



Minto Aquaview Stage 1 & 2

TIA Forecasting and Strategy Report



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TIA Forecasting and Strategy Report

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Forecasting and Strategy Report

1. SCREENING FORM

The screening form was submitted for the subject development on February 16th, 2018 to City of Ottawa staff for review and confirmation of the need for a Transportation Impact Assessment (TIA). The Trip Generation, Location, and Safety triggers were met based on the unit count, proximity to the Tenth Line Transit Station and proposed driveway within 150m of a signalized intersection. The Scoping and Strategy Report provided the exemptions review prior to production of the following Forecasting and Strategy Reports. No response has been received from the City TPM at the time of the submission of this report.

The Screening Form and Correspondence are provided in Appendix A.

2. DESCRIPTION OF PROPOSED DEVELOPMENT

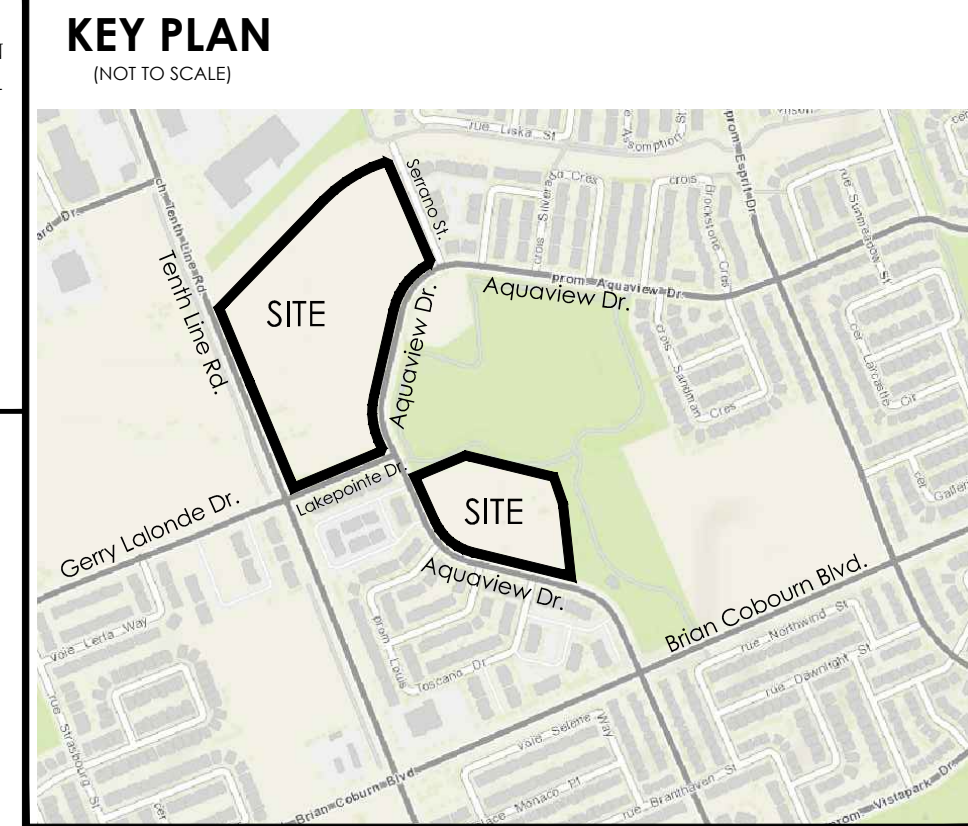
2.1. PROPOSED DEVELOPMENT

The proposed Aquaview development is located in south Orleans. The subdivision is in Ward 19 and the site's local context is illustrated in Figure 1.

The development will include 322 units, consisting of 274 townhomes and 48 single family homes. The subdivision will connect to the previously developed Aquaview Stages to the east and south, accessing Tenth Line Road via Lakepointe Drive and Brian Coburn Boulevard via Aquaview Drive. The site plan is illustrated in Figure 2. The estimated date of occupancy is 2020 for Stages 1 and 2. This development requires a plan of subdivision and zoning amendment.

Figure 1: Local Context





BLOCK 12
REGISTERED PLAN 4M-1253 AND
BLOCK 205
REGISTERED PLAN 4M-1172
PART OF LOT 2
CONCESSION 10
(GEOGRAPHIC TOWNSHIP OF CUMBERLAND)
CITY OF OTTAWA

METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE
CONVERTED TO FEET BY DIVIDING BY 0.3048

SCHEDULE OF LAND USE (Stage 1)			
LOT	USE	UNITS	AREA (Ha/ac)
1 to 48	Singles	48	2,145.30
Street	Street	*	0.42/1.03
Total		48	2,566.33
SCHEDULE OF LAND USE (Stage 2)			
BLOCK	USE	UNITS	AREA (Ha/ac)
58 to 87, 94 to 101	Executive Townhomes	181	3,829.45
88 to 93	Avenue Townhomes (B28)	58	0,697.70
49 to 57	Rear Lane Townhomes	35	0,581.41
102 to 104	Open Space		0.04/0.09
105	Transitway		0.35/0.85
Streets	Streets		2.39/5.91
Total	*	274	7,866/19.41

- a. SEE PLAN
- b. SEE PLAN
- c. SEE PLAN
- d. SEE PROPOSED LAND USE SCHEDULE (ABOVE)
- e. SEE PLAN
- f. SEE PLAN
- g. SEE PLAN
- h. CITY WATER AVAILABLE
- i. SEE SOIL REPORT
- j. SEE TOPOGRAPHICAL INFORMATION
- k. ALL CITY SERVICES AVAILABLE
- l. SUBJECT TO EASEMENT PER INST. NO. OC422

I HEREBY AUTHORIZE STANTEC GEOMATICS LTD. TO SUBMIT THIS DRAFT PLAN OF SUBDIVISION ON MY BEHALF

MINTO COMMUNITIES INC.

DATE	DATE
SUSAN MURPHY VICE PRESIDENT	BRENT STRACHAN SENIOR VICE PRESIDENT
I HAVE THE AUTHORITY TO BIND THE CORPORATION	I HAVE THE AUTHORITY TO BIND THE CORPORATION

I HEREBY AUTHORIZE STANTEC GEOMATICS LTD. TO SUBMIT THIS DRAFT PLAN OF
SUBDIVISION ON MY BEHALF

CITY OF OTTAWA

DATE _____

JEFF MCEWEN, P.ENG
MANAGER, DEVELOPMENT REVIEW-EAST
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE SUBJECT LANDS AND THEIR RELATIONSHIP TO ADJOINING LANDS HAVE BEEN ACCURATELY AND CORRECTLY SHOWN.

DATE _____

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR



NOTE:
THE PLAN DATA IS COMPILED FROM OFFICE RECORDS OF STANTEC GEOMATICS LTD.
AND HAS NOT BEEN VERIFIED BY FIELD MEASUREMENTS. ALL DISTANCES ARE
APPROXIMATE, TO BE VERIFIED BY FINAL REGISTERED PLAN(S).

DRAWN: CEC	CHECKED: *	PM: KJ	FIELD: *	PROJECT No.: 161613771-1
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3. EXISTING CONDITIONS

3.1. AREA ROAD NETWORK

Tenth Line Road is a north-south arterial roadway, which extends north from Smith Road to Jeanne D’Arc Boulevard. Within the study area the cross-section consists of a divided roadway with two travel lanes in each direction. The posted speed is 60km/h and the road is designated as a truck route.

Brian Coburn Boulevard is an east-west arterial roadway that extends east from Trim Road to Navan Road. Within the study area the road has a cross-section consisting of a single travel lane in both directions and a posted speed of 60km/h. Brian Coburn Boulevard is a partial truck route.

Aquaview Drive is an east-west collector roadway between Portobello Boulevard and Esprit Drive, which continues west of Esprit Drive and loops around Aquaview Park to continue north-south to Brian Coburn Boulevard. The road cross-section consists of a single travel lane in both directions and parking provided on a single side of the roadway. The road has a posted speed of 50km/h.

Lakepointe Drive is an east-west collector roadway that extends east from Tenth Line Road to Aquaview Drive. The road cross section consists of a single travel lane in each direction. Parking is permitted on both sides of the roadway from April to November. The unposted speed limit is understood to be 50km/h.

Vanguard Drive is an east-west collector roadway that extends east from Lanthier Drive to Tenth Line Road. The road cross section consists of a single travel lane in each direction and the unposted speed limit is understood to be 50km/h.

Esprit Drive is a north-south major collector roadway that extends south from Innes Road to Mirabeau Terrace. The road cross-section consists of a single travel lane in both directions and parking provided on a both sides of the roadway. The road has a posted speed of 50km/h.

3.2. PEDESTRIAN AND CYCLING NETWORK

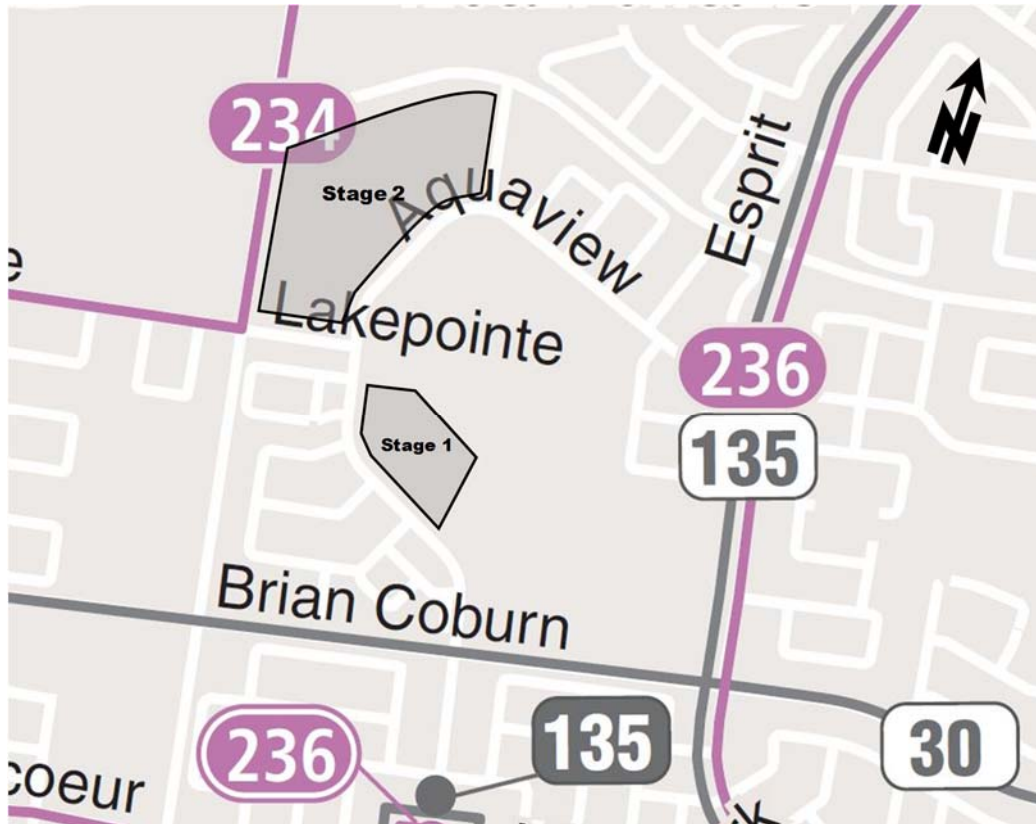
The existing pedestrian network consists of sidewalks provided on both sides of Tenth Line Road, Lakepointe Drive, Esprit Drive and both sides of Aquaview Drive between Louis Toscana Drive and Brian Coburn Boulevard and between Esprit Drive and Brockstone Crescent. Sidewalks are also provided on the north side of Brian Coburn Boulevard and the west/north side of Aquaview Drive between Brockstone Crescent and Louis Toscana Drive. There is a network of MUPs and sidewalks in Aquaview park, adjacent to the subject site.

According to the City’s Ultimate Cycling Plan, Tenth Line Road is classified as a ‘Spine’ route, and Brian Coburn Boulevard and Esprit Drive as ‘Suggested’ cycling routes.

3.3. TRANSIT NETWORK

OC Transpo service is currently located along Esprit, Tenth Line Road, and Brian Coburn Boulevard. The Routes in the area are #30, #135, #236, and #234. Regular Routes #30 and #135 provide frequent all-day service and Peak Hour Routes #234 and #236 provide weekday morning and afternoon peak hour service only. Figure 3 illustrates the current system map.

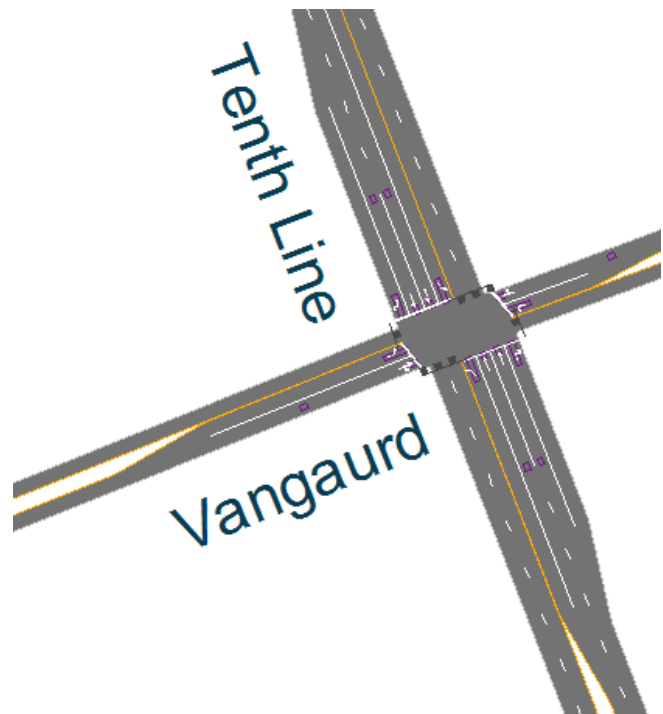
Figure 3: Area Transit Network



3.4. EXISTING STUDY AREA INTERSECTION

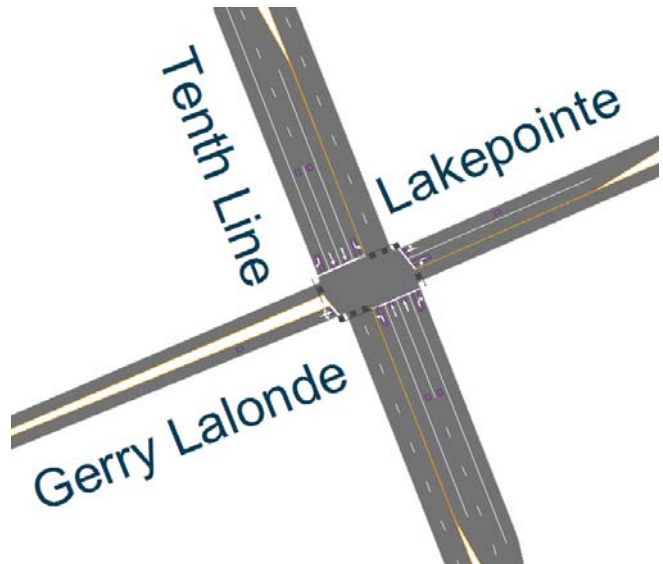
Tenth Line/Vanguard

The Tenth Line/Vanguard intersection is a signalized four-legged intersection. The east and westbound approaches consist of single left-turn lanes and shared through/right-turn lanes. The north and southbound approaches consist of single left-turn lanes, two through lanes and right-turn lanes. All movements are permitted at this location.



Tenth Line/Lakepointe/Gerry Lalonde

The Tenth Line/Lakepointe/Gerry Lalonde intersection is a signalized four-legged intersection. The eastbound approach consists of a single all-movement lane. The westbound approach consists of a single left-turn lane and shared through/right-turn lane. The north and southbound approaches consist of single left-turn lanes, two through lanes and right-turn lanes. All movements are permitted at this location.



Tenth Line/Brian Coburn

The Tenth Line/Brian Coburn intersection is a signalized four-legged intersection. The eastbound approach consists of a single left-turn lane and a shared through/right-turn lane. The westbound approach consists of a single left-turn lane, a through lane and a channelized right-turn lane. The north and southbound approaches consist of single left-turn lanes, single through lanes and shared through/right-turn lanes. All movements are permitted at this location.



Brian Coburn/Aquaview

The Brian Coburn/Aquaview intersection is a STOP controlled four-legged intersection. The east and westbound approaches consist of single left-turn lanes and shared through/right-turn lanes. The north and southbound approaches consist of single full movement lanes. All movements are permitted at this location.



Aquaview/Lakepointe

The Aquaview/Lakepointe intersection is a STOP controlled 'T' intersection. The north, south and westbound approaches consist of single full movement lanes. All movements are permitted at this location.



Aquaview/Esprit

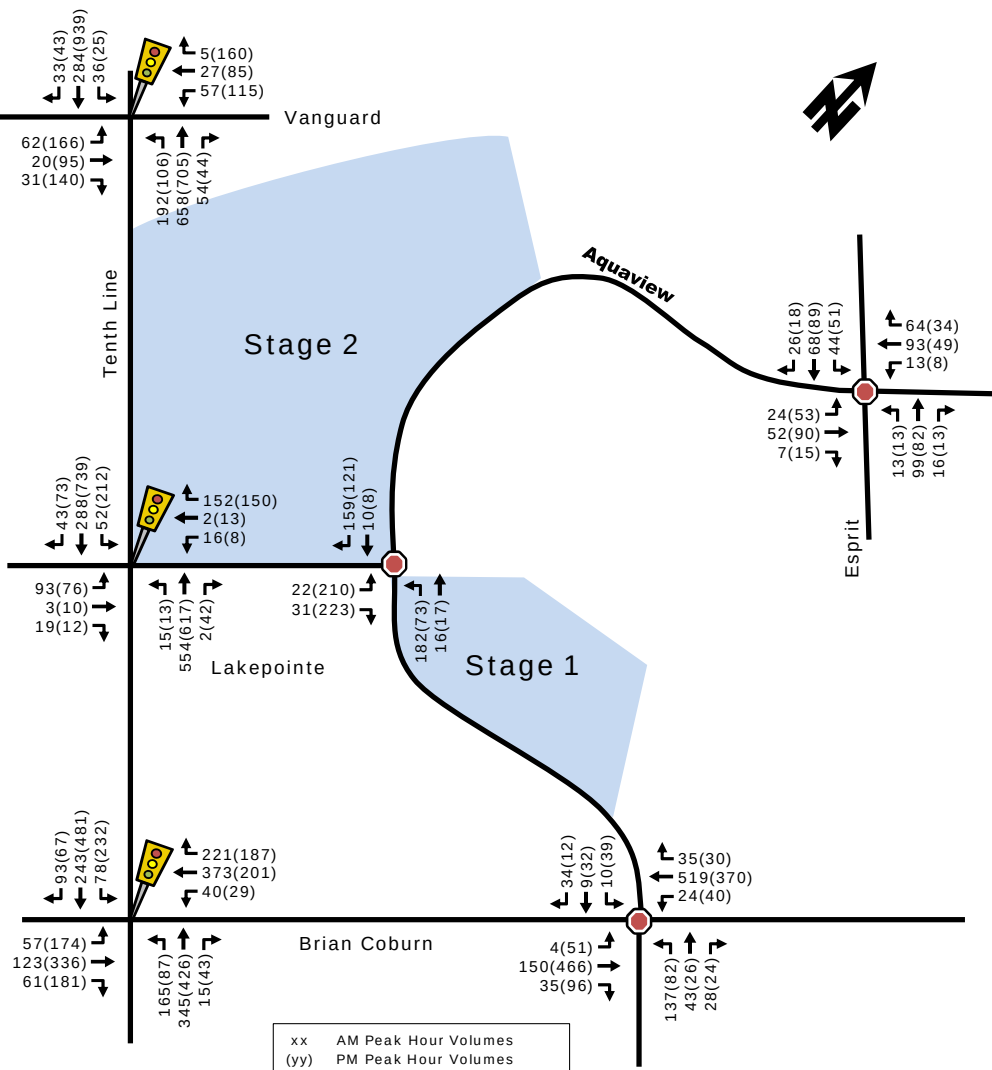
The Aquaview/Esprit intersection is an all-way STOP controlled intersection. The approaches consist of single full movement lanes. All movements are permitted at this location.



3.5. EXISTING INTERSECTION VOLUMES

The existing peak hour traffic volumes (illustrated in Figure 4 below) were collected from City of Ottawa turning movement counts. The resulting peak hour and full traffic volume counts are included as Appendix B.

Figure 4: Existing Peak Hour Traffic Volumes



3.6. EXISTING ROAD SAFETY CONDITIONS

Collision history for the study area intersections (2012 to 2016, inclusive) was obtained from the City of Ottawa and most collisions (89% or 17 collisions) involved only property damage, indicating low impact speeds, and 11% (or 2 collisions) involved personal injuries. The primary causes of collisions cited by police include; single vehicle (unattended vehicle) (37% or 7 collisions), rear end and angle (21% or 4 collisions each), and approaching and single vehicle (other) (11% or 2 collisions each) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At intersections within the study area, reported collisions have historically take place at a rate of:

- 0.08/MEV at the Aquaview/Lakepointe intersection;
- 1.03/MEV along Aquaview, between Lakepointe and Brian Coburn;
- 0.09/MEV at the Aquaview/Brian Coburn intersection;
- 1.22/MEV along Aquaview, between Lakepointe and Esprit; and
- 0.23/MEV at the Aquaview/Esprit intersection.

Based on the available data, there does not appear to be any prevailing safety issues at any of the study area intersections. The 2 segments of Aquaview are above the 1.00/MEV threshold, with each having 4 or more single vehicle accidents. It is likely that the curvilinear alignment of the road, on-street parking south of Lakepointe and parked vehicles at the future Street 10 location (adjacent to 505 Aquaview) are likely factors in the higher collision rate noted along Aquaview.

The source collision data as provided by the City of Ottawa and related analysis is included as Appendix C.

4. PLANNED CONDITIONS

4.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES

As outlined within the Ottawa Transportation Master Plan Affordable Network and the Ward 19 Planned Construction Projects map, the following projects are identified for south Orleans:

- Chapel Hill Park & Ride: A new park and ride facility is anticipated to be constructed during 2018 at Navan Road, on the north side of Brian Coburn Boulevard
- Brian Coburn Boulevard: Four-lane extension between Navan Road and Orleans Boulevard between 2018-2021, and an extension continuing to Innes Road is anticipated during Phase 2 (2020 and 2025)
- Tenth Line Road: Widening to 4-lanes will extend between Harvest Valley Road and the urban boundary (north of Wall Road) within Phase 2 (2020 and 2025)
- A new traffic signal is proposed at the Aquaview/Brian Coburn STOP-controlled intersection, identified Planned Construction Program 2018-2021¹

Beyond the 2031 horizon, the Cumberland Bus Rapid Transit is planned to run along the north side of the Aquaview Stage 2 lands, with a grade separated crossing of Tenth Line Road.

4.2. OTHER AREA DEVELOPMENTS

4.2.1. 236 VANGUARD

A single storey mixed use building is proposed at the 236 Vanguard Drive site with approximately 1,600ft² of floor area for light industrial use, such as heavy equipment and vehicles sales, rental and servicing, and an outside storage yard. The development is part of the Orleans Industrial Park lands.

5. TIME PERIODS

The weekday morning and afternoon peak hours are considered the appropriate time periods for operational analysis for this residential development.

6. HORIZON YEARS

The expected build-out date for the proposed development is assumed to be 2020 for Stages 1 and 2 and the horizon year 2025 will be assessed for 5-years beyond site build out.

¹ https://documents.ottawa.ca/sites/documents.ottawa.ca/files/construction_ward19_en.pdf

7. EXEMPTIONS REVIEW

Based on the foregoing analysis and review of the existing conditions in Step 2, the Scoping Report, it is recommended that, if required, any future work within the context of this TIA excludes the following modules and elements summarized in Table 1.

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 Development Design	4.1.2 Circulation and Access	Not required for applications involving plans of subdivision
4.2 Parking	All elements	Not required for applications involving plans of subdivision
4.5 Transportation Demand Management	All elements	Residential development with less than 60 auto trips.
4.6 Neighbourhood Traffic Management	All elements	Auto trip generations not anticipated to exceed ATM thresholds for collector roads.
4.8 Review of Network Concept	All elements	This development is not expected to generate 200-person trips more than the permitted zoning for the site.

In addition to the above recommendations of the Exemptions Review, the following exemptions are also proposed for Step 4 – Strategy Report and are summarized in Table 2.

Table 2: Additional Recommended Exemptions Summary

Module	Element	Exemption Consideration
4.4 Access Intersection Design	4.4.2 Intersection Control	Site access will operate at local road intersections and will not require an intersection screening for a signal or roundabout.
	4.4.3 Intersection Design	Site access will operate at local road intersections and will not require an intersection screening for a signal or roundabout.
4.7 Transit	4.7.2 Transit Priority	Site access will operate at local road intersections and will not require an intersection screening for a signal or roundabout.
4.9 Intersection Design	All Elements	Site access will operate at local road intersections and will not require an intersection screening for a signal or roundabout.

8. DEVELOPMENT GENERATED TRAFFIC

8.1. TRIP GENERATION

8.1.1. TRIP GENERATION RATES

The trip generation rates for the proposed development were obtained from the City's 2009 TRANS Trip Generation for 322 residential units, consisting of 274 townhomes and 48 single family homes. While the development is in the vicinity of a future transit station, it will not be built within the horizon years. As such, the base vehicle trip rate for a suburban neighbourhood was used. Table 3 summarizes the trip generation rates.

Table 3: Vehicle Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Single Family Homes	TRANS	$T = 0.70(x)$	$T = 0.90(x)$
Townhomes	TRANS	$T = 0.54(x)$	$T = 0.71(x)$
Notes: T = Average Vehicle Trip Ends X = Residential units			

The TRANS vehicle trip generation rates were generated and are summarized in Table 4.

Table 4: Projected Vehicle Trip Generation – TRANS Model

Land Use	Source	Units	AM Peak (veh/h)			PM Peak (veh/h)		
			In	Out	Total	In	Out	Total
Single Family Homes	TRANS	48 du	9	25	34	26	17	43
Townhomes	TRANS	274 du	54	94	148	103	92	195
Total Vehicle Trips			63	119	182	129	109	238

As shown in Table 4, a total of approximately 185 veh/h and 240 veh/h are projected to travel to/from the proposed development during the weekday morning and afternoon commuter peak hours, respectively.

8.1.2. MODE SHARES

Using the TRANS Auto Trips projected in Table 4 and the mode share percentages outline in Table 3.13 of the TRANS Trip Generation Study, the modal shares for the single-detached and semi-detached/townhomes land uses within the proposed development are summarized in Table 5 and Table 6, respectively. The total site trip generation is summarized in Table 7.

Table 5: TRANS Model Site Trip Generation – Single-Family Homes

Travel Mode	Mode Share	AM Peak (Person Trips/h)			Mode Share	PM Peak (Person Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	55%	9	25	34	64%	26	17	43
Auto Passenger	11%	2	4	6	11%	5	2	7
Transit	25%	5	11	16	19%	8	5	13
Non-motorized	9%	2	3	5	6%	2	2	4
Total Person Trips	100%	18	43	61	100%	41	26	67

Table 6: TRANS Model Site Trip Generation –Townhomes

Travel Mode	Mode Share	AM Peak (Person Trips/h)			Mode Share	PM Peak (Person Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	55%	54	94	148	62%	103	92	195
Auto Passenger	10%	10	16	26	14%	24	20	44
Transit	27%	28	45	73	17%	28	26	54
Non-motorized	8%	8	14	22	7%	11	11	22
Total Person Trips	100%	100	169	269	100%	166	149	315

Table 7: TRANS Model Site Trip Generation – Total Site Generation

Travel Mode	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
	In	Out	Total	In	Out	Total
Auto Driver	63	119	182	129	109	238
Auto Passenger	12	20	32	29	22	51
Transit	33	56	89	36	31	67
Non-motorized	10	16	26	13	13	26
Total Person Trips	118	211	330	207	175	382
Total 'New' Auto Trips	63	119	182	129	109	238

As shown in Table 7, based on the TRANS Trip Generation method, the proposed site is projected to generate approximately 330 to 385 person-trips per hour during the weekday commuter peak hours. The increase in two-way transit trips is estimated to be 65 to 90 persons per hour, and the increase in bike/walk trips is approximately 25 persons per hour. The total amount of 'new' vehicle traffic to the study area is projected to be 180 to 240 veh/h during the peak hours.

8.2. TRIP DISTRIBUTION

Traffic distribution was based on the site's connectivity to the existing road network and our knowledge of the surrounding area. The resultant distribution is outlined as follows:

- 90% to/from the northwest
- 5% to/from the south; and
- 5% to/from the east.

8.3. TRIP ASSIGNMENT

Based on these distributions, 'new' Stage 1 and Stage 2 site-generated trips to/from the proposed development are assigned to study area intersections and are illustrated as Figure 5 and Figure 6, respectively. The total site generated trips are shown in Figure 7.

Figure 5: 'New' Stage 1 (Single Homes) Site-Generated Traffic Volumes

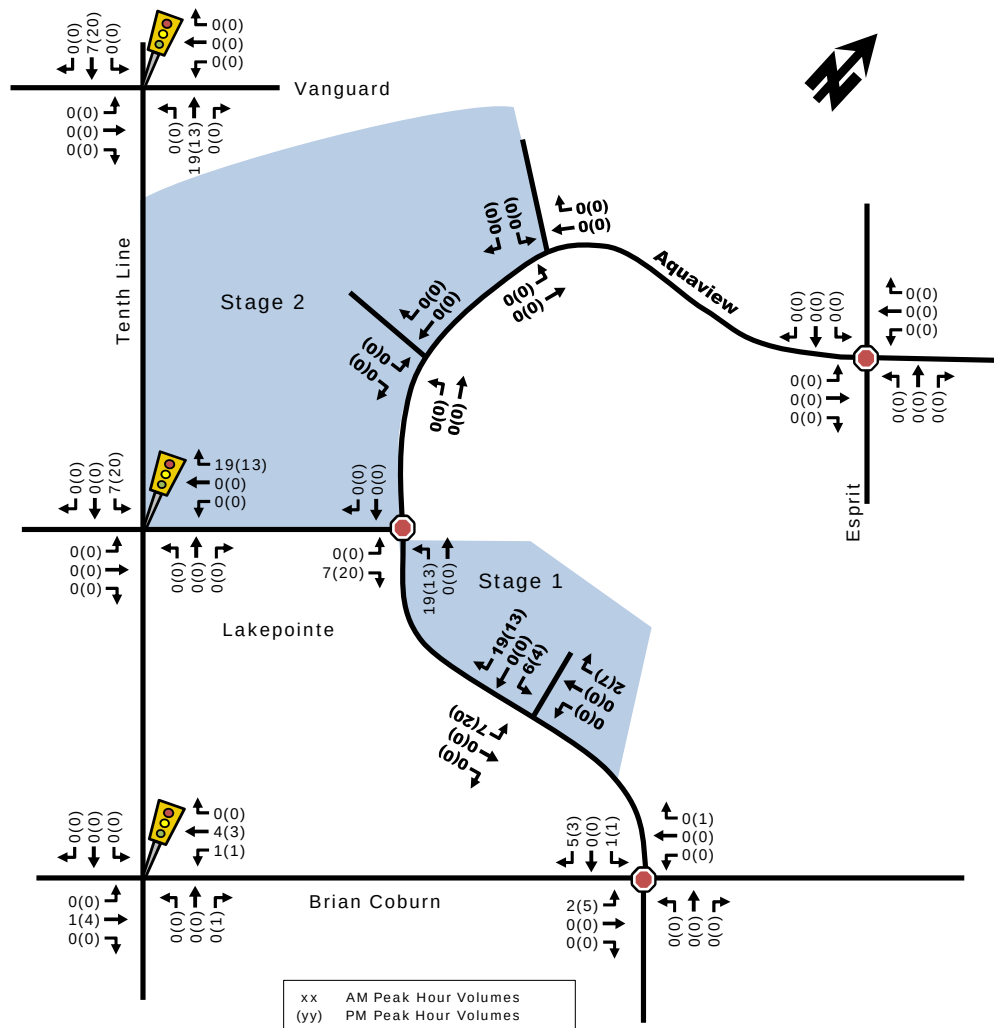


Figure 6: 'New' Stage 2 (Townhomes) Site-Generated Traffic Volumes

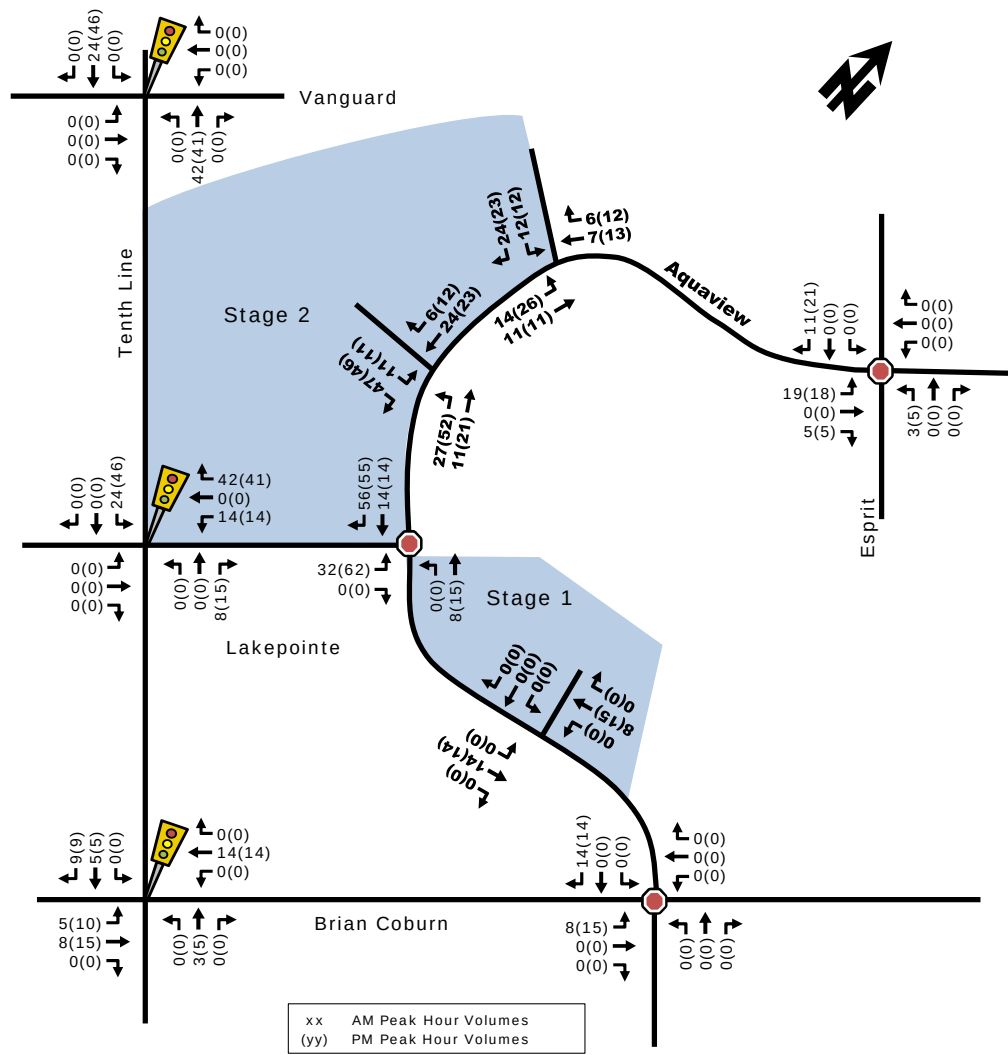
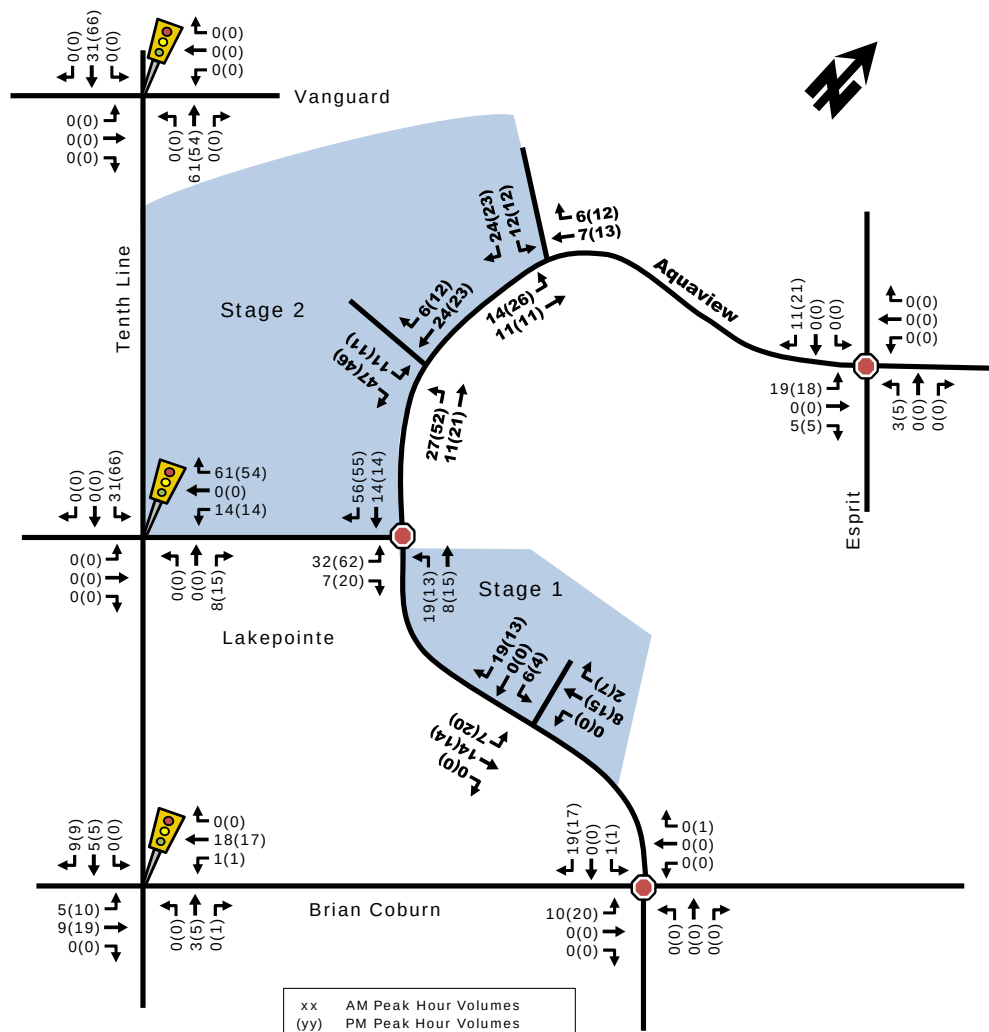


Figure 7: 'New' Total Site-Generated Traffic Volumes



9. BACKGROUND NETWORK TRAFFIC

9.1. HISTORICAL BACKGROUND GROWTH RATES

The following background traffic growth through the immediate study area (summarized in Table 9) was calculated based on historical traffic count data (years 2009, 2013, and 2016) provided by the City of Ottawa at the Tenth Line/Brian Coburn intersection. Detailed background traffic growth analysis is included as Appendix D.

Table 8: Tenth Line/Brian Coburn Historical Background Growth (2009 – 2016)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	6.24%	6.41%	14.78%	31.41%	13.81%
AM Peak	6.90%	8.36%	15.91%	32.85%	16.09%
PM Peak	7.54%	8.07%	12.67%	33.96%	14.87%

As shown in Table 8, the Brian Coburn/Tenth Line intersection has experienced approximately 13% to 16% annual growth within recent years (calculated as a weighted average). Given that these significant growth rates are unlikely to continue for any length of time, a 1% per annum traffic growth factor has been assumed along Brian Coburn Road, and Tenth Line Road for the horizon years 2020 and 2025.

The resulting future background traffic for the horizon years 2020 and 2025 are depicted as respectively.

10. DEMAND RATIONALIZATION

10.1. DESCRIPTION OF CAPACITY ISSUE(S)

10.1.1. 2020 HORIZON – STAGE 1 AND STAGE 2 BUILD-OUT

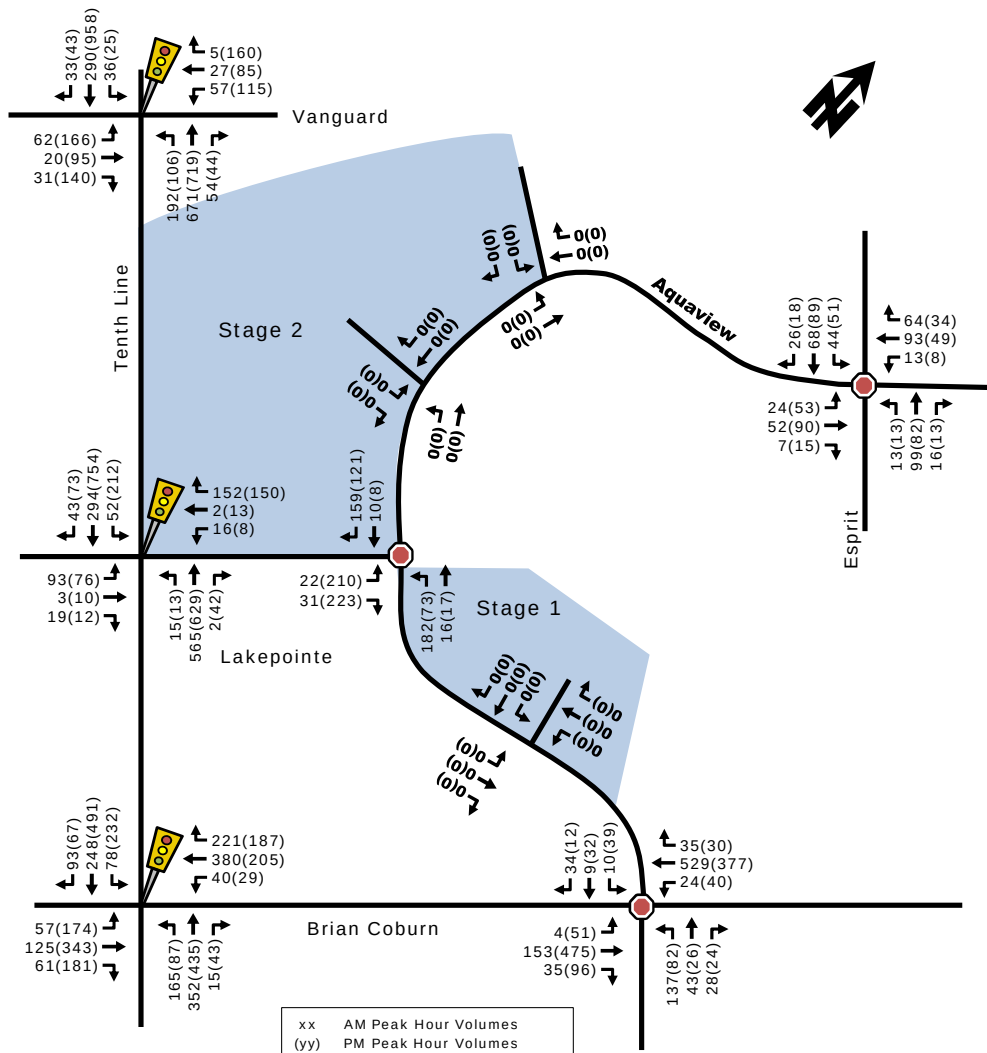
The 2020 background peak hour traffic volumes (illustrated in Figure 8 below) have been generated from the existing turning movement counts and the application of the growth rates discussed in Section 9.1. The background operations are summarized in

As stated in Section 4.1, the Aquaview/Brian Coburn intersection is expected to be signalized by 2021. To remain conservative, this intersection was analyzed as both a STOP-controlled intersection and signalized intersection for the 2020 background conditions.

STOP-Control at Aquaview/Brian Coburn

Table 9 and the detailed synchro worksheets are provided in Appendix E.

Figure 8: 2020 Background Peak Hour Traffic Volumes



As stated in Section 4.1, the Aquaview/Brian Coburn intersection is expected to be signalized by 2021. To remain conservative, this intersection was analyzed as both a STOP-controlled intersection and signalized intersection for the 2020 background conditions.

STOP-Control at Aquaview/Brian Coburn

Table 9: 2020 Background Conditions Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c / delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Lakepointe	B(B)	0.64(0.63)	EBT(EBT)	10.5(9.6)	A(A)	0.31(0.38)
Tenth Line/Brian Coburn	C(E)	0.77(0.91)	WBT(EBT)	17.8(23.4)	A(B)	0.47(0.63)
Tenth Line/Vanguard	A(F)	0.45(1.05)	EBL(EBL)	9.1(24.7)	A(A)	0.21(0.56)
Unsignalized						
Aquaview/Brian Coburn	F(F)	59.7(73.9)	WB(EB)	39.2(46.8)	-	-

Aquaview/Esprit	A(A)	9.0(9.3)	WB(EB)	8.9(9.0)	-	-
Aquaview/Lakepointe	A(B)	9.1(13.2)	NB(EB)	8.3(11.8)	-	-
Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in

As stated in Section 4.1, the Aquaview/Brian Coburn intersection is expected to be signalized by 2021. To remain conservative, this intersection was analyzed as both a STOP-controlled intersection and signalized intersection for the 2020 background conditions.

STOP-Control at Aquaview/Brian Coburn

Table 9, the signalized study area intersections 'as a whole' are projected to continue to operate at an acceptable LoS 'B' during both peak hours, with respect to the City of Ottawa operating standards of LoS 'D' or better ($v/c \leq 0.90$). The critical eastbound movements at the Tenth Line/Brian Coburn and Tenth Line/Vanguard intersections are noted to have an LoS 'E' and LoS 'F' during the PM peak hour, respectively.

With regard to 'critical movements' at the stop-controlled intersections, the intersections operate at an acceptable LOS 'B' or better with respect to the City of Ottawa operating standards of LoS 'D', with the exception of Aquaview/Brian Coburn that has an overall delay of approximately 45s in the PM peak hour. The critical movements at the Aquaview/Brian Coburn intersection are noted to have a delay of over 60 to 75 seconds (LoS 'F') in the west and eastbound movements in the AM and PM peak hours, respectively.

Traffic Signal at Aquaview/Brian Coburn

Table 10: 2020 Background Conditions Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c / delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Aquaview/Brian Coburn	B(B)	0.63(0.64)	WBT(EBT)	18.5(14.6)	A(A)	0.57(0.53)
Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 10, the signalization of Aquaview and Brian Coburn improves the operates 'as a whole' to a LoS 'A' during both peak periods and the critical movements to a LoS 'B'.

10.1.2. 2025 HORIZON – BUILD-OUT +5 YEARS

The 2025 background peak hour traffic volumes (illustrated in Figure 9 below) have been generated from the existing turning movement counts and the application of the growth rates discussed in Section 9.1. The background operations are summarized in Table 11 and the detailed synchro worksheets are provided in Appendix F.

Figure 9: 2025 Background Peak Hour Traffic Volumes

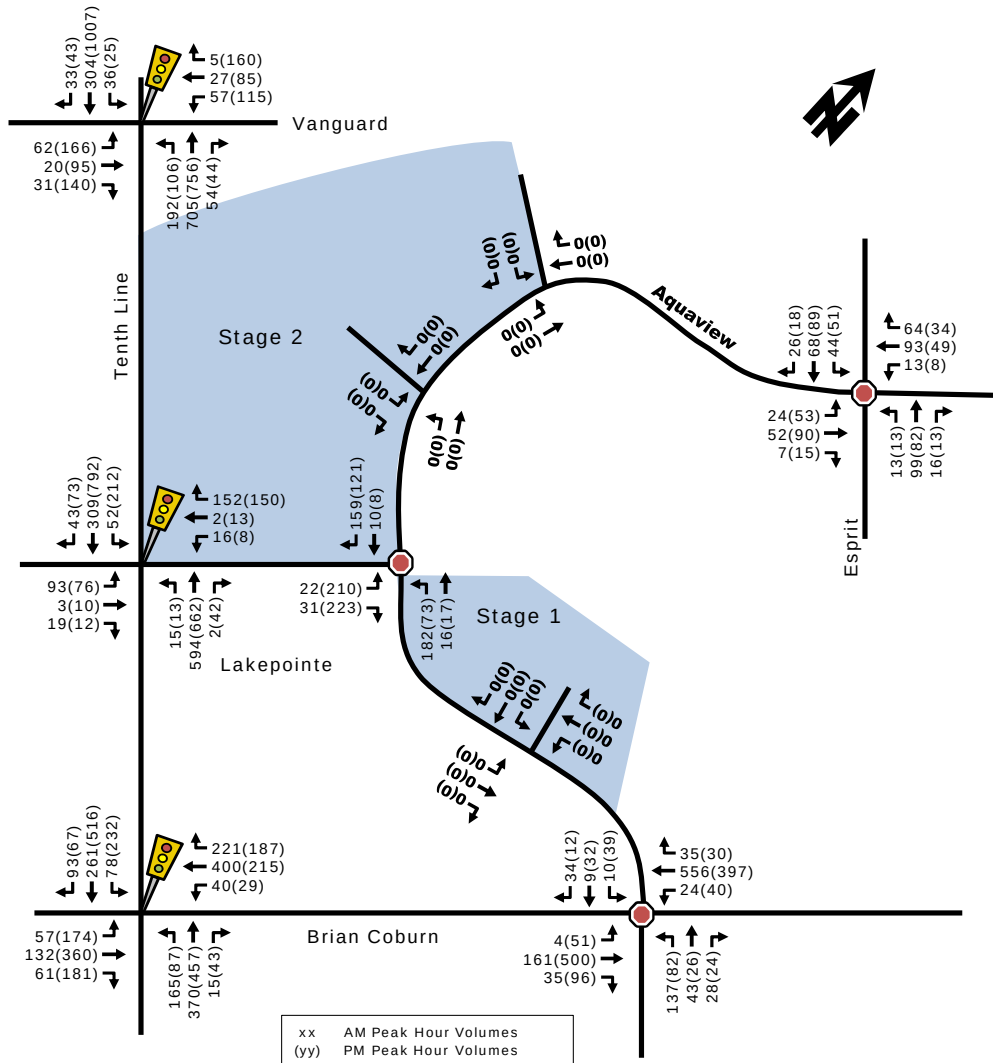


Table 11: 2025 Background Conditions Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c / delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Lakepointe	B(B)	0.67(0.63)	EBT(EBT)	10.6(9.7)	A(A)	0.32(0.39)
Tenth Line/Brian Coburn	C(E)	0.79(0.91)	WBT(EBT)	18.3(24.1)	A(B)	0.49(0.65)
Tenth Line/Vangaurd	A(F)	0.45(1.05)	EBL(EBL)	9.0(24.6)	A(A)	0.28(0.58)
Aquaview/Brian Coburn	B(B)	0.66(0.66)	WBT(EBT)	19.0(15.2)	A(A)	0.59(0.55)
Unsignalized						
Aquaview/Esprit	A(A)	9.0(9.3)	WB(EB)	8.9(9.0)	-	-
Aquaview/Lakepointe	A(B)	9.1(13.2)	NB(EB)	8.3(11.8)	-	-

Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

As shown in Table 11, the signalized study area intersections ‘as a whole’ are projected to continue to operate at an acceptable LoS ‘B’ during both peak hours, with respect to the City of Ottawa operating standards of LoS ‘D’ or better ($v/c \leq 0.90$). The critical eastbound movements at the Tenth Line/Brian Coburn and Tenth Line/Vanguard intersections are noted to have an LoS ‘E’ and LoS ‘F’ during the PM peak hour, respectively.

With regard to ‘critical movements’ at the stop-controlled intersections, the intersections operate at an acceptable LOS ‘B’ or better with respect to the City of Ottawa operating standards of LoS ‘D’

11.DEVELOPMENT DESIGN

11.1. NEW STREETS NETWORK

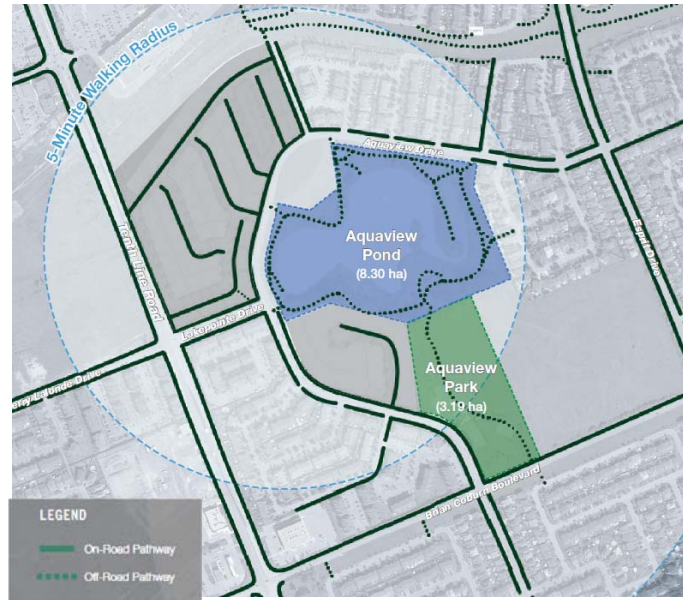
The planned network street design is consistent with the *Building Better and Smarter Suburbs* philosophy. The network design is consistent with road classification and anticipated usage within the community. Furthermore, pathways and cycling facilities have been integrated into the design to encourage travel by sustainable modes. Figure 10 and Figure 11 show the preferred demonstration plan and pathways in the Aquaview Community Concept Plan (Appendix G), respectively.

Figure 10: Aquaview Demonstration Plan



Source: Aquaview Community Concept Plan, Appendix G

Figure 11: Aquaview Parks and Pathway Plan



Source: Aquaview Community Concept Plan, Appendix G

12. BOUNDARY STREET DESIGN

12.1. MOBILITY

The boundary streets for the development are Tenth Line Road, Aquaview Drive and Lakepointe Drive. At this time, there has not been any complete street concepts prepared for these streets in proximity of the development. The existing roadways, geometry consists of the following features.

- Tenth Line Road:
 - o 2 vehicle travel lane in each direction, divided by a median;
 - o 2m sidewalks on the east side of the roadway;
 - o A separate bike path on the west side of the roadway; and,
 - o More than 3,000 vehicles per day along Tenth Line Road.
- Aquaview Drive:
 - o 1 vehicle travel lane in each direction;
 - o 1.8m sidewalks on the west/north side of the roadway; and
 - o Less than 3,000 vehicles per day along Aquaview Drive.
- Lakepointe Drive:
 - o 1 vehicle travel lane in each direction, divided by a median;
 - o 1.8m sidewalks on both sides of the roadway; and
 - o Less than 3,000 vehicles per day along Rochester Street.

The multi-modal level of service analysis for the subject road segments adjacent to the site is summarized in Table 10 with detail analysis provided in Appendix H.

Table 12: MMLOS – Boundary Street Segment

Road Segment	Level of Service							
	Pedestrian		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Tenth Line Road	D	C	A	C	D	N/A	A	D
Aquaview Drive	A	C	A	D	N/A	N/A	N/A	N/A
Lakepointe Drive	A	C	A	D	N/A	N/A	N/A	N/A

With regard to pedestrians, the low traffic volumes and large boulevard widths result in a high level of service for pedestrians along Aquaview Drive and Lakepointe Drive. The PLoS along Tenth Line Road can be improved to a PLoS ‘C’ to meet the target by ensuring the boulevard width is greater than 2m.

With regard to cyclists, the low traffic volumes and low operating speed results in a high level of service for cyclists along Aquaview Drive and Lakepointe Drive. Additionally, the separated cycling facilities on Tenth Line Road provide a high level of service. Additional cycling facilities are available adjacent Aquaview Park in the form of multi-use pathways connecting the development to the rest of the community.

13.ACCESS INTERSECTION DESIGN

13.1. LOCATION AND DESIGN OF ACCESS

Stage 1 Access on Aquaview Drive

The vehicle access for the Stage 1 development is proposed via Aquaview Drive with a new driveway connection at the Aquaview/Louis Toscano S intersection. The intersection is located west of the Stage 1 development, approximately 200m north of the future signalized intersection of Aquaview/Brian Coburn. This intersection will be a minor stop-control on the Stage 1 Access.

Stage 2 South Access on Aquaview Drive

The primary vehicle access for the Stage 2 development is proposed via Aquaview Drive, at a new driveway connection. The intersection is located east of the Stage 2 development, approximately 250m northeast of the signalized intersection of Tenth Line/Lakepointe. This intersection will be a minor stop-control on the Stage 2 South Access.

Stage 2 North Access on Aquaview Drive

The secondary vehicle access for the Stage 2 development is proposed via Aquaview Drive, at the Aquaview/Serrano intersection. The intersection is located east of the Stage 2 development, approximately 400m northeast of the signalized intersection of Tenth Line/Lakepointe. This intersection will be a minor stop-control on the Stage 2 North Access.

14.TRANSIT

14.1. ROUTE CAPACITY

The existing transit loads of Routes #30, # 135, #234, and #236 were received from OC Transpo and have been summarized below in Table 13 for boarding, alighting and average load at departure. The passenger loads were calculated in January 2017 for the weekday peak periods. The typical passenger loads for OC Transpo are 50 passengers for a single bus, 75 passengers for an articulated bus, and 90 passengers for a double-decker bus. Typical buses planned for Route Routes #30, #618, #234, and #236 include mostly double-decker and articulated buses with some single buses in the AM and PM peaks.

Table 13: Transit Average and Max Passenger Loads

Route	Direction	AM Peak (6:45-9:30am)			PM Peak (3:30-6:30pm)		
		Boarding	Alighting	Average Load at Departure	Boarding	Alighting	Average Load at Departure
30	Westbound	6	0	21	1	1	15
	Eastbound	2	1	14	0	2	10
135	Northbound	1	0	9	1	2	3
	Southbound	2	0	11	1	2	9
234	Northbound	5	0	12	1	0	3
	Southbound	0	1	1	0	3	6
236	Northbound	6	0	21	n/a	n/a	n/a
	Southbound	n/a	n/a	n/a	1	4	13

The projected transit ridership from the subject development was forecasted as 89 (33 in, 56 out) and 67 (36 in, 31 out) persons/h in the AM and PM peaks, respectively. Applying these trips to the existing route and passenger loads, the AM and PM routes may need higher capacity buses (e.g. double-decker buses) to be able to accommodate the forecasted additional trips.

15. INTERSECTION DESIGN

15.1. TOTAL PROJECTED 2020 CONDITIONS

The total projected 2020 traffic volumes were derived by superimposing the total site-generated traffic volumes on background 2020 traffic volumes. The resulting total projected 2020 traffic volumes are illustrated in Figure 12. Table 14 provides a summary of the total projected 2025 operations at the study area intersections. The SYNCHRO model output of total projected 2020 conditions is provided within Appendix I.

Figure 12: Total Projected 2020 Traffic Volumes

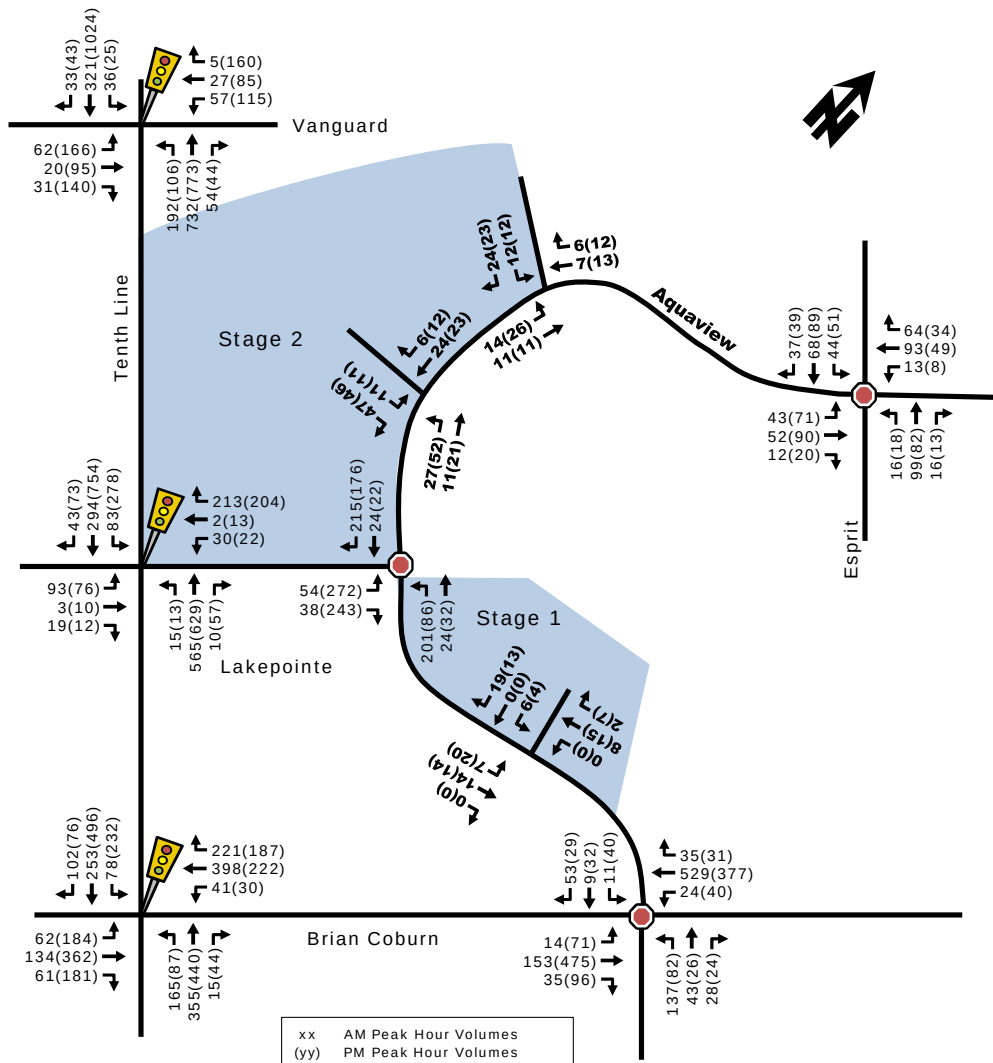


Table 14: Total Projected 2020 Performance at Study Area Intersection

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c / delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Lakepointe	C(C)	0.79(0.74)	EBT(EBT)	12.3(12.0)	A(A)	0.34(0.44)
Tenth Line/Brian Coburn	C(E)	0.78(0.92)	WBT(EBT)	15.7(26.2)	A(B)	0.49(0.65)
Tenth Line/Vangaurd	A(F)	0.45(1.05)	EBL(EBL)	8.9(24.5)	A(A)	0.29(0.59)
Aquaview/Brian Coburn	B(B)	0.67(0.64)	WBT(EBT)	19.3(14.3)	A(A)	0.57(0.53)
Unsignalized						
Aquaview/Esprit	A(A)	9.2(9.7)	WB(EB)	9.1(9.3)	-	-
Aquaview/Lakepointe	A(C)	9.8(20.5)	NB(EB)	9.1(16.7)	-	-
Aquaview/Stage 1 Access	A(A)	8.6(8.6)	SB(SB)	2.4(5.3)	-	-
Aquaview/Stage 1 Access N	A(A)	8.7(8.8)	SB(SB)	5.6(5.2)	-	-
Aquaview/Stage 1 Access S	A(A)	8.8(8.9)	EB(EB)	3.2(4.7)	-	-

Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

As shown in Table 14, the addition of the site traffic to the study area intersections results in similar levels of service, 'as-a-whole', as the projected background 2020 conditions.

With regard to 'critical movements', the eastbound through at Tenth Line/Lakepointe drops from a 'B' to 'C' during both peak periods, and the eastbound movement at Aquaview/Lakepointe drops from a 'B' to 'C' during the PM peak. The remaining intersections and movements operation similarly to the background 2020 conditions.

15.2. TOTAL PROJECTED 2025 CONDITIONS

The total projected 2025 traffic volumes were derived by superimposing the total site-generated traffic volumes on background 2025 traffic volumes. The resulting total projected 2025 traffic volumes are illustrated in Figure 13.

Table 15 provides a summary of the total projected 2025 operations at the study area intersection. The SYNCHRO model output of total projected 2029 conditions is provided within Appendix J.

Figure 13: Total Projected 2025 Traffic Volumes

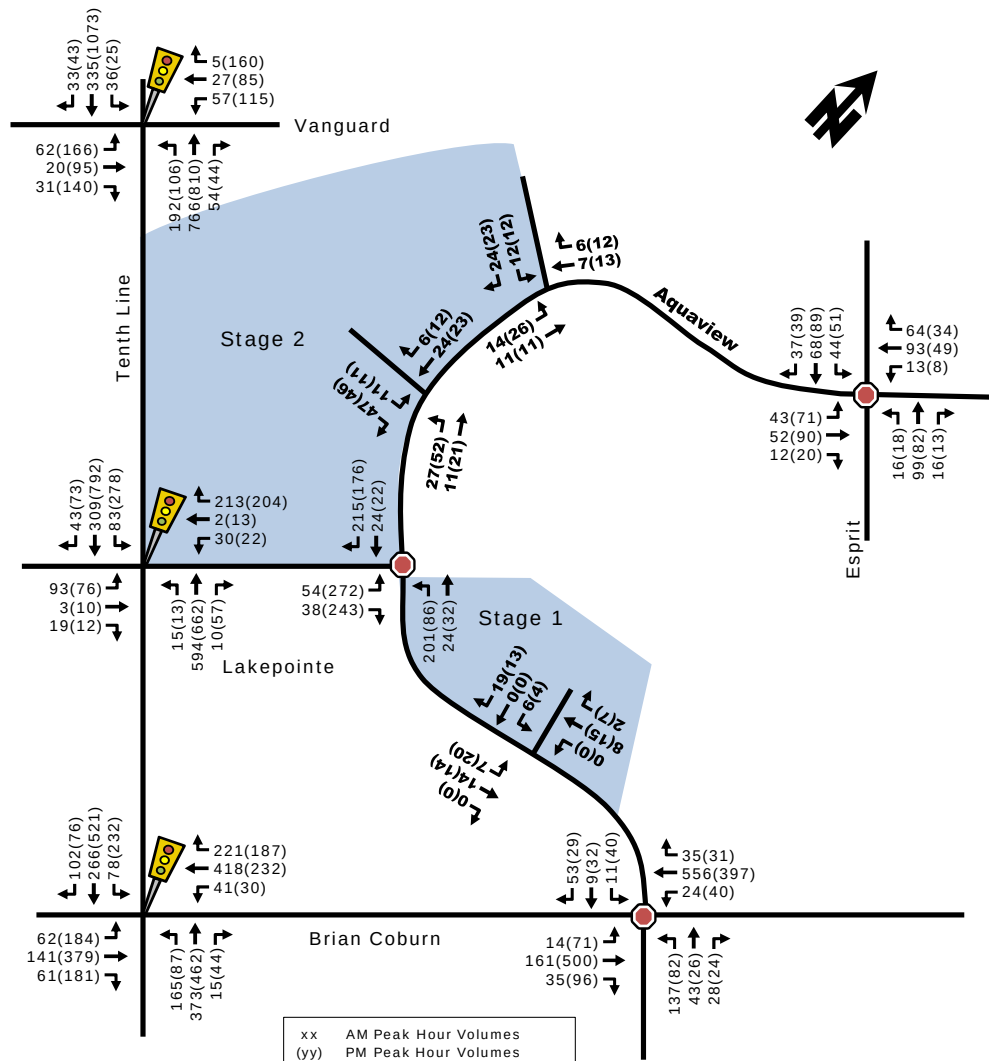


Table 15: Total Projected 2025 Performance at Study Area Intersection

Intersection	Weekday AM Peak (PM Peak)
--------------	---------------------------

	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c / delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Lakepointe	C(C)	0.79(0.74)	EBT(EBT)	12.3(12.4)	A(A)	0.35(0.46)
Tenth Line/Brian Coburn	C(E)	0.80(0.93)	WBT(EBT)	15.6(24.3)	A(B)	0.50(0.66)
Tenth Line/Vangaurd	A(F)	0.45(1.05)	EBL(EBL)	8.8(24.4)	A(A)	0.31(0.60)
Aquaview/Brian Coburn	B(B)	0.68(0.68)	WBT(EBT)	19.0(16.3)	A(A)	0.59(0.55)
Unsignalized						
Aquaview/Esprit	A(A)	9.2(9.7)	WB(EB)	9.1(9.3)	-	-
Aquaview/Lakepointe	A(C)	9.8(20.5)	NB(EB)	9.1(16.7)	-	-
Aquaview/Stage 1 Access	A(A)	8.6(8.6)	SB(SB)	2.4(5.3)	-	-
Aquaview/Stage 1 Access N	A(A)	8.7(8.8)	SB(SB)	5.6(5.2)	-	-
Aquaview/Stage 1 Access S	A(A)	8.8(8.9)	EB(EB)	3.2(4.7)	-	-
Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 15, the addition of the site traffic to the study area intersections results in similar levels of service, 'as-a-whole', as the projected background 2025 conditions.

With regard to 'critical movements', the eastbound through at Tenth Line/Lakepointe drops from a 'B' to 'C' during both peak periods, and the eastbound movement at Aquaview/Lakepointe drops from a 'B' to 'C' during the PM peak. The remaining intersections and movements operation similarly to the background 2025 conditions.

16. CONCLUSIONS

Based on the results summarized herein the following conclusions are offered:

Proposed Site

- The development will include 322 units, consisting of 274 townhomes and 48 single family homes;
- The proposed development will consist of two (2) stages, with Stage 1 and 2 being completed by 2020;
- The proposed development is projected to generate 'new' two-way vehicle volumes of approximately 182 and 238 trips during the weekday morning and afternoon peak hours; and
- The accesses to the development are proposed at three proposed new connections to Aquaview Drive.

Background Conditions

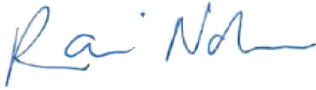
- The unsignalized study area intersections will operate well during the projected background horizons, with the exception of the Aquaview/Brian Coburn intersection with is projected to operate at a LoS 'F'. However, once the traffic signal is built at that location, it will operate at a LoS 'B' overall; and
- The signalized study area intersections will operate well overall during the projected background horizons. The critical movements at the Tenth Line/Vanguard and Tenth Line/Brian Coburn intersections are projected to operate at LoS 'F' and LoS 'E' during the PM peak hour.

Projected Conditions

- The proposed site accesses are projected to operate well during AM and PM peak hours;
- The signalized and unsignalized study area intersections are projected to operate similar to forecasted background conditions;
- Additional capacity may be required to accommodate the increase in transit trips; and,
- MMLOS targets are met along boundary streets with the exception of the PLoS target along Tenth Line Road.

Based on the foregoing conclusions, the proposed development is recommended to proceed from a transportation perspective.

Prepared By:



Rani Nahas, E.I.T.
Transportation Analyst

Reviewed By:



Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

Screening Form and City Response

City of Ottawa 2017 TIA Guidelines

Date

15-Feb-18

TIA Screening Form

Project

Minto Aquaview Stage 1 and 2

Project Number

476521

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	Yes
Development Satisfies the Location Trigger	Yes
Development Satisfies the Safety Trigger	Yes

Module 1.1 - Description of Proposed Development

Municipal Address	352 Aquaview Drive
Description of location	Currently vacant lots along Aquaview drive, 10.35 ha in size
Land Use	Residential
Development Size	275 units (227 Townhomes, 48 Single Detached Homes)
Number of Accesses and Locations	4 proposed local road accesses to Aquaview Drive
Development Phasing	Phase 1 - Single Homes Phase 2 - Townhomes
Buildout Year	Assumed Phase 1: 2020, Phase 2: 2020
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger

Land Use Type	Townhomes or Apartments	
Development Size	275	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers

Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	No
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes
Location Trigger Met?	Yes

Module 1.4 - Safety Triggers

Posted Speed Limit on any boundary road	<80	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	Yes	
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	Yes	

From: [Yousfani, Asad](#)
To: [Harte, Andrew](#)
Subject: RE: Minto - Aquaview Plan
Date: Thursday, March 01, 2018 9:48:24 AM
Attachments: [image006.png](#)

Hi Andrew,
I'll call you 10:30 am tomorrow to go over the report.
Thanks-Asad

From: Harte, Andrew [mailto:Andrew.Harte@parsons.com]
Sent: Wednesday, February 28, 2018 12:49 PM
To: Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>; Yousfani, Asad <Asad.Yousfani@ottawa.ca>
Cc: Susan Murphy <SMurphy@minto.com>; 'De Santi, Nadia' <Nadia.De-Santi@wsp.com>; Gordon, Christopher <Christopher.Gordon@parsons.com>
Subject: RE: Minto - Aquaview Plan

Julie / Asad,

Thanks for the update about today's meeting. I have attached the Scoping and Screening Report for the subdivision as we will still need comments/verification on our recommendations in the exemptions review.

I will proceed with combining the Forecasting and Strategy Reports to cut down on one circulation during the TIA process.

Regards,
Andrew Harte, P.Eng.
Senior Transportation Engineer
1223 Michael Street North, Suite 100, Ottawa, Ontario, K1J 7T2
andrew.harte@parsons.com – P: +1 613.691.1527
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www.parsons.com | [LinkedIn](#) | [Twitter](#) | [Facebook](#)



From: Lebrun, Julie (Planning) [mailto:Julie.Lebrun@ottawa.ca]
Sent: Wednesday, February 28, 2018 10:52 AM
To: 'De Santi, Nadia' <Nadia.De-Santi@wsp.com>
Cc: Susan Murphy <SMurphy@minto.com>; Koblauch, Kasper <kasper.koblauch@wsp.com>; andresauve@atrel.com; Jean Decoeur <jeandecoeur@atrel.com>; Frank.Penney@stantec.com; Harte, Andrew <Andrew.Harte@parsons.com>; Yousfani, Asad <Asad.Yousfani@ottawa.ca>
Subject: RE: Minto - Aquaview Plan

Hi Nadia,

Our transportation engineer, Asad Yousfani will not be able to attend this afternoon's meeting. However, he has provided the following requirements:

-TIA is required. This proposal will trigger volume warrants. Parsons must provide a [complete TIA](#) with the submission including functional road modifications, if required. There is no need to forward to Asad every step and get approval. However, he can answer any question on any parameters during the TIA completion.

-Traffic noise impact assessment is required. Future transitway and any collector road, such as Aquaview, need to be taken into account. This is more or less similar to the situation when Minto developed the lands along Gerry Lalonde on the west side of Tenth Line and north of Brian Coburn Blvd. A detailed noise study is preferred once the concept plan is finalized.

Regards,

Julie Lebrun, MCIP, RPP (MICU, UPC)
Planner / Urbaniste
Development Review, Suburban Services East /
Examen des demandes d'aménagement, Services suburbains est
Planning, Infrastructure and Economic Development /
Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
☎ 613.580.2424 ext./poste 27816
ottawa.ca/planning [ottawa.ca] / ottawa.ca/urbanisme[ottawa.ca]

From: De Santi, Nadia [<mailto:Nadia.De-Santi@wsp.com>]
Sent: Friday, February 23, 2018 9:30 AM
To: Lebrun, Julie (Planning) <Julie.Lebrun@ottawa.ca>
Cc: Susan Murphy <SMurphy@minto.com>; Koblauch, Kasper <kasper.koblauch@wsp.com>;
andresauve@atrel.com; Jean Decoeur <jeandecoeur@atrel.com>; Frank.Penney@stantec.com;
Harte, Andrew <Andrew.Harte@parsons.com>
Subject: Minto - Aquaview Plan

Hi Julie,

It's me again. Thanks for your patience.

Please find attached the concept plan for our pre-consultation meeting next Wednesday.

Thank you.

Regards,

Nadia De Santi, MCIP, RPP
Senior Project Manager
Planning, Landscape Architecture and Urban Design



T+ 1 613-690-1114
M+ 1 613-816-0664

Appendix B

City of Ottawa Traffic Data



Transportation Services - Traffic Services
Turning Movement Count - 15 Minute Summary Report

36983

W.O.

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date:		Wednesday, May 03, 2017																Total Observed U-Turns			
		Northbound:				Southbound:				Eastbound:				Westbound:							
		0				0				0				0							
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		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
		0				0				0				0							
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		0				0				0				0							
		0				0															

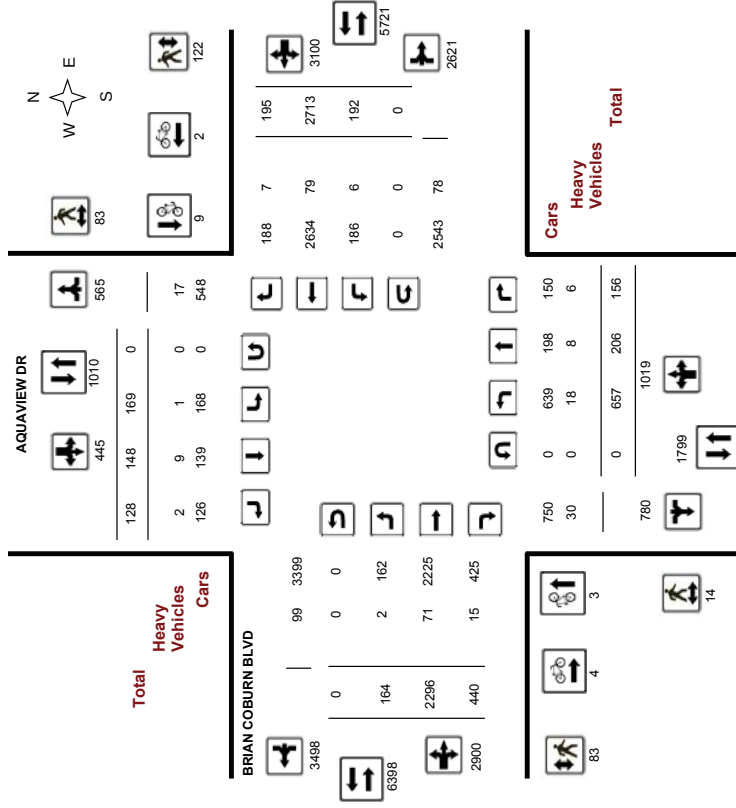


Transportation Services - Traffic Services
Turning Movement Count - Full Study Diagram

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date: Wednesday, May 03, 2017

WO#: 36983
Device: Miovision



Comments



Transportation Services - Traffic Services
Turning Movement Count - Heavy Vehicle Report

W.O.
36983

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date: Wednesday, May 03, 2017

AQUAVIEW DR										BRIAN COBURN BLVD										Grand Total									
Northbound					Southbound					Eastbound					Westbound														
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT											
07:00 - 08:00	2	2	0	4	0	1	1	2	6	1	9	7	17	0	15	4	19	36	42										
08:00 - 09:00	4	1	2	7	0	4	0	4	11	0	12	3	15	2	10	2	14	29	40										
09:00 - 10:00	1	0	0	1	0	0	0	0	1	0	7	1	8	1	9	0	10	18	19										
11:30 - 12:30	0	0	0	0	0	1	0	1	1	0	8	1	9	0	8	0	8	17	18										
12:30 - 13:30	1	1	3	5	0	0	1	1	6	1	6	1	8	0	8	0	8	16	22										
15:00 - 16:00	2	3	0	5	1	2	0	3	8	0	7	0	7	1	7	0	8	15	23										
16:00 - 17:00	3	1	1	5	0	1	0	1	6	0	11	1	12	0	14	1	15	27	33										
17:00 - 18:00	5	0	0	5	0	0	0	0	5	0	11	1	12	2	8	0	10	22	27										
Sub Total										18	8	6	32	1	9	2	12	44	2	71	15	88	6	79	7	92	180	224	
U-Turns (Heavy Vehicles)										0				0				0				0				0			
Total										18	8	6	0	1	9	2	12	44	2	71	15	88	6	79	7	92	180	224	
Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.																													

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.



Transportation Services - Traffic Services

Work Order
36983

Turning Movement Count - Full Study Summary Report

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date: Wednesday, May 03, 2017

Total Observed U-Turns

Northbound: 0

Southbound: 0

Eastbound: 0

Westbound: 0

AADT Factor
90

Full Study													BRIAN COBURN BLVD											
Period	AQUAVIEW DR						Eastbound						Westbound											
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	EB TOT	LT	ST	RT	WB TOT	WB TOT					
07:00 08:00	137	43	28	208	10	9	34	53	261	4	150	35	189	24	519	35	578	767	1028					
08:00 09:00	145	33	36	214	15	19	21	55	269	11	176	39	226	40	405	25	470	696	965					
09:00 10:00	59	18	6	83	15	16	15	46	129	6	176	21	203	19	285	34	338	541	670					
11:30 12:30	47	17	8	72	22	9	8	39	111	4	251	34	289	5	263	13	281	570	681					
12:30 13:30	41	10	11	62	16	8	9	33	95	8	230	38	276	9	216	19	244	520	615					
15:00 16:00	73	25	20	118	25	18	13	56	174	37	393	79	509	22	331	11	364	873	1047					
16:00 17:00	77	27	26	130	27	47	16	90	220	38	455	87	580	38	346	20	404	984	1204					
17:00 18:00	78	33	21	132	39	22	12	73	205	56	465	107	628	35	348	38	421	1049	1254					
Sub Total	657	206	156	1019	169	148	128	445	1464	164	2296	440	2900	192	2713	195	3100	6000	7464					
U-Turns				0				0	0				0				0	0	0					
Total	657	206	156	1019	169	148	128	445	1464	164	2296	440	2900	192	2713	195	3100	6000	7464					
EQ 12Hr	913	286	217	1416	235	206	178	619	2035	228	3191	612	4031	267	3771	271	4309	8340	10375					
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																				1.39				
AVG 12Hr	822	258	195	1275	211	185	160	557	1832	205	2872	550	3628	240	3394	244	3878	7506	9338					
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																				.90				
AVG 24Hr	1077	338	256	1670	277	243	210	729	2399	269	3763	721	4753	315	4446	320	5080	9833	12232					
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																				1.31				



Transportation Services - Traffic Services

Work Order
36983

Turning Movement Count - Pedestrian Volume Report

AQUAVIEW DR @ BRIAN COBURN BLVD

Count Date: Wednesday, May 03, 2017

Start Time:

07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	1	0	5	5	6
07:15 07:30	0	1	1	9	10	11
07:30 07:45	0	1	3	10	13	14
07:45 08:00	0	1	12	12	25	26
08:00 08:15	0	4	36	40	80	84
08:15 08:30	0	2	9	10	21	22
08:30 08:45	0	2	6	8	16	17
08:45 09:00	0	0	1	1	2	2
09:00 09:15	2	5	6	24	37	39
09:15 09:30	0	3	5	8	16	17
09:30 09:45	0	3	1	3	7	7
09:45 10:00	0	4	1	3	8	8
10:00 10:15	0	0	0	0	0	0
10:15 10:30	0	10	11	16	37	37
10:30 10:45	0	0	2	2	4	4
10:45 11:00	0	0	1	2	3	3
11:00 11:15	0	0	1	2	3	3
11:15 11:30	0	3	2	0	5	5
11:30 11:45	0	2	2	2	6	6
11:45 12:00	0	0	1	1	2	2
12:00 12:15	0	3	2	0	5	5
12:15 12:30	0	2	2	2	6	6
12:30 12:45	0	5	5	8	18	18
12:45 13:00	0	0	3	5	8	8
13:00 13:15	0	2	1	3	6	6
13:15 13:30	2	2	4	4	12	12
13:30 13:45	2	6	7	5	20	20
13:45 14:00	1	7	8	7	23	23
14:00 14:15	0	4	4	7	15	15
14:15 14:30	0	2	1	5	8	8
14:30 14:45	0	2	2	7	11	11
14:45 15:00	0	2	2	8	14	14
15:00 15:15	1	15	16	39	51	55
15:15 15:30	3	10	5	10	28	30
15:30 15:45	1	3	4	6	14	15
15:45 16:00	0	2	2	6	10	10
16:00 16:15	0	2	1	5	8	8
16:15 16:30	0	6	4	8	18	19
16:30 16:45	4	17	21	30	52	56
16:45 17:00	0	6	5	10	21	22
17:00 17:15	3	1	4	5	13	14
17:15 17:30	0	2	3	8	13	13
17:30 17:45	0	12	14	17	43	47
17:45 18:00	5	21	26	36	68	72
18:00 18:15	14	83	97	122	205	209
Total	14	83	97	122	205	209

Comment:



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date: Wednesday, May 03, 2017

Start Time: 07:00

WO No: 36983

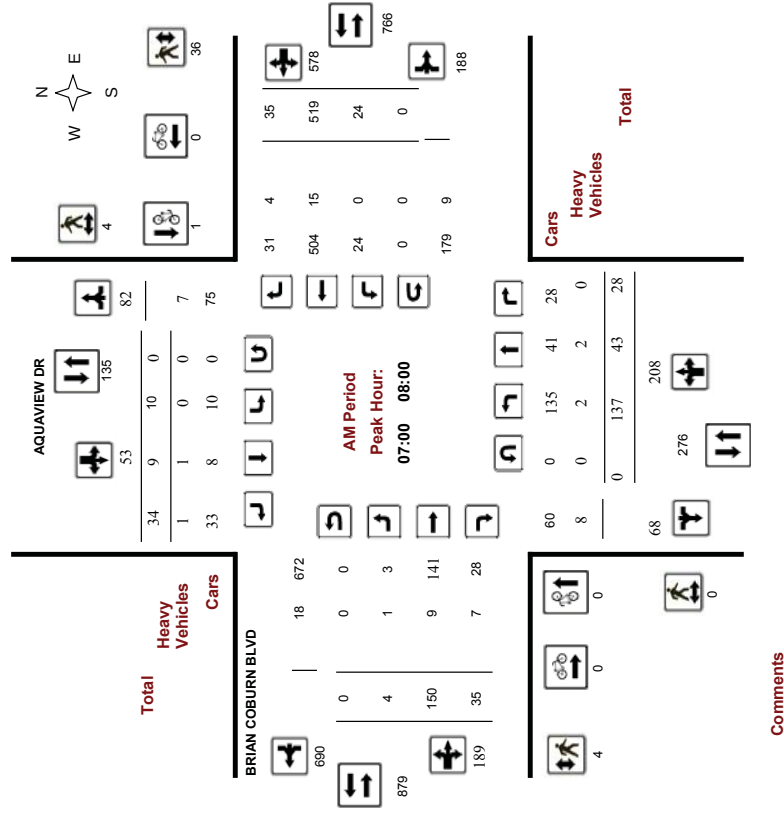
Device: Miovision

Survey Date: Wednesday, May 03, 2017

Start Time: 07:00

WO No: 36983

Device: Miovision



Comments

Comments



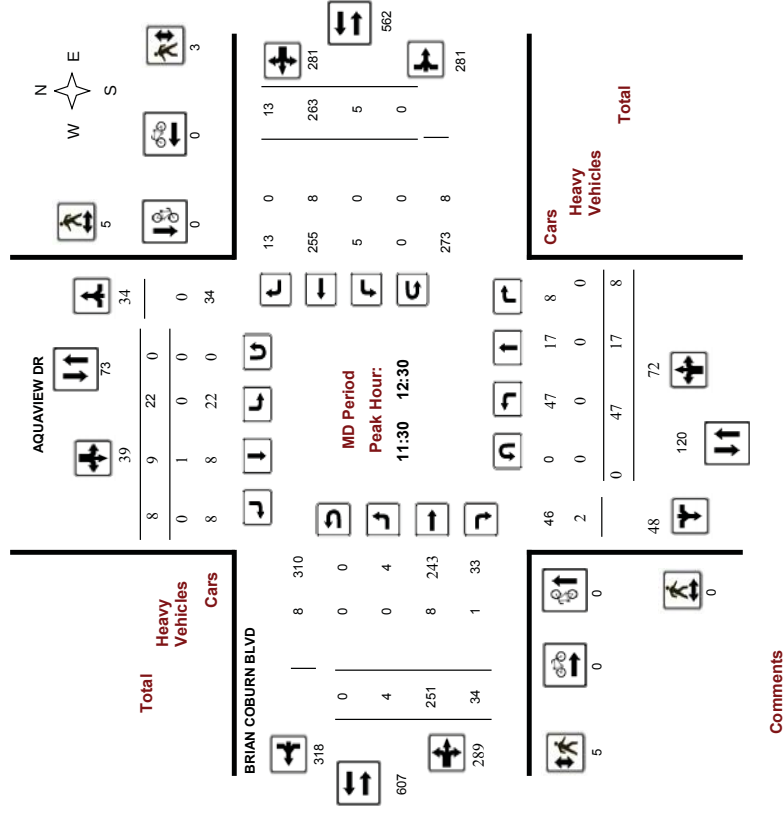
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date: Wednesday, May 03, 2017
Start Time: 07:00

WO No: 36983
Device: Miovision



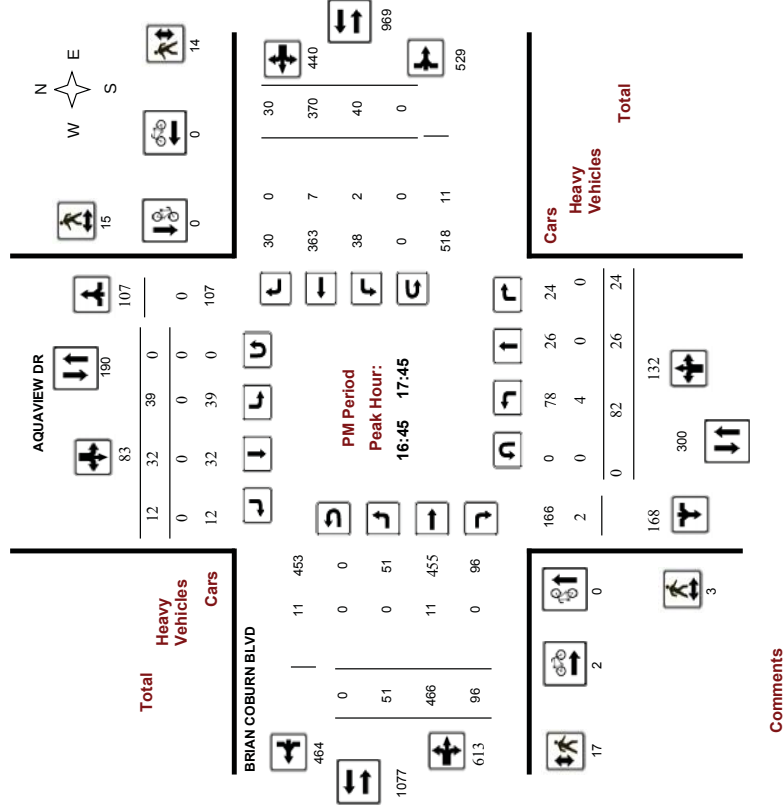
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date: Wednesday, May 03, 2017
Start Time: 07:00

WO No: 36983
Device: Miovision





Transportation Services - Traffic Services

Work Order
36983

36410

Turning Movement Count - 15 Min U-Turn Total Report

AQUAVIEW DR @ BRIAN COBURN BLVD

Survey Date: Wednesday, May 03, 2017

Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	0	0	0	0	0
07:15	0	0	0	0	0
07:30	0	0	0	0	0
07:45	0	0	0	0	0
08:00	0	0	0	0	0
08:15	0	0	0	0	0
08:30	0	0	0	0	0
08:45	0	0	0	0	0
09:00	0	0	0	0	0
09:15	0	0	0	0	0
09:30	0	0	0	0	0
09:45	0	0	0	0	0
10:00	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
Total	0	0	0	0	0

2018-Jan-22

Page 1 of 1



Transportation Services - Traffic Services

36410

Turning Movement Count - 15 Minute Summary Report

AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016

Total Observed U-Turns

Northbound: 2
Southbound: 1
Eastbound: 0
Westbound: 0

Time Period	Northbound				Southbound				Eastbound				Westbound				W	STR	Grand Total
	LT	ST	RT	TOT	N	LT	ST	RT	TOT	S	STR	TOT	LT	ST	RT	TOT	RT	TOT	
07:00	0	22	4	26	2	14	8	24	50	9	2	2	13	5	13	12	30	43	93
07:15	0	22	1	23	2	8	14	7	29	57	7	9	4	20	1	21	10	32	109
07:30	0	38	12	50	2	31	69	7	104	0	21	4	18	14	36	57	126	126	126
07:45	0	38	19	57	21	5	45	83	7	22	2	31	4	33	16	53	84	167	167
08:00	0	20	3	23	24	5	24	4	33	57	3	7	1	11	4	21	24	60	117
08:15	0	14	2	16	20	3	15	8	26	46	1	5	2	8	3	15	14	32	86
08:30	0	14	1	15	17	7	11	5	23	40	2	7	1	10	3	21	8	32	82
08:45	0	13	1	14	17	0	19	1	20	37	1	10	3	14	0	8	10	18	69
09:00	0	21	7	28	21	7	10	1	18	39	2	5	4	11	1	7	8	16	66
09:15	0	13	3	16	13	3	6	3	12	25	3	4	0	7	2	6	10	18	50
09:30	0	6	0	6	7	3	15	2	20	27	2	3	0	5	1	6	13	20	52
09:45	0	6	0	6	6	2	6	2	10	16	1	6	0	7	2	3	8	15	31
11:30	0	3	3	6	8	4	5	2	12	20	4	3	2	9	1	4	5	10	39
11:45	0	7	1	8	12	10	10	3	23	35	3	9	4	16	0	8	7	15	66
12:00	0	7	2	9	12	6	9	5	20	32	4	9	1	14	0	6	12	26	58
12:15	0	9	1	10	11	6	15	2	23	34	3	7	0	10	0	9	12	22	56
12:30	0	8	2	10	10	3	4	3	10	20	4	5	1	10	2	6	7	15	45
12:45	0	7	1	8	10	5	6	3	14	24	1	1	1	3	1	6	13	16	40
13:00	0	9	3	12	13	3	10	2	15	28	4	6	4	14	1	8	4	13	55
13:15	0	5	0	5	6	7	7	5	19	25	4	8	0	12	1	7	4	12	49
15:00	0	5	20	25	28	3	12	8	23	51	4	8	2	14	3	8	14	28	79
15:15	0	2	15	17	19	6	19	7	32	51	5	17	7	29	2	7	6	15	95
15:30	0	14	2	16	16	9	23	9	41	57	9	15	2	26	5	10	6	21	104
15:45	0	28	8	40	40	8	20	6	34	74	8	19	4	31	3	19	7	29	134
16:00	0	5	21	26	32	8	13	6	27	59	9	15	5	29	1	16	3	20	108
16:15	0	16	4	21	10	19	7	36	57	7	10	5	22	3	7	5	15	37	94
16:30	0	27	4	36	9	22	10	41	77	10	23	6	39	5	9	10	24	63	140
16:45	0	5	16	21	22	7	22	7	36	58	12	16	2	30	1	13	6	20	108
17:00	0	24	4	30	16	21	4	41	71	7	19	7	33	0	14	11	25	58	129
17:15	0	18	1	24	13	24	7	44	68	21	24	3	48	2	9	6	17	65	133
17:30	0	3	19	28	13	20	4	37	65	13	31	1	45	4	14	13	31	76	141
17:45	0	3	21	26	9	24	3	36	62	12	16	4	32	2	12	4	18	50	112
TOTAL:	79	495	83	659	226	469	159	855	1514	189	355	80	624	67	359	269	695	1319	2833

Note: U-Turns are included in Totals.

Comment:

2018-Jan-22

Page 1 of 1



Transportation Services - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
36410

Count Date: Wednesday, October 19, 2016

Start Time: 07:00

AQUAVIEW DR @ ESPRIT DR

Time Period	ESPRIT DR			AQUAVIEW DR			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 08:00	0	1	1	2	0	2	3
08:00 09:00	1	0	1	1	0	1	2
09:00 10:00	1	1	2	1	1	2	4
11:30 12:30	0	0	0	0	0	0	0
12:30 13:30	0	0	0	0	0	0	0
15:00 16:00	1	2	3	2	1	3	6
16:00 17:00	0	2	2	0	0	0	2
17:00 18:00	1	1	2	1	1	2	4
Total	4	7	11	7	3	10	21

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

2018-Jan-22

Page 1 of 1



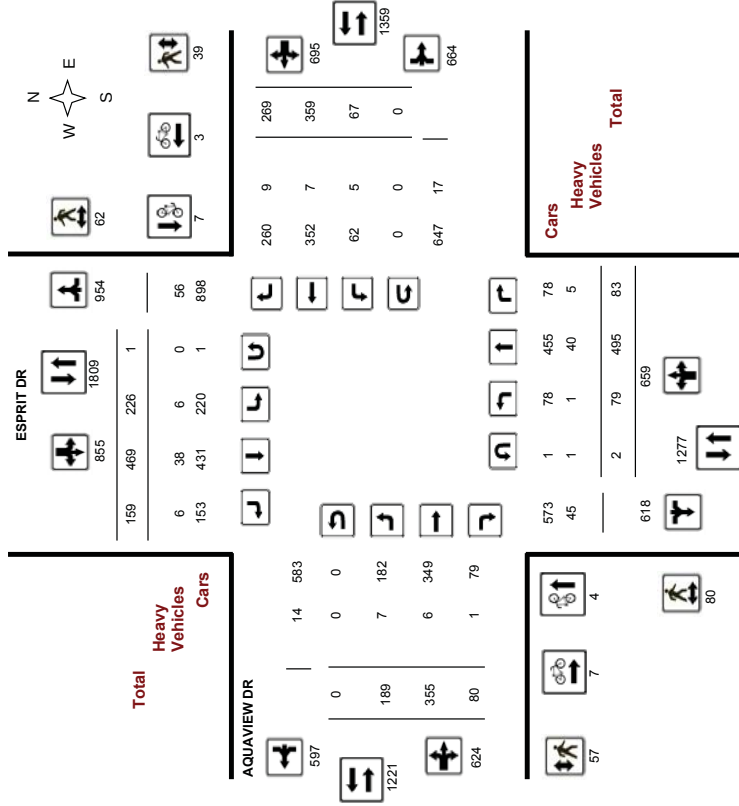
Transportation Services - Traffic Services
Turning Movement Count - Full Study Diagram

AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016

WO#: 36410

Device: Miovision



2018-Jan-22

Page 1 of 1



Transportation Services - Traffic Services

W.O.
36410

Turning Movement Count - Heavy Vehicle Report

AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016

Time Period	Northbound						Eastbound						Westbound						Grand Total						
	ST			N	RT			ST			S	RT			ST			E		RT			W	STR	TOT
	LT	ST	RT		LT	ST	RT	LT	ST	RT		LT	ST	RT	LT	ST	RT								
07:00 08:00	0	12	1	13	1	2	2	5	18	2	3	0	5	1	0	2	3	8	26						
08:00 09:00	0	8	1	9	2	7	2	11	20	0	0	0	0	0	3	3	6	6	26						
09:00 10:00	1	2	1	4	1	3	1	5	9	1	0	0	1	1	0	1	2	3	12						
11:30 12:30	0	3	1	4	0	3	1	4	8	1	0	0	1	0	1	0	1	2	10						
12:30 13:30	0	4	1	6	1	2	0	3	9	1	0	0	1	1	1	1	3	4	13						
15:00 16:00	0	6	0	6	0	4	0	4	10	1	3	1	5	1	1	2	4	9	19						
16:00 17:00	0	3	0	3	1	9	0	10	13	1	0	0	1	1	1	0	2	3	16						
17:00 18:00	0	2	0	2	0	8	0	8	10	0	0	0	0	0	0	0	0	0	10						
Sub Total	1	40	5	47	6	38	6	50	97	7	6	1	14	5	7	9	21	35	132						
U-Turns (Heavy Vehicles)				1				0	1				0				0	0	1						
Total	1	40	5	47	6	38	6	50	98	7	6	1	14	5	7	9	21	35	133						

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.



Transportation Services - Traffic Services

Work Order
36410

Turning Movement Count - Pedestrian Volume Report

AQUAVIEW DR @ ESPRIT DR

Count Date: Wednesday, October 19, 2016

Start Time: 07:00

Time Period	NB Approach (E or W Crossing)		SB Approach (E or W Crossing)		Total	EB Approach (N or S Crossing)		WB Approach (N or S Crossing)		Total	Grand Total
07:00 07:15	1	2	2	0	3	0	3	3	0	3	6
07:15 07:30	2	2	4	2	4	2	2	4	2	4	8
07:30 07:45	3	0	3	3	3	3	2	5	3	8	8
07:45 08:00	1	3	4	3	6	3	3	6	6	10	10
07:00 08:00	7	7	14	8	18	10	10	20	18	32	32
08:00 08:15	4	0	4	2	4	2	0	2	2	6	6
08:15 08:30	0	3	3	2	3	2	0	2	2	5	5
08:30 08:45	1	7	8	2	8	2	0	2	2	10	10
08:45 09:00	4	2	6	4	6	4	0	4	4	10	10
08:00 09:00	9	12	21	10	31	10	10	20	10	31	31
09:00 09:15	2	0	2	0	2	0	1	1	0	3	3
09:15 09:30	1	0	1	2	2	2	2	4	2	5	5
09:30 09:45	2	0	2	0	2	0	0	0	0	2	2
09:45 10:00	1	0	1	1	2	1	1	2	1	3	3
09:00 10:00	6	0	6	2	8	4	4	8	6	12	12
10:00 11:00	2	0	2	2	4	2	1	3	2	5	5
11:00 11:45	4	2	6	1	7	1	2	3	3	6	6
11:45 12:00	4	2	6	1	7	1	2	3	3	6	6
12:00 12:15	0	0	0	0	0	0	0	0	0	0	0
12:15 12:30	3	0	3	3	6	2	1	3	3	6	6
11:30 12:30	9	2	11	5	16	4	4	8	9	20	20
12:30 12:45	1	0	1	2	3	0	0	2	2	4	4
12:45 13:00	0	3	3	3	6	3	2	5	3	8	8
13:00 13:15	0	0	0	2	2	0	0	2	2	4	4
13:15 13:30	1	3	4	3	7	3	2	5	3	8	8
12:30 13:30	2	6	8	10	18	4	4	8	14	22	22
15:00 15:15	0	1	1	0	2	0	1	1	1	2	2
15:15 15:30	2	0	2	2	4	2	0	2	2	4	4
15:30 15:45	4	2	6	0	6	0	0	0	0	6	6
15:45 16:00	8	13	21	6	27	6	2	8	8	16	16
15:00 16:00	14	16	30	8	38	4	4	8	12	20	20
16:00 16:15	4	3	7	1	8	3	3	6	4	10	10
16:15 16:30	5	0	5	3	8	3	0	3	3	6	6
16:30 16:45	5	1	6	0	6	0	1	1	1	2	2
16:45 17:00	5	3	8	4	12	4	1	5	5	10	10
16:00 17:00	19	7	26	8	34	5	5	10	13	23	23
17:00 17:15	1	0	1	3	4	2	2	4	2	6	6
17:15 17:30	0	3	3	0	3	0	2	2	2	4	4
17:30 17:45	5	5	10	1	11	1	1	2	2	4	4
17:45 18:00	8	4	12	2	14	3	3	6	5	11	11
17:00 18:00	14	12	26	8	34	8	8	16	14	30	30
Total	80	62	142	57	199	39	39	78	36	114	114

Comment:



Transportation Services - Traffic Services

Work Order
36410

Turning Movement Count - Full Study Summary Report

AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016
Total Observed U-Turns
Northbound: 2
Southbound: 1
Eastbound: 0
Westbound: 0
AADT Factor .90

Full Study

Period	ESPRIT DR					AQUAVIEW DR																		
	Northbound					Southbound					Eastbound					Westbound								
	LT	ST	RT	NB TOT	SB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand TOT				
07:00-08:00	12	101	17	130	41	58	30	129	259	30	47	8	85	14	85	52	151	236	495					
08:00-09:00	9	61	7	77	15	69	18	102	179	7	29	7	43	10	65	56	131	174	353					
09:00-10:00	5	39	3	47	15	37	8	60	107	8	18	4	30	6	22	34	62	92	199					
11:30-12:30	10	26	7	43	26	39	12	77	120	14	28	7	49	1	27	21	49	98	218					
12:30-13:30	3	29	6	38	18	27	13	58	96	13	20	6	39	5	27	21	53	92	188					
15:00-16:00	11	77	15	103	26	74	30	130	233	26	59	15	100	13	39	27	79	179	412					
16:00-17:00	16	80	15	111	34	76	30	140	251	38	64	18	120	10	45	24	79	199	450					
17:00-18:00	13	82	13	108	51	89	18	158	266	53	90	15	158	8	49	34	91	249	515					
Sub Total	79	495	83	657	226	469	159	854	1511	189	355	80	624	67	359	269	695	1319	2830					
U-Turns	2			1		3		0					0					0					0	
Total	79	495	83	659	226	469	159	855	1514	189	355	80	624	67	359	269	695	1319	2833					
EQ 12Hr	110	688	115	916	314	652	221	1188	2104	263	493	111	867	93	499	374	966	1833	3937					
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																								
													1.39											
AVG 12Hr	99	619	104	824	283	587	199	1070	1894	236	444	100	781	84	449	337	869	1650	3544					
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																								
													.90											
AVG 24Hr	129	811	136	1080	370	769	261	1401	2481	310	592	131	1023	110	588	441	1139	2162	4643					
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																								
													1.31											

Comments:

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

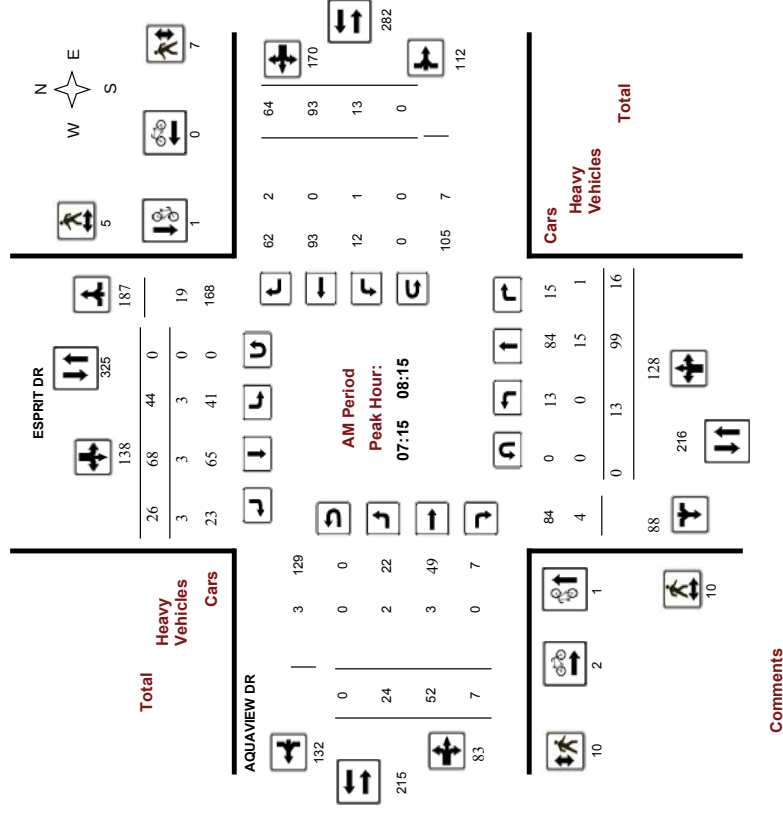


Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016
Start Time: 07:00
WO No: 36410
Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

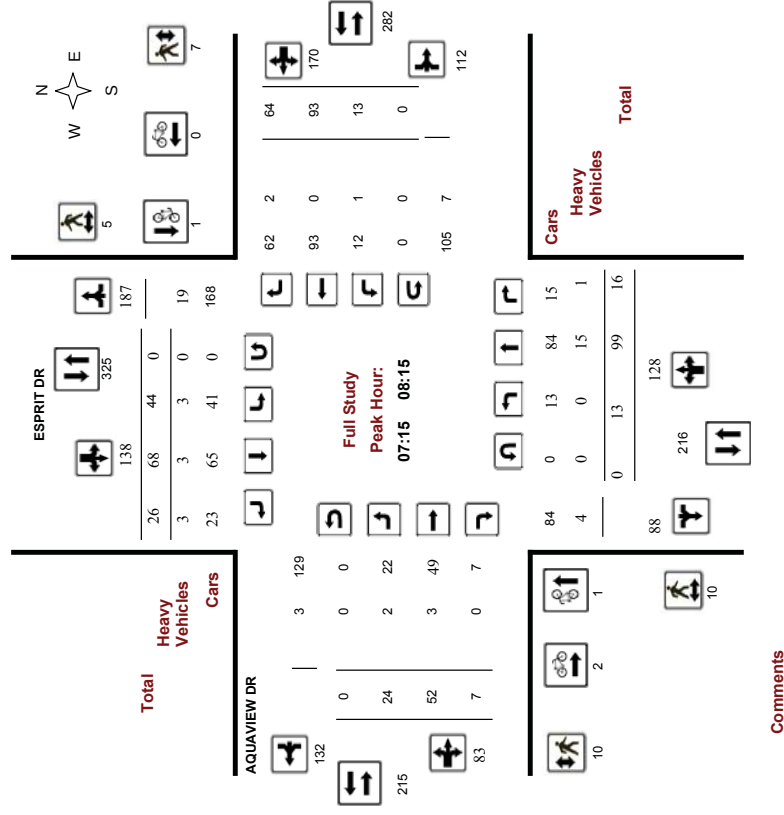
AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016

WO No: 36410

Device: Miovision

Start Time: 07:00



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

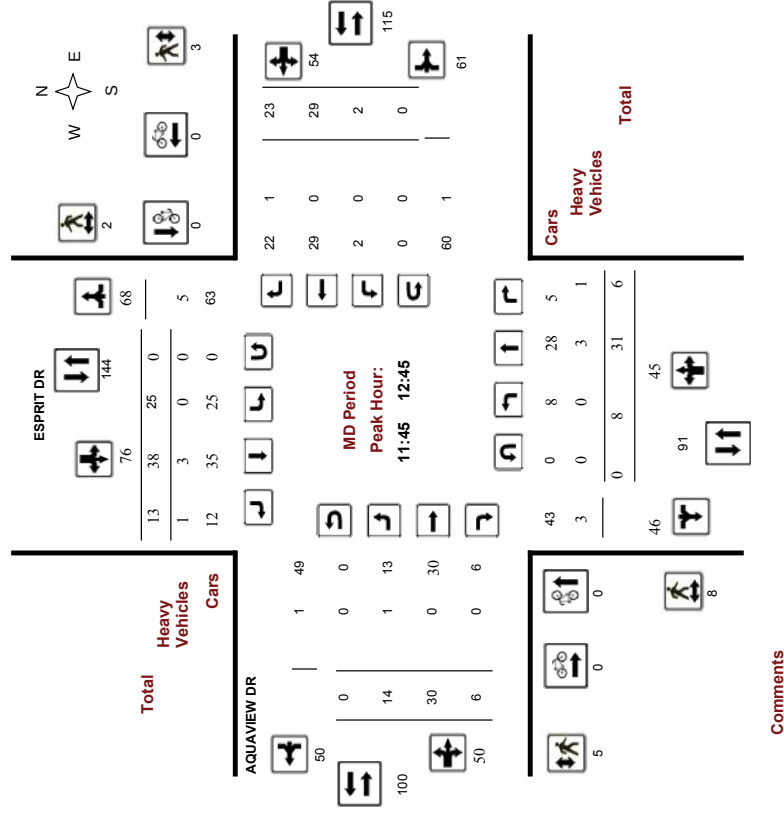
AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016

WO No: 36410

Device: Miovision

Start Time: 07:00





Transportation Services - Traffic Services

Work Order
36410

Turning Movement Count - 15 Min U-Turn Total Report

AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016

Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00 07:15	0	0	0	0	0
07:15 07:30	0	0	0	0	0
07:30 07:45	0	0	0	0	0
07:45 08:00	0	0	0	0	0
08:00 08:15	0	0	0	0	0
08:15 08:30	0	0	0	0	0
08:30 08:45	0	0	0	0	0
08:45 09:00	1	0	0	0	1
09:00 09:15	0	0	0	0	0
09:15 09:30	0	0	0	0	0
09:30 09:45	0	0	0	0	0
09:45 10:00	0	0	0	0	0
11:30 11:45	0	1	0	0	1
11:45 12:00	0	0	0	0	0
12:00 12:15	0	0	0	0	0
12:15 12:30	0	0	0	0	0
12:30 12:45	0	0	0	0	0
12:45 13:00	0	0	0	0	0
13:00 13:15	1	0	0	0	1
13:15 13:30	0	0	0	0	0
15:00 15:15	0	0	0	0	0
15:15 15:30	0	0	0	0	0
15:30 15:45	0	0	0	0	0
15:45 16:00	0	0	0	0	0
16:00 16:15	0	0	0	0	0
16:15 16:30	0	0	0	0	0
16:30 16:45	0	0	0	0	0
16:45 17:00	0	0	0	0	0
17:00 17:15	0	0	0	0	0
17:15 17:30	0	0	0	0	0
17:30 17:45	0	0	0	0	0
17:45 18:00	0	0	0	0	0
Total	2	1	0	0	3

2016-Jan-22

Page 1 of 1



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

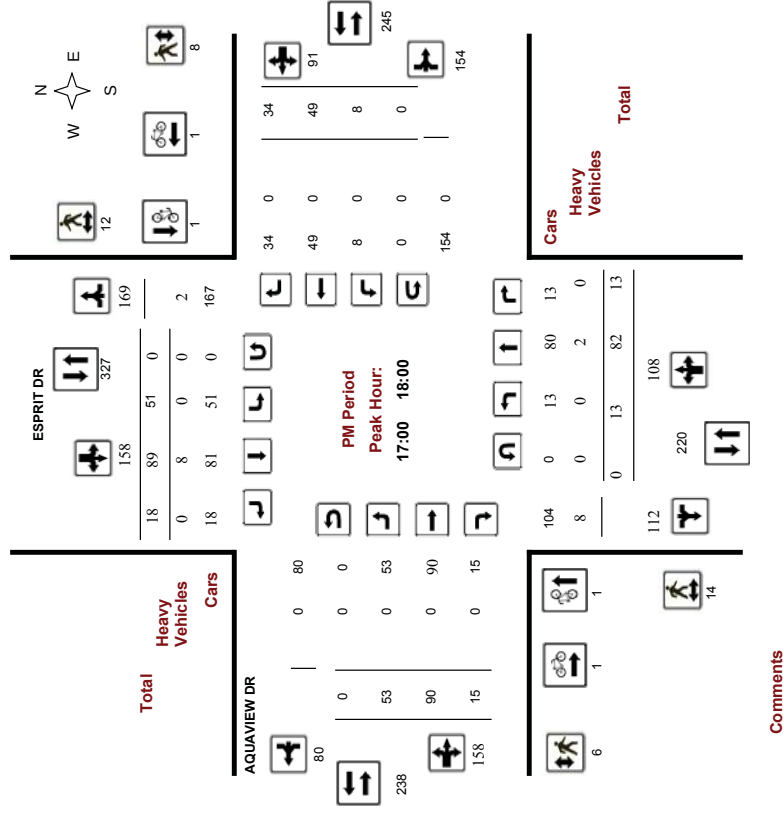
AQUAVIEW DR @ ESPRIT DR

Survey Date: Wednesday, October 19, 2016

Start Time: 07:00

WO No: 36410

Device: Miovision



2016-Jan-22

Page 4 of 4

Turning Movement Count - 15 Minute Summary Report

Work Order
36420

BRIAN COBURN BLVD @ TENTH LINE RD									
Count Date: Wednesday, October 26, 2016					Start Time: 07:00				
TENTH LINE RD					BRIAN COBURN BLVD				
Time Period	Northbound	Southbound	Street Total		Eastbound	Westbound	Street Total		Grand Total
07:00-08:00	1	0	1	0	0	0	0	0	1
08:00-09:00	1	0	1	0	0	2	2	3	3
09:00-10:00	0	0	0	0	0	2	2	2	2
11:30-12:30	2	0	2	0	0	0	0	2	2
12:30-13:30	1	0	1	1	1	1	1	2	2
15:00-16:00	0	0	0	1	0	0	1	1	1
16:00-17:00	0	0	0	1	0	0	1	1	1
17:00-18:00	1	0	1	1	1	0	1	2	1
Total	6	0	6	3	5	5	8	14	14

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

2017-Jun-22

Page 1 of 1

BRIAN COBURN BLVD @ TENTH LINE RD																																							
Survey Date:			Wednesday, October 26, 2016										Total Observed U-Turns																										
			Northbound: 2					Southbound: 11					Eastbound: 0							Westbound: 0																			
TENTH LINE RD													BRIAN COBURN BLVD																										
Northbound						Southbound						Eastbound							Westbound																				
Time Period	L T	S T	R T	TOT	N	L T	S T	R T	TOT	S	STR	TOT	L T	S T	R T	TOT	E	L T	S T	R T	TOT	W	STR	TOT	Grand Total														
07:00 - 07:15	39	63	5	107	9	40	12	61	168	11	12	13	36	14	112	52	178	214	382																				
07:15 - 07:30	48	90	6	140	23	66	25	114	254	10	23	17	50	15	85	52	152	202	456																				
07:30 - 07:45	39	86	6	131	16	49	20	85	216	23	39	20	82	10	107	54	171	253	469																				
07:45 - 08:00	35	82	6	123	19	62	29	110	233	13	30	14	57	5	93	55	153	210	443																				
08:00 - 08:15	43	88	1	132	20	66	19	105	237	11	31	10	52	10	88	60	158	210	447																				
08:15 - 08:30	45	71	7	123	21	71	14	106	229	17	18	11	46	9	75	45	129	175	404																				
08:30 - 08:45	34	86	3	123	19	58	14	91	214	16	27	12	55	4	80	66	150	205	419																				
08:45 - 09:00	35	86	4	126	17	55	19	92	218	20	23	15	58	9	68	52	129	187	405																				
09:00 - 09:15	12	72	4	88	24	53	18	95	183	17	22	9	48	10	51	60	121	169	352																				
09:15 - 09:30	28	58	2	88	22	44	13	79	167	19	14	12	45	7	47	45	99	144	311																				
09:30 - 09:45	28	44	2	74	26	44	15	85	159	14	13	10	37	2	41	31	74	111	270																				
09:45 - 10:00	24	61	1	86	23	45	12	80	166	20	17	11	48	2	34	31	67	115	281																				
11:00 - 11:45	20	71	6	97	28	62	15	102	199	15	27	14	56	9	25	36	70	126	325																				
11:45 - 12:00	15	66	6	87	30	66	11	111	198	20	31	16	67	6	29	29	64	131	329																				
12:00 - 12:15	11	77	4	92	34	53	14	102	194	24	22	13	59	5	29	23	57	116	310																				
12:15 - 12:30	18	53	3	74	32	54	14	101	175	20	28	21	69	2	33	38	73	142	317																				
12:30 - 12:45	13	62	4	79	23	74	11	109	188	18	23	10	51	2	21	32	55	106	294																				
12:45 - 13:00	17	72	4	93	35	74	16	125	218	11	30	21	62	1	41	37	79	141	359																				
13:00 - 13:15	17	84	4	105	37	61	11	110	215	13	31	24	68	7	22	24	53	121	336																				
13:15 - 13:30	9	59	5	73	29	70	6	105	178	16	26	15	57	3	29	37	69	126	304																				
15:00 - 15:15	22	57	4	83	46	89	13	148	231	24	45	26	95	6	45	33	84	179	410																				
15:15 - 15:30	14	93	11	118	50	95	14	159	277	41	60	34	135	3	36	52	91	226	503																				
15:30 - 15:45	16	83	7	107	54	79	14	147	254	27	63	32	122	2	47	39	88	210	464																				
15:45 - 16:00	17	86	9	112	41	113	17	171	283	44	89	32	165	7	35	55	97	262	545																				
16:00 - 16:15	12	85	8	105	63	99	31	193	298	38	78	33	149	5	49	48	102	251	549																				
16:15 - 16:30	25	95	11	131	45	121	9	176	307	40	76	54	170	7	38	51	96	266	573																				
16:30 - 16:45	19	111	15	145	66	122	21	210	355	52	89	44	185	11	62	49	122	307	662																				
16:45 - 17:00	21	99	7	127	60	108	24	192	319	40	83	34	157	4	51	39	94	251	570																				
17:00 - 17:15	22	121	10	153	61	130	13	206	359	42	88	49	179	7	50	48	105	284	643																				
17:15 - 17:30	14	110	16	140	66	96	16	179	319	37	90	34	161	2	48	42	92	253	572																				
17:30 - 17:45	22	99	10	131	61	113	18	192	323	36	85	29	150	7	46	45	98	248	571																				
17:45 - 18:00	27	98	17	142	74	103	21	198	340	33	76	50	159	6	56	51	113	272	612																				
TOTAL:		761		2568		204		3535		1174		2435		519		4139		7674		782		1409		739		2930		199		1673		1411		3283		6213		13887	

Comment:

Note: U-Turns are included in Totals.

2017-Jun-22



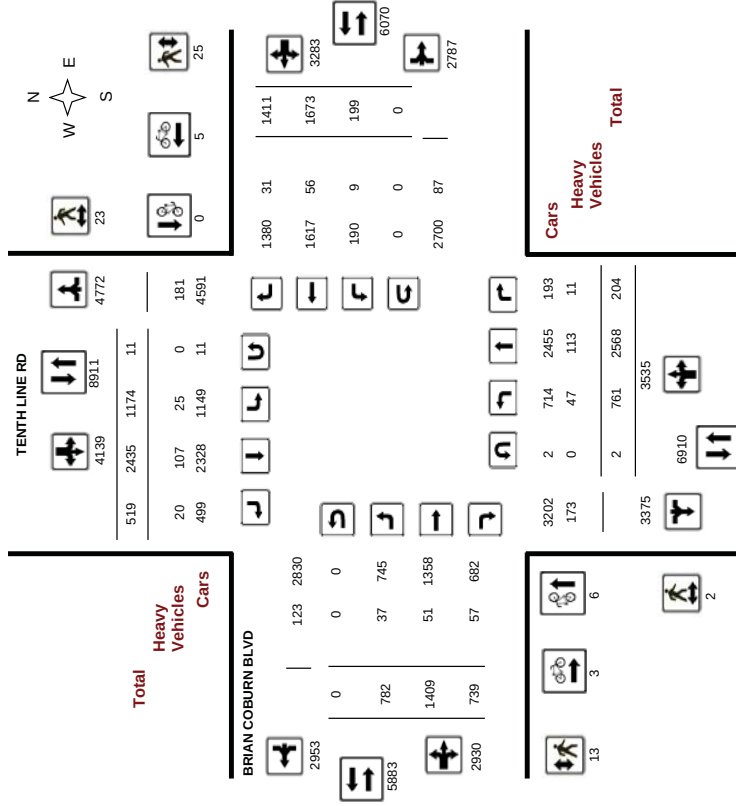
Transportation Services - Traffic Services
Turning Movement Count - Full Study Diagram

BRIAN COBURN BLVD @ TENTH LINE RD

Survey Date: Wednesday, October 26, 2016

WO#: 36420

Device: Miovision



Comments



Transportation Services - Traffic Services
Turning Movement Count - Heavy Vehicle Report

W.O.
36420

BRIAN COBURN BLVD @ TENTH LINE RD

Survey Date: Wednesday, October 26, 2016

TENTH LINE RD										BRIAN COBURN BLVD										Grand Total
Northbound					Southbound					Eastbound					Westbound					
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT		
07:00 08:00	6	18	3	27	9	9	4	22	49	2	8	10	20	0	11	3	14	34	83	
08:00 09:00	7	15	0	22	5	18	1	24	46	8	6	10	24	0	12	3	15	39	85	
09:00 10:00	7	9	1	17	3	20	6	29	46	6	3	8	17	2	4	3	9	26	72	
11:30 12:30	9	12	2	23	2	7	2	11	34	7	2	8	17	2	3	1	6	23	57	
12:30 13:30	8	17	2	27	1	10	2	13	40	3	4	9	16	2	3	3	8	24	64	
15:00 16:00	5	18	0	23	3	17	2	22	45	6	11	4	21	1	9	1	11	32	77	
16:00 17:00	4	16	2	22	1	15	3	19	41	3	11	6	20	2	4	7	13	33	74	
17:00 18:00	1	8	1	10	1	11	0	12	22	2	6	2	10	0	10	10	20	30	52	
Sub Total	47	113	11	171	25	107	20	152	323	37	51	57	145	9	56	31	96	241	564	
U-Turns (Heavy Vehicles)				0				0	0				0				0	0	0	
Total	47	113	11	0	25	107	20	152	323	37	51	57	145	9	56	31	96	241	564	
Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.																				

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

BRIAN COBURN BLVD @ TENTH LINE RD							
Count Date: Wednesday, October 26, 2016		Start Time:		Total		Grand Total	
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	1	1	0	0	0	1
07:15 07:30	0	0	0	1	0	1	1
07:30 07:45	0	1	1	0	1	1	2
07:45 08:00	0	3	3	0	3	3	6
07:00 08:00	0	5	5	1	4	5	10
08:00 08:15	0	0	0	2	1	3	3
08:15 08:30	1	3	4	4	1	5	9
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
08:00 09:00	1	3	4	6	2	8	12
09:00 09:15	1	1	2	1	0	1	3
09:15 09:30	0	2	2	1	1	2	4
09:30 09:45	0	1	1	0	3	3	4
09:45 10:00	0	2	2	0	1	1	3
09:00 10:00	1	6	7	2	5	7	14
10:00 10:15	0	0	0	0	0	0	0
10:15 10:30	0	0	0	0	2	2	2
10:30 10:45	0	0	0	0	0	0	0
10:45 11:00	0	0	0	0	0	0	0
11:00 11:15	0	0	0	0	0	0	0
11:15 11:30	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	2	2	2
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	2	2	2
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	1	1	0	1	1	1
12:30 13:30	0	1	1	0	0	0	1
15:00 15:15	0	1	1	0	1	1	2
15:15 15:30	0	2	2	0	1	1	3
15:30 15:45	0	0	0	0	1	1	1
15:45 16:00	0	1	1	0	3	3	4
15:00 16:00	0	4	4	0	6	6	10
16:00 16:15	0	1	1	0	1	1	2
16:15 16:30	0	0	0	0	1	1	1
16:30 16:45	0	1	1	3	2	5	6
16:45 17:00	0	2	2	1	2	3	5
16:00 17:00	0	4	4	4	6	10	14
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
17:00 18:00	0	0	0	0	0	0	0
Total	2	23	25	13	25	38	63
Comment:							

Turning Movement Count - Full Study Summary Report
BRIAN COBURN BLVD @ TENTH LINE RD

Survey Date:		Wednesday, October 26, 2016				Total Observed U-Turns								AADT Factor										
						Northbound: 2		Southbound: 11				.90												
						Eastbound: 0		Westbound: 0																
Full Study														BRIAN COBURN BLVD										
TENTH LINE RD														Eastbound				Westbound						
Period	Northbound				Southbound				SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand TOT				
	LT	ST	RT	NB TOT	LT	ST	RT	RT													ST	RT	ST	RT
07:00 08:00	161	321	19	501	67	217	86	370	871	57	104	64	225	44	397	213	654	879	1750					
08:00 09:00	157	331	15	503	77	250	66	393	896	64	99	48	211	32	311	223	566	777	1673					
09:00 10:00	92	235	9	336	95	186	58	339	675	70	66	42	178	21	173	167	361	539	1214					
11:00 12:30	64	267	19	350	124	235	54	413	763	79	108	64	251	22	116	126	264	515	1278					
12:30 13:30	56	277	17	350	124	279	44	447	797	58	110	70	238	13	113	130	256	484	1291					
15:00 16:00	69	319	31	419	191	376	58	625	1044	136	257	124	517	18	163	179	360	877	1921					
16:00 17:00	77	390	41	508	234	450	85	769	1277	170	326	165	661	27	200	187	414	1075	2352					
17:00 18:00	85	428	53	566	262	442	68	772	1338	148	339	162	649	22	200	186	408	1057	2395					
Sub Total	761	2568	204	3533	1174	2435	519	4128	7661	782	1409	739	2930	199	1673	1411	3283	6213	13874					
U-Turns	2				11				13				0				0				13			
Total	761	2568	204	3535	1174	2435	519	4139	7674	782	1409	739	2930	199	1673	1411	3283	6213	13887					
EQ 12hr	1058	3570	284	4914	1632	3385	721	5753	10667	1087	1959	1027	4073	277	2325	1961	4553	8636	19303					
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																								
1.39																								
AVG 12hr	952	3213	255	4422	1469	3046	649	5178	9600	978	1763	924	3685	249	2093	1765	4107	7772	17372					
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																								
.90																								
AVG 24hr	1247	4208	334	5793	1924	3991	851	6783	12576	1282	2309	1211	4902	326	2742	2312	5380	10182	22758					
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																								
1.31																								

Comments:

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



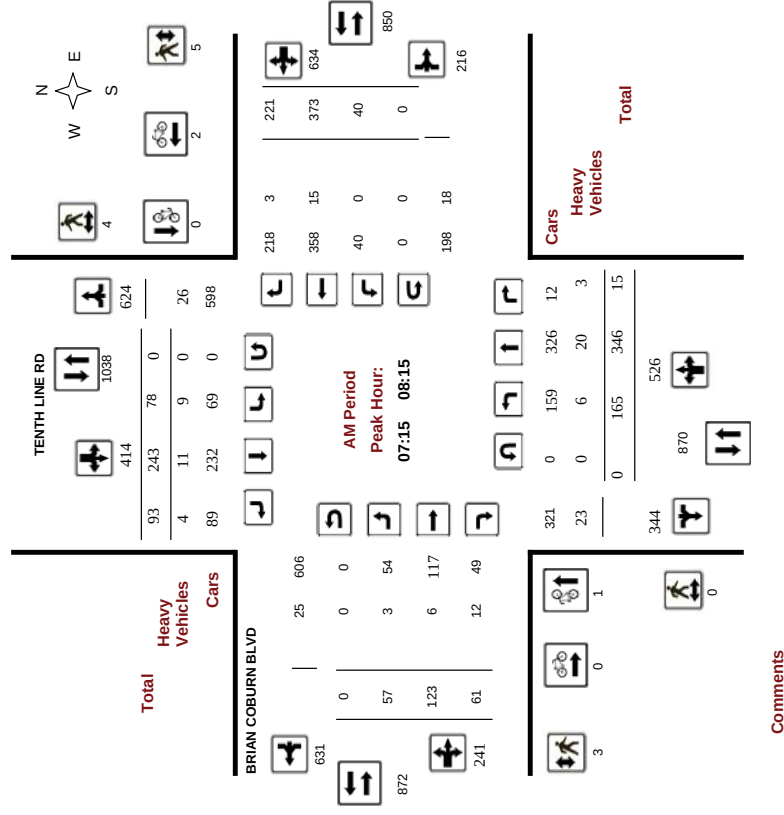
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BRIAN COBURN BLVD @ TENTH LINE RD

Survey Date: Wednesday, October 26, 2016
Start Time: 07:00

WO No: 36420
Device: Miovision



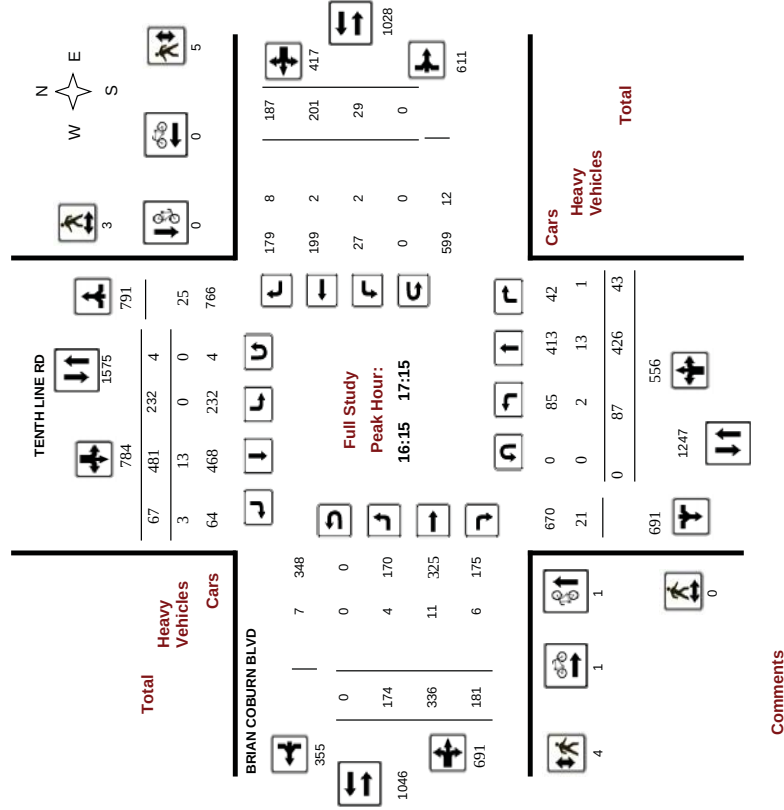
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BRIAN COBURN BLVD @ TENTH LINE RD

Survey Date: Wednesday, October 26, 2016
Start Time: 07:00

WO No: 36420
Device: Miovision

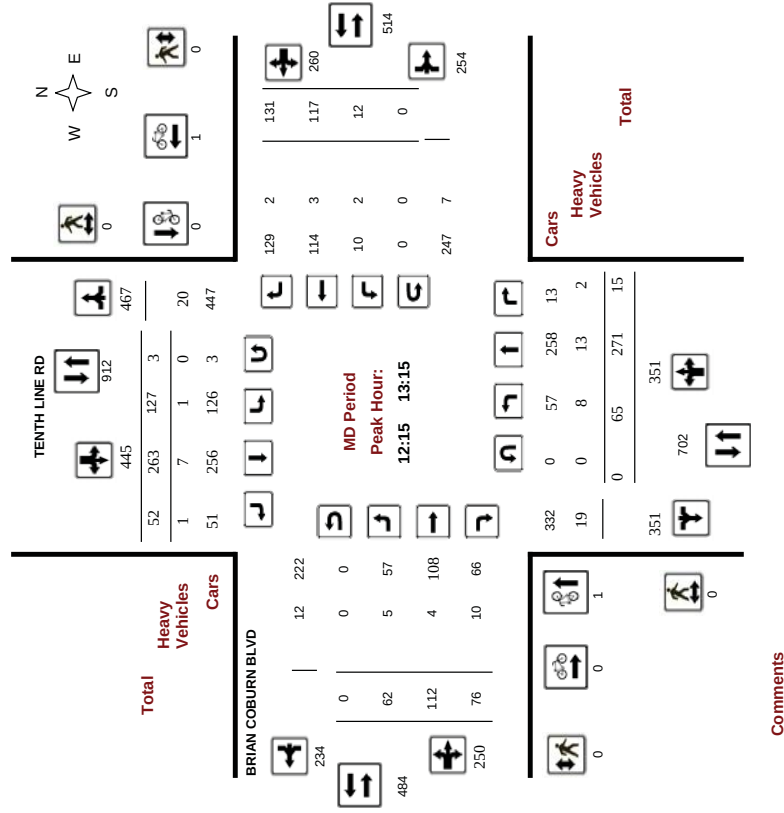


Survey Date: Wednesday, October 26, 2016

WO No: 36420

Start Time: 07:00

Device: Miovision



Comments

2017-Jun-22

2017-Jun-22

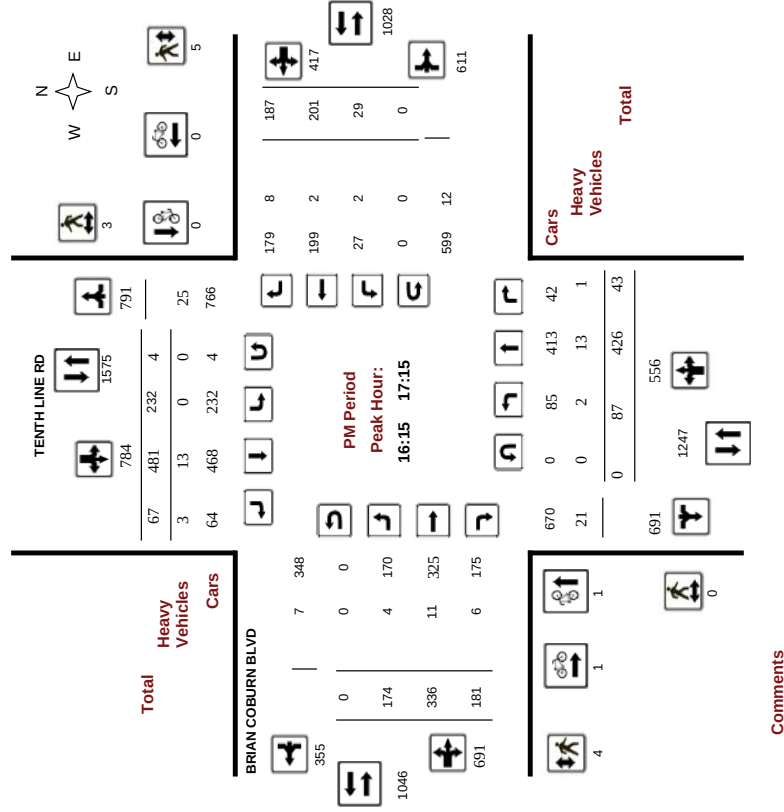
Page 4 of 4

Survey Date: Wednesday, October 26, 2016

WO No: 36420

Start Time: 07:00

Device: Miovision



Comments

Page 3 of 4

2017-Jun-22

Page 4 of 4



Transportation Services - Traffic Services

Work Order
36420

Turning Movement Count - 15 Min U-Turn Total Report

BRIAN COBURN BLVD @ TENTH LINE RD

Survey Date: Wednesday, October 26, 2016

Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00 07:15	0	0	0	0	0
07:15 07:30	0	0	0	0	0
07:30 07:45	0	0	0	0	0
07:45 08:00	0	0	0	0	0
08:00 08:15	0	0	0	0	0
08:15 08:30	0	0	0	0	0
08:30 08:45	0	0	0	0	0
08:45 09:00	1	1	0	0	2
09:00 09:15	0	0	0	0	0
09:15 09:30	0	0	0	0	0
09:30 09:45	0	0	0	0	0
09:45 10:00	0	0	0	0	0
11:30 11:45	0	1	0	0	1
11:45 12:00	0	0	0	0	0
12:00 12:15	0	1	0	0	1
12:15 12:30	0	1	0	0	1
12:30 12:45	0	1	0	0	1
12:45 13:00	0	0	0	0	0
13:00 13:15	0	1	0	0	1
13:15 13:30	0	0	0	0	0
15:00 15:15	0	0	0	0	0
15:15 15:30	0	0	0	0	0
15:30 15:45	1	0	0	0	1
15:45 16:00	0	0	0	0	0
16:00 16:15	0	0	0	0	0
16:15 16:30	0	1	0	0	1
16:30 16:45	0	1	0	0	1
16:45 17:00	0	0	0	0	0
17:00 17:15	0	2	0	0	2
17:15 17:30	0	1	0	0	1
17:30 17:45	0	0	0	0	0
17:45 18:00	0	0	0	0	0
Total	2	11	0	0	13



Transportation Services - Traffic Services

W.O.
35227

Turning Movement Count - 15 Minute Summary Report

TENTH LINE RD @ LAKEPOINTE DR

Survey Date: Friday, August 14, 2015

Total Observed U-Turns

Northbound: 4
Southbound: 8
Eastbound: 0
Westbound: 2

TENTH LINE RD										LAKEPOINTE DR									
Northbound					Southbound					Eastbound					Westbound				
Time Period	LT	ST	RT	TOT	N	LT	ST	RT	TOT	S	STR	LT	ST	RT	E	LT	ST	RT	TOT
07:00 07:15	6	94	1	101	3	55	3	61	162	12	0	2	14	4	0	44	48	62	224
07:15 07:30	4	105	0	109	14	71	6	91	200	10	0	8	18	3	0	40	43	61	261
07:30 07:45	7	117	0	124	10	65	9	84	208	27	2	0	29	4	1	39	44	73	281
07:45 08:00	1	128	0	129	7	67	6	80	209	17	1	4	22	3	1	29	33	55	284
08:00 08:15	5	106	2	113	10	81	9	100	213	24	1	4	29	6	1	35	42	71	264
08:15 08:30	2	145	0	148	15	62	15	92	240	22	1	2	25	6	1	38	45	70	310
08:30 08:45	4	151	0	155	15	70	9	95	250	27	1	7	35	2	0	50	52	87	337
08:45 09:00	4	152	0	156	12	75	10	97	253	20	0	6	26	2	0	29	31	57	310
09:00 09:15	6	121	2	129	15	73	6	94	223	22	1	3	26	0	1	32	33	59	282
09:15 09:30	2	122	1	125	21	77	13	111	236	23	0	5	28	0	0	36	36	64	300
09:30 09:45	3	106	2	111	28	85	10	123	234	22	1	4	27	1	1	33	35	62	296
09:45 10:00	0	132	1	133	18	74	10	102	235	24	0	2	26	1	3	33	38	64	299
11:30 11:45	3	127	0	130	16	83	14	113	243	11	1	5	17	2	0	23	25	42	285
11:45 12:00	0	117	2	119	20	120	14	154	273	19	1	5	25	3	1	27	31	56	329
12:00 12:15	0	129	2	131	19	124	20	163	294	25	0	5	30	3	1	23	27	57	351
12:15 12:30	1	170	2	173	33	159	14	207	380	23	0	5	28	1	2	28	31	59	439
12:30 12:45	1	146	2	149	24	154	10	188	337	21	2	4	27	4	0	37	41	68	405
12:45 13:00	1	128	1	131	27	115	10	152	283	26	0	3	29	4	0	27	31	60	343
13:00 13:15	2	140	0	142	29	103	19	151	293	23	3	3	29	0	0	25	25	54	347
13:15 13:30	5	121	6	133	25	125	14	164	297	19	0	5	24	4	0	34	38	62	359
15:00 15:15	0	112	3	115	29	114	14	158	273	9	1	2	12	1	0	22	23	35	308
15:15 15:30	1	112	3	116	28	149	18	195	311	20	1	5	26	2	0	19	22	48	359
15:30 15:45	4	145	3	152	46	161	16	223	375	26	4	5	35	0	1	18	19	54	429
15:45 16:00	3	135	7	145	40	158	13	213	358	35	7	2	44	0	2	21	23	67	425
16:00 16:15	2	121	7	130	42	140	17	199	329	12	0	5	17	1	3	27	31	48	377
16:15 16:30	3	122	9	134	50	152	18	220	354	10	0	8	18	2	1	25	28	46	400
16:30 16:45	3	124	9	136	60	210	22	293	429	11	0	8	19	2	1	27	30	49	478
16:45 17:00	0	157	2	159	52	175	20	247	406	22	2	6	30	2	3	38	43	73	479
17:00 17:15	4	137	8	149	56	181	17	254	403	25	2	1	28	3	7	34	44	72	475
17:15 17:30	2	163	7	173	42	188	15	246	419	22	0	4	26	1	0	31	32	58	477
17:30 17:45	2	116	10	128	54	171	25	251	379	12	5	4	21	2	3	40	45	66	445
17:45 18:00	5	201	17	223	60	199	16	275	498	17	3	3	23	2	3	45	50	73	571
TOTAL:	86	4202	109	4401	920	3836	432	5196	9597	638	40	135	813	71	37	1009	1119	1932	11529

Note: U-Turns are included in Totals.

Comment:



Transportation Services - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
35227

Count Date: Friday, August 14, 2015

Start Time: 07:00

TENTH LINE RD @ LAKEPOINTE DR

Time Period	TENTH LINE RD			LAKEPOINTE DR			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 08:00	0	1	1	0	0	0	1
08:00 09:00	3	0	3	2	1	3	6
09:00 10:00	3	4	7	0	0	0	7
11:30 12:30	6	2	8	1	0	1	9
12:30 13:30	1	2	3	0	0	0	3
15:00 16:00	3	1	4	0	0	0	4
16:00 17:00	2	3	5	0	1	1	6
17:00 18:00	0	2	2	1	0	1	3
Total	18	15	33	4	2	6	39

Comment:

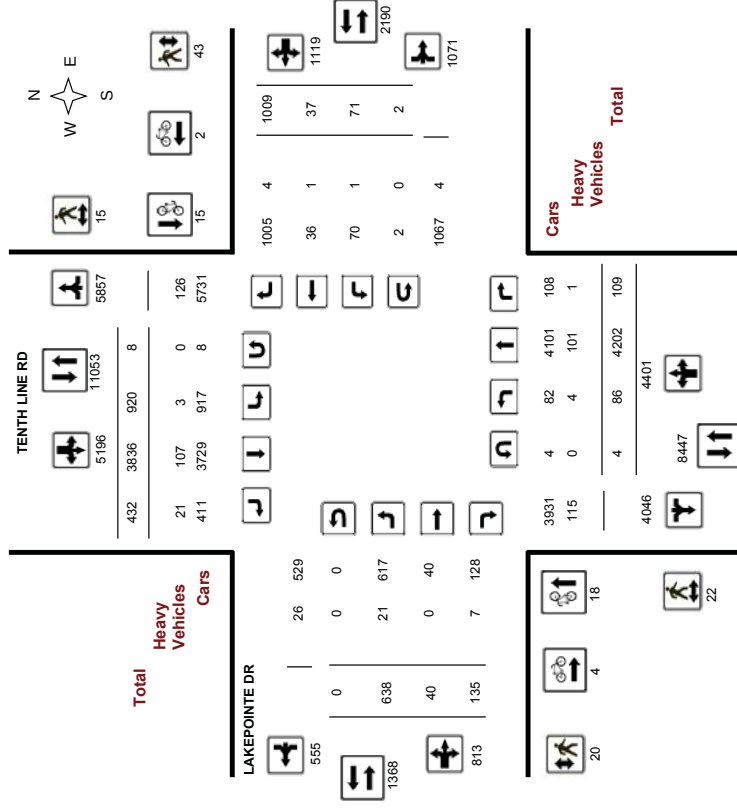


Transportation Services - Traffic Services
Turning Movement Count - Full Study Diagram

Survey Date: Friday, August 14, 2015

WO#: 35227
Device: Jamar Technologies, Inc

TENTH LINE RD @ LAKEPOINTE DR



Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.



Transportation Services - Traffic Services

W.O.
35227

Turning Movement Count - Heavy Vehicle Report

TENTH LINE RD @ LAKEPOINTE DR																
TENTH LINE RD																
LAKEPOINTE DR																
Survey Date: Friday, August 14, 2015																
Time Period	Northbound				Southbound				Eastbound				Westbound			
	LT	ST	RT	TOT	N	LT	ST	RT	TOT	S	LT	ST	RT	TOT	E	TOT
07:00 08:00	1	8	0	9	0	22	3	25	34	2	0	1	3	0	0	0
08:00 09:00	0	15	0	15	0	19	6	25	40	7	0	2	9	0	0	0
09:00 10:00	1	8	0	9	0	14	1	15	24	1	0	0	1	0	1	0
11:30 12:30	1	18	1	20	1	13	5	19	39	4	0	0	4	0	0	1
12:30 13:30	0	10	0	10	0	11	2	13	23	5	0	1	6	0	0	1
15:00 16:00	1	14	0	15	0	12	2	14	29	2	0	1	3	0	0	0
16:00 17:00	0	16	0	16	0	10	1	11	27	0	0	2	2	0	0	0
17:00 18:00	0	12	0	12	2	6	1	9	21	0	0	0	0	1	0	2
Sub Total	4	101	1	106	3	107	21	131	237	21	0	7	28	1	1	4
U-Turns (Heavy Vehicles)																
Total	4	101	1	0	3	107	21	131	237	21	0	7	28	1	1	4
Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.																



Transportation Services - Traffic Services

Work Order
35227

Turning Movement Count - Pedestrian Volume Report

TENTH LINE RD @ LAKEPOINTE DR							
Count Date: Friday, August 14, 2015				Start Time: 07:00			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	1	1	1
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	1	1	1
07:45 08:00	2	1	3	1	1	2	5
07:00 08:00	2	1	3	1	3	4	7
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	2	1	3	1	1	2	5
08:30 08:45	1	2	3	1	0	1	4
08:45 09:00	1	0	1	1	2	3	4
08:00 09:00	4	3	7	3	3	6	13
09:00 09:15	0	0	0	0	2	2	2
09:15 09:30	0	1	1	1	0	1	2
09:30 09:45	0	0	0	1	4	5	5
09:45 10:00	0	0	0	0	0	0	0
09:00 10:00	0	1	1	2	6	8	9
11:30 11:45	1	0	1	0	4	4	5
11:45 12:00	0	0	0	0	1	1	1
12:00 12:15	0	0	0	2	2	4	4
12:15 12:30	0	0	0	0	2	2	2
11:30 12:30	1	0	1	2	9	11	12
12:30 12:45	1	0	1	0	0	1	1
12:45 13:00	0	0	0	1	1	2	2
13:00 13:15	1	2	3	0	3	3	6
13:15 13:30	0	1	1	0	0	1	1
12:30 13:30	2	3	5	1	4	5	10
15:00 15:15	1	0	1	0	3	3	4
15:15 15:30	0	1	1	1	1	2	3
15:30 15:45	3	0	3	2	1	3	6
15:45 16:00	0	2	2	1	0	1	3
15:00 16:00	4	3	7	4	5	9	16
16:00 16:15	0	1	1	0	1	1	2
16:15 16:30	1	1	2	0	2	2	4
16:30 16:45	1	0	1	0	2	2	3
16:45 17:00	3	0	3	1	1	2	5
16:00 17:00	5	2	7	1	6	7	14
17:00 17:15	0	0	0	1	0	1	1
17:15 17:30	1	1	2	2	2	4	6
17:30 17:45	0	0	0	1	3	4	4
17:45 18:00	3	1	4	2	2	4	8
17:00 18:00	4	2	6	6	7	13	19
Total	22	15	37	20	43	63	100
Comment:							



Transportation Services - Traffic Services

Work Order
35227

Turning Movement Count - Full Study Summary Report

TENTH LINE RD @ LAKEPOINTE DR

Survey Date: Friday, August 14, 2015

Total Observed U-Turns

AADT Factor

.90

Northbound: 4 Southbound: 8

Eastbound: 0 Westbound: 2

Full Study

Period	TENTH LINE RD										LAKEPOINTE DR										Grand Total									
	Northbound					Southbound					Eastbound					Westbound														
	LT	ST	RT	TOT	NB TOT	LT	ST	RT	TOT	SB TOT	STR TOT	LT	ST	RT	TOT	EB TOT	LT	ST	RT	TOT		WB TOT								
07:00-08:00	18	444	1	463	34	258	24	316	779	66	3	14	83	14	2	152	168	251	1030											
08:00-09:00	15	554	2	571	52	288	43	383	954	93	3	19	115	16	2	152	170	285	1239											
09:00-10:00	11	481	6	498	82	309	39	430	928	91	2	14	107	2	5	134	141	248	1176											
11:30-12:30	4	543	6	553	88	486	62	636	1189	78	2	20	100	9	4	101	114	214	1403											
12:30-13:30	9	535	9	553	105	497	53	655	1208	89	5	15	109	12	0	123	135	244	1452											
15:00-16:00	8	504	16	528	143	582	61	786	1314	90	13	14	117	3	3	80	86	203	1517											
16:00-17:00	8	524	27	559	204	677	77	958	1517	55	2	27	84	7	8	117	132	216	1733											
17:00-18:00	13	617	42	672	212	739	73	1024	1696	76	10	12	98	8	13	150	171	269	1965											
Sub Total	86	4202	109	4397	920	3836	432	5188	9585	638	40	135	813	71	37	1009	1117	1930	11515											
U-Turns	4					8					12					2					2					14				
Total	86	4202	109	4401	920	3836	432	5196	9597	638	40	135	813	71	37	1009	1119	1932	11529											
EQ 12hr	120	5841	152	6117	1279	5332	600	7222	13339	887	56	188	1130	99	51	1403	1555	2685	16024											
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																														
																1.39														
AVG 12hr	108	5257	136	5506	1151	4799	540	6500	12006	798	50	169	1017	89	46	1262	1400	2417	14423											
																.90														
AVG 24hr	141	6886	179	7212	1508	6286	708	8515	15727	1046	66	221	1332	116	61	1654	1834	3166	18893											
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																														
																1.31														

Comments:

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

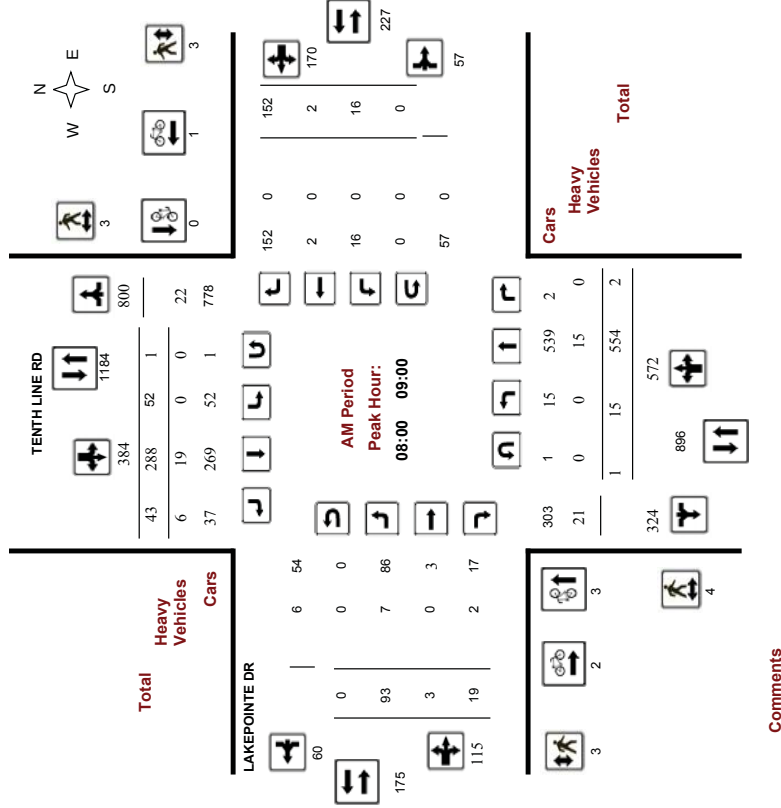
TENTH LINE RD @ LAKEPOINTE DR

Survey Date: Friday, August 14, 2015

WO No: 35227

Device: Jamar Technologies, Inc

Start Time: 07:00





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

TENTH LINE RD @ LAKEPOINTE DR

Survey Date: Friday, August 14, 2015

WO No: 35227

Device: Jamar Technologies, Inc

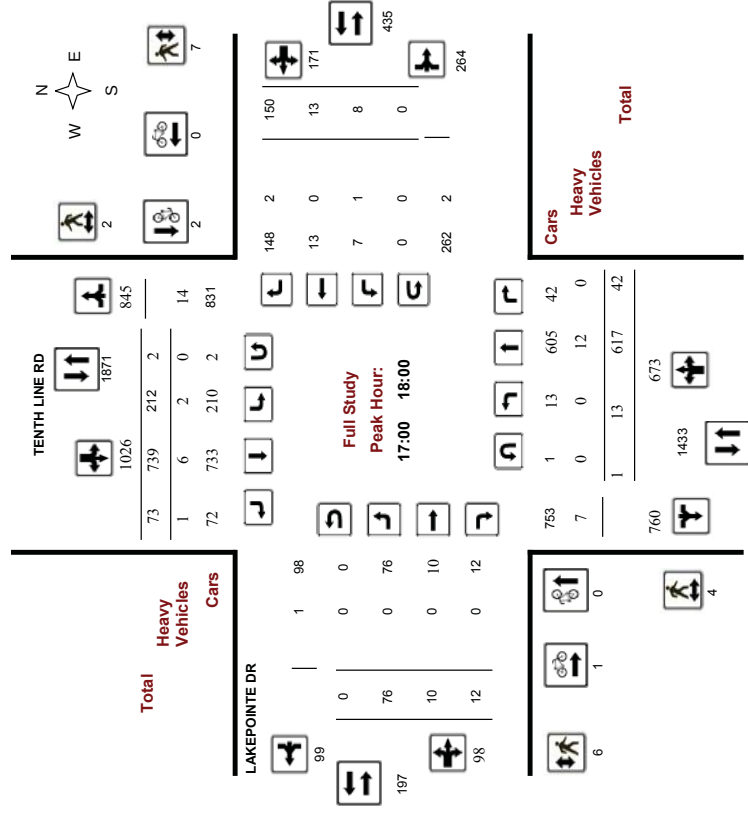
Start Time: 07:00

WO No: 35227

Device: Jamar Technologies, Inc

Survey Date: Friday, August 14, 2015

Start Time: 07:00



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

TENTH LINE RD @ LAKEPOINTE DR

Survey Date: Friday, August 14, 2015

WO No: 35227

Device: Jamar Technologies, Inc

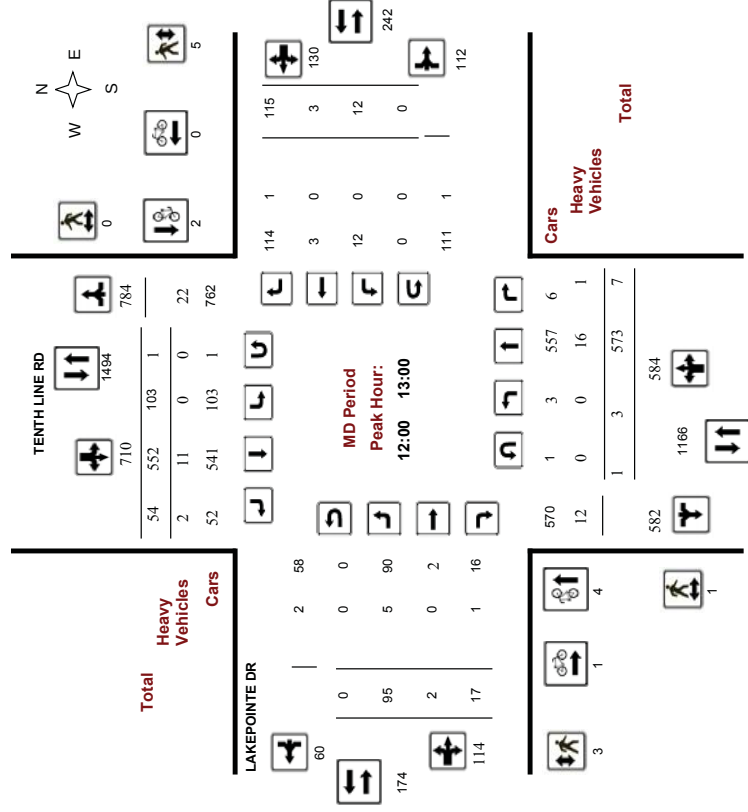
Start Time: 07:00

WO No: 35227

Device: Jamar Technologies, Inc

Survey Date: Friday, August 14, 2015

Start Time: 07:00



Transportation Services - Traffic Services



Turning Movement Count - 15 Min U-Turn Total Report

TENTH LINE RD @ LAKEPOINTE DR

Survey Date: Friday, August 14, 2015

Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00 07:15	0	0	0	0	0
07:15 07:30	0	0	0	0	0
07:30 07:45	0	0	0	0	0
07:45 08:00	0	0	0	0	0
08:00 08:15	0	0	0	0	0
08:15 08:30	1	0	0	0	1
08:30 08:45	0	1	0	0	1
08:45 09:00	0	0	0	0	0
09:00 09:15	0	0	0	0	0
09:15 09:30	0	0	0	0	0
09:30 09:45	0	0	0	0	0
09:45 10:00	0	0	0	1	1
11:30 11:45	0	0	0	0	0
11:45 12:00	0	0	0	0	0
12:00 12:15	0	0	0	0	0
12:15 12:30	0	1	0	0	1
12:30 12:45	0	0	0	0	0
12:45 13:00	1	0	0	0	1
13:00 13:15	0	0	0	0	0
13:15 13:30	1	0	0	0	1
15:00 15:15	0	1	0	0	1
15:15 15:30	0	0	0	1	1
15:30 15:45	0	0	0	0	0
15:45 16:00	0	2	0	0	2
16:00 16:15	0	0	0	0	0
16:15 16:30	0	0	0	0	0
16:30 16:45	0	1	0	0	1
16:45 17:00	0	0	0	0	0
17:00 17:15	0	0	0	0	0
17:15 17:30	1	1	0	0	2
17:30 17:45	0	1	0	0	1
17:45 18:00	0	0	0	0	0
Total	4	8	0	2	14

Transportation Services - Traffic Services



Turning Movement Count - Full Study Peak Hour Diagram

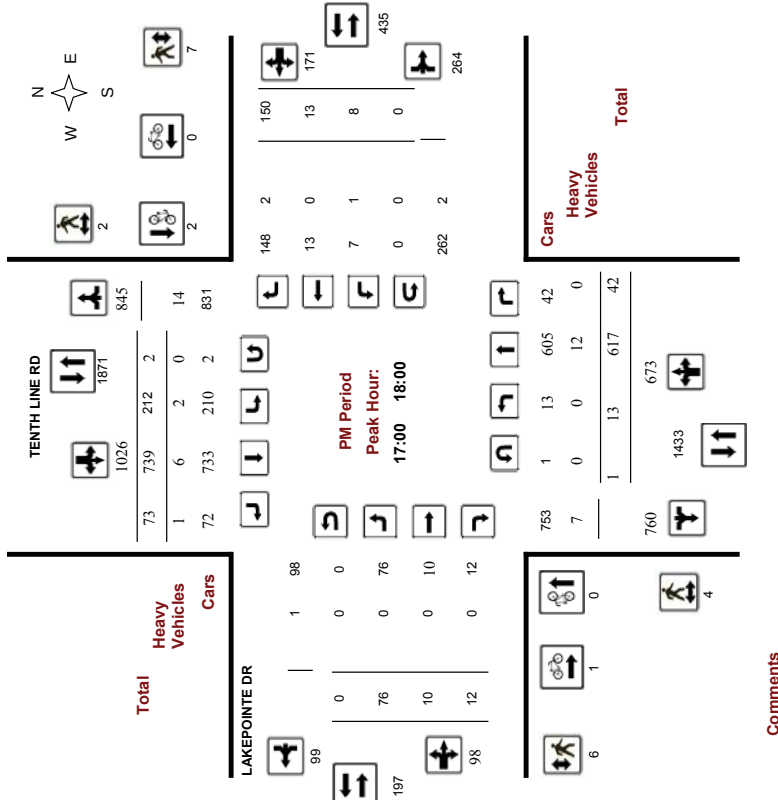
TENTH LINE RD @ LAKEPOINTE DR

Survey Date: Friday, August 14, 2015

Start Time: 07:00

WO No: 35227

Device: Jamar Technologies, Inc



TOTAL: 843 4834 32/ 6024

Page 1 of 1

2017-Dec-11

Page 1 of 1

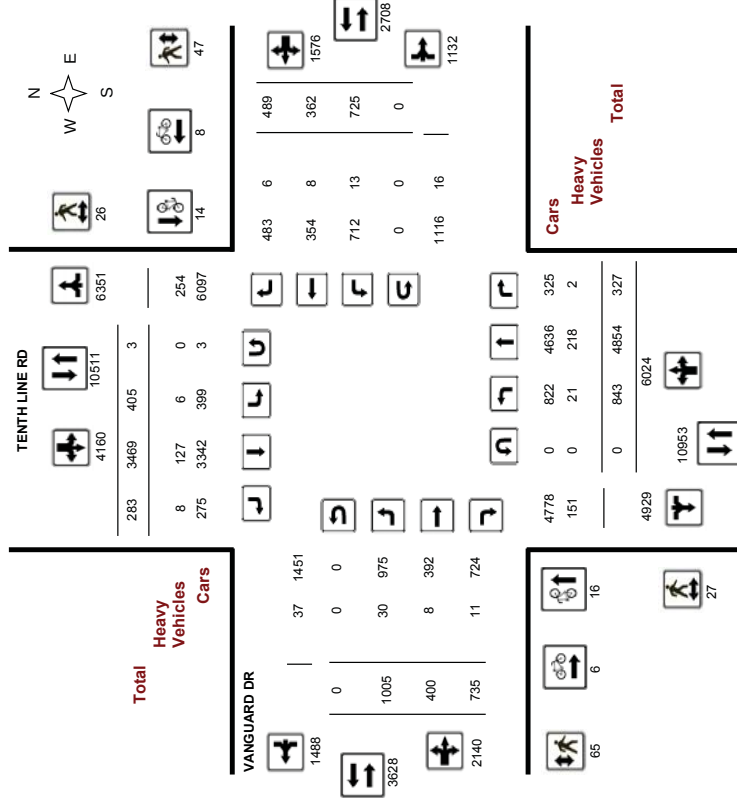


Transportation Services - Traffic Services
Turning Movement Count - Full Study Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

WO#: 35199
Device: Jamar Technologies, Inc



Comments



Transportation Services - Traffic Services
Turning Movement Count - Heavy Vehicle Report

W.O.
35199

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

TENTH LINE RD										VANGUARD DR											
Northbound					Southbound					Eastbound					Westbound						
Time Period	LT	ST	RT	TOT	N	LT	ST	RT	TOT	S	STR	TOT	LT	ST	RT	TOT	E	LT	ST	TOT	
07:00-08:00	3	14	0	17	1	6	2	9	26	2	0	2	0	0	2	0	0	0	0	0	
08:00-09:00	1	13	0	14	0	5	2	7	21	3	3	0	6	0	1	0	0	0	0	1	
09:00-10:00	1	31	0	32	0	14	0	14	46	0	0	1	1	0	0	0	0	0	0	1	
11:30-12:30	1	53	1	55	2	12	2	16	71	5	1	1	7	1	1	1	7	1	1	1	
12:30-13:30	10	33	0	43	0	18	0	18	61	8	0	0	8	0	8	8	1	0	0	1	
15:00-16:00	3	10	1	14	2	11	1	14	28	5	2	6	13	2	2	2	6	13	2	2	
16:00-17:00	1	18	0	19	1	5	1	7	26	2	1	1	4	1	1	1	4	1	1	1	
17:00-18:00	1	46	0	47	0	56	0	56	103	5	1	2	8	1	2	8	1	2	8	1	
Sub Total	21	218	2	241	6	127	8	141	382	30	8	11	49	13	8	11	49	13	8	8	
U-Turns (Heavy Vehicles)	0				0				0				0				0				
Total	21	218	2	0	6	127	8	141	382	30	8	11	49	13	8	11	49	13	8	8	
Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement.																					

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.



Transportation Services - Traffic Services

Work Order
35199

Turning Movement Count - Full Study Summary Report

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

Total Observed U-Turns
Northbound: 0 Southbound: 3
Eastbound: 0 Westbound: 0
AADT Factor
90

Full Study																								
TENTH LINE RD											VANGUARD DR													
Period	Northbound					Southbound					Eastbound						Westbound							
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total					
07:00 08:00	192	658	54	904	36	284	33	353	1257	62	20	31	113	57	27	5	89	202	1459					
08:00 09:00	11	518	5	534	8	228	26	262	796	87	30	24	141	55	13	35	103	244	1040					
09:00 10:00	22	629	14	665	20	237	42	299	964	62	19	34	115	61	17	48	126	241	1205					
11:30 12:30	62	605	41	708	18	324	14	356	1064	119	25	98	242	86	37	51	174	416	1480					
12:30 13:30	145	655	61	861	59	404	33	496	1357	149	54	49	252	94	41	119	254	506	1863					
15:00 16:00	146	475	43	664	139	472	51	662	1326	182	88	162	432	126	76	33	235	667	1993					
16:00 17:00	159	609	65	833	100	581	41	722	1555	178	69	197	444	131	66	38	235	679	2234					
17:00 18:00	106	705	44	855	25	939	43	1007	1862	166	95	140	401	115	85	160	360	761	2623					
Sub Total	843	4854	327	6024	405	3469	283	4157	10181	1005	400	735	2140	725	362	489	1576	3716	13897					
U-Turns	0				3				3				0				0				0			
Total	843	4854	327	6024	405	3469	283	4160	10184	1005	400	735	2140	725	362	489	1576	3716	13900					
EQ 12Hr	1172	6747	455	8373	563	4822	393	5782	14155	1397	556	1022	2975	1008	503	680	2191	5166	19321					
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																								
1.39																								
AVG 12Hr	1055	6072	409	7536	507	4340	354	5204	12740	1257	500	919	2677	907	453	612	1972	4649	17389					
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																								
AVG 24Hr	1382	7955	536	9872	664	5685	464	6817	16689	1647	656	1205	3507	1188	593	801	2583	6090	22779					
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																								
1.31																								



Transportation Services - Traffic Services

Work Order
35199

Turning Movement Count - Pedestrian Volume Report

TENTH LINE RD @ VANGUARD DR

Count Date: Tuesday, August 18, 2015

Start Time: 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0
07:15 07:30	0	0	5	3	8	8
07:30 07:45	0	0	3	0	3	3
07:45 08:00	1	0	1	3	4	5
07:00 08:00	1	0	9	6	15	16
08:00 08:15	2	1	3	2	2	5
08:15 08:30	2	6	1	0	1	9
08:30 08:45	0	0	5	2	7	7
08:45 09:00	0	0	0	0	0	0
08:00 09:00	4	7	8	2	10	21
09:00 09:15	1	0	1	4	4	5
09:15 09:30	0	2	0	0	0	2
09:30 09:45	0	0	0	0	0	0
09:45 10:00	0	2	0	5	5	7
09:00 10:00	1	4	5	9	9	14
11:30 11:45	1	0	1	3	4	5
11:45 12:00	1	1	7	3	10	12
12:00 12:15	4	2	5	0	5	11
12:15 12:30	0	0	2	2	4	4
11:30 12:30	6	3	9	6	23	32
12:30 12:45	0	2	0	1	1	3
12:45 13:00	0	1	0	1	1	2
13:00 13:15	0	0	0	7	7	7
13:15 13:30	0	0	0	0	0	0
12:30 13:30	0	3	0	9	9	12
15:00 15:15	0	0	1	0	1	1
15:15 15:30	0	0	1	0	1	1
15:30 15:45	2	0	2	2	4	6
15:45 16:00	0	0	0	0	0	0
15:00 16:00	2	0	4	2	6	8
16:00 16:15	1	0	1	0	0	1
16:15 16:30	0	0	3	0	3	3
16:30 16:45	1	1	2	2	2	4
16:45 17:00	2	0	4	1	5	7
16:00 17:00	4	1	5	3	10	15
17:00 17:15	0	1	4	1	5	6
17:15 17:30	0	2	9	7	16	18
17:30 17:45	2	0	5	2	7	9
17:45 18:00	7	5	12	2	2	14
17:00 18:00	9	8	17	30	30	47
Total	27	26	65	47	112	165

Comment:



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

WO No: 35199

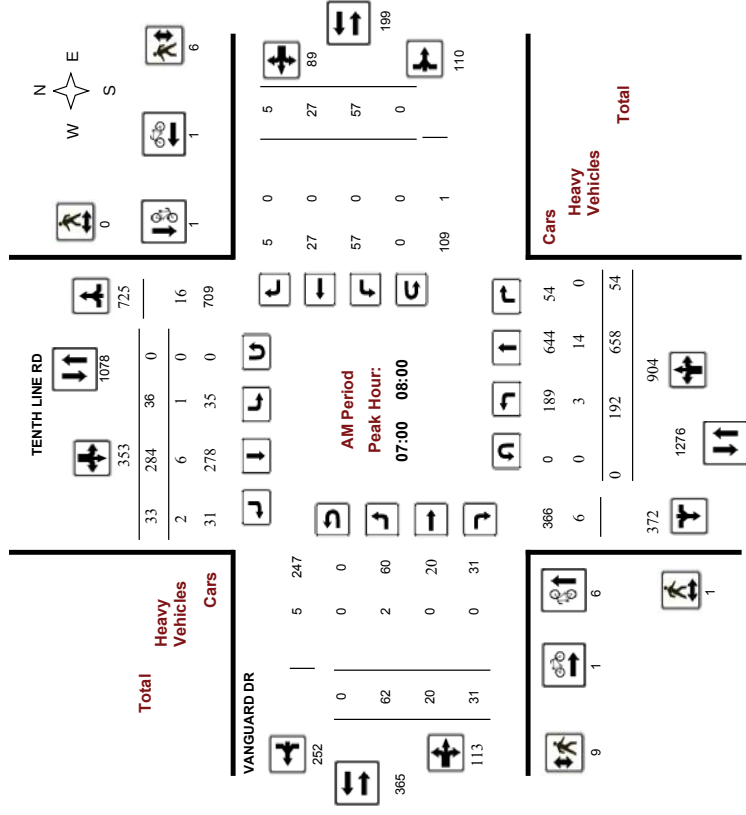
Device: Jamar

Technologies, Inc

Start Time: 07:00

Device: Jamar

Technologies, Inc



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

WO No: 35199

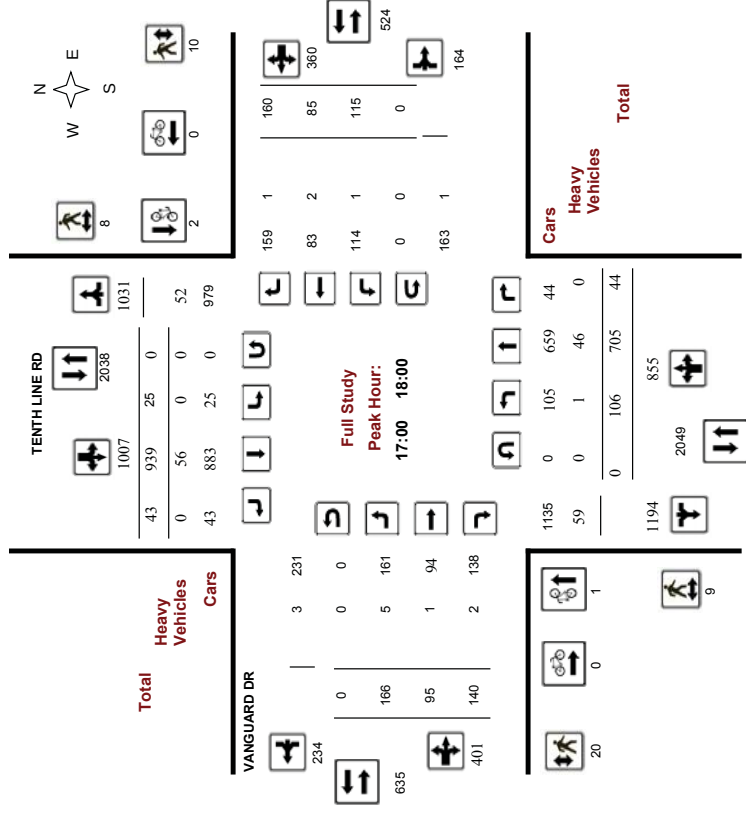
Device: Jamar

Technologies, Inc

Start Time: 07:00

Device: Jamar

Technologies, Inc





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

WO No: 35199

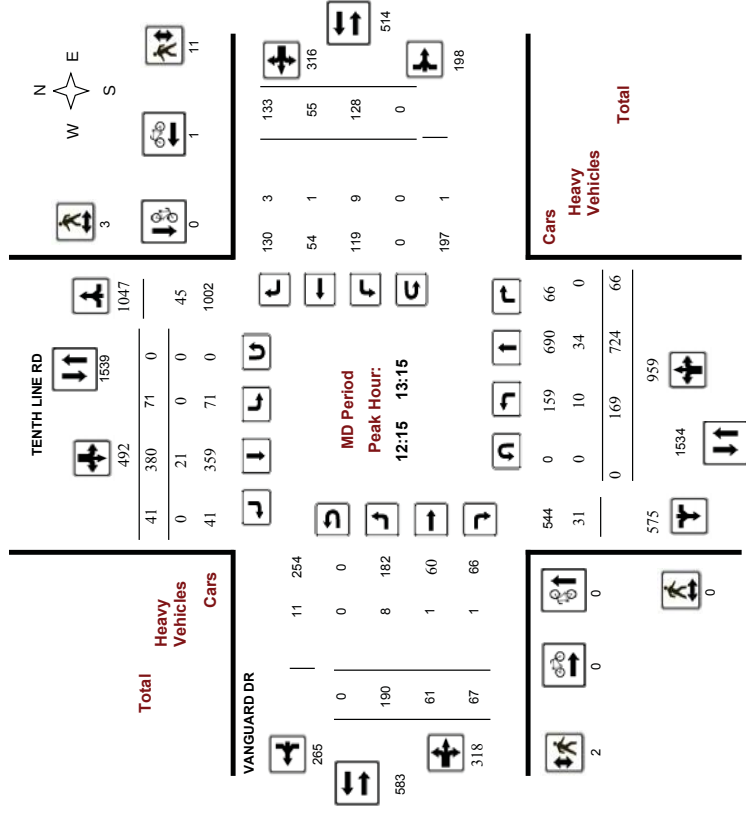
Device: Jamar

Technologies, Inc

Start Time: 07:00

Device: Jamar

Technologies, Inc



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

WO No: 35199

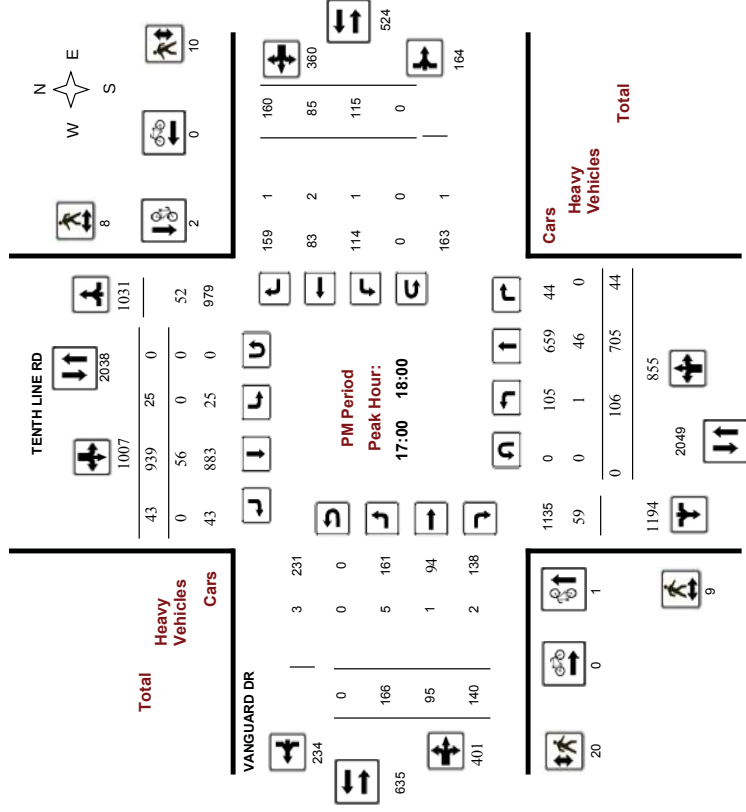
Device: Jamar

Technologies, Inc

Start Time: 07:00

Device: Jamar

Technologies, Inc





Transportation Services - Traffic Services

Work Order
35199

Turning Movement Count - 15 Min U-Turn Total Report

TENTH LINE RD @ VANGUARD DR

Survey Date:

Tuesday, August 18, 2015

Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00 07:15	0	0	0	0	0
07:15 07:30	0	0	0	0	0
07:30 07:45	0	0	0	0	0
07:45 08:00	0	0	0	0	0
08:00 08:15	0	0	0	0	0
08:15 08:30	0	0	0	0	0
08:30 08:45	0	0	0	0	0
08:45 09:00	0	0	0	0	0
09:00 09:15	0	0	0	0	0
09:15 09:30	0	0	0	0	0
09:30 09:45	0	0	0	0	0
09:45 10:00	0	0	0	0	0
10:00 10:15	0	0	0	0	0
10:15 10:30	0	0	0	0	0
10:30 10:45	0	0	0	0	0
10:45 11:00	0	0	0	0	0
11:00 11:15	0	0	0	0	0
11:15 11:30	0	0	0	0	0
11:30 11:45	0	0	0	0	0
11:45 12:00	0	0	0	0	0
12:00 12:15	0	0	0	0	0
12:15 12:30	0	0	0	0	0
12:30 12:45	0	0	0	0	0
12:45 13:00	0	0	0	0	0
13:00 13:15	0	0	0	0	0
13:15 13:30	0	0	0	0	0
13:30 13:45	0	0	0	0	0
13:45 14:00	0	0	0	0	0
14:00 14:15	0	0	0	0	0
14:15 14:30	0	0	0	0	0
14:30 14:45	0	0	0	0	0
14:45 15:00	0	0	0	0	0
15:00 15:15	0	2	0	0	2
15:15 15:30	0	1	0	0	1
15:30 15:45	0	0	0	0	0
15:45 16:00	0	0	0	0	0
16:00 16:15	0	0	0	0	0
16:15 16:30	0	0	0	0	0
16:30 16:45	0	0	0	0	0
16:45 17:00	0	0	0	0	0
17:00 17:15	0	0	0	0	0
17:15 17:30	0	0	0	0	0
17:30 17:45	0	0	0	0	0
17:45 18:00	0	0	0	0	0
Total	0	3	0	0	3

Appendix C

City of Ottawa Collision Data

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	4	0	0	4	1	2	6	0	17	89%
Non-fatal injury	0	0	0	0	1	0	1	0	2	11%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	4	0	0	4	2	2	7	0	19	100%
	#2 or 21%	#6 or 0%	#6 or 0%	#2 or 21%	#4 or 11%	#4 or 11%	#1 or 37%	#6 or 0%		

AQUAVIEW DR/LAKEPOINTE DR

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	2	6,520	1825	0.17

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	0	0	0	0	1	0	0	2	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	1	0	0	0	0	1	0	0	2	100%
	50%	0%	0%	0%	0%	50%	0%	0%		

AQUAVIEW DR, LAKEPOINTE DR to LOUIS TOSCANO DR

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	1	3,300	1825	0.17

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	0	0	0	0	0	1	0	1	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	0	0	0	0	0	0	1	0	1	100%
	0%	0%	0%	0%	0%	0%	100%	0%		

AQUAVIEW DR, CROWBERRY ST to LOUIS TOSCANO DR

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	5	3,300	1825	0.83

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	2	0	0	0	0	1	1	0	4	80%
Non-fatal injury	0	0	0	0	0	0	1	0	1	20%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	2	0	0	0	0	1	2	0	5	100%
	40%	0%	0%	0%	0%	20%	40%	0%		

AQUAVIEW DR/BROCKSTONE CRES E

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	1	1,700	1825	0.32

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	0	0	0	0	0	0	0	1	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	1	0	0	0	0	0	0	0	1	100%
	100%	0%	0%	0%	0%	0%	0%	0%		

AQUAVIEW DR, BOIS VERT PL to SERRANO ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	6	1,700	1825	1.93

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	0	0	0	1	0	4	0	5	83%
Non-fatal injury	0	0	0	0	1	0	0	0	1	17%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	0	0	0	0	2	0	4	0	6	100%
	0%	0%	0%	0%	33%	0%	67%	0%		

AQUAVIEW DR/BRIAN COBURN BLVD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	2	12,232	1825	0.09

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	0	0	2	0	0	0	0	2	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	0	0	0	2	0	0	0	0	2	100%
	0%	0%	0%	100%	0%	0%	0%	0%		

AQUAVIEW DR/ESPRIT DR

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2016	2	4,650	1825	0.24

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	0	0	2	0	0	0	0	2	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	0	0	0	2	0	0	0	0	2	100%
	0%	0%	0%	100%	0%	0%	0%	0%		

Appendix D

Background Growth Analysis

Tenth Line / Brian Coburn
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	Friday 14 August	2823	3061	2285	2196	1129	1010	242	212	12958
2013	Thursday 4 July	3616	4412	3103	2580	3072	2560	2509	2748	24600
2016	Wednesday 26 October	4239	4772	3535	3375	3283	2787	2930	2853	27774

North Leg	Year	Counts				% Change			
		NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
	2009	3061	2823	5884	12958				
	2013	4412	3616	8028	24600	44.1%	28.1%	36.4%	89.8%
	2016	4772	4239	9011	27774	8.2%	17.2%	12.2%	12.9%

Regression Estimate 2009 3167 2818 5985
Regression Estimate 2016 4913 4233 9146
Average Annual Change 6.47 % 5.98 % 6.24 %

West Leg	Year	Counts				% Change			
		EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
	2009	242	212	454	12958				
	2013	2509	2748	5257	24600	936.8%	1196.2%	1057.9%	89.8%
	2016	2930	2853	5783	27774	16.8%	3.8%	10.0%	12.9%

Regression Estimate 2009 449 503 953
Regression Estimate 2016 3207 3242 6448
Average Annual Change 32.41 % 30.48 % 31.41 %

East Leg	Year	Counts				% Change			
		EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
	2009	1010	1129	2139	12958				
	2013	2560	3072	5632	24600	153.5%	172.1%	163.3%	89.8%
	2016	2787	3283	6070	27774	8.9%	6.9%	7.8%	12.9%

Regression Estimate 2009 1162 1331 2493
Regression Estimate 2016 2989 3552 6542
Average Annual Change 14.46 % 15.05 % 14.78 %

South Leg	Year	Counts				% Change			
		NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
	2009	2285	2196	4481	12958				
	2013	3103	2580	5683	24600	35.8%	17.5%	26.8%	89.8%
	2016	3535	3375	6910	27774	13.9%	30.8%	21.6%	12.9%

Regression Estimate 2009 2314 2114 4428
Regression Estimate 2016 3574 3265 6840
Average Annual Change 6.41 % 6.41 % 6.41 %

Tenth Line / Brian Coburn
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	Friday 14 August	256	392	248	251	204	54	20	31	1456
2013	Thursday 4 July	321	604	442	226	732	162	156	659	3302
2016	Wednesday 26 October	414	624	526	344	634	216	241	631	3630

North Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	392	256	648	1456				
2013	604	321	925	3302	54.1%	25.4%	42.7%	126.8%
2016	624	414	1038	3630	3.3%	29.0%	12.2%	9.9%

Regression Estimate 2009 415 249 663
Regression Estimate 2016 654 404 1058
Average Annual Change 6.73% 7.19% 6.90%

West Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	20	31	51	1456				
2013	156	659	815	3302	680.0%	2025.8%	1498.0%	126.8%
2016	241	631	872	3630	54.5%	-4.2%	7.0%	9.9%

Regression Estimate 2009 23 112 135
Regression Estimate 2016 245 739 984
Average Annual Change 40.40% 30.95% 32.85%

East Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	54	204	258	1456				
2013	162	732	894	3302	200.0%	258.8%	246.5%	126.8%
2016	216	634	850	3630	33.3%	-13.4%	-4.9%	9.9%

Regression Estimate 2009 58 284 342
Regression Estimate 2016 222 741 963
Average Annual Change 21.01% 14.67% 15.91%

South Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	248	251	499	1456				
2013	442	226	668	3302	78.2%	-10.0%	33.9%	126.8%
2016	526	344	870	3630	19.0%	52.2%	30.2%	9.9%

Regression Estimate 2009 258 229 487
Regression Estimate 2016 539 314 854
Average Annual Change 11.11% 4.64% 8.36%

Tenth Line / Brian Coburn
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	Friday 14 August	494	446	377	351	170	246	25	23	2132
2013	Thursday 4 July	714	709	466	499	403	614	614	375	4394
2016	Wednesday 26 October	784	791	556	691	417	611	691	355	4896

North Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	446	494	940	2132				
2013	709	714	1423	4394	59.0%	44.5%	51.4%	106.1%
2016	791	784	1575	4896	11.6%	9.8%	10.7%	11.4%

Regression Estimate 2009 465 509 974
Regression Estimate 2016 816 805 1620
Average Annual Change 8.37 % 6.75 % 7.54 %

West Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	25	23	48	2132				
2013	614	375	989	4394	2356.0%	1530.4%	1960.4%	106.1%
2016	691	355	1046	4896	12.5%	-5.3%	5.8%	11.4%

Regression Estimate 2009 84 69 153
Regression Estimate 2016 770 416 1186
Average Annual Change 37.19 % 29.26 % 33.96 %

East Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	246	170	416	2132				
2013	614	403	1017	4394	149.6%	137.1%	144.5%	106.1%
2016	611	417	1028	4896	-0.5%	3.5%	1.1%	11.4%

Regression Estimate 2009 291 196 487
Regression Estimate 2016 671 452 1123
Average Annual Change 12.67 % 12.66 % 12.67 %

South Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	377	351	728	2132				
2013	466	499	965	4394	23.6%	42.2%	32.6%	106.1%
2016	556	691	1247	4896	19.3%	38.5%	29.2%	11.4%

Regression Estimate 2009 373 338 711
Regression Estimate 2016 551 673 1224
Average Annual Change 5.72 % 10.36 % 8.07 %

Appendix E

Synchro Capacity Analysis: Projected Background 2020 Operation

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/27/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	3	16	2	15	565	2	52	294	43
Future Volume (vph)	93	3	16	2	15	565	2	52	294	43
Lane Group Flow (vph)	0	127	18	171	17	628	2	58	327	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		16.2	16.2	16.2	61.1	61.1	61.1	61.1	61.1	61.1
Actuated g/C Ratio		0.18	0.18	0.18	0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio		0.64	0.08	0.42	0.03	0.27	0.00	0.12	0.14	0.05
Control Delay		44.1	27.9	7.9	7.1	7.1	0.0	7.7	6.4	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.1	27.9	7.9	7.1	7.1	0.0	7.7	6.4	2.7
LOS		D	C	A	A	A	A	A	A	A
Approach Delay		44.1		9.8		7.0			6.1	
Approach LOS		D		A		A			A	
Queue Length 50th (m)		19.2	2.7	0.3	0.8	18.5	0.0	2.9	8.6	0.0
Queue Length 95th (m)		31.7	7.1	14.0	4.1	39.5	0.0	10.6	20.3	4.5
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		333	386	573	666	2295	1014	495	2295	1013
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.38	0.05	0.30	0.03	0.27	0.00	0.12	0.14	0.05

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 10.5

Intersection LOS: B

Intersection Capacity Utilization 69.1%

ICU Level of Service C

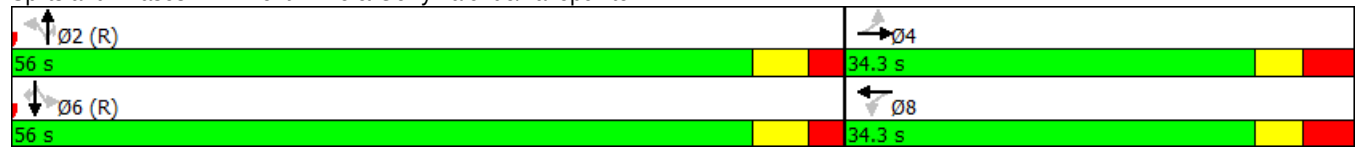
Analysis Period (min) 15

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/27/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

4: Tenth Line & Brian Coburn

03/27/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	57	125	40	380	221	165	352	78	248
Future Volume (vph)	57	125	40	380	221	165	352	78	248
Lane Group Flow (vph)	63	207	44	422	246	183	408	87	379
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	27.7	27.7	27.7	27.7	27.7	49.9	49.9	49.9	49.9
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.55	0.55	0.55	0.55
v/c Ratio	0.41	0.38	0.14	0.77	0.39	0.35	0.22	0.17	0.21
Control Delay	31.1	21.1	20.9	37.3	4.5	15.5	11.6	13.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	21.1	20.9	37.3	4.5	15.5	11.6	13.2	9.3
LOS	C	C	C	D	A	B	B	B	A
Approach Delay		23.4		25.0			12.8		10.0
Approach LOS		C		C			B		A
Queue Length 50th (m)	8.5	23.0	5.4	65.1	0.0	16.7	17.6	7.1	12.7
Queue Length 95th (m)	18.2	36.0	11.6	86.0	13.6	37.6	30.6	18.0	24.1
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	196	690	416	705	738	518	1867	503	1824
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.30	0.11	0.60	0.33	0.35	0.22	0.17	0.21

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 43 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 17.8

Intersection LOS: B

Intersection Capacity Utilization 78.9%

ICU Level of Service D

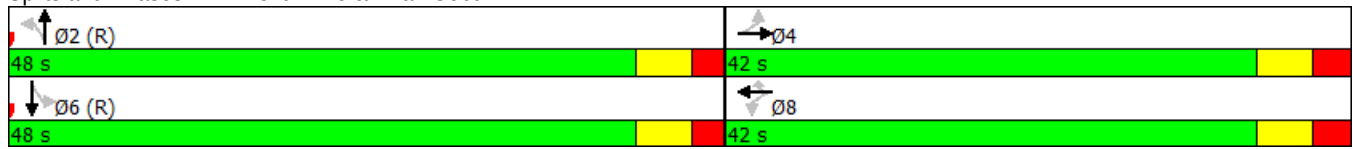
Analysis Period (min) 15

Timings

4: Tenth Line & Brian Coburn

03/27/2018

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/27/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	62	20	57	27	192	671	54	36	290	33
Future Volume (vph)	62	20	57	27	192	671	54	36	290	33
Lane Group Flow (vph)	69	56	63	36	213	746	60	40	322	37
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	28.0	28.0	28.0	28.0	82.0	82.0	82.0	82.0	82.0	82.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	74.5%	74.5%	74.5%	74.5%	74.5%	74.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.0	13.0	13.0	13.0	89.5	89.5	89.5	89.5	89.5	89.5
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.45	0.25	0.42	0.17	0.27	0.27	0.05	0.08	0.12	0.03
Control Delay	53.1	23.6	52.1	37.9	5.0	3.9	1.3	4.2	3.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.1	23.6	52.1	37.9	5.0	3.9	1.3	4.2	3.3	1.5
LOS	D	C	D	D	A	A	A	A	A	A
Approach Delay		39.9		46.9		4.0			3.3	
Approach LOS		D		D		A			A	
Queue Length 50th (m)	14.3	4.4	13.0	6.0	9.8	17.9	0.0	1.5	6.7	0.0
Queue Length 95th (m)	25.7	14.6	24.1	14.1	26.5	36.8	3.6	6.0	15.2	2.8
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	260	347	255	350	792	2757	1203	528	2757	1191
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.16	0.25	0.10	0.27	0.27	0.05	0.08	0.12	0.03

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 57.3%

ICU Level of Service B

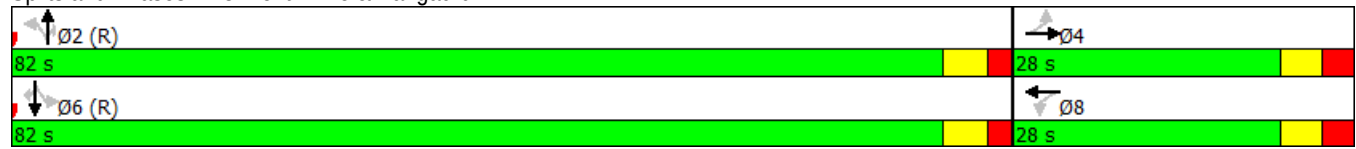
Analysis Period (min) 15

Timings

8: Tenth Line & Vangaurd

03/27/2018

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

03/27/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	22	31	182	16	10	159
Future Volume (vph)	22	31	182	16	10	159
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	34	202	18	11	177
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	58	220	188			
Volume Left (vph)	24	202	0			
Volume Right (vph)	34	0	177			
Hadj (s)	-0.23	0.22	-0.53			
Departure Headway (s)	4.5	4.4	3.7			
Degree Utilization, x	0.07	0.27	0.20			
Capacity (veh/h)	724	793	938			
Control Delay (s)	7.9	9.1	7.6			
Approach Delay (s)	7.9	9.1	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.3			
Level of Service			A			
Intersection Capacity Utilization			35.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Brian Coburn & Aquaview

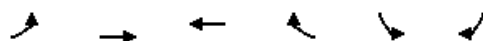
03/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	153	35	24	529	35	137	43	28	10	9	34
Future Volume (vph)	4	153	35	24	529	35	137	43	28	10	9	34
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	170	39	27	588	39	152	48	31	11	10	38
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total (vph)	4	209	27	627	231	59						
Volume Left (vph)	4	0	27	0	152	11						
Volume Right (vph)	0	39	0	39	31	38						
Hadj (s)	0.53	-0.10	0.53	-0.01	0.09	-0.32						
Departure Headway (s)	6.9	6.2	6.4	5.8	6.4	6.5						
Degree Utilization, x	0.01	0.36	0.05	1.01	0.41	0.11						
Capacity (veh/h)	498	556	550	617	544	510						
Control Delay (s)	8.7	11.5	8.5	61.9	13.9	10.3						
Approach Delay (s)	11.5		59.7		13.9	10.3						
Approach LOS	B		F		B	B						
Intersection Summary												
Delay	39.2											
Level of Service	E											
Intersection Capacity Utilization	57.6%			ICU Level of Service			B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/27/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/27/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/27/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	52	7	13	93	64	13	99	16	44	68	26
Future Volume (vph)	24	52	7	13	93	64	13	99	16	44	68	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	58	8	14	103	71	14	110	18	49	76	29
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	93	188	142	154								
Volume Left (vph)	27	14	14	49								
Volume Right (vph)	8	71	18	29								
Hadj (s)	0.04	-0.18	-0.02	-0.02								
Departure Headway (s)	4.9	4.6	4.8	4.8								
Degree Utilization, x	0.13	0.24	0.19	0.20								
Capacity (veh/h)	673	733	706	705								
Control Delay (s)	8.6	9.0	8.9	9.0								
Approach Delay (s)	8.6	9.0	8.9	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.9								
Level of Service				A								
Intersection Capacity Utilization				33.6%	ICU Level of Service	A						
Analysis Period (min)				15								

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/27/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	76	10	8	13	13	629	42	212	754	73
Future Volume (vph)	76	10	8	13	13	629	42	212	754	73
Lane Group Flow (vph)	0	108	9	181	14	699	47	236	838	81
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		14.7	14.7	14.7	62.6	62.6	62.6	62.6	62.6	62.6
Actuated g/C Ratio		0.16	0.16	0.16	0.69	0.69	0.69	0.69	0.69	0.69
v/c Ratio		0.63	0.04	0.47	0.04	0.30	0.05	0.50	0.36	0.08
Control Delay		47.1	27.9	10.1	7.0	6.7	2.6	13.3	7.1	2.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		47.1	27.9	10.1	7.0	6.7	2.6	13.3	7.1	2.1
LOS		D	C	B	A	A	A	B	A	A
Approach Delay		47.1		10.9		6.4			8.0	
Approach LOS		D		B		A			A	
Queue Length 50th (m)		17.0	1.4	2.2	0.6	18.6	0.0	14.5	23.6	0.0
Queue Length 95th (m)		27.7	4.5	16.1	3.8	44.6	4.4	53.9	55.5	5.8
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		317	395	577	396	2351	1038	469	2351	1047
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.34	0.02	0.31	0.04	0.30	0.05	0.50	0.36	0.08

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 9.6

Intersection LOS: A

Intersection Capacity Utilization 74.4%

ICU Level of Service D

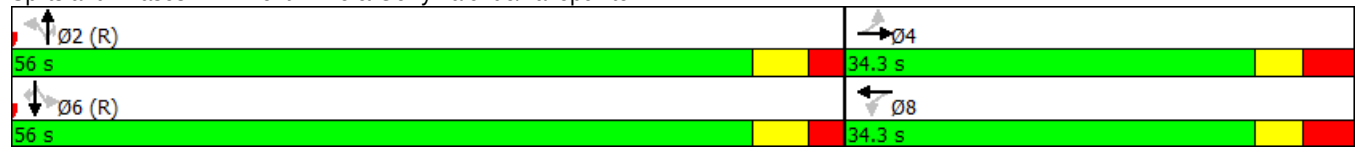
Analysis Period (min) 15

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/27/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

4: Tenth Line & Brian Coburn

03/27/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	174	343	29	205	187	87	435	232	491
Future Volume (vph)	174	343	29	205	187	87	435	232	491
Lane Group Flow (vph)	193	582	32	228	208	97	531	258	620
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	33.2	33.2	33.2	33.2	33.2	44.4	44.4	44.4	44.4
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.49	0.49	0.49	0.49
v/c Ratio	0.51	0.91	0.29	0.35	0.30	0.29	0.32	0.69	0.38
Control Delay	26.7	44.4	27.2	21.6	4.0	17.8	14.5	30.4	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	44.4	27.2	21.6	4.0	17.8	14.5	30.4	15.0
LOS	C	D	C	C	A	B	B	C	B
Approach Delay		40.0		14.1			15.0		19.5
Approach LOS		D		B			B		B
Queue Length 50th (m)	24.3	84.9	3.7	26.7	0.0	10.1	28.5	34.6	34.1
Queue Length 95th (m)	44.0	#144.1	11.6	44.1	12.6	21.7	39.8	#74.4	46.9
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	409	687	117	705	716	330	1652	376	1648
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.85	0.27	0.32	0.29	0.29	0.32	0.69	0.38

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 35 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 23.4

Intersection LOS: C

Intersection Capacity Utilization 92.4%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

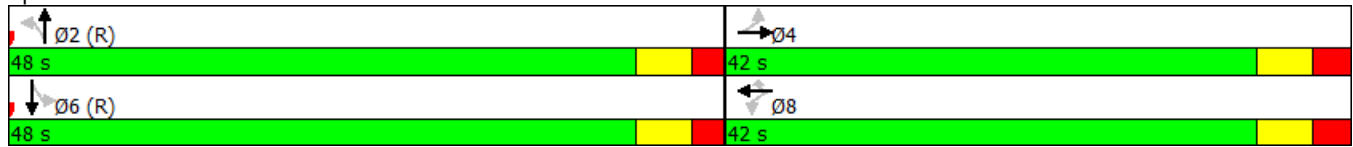
Timings

4: Tenth Line & Brian Coburn

03/27/2018

Queue shown is maximum after two cycles.

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/27/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	166	95	115	85	106	719	44	25	958	43
Future Volume (vph)	166	95	115	85	106	719	44	25	958	43
Lane Group Flow (vph)	184	262	128	272	118	799	49	28	1064	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	36.0	36.0	36.0	36.0	84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	24.5	24.5	24.5	24.5	83.6	83.6	83.6	83.6	83.6	83.6
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	1.55	0.69	1.01	0.71	0.41	0.34	0.05	0.07	0.45	0.05
Control Delay	317.4	43.0	128.8	41.1	14.4	8.4	2.2	7.8	9.5	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	317.4	43.0	128.8	41.1	14.4	8.4	2.2	7.8	9.5	2.2
LOS	F	D	F	D	B	A	A	A	A	A
Approach Delay		156.2		69.2		8.8			9.2	
Approach LOS		F		E		A			A	
Queue Length 50th (m)	~58.1	43.6	29.6	42.3	11.4	38.1	0.0	2.0	56.5	0.0
Queue Length 95th (m)	#99.1	69.7	#63.4	69.4	27.4	52.4	4.1	5.8	75.9	4.0
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	145	449	155	453	290	2360	1022	404	2360	1044
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.58	0.83	0.60	0.41	0.34	0.05	0.07	0.45	0.05

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.55

Intersection Signal Delay: 39.4

Intersection LOS: D

Intersection Capacity Utilization 81.3%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Timings

8: Tenth Line & Vangaurd

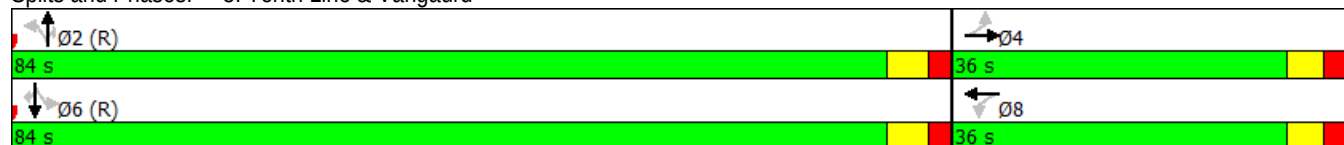
03/27/2018

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

03/27/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	210	223	73	17	8	121
Future Volume (vph)	210	223	73	17	8	121
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	233	248	81	19	9	134
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	481	100	143			
Volume Left (vph)	233	81	0			
Volume Right (vph)	248	0	134			
Hadj (s)	-0.18	0.20	-0.53			
Departure Headway (s)	4.3	5.4	4.7			
Degree Utilization, x	0.58	0.15	0.18			
Capacity (veh/h)	799	604	698			
Control Delay (s)	13.2	9.4	8.7			
Approach Delay (s)	13.2	9.4	8.7			
Approach LOS	B	A	A			
Intersection Summary						
Delay			11.8			
Level of Service			B			
Intersection Capacity Utilization			50.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Brian Coburn & Aquaview

03/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	51	475	96	40	377	30	82	26	24	39	32	12
Future Volume (vph)	51	475	96	40	377	30	82	26	24	39	32	12
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	57	528	107	44	419	33	91	29	27	43	36	13
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total (vph)	57	635	44	452	147	92						
Volume Left (vph)	57	0	44	0	91	43						
Volume Right (vph)	0	107	0	33	27	13						
Hadj (s)	0.53	-0.08	0.53	-0.02	0.05	0.04						
Departure Headway (s)	6.7	6.1	6.8	6.3	7.1	7.4						
Degree Utilization, x	0.11	1.07	0.08	0.79	0.29	0.19						
Capacity (veh/h)	518	597	517	564	464	447						
Control Delay (s)	9.3	79.7	9.2	27.2	13.0	12.1						
Approach Delay (s)	73.9		25.6		13.0	12.1						
Approach LOS	F		D		B	B						
Intersection Summary												
Delay	46.8											
Level of Service	E											
Intersection Capacity Utilization	58.0%			ICU Level of Service				B				
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/27/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰		↰	
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/27/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/27/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	53	90	15	8	49	34	13	82	13	51	89	18
Future Volume (vph)	53	90	15	8	49	34	13	82	13	51	89	18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	59	100	17	9	54	38	14	91	14	57	99	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	176	101	119	176								
Volume Left (vph)	59	9	14	57								
Volume Right (vph)	17	38	14	20								
Hadj (s)	0.04	-0.17	-0.01	0.03								
Departure Headway (s)	4.8	4.7	4.8	4.8								
Degree Utilization, x	0.23	0.13	0.16	0.23								
Capacity (veh/h)	699	705	698	705								
Control Delay (s)	9.3	8.4	8.7	9.2								
Approach Delay (s)	9.3	8.4	8.7	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				38.3%	ICU Level of Service		A					
Analysis Period (min)				15								

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

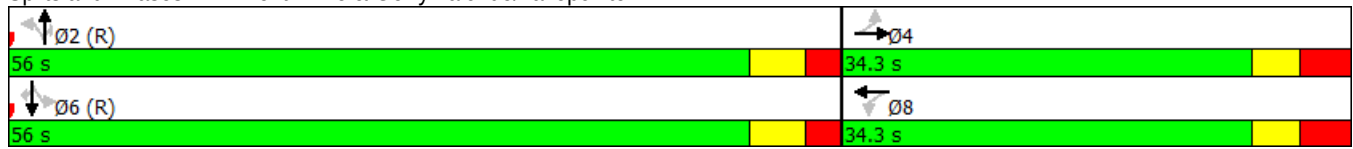
										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	3	16	2	15	565	2	52	294	43
Future Volume (vph)	93	3	16	2	15	565	2	52	294	43
Lane Group Flow (vph)	0	127	18	171	17	628	2	58	327	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		16.2	16.2	16.2	61.1	61.1	61.1	61.1	61.1	61.1
Actuated g/C Ratio		0.18	0.18	0.18	0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio		0.64	0.08	0.42	0.03	0.27	0.00	0.12	0.14	0.05
Control Delay		44.1	27.9	7.9	7.1	7.1	0.0	7.7	6.4	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.1	27.9	7.9	7.1	7.1	0.0	7.7	6.4	2.7
LOS		D	C	A	A	A	A	A	A	A
Approach Delay		44.1		9.8		7.0			6.1	
Approach LOS		D		A		A			A	
Queue Length 50th (m)		19.2	2.7	0.3	0.8	18.5	0.0	2.9	8.6	0.0
Queue Length 95th (m)		31.7	7.1	14.0	4.1	39.5	0.0	10.6	20.3	4.5
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		333	386	573	666	2295	1014	495	2295	1013
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.38	0.05	0.30	0.03	0.27	0.00	0.12	0.14	0.05
Intersection Summary										
Cycle Length: 90.3										
Actuated Cycle Length: 90.3										
Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green										
Natural Cycle: 65										
Control Type: Actuated-Coordinated										
Maximum v/c Ratio: 0.64										
Intersection Signal Delay: 10.5					Intersection LOS: B					
Intersection Capacity Utilization 69.1%					ICU Level of Service C					
Analysis Period (min) 15										

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/28/2018

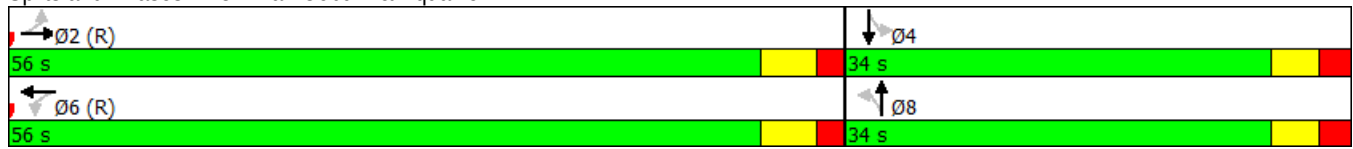
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	153	24	529	137	43	10	9
Future Volume (vph)	4	153	24	529	137	43	10	9
Lane Group Flow (vph)	4	209	27	627	0	231	0	59
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.6	30.6	30.6	30.6	32.5	32.5	32.5	32.5
Total Split (s)	56.0	56.0	56.0	56.0	34.0	34.0	34.0	34.0
Total Split (%)	62.2%	62.2%	62.2%	62.2%	37.8%	37.8%	37.8%	37.8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	50.4	50.4	50.4	50.4		28.5		28.5
Actuated g/C Ratio	0.56	0.56	0.56	0.56		0.32		0.32
v/c Ratio	0.01	0.21	0.04	0.63		0.54		0.12
Control Delay	13.0	13.8	9.2	17.0		30.1		11.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	13.0	13.8	9.2	17.0		30.1		11.6
LOS	B	B	A	B		C		B
Approach Delay		13.8		16.7		30.1		11.6
Approach LOS		B		B		C		B
Queue Length 50th (m)	0.4	19.4	2.0	68.3		31.4		2.5
Queue Length 95th (m)	m1.6	31.8	5.5	102.8		54.1		10.8
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	294	980	626	991		425		497
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.01	0.21	0.04	0.63		0.54		0.12
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 60 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 65								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.63								
Intersection Signal Delay: 18.5					Intersection LOS: B			
Intersection Capacity Utilization 63.4%					ICU Level of Service B			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/28/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/28/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	57	125	40	380	221	165	352	78	248
Future Volume (vph)	57	125	40	380	221	165	352	78	248
Lane Group Flow (vph)	63	207	44	422	246	183	408	87	379
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	27.7	27.7	27.7	27.7	27.7	49.9	49.9	49.9	49.9
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.55	0.55	0.55	0.55
v/c Ratio	0.41	0.38	0.14	0.77	0.39	0.35	0.22	0.17	0.21
Control Delay	31.1	21.1	14.4	27.6	2.2	15.5	11.6	13.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	21.1	14.4	27.6	2.2	15.5	11.6	13.2	9.3
LOS	C	C	B	C	A	B	B	B	A
Approach Delay		23.4		18.0			12.8		10.0
Approach LOS		C		B			B		A
Queue Length 50th (m)	8.5	23.0	3.2	53.2	1.2	16.7	17.6	7.1	12.7
Queue Length 95th (m)	18.2	36.0	4.7	64.8	3.2	37.6	30.6	18.0	24.1
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	197	690	416	705	738	519	1867	503	1824
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.30	0.11	0.60	0.33	0.35	0.22	0.17	0.21

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 43 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 15.4

Intersection LOS: B

Intersection Capacity Utilization 78.9%

ICU Level of Service D

Analysis Period (min) 15

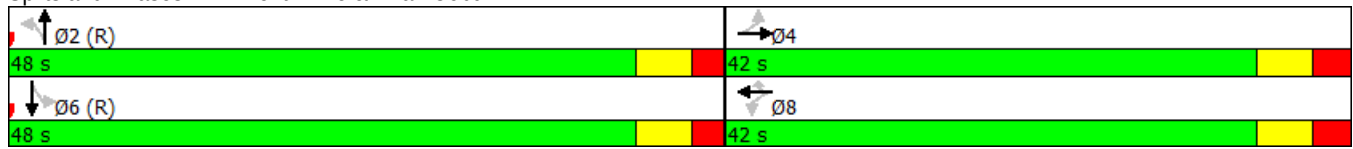
m Volume for 95th percentile queue is metered by upstream signal.

Timings

4: Tenth Line & Brian Coburn

03/28/2018

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	62	20	57	27	192	671	54	36	290	33
Future Volume (vph)	62	20	57	27	192	671	54	36	290	33
Lane Group Flow (vph)	69	56	63	36	213	746	60	40	322	37
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	28.0	28.0	28.0	28.0	82.0	82.0	82.0	82.0	82.0	82.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	74.5%	74.5%	74.5%	74.5%	74.5%	74.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.1	13.1	13.1	13.1	89.4	89.4	89.4	89.4	89.4	89.4
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.45	0.25	0.41	0.17	0.27	0.27	0.05	0.08	0.12	0.03
Control Delay	52.9	23.6	51.9	37.8	5.0	3.9	1.3	4.3	3.4	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	23.6	51.9	37.8	5.0	3.9	1.3	4.3	3.4	1.5
LOS	D	C	D	D	A	A	A	A	A	A
Approach Delay		39.8		46.8		4.0			3.3	
Approach LOS		D		D		A			A	
Queue Length 50th (m)	14.3	4.4	13.0	6.0	9.8	18.1	0.0	1.5	6.7	0.0
Queue Length 95th (m)	25.7	14.6	24.1	14.1	26.4	36.8	3.6	6.0	15.2	2.8
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	260	347	255	350	797	2756	1203	528	2756	1190
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.16	0.25	0.10	0.27	0.27	0.05	0.08	0.12	0.03

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 9.1
 Intersection Capacity Utilization 57.3%
 Analysis Period (min) 15

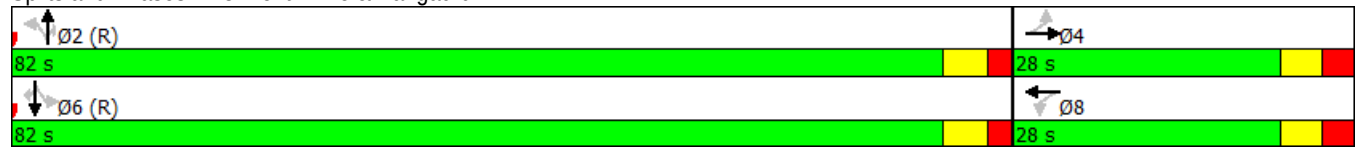
Intersection LOS: A
 ICU Level of Service B

Timings

8: Tenth Line & Vangaurd

03/28/2018

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	22	31	182	16	10	159
Future Volume (vph)	22	31	182	16	10	159
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	34	202	18	11	177
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	58	220	188			
Volume Left (vph)	24	202	0			
Volume Right (vph)	34	0	177			
Hadj (s)	-0.23	0.22	-0.53			
Departure Headway (s)	4.5	4.4	3.7			
Degree Utilization, x	0.07	0.27	0.20			
Capacity (veh/h)	724	793	938			
Control Delay (s)	7.9	9.1	7.6			
Approach Delay (s)	7.9	9.1	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.3			
Level of Service			A			
Intersection Capacity Utilization			35.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	52	7	13	93	64	13	99	16	44	68	26
Future Volume (vph)	24	52	7	13	93	64	13	99	16	44	68	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	58	8	14	103	71	14	110	18	49	76	29
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	93	188	142	154								
Volume Left (vph)	27	14	14	49								
Volume Right (vph)	8	71	18	29								
Hadj (s)	0.04	-0.18	-0.02	-0.02								
Departure Headway (s)	4.9	4.6	4.8	4.8								
Degree Utilization, x	0.13	0.24	0.19	0.20								
Capacity (veh/h)	673	733	706	705								
Control Delay (s)	8.6	9.0	8.9	9.0								
Approach Delay (s)	8.6	9.0	8.9	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.9								
Level of Service				A								
Intersection Capacity Utilization				33.6%	ICU Level of Service	A						
Analysis Period (min)				15								

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	76	10	8	13	13	629	42	212	754	73
Future Volume (vph)	76	10	8	13	13	629	42	212	754	73
Lane Group Flow (vph)	0	108	9	181	14	699	47	236	838	81
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		15.3	15.3	15.3	62.0	62.0	62.0	62.0	62.0	62.0
Actuated g/C Ratio		0.17	0.17	0.17	0.69	0.69	0.69	0.69	0.69	0.69
v/c Ratio		0.60	0.04	0.46	0.04	0.30	0.05	0.51	0.36	0.08
Control Delay		44.0	27.2	9.7	7.2	6.9	2.6	13.9	7.4	2.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.0	27.2	9.7	7.2	6.9	2.6	13.9	7.4	2.2
LOS		D	C	A	A	A	A	B	A	A
Approach Delay		44.0		10.5		6.7			8.3	
Approach LOS		D		B		A			A	
Queue Length 50th (m)		16.7	1.4	2.1	0.6	19.8	0.0	15.5	25.1	0.0
Queue Length 95th (m)		27.6	4.5	16.1	3.8	44.6	4.4	54.1	55.5	5.8
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		320	394	577	391	2326	1028	463	2326	1037
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.34	0.02	0.31	0.04	0.30	0.05	0.51	0.36	0.08

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 9.7

Intersection LOS: A

Intersection Capacity Utilization 74.4%

ICU Level of Service D

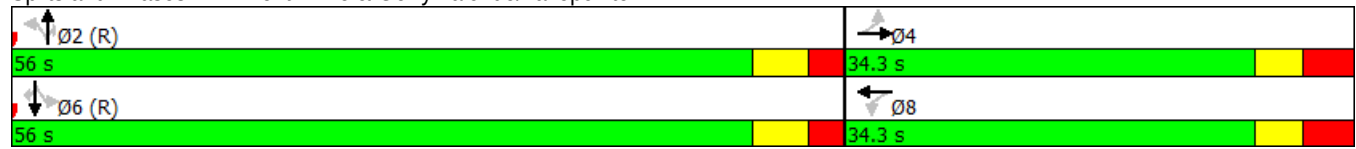
Analysis Period (min) 15

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/28/2018

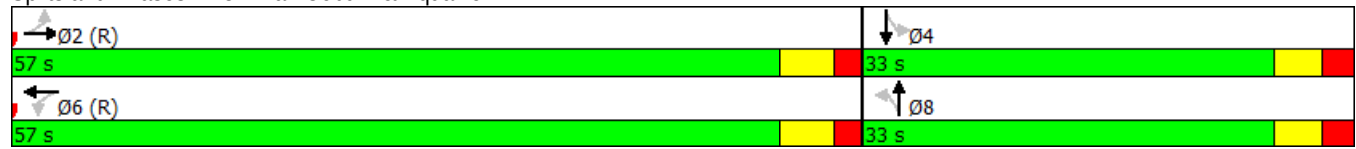
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	51	475	40	377	82	26	39	32
Future Volume (vph)	51	475	40	377	82	26	39	32
Lane Group Flow (vph)	57	635	44	452	0	147	0	92
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.6	30.6	30.6	30.6	32.5	32.5	32.5	32.5
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	51.4	51.4	51.4	51.4		27.5		27.5
Actuated g/C Ratio	0.57	0.57	0.57	0.57		0.31		0.31
v/c Ratio	0.13	0.64	0.15	0.45		0.36		0.21
Control Delay	8.6	13.1	10.6	12.7		25.3		22.4
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	8.6	13.1	10.6	12.7		25.3		22.4
LOS	A	B	B	B		C		C
Approach Delay		12.7		12.5		25.3		22.4
Approach LOS		B		B		C		C
Queue Length 50th (m)	4.2	54.4	3.3	41.2		17.9		10.5
Queue Length 95th (m)	m5.3	m78.0	8.7	62.8		34.1		22.2
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	432	997	300	1007		406		440
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.13	0.64	0.15	0.45		0.36		0.21
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 65								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.64								
Intersection Signal Delay: 14.6					Intersection LOS: B			
Intersection Capacity Utilization 76.5%					ICU Level of Service D			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/28/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/28/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	174	343	29	205	187	87	435	232	491
Future Volume (vph)	174	343	29	205	187	87	435	232	491
Lane Group Flow (vph)	193	582	32	228	208	97	531	258	620
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	33.2	33.2	33.2	33.2	33.2	44.4	44.4	44.4	44.4
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.49	0.49	0.49	0.49
v/c Ratio	0.51	0.91	0.29	0.35	0.30	0.29	0.32	0.69	0.38
Control Delay	26.7	44.4	41.8	35.3	15.1	17.8	14.5	30.4	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	44.4	41.8	35.3	15.1	17.8	14.5	30.4	15.0
LOS	C	D	D	D	B	B	B	C	B
Approach Delay		40.0		26.8			15.0		19.5
Approach LOS		D		C			B		B
Queue Length 50th (m)	24.3	84.9	4.8	35.6	8.8	10.1	28.5	34.6	34.1
Queue Length 95th (m)	43.9	#144.1	m13.2	58.4	26.0	21.7	39.8	#74.4	46.9
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	409	687	117	705	716	331	1652	376	1648
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.85	0.27	0.32	0.29	0.29	0.32	0.69	0.38

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 35 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 25.5

Intersection LOS: C

Intersection Capacity Utilization 92.4%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Timings

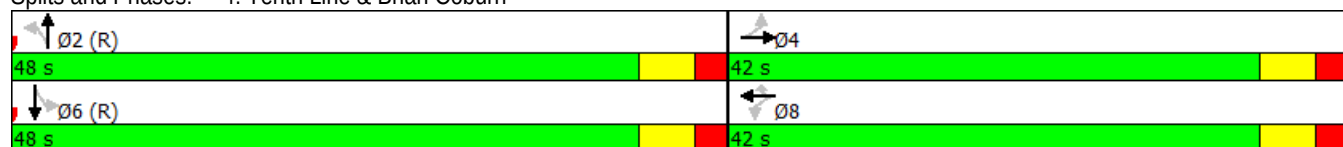
4: Tenth Line & Brian Coburn

03/28/2018

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	166	95	115	85	106	719	44	25	958	43
Future Volume (vph)	166	95	115	85	106	719	44	25	958	43
Lane Group Flow (vph)	184	262	128	272	118	799	49	28	1064	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	36.0	36.0	36.0	36.0	84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.9	29.9	29.9	29.9	78.2	78.2	78.2	78.2	78.2	78.2
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.65	0.65	0.65	0.65	0.65	0.65
v/c Ratio	1.05	0.58	0.70	0.60	0.45	0.36	0.05	0.08	0.48	0.05
Control Delay	126.7	36.3	62.7	34.6	17.2	10.1	2.2	8.4	11.5	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.7	36.3	62.7	34.6	17.2	10.1	2.2	8.4	11.5	2.2
LOS	F	D	E	C	B	B	A	A	B	A
Approach Delay		73.6		43.5		10.6			11.0	
Approach LOS		E		D		B			B	
Queue Length 50th (m)	~47.2	42.1	27.5	40.8	12.7	41.5	0.0	2.2	61.7	0.0
Queue Length 95th (m)	#91.8	69.7	#56.5	69.4	28.6	52.4	4.1	5.9	75.9	4.0
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	175	449	183	453	260	2209	960	368	2209	980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.58	0.70	0.60	0.45	0.36	0.05	0.08	0.48	0.05

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 24.7

Intersection LOS: C

Intersection Capacity Utilization 81.3%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Timings

8: Tenth Line & Vangaurd

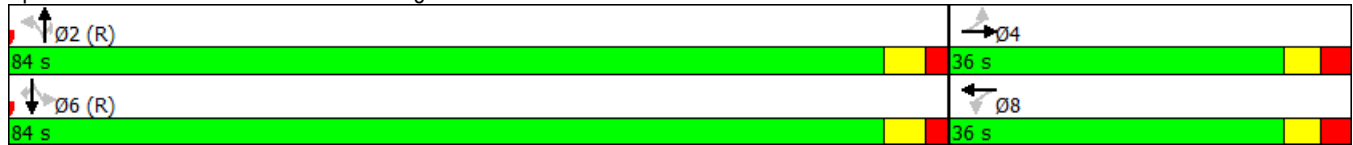
03/28/2018

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	210	223	73	17	8	121
Future Volume (vph)	210	223	73	17	8	121
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	233	248	81	19	9	134
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	481	100	143			
Volume Left (vph)	233	81	0			
Volume Right (vph)	248	0	134			
Hadj (s)	-0.18	0.20	-0.53			
Departure Headway (s)	4.3	5.4	4.7			
Degree Utilization, x	0.58	0.15	0.18			
Capacity (veh/h)	799	604	698			
Control Delay (s)	13.2	9.4	8.7			
Approach Delay (s)	13.2	9.4	8.7			
Approach LOS	B	A	A			
Intersection Summary						
Delay			11.8			
Level of Service			B			
Intersection Capacity Utilization			50.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	53	90	15	8	49	34	13	82	13	51	89	18
Future Volume (vph)	53	90	15	8	49	34	13	82	13	51	89	18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	59	100	17	9	54	38	14	91	14	57	99	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	176	101	119	176								
Volume Left (vph)	59	9	14	57								
Volume Right (vph)	17	38	14	20								
Hadj (s)	0.04	-0.17	-0.01	0.03								
Departure Headway (s)	4.8	4.7	4.8	4.8								
Degree Utilization, x	0.23	0.13	0.16	0.23								
Capacity (veh/h)	699	705	698	705								
Control Delay (s)	9.3	8.4	8.7	9.2								
Approach Delay (s)	9.3	8.4	8.7	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				38.3%	ICU Level of Service	A						
Analysis Period (min)				15								

Appendix F

Synchro Capacity Analysis: Projected Background 2025 Operation

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	3	16	2	15	594	2	52	309	43
Future Volume (vph)	93	3	16	2	15	594	2	52	309	43
Lane Group Flow (vph)	0	127	18	171	17	660	2	58	343	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		16.2	16.2	16.2	61.1	61.1	61.1	61.1	61.1	61.1
Actuated g/C Ratio		0.18	0.18	0.18	0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio		0.64	0.08	0.42	0.03	0.29	0.00	0.12	0.15	0.05
Control Delay		44.1	27.9	7.9	7.1	7.1	0.0	7.8	6.4	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.1	27.9	7.9	7.1	7.1	0.0	7.8	6.4	2.7
LOS		D	C	A	A	A	A	A	A	A
Approach Delay		44.1		9.8		7.1			6.2	
Approach LOS		D		A		A			A	
Queue Length 50th (m)		19.2	2.7	0.3	0.8	19.6	0.0	2.9	9.1	0.0
Queue Length 95th (m)		31.7	7.1	14.0	4.1	41.8	0.0	10.7	21.2	4.5
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		333	386	573	656	2295	1014	477	2295	1013
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.38	0.05	0.30	0.03	0.29	0.00	0.12	0.15	0.05

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 10.4

Intersection LOS: B

Intersection Capacity Utilization 69.1%

ICU Level of Service C

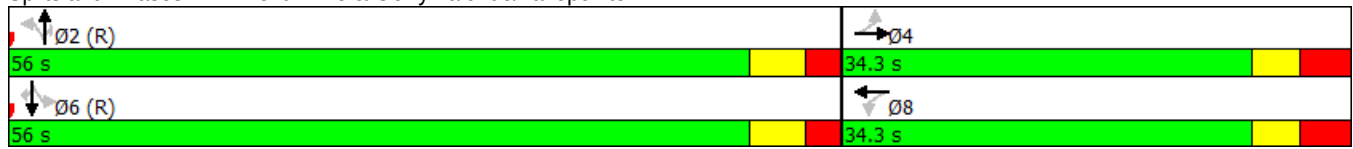
Analysis Period (min) 15

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/28/2018

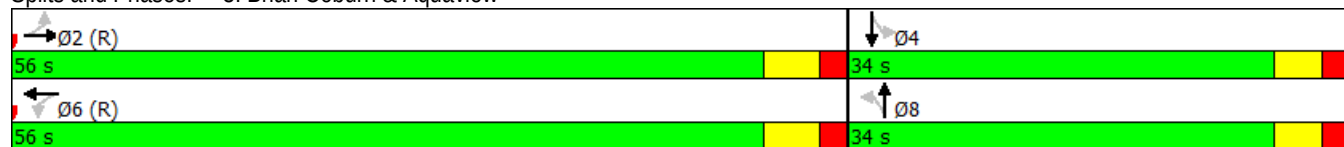
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	161	24	556	137	43	10	9
Future Volume (vph)	4	161	24	556	137	43	10	9
Lane Group Flow (vph)	4	218	27	657	0	231	0	59
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.6	30.6	30.6	30.6	32.5	32.5	32.5	32.5
Total Split (s)	56.0	56.0	56.0	56.0	34.0	34.0	34.0	34.0
Total Split (%)	62.2%	62.2%	62.2%	62.2%	37.8%	37.8%	37.8%	37.8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	50.4	50.4	50.4	50.4		28.5		28.5
Actuated g/C Ratio	0.56	0.56	0.56	0.56		0.32		0.32
v/c Ratio	0.01	0.22	0.04	0.66		0.54		0.12
Control Delay	13.5	14.3	9.2	17.8		30.1		11.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	13.5	14.3	9.2	17.8		30.1		11.6
LOS	B	B	A	B		C		B
Approach Delay		14.3		17.5		30.1		11.6
Approach LOS		B		B		C		B
Queue Length 50th (m)	0.4	21.2	2.0	73.5		31.4		2.5
Queue Length 95th (m)	m1.7	34.2	5.5	110.8		54.1		10.8
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	273	980	621	991		425		497
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.01	0.22	0.04	0.66		0.54		0.12
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 60 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 65								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.66								
Intersection Signal Delay: 19.0					Intersection LOS: B			
Intersection Capacity Utilization 64.9%					ICU Level of Service C			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/28/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/28/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	57	132	40	400	221	165	370	78	261
Future Volume (vph)	57	132	40	400	221	165	370	78	261
Lane Group Flow (vph)	63	215	44	444	246	183	428	87	393
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	28.5	28.5	28.5	28.5	28.5	49.1	49.1	49.1	49.1
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.55	0.55	0.55	0.55
v/c Ratio	0.43	0.38	0.13	0.79	0.38	0.36	0.23	0.18	0.22
Control Delay	31.8	21.0	13.9	27.4	2.0	16.1	12.0	13.6	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	21.0	13.9	27.4	2.0	16.1	12.0	13.6	9.9
LOS	C	C	B	C	A	B	B	B	A
Approach Delay		23.5		18.1			13.2		10.5
Approach LOS		C		B			B		B
Queue Length 50th (m)	8.4	23.8	3.1	54.7	1.0	17.3	19.2	7.3	14.0
Queue Length 95th (m)	18.6	37.6	m4.4	67.0	2.7	37.8	32.2	18.1	25.4
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	184	691	410	705	738	504	1837	486	1797
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.31	0.11	0.63	0.33	0.36	0.23	0.18	0.22

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 43 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 15.7

Intersection LOS: B

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

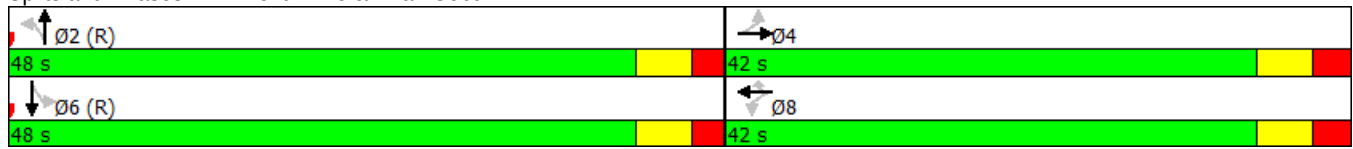
m Volume for 95th percentile queue is metered by upstream signal.

Timings

4: Tenth Line & Brian Coburn

03/28/2018

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	62	20	57	27	192	705	54	36	304	33
Future Volume (vph)	62	20	57	27	192	705	54	36	304	33
Lane Group Flow (vph)	69	56	63	36	213	783	60	40	338	37
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	28.0	28.0	28.0	28.0	82.0	82.0	82.0	82.0	82.0	82.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	74.5%	74.5%	74.5%	74.5%	74.5%	74.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.1	13.1	13.1	13.1	89.4	89.4	89.4	89.4	89.4	89.4
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.45	0.25	0.41	0.17	0.27	0.28	0.05	0.08	0.12	0.03
Control Delay	52.9	23.6	51.9	37.8	5.0	4.0	1.3	4.3	3.4	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	23.6	51.9	37.8	5.0	4.0	1.3	4.3	3.4	1.5
LOS	D	C	D	D	A	A	A	A	A	A
Approach Delay		39.8		46.8		4.0			3.3	
Approach LOS		D		D		A			A	
Queue Length 50th (m)	14.3	4.4	13.0	6.0	9.8	19.2	0.0	1.5	7.1	0.0
Queue Length 95th (m)	25.7	14.6	24.1	14.1	26.6	38.9	3.6	6.0	15.9	2.8
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	260	347	255	350	785	2756	1203	507	2756	1190
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.16	0.25	0.10	0.27	0.28	0.05	0.08	0.12	0.03

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 9.0

Intersection LOS: A

Intersection Capacity Utilization 57.3%

ICU Level of Service B

Analysis Period (min) 15

Timings

8: Tenth Line & Vangaurd

03/28/2018

Splits and Phases: 8: Tenth Line & Vangaurd

 Ø2 (R)	 Ø4
82 s	28 s
 Ø6 (R)	 Ø8
82 s	28 s

HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	22	31	182	16	10	159
Future Volume (vph)	22	31	182	16	10	159
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	34	202	18	11	177
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	58	220	188			
Volume Left (vph)	24	202	0			
Volume Right (vph)	34	0	177			
Hadj (s)	-0.23	0.22	-0.53			
Departure Headway (s)	4.5	4.4	3.7			
Degree Utilization, x	0.07	0.27	0.20			
Capacity (veh/h)	724	793	938			
Control Delay (s)	7.9	9.1	7.6			
Approach Delay (s)	7.9	9.1	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.3			
Level of Service			A			
Intersection Capacity Utilization			35.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	52	7	13	93	64	13	99	16	44	68	26
Future Volume (vph)	24	52	7	13	93	64	13	99	16	44	68	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	58	8	14	103	71	14	110	18	49	76	29
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	93	188	142	154								
Volume Left (vph)	27	14	14	49								
Volume Right (vph)	8	71	18	29								
Hadj (s)	0.04	-0.18	-0.02	-0.02								
Departure Headway (s)	4.9	4.6	4.8	4.8								
Degree Utilization, x	0.13	0.24	0.19	0.20								
Capacity (veh/h)	673	733	706	705								
Control Delay (s)	8.6	9.0	8.9	9.0								
Approach Delay (s)	8.6	9.0	8.9	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.9									
Level of Service			A									
Intersection Capacity Utilization			33.6%		ICU Level of Service					A		
Analysis Period (min)			15									

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	76	10	8	13	13	662	42	212	792	73
Future Volume (vph)	76	10	8	13	13	662	42	212	792	73
Lane Group Flow (vph)	0	108	9	181	14	736	47	236	880	81
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		15.3	15.3	15.3	62.0	62.0	62.0	62.0	62.0	62.0
Actuated g/C Ratio		0.17	0.17	0.17	0.69	0.69	0.69	0.69	0.69	0.69
v/c Ratio		0.60	0.04	0.46	0.04	0.32	0.05	0.53	0.38	0.08
Control Delay		44.0	27.2	9.7	7.3	7.0	2.6	14.9	7.5	2.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.0	27.2	9.7	7.3	7.0	2.6	14.9	7.5	2.2
LOS		D	C	A	A	A	A	B	A	A
Approach Delay		44.0		10.5		6.8			8.6	
Approach LOS		D		B		A			A	
Queue Length 50th (m)		16.7	1.4	2.1	0.6	21.1	0.0	15.9	26.6	0.0
Queue Length 95th (m)		27.6	4.5	16.1	3.8	47.4	4.4	56.9	59.1	5.8
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		320	394	577	371	2326	1028	443	2326	1037
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.34	0.02	0.31	0.04	0.32	0.05	0.53	0.38	0.08

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 9.8

Intersection LOS: A

Intersection Capacity Utilization 75.4%

ICU Level of Service D

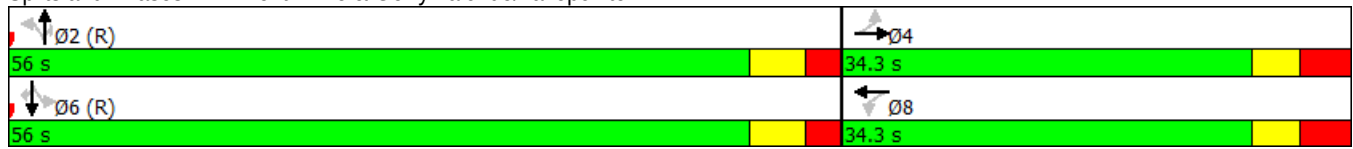
Analysis Period (min) 15

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/28/2018

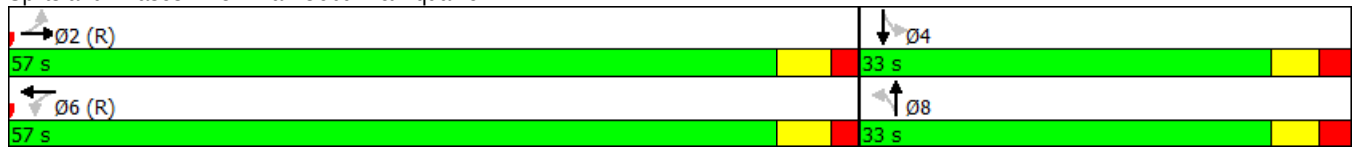
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	51	500	40	397	82	26	39	32
Future Volume (vph)	51	500	40	397	82	26	39	32
Lane Group Flow (vph)	57	663	44	474	0	147	0	92
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.6	30.6	30.6	30.6	32.5	32.5	32.5	32.5
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	51.4	51.4	51.4	51.4		27.5		27.5
Actuated g/C Ratio	0.57	0.57	0.57	0.57		0.31		0.31
v/c Ratio	0.14	0.66	0.16	0.47		0.36		0.21
Control Delay	8.0	14.3	10.9	13.1		25.3		22.4
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	8.0	14.3	10.9	13.1		25.3		22.4
LOS	A	B	B	B		C		C
Approach Delay		13.8		12.9		25.3		22.4
Approach LOS		B		B		C		C
Queue Length 50th (m)	3.7	75.0	3.3	43.9		17.9		10.5
Queue Length 95th (m)	m5.4	m103.5	8.9	66.9		34.1		22.2
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	415	998	282	1008		406		440
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.14	0.66	0.16	0.47		0.36		0.21
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 39 (43%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 65								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.66								
Intersection Signal Delay: 15.2					Intersection LOS: B			
Intersection Capacity Utilization 76.5%					ICU Level of Service D			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/28/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/28/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	174	360	29	215	187	87	457	232	516
Future Volume (vph)	174	360	29	215	187	87	457	232	516
Lane Group Flow (vph)	193	601	32	239	208	97	556	258	647
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	34.0	43.6	43.6	43.6	43.6
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.48	0.48	0.48	0.48
v/c Ratio	0.50	0.91	0.30	0.36	0.30	0.31	0.34	0.73	0.40
Control Delay	26.4	45.5	23.0	16.9	4.9	18.5	15.0	33.8	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	45.5	23.0	16.9	4.9	18.5	15.0	33.8	15.6
LOS	C	D	C	B	A	B	B	C	B
Approach Delay		40.8		12.1			15.6		20.8
Approach LOS		D		B			B		C
Queue Length 50th (m)	24.4	89.5	4.1	31.8	10.0	10.1	30.2	35.3	36.1
Queue Length 95th (m)	44.3	#151.7	m10.7	51.1	16.1	22.0	41.9	#76.9	49.4
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	402	687	112	705	716	311	1626	355	1621
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.87	0.29	0.34	0.29	0.31	0.34	0.73	0.40

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 35 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 23.7

Intersection LOS: C

Intersection Capacity Utilization 93.4%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Timings

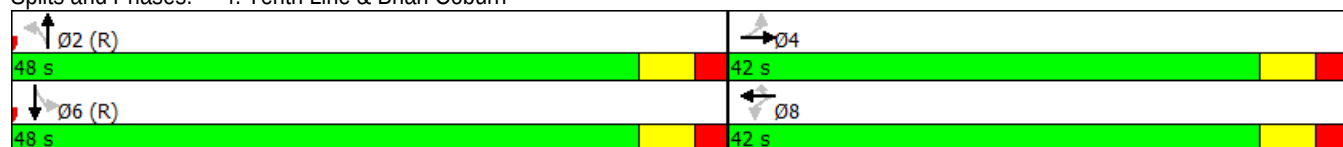
4: Tenth Line & Brian Coburn

03/28/2018

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	166	95	115	85	106	756	44	25	1007	43
Future Volume (vph)	166	95	115	85	106	756	44	25	1007	43
Lane Group Flow (vph)	184	262	128	272	118	840	49	28	1119	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	36.0	36.0	36.0	36.0	84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.9	29.9	29.9	29.9	78.2	78.2	78.2	78.2	78.2	78.2
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.65	0.65	0.65	0.65	0.65	0.65
v/c Ratio	1.05	0.58	0.70	0.60	0.49	0.38	0.05	0.08	0.51	0.05
Control Delay	126.7	36.3	62.7	34.6	19.3	10.3	2.2	8.4	11.9	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.7	36.3	62.7	34.6	19.3	10.3	2.2	8.4	11.9	2.2
LOS	F	D	E	C	B	B	A	A	B	A
Approach Delay		73.6		43.5		11.0			11.4	
Approach LOS		E		D		B			B	
Queue Length 50th (m)	~47.2	42.1	27.5	40.8	13.1	44.4	0.0	2.2	66.4	0.0
Queue Length 95th (m)	#91.8	69.7	#56.5	69.4	31.0	55.7	4.1	5.9	81.5	4.0
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	175	449	183	453	240	2209	960	348	2209	980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.58	0.70	0.60	0.49	0.38	0.05	0.08	0.51	0.05

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 24.6

Intersection LOS: C

Intersection Capacity Utilization 82.8%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Timings

8: Tenth Line & Vangaurd

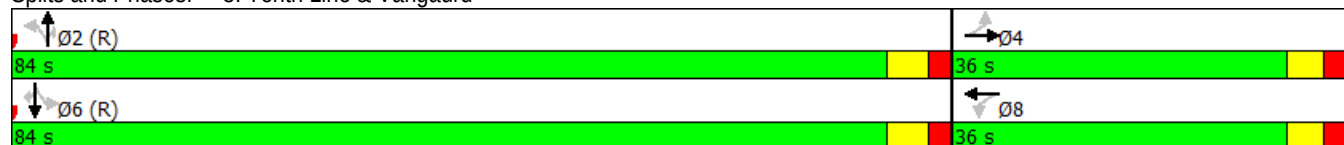
03/28/2018

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	210	223	73	17	8	121
Future Volume (vph)	210	223	73	17	8	121
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	233	248	81	19	9	134
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	481	100	143			
Volume Left (vph)	233	81	0			
Volume Right (vph)	248	0	134			
Hadj (s)	-0.18	0.20	-0.53			
Departure Headway (s)	4.3	5.4	4.7			
Degree Utilization, x	0.58	0.15	0.18			
Capacity (veh/h)	799	604	698			
Control Delay (s)	13.2	9.4	8.7			
Approach Delay (s)	13.2	9.4	8.7			
Approach LOS	B	A	A			
Intersection Summary						
Delay			11.8			
Level of Service			B			
Intersection Capacity Utilization			50.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	53	90	15	8	49	34	13	82	13	51	89	18
Future Volume (vph)	53	90	15	8	49	34	13	82	13	51	89	18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	59	100	17	9	54	38	14	91	14	57	99	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	176	101	119	176								
Volume Left (vph)	59	9	14	57								
Volume Right (vph)	17	38	14	20								
Hadj (s)	0.04	-0.17	-0.01	0.03								
Departure Headway (s)	4.8	4.7	4.8	4.8								
Degree Utilization, x	0.23	0.13	0.16	0.23								
Capacity (veh/h)	699	705	698	705								
Control Delay (s)	9.3	8.4	8.7	9.2								
Approach Delay (s)	9.3	8.4	8.7	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				38.3%	ICU Level of Service	A						
Analysis Period (min)				15								

Appendix G

Aquaview Community Concept Plan

AQUAVIEW

BY



DRAFT

03/26

COMMUNITY VISION

CONTENTS

Area Context	1
Neighbourhood Context	2
Vision	3
Master Plan	4
Density Analysis	5
Open Space Connectivity	6
Park Land Dedication Analysis	7
Built Form	9
Tenth Line Interface	10



AREA CONTEXT



NEIGHBOURHOOD CONTEXT



1 Aquaview Pond



2 Playground



3 Playground & Community Hall

EXISTING UNIT COUNT

Single Detached Homes	223
Townhomes	393
Condo Block	352
TOTAL	968

DENSITY

62.94 units / hectare*

* "Net residential density is based on the area of land in exclusively residential use, including lanes and parking areas internal to developments but excluding public streets, rights-of-way and all non-residential uses." (Official Plan, Volume 1 - Official Plan, Section 2 Strategic Directions, 18)

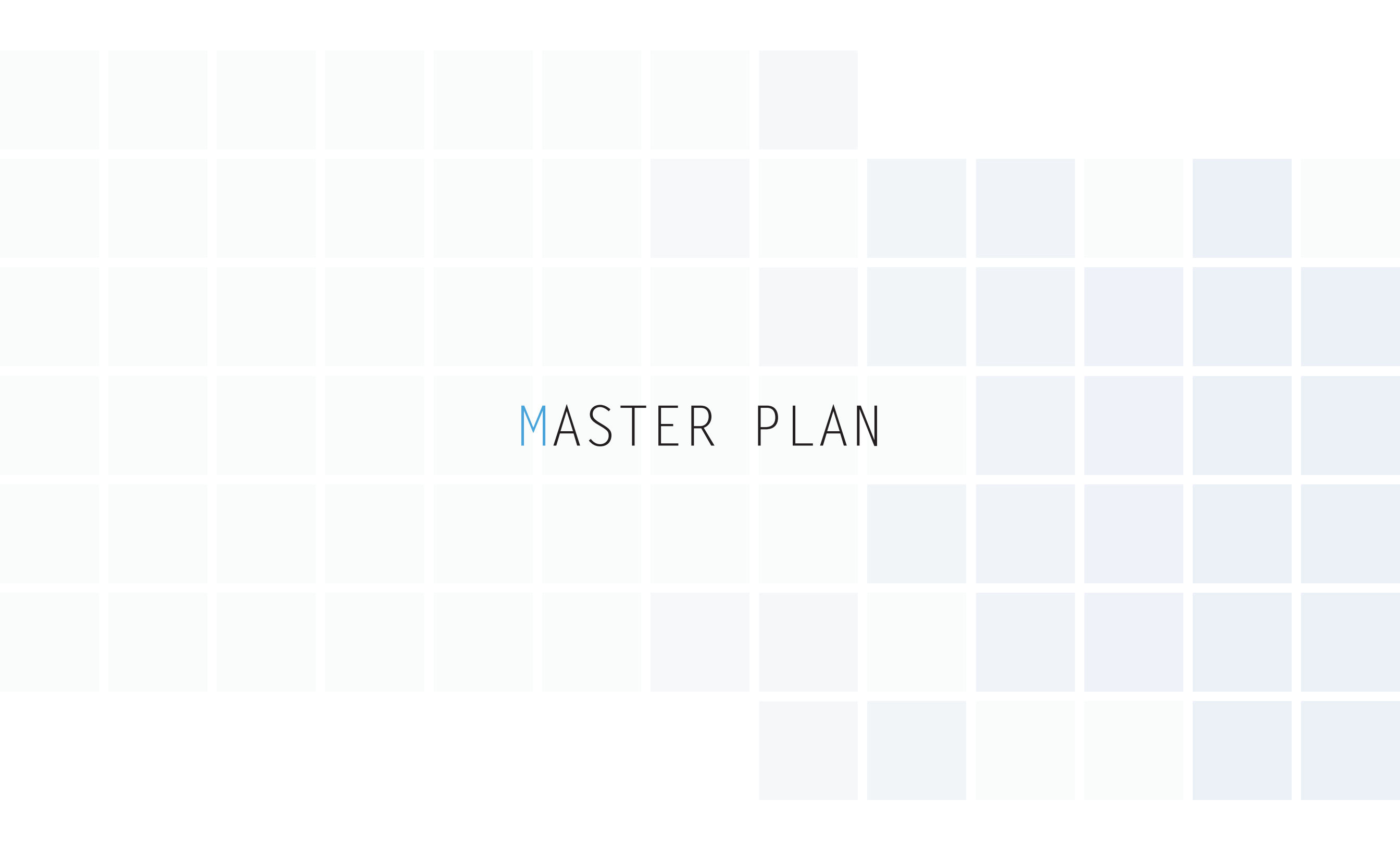
VISION

An aerial photograph of a suburban neighborhood, overlaid with a semi-transparent blue filter. The image shows a mix of residential housing, including single-family homes and some larger commercial or institutional buildings. A prominent feature is a large, irregularly shaped pond in the center-right of the frame. To the left of the pond, there's a large, open grassy area. The streets are visible, showing a grid-like pattern in some areas and more winding paths in others. The overall scene depicts a typical suburban environment with green spaces and residential development.

Integrate the AQUAVIEW sites with the surrounding neighbourhood context in order to develop strong pedestrian and cycling networks, and create one cohesive community.

PRINCIPLES

- Incorporate a variety of housing product (i.e. single detached homes, townhomes and back-to-back townhomes) that are representative of the adjacent built form;
- Maintain pedestrian access and connections to parks, open space, commercial and public transit; and
- Upgrade and renew existing park and pathway system with new amenities for the neighbourhood at large.



MASTER PLAN



AREA STATISTICS

Single Detached Homes	2.15 ha
Townhomes	3.83 ha
Rear Lane Townhomes	0.57 ha
Back-to-Back Townhomes	0.69 ha

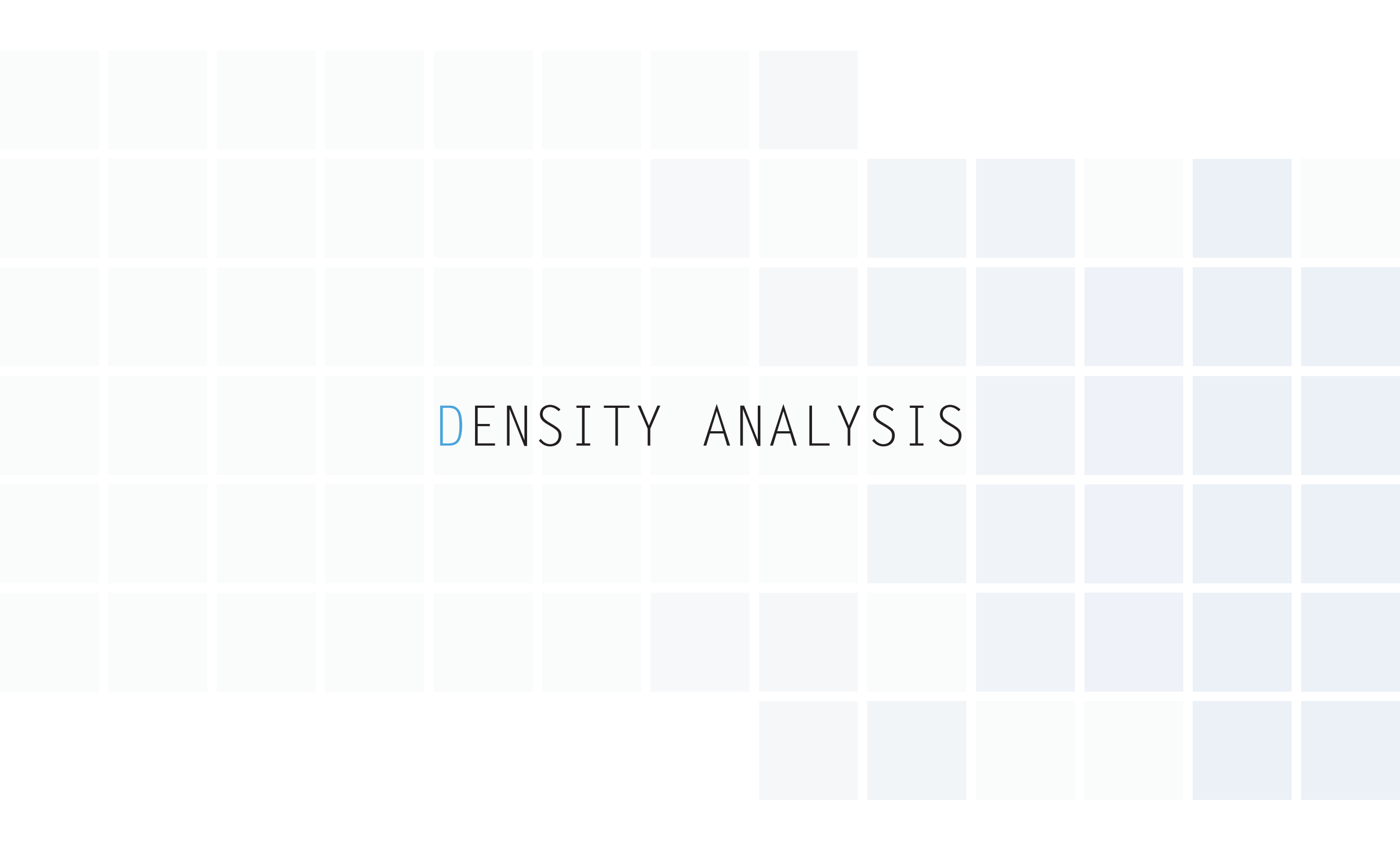
UNIT COUNT

Single Detached Homes	48
Townhomes	181
Rear Lane Townhomes	35
Back-to-Back Townhomes	58
TOTAL	322

DENSITY

44.48 units / hectare*

* "Net residential density is based on the area of land in exclusively residential use, including lanes and parking areas internal to developments but excluding public streets, rights-of-way and all non-residential uses." (Official Plan, Volume 1 - Official Plan, Section 2 Strategic Directions, 18)



DENSITY ANALYSIS



NEIGHBOURHOOD UNIT COUNT



271

Single Detached Homes



574

Townhomes



35

Rear Lane Townhomes



410

Back-to-Back Townhomes /
Condo Block

TOTAL

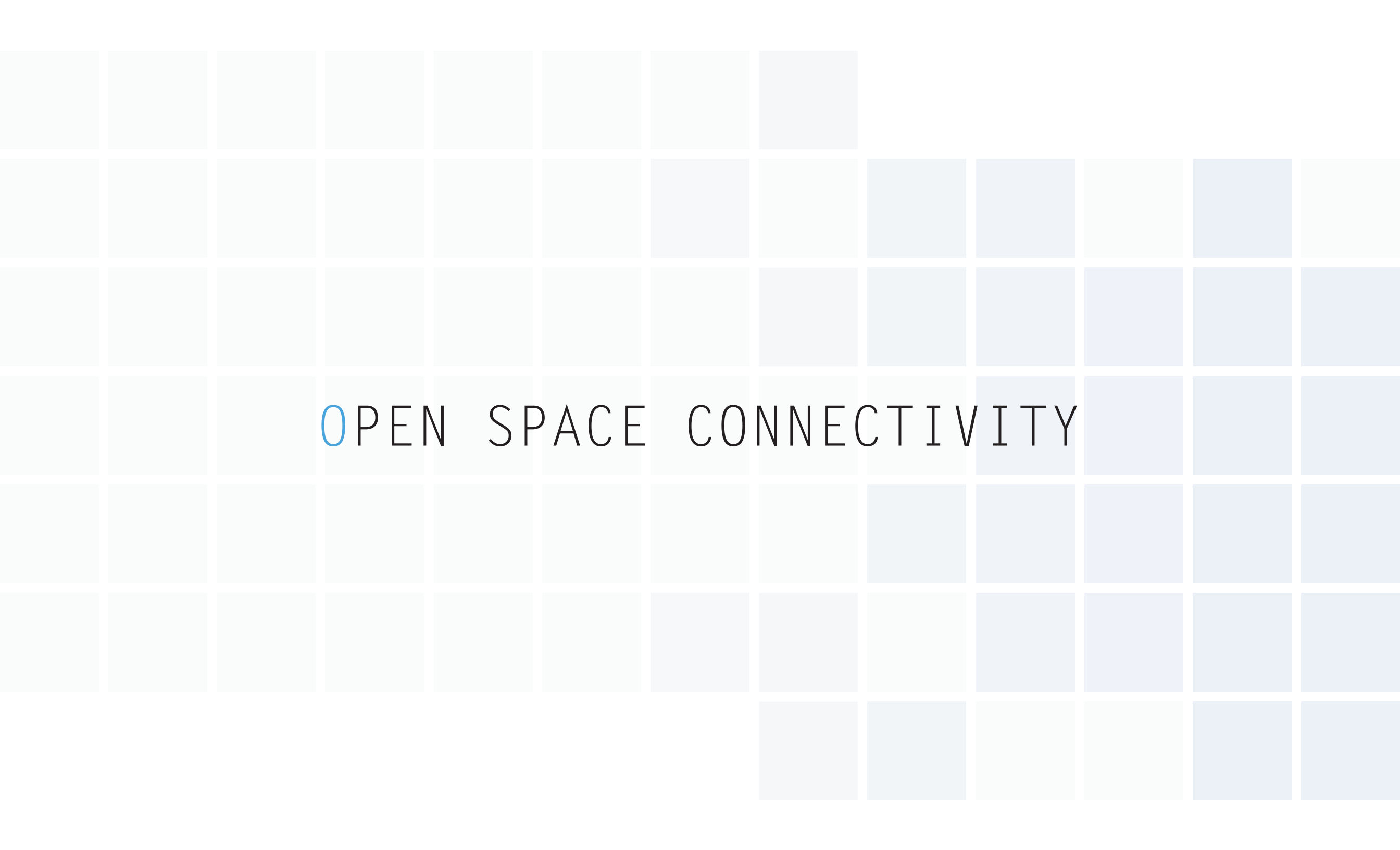
1290

Homes

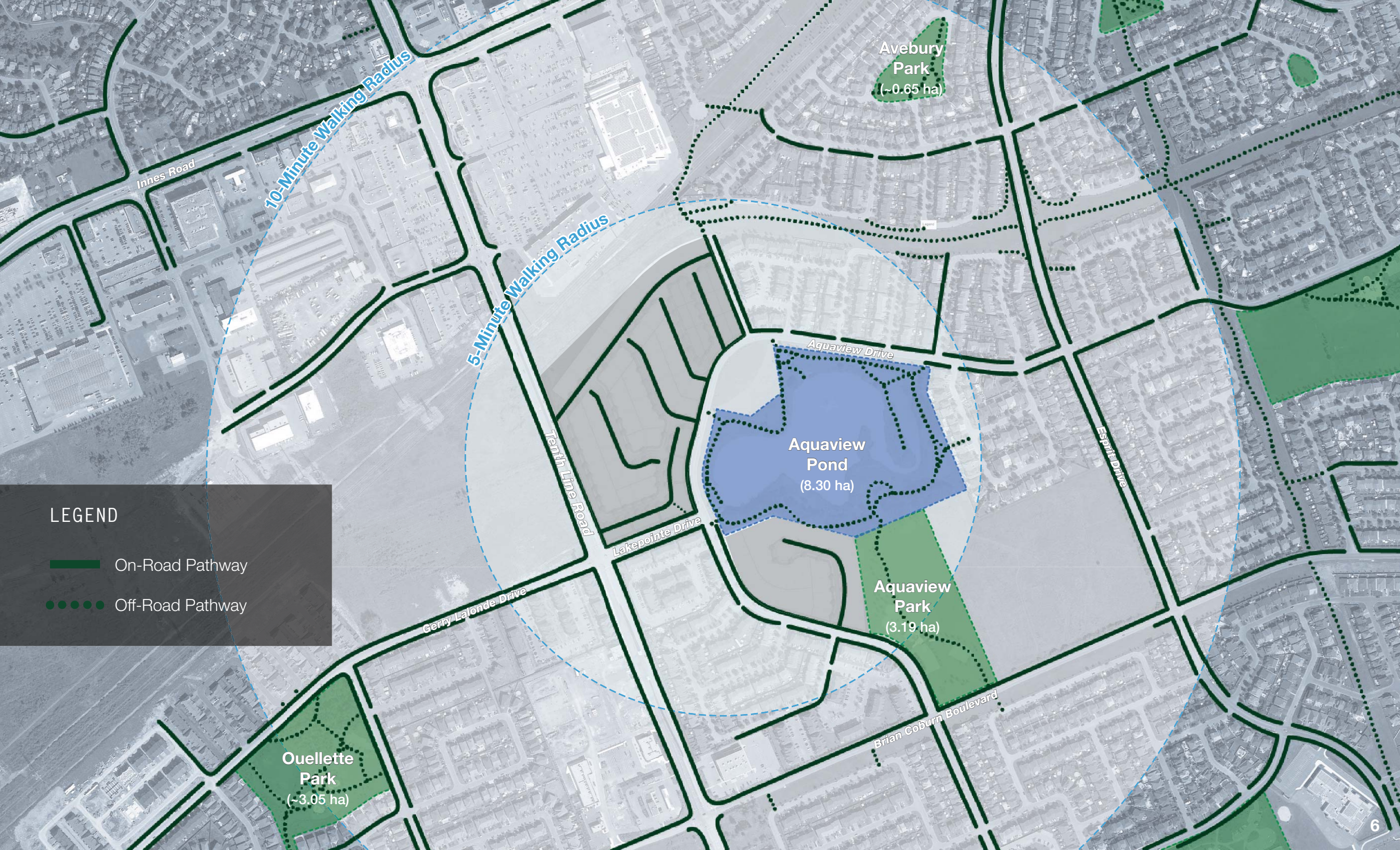
NEIGHBOURHOOD DENSITY

57.03 units / hectare*

* "Net residential density is based on the area of land in exclusively residential use, including lanes and parking areas internal to developments but excluding public streets, rights-of-way and all non-residential uses." (Official Plan, Volume 1 - Official Plan, Section 2 Strategic Directions, 18)

The background consists of a grid of squares. The squares are arranged in a pattern that is roughly rectangular, with some squares missing or faded towards the edges. The colors of the squares range from light gray to a medium blue. The text 'OPEN SPACE CONNECTIVITY' is centered horizontally and vertically. The letter 'O' is a light blue color, while the other letters are a dark gray color.

OPEN SPACE CONNECTIVITY



LEGEND

- On-Road Pathway
- Off-Road Pathway



PARKLAND DEDICATION ANALYSIS



NEIGHBOURHOOD 2 SUMMARY

Total Unit Count	1290
Parks Within a 5-Minute Walk	1
Parks Within a 10-Minute Walk	2

PARKLAND DEDICATION STATISTICS

Required Parkland Dedication for Neighbourhood 2	4.30 ha*
Current Park Area	3.19 ha
Park Area Required to Fulfill Parkland Dedication Requirements	1.11 ha

* **Required Parkland Dedication Formula:**
Total Unit Count (1,290) ÷ One Hectare of Parkland for Every 300 Dwelling Units (300) = 4.30 Hectares
“A maximum of five per cent (5%) of the land area for any other development including residential uses. However, in the case of the development or redevelopment of land for residential purposes, **a municipality may choose to utilize an ‘alternate rate’ that provides up to one hectare of parkland for every 300 dwelling units proposed in the development.** For most new urban development this rate would provide more than five per cent of the developable land area. But, to use this ‘alternative rate’ the City must indicate when it will be used in the Official Plan.” (PARKLAND DEDICATION BY-LAW, Ref N°: ACS2008-ICS-PLA-0242)



PARKLAND DEDICATION ANALYSIS

CASH-IN-LIEU SCENARIO

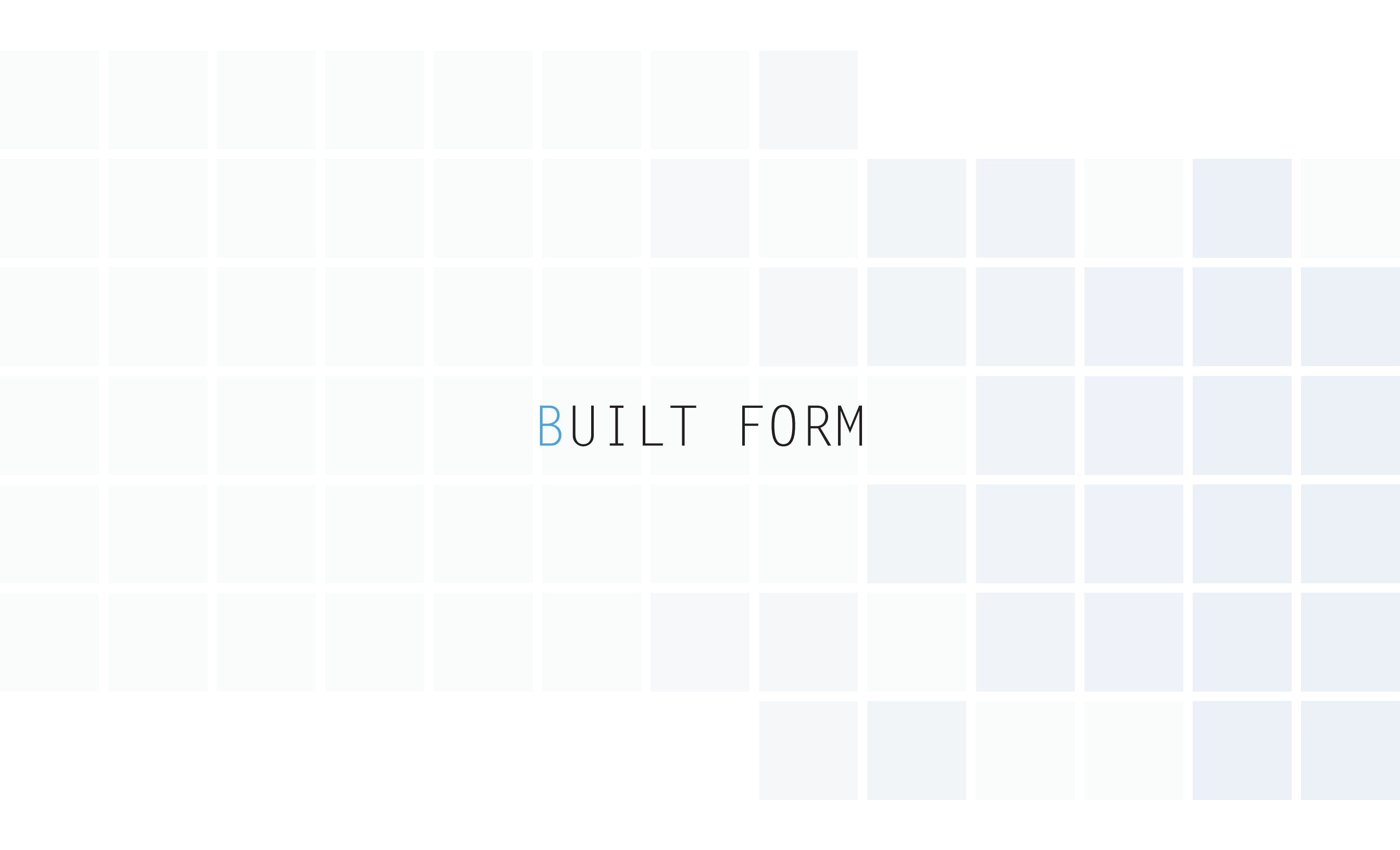
The need for an additional 1.11 ha of dedicated parkland seems repetitive for this neighbourhood as there are already three parks within a 5 to 10-minute walk - as well as a programmed stormwater management (swm) pond area.

Minto is proposing a cash-in-lieu scenario where the collected funds may be put towards equipment upgrades and additions to Aquaview Park and/or Aquaview Pond.

Potential offerings may include:

- ① Upgraded features to the existing playground equipment within Aquaview Pond;
- ② Additional equipment (i.e. fitness pods) along the Aquaview Pond trail; or
- ③ Additional/upgraded features and equipment within Aquaview Park (i.e. splash pad)





BUILT FORM



Single Detached Homes



Executive Front Drive Townhomes

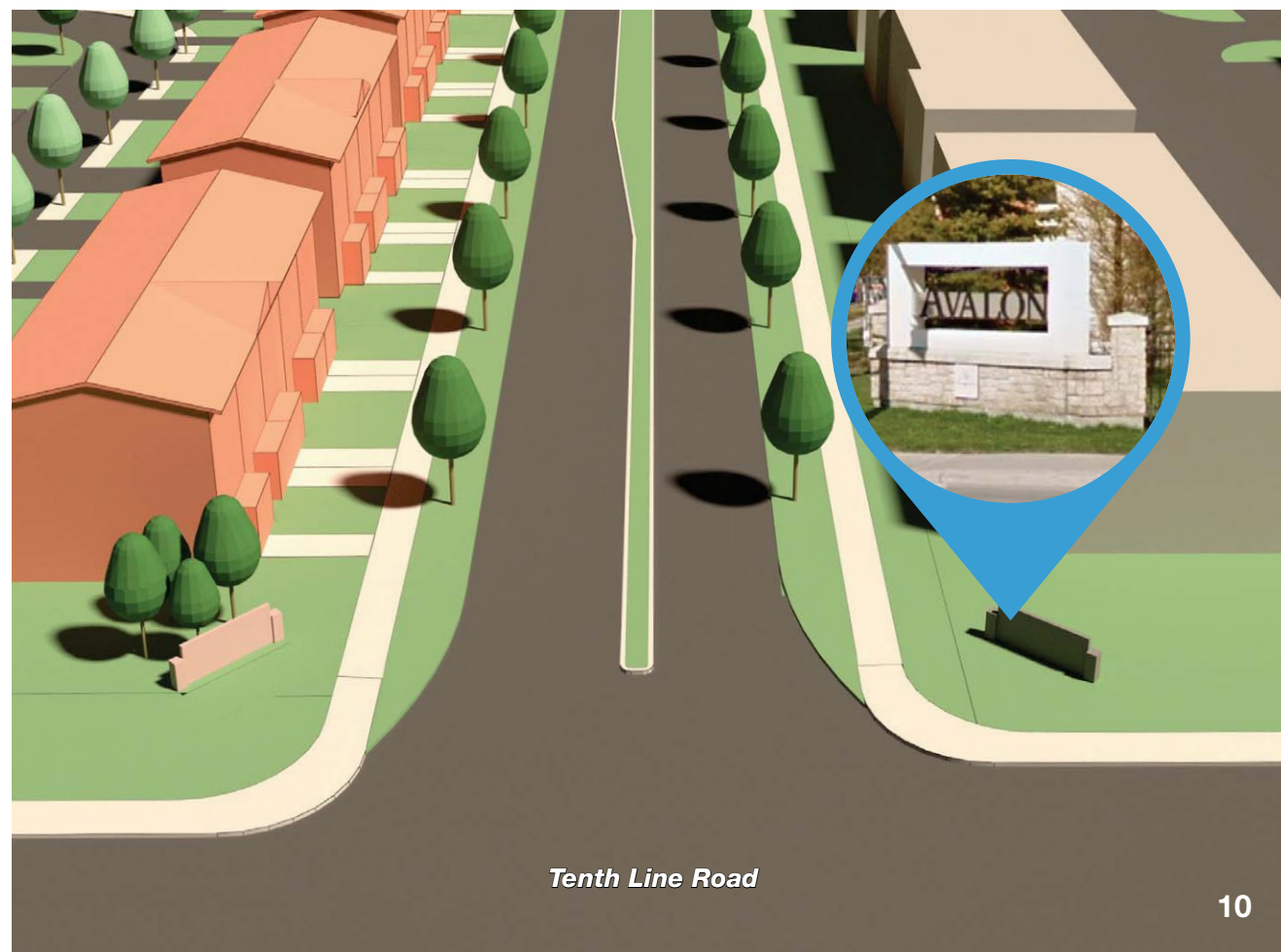
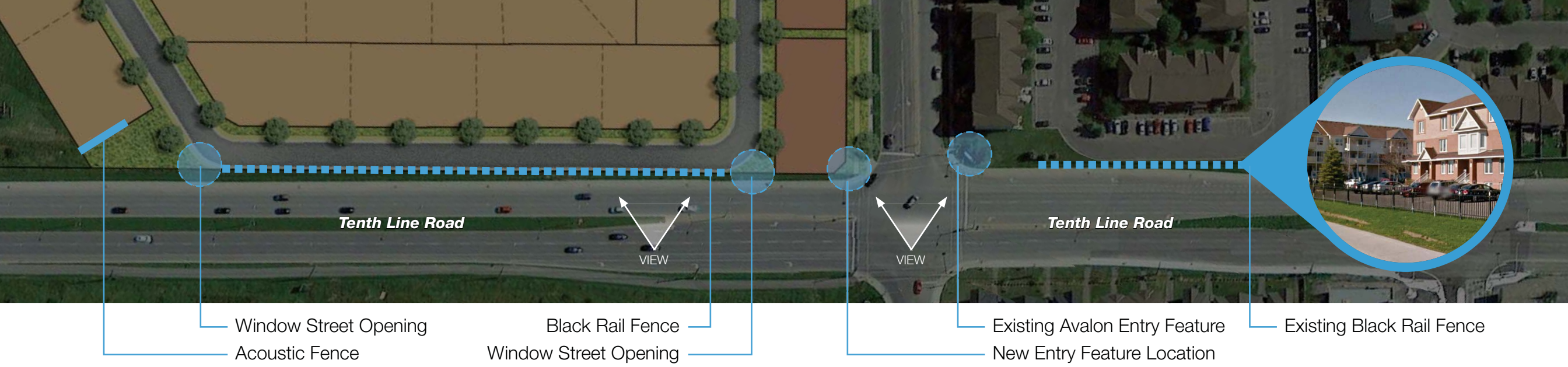


Back-to-Back Townhomes



Rear Lane Townhomes

TENTH LINE INTERFACE



Appendix H

Boundary Street MMLOS Analysis

Multi-Modal Level of Service - Segments Form

Consultant

Scenario

Comments

Minto

Projected Conditions

Project Date

Aquaview

3/28/2018

SEGMENTS		Street A	Tenth Line	Aquaview	Lakepointe	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width	-	≥ 2 m	1.8 m	1.8 m						
	Boulevard Width		0.5 - 2 m	> 2 m	> 2 m						
	Avg Daily Curb Lane Traffic Volume		> 3000	≤ 3000	≤ 3000						
	Operating Speed		> 50 to 60 km/h	> 30 to 50 km/h	> 30 to 50 km/h						
	On-Street Parking		no	yes	no						
	Exposure to Traffic PLoS		D	A	A	-	-	-	-	-	-
	Effective Sidewalk Width										
	Pedestrian Volume										
	Crowding PLoS		-	-	-	-	-	-	-	-	-
Level of Service	-	-	-	-	-	-	-	-	-		
Bicycle	Type of Cycling Facility	A	Physically Separated	Mixed Traffic	Mixed Traffic						
	Number of Travel Lanes			≤ 2 (no centreline)	≤ 2 (no centreline)						
	Operating Speed			≤ 40 km/h	≤ 40 km/h						
	# of Lanes & Operating Speed LoS		-	A	A	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)			< 1.8 m refuge							
	No. of Lanes at Unsignalized Crossing			≤ 3 lanes							
	Sidestreet Operating Speed			≤ 40 km/h							
	Unsignalized Crossing - Lowest LoS		A	A	-	-	-	-	-	-	-
	Level of Service		A	A	-	-	-	-	-	-	-
	Transit		Facility Type	D	Mixed Traffic						
Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8									
Level of Service		D	-		-	-	-	-	-	-	-
Truck	Truck Lane Width	A	> 3.7 m								
	Travel Lanes per Direction		> 1								
	Level of Service		A	-	-	-	-	-	-	-	-

Appendix I

Synchro Capacity Analysis: Projected Total 2020 Operation

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	3	30	2	15	565	10	83	294	43
Future Volume (vph)	93	3	30	2	15	565	10	83	294	43
Lane Group Flow (vph)	0	127	33	239	17	628	11	92	327	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		17.2	17.2	17.2	60.1	60.1	60.1	60.1	60.1	60.1
Actuated g/C Ratio		0.19	0.19	0.19	0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio		0.79	0.14	0.50	0.03	0.28	0.01	0.19	0.14	0.05
Control Delay		62.6	28.5	7.7	7.5	7.5	0.0	8.8	6.7	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		62.6	28.5	7.7	7.5	7.5	0.0	8.8	6.7	2.7
LOS		E	C	A	A	A	A	A	A	A
Approach Delay		62.6		10.2		7.4			6.7	
Approach LOS		E		B		A			A	
Queue Length 50th (m)		19.7	4.9	0.3	0.9	20.0	0.0	5.2	9.3	0.0
Queue Length 95th (m)		34.7	10.9	16.2	4.1	39.5	0.0	16.3	20.3	4.5
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		250	385	620	655	2257	998	486	2257	997
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.51	0.09	0.39	0.03	0.28	0.01	0.19	0.14	0.05

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 12.3

Intersection LOS: B

Intersection Capacity Utilization 72.7%

ICU Level of Service C

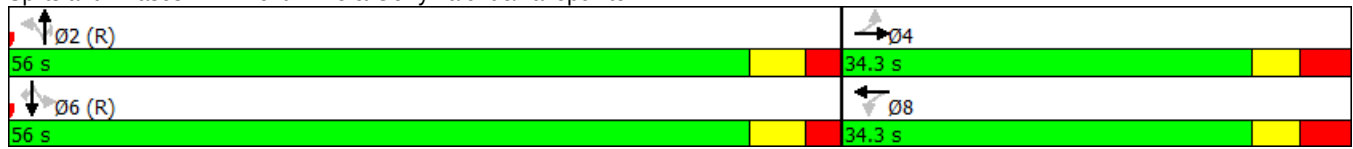
Analysis Period (min) 15

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/28/2018

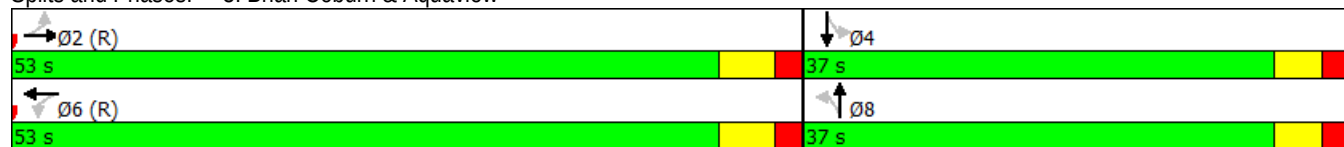
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	14	153	24	529	137	43	11	9
Future Volume (vph)	14	153	24	529	137	43	11	9
Lane Group Flow (vph)	16	209	27	627	0	231	0	81
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.6	30.6	30.6	30.6	32.5	32.5	32.5	32.5
Total Split (s)	53.0	53.0	53.0	53.0	37.0	37.0	37.0	37.0
Total Split (%)	58.9%	58.9%	58.9%	58.9%	41.1%	41.1%	41.1%	41.1%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	47.4	47.4	47.4	47.4		31.5		31.5
Actuated g/C Ratio	0.53	0.53	0.53	0.53		0.35		0.35
v/c Ratio	0.06	0.23	0.05	0.67		0.50		0.14
Control Delay	14.5	14.7	10.7	20.0		26.6		8.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	14.5	14.7	10.7	20.0		26.6		8.9
LOS	B	B	B	B		C		A
Approach Delay		14.7		19.6		26.6		8.9
Approach LOS		B		B		C		A
Queue Length 50th (m)	1.7	21.2	2.1	74.3		29.6		2.5
Queue Length 95th (m)	m5.4	34.0	6.0	111.9		51.4		11.8
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	254	922	589	932		461		559
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.23	0.05	0.67		0.50		0.14
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 59 (66%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 65								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.67								
Intersection Signal Delay: 19.3					Intersection LOS: B			
Intersection Capacity Utilization 63.4%					ICU Level of Service B			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/28/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/28/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	62	134	41	398	221	165	355	78	253
Future Volume (vph)	62	134	41	398	221	165	355	78	253
Lane Group Flow (vph)	69	217	46	442	246	183	411	87	394
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	28.5	28.5	28.5	28.5	28.5	49.1	49.1	49.1	49.1
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.55	0.55	0.55	0.55
v/c Ratio	0.46	0.39	0.14	0.78	0.38	0.36	0.22	0.18	0.22
Control Delay	33.5	21.3	13.9	27.3	2.2	16.1	11.9	13.5	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	21.3	13.9	27.3	2.2	16.1	11.9	13.5	9.4
LOS	C	C	B	C	A	B	B	B	A
Approach Delay		24.2		18.1			13.2		10.1
Approach LOS		C		B			B		B
Queue Length 50th (m)	9.3	24.3	3.1	56.2	1.2	17.2	18.3	7.3	13.3
Queue Length 95th (m)	20.4	38.1	m4.5	68.1	m3.4	37.9	30.9	18.0	24.5
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	186	690	407	705	738	503	1840	495	1798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.31	0.11	0.63	0.33	0.36	0.22	0.18	0.22

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 43 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 15.7

Intersection LOS: B

Intersection Capacity Utilization 79.9%

ICU Level of Service D

Analysis Period (min) 15

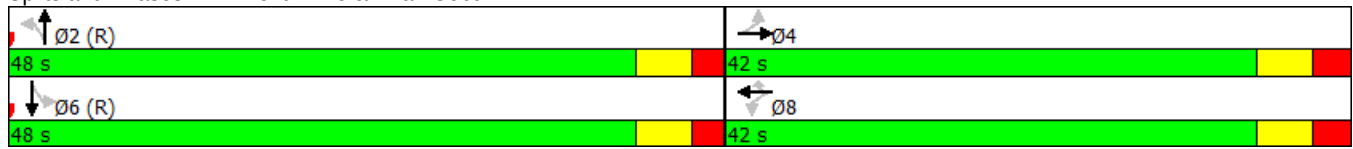
m Volume for 95th percentile queue is metered by upstream signal.

Timings

4: Tenth Line & Brian Coburn

03/28/2018

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	62	20	57	27	192	732	54	36	321	33
Future Volume (vph)	62	20	57	27	192	732	54	36	321	33
Lane Group Flow (vph)	69	56	63	36	213	813	60	40	357	37
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	28.0	28.0	28.0	28.0	82.0	82.0	82.0	82.0	82.0	82.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	74.5%	74.5%	74.5%	74.5%	74.5%	74.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.1	13.1	13.1	13.1	89.4	89.4	89.4	89.4	89.4	89.4
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.45	0.25	0.41	0.17	0.28	0.29	0.05	0.08	0.13	0.03
Control Delay	52.9	23.6	51.9	37.8	5.1	4.0	1.3	4.4	3.4	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	23.6	51.9	37.8	5.1	4.0	1.3	4.4	3.4	1.5
LOS	D	C	D	D	A	A	A	A	A	A
Approach Delay		39.8		46.8		4.1			3.3	
Approach LOS		D		D		A			A	
Queue Length 50th (m)	14.3	4.4	13.0	6.0	9.9	20.2	0.0	1.5	7.5	0.0
Queue Length 95th (m)	25.7	14.6	24.1	14.1	26.8	40.7	3.6	6.0	16.7	2.8
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	260	347	255	350	770	2756	1203	490	2756	1190
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.16	0.25	0.10	0.28	0.29	0.05	0.08	0.13	0.03

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 8.9

Intersection LOS: A

Intersection Capacity Utilization 57.3%

ICU Level of Service B

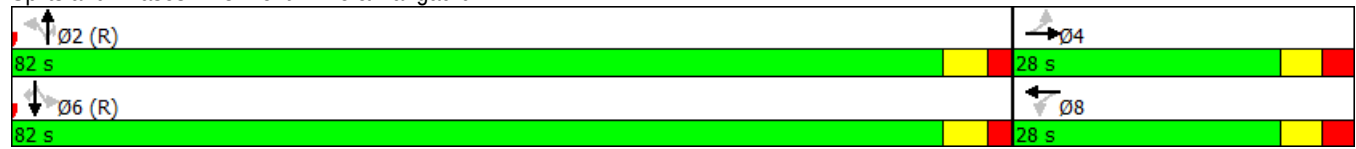
Analysis Period (min) 15

Timings

8: Tenth Line & Vangaurd

03/28/2018

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

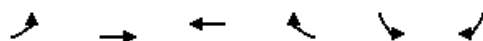
03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	54	38	201	24	24	215
Future Volume (vph)	54	38	201	24	24	215
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	60	42	223	27	27	239
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	102	250	266			
Volume Left (vph)	60	223	0			
Volume Right (vph)	42	0	239			
Hadj (s)	-0.10	0.21	-0.51			
Departure Headway (s)	4.9	4.6	3.9			
Degree Utilization, x	0.14	0.32	0.29			
Capacity (veh/h)	664	751	874			
Control Delay (s)	8.7	9.8	8.6			
Approach Delay (s)	8.7	9.8	8.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			9.1			
Level of Service			A			
Intersection Capacity Utilization			44.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

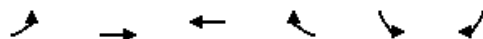


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰		↰	
Traffic Volume (veh/h)	0	0	0	19	7	0
Future Volume (Veh/h)	0	0	0	19	7	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	21	8	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	21				10	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21				10	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1595				1009	1071
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	21	8			
Volume Left	0	0	8			
Volume Right	0	21	0			
cSH	1700	1700	1009			
Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	8.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	11	7	6	12	24
Future Volume (Veh/h)	14	11	7	6	12	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	12	8	7	13	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	15				56	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	15				56	12
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1603				943	1069
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	28	15	40			
Volume Left	16	0	13			
Volume Right	0	7	27			
cSH	1603	1700	1025			
Volume to Capacity	0.01	0.01	0.04			
Queue Length 95th (m)	0.2	0.0	0.9			
Control Delay (s)	4.2	0.0	8.7			
Lane LOS	A		A			
Approach Delay (s)	4.2	0.0	8.7			
Approach LOS			A			
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			18.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	0	0	0	0	47
Future Volume (Veh/h)	27	0	0	0	0	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	30	0	0	0	0	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	26	26	52			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	26	26	52			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	989	1050	1554			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	30	0	52			
Volume Left	30	0	0			
Volume Right	0	0	52			
cSH	989	1700	1700			
Volume to Capacity	0.03	0.00	0.03			
Queue Length 95th (m)	0.7	0.0	0.0			
Control Delay (s)	8.8	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.8	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	52	12	13	93	64	16	99	16	44	68	37
Future Volume (vph)	43	52	12	13	93	64	16	99	16	44	68	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	48	58	13	14	103	71	18	110	18	49	76	41
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	119	188	146	166								
Volume Left (vph)	48	14	18	49								
Volume Right (vph)	13	71	18	41								
Hadj (s)	0.05	-0.18	-0.02	-0.06								
Departure Headway (s)	5.0	4.7	4.9	4.8								
Degree Utilization, x	0.16	0.24	0.20	0.22								
Capacity (veh/h)	665	717	688	695								
Control Delay (s)	9.0	9.2	9.1	9.2								
Approach Delay (s)	9.0	9.2	9.1	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.1								
Level of Service				A								
Intersection Capacity Utilization				41.7%	ICU Level of Service	A						
Analysis Period (min)				15								

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	76	10	22	13	13	629	57	278	754	73
Future Volume (vph)	76	10	22	13	13	629	57	278	754	73
Lane Group Flow (vph)	0	108	24	241	14	699	63	309	838	81
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		16.1	16.1	16.1	61.2	61.2	61.2	61.2	61.2	61.2
Actuated g/C Ratio		0.18	0.18	0.18	0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio		0.74	0.10	0.55	0.04	0.30	0.06	0.68	0.36	0.08
Control Delay		60.4	28.5	11.6	7.5	7.3	2.4	21.2	7.7	2.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		60.4	28.5	11.6	7.5	7.3	2.4	21.2	7.7	2.2
LOS		E	C	B	A	A	A	C	A	A
Approach Delay		60.4		13.1		6.9			10.8	
Approach LOS		E		B		A			B	
Queue Length 50th (m)		17.0	3.6	5.5	0.7	21.1	0.0	26.0	26.6	0.0
Queue Length 95th (m)		29.8	8.7	21.6	3.8	44.6	5.1	#93.2	55.5	5.8
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		242	394	602	385	2297	1021	456	2297	1024
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.45	0.06	0.40	0.04	0.30	0.06	0.68	0.36	0.08

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 12.0

Intersection LOS: B

Intersection Capacity Utilization 81.5%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

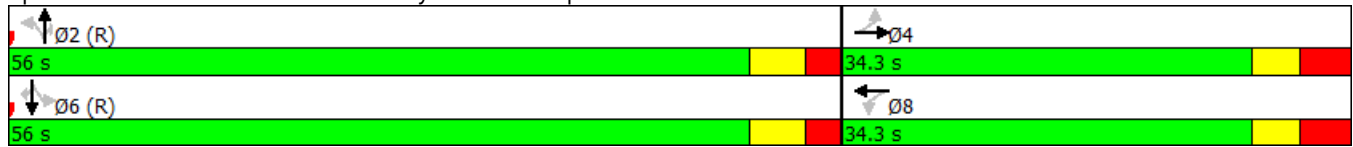
Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/28/2018

Queue shown is maximum after two cycles.

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/28/2018

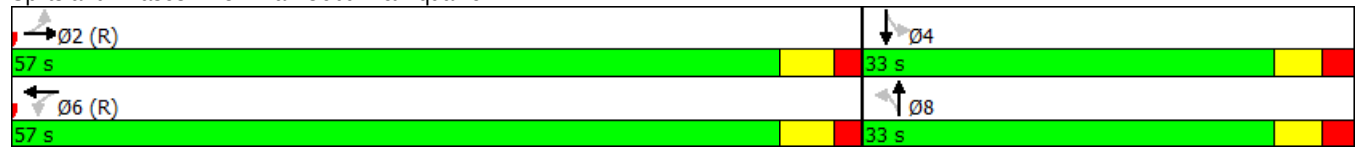
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	71	475	40	377	82	26	40	32
Future Volume (vph)	71	475	40	377	82	26	40	32
Lane Group Flow (vph)	79	635	44	453	0	147	0	112
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	32.9	32.9	30.6	30.6	32.5	32.5	32.5	32.5
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	51.4	51.4	51.4	51.4		27.5		27.5
Actuated g/C Ratio	0.57	0.57	0.57	0.57		0.31		0.31
v/c Ratio	0.18	0.64	0.15	0.45		0.36		0.25
Control Delay	9.2	12.8	10.6	12.7		25.1		20.3
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	9.2	12.8	10.6	12.7		25.1		20.3
LOS	A	B	B	B		C		C
Approach Delay		12.4		12.5		25.1		20.3
Approach LOS		B		B		C		C
Queue Length 50th (m)	5.9	52.7	3.3	41.2		17.8		11.3
Queue Length 95th (m)	m7.3	m73.8	8.7	62.8		34.0		24.2
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	431	997	300	1008		413		450
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.18	0.64	0.15	0.45		0.36		0.25
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 70								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.64								
Intersection Signal Delay: 14.3					Intersection LOS: B			
Intersection Capacity Utilization 77.3%					ICU Level of Service D			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/28/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/28/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	184	362	30	222	187	87	440	232	496
Future Volume (vph)	184	362	30	222	187	87	440	232	496
Lane Group Flow (vph)	204	603	33	247	208	97	538	258	635
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	34.0	43.6	43.6	43.6	43.6
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.48	0.48	0.48	0.48
v/c Ratio	0.54	0.92	0.31	0.37	0.30	0.31	0.33	0.71	0.39
Control Delay	27.7	45.8	42.1	34.9	14.2	18.3	14.9	32.2	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	45.8	42.1	34.9	14.2	18.3	14.9	32.2	15.4
LOS	C	D	D	C	B	B	B	C	B
Approach Delay		41.2		26.5			15.4		20.3
Approach LOS		D		C			B		C
Queue Length 50th (m)	26.2	90.0	4.7	38.6	8.1	10.1	28.9	34.8	35.0
Queue Length 95th (m)	47.7	#152.5	m13.8	63.1	24.4	21.9	40.3	#75.3	48.0
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	395	687	110	705	716	317	1623	364	1616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.88	0.30	0.35	0.29	0.31	0.33	0.71	0.39

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 35 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 26.2

Intersection LOS: C

Intersection Capacity Utilization 93.5%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Timings

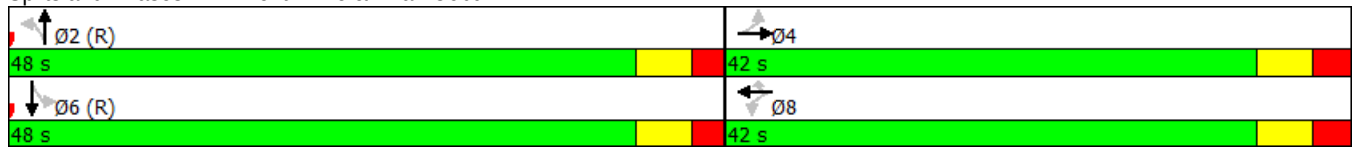
4: Tenth Line & Brian Coburn

03/28/2018

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/28/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	166	95	115	85	106	773	44	25	1024	43
Future Volume (vph)	166	95	115	85	106	773	44	25	1024	43
Lane Group Flow (vph)	184	262	128	272	118	859	49	28	1138	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	36.0	36.0	36.0	36.0	84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.9	29.9	29.9	29.9	78.2	78.2	78.2	78.2	78.2	78.2
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.65	0.65	0.65	0.65	0.65	0.65
v/c Ratio	1.05	0.58	0.70	0.60	0.50	0.39	0.05	0.08	0.52	0.05
Control Delay	126.7	36.3	62.7	34.6	20.1	10.4	2.2	8.5	12.0	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.7	36.3	62.7	34.6	20.1	10.4	2.2	8.5	12.0	2.2
LOS	F	D	E	C	C	B	A	A	B	A
Approach Delay		73.6		43.5		11.1			11.5	
Approach LOS		E		D		B			B	
Queue Length 50th (m)	~47.2	42.1	27.5	40.8	13.3	45.7	0.0	2.2	68.2	0.0
Queue Length 95th (m)	#91.8	69.7	#56.5	69.4	31.8	57.3	4.1	5.9	83.7	4.0
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	175	449	183	453	234	2209	960	340	2209	980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.58	0.70	0.60	0.50	0.39	0.05	0.08	0.52	0.05

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 24.5

Intersection LOS: C

Intersection Capacity Utilization 83.3%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Timings

8: Tenth Line & Vangaurd

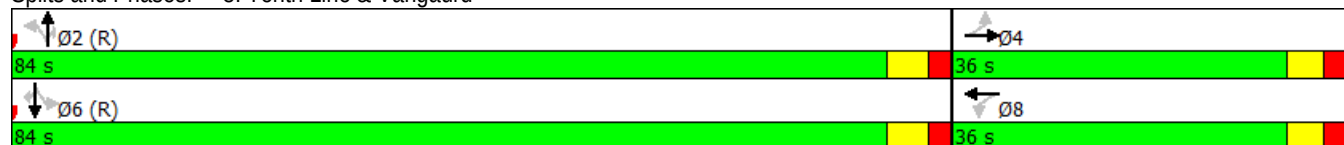
03/28/2018

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

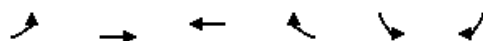
03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	272	243	86	32	22	176
Future Volume (vph)	272	243	86	32	22	176
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	302	270	96	36	24	196
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	572	132	220			
Volume Left (vph)	302	96	0			
Volume Right (vph)	270	0	196			
Hadj (s)	-0.14	0.18	-0.50			
Departure Headway (s)	4.7	5.9	5.1			
Degree Utilization, x	0.75	0.22	0.31			
Capacity (veh/h)	742	544	642			
Control Delay (s)	20.5	10.5	10.4			
Approach Delay (s)	20.5	10.5	10.4			
Approach LOS	C	B	B			
Intersection Summary						
Delay			16.7			
Level of Service			C			
Intersection Capacity Utilization			61.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

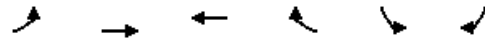


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	13	20	0
Future Volume (Veh/h)	0	0	0	13	20	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	14	22	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	14				7	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14				7	7
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1604				1014	1075
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	14	22			
Volume Left	0	0	22			
Volume Right	0	14	0			
cSH	1700	1700	1014			
Volume to Capacity	0.00	0.01	0.02			
Queue Length 95th (m)	0.0	0.0	0.5			
Control Delay (s)	0.0	0.0	8.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	11	13	12	12	23
Future Volume (Veh/h)	26	11	13	12	12	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	12	14	13	13	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	27				90	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27				90	20
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1587				893	1057
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	41	27	39			
Volume Left	29	0	13			
Volume Right	0	13	26			
cSH	1587	1700	996			
Volume to Capacity	0.02	0.02	0.04			
Queue Length 95th (m)	0.4	0.0	0.9			
Control Delay (s)	5.2	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	5.2	0.0	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	52	0	0	0	0	46
Future Volume (Veh/h)	52	0	0	0	0	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	58	0	0	0	0	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	26	26	51			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	26	26	51			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	100	100			
cM capacity (veh/h)	990	1050	1555			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	58	0	51			
Volume Left	58	0	0			
Volume Right	0	0	51			
cSH	990	1700	1700			
Volume to Capacity	0.06	0.00	0.03			
Queue Length 95th (m)	1.4	0.0	0.0			
Control Delay (s)	8.9	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.9	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	71	90	20	8	49	34	18	82	13	51	89	39
Future Volume (vph)	71	90	20	8	49	34	18	82	13	51	89	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	79	100	22	9	54	38	20	91	14	57	99	43
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	201	101	125	199								
Volume Left (vph)	79	9	20	57								
Volume Right (vph)	22	38	14	43								
Hadj (s)	0.05	-0.17	0.00	-0.04								
Departure Headway (s)	4.9	4.8	4.9	4.8								
Degree Utilization, x	0.27	0.14	0.17	0.27								
Capacity (veh/h)	686	680	675	701								
Control Delay (s)	9.7	8.6	8.9	9.5								
Approach Delay (s)	9.7	8.6	8.9	9.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.3								
Level of Service				A								
Intersection Capacity Utilization				41.2%	ICU Level of Service	A						
Analysis Period (min)				15								

Appendix J

Synchro Capacity Analysis: Projected Total 2025 Operation

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/29/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	3	30	2	15	594	10	83	309	43
Future Volume (vph)	93	3	30	2	15	594	10	83	309	43
Lane Group Flow (vph)	0	127	33	239	17	660	11	92	343	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		17.2	17.2	17.2	60.1	60.1	60.1	60.1	60.1	60.1
Actuated g/C Ratio		0.19	0.19	0.19	0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio		0.79	0.14	0.51	0.03	0.29	0.01	0.20	0.15	0.05
Control Delay		62.6	28.5	8.7	7.5	7.6	0.0	8.9	6.8	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		62.6	28.5	8.7	7.5	7.6	0.0	8.9	6.8	2.7
LOS		E	C	A	A	A	A	A	A	A
Approach Delay		62.6		11.1		7.5			6.8	
Approach LOS		E		B		A			A	
Queue Length 50th (m)		19.7	4.9	1.9	0.9	21.2	0.0	5.2	9.8	0.0
Queue Length 95th (m)		34.7	10.9	17.8	4.1	41.8	0.0	16.5	21.2	4.5
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		250	385	612	645	2257	998	466	2257	997
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.51	0.09	0.39	0.03	0.29	0.01	0.20	0.15	0.05

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 12.3

Intersection LOS: B

Intersection Capacity Utilization 72.7%

ICU Level of Service C

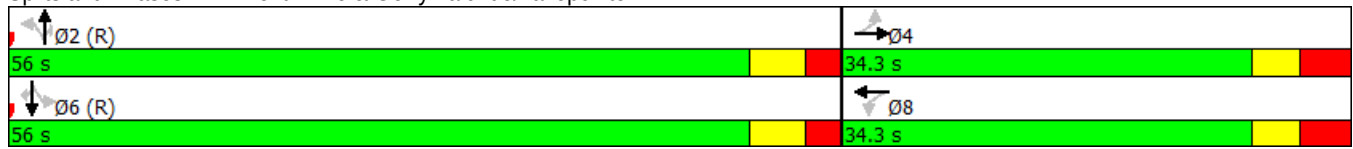
Analysis Period (min) 15

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/29/2018

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/29/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	14	161	24	556	137	43	11	9
Future Volume (vph)	14	161	24	556	137	43	11	9
Lane Group Flow (vph)	16	218	27	657	0	231	0	81
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	29.9	29.9	29.9	29.9	32.5	32.5	32.5	32.5
Total Split (s)	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.2	1.2	1.2	1.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.9	4.9	4.9	4.9		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	49.1	49.1	49.1	49.1		30.5		30.5
Actuated g/C Ratio	0.55	0.55	0.55	0.55		0.34		0.34
v/c Ratio	0.06	0.23	0.05	0.68		0.52		0.15
Control Delay	14.1	14.2	9.9	19.2		27.9		9.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	14.1	14.2	9.9	19.2		27.9		9.2
LOS	B	B	A	B		C		A
Approach Delay		14.2		18.8		27.9		9.2
Approach LOS		B		B		C		A
Queue Length 50th (m)	1.7	22.5	2.0	76.4		30.4		2.5
Queue Length 95th (m)	m5.3	35.7	5.8	115.2		52.6		12.0
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	250	955	596	965		446		543
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.23	0.05	0.68		0.52		0.15
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 58 (64%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 65								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.68								
Intersection Signal Delay: 19.0					Intersection LOS: B			
Intersection Capacity Utilization 64.3%					ICU Level of Service C			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/29/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/29/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	62	141	41	418	221	165	373	78	266
Future Volume (vph)	62	141	41	418	221	165	373	78	266
Lane Group Flow (vph)	69	225	46	464	246	183	431	87	409
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.3	29.3	29.3	29.3	29.3	48.3	48.3	48.3	48.3
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.54	0.54	0.54	0.54
v/c Ratio	0.48	0.39	0.14	0.80	0.38	0.37	0.24	0.18	0.23
Control Delay	34.6	21.2	13.6	28.1	2.1	16.7	12.4	14.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	21.2	13.6	28.1	2.1	16.7	12.4	14.0	10.0
LOS	C	C	B	C	A	B	B	B	A
Approach Delay		24.3		18.8			13.7		10.7
Approach LOS		C		B			B		B
Queue Length 50th (m)	9.3	25.2	3.0	62.0	1.0	17.8	19.8	7.5	14.7
Queue Length 95th (m)	21.0	39.7	m4.5	76.0	m3.0	38.1	32.4	18.1	26.1
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	174	691	402	705	738	489	1810	477	1772
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.33	0.11	0.66	0.33	0.37	0.24	0.18	0.23

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 43 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 81.0%

ICU Level of Service D

Analysis Period (min) 15

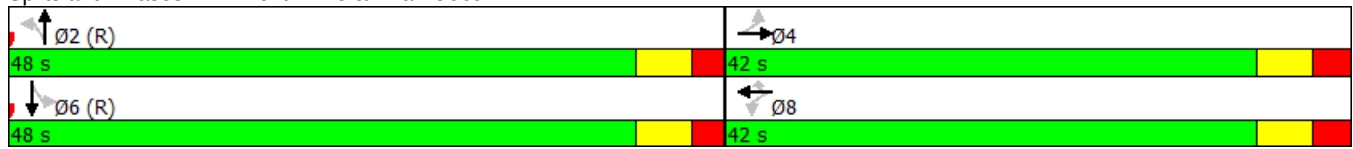
m Volume for 95th percentile queue is metered by upstream signal.

Timings

4: Tenth Line & Brian Coburn

03/29/2018

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/29/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	62	20	57	27	192	766	54	36	335	33
Future Volume (vph)	62	20	57	27	192	766	54	36	335	33
Lane Group Flow (vph)	69	56	63	36	213	851	60	40	372	37
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	28.0	28.0	28.0	28.0	82.0	82.0	82.0	82.0	82.0	82.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	74.5%	74.5%	74.5%	74.5%	74.5%	74.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.1	13.1	13.1	13.1	89.4	89.4	89.4	89.4	89.4	89.4
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.45	0.25	0.41	0.17	0.28	0.31	0.05	0.09	0.13	0.03
Control Delay	52.9	23.6	51.9	37.8	5.2	4.1	1.3	4.4	3.4	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	23.6	51.9	37.8	5.2	4.1	1.3	4.4	3.4	1.5
LOS	D	C	D	D	A	A	A	A	A	A
Approach Delay		39.8		46.8		4.2			3.3	
Approach LOS		D		D		A			A	
Queue Length 50th (m)	14.3	4.4	13.0	6.0	9.9	21.5	0.0	1.6	7.8	0.0
Queue Length 95th (m)	25.7	14.6	24.1	14.1	27.0	43.2	3.6	6.1	17.5	2.8
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	260	347	255	350	761	2756	1203	470	2756	1190
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.16	0.25	0.10	0.28	0.31	0.05	0.09	0.13	0.03

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 8.8

Intersection LOS: A

Intersection Capacity Utilization 57.3%

ICU Level of Service B

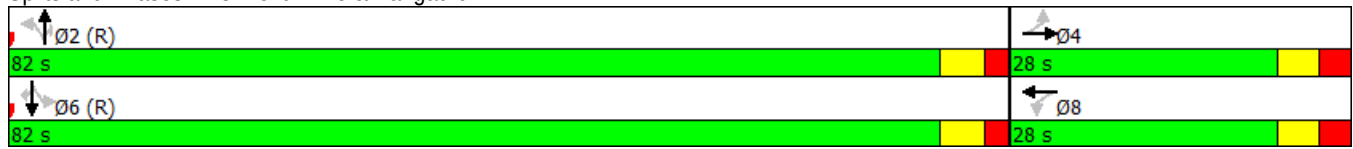
Analysis Period (min) 15

Timings

8: Tenth Line & Vangaurd

03/29/2018

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

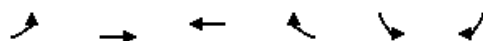
03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	54	38	201	24	24	215
Future Volume (vph)	54	38	201	24	24	215
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	60	42	223	27	27	239
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	102	250	266			
Volume Left (vph)	60	223	0			
Volume Right (vph)	42	0	239			
Hadj (s)	-0.10	0.21	-0.51			
Departure Headway (s)	4.9	4.6	3.9			
Degree Utilization, x	0.14	0.32	0.29			
Capacity (veh/h)	664	751	874			
Control Delay (s)	8.7	9.8	8.6			
Approach Delay (s)	8.7	9.8	8.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			9.1			
Level of Service			A			
Intersection Capacity Utilization			44.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

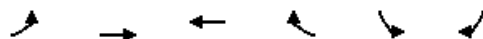


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	19	7	0
Future Volume (Veh/h)	0	0	0	19	7	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	21	8	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	21				10	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21				10	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1595				1009	1071
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	21	8			
Volume Left	0	0	8			
Volume Right	0	21	0			
cSH	1700	1700	1009			
Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	8.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	11	7	6	12	24
Future Volume (Veh/h)	14	11	7	6	12	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	12	8	7	13	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	15				56	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	15				56	12
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1603				943	1069
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	28	15	40			
Volume Left	16	0	13			
Volume Right	0	7	27			
cSH	1603	1700	1025			
Volume to Capacity	0.01	0.01	0.04			
Queue Length 95th (m)	0.2	0.0	0.9			
Control Delay (s)	4.2	0.0	8.7			
Lane LOS	A		A			
Approach Delay (s)	4.2	0.0	8.7			
Approach LOS			A			
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			18.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	0	0	0	0	47
Future Volume (Veh/h)	27	0	0	0	0	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	30	0	0	0	0	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	26	26	52			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	26	26	52			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	989	1050	1554			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	30	0	52			
Volume Left	30	0	0			
Volume Right	0	0	52			
cSH	989	1700	1700			
Volume to Capacity	0.03	0.00	0.03			
Queue Length 95th (m)	0.7	0.0	0.0			
Control Delay (s)	8.8	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.8	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	52	12	13	93	64	16	99	16	44	68	37
Future Volume (vph)	43	52	12	13	93	64	16	99	16	44	68	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	48	58	13	14	103	71	18	110	18	49	76	41
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	119	188	146	166								
Volume Left (vph)	48	14	18	49								
Volume Right (vph)	13	71	18	41								
Hadj (s)	0.05	-0.18	-0.02	-0.06								
Departure Headway (s)	5.0	4.7	4.9	4.8								
Degree Utilization, x	0.16	0.24	0.20	0.22								
Capacity (veh/h)	665	717	688	695								
Control Delay (s)	9.0	9.2	9.1	9.2								
Approach Delay (s)	9.0	9.2	9.1	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.1								
Level of Service				A								
Intersection Capacity Utilization				41.7%	ICU Level of Service	A						
Analysis Period (min)				15								

Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/29/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	76	10	22	13	13	662	57	278	792	73
Future Volume (vph)	76	10	22	13	13	662	57	278	792	73
Lane Group Flow (vph)	0	108	24	241	14	736	63	309	880	81
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (s)	34.3	34.3	34.3	34.3	56.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	3.5	3.5	3.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.8	6.2	6.2	6.2	6.2	6.2	6.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		16.1	16.1	16.1	61.2	61.2	61.2	61.2	61.2	61.2
Actuated g/C Ratio		0.18	0.18	0.18	0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio		0.74	0.10	0.57	0.04	0.32	0.06	0.71	0.38	0.08
Control Delay		60.4	28.5	13.7	7.5	7.4	2.4	23.4	7.9	2.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		60.4	28.5	13.7	7.5	7.4	2.4	23.4	7.9	2.2
LOS		E	C	B	A	A	A	C	A	A
Approach Delay		60.4		15.0		7.0			11.3	
Approach LOS		E		B		A			B	
Queue Length 50th (m)		17.0	3.6	8.3	0.7	22.5	0.0	27.1	28.4	0.0
Queue Length 95th (m)		29.8	8.7	24.7	3.8	47.4	5.1	#96.2	59.1	5.8
Internal Link Dist (m)		184.3		143.8		400.5			469.3	
Turn Bay Length (m)			55.0		65.0		76.0	58.0		80.0
Base Capacity (vph)		242	394	589	364	2297	1021	436	2297	1024
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.45	0.06	0.41	0.04	0.32	0.06	0.71	0.38	0.08

Intersection Summary

Cycle Length: 90.3

Actuated Cycle Length: 90.3

Offset: 61 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 12.4

Intersection LOS: B

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

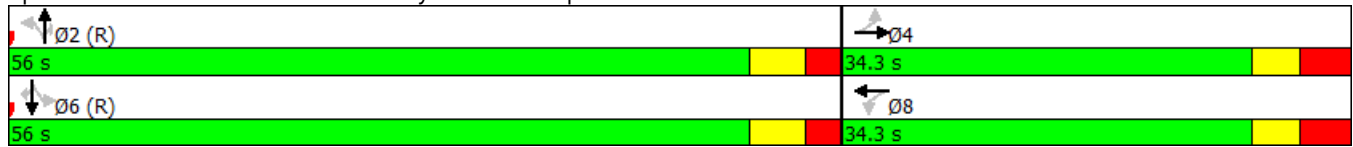
Timings

1: Tenth Line & Gerry Lalonde/Lakepointe

03/29/2018

Queue shown is maximum after two cycles.

Splits and Phases: 1: Tenth Line & Gerry Lalonde/Lakepointe



Timings

3: Brian Coburn & Aquaview

03/29/2018

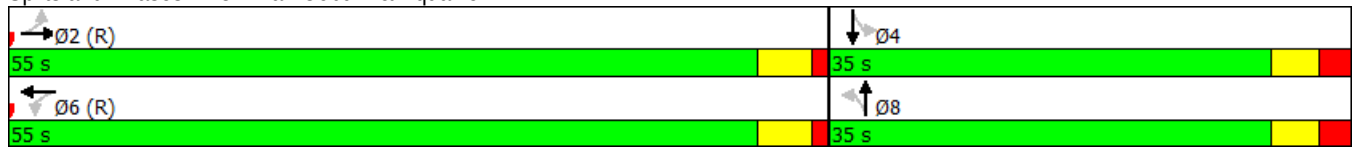
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	71	500	40	397	82	26	40	32
Future Volume (vph)	71	500	40	397	82	26	40	32
Lane Group Flow (vph)	79	663	44	475	0	147	0	112
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	29.9	29.9	29.9	29.9	32.5	32.5	32.5	32.5
Total Split (s)	55.0	55.0	55.0	55.0	35.0	35.0	35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%	61.1%	38.9%	38.9%	38.9%	38.9%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	1.2	1.2	1.2	1.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.9	4.9	4.9	4.9		5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	50.1	50.1	50.1	50.1		29.5		29.5
Actuated g/C Ratio	0.56	0.56	0.56	0.56		0.33		0.33
v/c Ratio	0.20	0.68	0.17	0.48		0.34		0.23
Control Delay	10.6	17.0	11.9	14.0		23.4		18.7
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	10.6	17.0	11.9	14.0		23.4		18.7
LOS	B	B	B	B		C		B
Approach Delay		16.4		13.8		23.4		18.7
Approach LOS		B		B		C		B
Queue Length 50th (m)	7.1	74.9	3.5	45.8		17.2		10.8
Queue Length 95th (m)	m9.4	m106.2	9.4	69.8		32.9		23.2
Internal Link Dist (m)		365.1		178.3		233.4		188.1
Turn Bay Length (m)	58.0		66.0					
Base Capacity (vph)	391	972	259	982		435		483
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.20	0.68	0.17	0.48		0.34		0.23
Intersection Summary								
Cycle Length: 90								
Actuated Cycle Length: 90								
Offset: 47 (52%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green								
Natural Cycle: 65								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.68								
Intersection Signal Delay: 16.3					Intersection LOS: B			
Intersection Capacity Utilization 77.6%					ICU Level of Service D			
Analysis Period (min) 15								
m Volume for 95th percentile queue is metered by upstream signal.								

Timings

3: Brian Coburn & Aquaview

03/29/2018

Splits and Phases: 3: Brian Coburn & Aquaview



Timings

4: Tenth Line & Brian Coburn

03/29/2018

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	184	379	30	232	187	87	462	232	521
Future Volume (vph)	184	379	30	232	187	87	462	232	521
Lane Group Flow (vph)	204	622	33	258	208	97	562	258	663
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.4	31.4	31.4	31.4	31.4	29.0	29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	48.0	48.0	48.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	43.1	43.1	43.1	43.1
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.48	0.48	0.48	0.48
v/c Ratio	0.55	0.93	0.34	0.38	0.30	0.32	0.35	0.74	0.41
Control Delay	27.8	48.1	24.6	16.1	2.7	19.0	15.3	35.4	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	48.1	24.6	16.1	2.7	19.0	15.3	35.4	15.9
LOS	C	D	C	B	A	B	B	D	B
Approach Delay		43.1		11.1			15.8		21.4
Approach LOS		D		B			B		C
Queue Length 50th (m)	26.3	94.6	3.3	28.4	2.3	10.2	30.5	35.6	37.0
Queue Length 95th (m)	48.2	#160.2	m10.8	42.7	3.6	22.2	42.5	#77.7	50.6
Internal Link Dist (m)		392.3		365.1			297.9		400.5
Turn Bay Length (m)	55.0		60.0		51.0	118.0		115.0	
Base Capacity (vph)	386	688	101	705	716	299	1607	347	1601
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.90	0.33	0.37	0.29	0.32	0.35	0.74	0.41

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 35 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 24.5

Intersection LOS: C

Intersection Capacity Utilization 94.4%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Timings

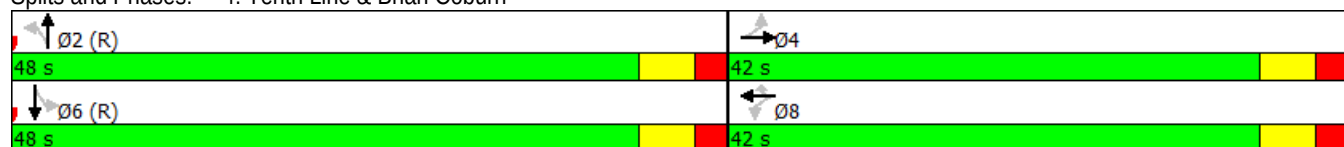
4: Tenth Line & Brian Coburn

03/29/2018

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tenth Line & Brian Coburn



Timings

8: Tenth Line & Vangaurd

03/29/2018

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	166	95	115	85	106	810	44	25	1073	43
Future Volume (vph)	166	95	115	85	106	810	44	25	1073	43
Lane Group Flow (vph)	184	262	128	272	118	900	49	28	1192	48
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.1	27.1	27.1	27.1	30.8	30.8	30.8	30.8	30.8	30.8
Total Split (s)	36.0	36.0	36.0	36.0	84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.9	29.9	29.9	29.9	78.2	78.2	78.2	78.2	78.2	78.2
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.65	0.65	0.65	0.65	0.65	0.65
v/c Ratio	1.05	0.58	0.70	0.60	0.55	0.41	0.05	0.09	0.54	0.05
Control Delay	126.7	36.3	62.7	34.6	23.0	10.6	2.2	8.6	12.4	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.7	36.3	62.7	34.6	23.0	10.6	2.2	8.6	12.4	2.2
LOS	F	D	E	C	C	B	A	A	B	A
Approach Delay		73.6		43.5		11.6			11.9	
Approach LOS		E		D		B			B	
Queue Length 50th (m)	~47.2	42.1	27.5	40.8	13.9	48.8	0.0	2.3	73.1	0.0
Queue Length 95th (m)	#91.8	69.7	#56.5	69.4	35.3	60.7	4.1	6.0	89.6	4.0
Internal Link Dist (m)		115.0		35.1		469.3			231.6	
Turn Bay Length (m)	50.0		20.0		65.0		47.0	166.0		54.0
Base Capacity (vph)	175	449	183	453	216	2209	960	323	2209	980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.58	0.70	0.60	0.55	0.41	0.05	0.09	0.54	0.05

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 24.4

Intersection LOS: C

Intersection Capacity Utilization 84.7%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Timings

8: Tenth Line & Vangaurd

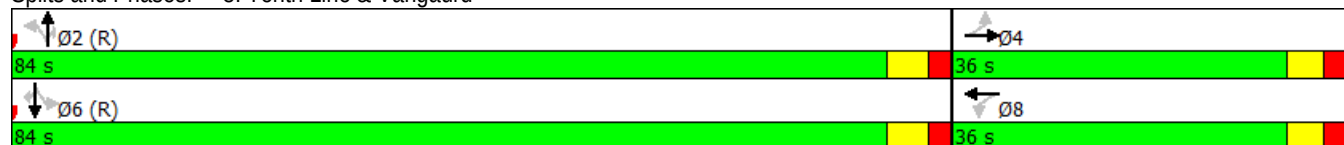
03/29/2018

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Tenth Line & Vangaurd



HCM Unsignalized Intersection Capacity Analysis

2: Aquaview & Lakepointe

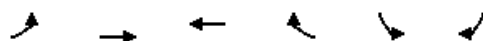
03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	272	243	86	32	22	176
Future Volume (vph)	272	243	86	32	22	176
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	302	270	96	36	24	196
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total (vph)	572	132	220			
Volume Left (vph)	302	96	0			
Volume Right (vph)	270	0	196			
Hadj (s)	-0.14	0.18	-0.50			
Departure Headway (s)	4.7	5.9	5.1			
Degree Utilization, x	0.75	0.22	0.31			
Capacity (veh/h)	742	544	642			
Control Delay (s)	20.5	10.5	10.4			
Approach Delay (s)	20.5	10.5	10.4			
Approach LOS	C	B	B			
Intersection Summary						
Delay			16.7			
Level of Service			C			
Intersection Capacity Utilization			61.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Aquaview & Stage 1 Access

03/28/2018

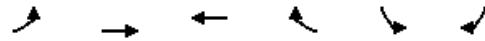


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	0	0	0	13	20	0
Future Volume (Veh/h)	0	0	0	13	20	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	14	22	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			212			
pX, platoon unblocked						
vC, conflicting volume	14				7	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14				7	7
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1604				1014	1075
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	0	14	22			
Volume Left	0	0	22			
Volume Right	0	14	0			
cSH	1700	1700	1014			
Volume to Capacity	0.00	0.01	0.02			
Queue Length 95th (m)	0.0	0.0	0.5			
Control Delay (s)	0.0	0.0	8.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: Aquaview & Stage 2 Access B

03/28/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	11	13	12	12	23
Future Volume (Veh/h)	26	11	13	12	12	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	12	14	13	13	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	27				90	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27				90	20
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1587				893	1057
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	41	27	39			
Volume Left	29	0	13			
Volume Right	0	13	26			
cSH	1587	1700	996			
Volume to Capacity	0.02	0.02	0.04			
Queue Length 95th (m)	0.4	0.0	0.9			
Control Delay (s)	5.2	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	5.2	0.0	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Aquaview & Stage 2 Access A

03/28/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	52	0	0	0	0	46
Future Volume (Veh/h)	52	0	0	0	0	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	58	0	0	0	0	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	26	26	51			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	26	26	51			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	100	100			
cM capacity (veh/h)	990	1050	1555			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	58	0	51			
Volume Left	58	0	0			
Volume Right	0	0	51			
cSH	990	1700	1700			
Volume to Capacity	0.06	0.00	0.03			
Queue Length 95th (m)	1.4	0.0	0.0			
Control Delay (s)	8.9	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.9	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

9: Esprit & Aquaview

03/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	71	90	20	8	49	34	18	82	13	51	89	39
Future Volume (vph)	71	90	20	8	49	34	18	82	13	51	89	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	79	100	22	9	54	38	20	91	14	57	99	43
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	201	101	125	199								
Volume Left (vph)	79	9	20	57								
Volume Right (vph)	22	38	14	43								
Hadj (s)	0.05	-0.17	0.00	-0.04								
Departure Headway (s)	4.9	4.8	4.9	4.8								
Degree Utilization, x	0.27	0.14	0.17	0.27								
Capacity (veh/h)	686	680	675	701								
Control Delay (s)	9.7	8.6	8.9	9.5								
Approach Delay (s)	9.7	8.6	8.9	9.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.3								
Level of Service				A								
Intersection Capacity Utilization				41.2%	ICU Level of Service	A						
Analysis Period (min)				15								