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Barrie YMCA, 535 Bayview Drive

TRAFFIC IMPACT STUDY

YMCA of Simcoe/Muskoka

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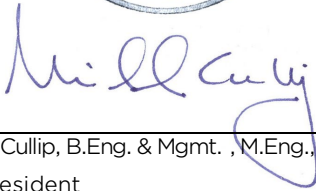
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Issue	Date	Description
1	January 19, 2024	Final Report

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1 Introduction

Tatham Engineering Limited was retained by YMCA of Simcoe/Muskoka to prepare a traffic impact study in support of the proposed YMCA development to be located at 535 Bayview Drive in the City of Barrie. The location of the development site is illustrated in Figure 1.

1.1 STUDY PURPOSE

The purpose of this study is to address the requirements of the City of Barrie with respect to the potential transportation impacts of the development on the study area road network. In particular, the following will be discussed:

- the operations of the road system through the study area prior to the proposed development.
- the growth in the traffic volumes not otherwise attributed to the development (i.e. from overall growth in the area and/or other developments);
- the number of new trips the proposed development is likely to generate;
- circulation of site traffic within and adjacent to the proposed development;
- the operations of the study area road system upon completion of the development; and
- the resulting impacts and need for mitigating measures (if required) to ensure acceptable overall road operations.

A Terms of Reference encompassing the above scope was submitted to the City for review prior to commencement of this study. The accepted Terms of Reference is provided in Appendix A.

1.2 REPORT STRUCTURE

The report is structured as follows:

- Chapter 1: introduction and study purpose;
- Chapter 2: existing conditions, detailing the road system and corresponding traffic operations;
- Chapter 3: future conditions, prior to the completion of the proposed development (referred to as future background conditions), the expected growth in traffic levels and the resulting operating conditions;
- Chapter 4: proposed development and associated details including land use, access, circulation, and traffic volumes;



- Chapter 5: future conditions, with completion of the proposed development (referred to as future total conditions); and
- Chapter 6: summary of the report and key findings.



2 Existing Conditions

This chapter will detail the current road network, traffic volumes, and traffic operations under existing conditions.

2.1 ROAD NETWORK

The road network to be addressed by this study consists of Bayview Drive and its intersections with South Village Way/Dale Hawerchuk Way and North Village Way/505 Bayview Drive. Additional details are provided below, with aerial imagery of the overall road network and key intersections provided in Figure 2.

Bayview Drive

Bayview Drive is oriented north-south through the study area and has a speed limit of 50 km/h and a 5-lane urban cross-section (i.e. curb and gutter) providing two travel lanes per direction, a centre two-way left turn lane, and a sidewalk on each side of the road. As per the City of Barrie's *2051 Official Plan*¹, Bayview Drive is classified as an arterial road. The City's *Transportation Master Plan*² (TMP) assigns arterial roads a planning capacity of 850 vehicles per hour per lane (vphpl), thus providing a directional planning capacity of 1,700 vehicles per hour (850 vphpl x 2 lanes per direction) on Bayview Drive.

Bayview Drive & North Village Way/505 Bayview Drive

The intersection of Bayview Drive with North Village Way/505 Bayview Drive is a 4-leg, signalized intersection. The north and south approaches (Bayview Drive) each consist of a left turn lane, a through lane and a shared through-right lane. The west approach (North Village Way) provides separate left, through and right lanes, whereas the east approach (the access to 505 Bayview Drive) provides an exclusive left turn lane and a shared through-right lane. It is noted that the east approach is not delineated with pavement markings, thus the noted configuration is assumed based on the available pavement width and the configuration provided at the opposing west approach. Both North Village Way and the 505 Bayview Drive access are considered private roads, serving Park Place and 505 Bayview Drive.

¹ *City of Barrie Official Plan 2051*. City of Barrie. April 2023.

² *City of Barrie Transportation Master Plan*. WSP. June 2019.



Bayview Drive & South Village Way/Dale Hawerchuk Way

The intersection of Bayview Drive with South Village Way/Dale Hawerchuk Way is a 4-leg, signalized intersection. The north and south approaches (Bayview Drive) each consist of a left turn lane, a through lane and a shared through-right lane. The west approach (South Village Way) provides a shared left-through lane and a shared through-right turn lane. The east approach (Dale Hawerchuk Way) serves as the main access to the Sadlon Arena and provides a left turn lane and a shared through-right turn lane. Both South Village Way and Dale Hawerchuk Way are considered private roads, serving Park Place and the Sadlon Arena respectively.

2.2 ACTIVE TRANSPORTATION

As referenced above, concrete sidewalks are currently provided along each side of Bayview Drive, which provide pedestrian connectivity along Bayview Drive between Mapleview Drive East and Big Bay Point Road. Sidewalks are also provided along both sides of South Village Way, the north side of Dale Hawerchuk Way, and the south side of North Village Way, providing pedestrian connectivity to Park Place and the Sadlon Arena. The existing sidewalk network is illustrated in Figure 3.

No dedicated cycling facilities are currently provided along Bayview Drive or the other noted study area roads.

2.3 TRANSIT NETWORK

2.3.1 Local Transit

Barrie Transit currently operates two bus routes along Bayview Drive – Route 1 and Route 3. Each of these routes operates 7 days per week with peak service frequencies of every 30 minutes. The nearest stops to the subject site are located along Bayview Drive at North Village Way and South Village Way. The subject site is also located within 400 metres of the Park Place transit hub. This transit hub is served by Routes 1, 2, 3, 7 and 8, offering comprehensive connectivity to the broader Barrie Transit network and providing access to all major transit hubs and destinations within the city. A system map of all current Barrie Transit routes and further information with respect to routing and stop locations within the study area are provided in Figure 4.

2.3.2 Regional Transit

GO Transit bus and train services are available within the City of Barrie, offering connections to regional transit services throughout the Greater Golden Horseshoe. Major stops are located at Allandale Waterfront GO (located approximately 3.75 km north of the subject site) and Barrie South GO (located approximately 4.0 km east of the subject site). Connections to these services are available through Barrie Transit Routes 1, 3, 7 and 8.



2.4 TRAFFIC VOLUMES

2.4.1 Traffic Counts

To determine existing traffic volumes, traffic counts were conducted at the intersections of Bayview Drive with North Village Way and with South Village Way. The counts were completed on Wednesday, December 20, 2023, from 7:00 to 10:00 and 15:00 to 18:00. Detailed count sheets are provided in Appendix B.

To reflect 2024 conditions, the 2023 volumes were adjusted as per the background growth rates noted in Section 3.4.1. The resulting 2024 peak hour traffic volumes are illustrated in Figure 5.

2.5 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic operations (both with and without the subject development) can be assessed from. The capacity, and hence operations, of a road system is effectively dictated by its intersections and thus the traffic operations assessment focuses on intersection operations, based on:

- the 2024 traffic volumes;
- the existing intersection configurations and control; and
- Procedures outlined in the *2000 Highway Capacity Manual*³ (using Synchro v.11 software).

For each intersection, the analysis considers:

- the average delay (measured in seconds);
- level of service (LOS); and
- volume to capacity (v/c) for each movement if signalized or, if unsignalized (such as those operating under stop control), for critical movements only.

With respect to the noted metrics:

- level of service 'A' corresponds to the best operating condition with minimal delays whereas level of service 'F' corresponds to poor operations resulting from high intersection delays (additional details regarding Level of Service definitions are provided in Appendix C); and
- a v/c ratio of less than 1.0 indicates the intersection movement is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

To ensure the traffic model more accurately represents existing conditions, the overall intersection peak hour factor and heavy vehicle percentage for each movement were based on

³ *Highway Capacity Manual*. Transportation Research Board, Washington DC, 2000.



the traffic counts and incorporated into the Synchro model. Where the observed heavy vehicle percentage was less than Synchro's default value of 2%, the default value was used.

The signal timing plans for the intersections of Bayview Drive with North Village Way and South Village Way (see Appendix B) were obtained from the City and input into the traffic model. It is noted that the approach configuration of South Village Way used in the Synchro model was modified slightly from that described in Section 2.1 (which reflect the existing pavement markings). The west approach was coded as a left turn lane (rather than a shared left-through lane) and a shared through-right lane. This was implemented to ensure that the in-use timing plan at the intersection (which included simultaneous advanced left turns for the opposing eastbound and westbound left turn movements) would operate without conflict.

The results of the operational analysis are summarized in Table 1 with detailed worksheets provided in Appendix D. In accordance with the City's *Transportation Impact Study Guidelines*⁴, the following conditions have been presented in bold in the operational summary tables:

- any individual movement operating at LOS F;
- any intersection operating at LOS D (or worse) overall; and
- any movement or intersection operating with $v/c \geq 0.85$.

As indicated, each intersection currently provides excellent overall operations (LOS B) with each movement providing acceptable operations (LOS D or better) during peak periods. Reserve capacity remains available on each movement to accommodate future growth (i.e. the existing $v/c \leq 0.80$ suggesting that the intersections are operating at less than 80% capacity).

2.6 ROAD NETWORK IMPROVEMENTS

In consideration of the noted intersection operations, no improvements are required to accommodate the existing traffic volumes within the study area.

⁴ City of Barrie *Transportation Impact Study Guidelines*. City of Barrie. December 1, 2021.



Table 1: Intersection Operations – 2024

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Bayview Drive & North Village Way/ 505 Bayview Drive	EB L	signal	36	D	0.30	52	D	0.80
	EB TR	signal	38	D	0.03	37	D	0.09
	WB L	signal	44	D	0.01	46	D	0.05
	WB TR	signal	45	D	0.00	47	D	0.07
	NB L	signal	5	A	0.07	6	A	0.25
	NB TR	signal	7	A	0.17	9	A	0.30
	SB L	signal	7	A	0.00	9	A	0.00
	SB TR	signal	9	A	0.33	12	B	0.37
	overall	signal	11	B	0.32	17	B	0.47
Bayview Drive & South Village Way/ Dale Hawerchuk Way	EB L	signal	37	D	0.26	37	D	0.53
	EB TR	signal	40	D	0.06	37	D	0.15
	WB L	signal	46	D	0.05	45	D	0.06
	WB TR	signal	48	D	0.05	46	D	0.14
	NB L	signal	5	A	0.24	8	A	0.49
	NB TR	signal	7	A	0.15	9	A	0.28
	SB L	signal	8	A	0.00	11	B	0.03
	SB TR	signal	11	B	0.29	15	B	0.34
	overall	signal	12	B	0.30	17	B	0.54



3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the years 2027, 2032 and 2037. The 2027 horizon year has been adopted to reflect full build-out of the proposed development, whereas the 2032 and 2037 horizons will address longer-term impacts of the development (5 and 10 years beyond build-out).

3.1 ROAD NETWORK

As per the City's TMP, the right-of-way for Bayview Drive, which currently varies between 28 and 30 metres within the study area, is proposed to be increased to 34 metres by 2041, reflective of an arterial road ROW. Notwithstanding, the 5-lane cross-section will be maintained through the study area.

3.2 ACTIVE TRANSPORTATION

Dedicated cycling facilities are proposed along Bayview Drive. Per details within the City's *TMP*, these facilities would consist of buffered bicycle lanes north of South Village Way/Dale Hawerchuk Way and an in-boulevard pathway (such as a multi-use path) to the south of South Village Way.

No other improvements to active transportation facilities are proposed within the study area.

3.3 TRANSIT NETWORK

3.3.1 Near-Term

Barrie Transit is in the process of revising its existing transit network to a new network intended to be fully implemented by 2025. The network revisions are intended to increase coverage areas, increase service frequency, reduce travel times and reduce operating costs. Based on information presented in the *Barrie Transit's New Network*⁵ report to City staff and as adopted by City Council, the new network will consist of:

- 1 “express” route operating at a 30-minute frequency, travelling between Royal Victoria Regional Health Centre/Georgian College and Park Place via Highway 400;
- 3 “frequent” routes operating at 15-minute frequencies, providing connections between most major destinations and hubs within the City;

⁵ *Barrie Transit's New Network Staff Report*. May 31, 2023.



- 5 “local” routes operating at 30-minute frequencies, providing service through many parts of the City not already covered by a frequent transit route; and
- 7 “transit-on-demand” (ToD) zones, serving nearly every major corridor within the City not already served by the above fixed routes.

ToD transit does not operate on a fixed route or schedule. Instead, riders will be able to book a transit trip (similar to a taxi or rideshare service) within a specific ToD zone and have a dedicated shuttle dispatched to either complete their entire trip (if within the same ToD zone) or provide a connection to one of the fixed routes. The ToD service states that a shuttle will arrive within 20 minutes of booking a transit trip.

A map of the proposed 2025 transit network is illustrated in Figure 6. As indicated, the subject site will be served by the express route and three local routes via the Park Place transit hub, with connections to two ToD zones available from the Park Place transit hub.

3.3.2 Long-Term

Further improvements to the proposed 2025 transit network were presented in the *Barrie Transit's New Network* report. These improvements include:

- expansion of service areas (both fixed-route and ToD) into future development areas in the City's south; and
- increased frequency on most of the fixed transit routes, with proposed peak frequencies of up to every 9 minutes on frequent routes and 20 minutes on local routes.

These longer-term improvements have not yet been formally adopted and remain conceptual. A map of the conceptual 2031 transit network is provided in Figure 6.

3.4 TRAFFIC VOLUMES

Background traffic volumes expected for the 2027, 2032 and 2037 horizon years have been determined based on the existing traffic volumes, projected growth and consideration for other development-specific traffic volumes.

3.4.1 Background Growth

Annual growth rates along Bayview Drive have been derived from the City's EMME traffic model created in support of their 2019 TMP. Based on a review of the EMME outputs, growth along Bayview Drive is expected to be in the order of 2.0% per annum between 2016 and 2031, and 0.6% per annum between 2031 and 2041. As such, a background growth rate of 2% per annum has been applied to volumes on Bayview Drive through the 2032 horizon, with 1% per annum applied thereafter.



With respect to volumes on North Village Way and South Village Way, a background growth rate of 1% per annum was considered through the 2037 horizon. This is considered conservative recognizing that Park Place's commercial area is largely built-out, with most of the remaining vacant land subject to individual consideration as a background development (as detailed in Section 3.4.2). As such, significant additional growth in traffic is not anticipated.

No growth was applied to volumes on Dale Hawerchuk Way or the access to 505 Bayview Drive.

3.4.2 Background Developments

City staff identified 2 background developments which will contribute additional traffic volumes to the study area road network. The location of each development site in relation to the proposed development is illustrated in Figure 7 with additional details provided below. Both developments are assumed to be fully built-out by the 2027 horizon.

109 Park Place Boulevard

109 Park Place Boulevard is a proposed mixed-use development consisting of 475 residential dwelling units and 2,346 m² (25,254 ft²) of commercial/retail space. As per the *Park Place Residential Development Traffic Impact Study*⁶, the development is expected to generate 175 trips during the weekday AM peak hour and 366 trips during the weekday PM peak hour. It is noted in the referenced report that the trip estimates did not consider non-auto modal reductions, pass-by trips, or synergies between different land uses, and thus the trip estimates are considered conservative. The distribution and assignment of these new trips to the study area road network is illustrated in Appendix E, based on that presented in the *Park Place Residential Development Traffic Impact Study*.

410 Bayview Drive

410 Bayview Drive is a proposed industrial development consisting of 4 buildings totaling approximately 47,700 m² (513,460 ft²) of gross floor area. As per the *Park Place North Lands Traffic Impact Study*⁷, the development is expected to generate 179 trips during the weekday AM peak hour and 181 trips during the weekday PM peak hour. The distribution and assignment of these new trips to the study area road network is illustrated in Appendix E, based on that presented in the noted report.

⁶ *Park Place Residential Development Traffic Impact Study*. Paradigm Transportation Solutions Limited. July 2022.

⁷ *Park Place North Lands Traffic Impact Study*. Paradigm Transportation Solutions Limited. July 2022.



Background Development Traffic

The resulting total background development traffic added to the road network is illustrated in Figure 8, reflective of full build-out of each noted background development.

3.4.3 Background Traffic Volumes

Future background traffic volumes at each horizon year are illustrated in Figure 9 through Figure 11 and are reflective of the 2024 traffic volumes, the noted background growth rates and additional volumes generated by the noted background developments (both of which are assumed to be fully built-out by 2027).

3.5 TRAFFIC OPERATIONS

The operations of the study area intersections were reviewed for each future horizon year considering the future background traffic volumes. The signal timing at each intersection was optimized at each horizon to ensure peak performance of the intersections are maintained. Results of the operational analyses are summarized in Table 2 through Table 4 with detailed operations worksheets provided in Appendix F.

As indicated, excellent overall operations (LOS B) at each intersection are maintained through the 2037 horizon under future background conditions, with individual movements providing acceptable operations (LOS D or better with one instance of LOS E) with low to moderate delays.

3.6 ROAD NETWORK IMPROVEMENTS

No improvements are required to accommodate the future background traffic volumes and the associated intersection operations.



Table 2: Intersection Operations – 2027 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Bayview Drive & North Village Way/ 505 Bayview Drive	EB L	signal	38	D	0.39	57	E	0.86
	EB TR	signal	40	D	0.03	37	D	0.09
	WB L	signal	45	D	0.01	45	D	0.05
	WB TR	signal	46	D	0.00	47	D	0.06
	NB L	signal	5	A	0.08	7	A	0.31
	NB TR	signal	7	A	0.19	9	A	0.34
	SB L	signal	7	A	0.00	9	A	0.00
	SB TR	signal	9	A	0.35	13	B	0.42
	overall	signal	11	B	0.36	18	B	0.53
Bayview Drive & South Village Way/ Dale Hawerchuk Way	EB L	signal	37	D	0.33	40	D	0.63
	EB TR	signal	39	D	0.07	37	D	0.16
	WB L	signal	45	D	0.05	47	D	0.06
	WB TR	signal	47	D	0.04	45	D	0.14
	NB L	signal	5	A	0.27	9	A	0.58
	NB TR	signal	7	A	0.17	9	A	0.30
	SB L	signal	8	A	0.00	11	B	0.04
	SB TR	signal	11	B	0.31	14	B	0.37
	overall	signal	12	B	0.33	17	B	0.63



Table 3: Intersection Operations – 2032 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Bayview Drive & North Village Way/ 505 Bayview Drive	EB L	signal	38	D	0.40	68	E	0.91
	EB TR	signal	40	D	0.04	37	D	0.10
	WB L	signal	45	D	0.01	45	D	0.05
	WB TR	signal	46	D	0.00	47	D	0.06
	NB L	signal	5	A	0.09	7	A	0.34
	NB TR	signal	7	A	0.21	9	A	0.37
	SB L	signal	7	A	0.00	9	A	0.01
	SB TR	signal	9	A	0.38	13	B	0.46
	overall	signal	12	B	0.38	19	B	0.57
Bayview Drive & South Village Way/ Dale Hawerchuk Way	EB L	signal	37	D	0.34	40	D	0.66
	EB TR	signal	39	D	0.07	37	D	0.17
	WB L	signal	45	D	0.05	47	D	0.06
	WB TR	signal	46	D	0.04	45	D	0.14
	NB L	signal	5	A	0.30	9	A	0.64
	NB TR	signal	7	A	0.19	9	A	0.33
	SB L	signal	8	A	0.01	11	B	0.04
	SB TR	signal	11	B	0.34	14	B	0.41
	overall	signal	13	B	0.36	17	B	0.70



Table 4: Intersection Operations – 2037 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Bayview Drive & North Village Way/ 505 Bayview Drive	EB L	signal	38	D	0.41	58	E	0.86
	EB TR	signal	39	D	0.04	37	D	0.10
	WB L	signal	45	D	0.01	47	D	0.06
	WB TR	signal	46	D	0.00	49	D	0.07
	NB L	signal	6	A	0.10	8	A	0.38
	NB TR	signal	7	A	0.22	9	A	0.40
	SB L	signal	7	A	0.00	9	A	0.01
	SB TR	signal	9	A	0.40	15	B	0.49
	overall	signal	12	B	0.40	19	B	0.60
Bayview Drive & South Village Way/ Dale Hawerchuk Way	EB L	signal	37	D	0.36	46	D	0.71
	EB TR	signal	39	D	0.07	39	D	0.18
	WB L	signal	45	D	0.05	45	D	0.07
	WB TR	signal	46	D	0.04	47	D	0.14
	NB L	signal	5	A	0.32	11	B	0.64
	NB TR	signal	7	A	0.20	9	A	0.34
	SB L	signal	8	A	0.01	12	B	0.04
	SB TR	signal	11	B	0.36	17	B	0.44
	overall	signal	13	B	0.38	19	B	0.71



4 Proposed Development

This chapter will provide additional details with respect to the proposed YMCA development, including its location, land-use, site access, anticipated trip generation and assignment of said trips to the adjacent road network.

4.1 LOCATION

The subject site is located in the northeast corner of 535 Bayview Drive, within the existing parking lot.

4.2 LAND USE

As noted above, the subject site is currently a portion of the parking lot which supports the adjacent Sadlon Arena, a medium-capacity arena and events centre. Also adjacent to the subject site is the Barrie Dog Off-Leash Recreation Area, an off-leash dog park. While the dog park is located at 118 Mapleview Drive East, access to and parking for the park is provided via 535 Bayview Drive.

The proposed development consists of a 2-storey YMCA facility with a gross floor area of 6,635 m² (71,419 ft²). The YMCA will include an aquatics centre, fitness and rehabilitation facilities, youth transitional housing, and community and youth outreach services.

A site plan is provided in Figure 12.

4.3 SITE ACCESS

Access to the site will be provided via Dale Hawerchuk Way, the existing primary access to 535 and 555 Bayview Drive (Sadlon Arena).

A second access to Bayview Drive is located at the north limit of 535 Bayview Drive. However, this is an unsignalized gated access and will not be used to serve general YMCA traffic. Rather, this access will be maintained for use by City staff to access and service the nearby stormwater management ponds, emergency vehicles (if needed) and for access to the Sadlon Arena parking area during events (otherwise, the access is expected to remain gated).

4.4 CIRCULATION

Vehicles

In accordance with City requirements, internal aisles providing access to parking and loading areas within the YMCA development area will be a minimum of 6.4 metres in width. The proposed fire route will maintain a minimum clear width of 6.0 metres with 12.0 metre centreline curve radii



in accordance with the requirements of the Ontario Building Code. A driveway along the north side of the site will provide access to the YMCA's loading area and to the municipal stormwater management ponds east of the site.

It is noted that as part of the proposed development, a portion of the existing parking lot serving 535 and 555 Bayview Drive will be reconfigured to extend Dale Hawerchuk Way eastwards towards the eastern limit of the parking area. This will improve vehicle circulation and access for both YMCA traffic and non-YMCA traffic within the shared parking area, providing a clearly defined route for vehicles travelling between the site access and the YMCA and preventing cut-through traffic across the parking areas.

Pedestrians

As part of the noted improvements to Dale Hawerchuk Way, the existing sidewalk on the north side of the access will be extended to the east limit of the parking area, providing a continuous pedestrian connection between the proposed YMCA and the external sidewalk network. Sidewalks and pathways provided within the YMCA site will provide access to the building and maintain access to the adjacent dog park.

4.5 PARKING

Further to discussions with the City, a total of 72 parking spaces are to be provided within the limits of the YMCA's leased area. Arrangements have also been made with the City for shared use of parking between the YMCA and the Sadlon Arena.

4.6 SITE TRAFFIC

4.6.1 Trip Generation

The number of vehicle trips to be generated by the proposed development during the weekday AM and weekday PM peak hours has been determined based on type of use, development size and trip generation rates per the *ITE Trip Generation Manual, 11th Edition*⁸. Based on the type of development proposed, the *recreational community centre* (ITE land use code 495) was considered (the corresponding ITE land use definition is provided in Appendix G). The ITE trip rates and resulting trip estimates for the site are provided in Table 5.

As indicated, the development is anticipated to generate 136 trips during the weekday AM peak hour and 179 trips during the weekday PM peak hour.

⁸ *Trip Generation Manual, 11th Edition*. Institute of Transportation Engineers. September 2021.



Table 5: Trip Generation – YMCA Barrie

LAND USE	VARIABLE/ SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
recreational community centre (ITE 495)	1,000 ft ² GFA	1.26	0.65	1.91	1.18	1.33	2.50
	71,419 ft ²	90	46	136	84	95	179

4.6.2 Trip Modal Split

Modal split is the proportion of trips to/from a specific location or area across different modes of transportation, such as automobiles, public transit, walking, cycling, etc. Data from the 2016 *Transportation Tomorrow Survey* (TTS) was used to determine the existing modal split in the area. The TTS is a comprehensive travel survey conducted every 5 years within the Greater Golden Horseshoe which is used to understand travel patterns between different survey zones, including primary modes of travel (i.e. modal split). The 2021 TTS was delayed by the COVID-19 pandemic, thus the 2016 TTS data represents the most recent data available.

Regarding the subject development, it is located within 2006 *GTA Zone 8527*, which covers an area generally bounded by Highway 400 to the west, Lockhart Road to the south, Lovers Creek/Huron Road to the east, and Lackie's Bush to the north. The following travel mode data was obtained for this area, representing the proportion of trips made across each major travel mode:

- public transit (local, GO Transit, taxi/rideshare) – 1.2%;
- active transportation (walking, cycling) – 0.8%; and
- private automobile (driver or passenger) – 98.0%.

As indicated, as of 2016, nearly all trips to/from Zone 8527 were made using a private automobile, either as a driver or passenger.

The City's *TMP* identifies a City-wide modal split target of 7% public transit and 12% active transportation by 2041, resulting in a total non-automobile modal share of 19% of all trips City-wide. Based on the proximity of the subject site to a major transit hub, proposed improvements to public transit services, and further improvements to active transportation infrastructure within the study area, it is considered reasonable that the City's modal split targets can be achieved by 2041. For each horizon year considered in this study, the proportion of site trips using each major travel mode have been linearly interpolated between the current (2016) modal split and 2041 target modal split. The modal splits applied at each horizon are summarized in Table 6.



Table 6: Area Modal Splits

YEAR	PUBLIC TRANSIT	ACTIVE TRANSPORTATION	AUTOMOBILE
2016	1.2%	0.8%	98.0%
2027	3.7%	5.7%	90.6%
2032	4.9%	8.0%	87.1%
2037	6.1%	10.2%	83.7%
2041	7.0%	12.0%	81.0%

The above modal splits were applied to the YMCA trip estimates (as per Table 5) to determine the total automobile and non-automobile trips generated by the site, as summarized in Table 7 (for the public transit and active transportation modes, the values presented reflect the number of automobile trips that will divert to the noted alternative modes).

Table 7: Modal Trip Estimates - YMCA Barrie

YEAR	PUBLIC TRANSIT		ACTIVE TRANSPORTATION		AUTOMOBILE	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
2027	5	7	8	10	123	162
2032	7	9	11	14	118	156
2037	8	11	14	18	114	150

4.6.3 Trip Distribution & Assignment

Recognizing the use of a YMCA as a community facility used primarily by residents of Barrie, trips to and from the site were distributed based on the proposed development's location in relation to the existing and future residential areas within the City (future residential areas primarily being located in the south of the City, within the Hewitt and Salem Secondary Areas). In consideration of this, the following distribution of site trips was assigned along Bayview Drive:

- to/from the north via Bayview Drive - 50%; and
- to/from the south via Bayview Drive - 50%.

The assignment of site trips to the road network is illustrated in Figure 13 through Figure 15.



5 Future Total Conditions

This chapter will address the resulting impacts of the proposed development on the adjacent road system. The following areas will be addressed:

- operations of the key intersections; and
- potential improvements to the study area road network, if necessary

5.1 TRAFFIC VOLUMES

To assess the impacts of the proposed development, the site-generated traffic volumes at each horizon year (Figure 13 through Figure 15) were added to the respective background traffic volumes at each horizon year (Figure 9 through Figure 11). The resulting total traffic volumes are illustrated in Figure 16 through Figure 18.

5.2 TRAFFIC OPERATIONS

A final analysis of the key intersections was conducted at each horizon year to determine the impact of the proposed development. Signal timing at each intersection was optimized again at each horizon to ensure that peak performance of each intersection is maintained. Results of the operational analyses are summarized below in Table 8 through Table 10, with detailed worksheets provided in Appendix H.

As indicated, each intersection will continue to provide excellent overall operations (LOS B) through the 2032 horizon and good overall operations (LOS C or better) through the 2037 horizon. Individual movements will continue to operate acceptably (LOS D or better with the exception of one instance of LOS E) through the 2037 horizon, with low to moderate delays and reserve capacity remaining available.

Compared to future background conditions, minimal changes in delays (0 to 5 seconds) and utilized capacity (0.00 to 0.23) are realized on each movement under future total conditions, with the largest impacts realized on the movements to/from Dale Hawerchuk Way. This indicates that the proposed YMCA will not have a significant impact on the operations of the adjacent road network.



Table 8: Intersection Operations – 2027 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Bayview Drive & North Village Way/ 505 Bayview Drive	EB L	signal	38	D	0.39	57	E	0.86
	EB TR	signal	40	D	0.03	37	D	0.09
	WB L	signal	45	D	0.01	45	D	0.05
	WB TR	signal	46	D	0.00	47	D	0.06
	NB L	signal	5	A	0.09	7	A	0.33
	NB TR	signal	7	A	0.20	9	A	0.36
	SB L	signal	7	A	0.00	9	A	0.01
	SB TR	signal	9	A	0.37	13	B	0.44
	overall	signal	11	B	0.37	18	B	0.55
Bayview Drive & South Village Way/ Dale Hawerchuk Way	EB L	signal	36	D	0.35	37	D	0.59
	EB TR	signal	40	D	0.07	39	D	0.16
	WB L	signal	43	D	0.21	37	D	0.29
	WB TR	signal	44	D	0.04	40	D	0.12
	NB L	signal	5	A	0.27	11	B	0.60
	NB TR	signal	8	A	0.20	14	B	0.36
	SB L	signal	8	A	0.11	9	A	0.12
	SB TR	signal	11	B	0.32	16	B	0.39
	overall	signal	14	B	0.34	19	B	0.64



Table 9: Intersection Operations – 2032 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Bayview Drive & North Village Way/ 505 Bayview Drive	EB L	signal	38	D	0.40	68	E	0.91
	EB TR	signal	40	D	0.04	37	D	0.10
	WB L	signal	45	D	0.01	45	D	0.05
	WB TR	signal	46	D	0.00	47	D	0.06
	NB L	signal	5	A	0.10	7	A	0.36
	NB TR	signal	7	A	0.22	9	A	0.39
	SB L	signal	7	A	0.00	9	A	0.01
	SB TR	signal	9	A	0.40	14	B	0.48
	overall	signal	12	B	0.40	19	B	0.59
Bayview Drive & South Village Way/ Dale Hawerchuk Way	EB L	signal	36	D	0.37	38	D	0.62
	EB TR	signal	39	D	0.07	39	D	0.17
	WB L	signal	43	D	0.20	37	D	0.28
	WB TR	signal	44	D	0.04	41	D	0.12
	NB L	signal	6	A	0.30	13	B	0.67
	NB TR	signal	8	A	0.22	14	B	0.39
	SB L	signal	8	A	0.11	9	A	0.13
	SB TR	signal	11	B	0.35	16	B	0.43
	overall	signal	14	B	0.37	19	B	0.70



Table 10: Intersection Operations – 2037 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Bayview Drive & North Village Way/ 505 Bayview Drive	EB L	signal	38	D	0.41	58	E	0.86
	EB TR	signal	39	D	0.04	37	D	0.10
	WB L	signal	45	D	0.01	47	D	0.06
	WB TR	signal	46	D	0.00	49	D	0.07
	NB L	signal	6	A	0.11	8	A	0.40
	NB TR	signal	8	A	0.23	10	A	0.42
	SB L	signal	7	A	0.00	9	A	0.01
	SB TR	signal	9	A	0.42	15	B	0.51
	overall	signal	12	B	0.42	19	B	0.61
Bayview Drive & South Village Way/ Dale Hawerchuk Way	EB L	signal	36	D	0.38	43	D	0.67
	EB TR	signal	39	D	0.07	41	D	0.18
	WB L	signal	43	D	0.20	40	D	0.28
	WB TR	signal	44	D	0.04	43	D	0.12
	NB L	signal	6	A	0.33	13	B	0.67
	NB TR	signal	8	A	0.23	13	B	0.40
	SB L	signal	8	A	0.11	11	B	0.13
	SB TR	signal	12	B	0.37	18	B	0.46
	overall	signal	14	B	0.39	21	C	0.71

5.3 ROAD NETWORK IMPROVEMENTS

5.3.1 Intersection Operations

No improvements to the study area intersections are considered necessary from a traffic operations perspective to accommodate the proposed YMCA development.



5.3.2 Turn Lane Requirements

Left Turn Lane

An exclusive southbound left turn lane is already present at the South Village Way/Dale Hawerchuk Way intersection, which will serve the YMCA site, and thus no further consideration has been given.

Right Turn Lane

The need for an exclusive northbound right turn lane on Bayview Drive at Dale Hawerchuk Way has been reviewed based on MTO guidelines. MTO guidelines recommend that a right turn lane be considered where the right turning volumes at an intersection exceed 60 vph and/or impede the operation of through traffic. Based on the future total traffic projections (Figure 16 through Figure 18), the 60 vph threshold is not surpassed. Moreover, as indicated in the intersection operational review, the operations of Bayview Drive is not meaningfully impacted by the right turning traffic at Dale Hawerchuk Way. As such, a northbound right turn lane is not required to serve the proposed development.



6 Summary

Proposed Development

This study has addressed the transportation impacts associated with the proposed YMCA development to be located at 535 Bayview Drive in the City of Barrie. The development will consist of a 6,635 m² YMCA facility containing an aquatics centre, fitness and rehabilitation facilities, youth transitional housing, and community and youth outreach services. Upon completion, the development is expected to generate 136 new trips during the weekday AM peak hour and 179 new trips during the weekday PM peak hour.

Transportation Impacts

In assessing the study area traffic operations, the key intersections were analyzed under existing (2024) and future (2027, 2032 and 2037) horizon periods.

Results of the operational analyses indicate that the network currently provides excellent overall operations (LOS B) under existing conditions, with individual movements providing acceptable operations (LOS D or better) with low to average delays. No improvements required to accommodate the existing traffic volumes.

Under future background conditions, the road network is expected to continue to provide excellent overall operations (LOS B), with individual movements providing acceptable operations (LOS E or better) with low to moderate delays. No improvements (beyond signal timing optimizations) were required to accommodate the future background traffic volumes at each future horizon.

Under future total conditions, the road network is expected to continue to provide excellent overall operations (LOS B) through the 2032 horizon and good overall operations (LOS C or better) through the 2037 horizon. Individual movements are expected to provide acceptable operations (LOS E or better) with low to moderate delays through the 2037 horizon. No improvements (beyond signal timing optimizations) were required to accommodate the additional site-generated volumes at each future horizon.

Overall, the proposed YMCA development is not expected to have a material impact on the operations of the adjacent road network.



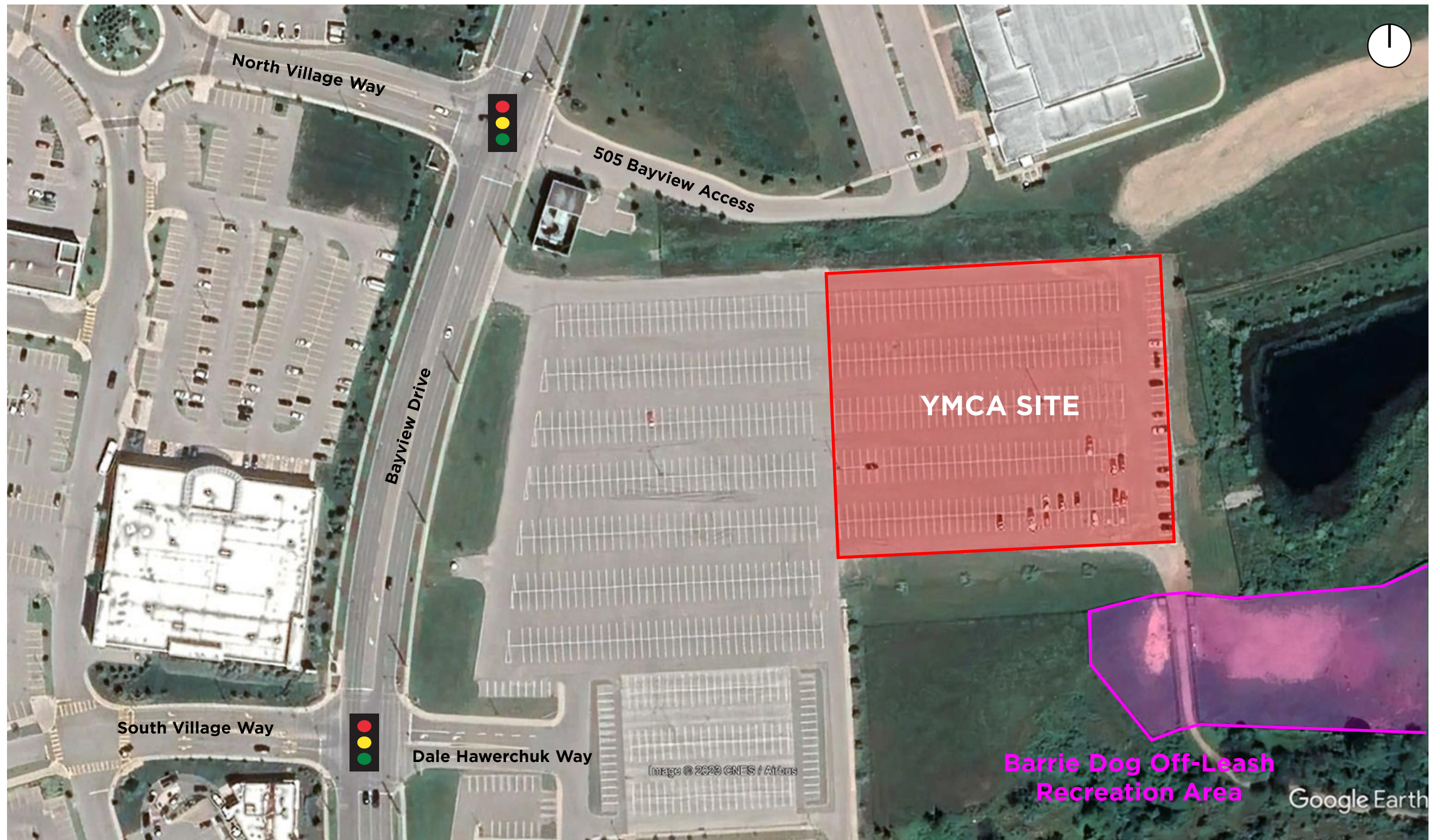


Source: opengis.simcoe.ca

BARRIE YMCA, 535 BAYVIEW DRIVE

Figure 1: Site Location

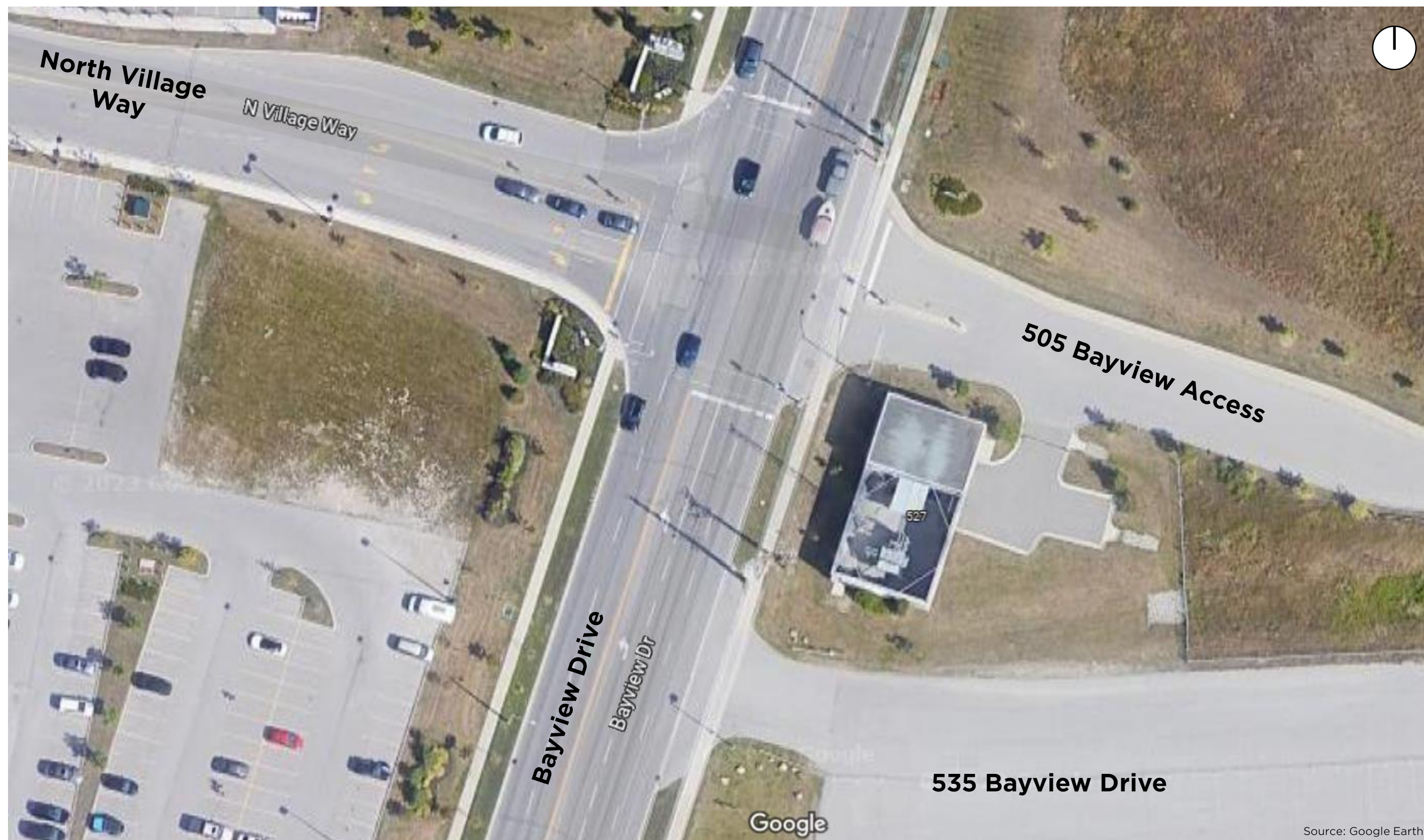




BARRIE YMCA, 535 BAYVIEW DRIVE

Figure 2A: Road Network

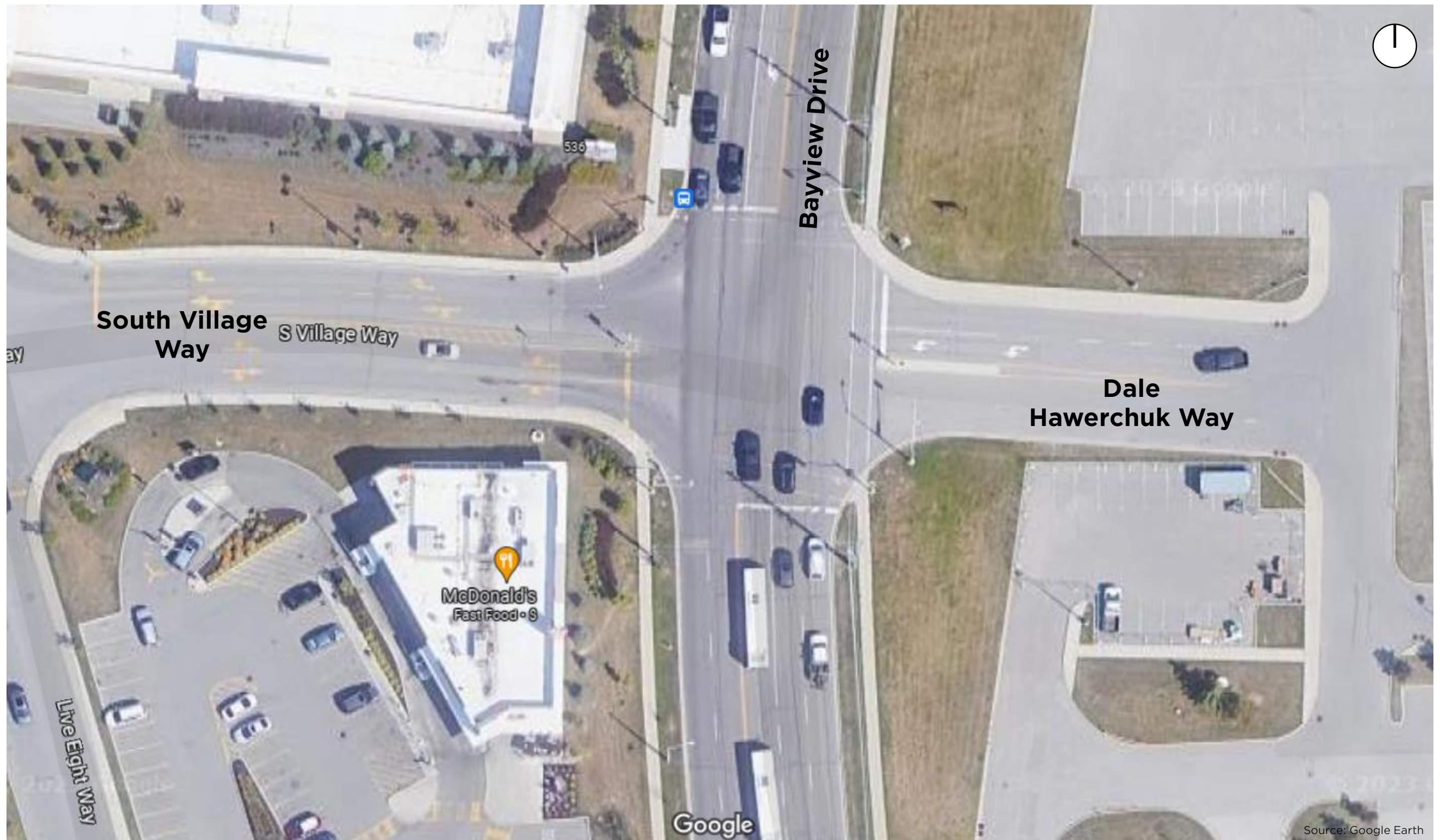




BARRIE YMCA, 535 BAYVIEW DRIVE

Figure 2B: Road Network

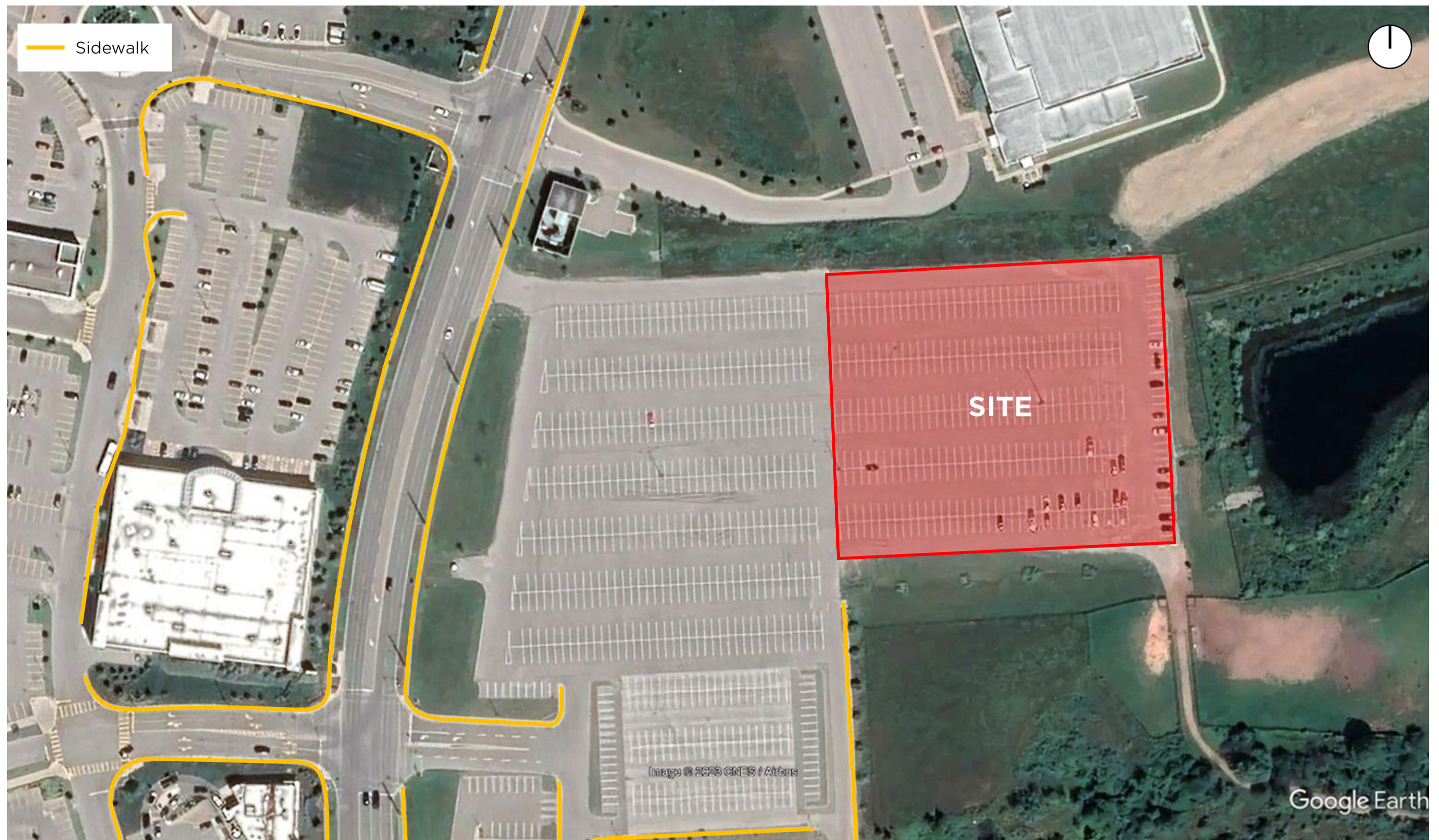




BARRIE YMCA, 535 BAYVIEW DRIVE

Figure 2C: Road Network

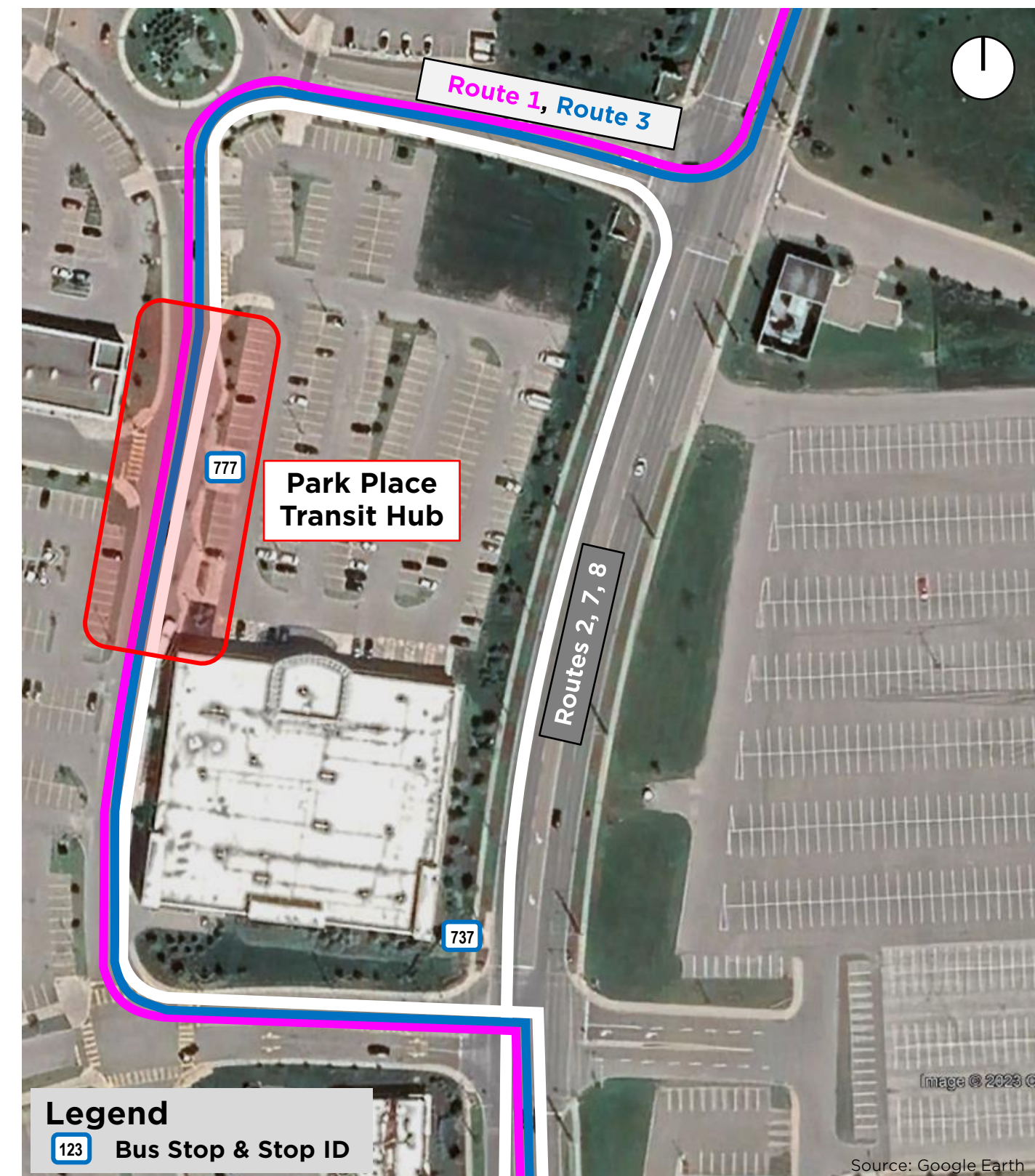




BARRIE YMCA, 535 BAYVIEW DRIVE

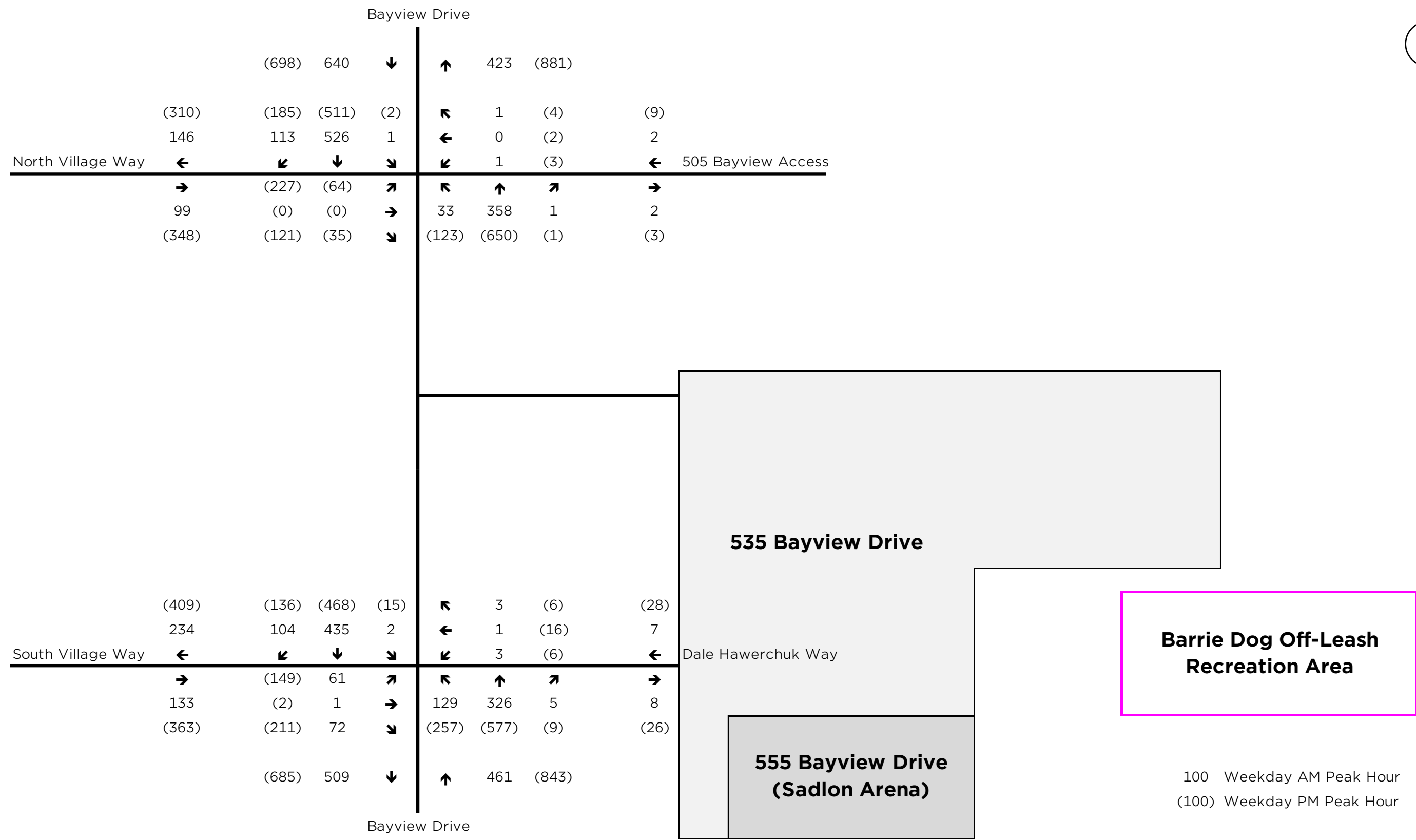
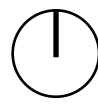
Figure 3: Active Transportation - Existing





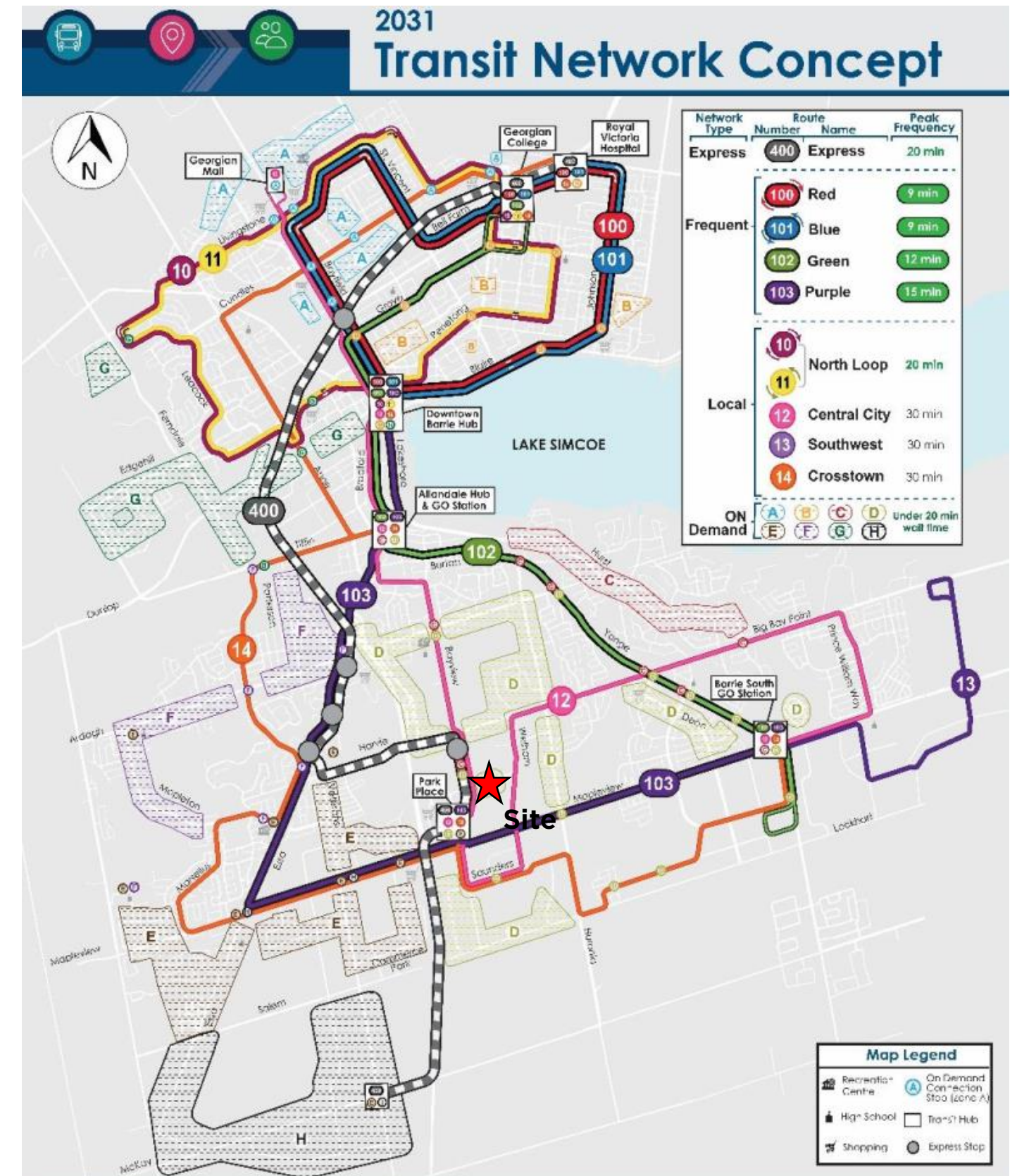
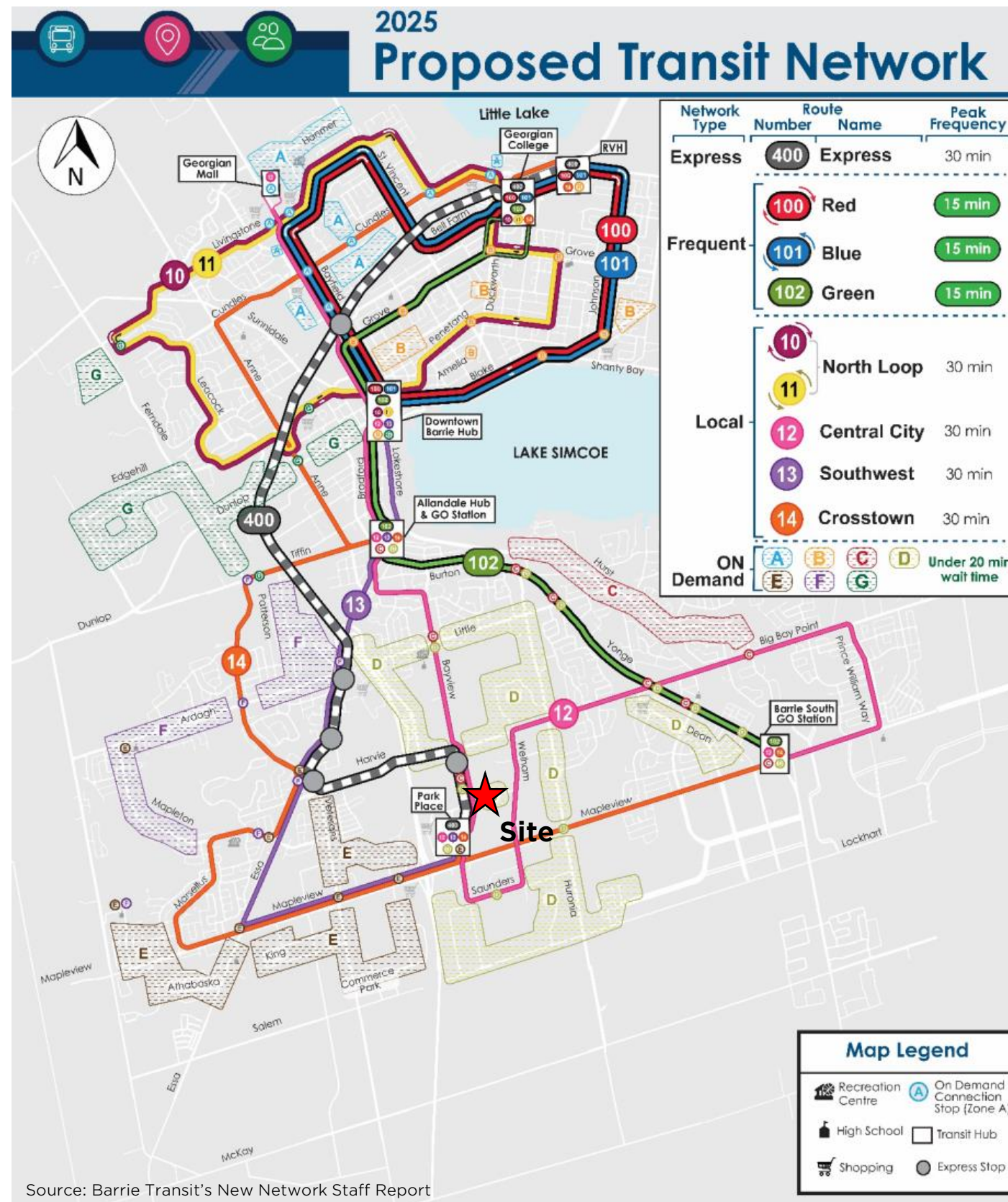
BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 4: Local Transit - Existing Network





BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 5: Traffic Volumes - 2024

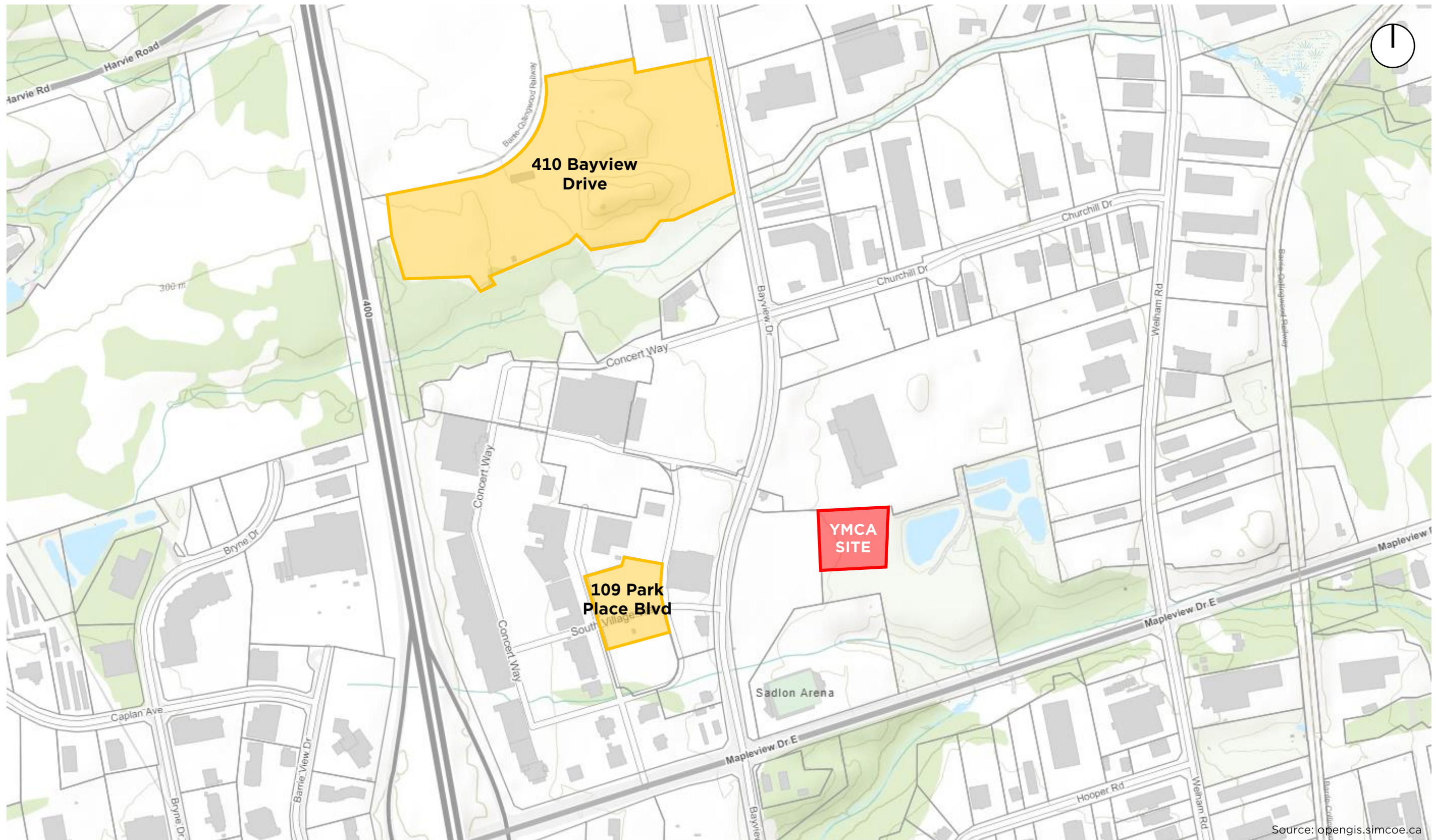




BARRIE YMCA, 535 BAYVIEW DRIVE

Figure 6: Local Transit – Future Network

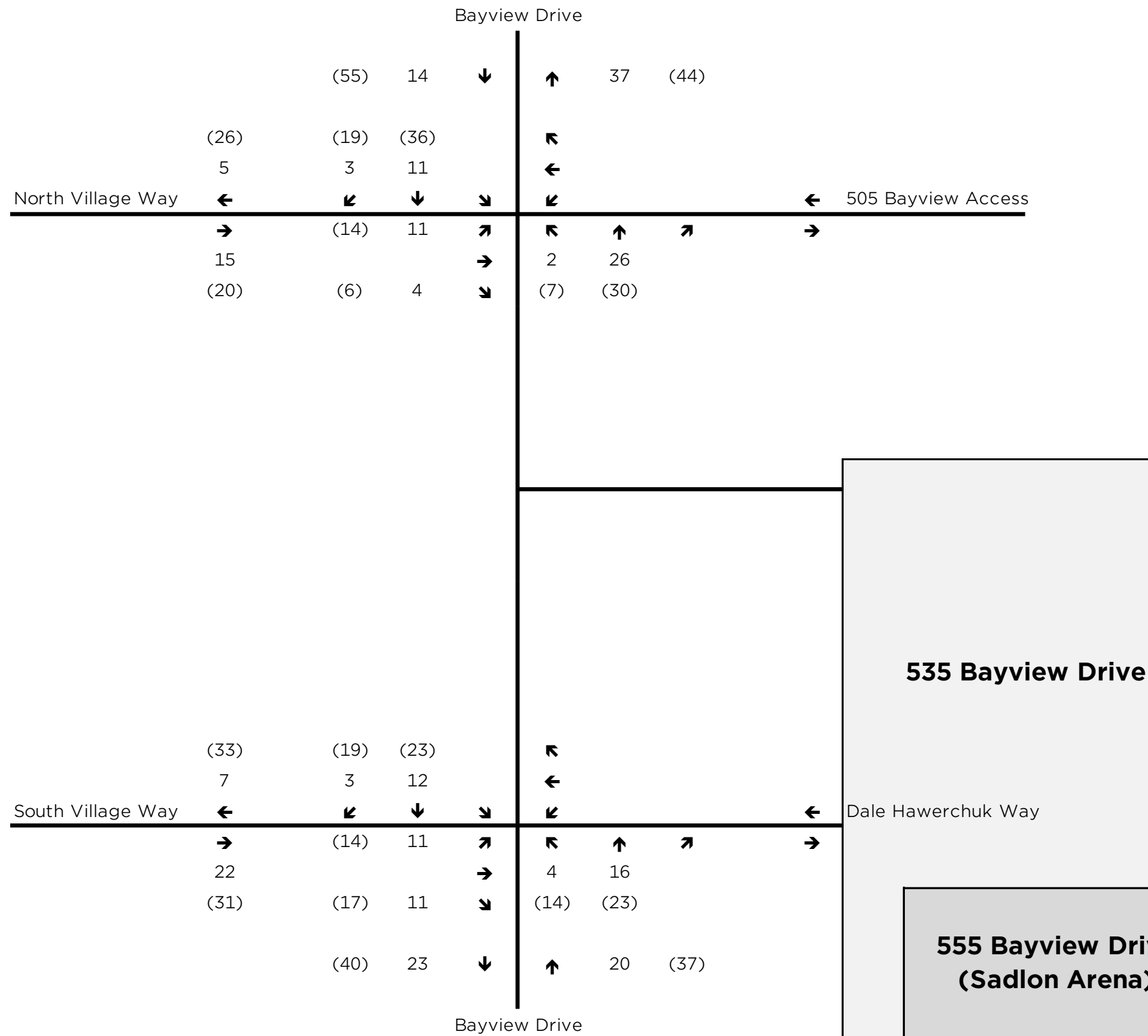
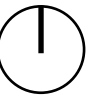




BARRIE YMCA, 535 BAYVIEW DRIVE

Figure 7: Background Developments



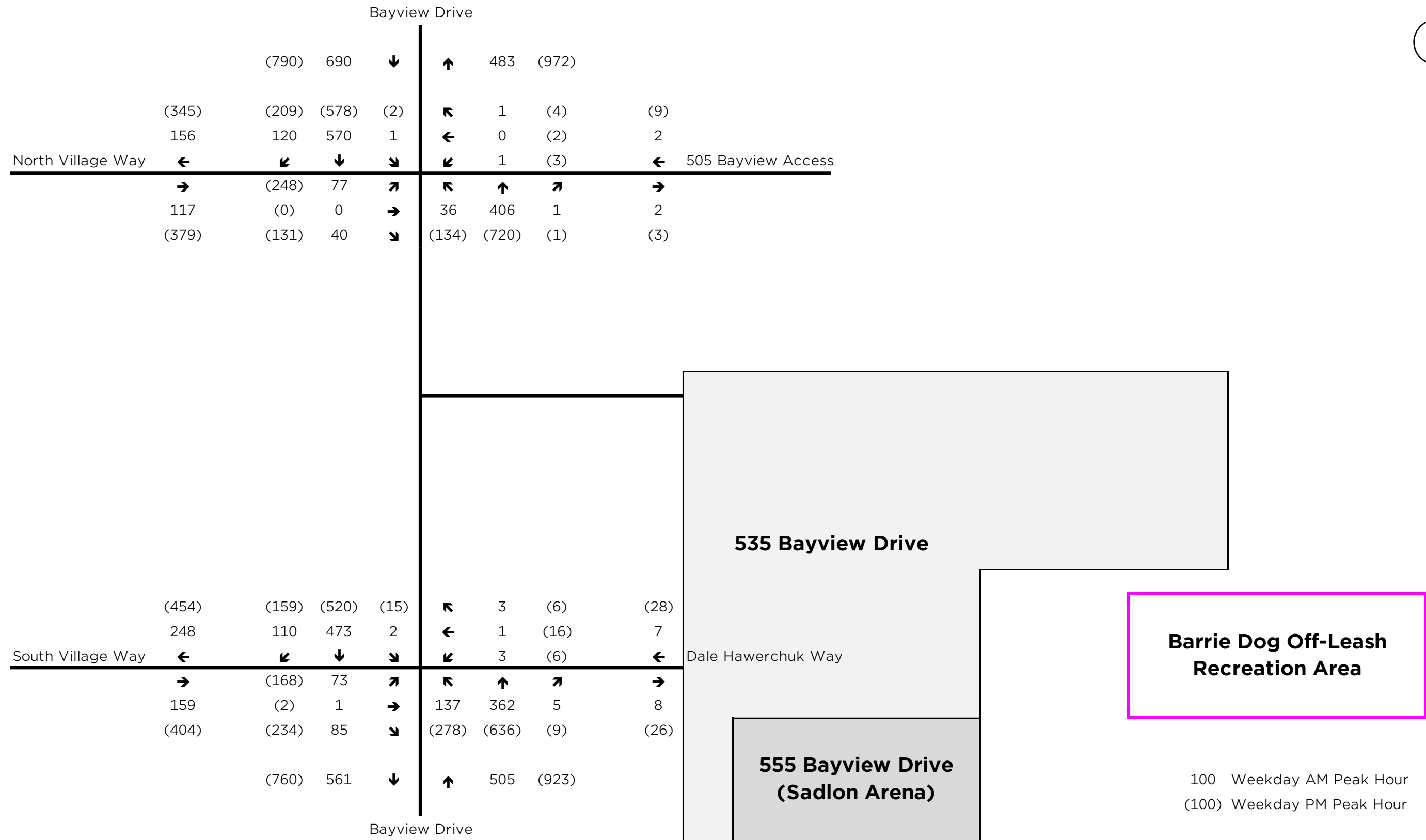


**Barrie Dog Off-Leash
Recreation Area**

100 Weekday AM Peak Hour
(100) Weekday PM Peak Hour

BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 8: Background Development Traffic

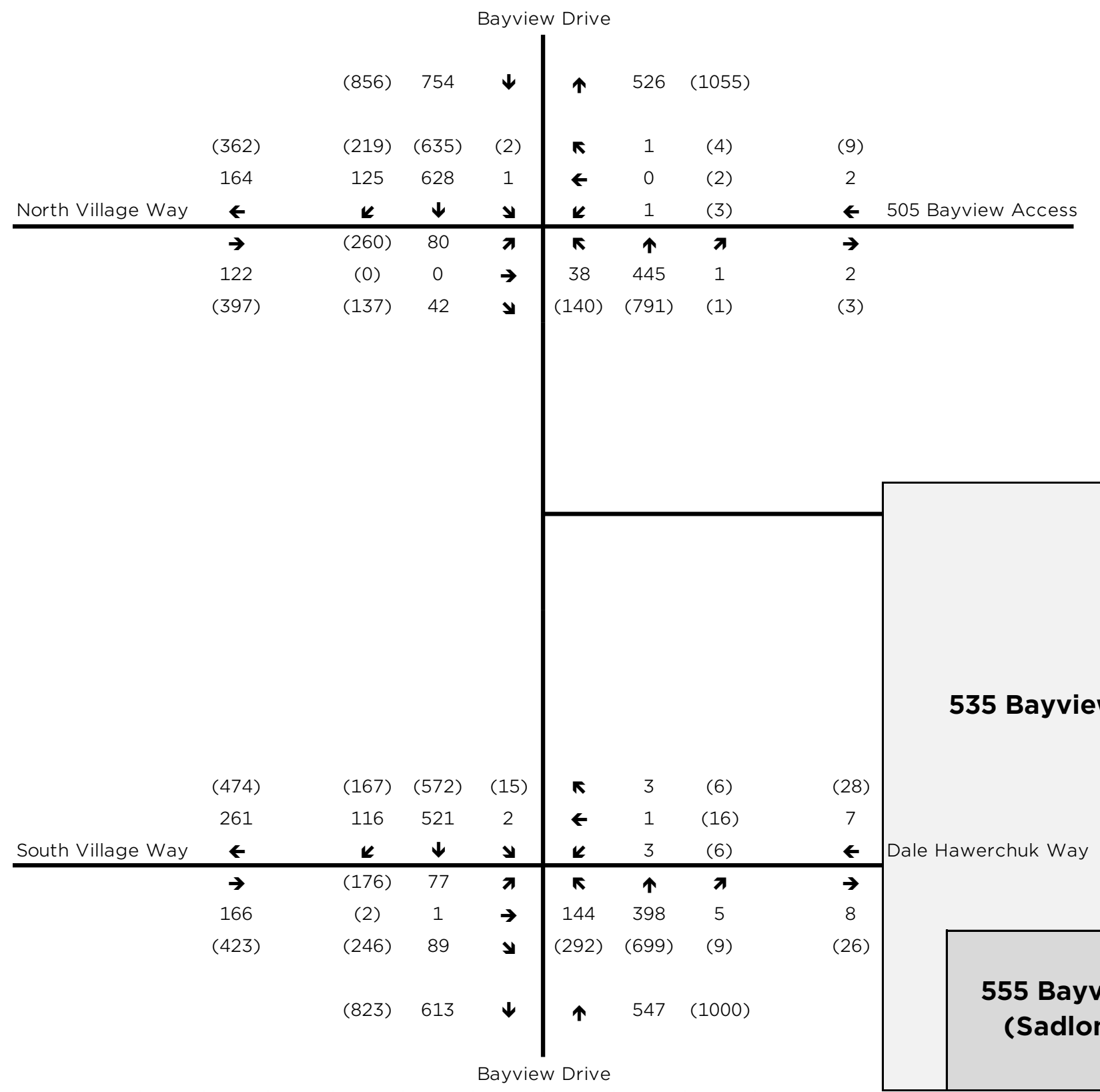
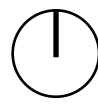




BARRIE YMCA, 535 BAYVIEW DRIVE

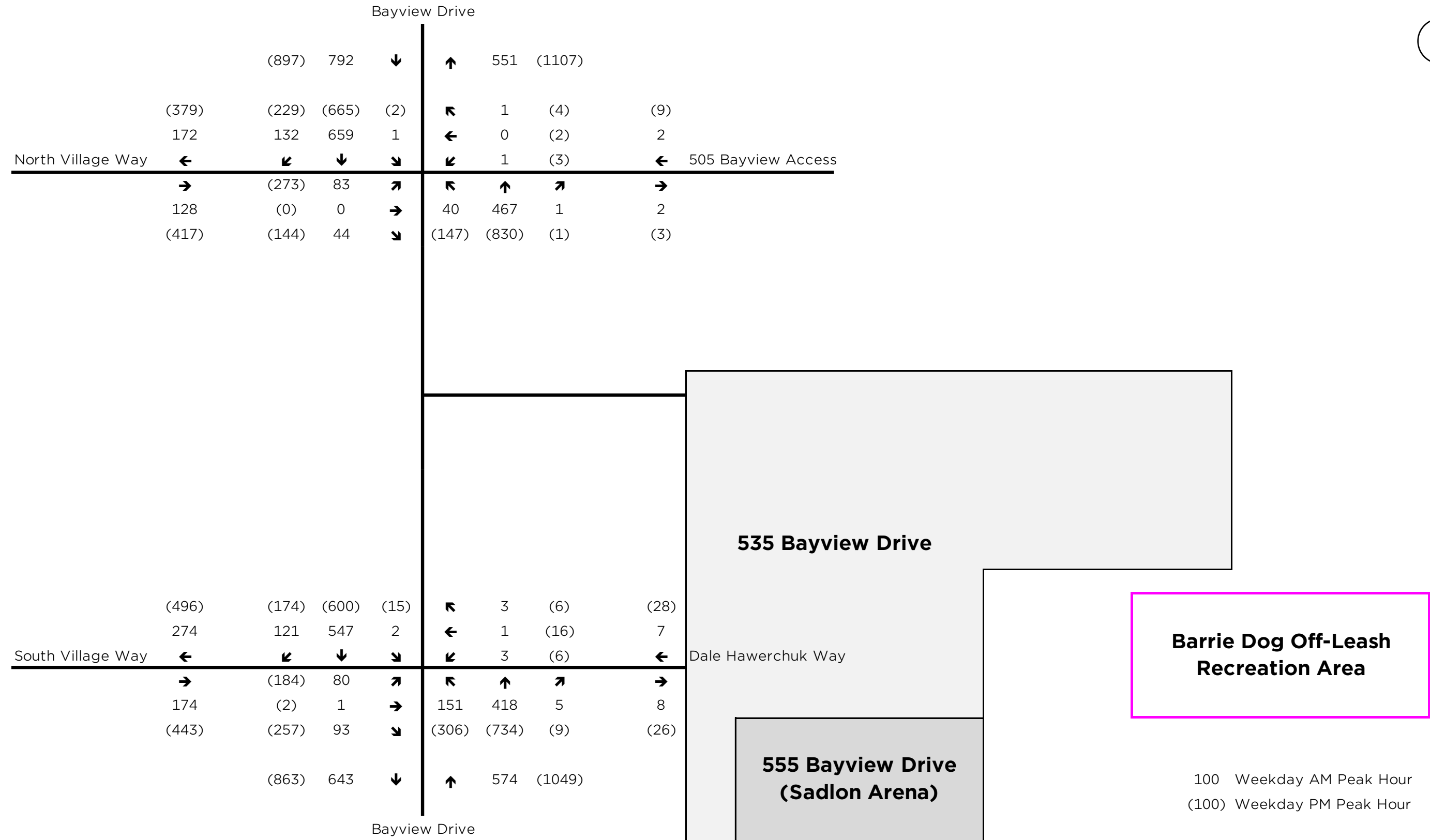
Figure 9: Traffic Volumes – 2027 Background





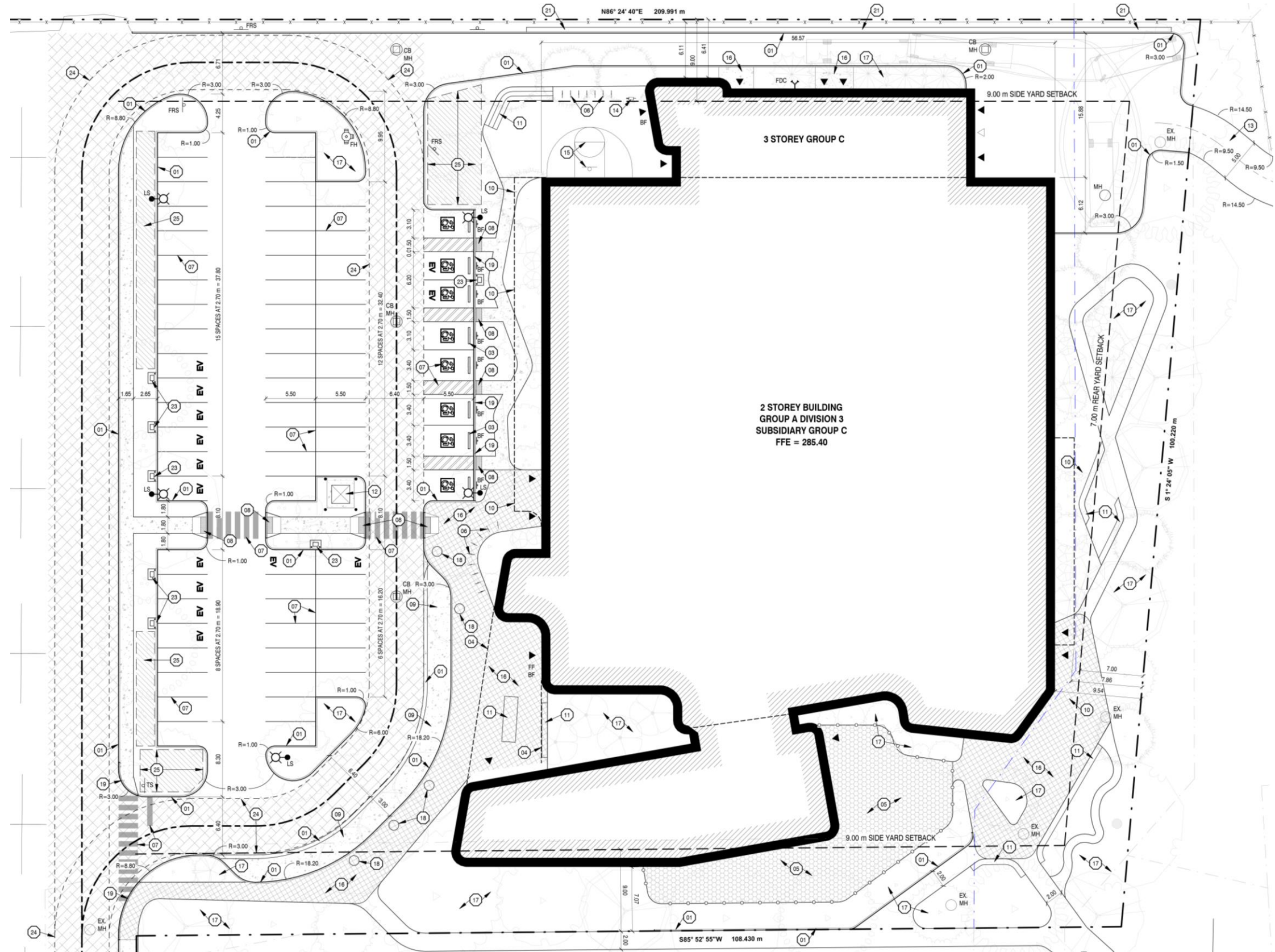
BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 10: Traffic Volumes - 2032 Background





BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 11: Traffic Volumes – 2037 Background

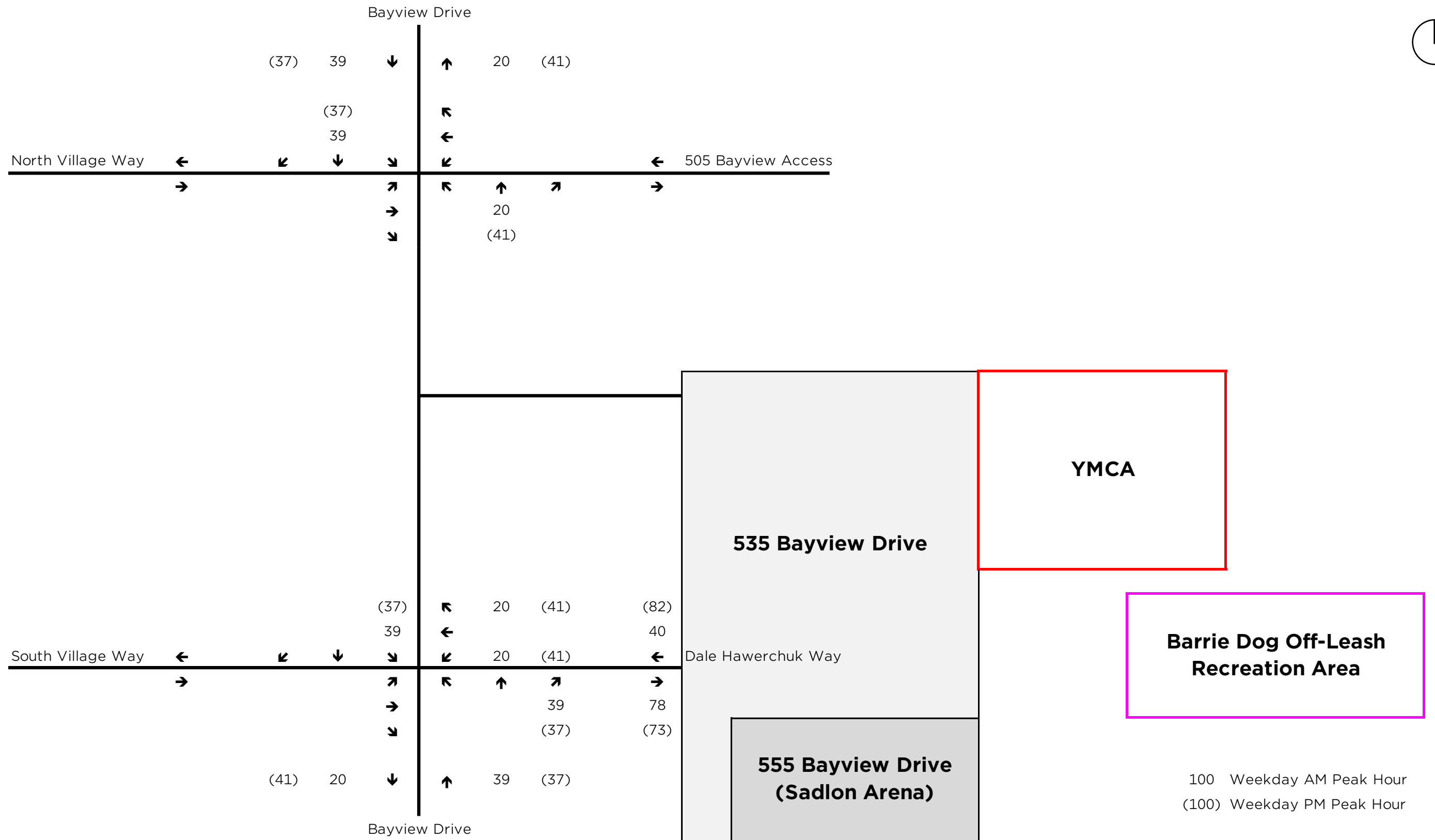
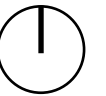




BARRIE YMCA, 535 BAYVIEW DRIVE

Figure 12: Site Plan

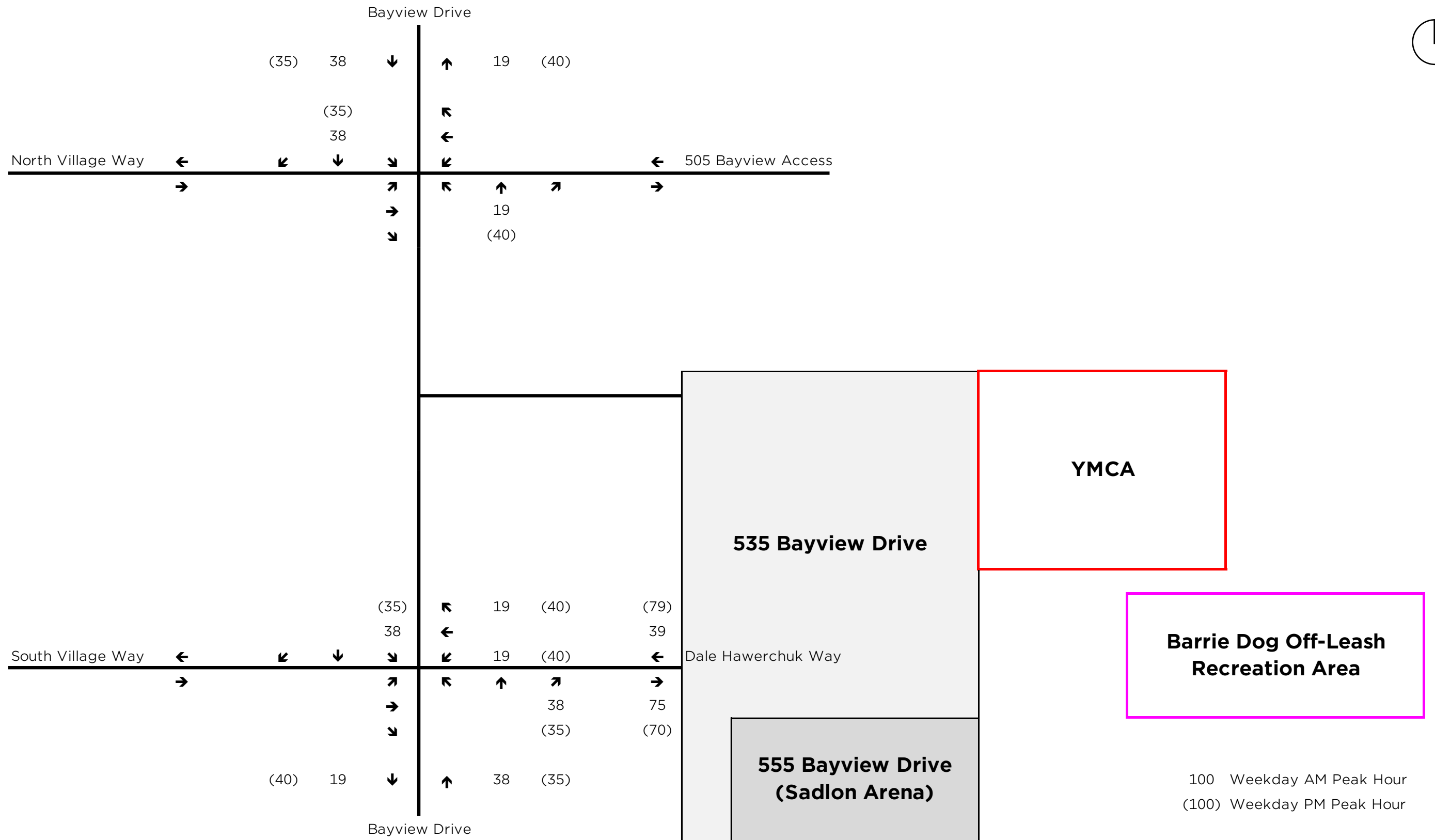
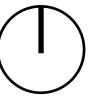




BARRIE YMCA, 535 BAYVIEW DRIVE

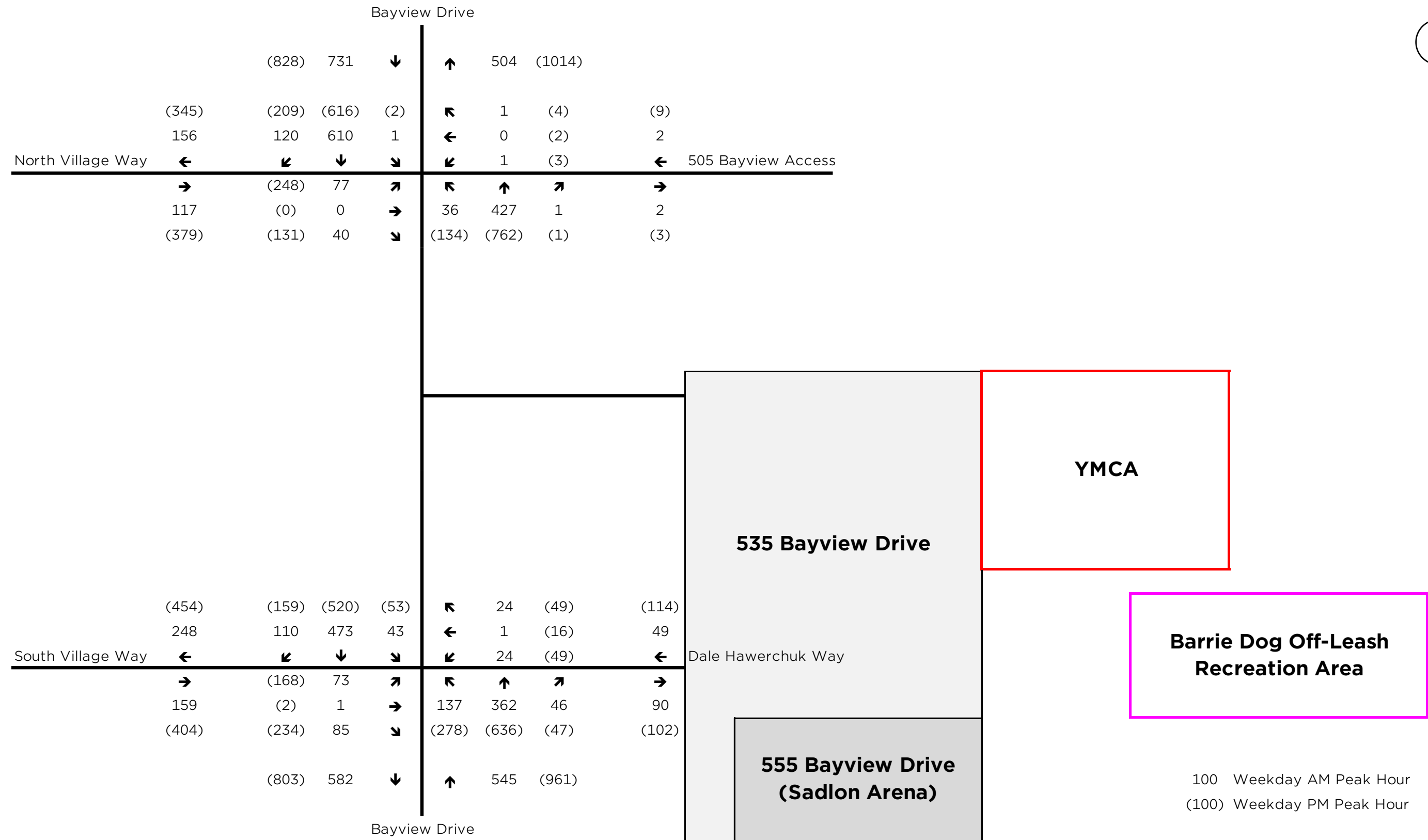
Figure 14: Site-Generated Traffic - 2032





BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 15: Site-Generated Traffic - 2037

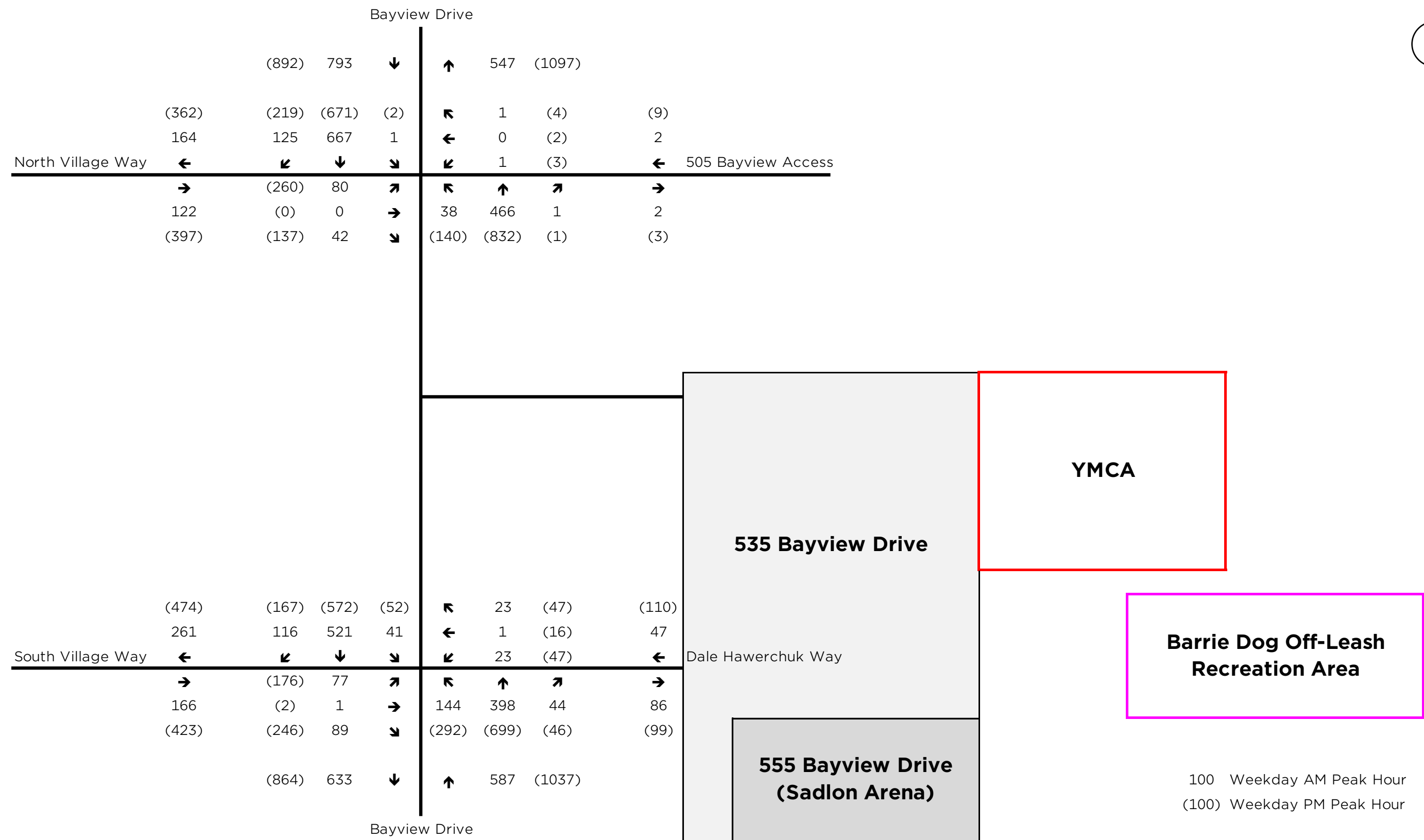




BARRIE YMCA, 535 BAYVIEW DRIVE

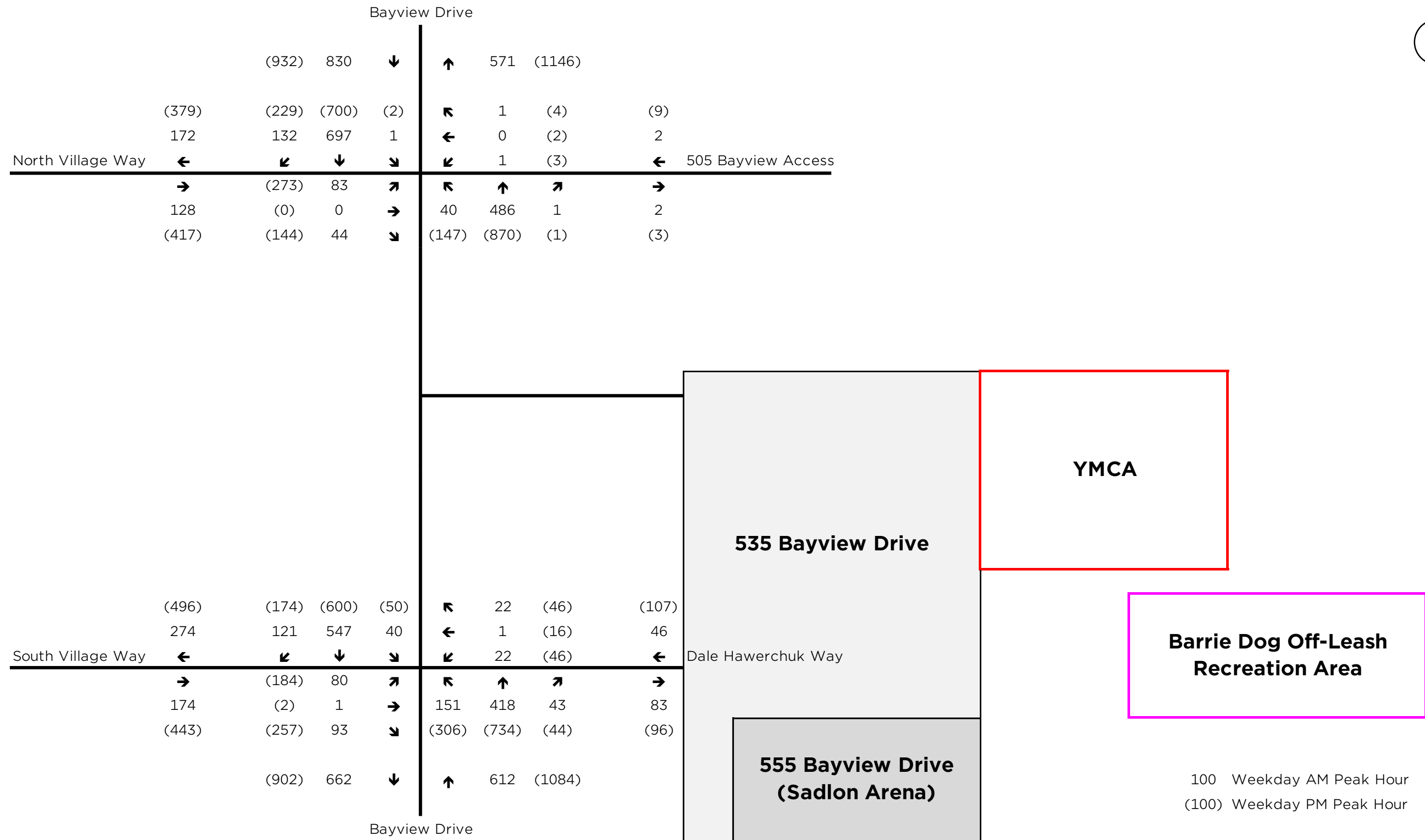
Figure 16: Traffic Volumes – 2027 Total





BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 17: Traffic Volumes – 2032 Total





BARRIE YMCA, 535 BAYVIEW DRIVE
Figure 18: Traffic Volumes – 2037 Total



Appendix A: Study Terms of Reference

From: [Justin MacDonald](#)
Sent: Wednesday, December 13, 2023 4:03 PM
To: [Matthew Buttrum](#)
Subject: RE: 555 Bayview Drive - Terms of Reference
Attachments: Bayview Drive @ North Village Way - Signal Timing Request.pdf; Bayview Drive @ South Village Way - Signal Timing Request.pdf; Bayview Drive & North Village Way.pdf; Bayview Drive & South Village Way.pdf

CAUTION: This email originated from outside of Tatham Engineering or Envision-Tatham. Do not click on links or open attachments unless you know the sender and have verified the sender's email address and know the content is safe.

Good afternoon Matthew,

I have had a chance to review the proposed Terms of Reference and provided information below.

Terms of Reference

1. Study area to consist of the following intersections:
 - a. Bayview Drive & North Village Way
 - b. Bayview Drive & Sadlon Arena North Access (it's my understanding that this access will be relocated further south to increase spacing from North Village Way, and be configured as a RIRO)
 - i. Staff are recommending that the north access be maintained as a service access road for the City's Stormwater Management ponds, for emergency access, and to restrict movement to egress only in accordance with Section 4.3.1.2 of the Official Plan. This option will limit the amount of disturbance to the existing Sadlon Arena parking and drive isles. Provided the existing north access is not needed for general traffic to the YMCA, it will not be required to be moved. Site generated traffic should be directed to the full signal intersection at South Village Way, as identified in Figure 1 - Site Volume - Site Traffic attached. If a redevelopment of the full frontage of Bayview Drive is required and/or proposed in the future, the north access will be reassessed to meet transportation standards, recognizing the lease agreement may need to be reviewed should this happen in the future.
 - c. Bayview Drive & South Village Way/Dale Hawerchuk Way
 - i. Requested STP attached.
2. Study horizons: 2023 (existing), 2027 (full build-out), 2032 and 2037 (5 and 10 years beyond build-out).
3. Traffic volumes will be based on recent traffic counts completed at each study area intersection identified above. If the City does not have recent data available at these intersections, new counts will be completed.
 - a. City has the following counts.
 - i. Bayview at North Village (2019)
 - ii. Bayview at South Village (2019)
 - b. I would recommend undertaking counts as well given the historic counts would not reflect the Harvie / BBP connection and amended travel patterns.
4. Establish future traffic volumes through application of general background growth (derived based on the City's EMME model) to study roads. Further consideration will be given to any other background developments proposed or underway in the area identified by the City.
 - a. Background Development:
 - i. [109 Park Place Boulevard | City of Barrie](#)
 - ii. [410 Bayview Drive | City of Barrie](#)

5. Provide details of the proposed development and estimate trip generation based on trip rates contained within the *ITE Trip Generation Manual, 11th Edition*. Trips will be distributed based on the location of the site within the City, recognizing that much of the site traffic will be generated locally within Barrie. Mode share adjustments in line with City targets will be considered at each future horizon.
6. Assess operations of the study area intersections for the weekday AM and PM peak periods using Synchro software. Operations will be assessed under existing (2023) conditions and at future horizons (2027, 2032 and 2037) both with and without the subject development. Any improvements required to accommodate the existing or future conditions will be identified.
7. Review the available sight distance at each proposed site access point.
8. Provide commentary on existing and proposed active transportation infrastructure and transit services in the area.
9. Review and provide commentary on internal circulation of vehicle and pedestrian traffic.
 - a. Please also include access to the SWM.
 - b. Pedestrian circulation to adjacent land uses and public open spaces.
10. Document the above into a Traffic Impact Study report for submission to the City for review and approval.

Justin MacDonald, C.E.T., PTP
Project Delivery – Transportation Planning, Development Services
The City of Barrie
Mobile 705-734-8020
Please consider the environment before printing this email.

From: Matthew Buttrum <mbuttrum@tathameng.com>
Sent: Tuesday, December 5, 2023 10:22 AM
To: Justin MacDonald <Justin.MacDonald@barrie.ca>
Subject: 555 Bayview Drive - Terms of Reference

Hi Justin,

We (Tatham Engineering Limited) have been retained to prepare a traffic impact study in support of the proposed YMCA development to be located at 555 Bayview Drive. We have prepared this Terms of Reference for your review prior to commencement of the study.

Development Details

As noted, the development site is located at 555 Bayview Drive, in the northeast corner of the existing parking lot for the Sadlon Arena. As per the most recent concept plans, the development will consist of a 3-storey, 72,000 ft² YMCA facility. The site is estimated to generate in the order of 140 trips during the weekday AM peak and 180 trips during the weekday PM peak.

Attached is a figure demonstrating anticipated trip generation and distribution through the proposed study area.

Terms of Reference

1. Study area to consist of the following intersections:
 - a. Bayview Drive & North Village Way
 - b. Bayview Drive & Sadlon Arena North Access (it's my understanding that this access will be relocated further south to increase spacing from North Village Way, and be configured as a RIRO)
 - c. Bayview Drive & South Village Way/Dale Hawerchuk Way
Could you please supply the signal timing plans in use at North Village Way and South Village Way for use in our assessments.
2. Study horizons: 2023 (existing), 2027 (full build-out), 2032 and 2037 (5 and 10 years beyond build-out).

3. Traffic volumes will be based on recent traffic counts completed at each study area intersection identified above. If the City does not have recent data available at these intersections, new counts will be completed.
4. Establish future traffic volumes through application of general background growth (derived based on the City's EMME model) to study roads. Further consideration will be given to any other background developments proposed or underway in the area identified by the City.
5. Provide details of the proposed development and estimate trip generation based on trip rates contained within the *ITE Trip Generation Manual, 11th Edition*. Trips will be distributed based on the location of the site within the City, recognizing that much of the site traffic will be generated locally within Barrie. Mode share adjustments in line with City targets will be considered at each future horizon.
6. Assess operations of the study area intersections for the weekday AM and PM peak periods using Synchro software. Operations will be assessed under existing (2023) conditions and at future horizons (2027, 2032 and 2037) both with and without the subject development. Any improvements required to accommodate the existing or future conditions will be identified.
7. Review the available sight distance at each proposed site access point.
8. Provide commentary on existing and proposed active transportation infrastructure and transit services in the area.
9. Review and provide commentary on internal circulation of vehicle and pedestrian traffic.
10. Document the above into a Traffic Impact Study report for submission to the City for review and approval.

Please review the above Terms of Reference and provide any necessary feedback. I look forward to hearing back from you.

Regards,



Matthew Buttrum EIT
Engineering Intern

mbuttrum@tathameng.com T 705-733-9037 x2222
41 King Street, Unit 4, Barrie, Ontario L4N 6B5

tathameng.com



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Appendix B: Traffic Data

Morning Peak Diagram		Specified Period From: 7:00:00 To: 10:00:00	One Hour Peak From: 9:00:00 To: 10:00:00
Municipality: Barrie Site #: 2327900001 Intersection: Bayview Dr & North Village Way TFR File #: 1 Count date: 20-Dec-23		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Bayview Dr runs N/S	

North Leg Total: 1043 North Entering: 629 North Peds: 2 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 1</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">7</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 3</td> <td style="padding: 2px;">26</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">29</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 108</td> <td style="padding: 2px;">484</td> <td style="padding: 2px;">1</td> <td style="border-right: 1px solid black; padding: 2px;">593</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 112</td> <td style="padding: 2px;">516</td> <td style="padding: 2px;">1</td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </table>	Buses 1	6	0	7		Trucks 3	26	0	29		Cars 108	484	1	593		Totals 112	516	1			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 6</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 16</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 392</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 414</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </table>	Buses 6					Trucks 16					Cars 392					Totals 414					East Leg Total: 2 East Entering: 0 East Peds: 4 Peds Cross:
Buses 1	6	0	7																																								
Trucks 3	26	0	29																																								
Cars 108	484	1	593																																								
Totals 112	516	1																																									
Buses 6																																											
Trucks 16																																											
Cars 392																																											
Totals 414																																											

Buses	Trucks	Cars	Totals
1	4	140	145

Bayview Dr

Cars	Trucks	Buses	Totals
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Buses	Trucks	Cars	Totals
5	0	58	63
0	0	0	0
10	0	25	35
15	0	83	

North Village Way

driveway

Cars	Trucks	Buses	Totals
2	0	0	2

Peds Cross:
 West Peds: 4
 West Entering: 98
 West Leg Total: 243

Bayview Dr

Cars 32	334	1	367	
Trucks 1	16	0	17	
Buses 0	1	0	1	
Totals 33	351	1		

Peds Cross:
 South Peds: 0
 South Entering: 385
 South Leg Total: 936

Comments

Afternoon Peak Diagram		Specified Period From: 15:00:00 To: 18:00:00	One Hour Peak From: 16:15:00 To: 17:15:00
Municipality: Barrie Site #: 2327900001 Intersection: Bayview Dr & North Village Way TFR File #: 1 Count date: 20-Dec-23		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Bayview Dr runs N/S	

North Leg Total: 1552 North Entering: 686 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 0</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">3</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 1</td> <td style="padding: 2px;">14</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">15</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 182</td> <td style="padding: 2px;">484</td> <td style="padding: 2px;">2</td> <td style="border-right: 1px solid black; padding: 2px;">668</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 183</td> <td style="padding: 2px;">501</td> <td style="padding: 2px;">2</td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </table>	Buses 0	3	0	3		Trucks 1	14	0	15		Cars 182	484	2	668		Totals 183	501	2			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 5</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 19</td> <td style="padding: 2px;">19</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 842</td> <td style="padding: 2px;">842</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 866</td> <td style="padding: 2px;">866</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </table>	Buses 5	5				Trucks 19	19				Cars 842	842				Totals 866	866				East Leg Total: 12 East Entering: 9 East Peds: 0 Peds Cross:
Buses 0	3	0	3																																								
Trucks 1	14	0	15																																								
Cars 182	484	2	668																																								
Totals 183	501	2																																									
Buses 5	5																																										
Trucks 19	19																																										
Cars 842	842																																										
Totals 866	866																																										

Buses	Trucks	Cars	Totals
0	3	304	307

Bayview Dr

Cars	Trucks	Buses	Totals
4	0	0	4
2	0	0	2
3	0	0	3
9	0	0	

North Village Way

Buses	Trucks	Cars	Totals
5	0	220	225
0	0	0	0
10	1	109	120
15	1	329	

Bayview Dr

driveway

Peds Cross:
 West Peds: 1
 West Entering: 345
 West Leg Total: 652

Cars 596	120	618	1	739
Trucks 15	2	19	0	21
Buses 13	0	0	0	0
Totals 624	122	637	1	

Peds Cross:
 South Peds: 0
 South Entering: 760
 South Leg Total: 1384

Comments

Total Count Diagram

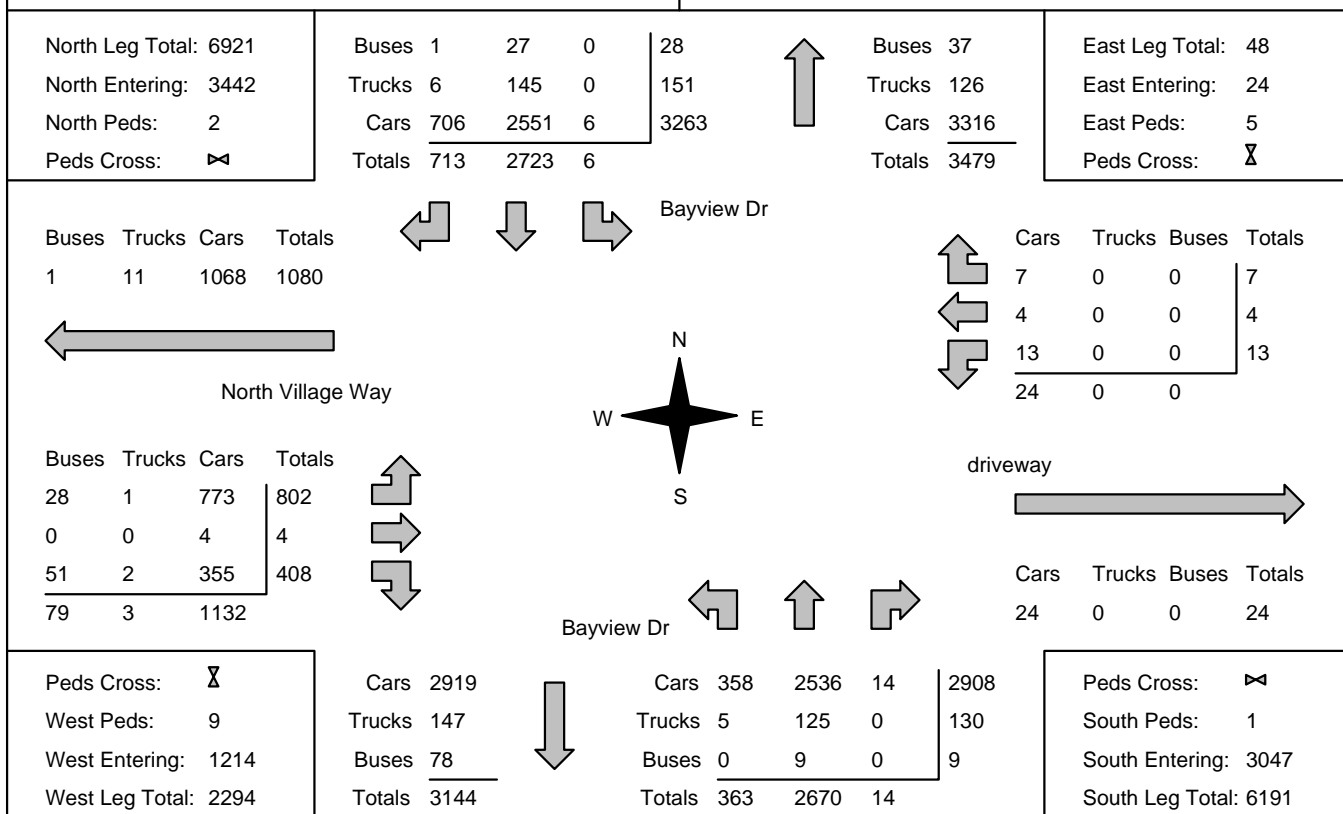
Municipality: Barrie
Site #: 2327900001
Intersection: Bayview Dr & North Village Way
TFR File #: 1
Count date: 20-Dec-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Bayview Dr runs N/S



Comments

Traffic Count Summary

Intersection: Bayview Dr & North Village Way

Count Date: 20-Dec-23

Municipality: Barrie

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	1	382	25	408	0	678	8:00:00	8	254	8	270	0
9:00:00	1	460	50	511	0	830	9:00:00	8	308	3	319	1
10:00:00	1	516	112	629	2	1014	10:00:00	33	351	1	385	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	1	449	160	610	0	1168	16:00:00	79	479	0	558	0
17:00:00	2	512	175	689	0	1442	17:00:00	118	634	1	753	0
18:00:00	0	404	191	595	0	1357	18:00:00	117	644	1	762	0

Morning Peak Diagram		Specified Period From: 7:00:00 To: 10:00:00	One Hour Peak From: 9:00:00 To: 10:00:00
Municipality: Barrie Site #: 2327900002 Intersection: Bayview Dr & South Village Way TFR File #: 1 Count date: 20-Dec-23		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Bayview Dr runs N/S	

North Leg Total: 914 North Entering: 531 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 0</td> <td style="padding: 2px;">16</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">16</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 2</td> <td style="padding: 2px;">22</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">25</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 101</td> <td style="padding: 2px;">388</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">490</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 103</td> <td style="padding: 2px;">426</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;"></td> </tr> </table>	Buses 0	16	0	16	Trucks 2	22	1	25	Cars 101	388	1	490	Totals 103	426	2		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 1</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 17</td> <td style="padding: 2px;">17</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 365</td> <td style="padding: 2px;">365</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 383</td> <td style="padding: 2px;">383</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </table>	Buses 1	1			Trucks 17	17			Cars 365	365			Totals 383	383			East Leg Total: 15 East Entering: 7 East Peds: 2 Peds Cross:
Buses 0	16	0	16																																
Trucks 2	22	1	25																																
Cars 101	388	1	490																																
Totals 103	426	2																																	
Buses 1	1																																		
Trucks 17	17																																		
Cars 365	365																																		
Totals 383	383																																		

Buses	Trucks	Cars	Totals
14	3	215	232

Bayview Dr

Cars	Trucks	Buses	Totals
2	1	0	3
1	0	0	1
3	0	0	3
6	1	0	

South Village Way

Buses	Trucks	Cars	Totals
0	0	60	60
0	0	1	1
0	3	68	71
0	3	129	

Bayview Dr

Cars	Trucks	Buses	Totals
113	1	0	114
303	16	1	320
4	1	0	5
420	18	15	

driveway

Cars	Trucks	Buses	Totals
6	2	0	8

Cars	Trucks	Buses	Totals
459	25	16	500

Cars	Trucks	Buses	Totals
113	1	0	114
303	16	1	320
4	1	0	5
420	18	15	

Cars	Trucks	Buses	Totals
6	2	0	8

Peds Cross: West Peds: 7 West Entering: 132 West Leg Total: 364	Cars 459 Trucks 25 Buses 16 Totals 500	Cars 113 Trucks 1 Buses 14 Totals 128	Cars 303 Trucks 16 Buses 1 Totals 320	Cars 4 Trucks 1 Buses 0 Totals 5	Peds Cross: South Peds: 0 South Entering: 453 South Leg Total: 953
--------------------------------------------------------------------------	-------------------------------------------------	------------------------------------------------	------------------------------------------------	-------------------------------------------	-----------------------------------------------------------------------------

Comments

Afternoon Peak Diagram		Specified Period From: 15:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
Municipality: Barrie Site #: 2327900002 Intersection: Bayview Dr & South Village Way TFR File #: 1 Count date: 20-Dec-23		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Bayview Dr runs N/S	

North Leg Total: 1329 North Entering: 609 North Peds: 1 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 2</td> <td style="padding: 2px;">11</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">13</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 1</td> <td style="padding: 2px;">14</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">15</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 132</td> <td style="padding: 2px;">434</td> <td style="padding: 2px;">15</td> <td style="border-right: 1px solid black; padding: 2px;">581</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 135</td> <td style="padding: 2px;">459</td> <td style="padding: 2px;">15</td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> </table>	Buses 2	11	0	13	Trucks 1	14	0	15	Cars 132	434	15	581	Totals 135	459	15		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 1</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 19</td> <td style="padding: 2px;">19</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 700</td> <td style="padding: 2px;">700</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 720</td> <td style="padding: 2px;">720</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> </table>	Buses 1	1			Trucks 19	19			Cars 700	700			Totals 720	720			East Leg Total: 53 East Entering: 27 East Peds: 2 Peds Cross:
Buses 2	11	0	13																																
Trucks 1	14	0	15																																
Cars 132	434	15	581																																
Totals 135	459	15																																	
Buses 1	1																																		
Trucks 19	19																																		
Cars 700	700																																		
Totals 720	720																																		

Buses	Trucks	Cars	Totals
15	1	388	404

Bayview Dr

Cars	Trucks	Buses	Totals
6	0	0	6
15	0	0	15
6	0	0	6
27	0	0	

South Village Way

Bayview Dr

driveway

Buses	Trucks	Cars	Totals
0	1	147	148
0	0	2	2
0	0	209	209
0	1	358	

Bayview Dr

Cars	Trucks	Buses	Totals
26	0	0	26

Peds Cross: West Peds: 7 West Entering: 359 West Leg Total: 763	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 649</td> <td style="padding: 2px;">649</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 14</td> <td style="padding: 2px;">14</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 11</td> <td style="padding: 2px;">11</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 674</td> <td style="padding: 2px;">674</td> <td style="padding: 2px;"></td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> </table>	Cars 649	649			Trucks 14	14			Buses 11	11			Totals 674	674			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 241</td> <td style="padding: 2px;">241</td> <td style="padding: 2px;">547</td> <td style="padding: 2px;">9</td> <td style="border-right: 1px solid black; padding: 2px;">797</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">18</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">18</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 13</td> <td style="padding: 2px;">13</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">0</td> <td style="border-right: 1px solid black; padding: 2px;">14</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 254</td> <td style="padding: 2px;">254</td> <td style="padding: 2px;">566</td> <td style="padding: 2px;">9</td> <td style="border-right: 1px solid black; padding: 2px;"></td> </tr> </table>	Cars 241	241	547	9	797	Trucks 0	0	18	0	18	Buses 13	13	1	0	14	Totals 254	254	566	9		Peds Cross: South Peds: 1 South Entering: 829 South Leg Total: 1503
Cars 649	649																																						
Trucks 14	14																																						
Buses 11	11																																						
Totals 674	674																																						
Cars 241	241	547	9	797																																			
Trucks 0	0	18	0	18																																			
Buses 13	13	1	0	14																																			
Totals 254	254	566	9																																				

Comments

Total Count Diagram

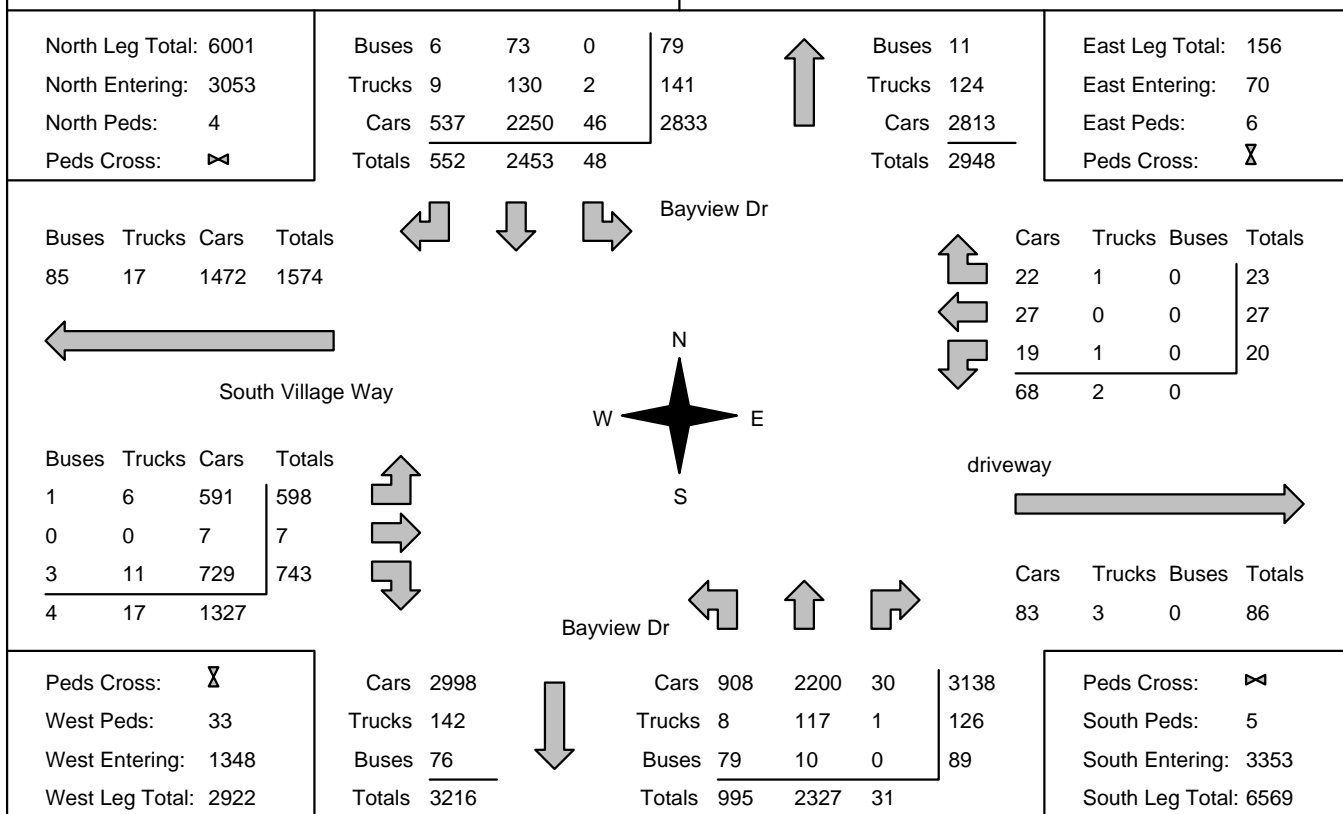
Municipality: Barrie
Site #: 2327900002
Intersection: Bayview Dr & South Village Way
TFR File #: 1
Count date: 20-Dec-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Bayview Dr runs N/S



Comments

Traffic Count Summary

Intersection: Bayview Dr & South Village Way						Count Date: 20-Dec-23		Municipality: Barrie				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	3	336	58	397	0	682	8:00:00	60	225	0	285	0
9:00:00	3	381	82	466	1	825	9:00:00	82	271	6	359	0
10:00:00	2	426	103	531	0	984	10:00:00	128	320	5	453	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	13	468	82	563	1	1168	16:00:00	205	392	8	605	0
17:00:00	15	459	135	609	1	1438	17:00:00	254	566	9	829	1
18:00:00	12	383	92	487	1	1309	18:00:00	266	553	3	822	4

December 11, 2023

File: T07-SI

Dear Matthew Buttrum, EIT

RE: Traffic Signal Timings – Bayview Drive and North Village Way

With respect to your inquiry on December 5, 2023, the above intersection traffic signal timings are as follows:

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Bayview Drive (Main Street)	Northbound/ Southbound	50	50	4	2	7	27
Bayview Drive (Main Street)	Advanced NBLT/ Advanced SBLT	7	10	3	1	N/A	N/A
North Village Way (Side Street)	Eastbound/ Westbound	10	27	4	2	7	20
North Village Way (Side Street)	Advanced EBLT/ Advanced WBLT	7	10	3	1	N/A	N/A

NOTE: All times are recorded in seconds, based on full demand.

The side street phases are actuated; meaning a vehicle or pedestrian must be present on the side street before the side street is given a green indication. Actuation at this intersection occurs in two ways: first, for vehicles a loop detector is imbedded into the roadway at the painted stop bar; and secondly, pushbuttons are located on each corner for pedestrians to activate their movement. Vehicle presence only on the side street would result in a possible green time of between the minimum and maximum times noted above, depending on demand.

Pedestrian “Walk” and “Flashing Don’t Walk” times on the side street as noted would be used in the event that the pedestrian push button was activated. Should there be no demand on the actuated phases; the signals would rest in a green indication for the main street.

Should you require any further information please feel free to contact me at (705) 739-4220 ext. 5178.

Yours truly,

Justin MacDonald, C.E.T., PTP
Senior Transportation Technologist

December 11, 2023

File: T07-SI

Dear Matthew Buttrum, EIT

RE: Traffic Signal Timings – Bayview Drive and South Village Way

With respect to your inquiry on December 5, 2023, the above intersection traffic signal timings are as follows:

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Bayview Drive (Main Street)	Northbound/ Southbound	50	50	4	2	7	26
Bayview Drive (Main Street)	Advanced NBLT/ Advanced SBLT	7	10	3	1	N/A	N/A
North Village Way (Side Street)	Eastbound/ Westbound	10	29	4	2	7	22
North Village Way (Side Street)	Advanced EBLT/ Advanced WBLT	7	10	3	1	N/A	N/A

NOTE: All times are recorded in seconds, based on full demand.

The side street phases are actuated; meaning a vehicle or pedestrian must be present on the side street before the side street is given a green indication. Actuation at this intersection occurs in two ways: first, for vehicles a loop detector is imbedded into the roadway at the painted stop bar; and secondly, pushbuttons are located on each corner for pedestrians to activate their movement. Vehicle presence only on the side street would result in a possible green time of between the minimum and maximum times noted above, depending on demand.

Pedestrian “Walk” and “Flashing Don’t Walk” times on the side street as noted would be used in the event that the pedestrian push button was activated. Should there be no demand on the actuated phases; the signals would rest in a green indication for the main street.

Should you require any further information please feel free to contact me at (705) 739-4220 ext. 5178.

Yours truly,

Justin MacDonald, C.E.T., PTP
Senior Transportation Technologist

Appendix C: Level of Service Definitions

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	Expected Delay to Minor Street Traffic	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 favorable 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.	$10 \leq d \leq 20$
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 length, 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.	$20 \leq d \leq 35$
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.	$35 \leq d \leq 55$
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.	$55 \leq d \leq 80$
F	LOS F describes operations with control delay in excess of 80 seconds/vehicle. This <i>oversaturation</i> , 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.	$d > 80$























Appendix D: Existing Operations

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2024 Existing Conditions

Weekday AM Peak





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	0	35	1	0	1	33	358	1	1	526	113
Future Volume (vph)	64	0	35	1	0	1	33	358	1	1	526	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.97	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685		1243	1782	1572		1770	3475		1785	3346	
Flt Permitted	0.49		1.00	0.98	1.00		0.35	1.00		0.52	1.00	
Satd. Flow (perm)	876		1243	1830	1572		652	3475		983	3346	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	69	0	38	1	0	1	35	385	1	1	566	122
RTOR Reduction (vph)	0	0	33	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	69	0	5	1	0	0	35	386	0	1	678	0
Confl. Peds. (#/hr)	6		6	4		6	6		4	6		6
Heavy Vehicles (%)	8%	2%	29%	2%	2%	2%	3%	5%	2%	2%	6%	4%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.1		12.0	5.2	4.1		66.9	62.7		60.7	59.6	
Effective Green, g (s)	17.1		12.0	5.2	4.1		66.9	62.7		60.7	59.6	
Actuated g/C Ratio	0.18		0.12	0.05	0.04		0.69	0.65		0.63	0.62	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	229		153	97	66		498	2248		624	2058	
v/s Ratio Prot	c0.03			0.00	0.00		c0.00	0.11		0.00	c0.20	
v/s Ratio Perm	c0.03		0.00	0.00			0.05			0.00		
v/c Ratio	0.30		0.03	0.01	0.00		0.07	0.17		0.00	0.33	
Uniform Delay, d1	34.3		37.3	43.4	44.4		5.0	6.8		6.8	9.0	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7		0.1	0.0	0.0		0.1	0.2		0.0	0.4	
Delay (s)	35.1		37.4	43.5	44.4		5.0	7.0		6.8	9.4	
Level of Service	D		D	D	D		A	A		A	A	
Approach Delay (s)		35.9			43.9			6.8			9.4	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			96.9				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			71.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2024 Existing Conditions

Weekday AM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	1	72	3	1	3	129	326	5	2	435	104
Future Volume (vph)	61	1	72	3	1	3	129	326	5	2	435	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1781	1545		1786	1347		1628	3461		1216	3281	
Flt Permitted	0.70	1.00		1.00	1.00		0.39	1.00		0.54	1.00	
Satd. Flow (perm)	1316	1545		1880	1347		674	3461		692	3281	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	65	1	77	3	1	3	137	347	5	2	463	111
RTOR Reduction (vph)	0	69	0	0	3	0	0	0	0	0	11	0
Lane Group Flow (vph)	65	9	0	3	1	0	137	352	0	2	563	0
Confl. Peds. (#/hr)	7		7	2		2	7		2	2		7
Heavy Vehicles (%)	2%	2%	4%	2%	2%	33%	12%	5%	20%	50%	9%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.9	9.7		2.9	1.7		69.3	64.1		58.0	56.8	
Effective Green, g (s)	14.9	9.7		2.9	1.7		69.3	64.1		58.0	56.8	
Actuated g/C Ratio	0.15	0.10		0.03	0.02		0.72	0.67		0.60	0.59	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	248	155		55	23		569	2306		423	1937	
v/s Ratio Prot	c0.03	0.01		0.00	0.00		c0.02	0.10		0.00	c0.17	
v/s Ratio Perm	c0.02			0.00			0.15			0.00		
v/c Ratio	0.26	0.06		0.05	0.05		0.24	0.15		0.00	0.29	
Uniform Delay, d1	35.7	39.1		45.3	46.5		4.3	6.0		7.6	9.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.2		0.4	0.8		0.2	0.1		0.0	0.4	
Delay (s)	36.2	39.3		45.8	47.3		4.6	6.1		7.6	10.1	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.9			46.6			5.7			10.1	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			11.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			96.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			75.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2024 Existing Conditions

Weekday PM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	0	121	3	2	4	123	650	1	2	511	185
Future Volume (vph)	227	0	121	3	2	4	123	650	1	2	511	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.90		1.00	1.00		1.00	0.96	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788		1479	1789	1695		1789	3543		1789	3392	
Flt Permitted	0.70		1.00	1.00	1.00		0.31	1.00		0.39	1.00	
Satd. Flow (perm)	1321		1479	1883	1695		589	3543		737	3392	
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)	239	0	127	3	2	4	129	684	1	2	538	195
RTOR Reduction (vph)	0	0	111	0	4	0	0	0	0	0	24	0
Lane Group Flow (vph)	239	0	16	3	2	0	129	685	0	2	709	0
Confl. Peds. (#/hr)	1		1				1					1
Heavy Vehicles (%)	2%	2%	9%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.4		12.2	2.9	1.7		65.8	60.6		54.8	53.6	
Effective Green, g (s)	17.4		12.2	2.9	1.7		65.8	60.6		54.8	53.6	
Actuated g/C Ratio	0.18		0.13	0.03	0.02		0.69	0.64		0.58	0.56	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	298		189	56	30		510	2255		437	1909	
v/s Ratio Prot	c0.10			0.00	0.00		c0.02	0.19		0.00	c0.21	
v/s Ratio Perm	c0.05		0.01	0.00			0.15			0.00		
v/c Ratio	0.80		0.09	0.05	0.07		0.25	0.30		0.00	0.37	
Uniform Delay, d1	36.8		36.6	44.8	46.0		5.5	7.8		8.6	11.5	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.3		0.2	0.4	1.0		0.3	0.3		0.0	0.6	
Delay (s)	51.1		36.8	45.2	46.9		5.7	8.1		8.6	12.0	
Level of Service	D		D	D	D		A	A		A	B	
Approach Delay (s)		46.1			46.4			7.8			12.0	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			95.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			81.2%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

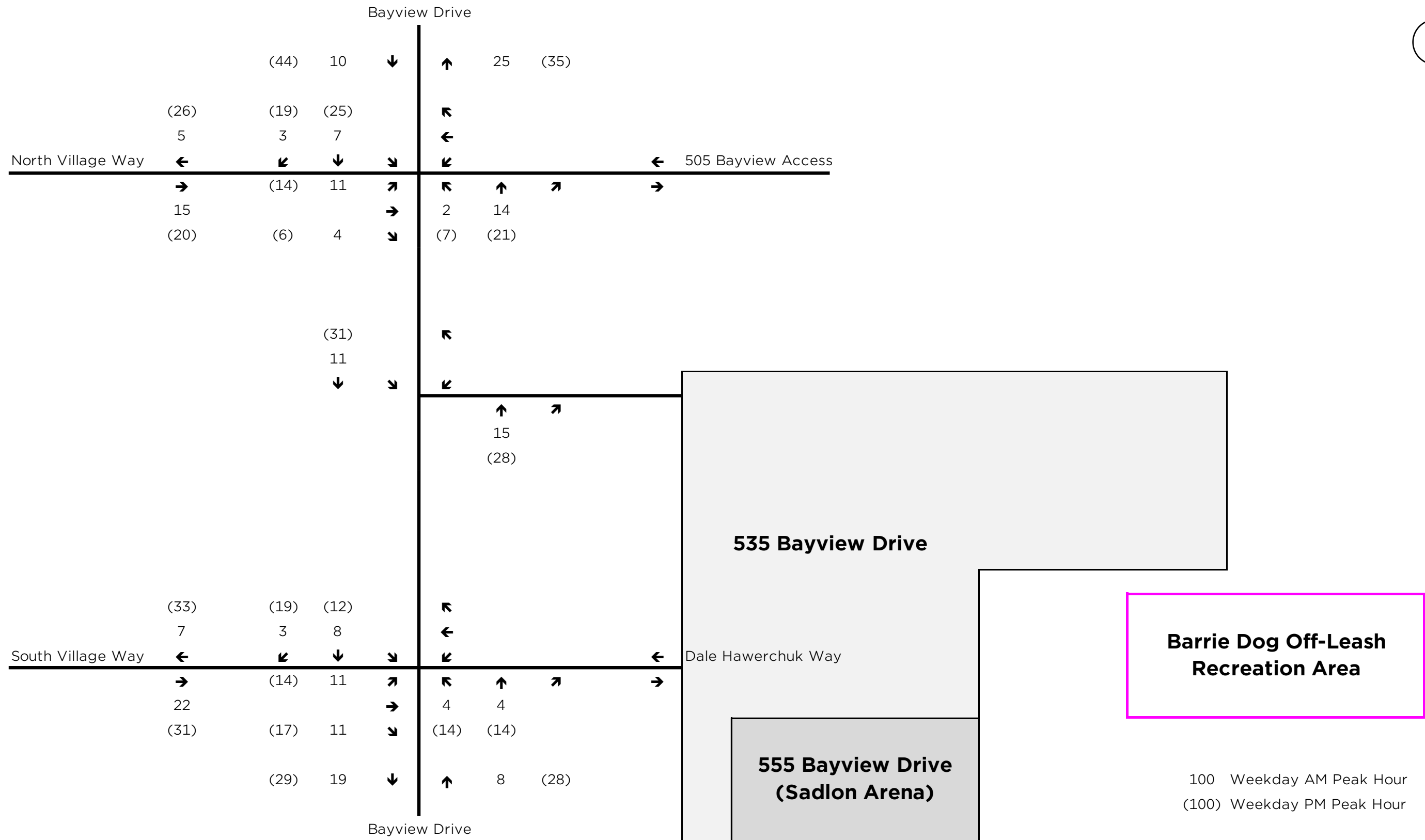
3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2024 Existing Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	2	211	6	16	6	257	577	9	15	468	136
Future Volume (vph)	149	2	211	6	16	6	257	577	9	15	468	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1783	1571		1787	1799		1737	3536		1788	3366	
Flt Permitted	0.46	1.00		0.62	1.00		0.35	1.00		0.42	1.00	
Satd. Flow (perm)	863	1571		1168	1799		648	3536		797	3366	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	154	2	218	6	16	6	265	595	9	15	482	140
RTOR Reduction (vph)	0	182	0	0	6	0	0	0	0	0	16	0
Lane Group Flow (vph)	154	38	0	6	16	0	265	604	0	15	606	0
Confl. Peds. (#/hr)	8		8	3		3	8		3	3		8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.0	16.9		7.6	6.5		68.2	63.1		55.4	54.3	
Effective Green, g (s)	22.0	16.9		7.6	6.5		68.2	63.1		55.4	54.3	
Actuated g/C Ratio	0.22	0.17		0.07	0.06		0.67	0.62		0.54	0.53	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	289	259		93	114		537	2183		442	1788	
v/s Ratio Prot	c0.06	0.02		0.00	0.01		c0.05	0.17		0.00	0.18	
v/s Ratio Perm	c0.05			0.00			c0.28			0.02		
v/c Ratio	0.53	0.15		0.06	0.14		0.49	0.28		0.03	0.34	
Uniform Delay, d1	34.5	36.5		43.9	45.2		7.2	9.0		10.8	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.3		0.3	0.6		0.7	0.3		0.0	0.5	
Delay (s)	36.4	36.7		44.2	45.8		8.0	9.3		10.8	14.2	
Level of Service	D	D		D	D		A	A		B	B	
Approach Delay (s)		36.6			45.5			8.9			14.1	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			102.2			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			86.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Appendix E: Background Development Trip Assignment



YMCA BARRIE - 555 BAYVIEW DRIVE - APPENDIX E
Figure E1: Background Development Traffic - 109 Park Place Boulevard



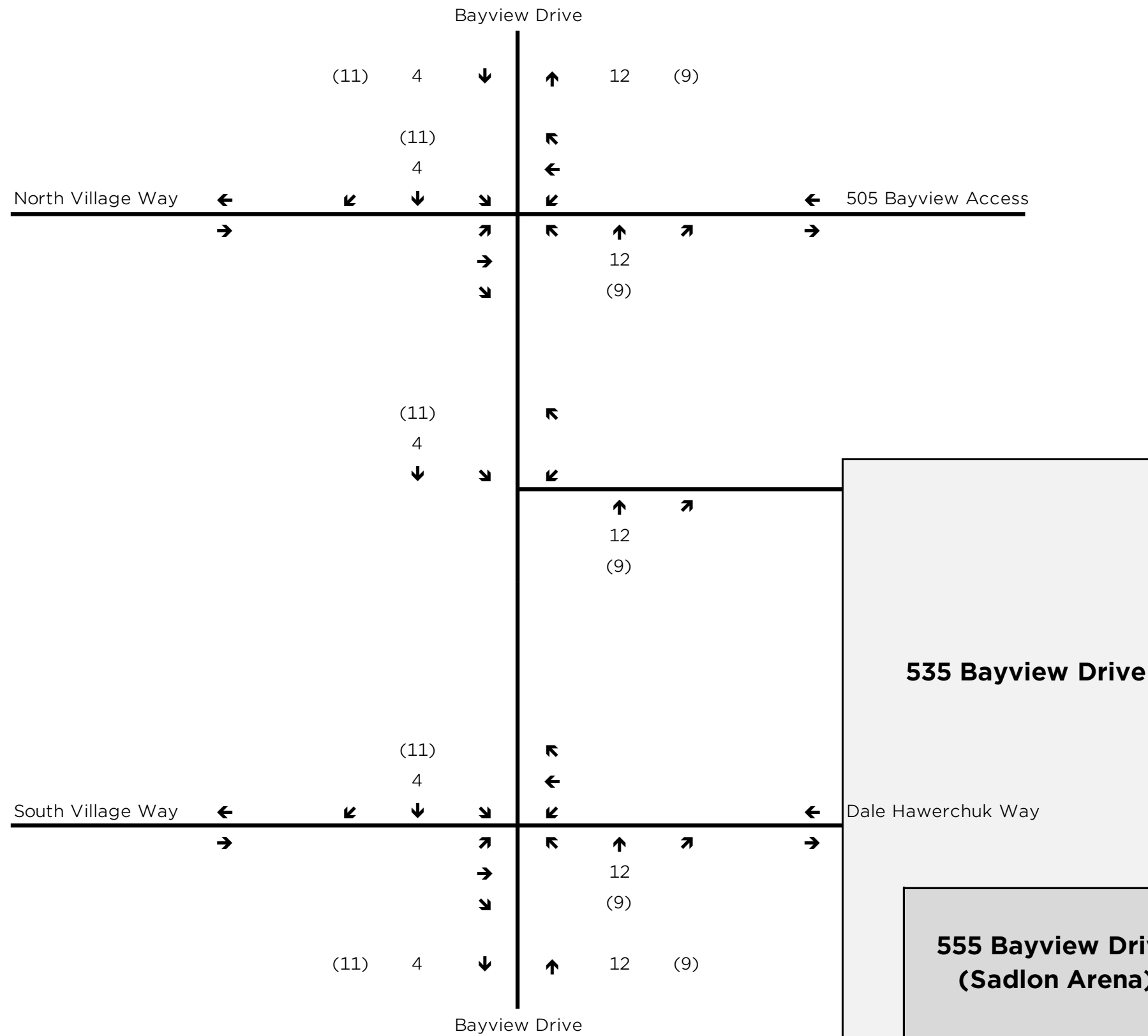


Figure E2: Background Development Traffic - 410 Bayview Drive























Appendix F: Future Background Operations

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2027 Background Conditions

Weekday AM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	0	40	1	0	1	36	406	1	1	570	120
Future Volume (vph)	77	0	40	1	0	1	36	406	1	1	570	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.97	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685		1242	1782	1571		1770	3475		1785	3348	
Flt Permitted	0.48		1.00	0.93	1.00		0.33	1.00		0.50	1.00	
Satd. Flow (perm)	855		1242	1745	1571		615	3475		935	3348	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	83	0	43	1	0	1	39	437	1	1	613	129
RTOR Reduction (vph)	0	0	38	0	1	0	0	0	0	0	11	0
Lane Group Flow (vph)	83	0	5	1	0	0	39	438	0	1	731	0
Confl. Peds. (#/hr)	6		6	4		6	6		4	6		6
Heavy Vehicles (%)	8%	2%	29%	2%	2%	2%	3%	5%	2%	2%	6%	4%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	16.8		11.7	5.4	4.3		69.9	65.9		64.1	63.0	
Effective Green, g (s)	16.8		11.7	5.4	4.3		69.9	65.9		64.1	63.0	
Actuated g/C Ratio	0.17		0.12	0.05	0.04		0.70	0.66		0.64	0.63	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	214		145	94	67		477	2294		609	2113	
v/s Ratio Prot	c0.03			0.00	0.00		c0.00	0.13		0.00	c0.22	
v/s Ratio Perm	c0.03		0.00	0.00			0.05			0.00		
v/c Ratio	0.39		0.03	0.01	0.00		0.08	0.19		0.00	0.35	
Uniform Delay, d1	36.4		39.0	44.7	45.7		4.8	6.6		6.4	8.7	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2		0.1	0.0	0.0		0.1	0.2		0.0	0.5	
Delay (s)	37.6		39.1	44.7	45.7		4.9	6.8		6.4	9.1	
Level of Service	D		D	D	D		A	A		A	A	
Approach Delay (s)		38.1			45.2			6.6			9.1	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			99.8				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			71.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2027 Background Conditions

Weekday AM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	1	85	3	1	3	137	362	5	2	473	110
Future Volume (vph)	73	1	85	3	1	3	137	362	5	2	473	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1544		1786	1347		1628	3463		1216	3283	
Flt Permitted	0.69	1.00		1.00	1.00		0.37	1.00		0.52	1.00	
Satd. Flow (perm)	1293	1544		1880	1347		637	3463		667	3283	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	78	1	90	3	1	3	146	385	5	2	503	117
RTOR Reduction (vph)	0	81	0	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	78	10	0	3	1	0	146	390	0	2	607	0
Confl. Peds. (#/hr)	7		7	2		2	7		2	2		7
Heavy Vehicles (%)	2%	2%	4%	2%	2%	33%	12%	5%	20%	50%	9%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.3	9.1		3.0	1.8		68.1	62.9		57.1	55.9	
Effective Green, g (s)	14.3	9.1		3.0	1.8		68.1	62.9		57.1	55.9	
Actuated g/C Ratio	0.15	0.10		0.03	0.02		0.72	0.67		0.60	0.59	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	239	148		58	25		545	2307		410	1944	
v/s Ratio Prot	c0.03	0.01		0.00	0.00		c0.02	0.11		0.00	c0.19	
v/s Ratio Perm	c0.02			0.00			0.17			0.00		
v/c Ratio	0.33	0.07		0.05	0.04		0.27	0.17		0.00	0.31	
Uniform Delay, d1	35.6	38.8		44.3	45.5		4.3	5.9		7.4	9.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.2		0.4	0.7		0.3	0.2		0.0	0.4	
Delay (s)	36.4	39.0		44.7	46.2		4.6	6.1		7.4	10.1	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.8			45.5			5.7			10.0	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			94.4				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			76.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2027 Background Conditions

Weekday PM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	248	0	131	3	2	4	134	720	1	2	578	209
Future Volume (vph)	248	0	131	3	2	4	134	720	1	2	578	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.90		1.00	1.00		1.00	0.96	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788		1479	1789	1695		1789	3543		1789	3392	
Flt Permitted	0.69		1.00	1.00	1.00		0.27	1.00		0.36	1.00	
Satd. Flow (perm)	1298		1479	1883	1695		518	3543		685	3392	
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)	261	0	138	3	2	4	141	758	1	2	608	220
RTOR Reduction (vph)	0	0	120	0	4	0	0	0	0	0	24	0
Lane Group Flow (vph)	261	0	18	3	2	0	141	759	0	2	804	0
Confl. Peds. (#/hr)	1		1				1					1
Heavy Vehicles (%)	2%	2%	9%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.7		12.5	3.0	1.8		64.5	59.3		54.7	53.5	
Effective Green, g (s)	17.7		12.5	3.0	1.8		64.5	59.3		54.7	53.5	
Actuated g/C Ratio	0.19		0.13	0.03	0.02		0.68	0.63		0.58	0.57	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	305		196	58	32		449	2230		411	1926	
v/s Ratio Prot	c0.11			0.00	0.00		c0.02	0.21		0.00	c0.24	
v/s Ratio Perm	c0.05		0.01	0.00			0.19			0.00		
v/c Ratio	0.86		0.09	0.05	0.06		0.31	0.34		0.00	0.42	
Uniform Delay, d1	36.5		35.9	44.2	45.4		5.9	8.2		8.3	11.5	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.3		0.2	0.4	0.9		0.4	0.4		0.0	0.7	
Delay (s)	56.8		36.1	44.6	46.2		6.3	8.6		8.3	12.2	
Level of Service	E		D	D	D		A	A		A	B	
Approach Delay (s)		49.6			45.7			8.3			12.2	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			17.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			94.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			82.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2027 Background Conditions

Weekday PM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	2	234	6	16	6	278	636	9	15	520	159
Future Volume (vph)	168	2	234	6	16	6	278	636	9	15	520	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.96		1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1783	1571		1787	1799		1737	3536		1789	3362	
Flt Permitted	0.46	1.00		0.61	1.00		0.32	1.00		0.40	1.00	
Satd. Flow (perm)	868	1571		1143	1799		585	3536		751	3362	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	173	2	241	6	16	6	287	656	9	15	536	164
RTOR Reduction (vph)	0	203	0	0	6	0	0	1	0	0	21	0
Lane Group Flow (vph)	173	40	0	6	16	0	287	664	0	15	679	0
Confl. Peds. (#/hr)	8		8	3		3	8		3	3		8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.0	15.9		7.7	6.6		67.2	62.1		55.2	54.1	
Effective Green, g (s)	21.0	15.9		7.7	6.6		67.2	62.1		55.2	54.1	
Actuated g/C Ratio	0.21	0.16		0.08	0.07		0.67	0.62		0.55	0.54	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	276	249		94	118		496	2191		425	1815	
v/s Ratio Prot	c0.06	0.03		0.00	0.01		c0.05	0.19		0.00	0.20	
v/s Ratio Perm	c0.07			0.00			c0.33			0.02		
v/c Ratio	0.63	0.16		0.06	0.14		0.58	0.30		0.04	0.37	
Uniform Delay, d1	34.8	36.4		42.8	44.1		7.3	8.9		10.2	13.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	0.3		0.3	0.5		1.6	0.4		0.0	0.6	
Delay (s)	39.2	36.7		43.1	44.7		9.0	9.3		10.2	13.9	
Level of Service	D	D		D	D		A	A		B	B	
Approach Delay (s)		37.7			44.3			9.2			13.8	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			100.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			88.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2032 Background Conditions

Weekday AM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	0	42	1	0	1	38	445	1	1	628	125
Future Volume (vph)	80	0	42	1	0	1	38	445	1	1	628	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685		1242	1782	1571		1771	3475		1786	3353	
Flt Permitted	0.49		1.00	0.95	1.00		0.30	1.00		0.48	1.00	
Satd. Flow (perm)	865		1242	1786	1571		564	3475		899	3353	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	86	0	45	1	0	1	41	478	1	1	675	134
RTOR Reduction (vph)	0	0	40	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	86	0	5	1	0	0	41	479	0	1	799	0
Confl. Peds. (#/hr)	6		6	4		6	6		4	6		6
Heavy Vehicles (%)	8%	2%	29%	2%	2%	2%	3%	5%	2%	2%	6%	4%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	16.8		11.7	5.3	4.2		69.7	65.7		63.9	62.8	
Effective Green, g (s)	16.8		11.7	5.3	4.2		69.7	65.7		63.9	62.8	
Actuated g/C Ratio	0.17		0.12	0.05	0.04		0.70	0.66		0.64	0.63	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	216		145	94	66		443	2292		586	2114	
v/s Ratio Prot	c0.03			0.00	0.00		c0.00	0.14		0.00	c0.24	
v/s Ratio Perm	c0.03		0.00	0.00			0.06			0.00		
v/c Ratio	0.40		0.04	0.01	0.00		0.09	0.21		0.00	0.38	
Uniform Delay, d1	36.4		39.0	44.7	45.7		5.0	6.7		6.4	8.9	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2		0.1	0.0	0.0		0.1	0.2		0.0	0.5	
Delay (s)	37.6		39.1	44.7	45.7		5.1	6.9		6.4	9.4	
Level of Service	D		D	D	D		A	A		A	A	
Approach Delay (s)		38.1			45.2			6.8			9.4	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			99.6				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			71.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2032 Background Conditions

Weekday AM Peak

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	1	89	3	1	3	144	398	5	2	521	116
Future Volume (vph)	77	1	89	3	1	3	144	398	5	2	521	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1544		1786	1347		1628	3464		1216	3285	
Flt Permitted	0.69	1.00		1.00	1.00		0.34	1.00		0.50	1.00	
Satd. Flow (perm)	1293	1544		1880	1347		590	3464		643	3285	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	82	1	95	3	1	3	153	423	5	2	554	123
RTOR Reduction (vph)	0	86	0	0	3	0	0	0	0	0	12	0
Lane Group Flow (vph)	82	10	0	3	1	0	153	428	0	2	665	0
Confl. Peds. (#/hr)	7		7	2		2	7		2	2		7
Heavy Vehicles (%)	2%	2%	4%	2%	2%	33%	12%	5%	20%	50%	9%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.3	9.1		3.0	1.8		67.8	62.6		56.7	55.5	
Effective Green, g (s)	14.3	9.1		3.0	1.8		67.8	62.6		56.7	55.5	
Actuated g/C Ratio	0.15	0.10		0.03	0.02		0.72	0.67		0.60	0.59	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	240	149		58	25		516	2304		394	1937	
v/s Ratio Prot	c0.03	0.01		0.00	0.00		c0.03	0.12		0.00	c0.20	
v/s Ratio Perm	c0.02			0.00			0.19			0.00		
v/c Ratio	0.34	0.07		0.05	0.04		0.30	0.19		0.01	0.34	
Uniform Delay, d1	35.5	38.6		44.2	45.3		4.4	6.0		7.4	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.2		0.4	0.7		0.3	0.2		0.0	0.5	
Delay (s)	36.3	38.8		44.6	46.0		4.8	6.2		7.4	10.4	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.7			45.4			5.8			10.4	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			94.1				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			76.7%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2032 Background Conditions

Weekday PM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	0	137	3	2	4	140	791	1	2	635	219
Future Volume (vph)	260	0	137	3	2	4	140	791	1	2	635	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.90		1.00	1.00		1.00	0.96	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788		1479	1789	1695		1789	3543		1789	3397	
Flt Permitted	0.69		1.00	1.00	1.00		0.25	1.00		0.34	1.00	
Satd. Flow (perm)	1298		1479	1883	1695		465	3543		636	3397	
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)	274	0	144	3	2	4	147	833	1	2	668	231
RTOR Reduction (vph)	0	0	125	0	4	0	0	0	0	0	23	0
Lane Group Flow (vph)	274	0	19	3	2	0	147	834	0	2	876	0
Confl. Peds. (#/hr)	1		1				1					1
Heavy Vehicles (%)	2%	2%	9%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.5		12.3	3.0	1.8		65.2	60.0		54.7	53.5	
Effective Green, g (s)	17.5		12.3	3.0	1.8		65.2	60.0		54.7	53.5	
Actuated g/C Ratio	0.18		0.13	0.03	0.02		0.69	0.63		0.58	0.56	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	300		192	58	32		427	2244		381	1919	
v/s Ratio Prot	c0.11			0.00	0.00		c0.03	0.24		0.00	c0.26	
v/s Ratio Perm	c0.06		0.01	0.00			0.21			0.00		
v/c Ratio	0.91		0.10	0.05	0.06		0.34	0.37		0.01	0.46	
Uniform Delay, d1	37.5		36.3	44.5	45.6		6.1	8.3		8.5	12.1	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.4		0.2	0.4	0.9		0.5	0.5		0.0	0.8	
Delay (s)	67.9		36.5	44.9	46.5		6.6	8.8		8.5	12.9	
Level of Service	E		D	D	D		A	A		A	B	
Approach Delay (s)		57.1			45.9			8.5			12.9	
Approach LOS		E			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			19.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			94.7				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			83.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2032 Background Conditions

Weekday PM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	2	246	6	16	6	292	699	9	15	572	167
Future Volume (vph)	176	2	246	6	16	6	292	699	9	15	572	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1783	1571		1787	1799		1737	3537		1789	3366	
Flt Permitted	0.46	1.00		0.61	1.00		0.29	1.00		0.37	1.00	
Satd. Flow (perm)	868	1571		1140	1799		535	3537		705	3366	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	181	2	254	6	16	6	301	721	9	15	590	172
RTOR Reduction (vph)	0	214	0	0	6	0	0	0	0	0	19	0
Lane Group Flow (vph)	181	42	0	6	16	0	301	730	0	15	743	0
Confl. Peds. (#/hr)	8		8	3		3	8		3	3		8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.0	15.9		7.7	6.6		67.2	62.1		55.2	54.1	
Effective Green, g (s)	21.0	15.9		7.7	6.6		67.2	62.1		55.2	54.1	
Actuated g/C Ratio	0.21	0.16		0.08	0.07		0.67	0.62		0.55	0.54	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	276	249		94	118		467	2192		400	1817	
v/s Ratio Prot	c0.07	0.03		0.00	0.01		c0.06	0.21		0.00	0.22	
v/s Ratio Perm	c0.07			0.00			c0.37			0.02		
v/c Ratio	0.66	0.17		0.06	0.14		0.64	0.33		0.04	0.41	
Uniform Delay, d1	34.9	36.4		42.8	44.1		7.7	9.1		10.2	13.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	0.3		0.3	0.5		3.0	0.4		0.0	0.7	
Delay (s)	40.4	36.8		43.1	44.7		10.8	9.5		10.2	14.3	
Level of Service	D	D		D	D		B	A		B	B	
Approach Delay (s)		38.3			44.3			9.9			14.2	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			17.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			100.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			89.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2037 Background Conditions

Weekday AM Peak





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	0	44	1	0	1	40	467	1	1	659	132
Future Volume (vph)	83	0	44	1	0	1	40	467	1	1	659	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.97	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685		1242	1782	1571		1771	3475		1786	3352	
Flt Permitted	0.49		1.00	0.95	1.00		0.29	1.00		0.47	1.00	
Satd. Flow (perm)	865		1242	1786	1571		533	3475		878	3352	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	89	0	47	1	0	1	43	502	1	1	709	142
RTOR Reduction (vph)	0	0	41	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	89	0	6	1	0	0	43	503	0	1	841	0
Confl. Peds. (#/hr)	6		6	4		6	6		4	6		6
Heavy Vehicles (%)	8%	2%	29%	2%	2%	2%	3%	5%	2%	2%	6%	4%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	16.8		11.7	5.3	4.2		69.4	65.4		63.6	62.5	
Effective Green, g (s)	16.8		11.7	5.3	4.2		69.4	65.4		63.6	62.5	
Actuated g/C Ratio	0.17		0.12	0.05	0.04		0.70	0.66		0.64	0.63	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	217		146	95	66		422	2288		572	2109	
v/s Ratio Prot	c0.04			0.00	0.00		c0.00	0.14		0.00	c0.25	
v/s Ratio Perm	c0.03		0.00	0.00			0.07			0.00		
v/c Ratio	0.41		0.04	0.01	0.00		0.10	0.22		0.00	0.40	
Uniform Delay, d1	36.3		38.8	44.5	45.5		5.1	6.8		6.4	9.1	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3		0.1	0.0	0.0		0.1	0.2		0.0	0.6	
Delay (s)	37.5		38.9	44.6	45.5		5.2	7.0		6.4	9.7	
Level of Service	D		D	D	D		A	A		A	A	
Approach Delay (s)		38.0			45.1			6.8			9.7	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			99.3				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			71.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2037 Background Conditions

Weekday AM Peak

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1	93	3	1	3	151	418	5	2	547	121
Future Volume (vph)	80	1	93	3	1	3	151	418	5	2	547	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1544		1786	1347		1629	3464		1216	3285	
Flt Permitted	0.69	1.00		1.00	1.00		0.33	1.00		0.49	1.00	
Satd. Flow (perm)	1293	1544		1880	1347		564	3464		630	3285	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	1	99	3	1	3	161	445	5	2	582	129
RTOR Reduction (vph)	0	89	0	0	3	0	0	0	0	0	12	0
Lane Group Flow (vph)	85	11	0	3	1	0	161	450	0	2	699	0
Confl. Peds. (#/hr)	7		7	2		2	7		2	2		7
Heavy Vehicles (%)	2%	2%	4%	2%	2%	33%	12%	5%	20%	50%	9%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.2	9.0		3.0	1.8		67.5	62.3		56.3	55.1	
Effective Green, g (s)	14.2	9.0		3.0	1.8		67.5	62.3		56.3	55.1	
Actuated g/C Ratio	0.15	0.10		0.03	0.02		0.72	0.66		0.60	0.59	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	239	148		58	25		501	2303		386	1931	
v/s Ratio Prot	c0.03	0.01		0.00	0.00		c0.03	0.13		0.00	c0.21	
v/s Ratio Perm	c0.02			0.00			0.20			0.00		
v/c Ratio	0.36	0.07		0.05	0.04		0.32	0.20		0.01	0.36	
Uniform Delay, d1	35.4	38.5		44.0	45.1		4.5	6.0		7.5	10.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.2		0.4	0.7		0.4	0.2		0.0	0.5	
Delay (s)	36.3	38.7		44.4	45.8		4.9	6.2		7.5	10.6	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.6			45.2			5.9			10.6	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			93.7				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			77.2%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2037 Background Conditions

Weekday PM Peak





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	0	144	3	2	4	147	830	1	2	665	229
Future Volume (vph)	273	0	144	3	2	4	147	830	1	2	665	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.90		1.00	1.00		1.00	0.96	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788		1479	1789	1695		1789	3543		1789	3397	
Flt Permitted	0.70		1.00	1.00	1.00		0.23	1.00		0.32	1.00	
Satd. Flow (perm)	1321		1479	1883	1695		427	3543		611	3397	
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)	287	0	152	3	2	4	155	874	1	2	700	241
RTOR Reduction (vph)	0	0	130	0	4	0	0	0	0	0	22	0
Lane Group Flow (vph)	287	0	22	3	2	0	155	875	0	2	919	0
Confl. Peds. (#/hr)	1		1				1					1
Heavy Vehicles (%)	2%	2%	9%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	19.6		14.4	2.9	1.7		65.9	60.7		54.8	53.6	
Effective Green, g (s)	19.6		14.4	2.9	1.7		65.9	60.7		54.8	53.6	
Actuated g/C Ratio	0.20		0.15	0.03	0.02		0.68	0.62		0.56	0.55	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	332		218	54	29		404	2205		357	1867	
v/s Ratio Prot	c0.12			0.00	0.00		c0.03	0.25		0.00	c0.27	
v/s Ratio Perm	c0.05		0.02	0.00			0.23			0.00		
v/c Ratio	0.86		0.10	0.06	0.07		0.38	0.40		0.01	0.49	
Uniform Delay, d1	37.2		36.0	46.0	47.1		7.1	9.2		9.4	13.5	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.2		0.2	0.4	1.0		0.6	0.5		0.0	0.9	
Delay (s)	57.4		36.2	46.4	48.2		7.7	9.8		9.4	14.5	
Level of Service	E		D	D	D		A	A		A	B	
Approach Delay (s)		50.0			47.6			9.5			14.5	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			97.5				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			85.0%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2037 Background Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	2	257	6	16	6	306	734	9	15	600	174
Future Volume (vph)	184	2	257	6	16	6	306	734	9	15	600	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1783	1571		1787	1799		1737	3537		1789	3366	
Flt Permitted	0.46	1.00		0.61	1.00		0.27	1.00		0.36	1.00	
Satd. Flow (perm)	868	1571		1140	1799		496	3537		680	3366	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	190	2	265	6	16	6	315	757	9	15	619	179
RTOR Reduction (vph)	0	224	0	0	6	0	0	0	0	0	18	0
Lane Group Flow (vph)	190	43	0	6	16	0	315	766	0	15	780	0
Confl. Peds. (#/hr)	8		8	3		3	8		3	3		8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.0	15.9		7.7	6.6		70.9	65.8		55.3	54.2	
Effective Green, g (s)	21.0	15.9		7.7	6.6		70.9	65.8		55.3	54.2	
Actuated g/C Ratio	0.20	0.15		0.07	0.06		0.68	0.63		0.53	0.52	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	267	240		91	114		490	2239		373	1755	
v/s Ratio Prot	c0.07	0.03		0.00	0.01		c0.08	0.22		0.00	0.23	
v/s Ratio Perm	c0.07			0.00			c0.36			0.02		
v/c Ratio	0.71	0.18		0.07	0.14		0.64	0.34		0.04	0.44	
Uniform Delay, d1	37.1	38.3		44.7	46.0		8.0	8.9		11.5	15.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.6	0.4		0.3	0.6		2.9	0.4		0.0	0.8	
Delay (s)	45.7	38.7		45.0	46.6		10.9	9.3		11.5	16.3	
Level of Service	D	D		D	D		B	A		B	B	
Approach Delay (s)		41.6			46.2			9.8			16.2	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			103.9				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			90.5%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Appendix G: ITE Land-Use Definitions

Land Use: 495

Recreational Community Center

Description

A recreational community center is a stand-alone public facility similar to and including YMCAs. These facilities often include classes and clubs for adults and children, a day care or nursery school, meeting rooms and other social facilities, swimming pools and whirlpools, saunas, tennis, racquetball, handball, pickle ball, basketball and volleyball courts; outdoor athletic fields/courts, exercise classes, weightlifting and gymnastics equipment, locker rooms, and a restaurant or snack bar. Public access is typically allowed and a membership fee may be charged. Racquet/tennis club (Land Use 491), health/fitness club (Land Use 492), and athletic club (Land Use 493) are related land uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), Arizona, Indiana, Minnesota, New Hampshire, New York, Oregon, Pennsylvania, Tennessee, and Utah.

Source Numbers

281, 410, 443, 571, 618, 705, 719, 850, 866, 971, 1055























Appendix H: Future Total Operations

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2027 Total Conditions

Weekday AM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	0	40	1	0	1	36	427	1	1	611	120
Future Volume (vph)	77	0	40	1	0	1	36	427	1	1	611	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685		1242	1782	1571		1771	3475		1785	3353	
Flt Permitted	0.48		1.00	0.93	1.00		0.31	1.00		0.49	1.00	
Satd. Flow (perm)	855		1242	1745	1571		581	3475		916	3353	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	83	0	43	1	0	1	39	459	1	1	657	129
RTOR Reduction (vph)	0	0	38	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	83	0	5	1	0	0	39	460	0	1	776	0
Confl. Peds. (#/hr)	6		6	4		6	6		4	6		6
Heavy Vehicles (%)	8%	2%	29%	2%	2%	2%	3%	5%	2%	2%	6%	4%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	16.8		11.7	5.4	4.3		69.9	65.9		64.1	63.0	
Effective Green, g (s)	16.8		11.7	5.4	4.3		69.9	65.9		64.1	63.0	
Actuated g/C Ratio	0.17		0.12	0.05	0.04		0.70	0.66		0.64	0.63	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	214		145	94	67		454	2294		597	2116	
v/s Ratio Prot	c0.03			0.00	0.00		c0.00	0.13		0.00	c0.23	
v/s Ratio Perm	c0.03		0.00	0.00			0.06			0.00		
v/c Ratio	0.39		0.03	0.01	0.00		0.09	0.20		0.00	0.37	
Uniform Delay, d1	36.4		39.0	44.7	45.7		4.9	6.6		6.4	8.8	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2		0.1	0.0	0.0		0.1	0.2		0.0	0.5	
Delay (s)	37.6		39.1	44.7	45.7		5.0	6.8		6.4	9.3	
Level of Service	D		D	D	D		A	A		A	A	
Approach Delay (s)		38.1			45.2			6.7			9.3	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			99.8			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			71.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2027 Total Conditions

Weekday AM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	1	85	24	1	24	137	362	46	43	473	110
Future Volume (vph)	73	1	85	24	1	24	137	362	46	43	473	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.86		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1784	1544		1786	1230		1628	3358		1216	3283	
Flt Permitted	0.52	1.00		1.00	1.00		0.37	1.00		0.50	1.00	
Satd. Flow (perm)	975	1544		1880	1230		632	3358		640	3283	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	78	1	90	26	1	26	146	385	49	46	503	117
RTOR Reduction (vph)	0	82	0	0	25	0	0	6	0	0	13	0
Lane Group Flow (vph)	78	9	0	26	2	0	146	428	0	46	607	0
Confl. Peds. (#/hr)	7		7	2		2	7		2	2		7
Heavy Vehicles (%)	2%	2%	4%	2%	2%	33%	12%	5%	20%	50%	9%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.3	8.7		6.3	3.7		66.9	58.9		58.7	54.7	
Effective Green, g (s)	15.3	8.7		6.3	3.7		66.9	58.9		58.7	54.7	
Actuated g/C Ratio	0.16	0.09		0.07	0.04		0.71	0.63		0.62	0.58	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	223	142		123	48		535	2099		423	1906	
v/s Ratio Prot	c0.03	0.01		0.01	0.00		c0.02	0.13		0.00	c0.18	
v/s Ratio Perm	c0.03			0.01			0.17			0.06		
v/c Ratio	0.35	0.07		0.21	0.04		0.27	0.20		0.11	0.32	
Uniform Delay, d1	34.6	39.0		41.6	43.5		4.6	7.6		7.0	10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.2		0.9	0.4		0.3	0.2		0.1	0.4	
Delay (s)	35.6	39.2		42.5	43.9		4.9	7.8		7.1	10.6	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.5			43.2			7.1			10.4	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			94.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			76.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2027 Total Conditions

Weekday PM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	248	0	131	3	2	4	134	763	1	2	617	209
Future Volume (vph)	248	0	131	3	2	4	134	763	1	2	617	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.90		1.00	1.00		1.00	0.96	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788		1479	1789	1695		1789	3543		1789	3399	
Flt Permitted	0.69		1.00	1.00	1.00		0.26	1.00		0.35	1.00	
Satd. Flow (perm)	1298		1479	1883	1695		488	3543		655	3399	
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)	261	0	138	3	2	4	141	803	1	2	649	220
RTOR Reduction (vph)	0	0	120	0	4	0	0	0	0	0	22	0
Lane Group Flow (vph)	261	0	18	3	2	0	141	804	0	2	847	0
Confl. Peds. (#/hr)	1		1				1					1
Heavy Vehicles (%)	2%	2%	9%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.7		12.5	3.0	1.8		64.5	59.3		54.7	53.5	
Effective Green, g (s)	17.7		12.5	3.0	1.8		64.5	59.3		54.7	53.5	
Actuated g/C Ratio	0.19		0.13	0.03	0.02		0.68	0.63		0.58	0.57	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	305		196	58	32		430	2230		394	1930	
v/s Ratio Prot	c0.11			0.00	0.00		c0.02	0.23		0.00	c0.25	
v/s Ratio Perm	c0.05		0.01	0.00			0.20			0.00		
v/c Ratio	0.86		0.09	0.05	0.06		0.33	0.36		0.01	0.44	
Uniform Delay, d1	36.5		35.9	44.2	45.4		6.1	8.4		8.3	11.7	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.3		0.2	0.4	0.9		0.4	0.5		0.0	0.7	
Delay (s)	56.8		36.1	44.6	46.2		6.5	8.8		8.3	12.4	
Level of Service	E		D	D	D		A	A		A	B	
Approach Delay (s)		49.6			45.7			8.5			12.4	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			17.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			94.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			82.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2027 Total Conditions

Weekday PM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	2	234	49	16	49	278	636	48	54	520	159
Future Volume (vph)	168	2	234	49	16	49	278	636	48	54	520	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.89		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1571		1788	1649		1737	3506		1789	3362	
Flt Permitted	0.57	1.00		0.36	1.00		0.32	1.00		0.37	1.00	
Satd. Flow (perm)	1075	1571		684	1649		576	3506		694	3362	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	173	2	241	51	16	51	287	656	49	56	536	164
RTOR Reduction (vph)	0	208	0	0	45	0	0	4	0	0	22	0
Lane Group Flow (vph)	173	35	0	51	22	0	287	701	0	56	678	0
Confl. Peds. (#/hr)	8		8	3		3	8		3	3		8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.9	13.7		16.5	11.0		64.1	55.0		56.9	51.4	
Effective Green, g (s)	21.9	13.7		16.5	11.0		64.1	55.0		56.9	51.4	
Actuated g/C Ratio	0.22	0.14		0.17	0.11		0.64	0.55		0.57	0.52	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	294	215		174	181		476	1934		456	1733	
v/s Ratio Prot	c0.05	0.02		0.02	0.01		c0.05	0.20		0.01	0.20	
v/s Ratio Perm	c0.08			0.03			c0.33			0.06		
v/c Ratio	0.59	0.16		0.29	0.12		0.60	0.36		0.12	0.39	
Uniform Delay, d1	33.7	37.9		35.9	40.0		8.5	12.5		9.5	14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.4		0.9	0.3		2.2	0.5		0.1	0.7	
Delay (s)	36.7	38.3		36.8	40.3		10.6	13.1		9.6	15.3	
Level of Service	D	D		D	D		B	B		A	B	
Approach Delay (s)		37.6			38.8			12.3			14.9	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			99.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			97.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2032 Total Conditions

Weekday AM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	0	42	1	0	1	38	466	1	1	667	125
Future Volume (vph)	80	0	42	1	0	1	38	466	1	1	667	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685		1242	1782	1571		1771	3475		1786	3357	
Flt Permitted	0.49		1.00	0.95	1.00		0.29	1.00		0.47	1.00	
Satd. Flow (perm)	865		1242	1786	1571		534	3475		879	3357	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	86	0	45	1	0	1	41	501	1	1	717	134
RTOR Reduction (vph)	0	0	40	0	1	0	0	0	0	0	9	0
Lane Group Flow (vph)	86	0	5	1	0	0	41	502	0	1	842	0
Confl. Peds. (#/hr)	6		6	4		6	6		4	6		6
Heavy Vehicles (%)	8%	2%	29%	2%	2%	2%	3%	5%	2%	2%	6%	4%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	16.8		11.7	5.3	4.2		69.7	65.7		63.9	62.8	
Effective Green, g (s)	16.8		11.7	5.3	4.2		69.7	65.7		63.9	62.8	
Actuated g/C Ratio	0.17		0.12	0.05	0.04		0.70	0.66		0.64	0.63	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	216		145	94	66		423	2292		573	2116	
v/s Ratio Prot	c0.03			0.00	0.00		c0.00	0.14		0.00	c0.25	
v/s Ratio Perm	c0.03		0.00	0.00			0.06			0.00		
v/c Ratio	0.40		0.04	0.01	0.00		0.10	0.22		0.00	0.40	
Uniform Delay, d1	36.4		39.0	44.7	45.7		5.0	6.7		6.4	9.1	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2		0.1	0.0	0.0		0.1	0.2		0.0	0.6	
Delay (s)	37.6		39.1	44.7	45.7		5.1	7.0		6.4	9.6	
Level of Service	D		D	D	D		A	A		A	A	
Approach Delay (s)		38.1			45.2			6.8			9.6	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			99.6				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			71.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2032 Total Conditions

Weekday AM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	1	89	23	1	23	144	398	45	42	521	116
Future Volume (vph)	77	1	89	23	1	23	144	398	45	42	521	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.86		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1784	1544		1786	1231		1628	3369		1216	3285	
Flt Permitted	0.53	1.00		1.00	1.00		0.34	1.00		0.48	1.00	
Satd. Flow (perm)	988	1544		1880	1231		586	3369		617	3285	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	82	1	95	24	1	24	153	423	48	45	554	123
RTOR Reduction (vph)	0	86	0	0	23	0	0	5	0	0	12	0
Lane Group Flow (vph)	82	10	0	24	2	0	153	466	0	45	665	0
Confl. Peds. (#/hr)	7		7	2		2	7		2	2		7
Heavy Vehicles (%)	2%	2%	4%	2%	2%	33%	12%	5%	20%	50%	9%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.1	8.6		6.1	3.6		66.5	58.5		58.2	54.2	
Effective Green, g (s)	15.1	8.6		6.1	3.6		66.5	58.5		58.2	54.2	
Actuated g/C Ratio	0.16	0.09		0.07	0.04		0.71	0.63		0.62	0.58	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	223	141		120	47		508	2105		409	1902	
v/s Ratio Prot	c0.03	0.01		0.01	0.00		c0.03	0.14		0.00	c0.20	
v/s Ratio Perm	c0.03			0.01			0.19			0.06		
v/c Ratio	0.37	0.07		0.20	0.04		0.30	0.22		0.11	0.35	
Uniform Delay, d1	34.6	38.8		41.5	43.3		4.7	7.6		7.0	10.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.2		0.8	0.4		0.3	0.2		0.1	0.5	
Delay (s)	35.6	39.0		42.3	43.7		5.1	7.9		7.1	10.9	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.5			43.0			7.2			10.7	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay	13.3			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	93.6			Sum of lost time (s)			20.0					
Intersection Capacity Utilization	76.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2032 Total Conditions

Weekday PM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	0	137	3	2	4	140	833	1	2	672	219
Future Volume (vph)	260	0	137	3	2	4	140	833	1	2	672	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.90		1.00	1.00		1.00	0.96	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788		1479	1789	1695		1789	3543		1789	3403	
Flt Permitted	0.69		1.00	1.00	1.00		0.23	1.00		0.32	1.00	
Satd. Flow (perm)	1298		1479	1883	1695		439	3543		609	3403	
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)	274	0	144	3	2	4	147	877	1	2	707	231
RTOR Reduction (vph)	0	0	125	0	4	0	0	0	0	0	21	0
Lane Group Flow (vph)	274	0	19	3	2	0	147	878	0	2	917	0
Confl. Peds. (#/hr)	1		1				1					1
Heavy Vehicles (%)	2%	2%	9%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.5		12.3	3.0	1.8		65.2	60.0		54.7	53.5	
Effective Green, g (s)	17.5		12.3	3.0	1.8		65.2	60.0		54.7	53.5	
Actuated g/C Ratio	0.18		0.13	0.03	0.02		0.69	0.63		0.58	0.56	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	300		192	58	32		412	2244		366	1922	
v/s Ratio Prot	c0.11			0.00	0.00		c0.03	0.25		0.00	c0.27	
v/s Ratio Perm	c0.06		0.01	0.00			0.22			0.00		
v/c Ratio	0.91		0.10	0.05	0.06		0.36	0.39		0.01	0.48	
Uniform Delay, d1	37.5		36.3	44.5	45.6		6.3	8.5		8.5	12.3	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.4		0.2	0.4	0.9		0.5	0.5		0.0	0.9	
Delay (s)	67.9		36.5	44.9	46.5		6.8	9.0		8.5	13.1	
Level of Service	E		D	D	D		A	A		A	B	
Approach Delay (s)		57.1			45.9			8.7			13.1	
Approach LOS		E			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			19.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			94.7				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			83.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2032 Total Conditions

Weekday PM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	2	246	48	16	48	292	699	46	52	572	167
Future Volume (vph)	176	2	246	48	16	48	292	699	46	52	572	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.89		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1571		1788	1652		1737	3510		1789	3366	
Flt Permitted	0.57	1.00		0.36	1.00		0.29	1.00		0.34	1.00	
Satd. Flow (perm)	1076	1571		684	1652		525	3510		635	3366	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	181	2	254	49	16	49	301	721	47	54	590	172
RTOR Reduction (vph)	0	219	0	0	44	0	0	4	0	0	20	0
Lane Group Flow (vph)	181	37	0	49	21	0	301	764	0	54	742	0
Confl. Peds. (#/hr)	8		8	3		3	8		3	3		8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.9	13.7		16.5	11.0		64.1	55.0		56.9	51.4	
Effective Green, g (s)	21.9	13.7		16.5	11.0		64.1	55.0		56.9	51.4	
Actuated g/C Ratio	0.22	0.14		0.17	0.11		0.64	0.55		0.57	0.52	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	294	215		174	182		448	1936		426	1735	
v/s Ratio Prot	c0.05	0.02		0.02	0.01		c0.06	0.22		0.01	0.22	
v/s Ratio Perm	c0.08			0.03			c0.37			0.07		
v/c Ratio	0.62	0.17		0.28	0.12		0.67	0.39		0.13	0.43	
Uniform Delay, d1	34.0	38.0		35.9	40.0		8.9	12.8		9.5	15.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	0.4		0.9	0.3		3.9	0.6		0.1	0.8	
Delay (s)	37.8	38.4		36.7	40.3		12.8	13.4		9.7	15.8	
Level of Service	D	D		D	D		B	B		A	B	
Approach Delay (s)		38.1			38.8			13.3			15.4	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			99.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			98.4%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2037 Total Conditions

Weekday AM Peak





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	0	44	1	0	1	40	487	1	1	697	132
Future Volume (vph)	83	0	44	1	0	1	40	487	1	1	697	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685		1242	1782	1571		1771	3475		1786	3356	
Flt Permitted	0.49		1.00	0.95	1.00		0.27	1.00		0.46	1.00	
Satd. Flow (perm)	865		1242	1786	1571		506	3475		860	3356	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	89	0	47	1	0	1	43	524	1	1	749	142
RTOR Reduction (vph)	0	0	41	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	89	0	6	1	0	0	43	525	0	1	881	0
Confl. Peds. (#/hr)	6		6	4		6	6		4	6		6
Heavy Vehicles (%)	8%	2%	29%	2%	2%	2%	3%	5%	2%	2%	6%	4%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	16.8		11.7	5.3	4.2		69.4	65.4		63.6	62.5	
Effective Green, g (s)	16.8		11.7	5.3	4.2		69.4	65.4		63.6	62.5	
Actuated g/C Ratio	0.17		0.12	0.05	0.04		0.70	0.66		0.64	0.63	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	217		146	95	66		404	2288		561	2112	
v/s Ratio Prot	c0.04			0.00	0.00		c0.00	0.15		0.00	c0.26	
v/s Ratio Perm	c0.03		0.00	0.00			0.07			0.00		
v/c Ratio	0.41		0.04	0.01	0.00		0.11	0.23		0.00	0.42	
Uniform Delay, d1	36.3		38.8	44.5	45.5		5.1	6.8		6.4	9.2	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3		0.1	0.0	0.0		0.1	0.2		0.0	0.6	
Delay (s)	37.5		38.9	44.6	45.5		5.3	7.1		6.4	9.9	
Level of Service	D		D	D	D		A	A		A	A	
Approach Delay (s)		38.0			45.1			6.9			9.9	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			99.3			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			71.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2037 Total Conditions

Weekday AM Peak























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1	93	23	1	23	151	418	43	40	547	121
Future Volume (vph)	80	1	93	23	1	23	151	418	43	40	547	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.86		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1784	1544		1786	1231		1629	3378		1216	3285	
Flt Permitted	0.52	1.00		1.00	1.00		0.33	1.00		0.47	1.00	
Satd. Flow (perm)	975	1544		1880	1231		559	3378		605	3285	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	1	99	24	1	24	161	445	46	43	582	129
RTOR Reduction (vph)	0	90	0	0	23	0	0	5	0	0	12	0
Lane Group Flow (vph)	85	10	0	24	2	0	161	486	0	43	699	0
Confl. Peds. (#/hr)	7		7	2		2	7		2	2		7
Heavy Vehicles (%)	2%	2%	4%	2%	2%	33%	12%	5%	20%	50%	9%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	8.7		6.2	3.7		66.3	58.3		57.9	53.9	
Effective Green, g (s)	15.2	8.7		6.2	3.7		66.3	58.3		57.9	53.9	
Actuated g/C Ratio	0.16	0.09		0.07	0.04		0.71	0.62		0.62	0.58	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	223	143		122	48		492	2106		400	1893	
v/s Ratio Prot	c0.03	0.01		0.01	0.00		c0.03	0.14		0.00	c0.21	
v/s Ratio Perm	c0.03			0.01			0.20			0.06		
v/c Ratio	0.38	0.07		0.20	0.04		0.33	0.23		0.11	0.37	
Uniform Delay, d1	34.5	38.7		41.3	43.2		4.9	7.7		7.0	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.2		0.8	0.3		0.4	0.3		0.1	0.6	
Delay (s)	35.6	38.9		42.1	43.5		5.3	8.0		7.1	11.2	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		37.4			42.8			7.3			11.0	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			93.5			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			77.2%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Bayview Dr & N. Village Way/505 Bayview Access

2037 Total Conditions

Weekday PM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	0	144	3	2	4	147	870	1	2	701	229
Future Volume (vph)	273	0	144	3	2	4	147	870	1	2	701	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.90		1.00	1.00		1.00	0.96	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788		1479	1789	1695		1789	3543		1789	3403	
Flt Permitted	0.70		1.00	1.00	1.00		0.21	1.00		0.31	1.00	
Satd. Flow (perm)	1321		1479	1883	1695		402	3543		582	3403	
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)	287	0	152	3	2	4	155	916	1	2	738	241
RTOR Reduction (vph)	0	0	130	0	4	0	0	0	0	0	20	0
Lane Group Flow (vph)	287	0	22	3	2	0	155	917	0	2	959	0
Confl. Peds. (#/hr)	1		1				1					1
Heavy Vehicles (%)	2%	2%	9%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	19.6		14.4	2.9	1.7		65.9	60.7		54.8	53.6	
Effective Green, g (s)	19.6		14.4	2.9	1.7		65.9	60.7		54.8	53.6	
Actuated g/C Ratio	0.20		0.15	0.03	0.02		0.68	0.62		0.56	0.55	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	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)	332		218	54	29		389	2205		341	1870	
v/s Ratio Prot	c0.12			0.00	0.00		c0.03	0.26		0.00	c0.28	
v/s Ratio Perm	c0.05		0.02	0.00			0.24			0.00		
v/c Ratio	0.86		0.10	0.06	0.07		0.40	0.42		0.01	0.51	
Uniform Delay, d1	37.2		36.0	46.0	47.1		7.3	9.4		9.4	13.8	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.2		0.2	0.4	1.0		0.7	0.6		0.0	1.0	
Delay (s)	57.4		36.2	46.4	48.2		8.0	10.0		9.4	14.8	
Level of Service	E		D	D	D		A	A		A	B	
Approach Delay (s)		50.0			47.6			9.7			14.8	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			97.5				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			85.0%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Bayview Dr & S. Village Way/Dale Hawerchuk Way

2037 Total Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	2	257	46	16	46	306	734	45	51	600	174
Future Volume (vph)	184	2	257	46	16	46	306	734	45	51	600	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.89		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1571		1788	1654		1737	3512		1789	3366	
Flt Permitted	0.57	1.00		0.36	1.00		0.26	1.00		0.34	1.00	
Satd. Flow (perm)	1063	1571		684	1654		483	3512		649	3366	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	190	2	265	47	16	47	315	757	46	53	619	179
RTOR Reduction (vph)	0	230	0	0	42	0	0	3	0	0	19	0
Lane Group Flow (vph)	190	37	0	47	21	0	315	800	0	53	779	0
Confl. Peds. (#/hr)	8		8	3		3	8		3	3		8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.2	13.9		16.4	11.0		68.7	59.3		57.5	52.1	
Effective Green, g (s)	22.2	13.9		16.4	11.0		68.7	59.3		57.5	52.1	
Actuated g/C Ratio	0.21	0.13		0.16	0.11		0.66	0.57		0.55	0.50	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	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)	284	209		165	174		470	2002		418	1686	
v/s Ratio Prot	c0.05	0.02		0.01	0.01		c0.08	0.23		0.01	0.23	
v/s Ratio Perm	c0.09			0.03			c0.36			0.06		
v/c Ratio	0.67	0.18		0.28	0.12		0.67	0.40		0.13	0.46	
Uniform Delay, d1	36.5	40.0		38.1	42.1		9.1	12.4		10.7	16.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.9	0.4		1.0	0.3		3.7	0.6		0.1	0.9	
Delay (s)	42.4	40.4		39.1	42.4		12.9	13.0		10.9	17.8	
Level of Service	D	D		D	D		B	B		B	B	
Approach Delay (s)		41.2			41.0			13.0			17.3	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay	20.7			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	104.0			Sum of lost time (s)			20.0					
Intersection Capacity Utilization	99.7%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												