/Concern:
I don't think we need any multi-use paths. Bike path should be on the road side, not the sidewalk. We need to separate pedestrians from bikes.

4. Answer:
Given the limited right-of-way (20 m) on the section of River Road West from Brillinger Drive to Main Street, only sidewalks can be accommodated with on-street bike lanes limited to a 3 lane scenario. For the section of River Road West from Zoo Park Road to the eastern Town limits, the road right-of-ways are wider (in the range of 30 to 60 m). Thus, multi-use paths are suggested to facilitate both pedestrian and bicycle traffic. The 3.0 m in width multi-use path was selected in accordance with the Transportation Association of Canada *Geometric Design Guide for Canadian Roads*.

5. Comment/Concern:
There should be a by-law restriction regarding heavy loads, trucks etc.

5. Answer:
The Town's current ATR (Automatic Traffic Recording) count data indicates that truck volumes on the section of River Road West between Brilliger Drive and Powerline Road are in the order of 3 trucks per hour during the period of 10:00 pm to 6:00 am. As a result, night time truck volumes are not considered high. The Town has considered restricting truck traffic on the road during the period of 10:00 pm to 6:00 am through by-laws. However, such by-law would be difficult to enforce. The Town plans to initiate discussions with the Simcoe County early for future alternate route options.

6. Comment/Concern:
What plans in the use of buffers or for privacy are being developed to deal with noise and vibration issues? Noise measurements were taken in September 2009 – a low traffic noise month – try June/July on a sunny weekend.

6. Answer:
J.E. Coulter Associates Limited, an acoustics and vibration consulting engineering diagnostics and design company, conducted a Class Environmental Noise Impact Assessment for the project. The report concluded that the net increase in the sound levels will be approximately 2dB from Oxbow Park Drive to the eastern Town limits. The report states that the potential increment in sound levels attributable to implementation of the project is insignificant, and mitigative measures (i.e. acoustic barriers) are not required to satisfy MTO/MOE protocol as the implementation of the project does not increase the sound level by 5dB or more.

The report was dated September 2009. However, the analysis was based on the AADT (Annual Average Daily Traffic) data. The AADT data provided to J.E. Coulter was higher than the actual AADT data as at that time recent traffic count data was not available. Thus, the actual noise impacts are less and the analysis presents the results of the highest possible impact.

For construction vibration, the report indicated that there are no sections of this roadway construction that will require vibratory compaction or piling.

Most of the vibration caused by driving trucks will be absolved by the pavement structure. The rest of the vibration is expected to be in an acceptable range as those on other arterial roads in the Town of Wasaga Beach.

7. Comment/Concern:
I don't understand why we can't have a by-pass around Town or a continuation of the Highway 26 re-alignment.

7. Answer:
The Town's 2010 traffic infiltration study indicates that the percents of total by-pass volumes are in the order of 5% to 9%, whereas the percents of truck by-pass volumes are in the range of 7% – 9%. Based on a review of by-pass route warrants in other municipalities, the percents of total by-pass volumes are in the range of 30% to 50% and the percents of truck by-pass volumes are in the order of 50% to 60% when these options are implemented to address traffic congestion problems. As such, the current percents of by-pass volumes on the east-west route do not warrant a by-pass. Based on the percent of truck by-pass growth rate of 0.685% per year from 2008 to 2010 (more critical than the percent of total by-pass growth rate), the percent of truck by-pass volumes will warrant a by-pass in approximately 70 years.

It is noted that Simcoe County's alternate east/west corridor through the Georgian Triangle will be built in the next 20 years. The Town may be able to divert some of the by-pass traffic to this corridor which connects with the Highway 26 re-alignment.

8. Comment/Concern:
Canada Post mail boxes are located on the opposite side of the road and will be difficult and unsafe to access when crossing 3 or 4 lanes of traffic.

8. Answer:
The Town will work with Canada Post at the detail design stage and would prefer to relocate mail boxes to the same side as the houses are located, so that residents can walk to access their mail boxes without crossing the road.

In addition to the above information, several written responses did include a preference to which concepts should be selected. Included below, we provide a table outlining a summary of the preferred choices:

Concepts	Number of Persons/Letters
No concepts	10
Concept 1 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 2 bike lanes	20
Concept 2 – 3 lanes (1 lane in each direction plus a centre turn lane) with 1 sidewalk and 1 multi use path	11
Concept 3 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 multi use paths	7
Concept 4 – 4 lanes (2 lane in each direction painted and used as 3 lanes up to 2026) with 1 sidewalk and 1 multi use path	4
Concept 6 – 4 lanes (2 lanes in each direction, painted and used as 3 lanes up to 2026) with 2 multi use paths and 2 boulevards	7
Concept 7 – 3 lanes (1 lane in each direction plus a centre turn lane) with 2 sidewalks and 1 bike lane	4
Concept 8 – 4 lanes (2 lane in each direction painted and used as 3 lanes up to 2026) with 2 sidewalks	2
Concept 9 – 4 lanes (2 lane in each direction painted and used as 3 lanes up to 2026) with 2 sidewalks and 1 bike lane	1
Concepts 1 and 6	1
Concepts 1 and 7	2
Concepts 1 and 9	1
Concepts 3 and 7	1
4 lanes	2
Flexibility	1
Total	74

We wish to thank you for your interest in this Class EA and we encourage you to continue to provide comments as the planning proceeds. We are continuing to document the Class EA planning process to address road capacity, pedestrian safety, drainage, and pavement structure deficiency issues and to incorporate Active Transportation. As the EA continues for the area of River Road West from Brillinger Drive to the easterly Town limits, we will include you on our contact list to keep you informed as the study proceeds.

Should you have any questions regarding this letter, please send them to the undersigned by August 24, 2010.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Kevin Lalonde, Acting Director of Public Works, Town of Wasaga Beach

Lilly Chen, Senior Transportation Engineer, Ainley Group

S:\1109049\Correspondence\Letter\PIC 3 response letter August 3 2010.doc

Lilly Chen

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, Ontario L9Y 4J5
Tel: (705) 445-3451 • Fax: (705) 445-0968
E-mail: collingwood@ainleygroup.com

August 3, 2010

File No. 109049

COPY

This letter sent to the attached list.

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment

Dear Resident:

As Project Managers for the River Road West Class Environmental Assessment (EA), we are responding to your petition regarding the recommended design concepts provided in the Public Information Centres dated February 18, 2010 and June 26, 2010. Included below is a summary of the petition comments and our response:

1. Comment/Concern:
I am a homeowner on River Road West and I oppose the Town's recommendation to change River Road West from 2 lanes to 3 lanes because of the possibility of changing to 4 lanes with removal of the 2 bike lanes in the future to accommodate the 4-lane road.

1. Answer/Response:
We understand your concern. Based on the traffic analysis for the section of River Road West, 3 lanes would be sufficient to accommodate future traffic volumes before 2026, 4 lanes will be needed in 2026 and beyond. Although building a by-pass or utilizing a by-pass corridor to be created by the County of Simcoe may divert some traffic volumes away from River Road West, thereby, not requiring changing the road to 4 lanes and removing the bike lanes, increases in peak hour development traffic volumes are expected to be in the order of 2200 vehicles (including both inbound and outbound trips) in the area in the next 20 years. These traffic volumes can not be accommodated through a by-pass. In addition, 4 lanes may be needed to accommodate future bus lane/bay areas.

It is noted that costs will be much higher ($11 to $14 million more) if the road needs to be reconstructed later from 3 lanes to 4 lanes given that all the utilities will have to be relocated.

In addition, it is identified in the Town's Official Plan that River Road West from Mosley Street to Main Street is an arterial road whereas Mosley Street from River Road West to Main Street is a collector road. The Town's Official Plan has the following policies for arterial roads:

"Section 16.2.8.1. Arterial roads should be designed primarily to facilitate traffic movements between major land use activity areas in the Town.
Section 16.2.8.2. In maintaining the traffic carrying function of arterial roads, the following policies shall apply:

a) The appropriate rights-of-way shall be provided which will facilitate the future provision of public transportation;

a) The appropriate rights-of-way shall be provided which will facilitate the future provision of public transportation;

b) Appropriate rights-of-way shall be provided for full channelization of arterial intersections;

c) Frontage, land use, entrances, exits, and curb use shall be controlled;

d) In existing built-up areas, remedial approaches to minimize the number of intersections with arterial roads shall be investigated."

2. Comment/Concern:
We are in favour of 3 lanes and 1 bike lane, which would allow enough room for either 1 or 2 sidewalks to create a safe zone for pedestrians.

2. Answer/Response:
1 bike lane allows only one-way bicycle traffic on it. For the bicyclists returning or traveling from another direction, they will have to use other routes or be forced to pass each other by moving into the traffic lanes. The 1.8 m sidewalk is not wide enough for a bicyclist to walk with his/her bike when combined with other pedestrian traffic. Thus, for safety reasons, a single one-way bike lane is not recommended.

Sidewalks or multi-use paths have to be provided on both sides of the road to facilitate pedestrians. Given the traffic volumes on the road, pedestrians should only cross the road at a signalized intersection under a protected pedestrian signal phase.

We wish to thank you for your interest in this Class EA and we encourage you to continue to provide comments as the planning proceeds. We are continuing to document the Class EA planning process to address road capacity, pedestrian safety, drainage, and pavement structure deficiency issues and to incorporate Active Transportation. As the EA continues for the area of River Road West from Brillinger Drive to the easterly Town limits, we will include you on our contact list to keep you informed as the study proceeds.

Should you have any questions regarding this letter, please send them to the undersigned by August 24, 2010.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Kevin Lalonde, Acting Director of Public Works, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group

S:\109049\Correspondence\Letter\Petition response letter August 3 2010.doc

THE TOWN OF WASAGA BEACH

RIVER ROAD WEST FROM BRILLINGER DRIVE TO EASTERLY TOWN LIMITS CLASS ENVIRONMENTAL ASSESSMENT

TO	SEEN
MN	MN
LLC	

RECEIVED
MAY 3 1 2010
AINLEY & ASSOC. LTD.

Public Information Centre – Thursday, October 29, 2009
7:00 p.m. to 9:00 p.m. – Wasaga Rec Plex

COMMENT SHEET

FILE NO. 109049

Please print all responses.

NAME OF RESPONDENT: [redacted]

REPRESENTING (Agency, Municipality, (Property Owner), Tenant, etc.):

ADDRESS (Including Postal Code & Telephone Number):
2045 RIVER ROAD WEST
WASAGA BEACH 905 607-2341
(MISSISSAUGA E)

COMMENTS (Please use the back of this sheet if necessary)

MY PROPERTY IS ONLY 15 FEET FROM THE EXISTING BIKE LANE. I UNDERSTAND THE NEED FOR AN ADDITIONAL LANE, BUT FOR ME THE RESULT IS A VIRTUALLY UNINHABITABLE HOME. THE PROPERTY IS AN INVESTMENT.

Which option do you prefer?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4 ☐ Option 5

Do you wish to be informed of the publication of the Notice of Study Completion?

☐ Yes ☐ No

DUE TO THE FACT THERE WON'T BE ENOUGH ROOM TO PARK A VEHICLE + THE HOUSE WILL BE ABOUT 10 FEET FROM A HIGH TRAFFIC ROAD. I WOULD LIKE THE TOWN TO LOOK AT PURCHASE

Please submit this comment sheet by **Friday, November 13, 2009** to:

Mike Neumann, P. Eng.
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood ON
L9Y 4J5

Tel: (705) 445-3451 Ext. 145
Fax: (705) 445-0968

E-mail: neumann@ainleygroup.com

THE PROPERTY. IT IS CURRENTLY FOR SALE AT $131,900

I WOULD BE AMMENABLE TO AN OFFER AT THE MARKET VALUE.

I'M AWAY THE WEEK OF THE JUNE 8 PUBLIC INFO MEETING, BUT I'VE SPOKEN TO THE PUBLIC WORKS DEPARTMENT AND WAS GIVEN THIS FORM TO GET ON RECORD AND HOPEFULLY COME TO A VIABLE CONCLUSION.

THANK YOU
JEFF PRICE

E-MAIL JTPRICE@ROGERS.COM

Ainley GROUP CONSULTING ENGINEERS PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

"By E-mail"

August 10, 2010 File No. 109049

[redacted]
4457 Marshdale Court
Missisauga, Ontario
L5N 4G2

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment
2045 River Road West

Dear Mr. [redacted]

As Project Managers for the River Road West Class Environmental Assessment (EA), and further to your conversation with Mr. Lalonde of the Town of Wasaga Beach, your conversation with the undersigned, and Mr. Lalonde's response email dated July 23, 2010, we are responding to your comments received on May 31, 2010 (copy attached). We have responded to your comments in the order presented in the comment sheet that you filled.

1. Your home was built on your property very close to the road right-of-way with minimal set back. Should design concept 1 be selected in the area, your property will be approximately 0.8m to 1.75m closer to a vehicle travel lane. Based on our review, we notice that you are using the existing shoulder area within the existing right-of-way to park your vehicles. In order to provide bike lanes and sidewalks, on-street parking will not likely be possible in the future. You will be contacted during the detail design stage to discuss parking and utilization of the property. Please note that detail design will not be initiated until (at the earliest) next year.

2. As noted in Mr. Lalonde's email noted above, the Town is not considering any property purchase at this time. At this stage of the Municipal Class Environmental Assessment Planning and Design Process, the Town is working on the selection of the preferred alternative design concept for the area of River Road West from Brillinger Drive to the eastern Town limits. Eliminating the purchase of private properties is one of the criteria used in the evaluation of alternative designs. The preferred design will be within the existing right-of-way limits, and thus will not likely require additional right-of-way for construction. Please note that property is typically purchased when work extends beyond the existing right-of-way limits.

We wish to thank you for your interest in this Class EA and we encourage you to provide

comment as the planning proceeds. We are continuing to document the Class EA planning process to address road capacity, pedestrian safety, drainage and pavement structure deficiencies issues and to incorporate Active Transportation into the plan for the area of River Road West from Brillinger Drive to the easterly Town limits on behalf of the Town of Wasaga Beach and will include you on our contact list to keep you informed as the study proceeds.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Kevin Lalonde, Acting Director of Public Works, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group
T:\109049\109049-Lilly\Correspondence\Letter\Response Letters\Jeff Price Letter August 3 2010.doc

-----Original Message-----
From: [mailto: @rogers.com]
Sent: August 26, 2010 6:35 PM
To: collingwood@ainleygroup.com
Subject: River Road Assessment

To whom it may concern:
Hello
I am a resident as well as a business owner in Wasaga Beach on River Road. As we were out of Town during your recent meeting we decided we did want to give out opinion for the counting as well. as we have friends that attended the meeting and received a letter in response to the meeting and we had a chance to read it thought we'd share our concerns as well.
We are located at 563 River road W across from the chamber of commerce.
We own the building and reside in the house attached in the back
WE also operate The Cutting Edge hairstyling and Day Spa and lease the space next door Arlene ladies clothing.
Back in June when we read of the possible expansion I took it upon myself for 1 week to poll our client to see how important sidewalks were to them past Zoo park road up to the arena.We received 60 signatures in that short of time.
Too me having the bus service has increased our traffic as teenagers and all who do not drive can get here even for hockey practice at the arena! Awesome. But the complaint is the lack of sidewalks and the dirt and muck people have to cross in to come in.
We feel very strongly that if we can have bus service to this end we may have sidewalks too. We have a large senior resident base moving to Marlwood, The new England estates, country life and there is lots of land just waiting to be developed as shopping and such right across the street from us.
So I write this a as concerned resident and business owner looking out for our residents who speak to us everyday in our salon and spa. You'd be amazed the polls we could take...
Anyhow thanks for reading our opinion and hope it helps.
And FYI I see many cyclists and runners also using this end so at least one bike lane would be appreciated for them as well.
Sincerely
The Cutting edge Hairstyling and Day Spa

Ainley GROUP CONSULTING ENGINEERS PLANNERS

Ainley & Associates Limited
280 Pretty River Parkway, Collingwood, ON L9Y4J5
Tel: (705) 445-3451 - Fax: (705) 445-0968
Email: collingwood@ainleygroup.com

"By E-mail"

September 27, 2010 File No. 109049

563 River Road West, Unit 1
Wasaga Beach, Ontario
L9Z 1S6

Ref: **Town of Wasaga Beach**
River Road West Class Environmental Assessment

Dear Ms. :

As Project Managers for the River Road West Class Environmental Assessment (EA), we are responding to your comments dated August 26, 2010 (copy attached). We have responded to your comments in the order presented in your email.

1. Thank you for your voluntarily collecting signatures from your clients in June regarding the importance of sidewalks on River Road West from Zoo Park Road to the arena and letting us know the results. Based on your results, most of your clients preferred sidewalks on the section of River Road West. The preferred design selected by the Town for the section of River Road West from Zoo Park Road to the eastern Town limits includes a 3.0 m multi-use path on each side of the road to accommodate future pedestrian and bicycle traffic.

2. You pointed out that there is currently bus service on River Road West in the area, thus sidewalks should be provided to accommodate pedestrians to walk to and from the bus stops and that due to the number and size of developments in your area, future senior population or population in general will increase thus sidewalks are required to accommodate the increased pedestrian traffic. We agree with you and sidewalks are recommended.

3. You saw many cyclists and runners using this section of River Road West, and preferred at least one bike lane. As noted above, two 3.0 m in width multi-use paths will be provided on the section of the road from Zoo Park Road to the eastern Town limits to accommodate pedestrian and bicycle traffic.

We wish to thank you for your interest in this Class EA and providing your comments. We are completing the Environmental Study Report on behalf of the Town of Wasaga Beach. We are

documenting the Class EA planning process and addressing road capacity, pedestrian safety, drainage and pavement structure deficiencies issues and incorporating Active Transportation into the plan for the area of River Road West from Brillinger Drive to the easterly Town limits. We will include you on our contact list and will notify you when the study is completed.

Yours truly,

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering

cc: Kevin Lalonde, Acting Director of Public Works, Town of Wasaga Beach
Lilly Chen, Senior Transportation Engineer, Ainley Group

T:\109049\109049-Lilly\Correspondence\Letter\Response Letters\ Letter September 27 2010.doc

APPENDIX T

Phase 3 Preferred Design Drawing

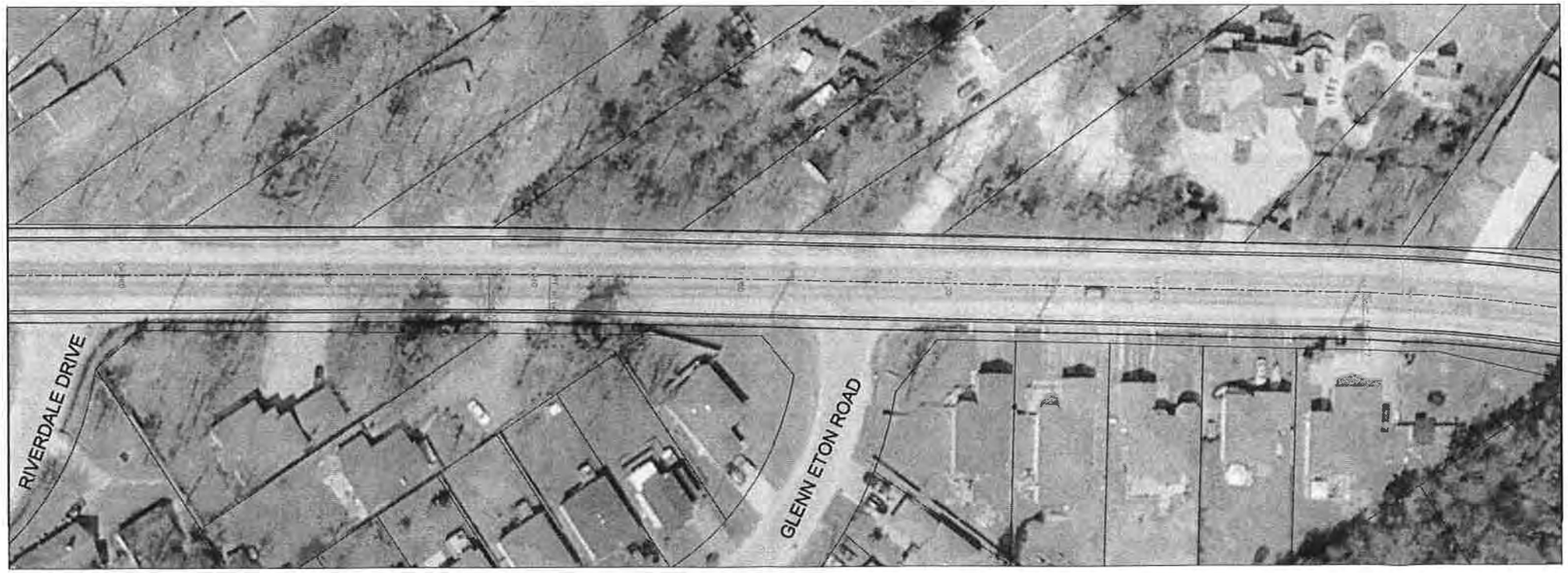
RIVER ROAD WEST

STA. 0+640

STA. 0+940

MATCH LINE

STA. 0+940



STA. 1+240

MATCH LINE

PLOT 1:1

LEGEND

CONTRACT DRAWINGS:
Contractor must verify all dimensions and be responsible for same. Any discrepancies must be reported to the Engineer before commencing work. Drawings are not to be scaled.

NO.	REVISIONS	DATE	INITIAL

Not Valid Unless Signed And Dated

PRELIMINARY

SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 0+640 TO STA. 1+240

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC1

PLOT 1=1

LEGEND

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DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 1+240 TO STA. 1+840

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC2

RIVER ROAD WEST

PLOT 1:1

LEGEND

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DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 1+840 TO STA. 2+440

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC3

RIVER ROAD WEST

STA. 2+440

PAULINE DRIVE

STA. 2+740

MATCH LINE

CARIBBEAN DRIVE

INDIANOLA DRIVE

MATCH LINE

STA. 2+740

OCALA DRIVE

STA. 3+040

MATCH LINE

OAK DELL AVENUE

SILVER BIRCH AVENUE

MATCH LINE

PLOT 1=1

LEGEND

CONTRACT DRAWINGS:
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NO.	REVISIONS	DATE	INITIAL

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PRELIMINARY

SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 2+440 TO STA. 3+040

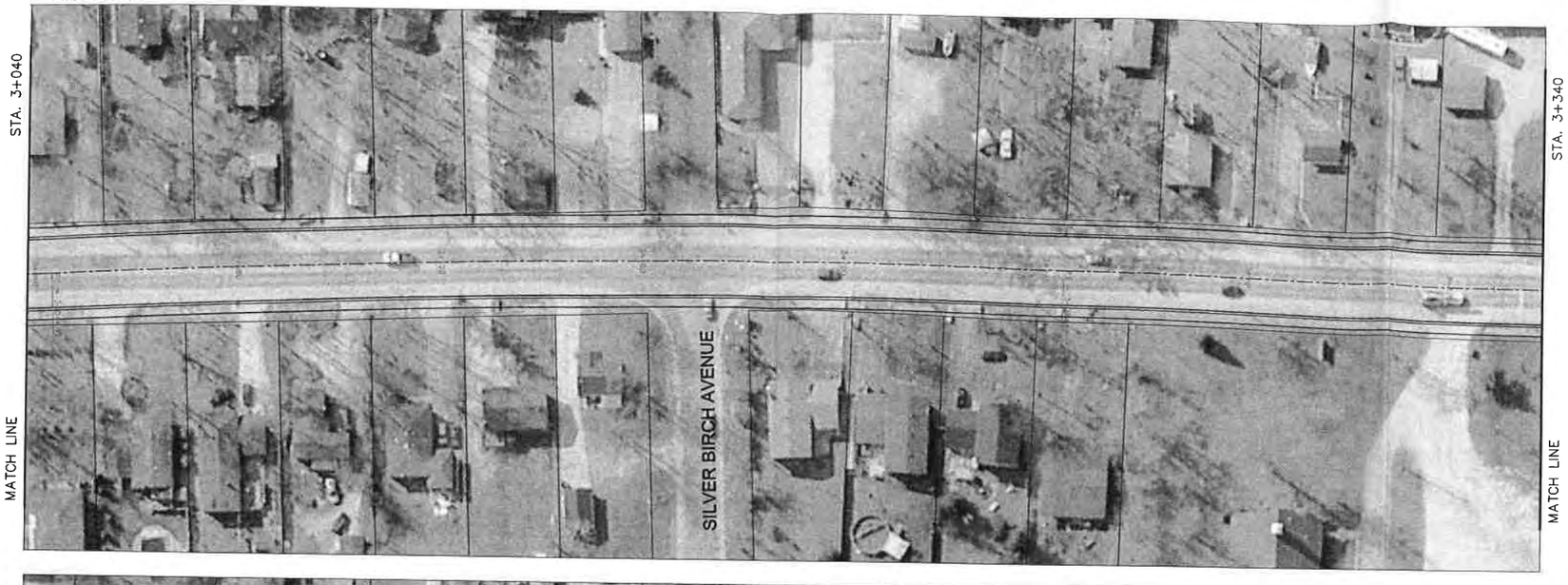
Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC4

RIVER ROAD WEST

STA. 3+040

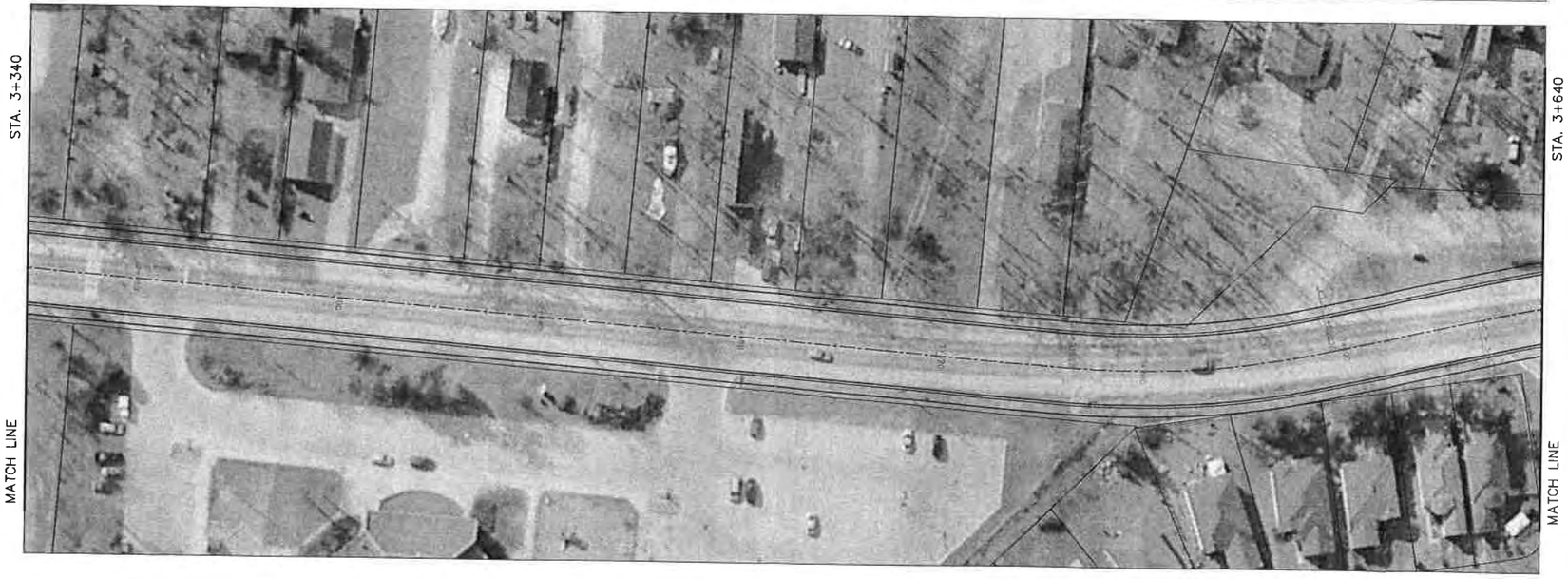


STA. 3+340

MATCH LINE

MATCH LINE

STA. 3+340



STA. 3+640

MATCH LINE

MATCH LINE

PLOT Ask

LEGEND

CONTRACT DRAWINGS
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DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 3+040 TO STA. 3+640

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC5

RIVER ROAD WEST

STA. 3+640

MATCH LINE

O'DELL GATE

STA. 3+940

MATCH LINE

STA. 3+940

MATCH LINE

STA. 4+240

MATCH LINE

PLOT 1:1

LEGEND

CONTRACT DRAWINGS:
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SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 3+640 TO STA. 4+240

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC6

RIVER ROAD WEST

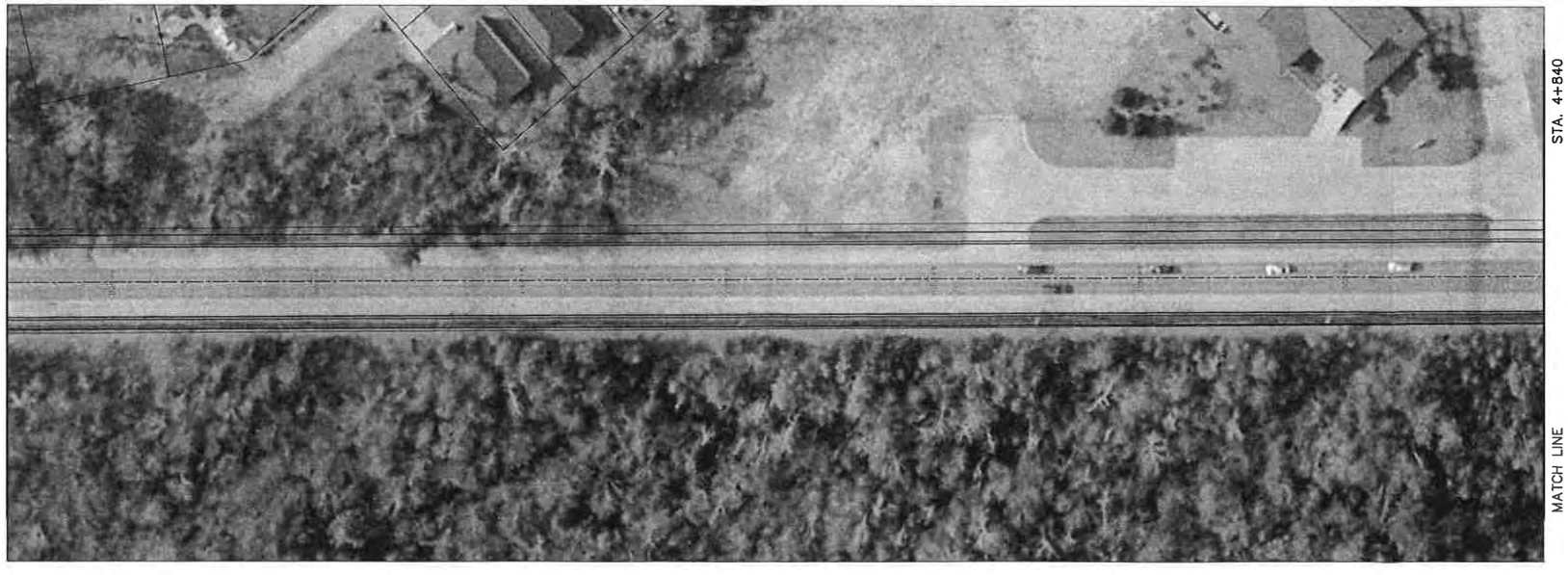
STA. 4+240

STA. 4+540

MATCH LINE

MATCH LINE

STA. 4+540



STA. 4+840

MATCH LINE

MATCH LINE

PLOT 1=1

LEGEND

CONTRACT DRAWING:
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DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 4+240 TO STA. 4+840

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC7

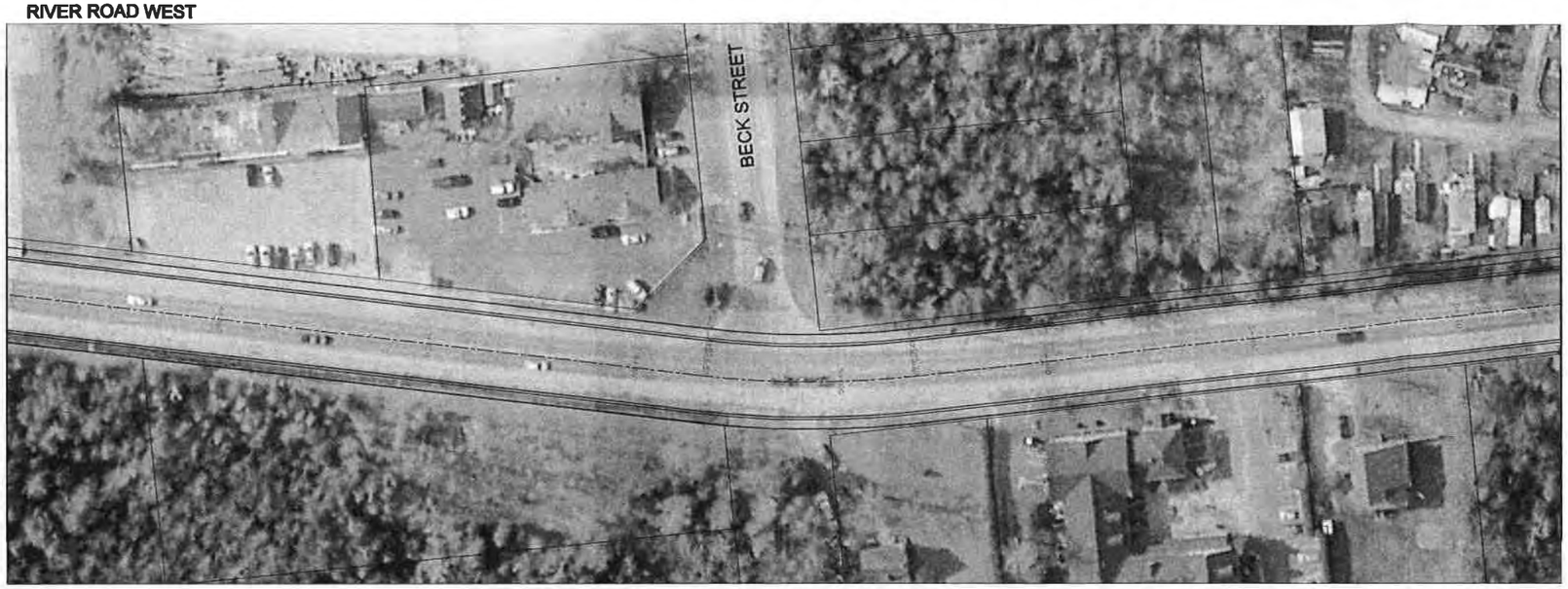
RIVER ROAD WEST

STA. 4+840

BECK STREET

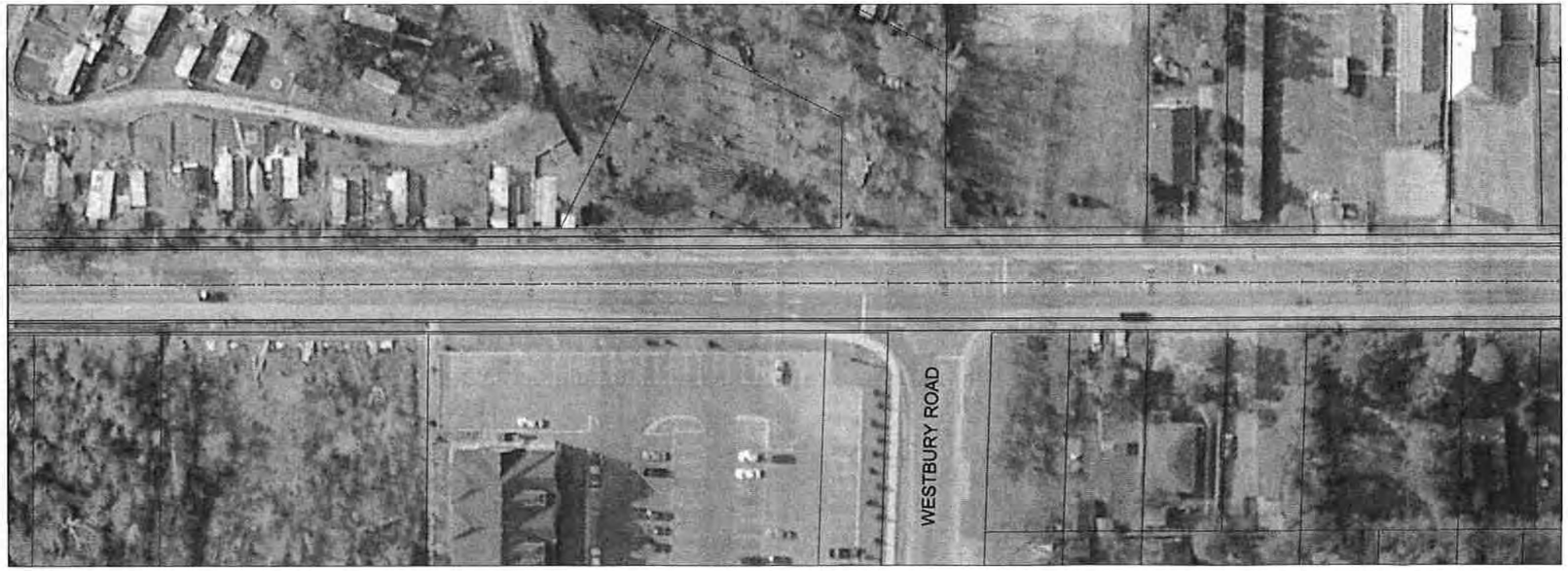
STA. 5+140

MATCH LINE



MATCH LINE

STA. 5+140



STA. 5+440

MATCH LINE

PLOT 1=1

LEGEND

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SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 4+840 TO STA. 5+440

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No. | DWG. 109049-RC8

PLOT 1=1

LEGEND

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NO.	REVISIONS	DATE	INITIAL

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SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 5+440 TO STA. 6+040

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No. | DWG. 109049-RC9

RIVER ROAD WEST

STA. 6+040

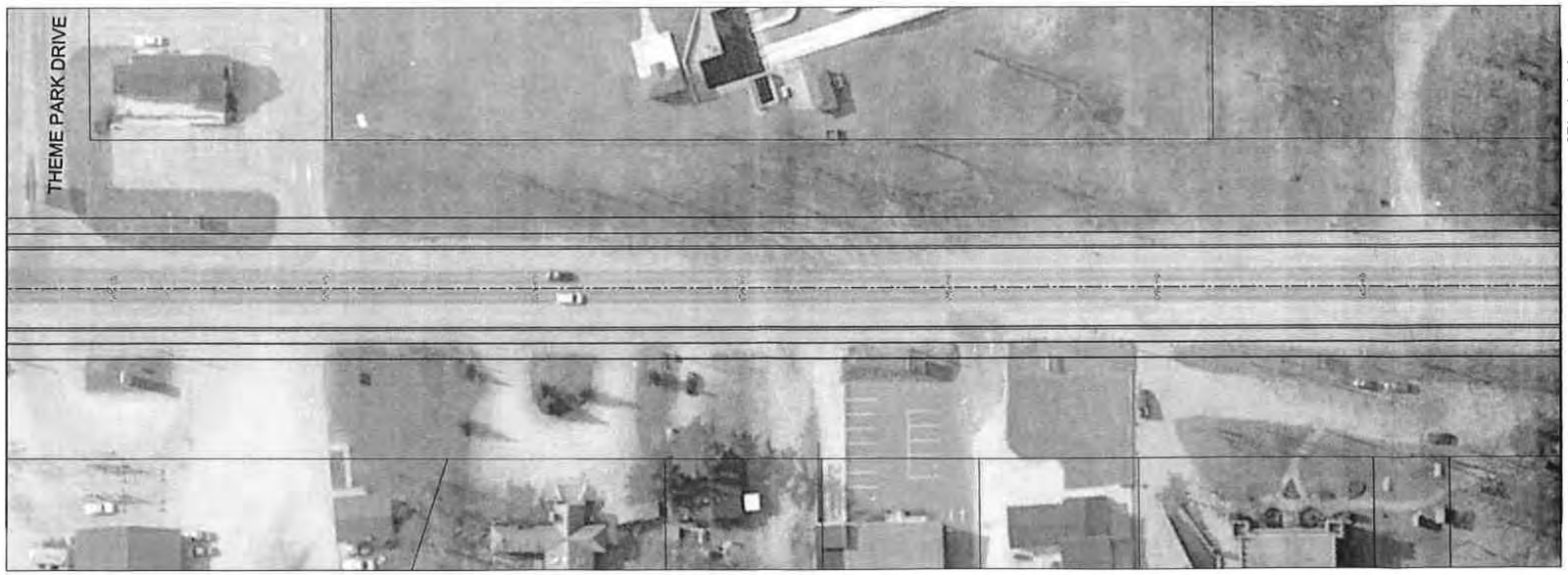
STA. 6+340

MATCH LINE

MATCH LINE

STA. 6+340

STA. 6+640



MATCH LINE

MATCH LINE

PLOT 1=1

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Not Valid Unless Signed And Dated

PRELIMINARY

SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

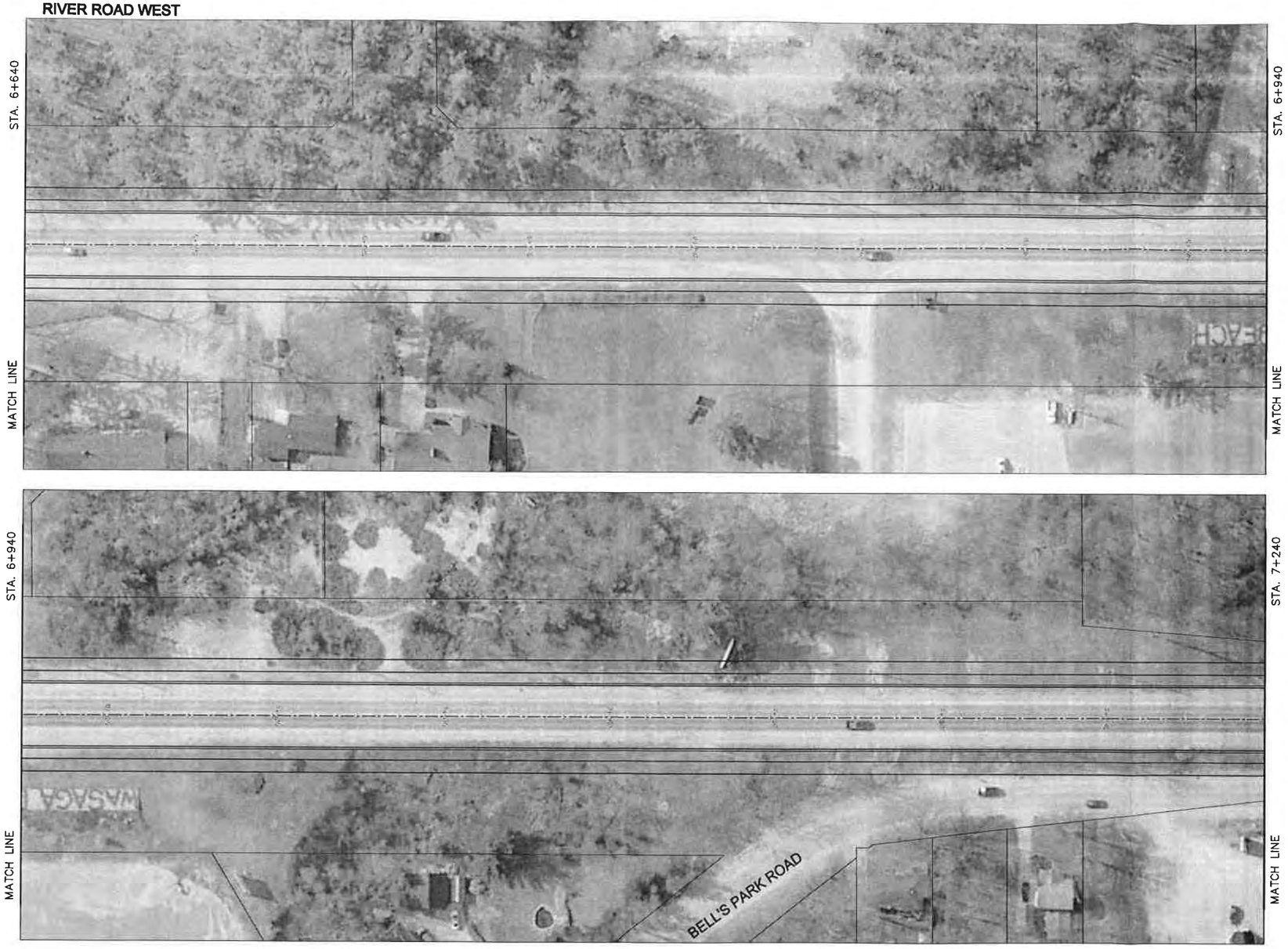
TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 6+040 TO STA. 6+640

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC10



PLOT 1:1

LEGEND

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NO.	REVISIONS	DATE	INITIAL

Not Valid Unless Signed And Dated

PRELIMINARY

SCALE:	1:500
DESIGN:	
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CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 6+640 TO STA. 7+240

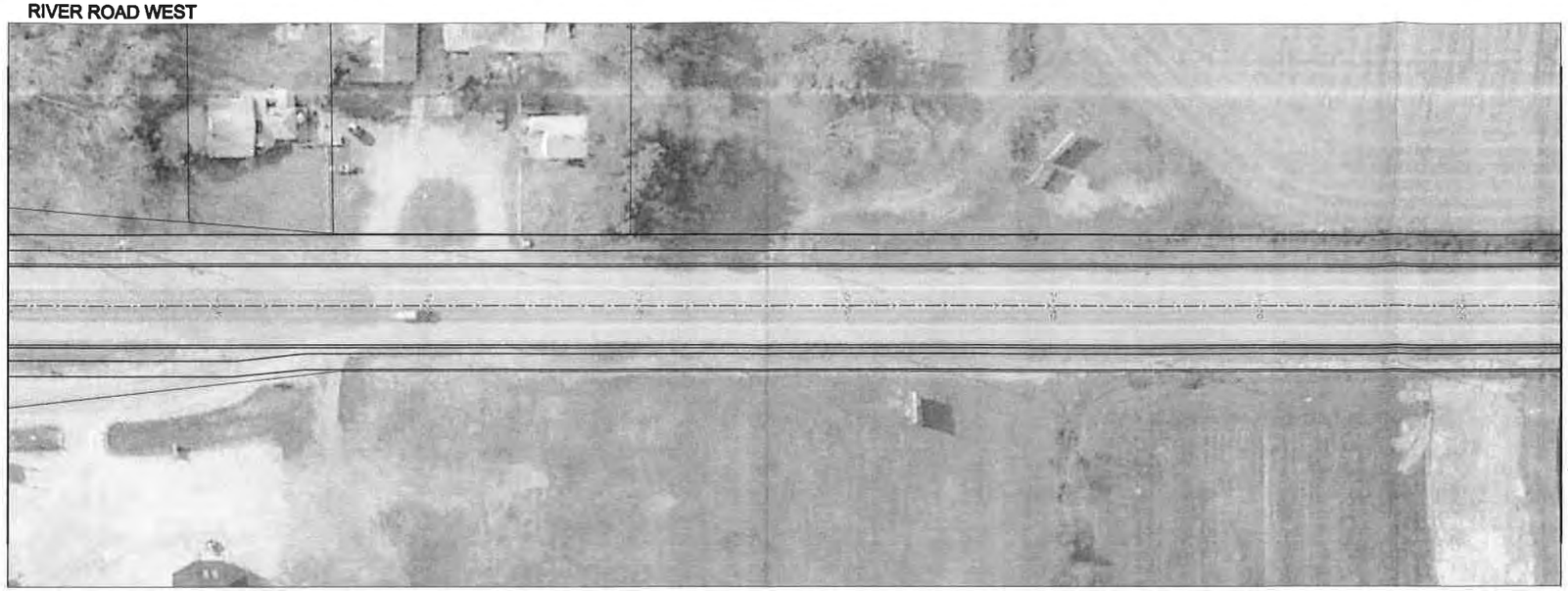
Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC11

RIVER ROAD WEST

STA. 7+240

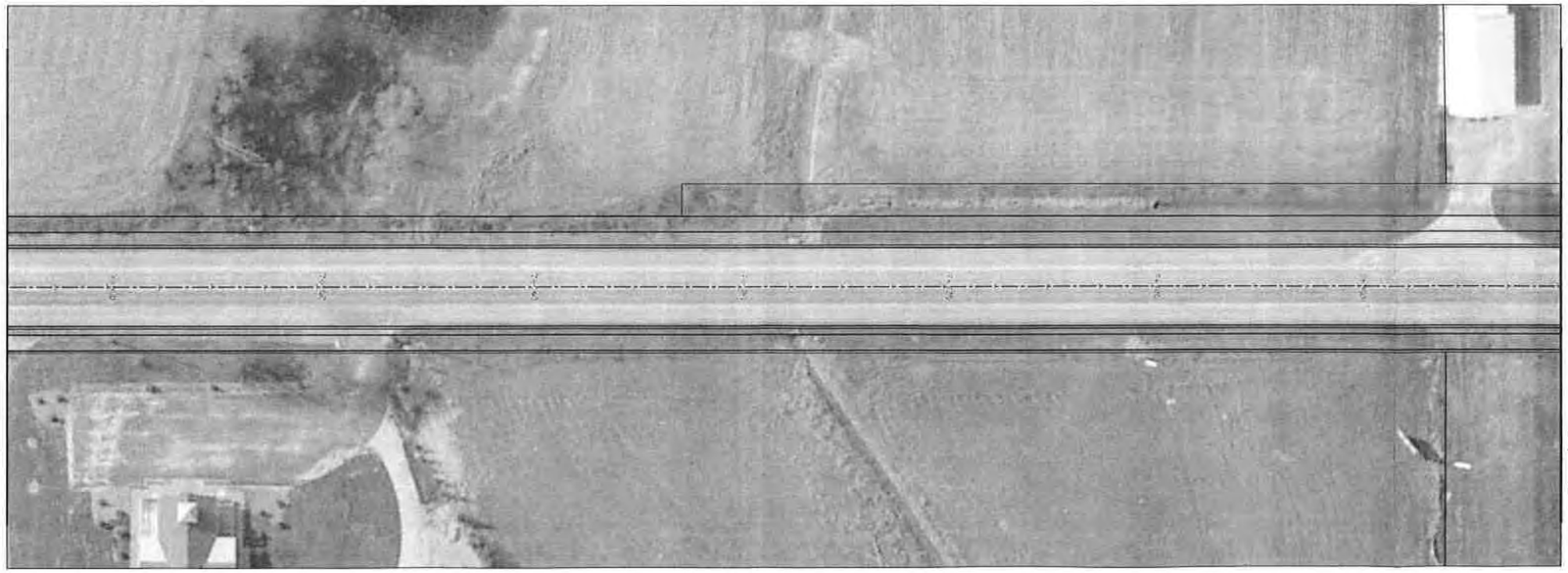


STA. 7+540

MATCH LINE

MATCH LINE

STA. 7+540



STA. 7+840

MATCH LINE

MATCH LINE

PLOT 1:1

LEGEND

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NO.	REVISIONS	DATE	INITIAL

Not Valid Unless Signed And Dated

PRELIMINARY

CAUTION: The information contained in this drawing is solely for the intended recipient. Any copying, distribution or use by others without the express written consent of Ainley & Associates Limited, is prohibited. The recipient is responsible for confirming the accuracy and completeness of the information with the originator.

SCALE:	1:500
DESIGN:	
DRAWN:	M.E.M.
CHECKED:	
DATE:	FEB. 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 7+240 TO STA. 7+840

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No.

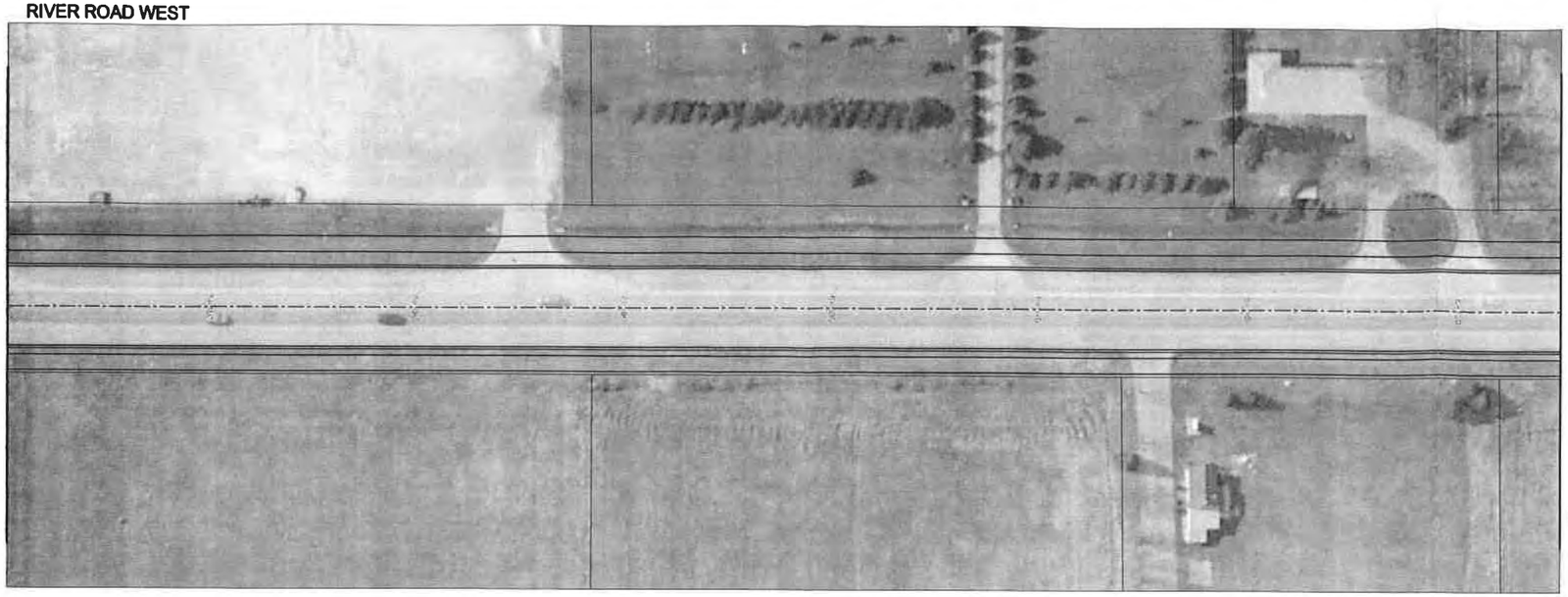
DWG. 109049-RC12

RIVER ROAD WEST

STA. 7+840

STA. 8+140

MATCH LINE

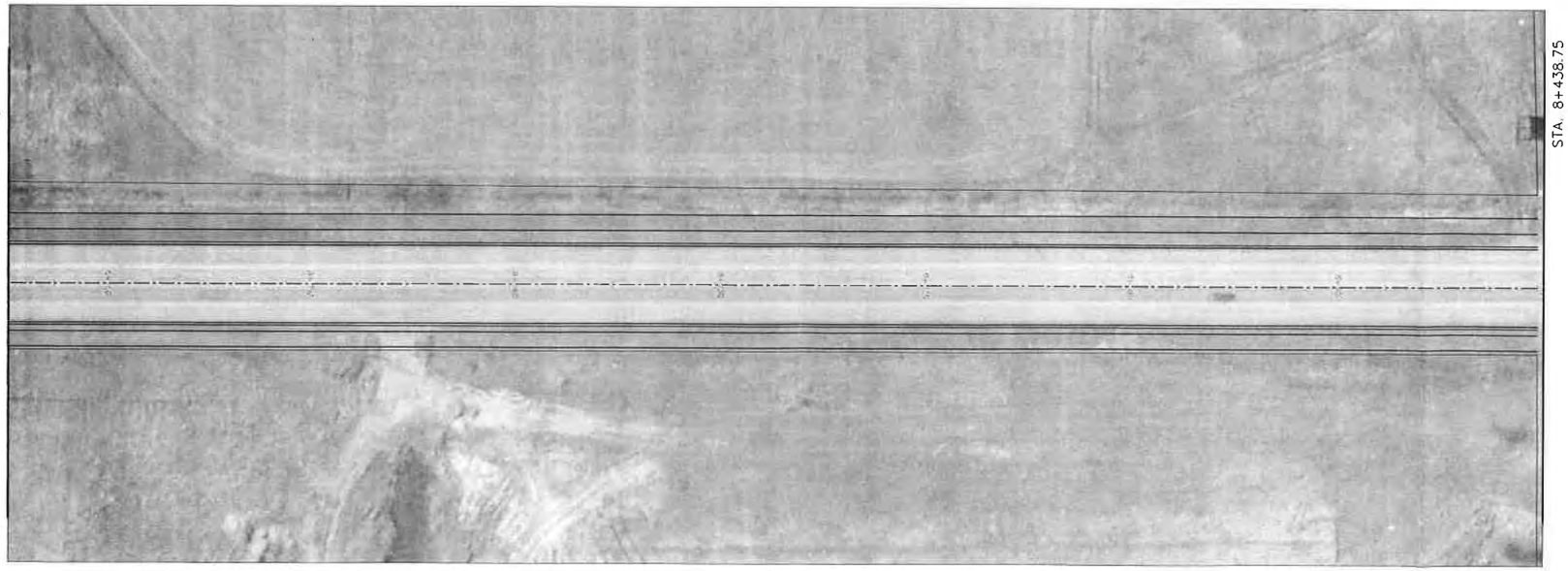


MATCH LINE

STA. 8+140

STA. 8+438.75

MATCH LINE



LEGEND

CONTRACT DRAWINGS
Contractor must verify all conditions and be responsible for same. Any discrepancies must be reported to the Engineer before commencing work. Drawings are not to be scaled. Ainley & Associates Limited claims copyright to this drawing and it may not be used for any purpose other than that stipulated in the contract between the owner/client and the Engineer without the express written consent of Ainley & Associates Limited.

NO.	REVISIONS	DATE	INITIAL

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PRELIMINARY

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SCALE:	1:500
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CHECKED:	
DATE:	FEB 2010

TOWN OF WASAGA BEACH
RIVER ROAD WEST
BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

RIVER ROAD WEST
STA. 7+840 TO STA. 8+439

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No.

DWG. 109049-RC13

APPENDIX U

Notice of Completion

CONSULTING
ENGINEERS
PLANNERS

Ainley & Associates Limited
550 Welham Road, Barrie, Ontario, L4N 8Z7
Tel: (705) 726-3371 ▪ Fax: (705) 726-4391
E-mail barrie@ainleygroup.com

September 21, 2010

File No. 109049

Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, ON
L9Z 1A1

Attn: **Mr. George Vadeboncoeur**
CAO

Ref: **Town of Wasaga Beach**
River Road West Urbanization from Brillinger Drive to Eastern Town Limits
Class Environmental Assessment, Notice of Study Completion

Dear Mr. Vadeboncoeur:

Further to the Public Information Centre (PIC) #3 which was held on June 26, 2010, the Town of Wasaga Beach has documented a Schedule C Class EA planning process to improve efficiency, enhance safety, address drainage and pavement structure deficiency issues in the area of River Road West from Brillinger Drive to the eastern Town limits. Please see the attached copy of a Notice of Completion of Environmental Study Report, which will appear in the local newspaper on September 29 and October 6, 2010.

Please contact the undersigned if you have any comments or questions with respect to this Notice.

Yours truly

AINLEY & ASSOCIATES LIMITED

Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Encl.

cc: Kevin Lalonde, Acting Director of Public Works

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TOWN OF WASAGA BEACH
RIVER ROAD WEST URBANIZATION
FROM BRILLINGER DRIVE TO EASTERN TOWN LIMITS
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF COMPLETION OF ENVIRONMENTAL STUDY REPORT

In order to improve efficiency, enhance safety and address drainage and pavement structure deficiency in the area of River Road West from Brillinger Drive to the eastern Town limits, and to integrate the active transportation components such as pedestrian sidewalks, bicycle lanes, multi-use pathways and public transit into the area, the Town is proposing to urbanize the existing River Road West from Brillinger Drive to the eastern Town limits. Specifically, the Project involves the following works:

- Four lane transition on River Road West from Oxbow Park Drive to Brillinger Drive complete with 3.0m wide left turn lane, 3.25m wide curb lanes, 3.5m wide centre lanes, 1.0m paved shoulders with 0.5m concrete curb and gutter, 1.8m wide concrete sidewalks and street lights as necessary for the 4-lane section, whereas, 3.5m wide centre left turn lane, 3.5m wide curb lanes, 1.5m wide bike lanes with 0.5m concrete curb and gutter, 1.8m wide concrete sidewalks and street lights as necessary for the 3-lane section,
- Widening of the existing River Road West from Brillinger Drive to Main Street to provide for three lanes with 3.5m wide centre left turn lane, 3.5m wide curb lanes, 1.5m wide bike lanes with 0.5m concrete curb and gutter, 1.8m wide sidewalks and street lights as necessary,
- Widening of River Road West from Zoo Park Road to the eastern Town limits with 13.5 m asphalt platform (given that the potential timing of construction is 2023-2024, the 13.5m asphalt platform will likely include two 3.5m centre lanes and two 3.25m wide curb lanes) with 0.5m concrete curb and gutter on each side, 1.5m boulevards, 3.0m multi-use paths and street lights as necessary, and
- Traffic signals and intersection improvements at River Road West with Powerline Road, Silver Birch Avenue (easterly intersection), Theme Park Drive and Bell's Park Road.

The Town has planned this Project as a Schedule C of the Municipal Class Environmental Assessment. An Environmental Study Report has been prepared and by this Notice is being placed in the public record for review. Subject to comments received as a result of this Notice and the receipt of necessary approvals, the Town intends to proceed with the construction beginning with the section of River Road West from Brillinger Drive to Powerline Road.

The Environmental Study Report is available for review (not removal) at the following locations:

Town Office
30 Lewis Street
Wasaga Beach

Mon-Fri: 9:00 am – 4:30 pm
Tel: 429-3844

Department of Public Works
150 Westbury Road
Wasaga Beach

Mon-Fri: 9:00 am – 4:30 pm
Tel: 429-2540

Municipal Library
150 Glenwood Dr.
Wasaga Beach

Tues – Thurs: 10:00 am – 8:00 pm
Fri & Sat: 10:00 am – 4:00 pm
Sun: noon – 4:00pm

Further information may be obtained from the Town's consultants, Ainley & Associates Limited at the address provided below.

Please provide written comment to the Town's Acting Director of Public Works at the address provided below within 30 calendar days from the date of this Notice. If concerns regarding this project cannot be resolved in discussion with the Town, a person may request that the Minister of the Environment make an order of the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Requests must be received by the Minister at the address below by Friday October 29, 2010. A copy of the request must also be sent to the Town's Acting Director of Public Works. If no request is received by October 29, 2010, the River Road West urbanization project will proceed to design and construction as outlined in the Environmental Study Report.

Minister of the Environment
135 St. Clair Avenue West, 19th Floor
Toronto Ont.
M4V 1P5

This notice issued September 29, 2010

Mr. Kevin Lalonde, P.Eng.
Acting Director of Public Works
30 Lewis Street
Wasaga Beach, Ontario
L9Z 1A1
Tel: (705) 429-2540
Fax: (705) 429-8226
Email: publicworksdirector@wasagabeach.com

Mr. Mike Neumann, P. Eng.
Vice-President, Transportation Engineering
Ainley & Associates Limited
280 Pretty River Parkway
Collingwood, Ontario
L9Y 4J5
Phone: (705) 445-3451
Fax: (705) 445-0968
Email: neumann@ainleygroup.com

RIVER ROAD WEST
CLASS EA
COMMUNICATION LIST

Title	First Name	Last Name	Title	Agency	Address	Town	Postal Code
Mr.	George	Vadeboncoeur	CAO	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Ray	Kelso	Manager of Planning & Development	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Kevin	Lalonde	Acting Director of Public Works	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Mike	McWilliam	Fire Chief	Town of Wasaga Beach	30 Lewis Street	Wasaga Beach, ON	L9Z 1A1
Mr.	Wayne	Wilson	CAO	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Glenn	Switzer	Director of Engineering	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Ms.	Patti	Young	Senior Planner	Nottawasaga Valley Conservation Authority	8195 Con. Line 8	Utopia, ON	L0M 1T0
Mr.	Graham	Findlay	Area Biologist	Ministry of Natural Resources	2284 Nursery Road	Midhurst, ON	L0L 1X0
Mr.	John	Fisher	Park Superintendent	Wasaga Beach Provincial Park (MNR)	11-22nd Street, North	Wasaga Beach, ON	L9Z 2V9
Mr.	Chris	Hyde	District Manager	Ministry of the Environment	54 Cedar Pointe Drive, Unit 1203	Barrie, ON	L4N 5R7
Ms.	Chunmei	Liu	Environmental Assessment and Planning Coordinator	Ministry of the Environment	5775 Yonge Street, 8th Floor	North York, ON	M2M 4J1
Mr.	Winston	Wong	Heritage Planner	Ministry of Culture	400 University Ave. 4th Floor	Toronto, ON	M7A 2R9
Mr.	Alejandro	Cifuentes	Heritage Planner	Ministry of Culture	400 University Ave. 4th Floor	Toronto, ON	M7A 2R9
Sir/Madam				Ministry of Labour	1201 Wilson Ave, Building E, 2nd Floor	Downsview, ON	M3M 1J8
Mr.	Paul	Trace	Manager Planning & Technical Services	Wasaga Distribution	950 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Colin	Bonnell	Manager Access Network	Bell Canada	2nd Fl. 136 Bayfield Street	Barrie, ON	L4M 3B1
Mr.	Bernie	Cyr	System Planner	Rogers Cable Systems	1 Sperling Dr., Box 8500	Barrie, ON	L4M 6B8
Ms.	Diedre	Broude	Manager	Enbridge Gas	500 Consumers Rd.	North York, ON	M2J 1P8
Mr.	Luke	Cechetto	Const. (Existing Dev.)	Enbridge Gas	10 Churchill Drive	Barrie, ON	L4N 8Z6
Const.	Mark	Kinney	Community Policing Officer	Ontario Provincial Police	1000 River Road West	Wasaga Beach, ON	L9Z 2K6
Mr.	Wayne	White		Ontario Clean Water Agency	100 Woodland Drive	Wasaga Beach, ON	L9Z 2V4
Mr.	Martin	Rukavina	Advisor	Ministry of Aboriginal Affairs	160 Bloor Street, 9th Floor	Toronto, ON	M7A 2E6
	C.	O'Meara		Dept. of Fisheries & Oceans	Bayfield Institute, 867 Lakeshore Road, Box 5050	Burlington, ON	L7R 4A6
Sir/Madam	Environment Unit			Indian & Northern Affairs Canada	Re: Environmental Assessment Coordination, 25 St. Clair Ave., E., 8th Floor	Toronto, ON	M4T 1M2
Sir/Madam				Chiefs of Ontario	Administration Office, 111 Peter Street, Suite 804	Toronto, ON	M5V 2H1
Sir/Madam				Metis Nation of Ontario	500 Old St. Patrick St., Unit 3	Ottawa, ON	K1N 9G4
Sir/Madam				Assembly of First Nations	Trebla Building, 473 Albert St., Suite 810	Ottawa, ON	K1R 5B4
Mr.	Dave	Simpson		Mississaugas of Alderville First Nation	P.O. Box 4	Roseneath, ON	K0K 2X0
Sir/Madam				Chippewas of Beausoliel First Nation	Cedar Point Post Office	via Penetanguishene, ON	L0K 1P0
Sir/Madam				Beausoleil First Nation	1 Ogema Street	Christian Island, ON	L0K 1C0
Karry	Karry	Sandy	Barrister/Solicitor, and Coordinator	Williams Treaty First Nations	8 Creswick Court	Barrie, ON	L4M 2J7
Sir/Madam				Chippewas of Georgina Island	RR#2, Box 12	Sutton West, ON	L0E 1R0
Sir/Madam				Chippewas of Nawash Unceded First Nation	R.R. 5	Wiarton, ON	N0H 2T0
Sir/Madam				Moose Deer Point First Nation	P.O. Box 119	Mactier, ON	P0C 1H0
Sir/Madam				Mnjikaning First Nation	5884 Rama Road, Suite 200	Rama, ON	L0K 1T0

RIVER ROAD WEST
CLASS EA
COMMUNICATION LIST

Ms.	Kelly	LaRocca	Councillor	Mississaugas of Scugog	RR#5, 22521 Island Road	Port Perry, ON	L9L 1B6
Sir/Madam				Saugeen First Nation	Highway 21, R.R. #1	Southampton, ON	N0H 2L0
Sir/Madam				Curve Lake First Nation	Curve Lake Post Office	Curve Lake, ON	K0L 1R0
Sir/Madam				Wahta Mohawk	P.O. Box 327	Bala, ON	P0C 1A0
Sir/Madam				Upper Mohawk First Nation c/o Six Nations of the Grand River	P.O. Box 5000	Ohsweken, ON	N0A 1MO
Ms.	Wanda	McGonigle		Ojibways of Hiawatha First Nation	RR#2	Keene, ON	K0L 2G0
Mrs.	Heather	Bastien		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Mr.	Luc	Lainé		Huron Wendat Council	255, Place Michel Laveau	Wendake, QC	G0A 4V0
Chief	Kris	Nahrgang		Kawartha Nishnawbe First Nation	R.R.#4, General Delivery	Burleigh Falls, ON	K0L 2H0
Chief	Bryan	LaForme		Mississaugas of the New Credit	2789 Mississauga Road, RR#6	Hagersville, ON	N0A 1H0
Mr.	Paul	Racher		Archaeological Research Associates Ltd.	4456 Cedar Springs Road R.R. #1	Burlington, ON	L7R 3X4
Mr.	John	Coulter		J.E.Coulter & Associates	1210 Sheppard Aven.E., Suite 211	North York, ON	M2K 1E3
Mr.	Yurij	Pelech	Senior Planner	EMC Group Limited	7577 Keele Street, Suite 200	Concord, ON	L4K 4X4
Mr.	Jeff	Mark		Mark Engineering	250 Bristol Road	Newmarket, ON	L3Y 7X7
Ms.	Janet	Porte-Jay	Senior Planner	Simcoe County District School Board	1170 Highway 26 West	Midhurst, ON	L0L 1X0
Ms.	Erica	Thomas	Transportation Officer	Simcoe County Student Transportation Consortium	568 Bryne Drive	Barrie, ON	L4N 9P6

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