390 Bank Street

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

Prepared for:

Urban Capital Property Group
17 Nelson Street
Toronto, Ontario M5V 0G2

Prepared by:

CGH TRANSPORTATION
13 Markham Avenue
Ottawa, ON K2G 3Z1

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1 Screening

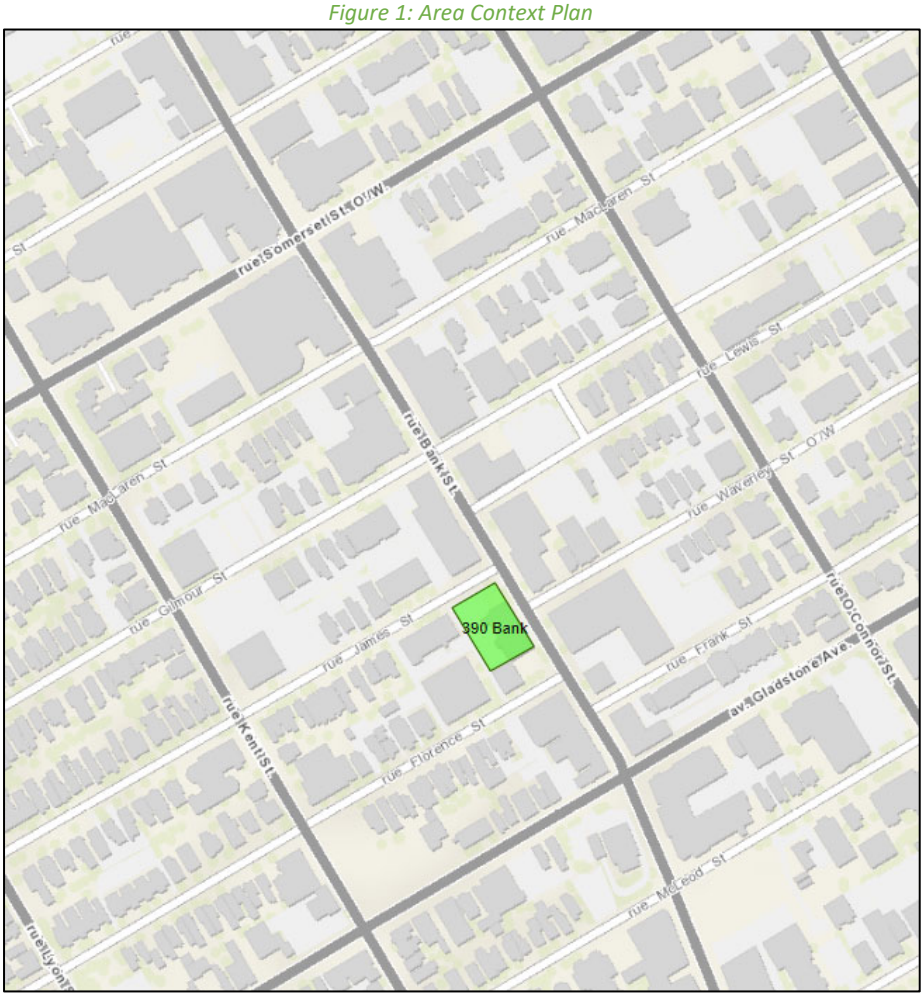
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for TIA Study PM. As shown in the Screening Form, the trip generation, location and safety triggers were met, and a TIA is required. This is a zoning by-law amendment application and only the Network Impact Component will be completed as part of this study.

2 Existing and Planned Conditions

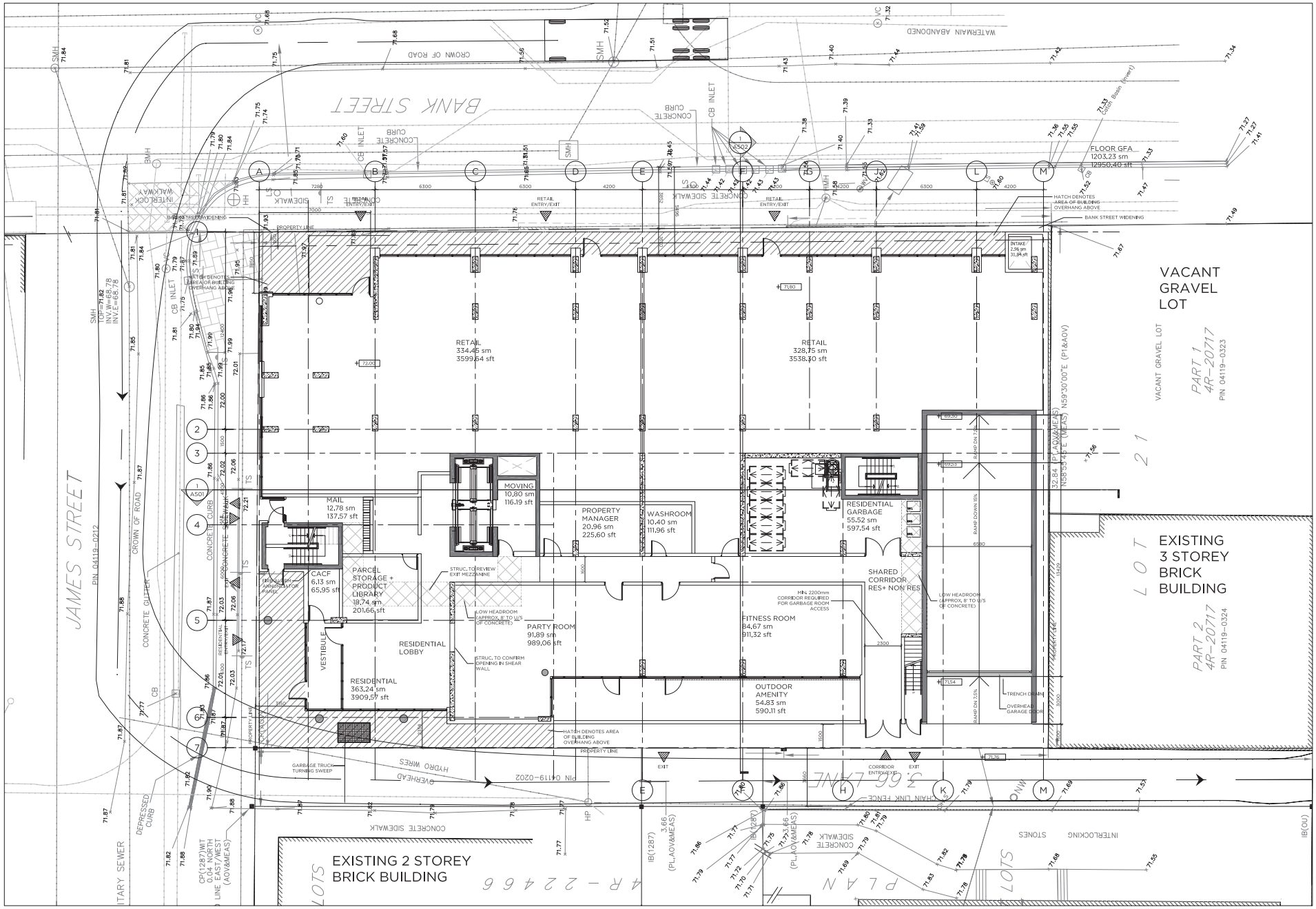
2.1 Proposed Development

The proposed site is located at 390 Bank Street, currently zoned as Traditional Mainstreet (TM), is planned to include a total of 128 apartment units, split between single and two-bedroom units, and approximately 7,100 sq. ft. of ground floor retail space. The proposed parking will be provided underground and accessed off the private laneway. The existing site is the James Street Pub, including approximately eight undefined parking stalls within a gravel lot. The anticipated full build-out and occupancy horizon is 2023. The site is within the Centretown Community Design Plan and Secondary Plan Area, and the Bank Traditional Mainstreet Design Priority Area. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: July 2, 2019



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ISSUED RECORD

2019.xx.xx - ISSUED FOR

REVISION RECORD

RAW
405-317 ADELAIDE STREET WEST
TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

12017

JAMES HOUSE
390 BANK STREET
OTTAWA, ON

URBAN CAPITAL

17 Nelson Street | Toronto | Ontario | M5V 0G2
T. 416.304.0431

GROUND FLOOR PLAN

1:100

A201

2.2 Existing Conditions

2.2.1 Area Road Network

Bank Street: Bank Street is a City of Ottawa arterial road with a two-lane urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on the west side. The posted speed limit is 50 km/h and the City protected right-of-way is 20.0 metres.

Kent Street: Kent Street is a City of Ottawa one-way arterial road (northbound) with a three-lane urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on the west side in laybys and on the east side in the travel lane (no stopping during AM peak). The unposted speed limit is 50 km/h and the City protected right-of-way is 20.0 metres. Kent Street is a truck route.

O'Connor Street: O'Connor Street is a City of Ottawa one-way arterial road (southbound) with a two-lane urban cross-section and sidewalks on both sides of the road. On-street parking is permitted on the west side in laybys, and a two-way cycle track is provided on the east side of the road. The unposted speed limit is 50 km/h and the City protected right-of-way is 20.0 metres. O'Connor Street is a truck route.

Somerset Street: Somerset Street is a City of Ottawa arterial road with a two-lane urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on both sides of the road. Parking on the north side is restricted during the AM peak and the south side is restricted during both peak hours. The unposted speed limit is 50 km/h and the City protected right-of-way is 20.0 metres. Somerset Street is a truck route.

Gilmour Street: Gilmour Street is a City of Ottawa one-way local road (eastbound) with an urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on the south side to the west of Bank Street and north side of the road to the east side of Bank Street. The unposted speed limit is 50 km/h and the existing right-of-way is 18.0 metres.

MacLaren Street: MacLaren Street is a City of Ottawa one-way local road (westbound) with an urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on the north side to the west of Bank Street and both sides of the road to the east side of Bank Street. The unposted speed limit is 50 km/h and the existing right-of-way is 18.0 metres.

James Street: James Street is a City of Ottawa one-way local road (westbound) with an urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on the south side and angled parking is located adjacent to Bank Street. The unposted speed limit is 50 km/h and the existing right-of-way is 18.0 metres.

Gladstone Avenue: Gladstone Avenue is a City of Ottawa major collector road with a two-lane urban cross-section east of Bank Street and a four-lane cross-section to the west. On-street parking is permitted along both sides of the roadway, with the parking laybys to the east of Bank Street and parking within the curbside lane to the west of Bank Street (off-peak only). Sidewalks are provided on both sides of the road and the unposted speed limit is 50 km/h. The existing right-of-way is approximately 18.0 metres, although it varies slightly at different properties. Gladstone Avenue is a truck route.

2.2.2 Existing Intersections

The existing area intersections adjacent to the proposed site and additional signalized intersections within 400 metres of the site have been summarized below:

Kent Street & Somerset Street	The intersection of Kent Street and Somerset Street is a signalized intersection. The northbound approach consists of a left-turn, two through lanes, and a shared through/right, the eastbound approach

consists of a left-turn lane and shared through, and the westbound approach consists of a shared through/right-turn lane. No turn restrictions are noted.

Kent Street & Gilmour Street — The intersection of Kent Street and Gilmour Street is a signalized intersection. The northbound approach consists of two through lanes and a shared through/right, and the eastbound approach consists of a shared left-turn/through. No turn restrictions are noted.

Kent Street & James Street — The intersection of Kent Street and James Street is an unsignalized intersection. The northbound approach consists of a shared left-turn/through lane and two through lanes, and the westbound approach consists of a shared through/right-lane. No turn restrictions are noted.

Kent Street & Gladstone Avenue — The intersection of Kent Street and Gladstone Avenue is a signalized intersection. The northbound approach consists of a left-turn, two through lanes, and a shared through/right, the eastbound approach consists of a left-turn lane and shared through, and the westbound approach consists of a shared through/right-turn lane. No turn restrictions are noted.

Bank Street & Somerset Street — The intersection of Bank Street and Somerset Street is a signalized intersection. The northbound approach consists of a shared all movement lane , the southbound approach consists of a shared through/right-turn lane, the eastbound approach consists of a left-turn lane and shared through/right-turn lane, and the westbound approach consists of a shared left-turn/through lane and a right-turn lane. No southbound left-turns are permitted, and the northbound left-turn is prohibited during the peak hours, buses excepted.

Bank Street & MacLaren Street — The intersection of Bank Street and MacLaren Street is a signalized intersection. The northbound approach consists of a shared left-turn/through, the southbound approach consists of a shared through/right-turn lane, and the westbound approach consists of a shared all movement lane. No turn restrictions are noted.

Bank Street & Gilmour Street — The intersection of Bank Street and Gilmour Street is a signalized intersection. The northbound approach consists of a shared through/right-lane, the southbound approach consists of a shared left-turn/through lane, and the eastbound approach consists of a shared all movement lane. No turn restrictions are noted.

Bank Street & James Street — The intersection of Bank Street and James Street is an unsignalized intersection. The northbound and southbound approaches consist of single travel lanes, and the west leg of the intersection is inbound only. No turn restrictions are noted.

Bank Street & Gladstone Avenue — The intersection of Bank Street and Gladstone Avenue is a signalized intersection. The northbound approach consists of a left-turn and a shared through/right, the southbound approach consists of a shared left-turn/through lane and a shared through/right-lane, the eastbound approach consists of a shared left-turn/through lane and a shared

	through/right-lane, and the westbound approach consists of a shared all movement lane. No left-turns are permitted in the southbound direction during the AM peak.
O'Connor Street & Somerset Street	The intersection of O'Connor Street and Somerset Street is a signalized intersection. The southbound approach consists of a shared left-turn/through lane and a shared through/right-lane, the eastbound approach consists of a shared through/right-lane, and the westbound approach consists of a shared left-turn/through lane. No turn restrictions are noted.
O'Connor Street & Gilmour Street	The intersection of O'Connor Street and Gilmour Street is a signalized intersection. The southbound approach consists of a shared left-turn/through lane and through lane, and the westbound approach consists of a shared through/right-turn lane. No turn restrictions are noted.
O'Connor Street & Gladstone Avenue	The intersection of O'Connor Street and Gladstone Avenue is a signalized intersection. The southbound approach consists of a shared left-turn/through lane and a shared through/right-lane, the eastbound approach consists of a shared through/right-lane, and the westbound approach consists of a shared left-turn/through lane. No turn restrictions are noted.

2.2.3 Existing Driveways

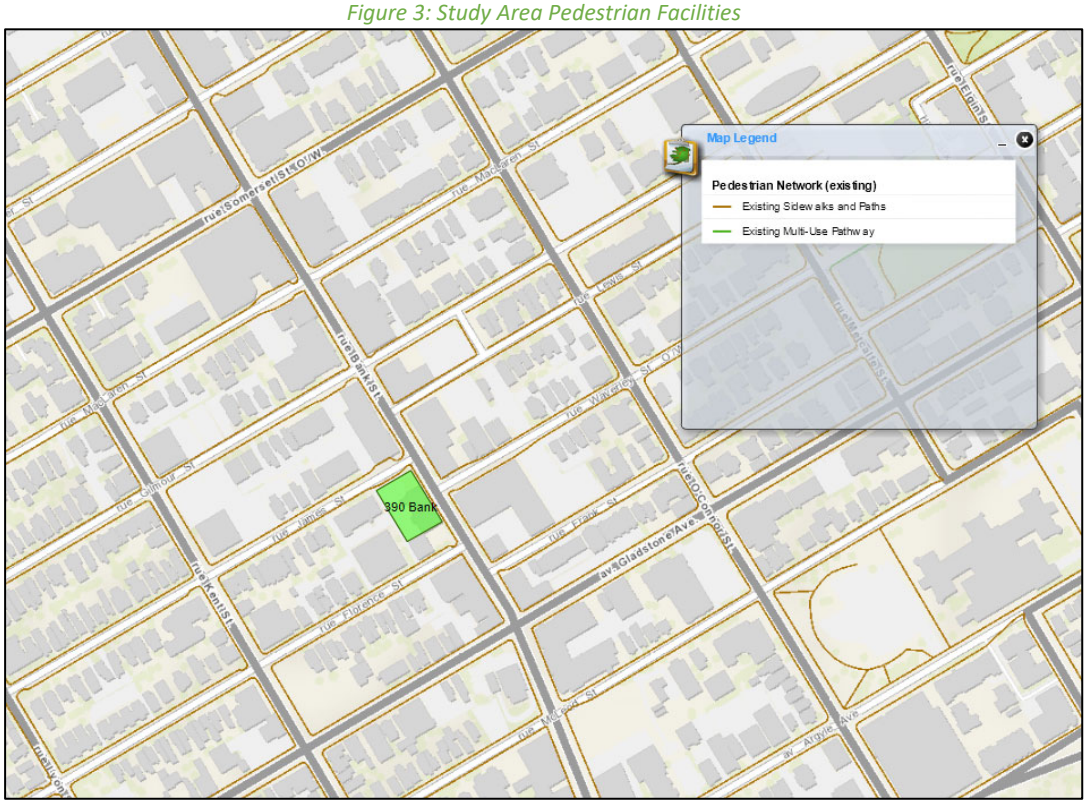
Within 200 metres of the proposed site, private accesses are located on both sides of James Street between Bank Street and Kent Street. Other minor intersections are located along Bank Street.

2.2.4 Cycling and Pedestrian Facilities

Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities.

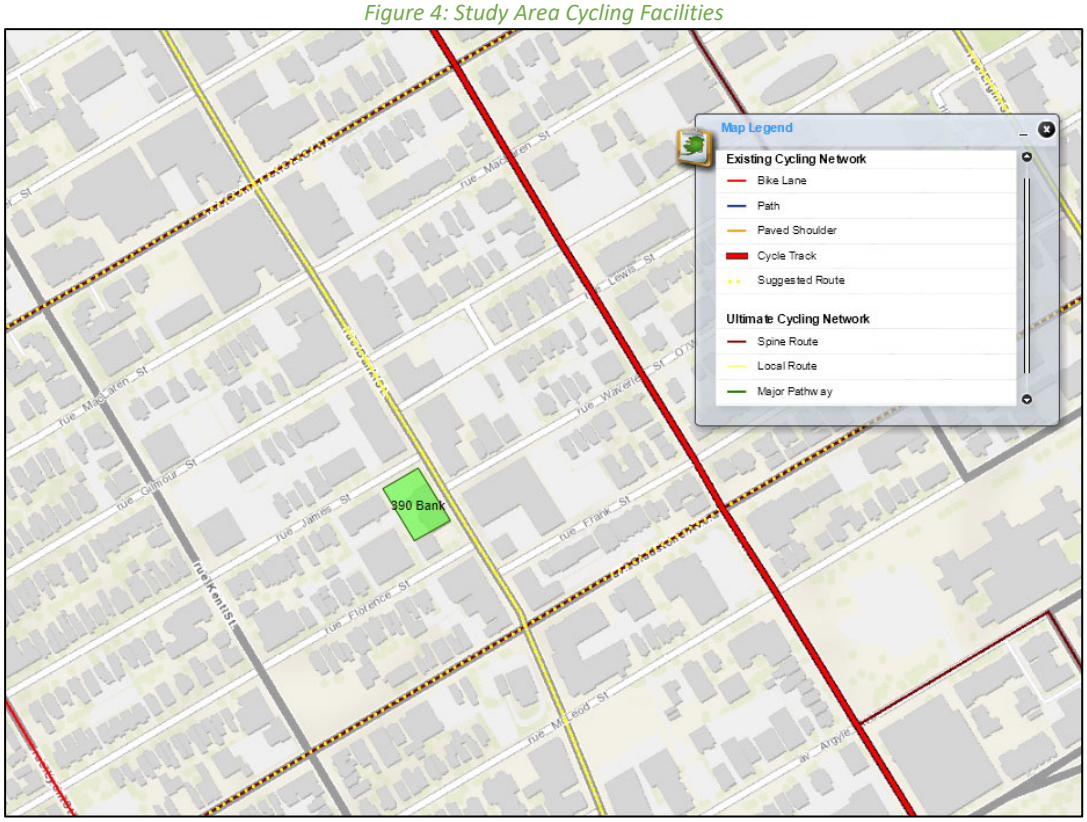
Sidewalks are provided along both sides of the roads within the study area. Bank Street is a local cycling route, and Somerset Street and Gladstone Street are spine routes. A two-way cycle track is provided along O'Connor Street.

Figure 3: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: June 26, 2019

Figure 4: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: July 2, 2019

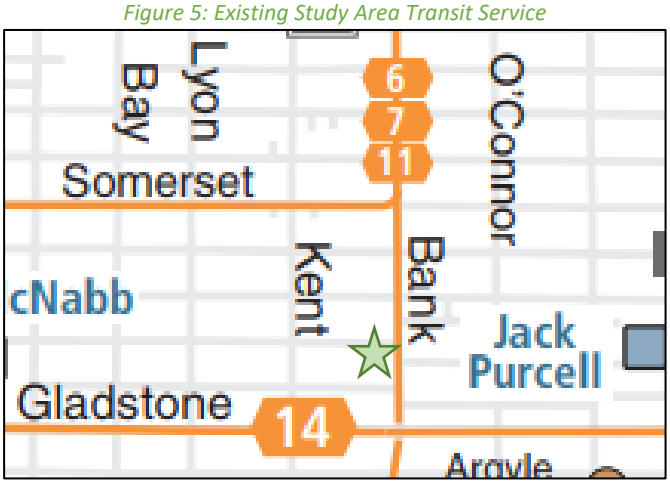
2.2.5 Existing Transit

Within the study area, the routes #6 and #7 travel along Bank Street, #11 travels along Somerset Street and north along Bank Street, and route #14 travels along Gladstone Avenue. Stops are located on Bank Street between Lewis Street and James Street, and at the intersections at Somerset Street and at Gladstone Avenue. The frequency of these routes within proximity of the proposed site currently are:

- Route #6 – 10-15-minute service all day, 30-minute service during the evening
- Route #7 – 10-15-minute service all day, 30-minute service during the evening
- Route #11 - 10-15-minute service all day, 30-minute service before 6am and after 10pm
- Route #14 – 10-15-minute service all day, 20-30 minute before 7am and after 7pm

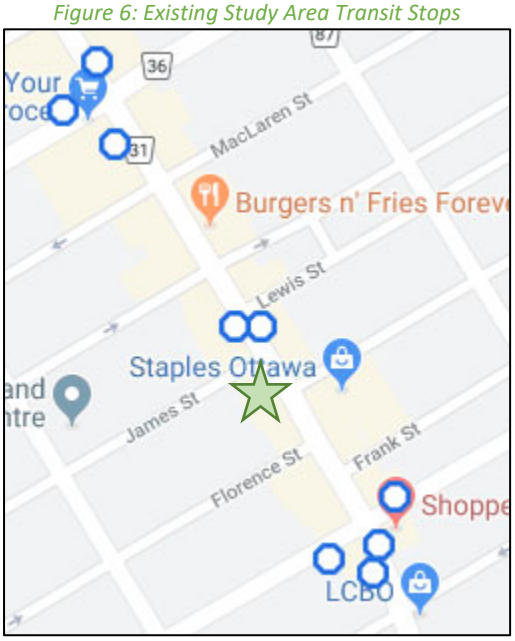
Figure 5 illustrates the transit system map in the study area and Figure 6 illustrates nearby transit stops.

Figure 5: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: July 2, 2019

Figure 6: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: July 2, 2019

2.2.6 Existing Area Traffic Management Measures

The study area traffic calming measures consist of narrowings at intersections, speed humps along local roads, and on-street parking and bulb-outs/planters to delineate the start and end of the parking areas.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from City counts for the existing Study Area intersection. Table 1 summarizes the intersection count dates. The local road intersections have not been counted and will not be assessed in this TIA.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Kent Street & Somerset Street	Wednesday. April 5, 2017	City of Ottawa
Kent Street & Gilmour Street	Wednesday, April 5, 2017	City of Ottawa
Kent Street & James Street	Tuesday, July 9, 2019	The Traffic Specialists
Kent Street & Gladstone Avenue	Tuesday, April 25, 2017	City of Ottawa
Bank Street & Somerset Street	Wednesday, August 5, 2015	City of Ottawa
Bank Street & MacLaren Street	Pending City information request	
Bank Street & Gilmour Street	Tuesday, August 25, 2015	City of Ottawa
Bank Street & James Street	Tuesday, July 9, 2019	The Traffic Specialist
Bank Street & Gladstone Avenue	Wednesday, July 27, 2016	City of Ottawa
O'Connor Street & Somerset Street	Tuesday, March 21, 2017	City of Ottawa
O'Connor Street & Gilmour Street	Tuesday, March 21, 2017	City of Ottawa
O'Connor Street & Gladstone Avenue	Tuesday, March 21, 2017	City of Ottawa

Figure 7 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on the TIA Guidelines for the lane movements and HCM average delay for the overall intersection, and HCM average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 7: Existing Traffic Counts

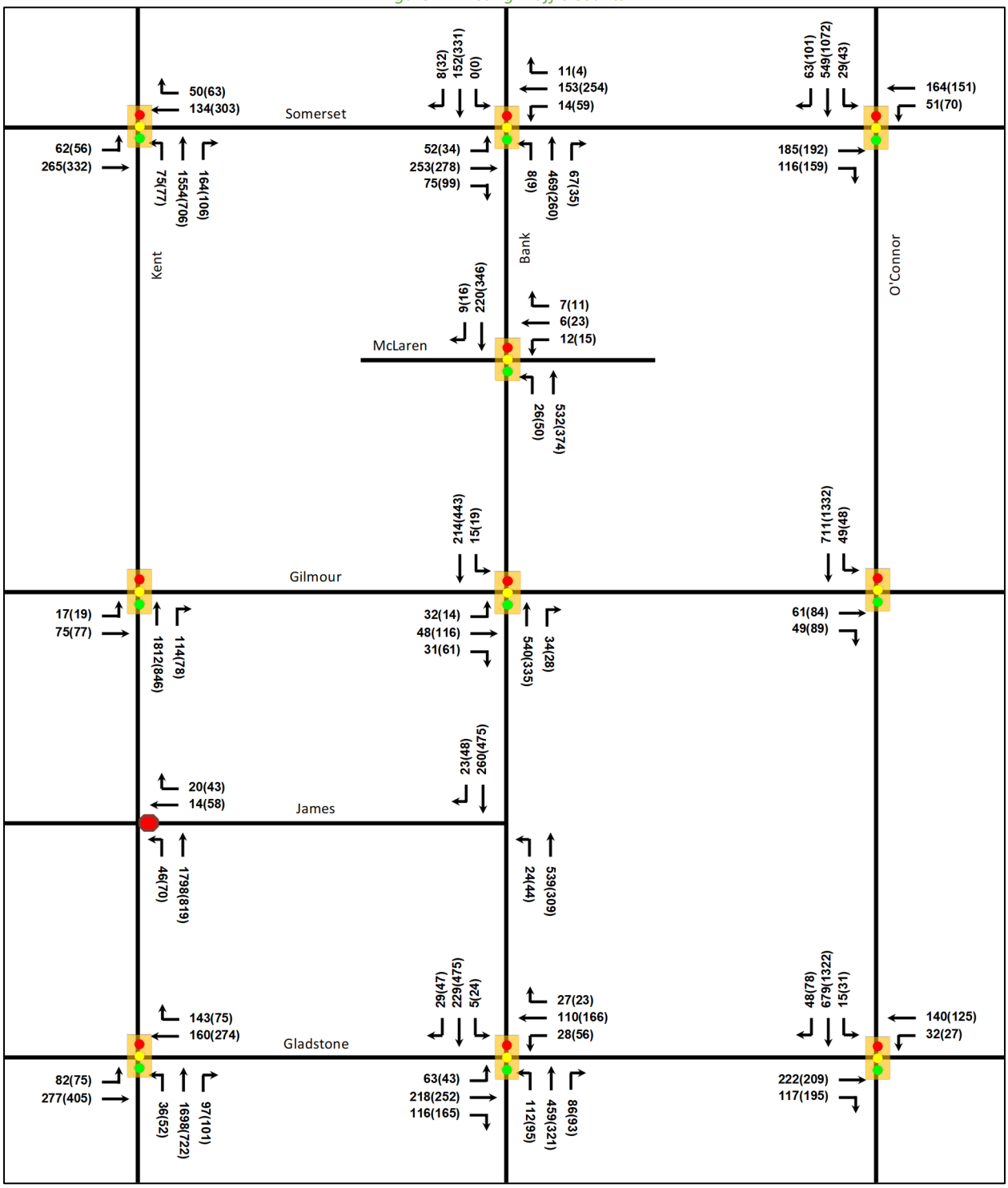


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Kent Street & Somerset Street *Signalized*	EBL	A	0.34	27.4	18.8	A	0.38	24.4	15.2
	EBT	C	0.73	37.4	62.4	B	0.66	26.6	61.5
	WBT/R	A	0.55	33.6	m51.7	C	0.77	36.5	87.7
	NBL	A	0.12	11.6	m13.3	A	0.16	9.9	10.0
	NBT/R	B	0.67	12.6	76.8	A	0.39	10.3	22.0
	Overall	**B**	**-**	**17.5**	**-**	**B**	**-**	**19.9**	**-**
Kent Street & Gilmour Street *Signalized*	EB	A	0.30	20.9	21.3	A	0.40	26.0	24.0
	NB	B	0.61	16.6	133.7	A	0.29	2.3	12.2
	Overall	**B**	**-**	**16.8**	**-**		**-**	**4.6**	**-**
Kent Street & James Street *Unsignalized*	WB	A	0.18	26.4	0.7	A	0.25	15.5	1.0
	NB	A	0.05	8.4	0.1	A	0.07	8.7	0.2
	Overall	**A**	**-**	**0.7**	**-**	**A**	**-**	**2.5**	**-**
Kent Street & Gladstone Avenue *Signalized*	EBL	A	0.57	36.5	25.5	A	0.39	21.6	17.3
	EBT	B	0.66	30.8	61.5	C	0.75	29.0	73.5
	WBT/R	C	0.80	35.9	74.8	B	0.66	27.4	m47.4
	NBL	A	0.05	8.4	7.1	A	0.08	12.7	12.8
	NBT/R	C	0.73	14.0	102.8	A	0.39	12.7	47.2
	Overall	**B**	**-**	**19.2**	**-**	**C**	**-**	**20.0**	**-**
Bank Street & Somerset Street *Signalized*	EBL	A	0.22	16.7	m11.2	A	0.21	16.8	m12.2
	EBR/T	C	0.78	28.2	#80.1	D	0.87	37.2	#103.0
	WBL	A	0.10	19.9	6.2	A	0.49	34.5	20.7
	WBT/R	A	0.36	22.0	35.7	A	0.55	26.0	56.6
	NB	B	0.70	8.6	21.4	A	0.40	14.3	37.8
	SB	A	0.19	9.2	23.3	A	0.46	12.5	57.3
	Overall	**B**	**-**	**16.0**	**-**	**C**	**-**	**23.1**	**-**
Bank Street & MacLaren Street *Signalized*	WB	A	0.07	17.8	8.3	A	0.14	19.1	13.7
	NB	A	0.60	12.0	80.6	A	0.50	10.5	57.5
	SB	A	0.24	7.2	25.6	A	0.39	8.7	43.6
	Overall	**B**	**-**	**10.8**	**-**	**B**	**-**	**10.2**	**-**
Bank Street & Gilmour Street *Signalized*	EB	A	0.38	18.8	m17.5	B	0.66	37.7	42.2
	NB	A	0.53	6.6	50.0	A	0.36	6.1	m36.8
	SB	A	0.22	4.2	m17.5	A	0.47	6.5	m37.3
	Overall	**A**	**-**	**7.5**	**-**	**B**	**-**	**12.2**	**-**
Bank Street & Gladstone Avenue *Signalized*	EB	B	0.66	22.8	m43.4	B	0.70	24.7	31.4
	WB	A	0.52	27.7	39.0	E	0.92	62.3	#77.7
	NBL	A	0.25	9.2	18.2	A	0.32	12.0	18.8
	NBT/R	B	0.65	14.0	95.0	A	0.53	11.9	64.4
	SB	A	0.17	8.8	21.3	A	0.37	4.7	15.2
	Overall	**B**	**-**	**16.6**	**-**	**C**	**-**	**20.0**	**-**
O'Connor Street & Somerset Street *Signalized*	EBT/R	B	0.66	27.2	61.0	B	0.69	26.0	78.8
	WBL/T	A	0.60	28.9	49.0	A	0.55	25.5	54.3
	SB	A	0.37	11.5	46.4	C	0.80	23.8	119.6
	Overall	**B**	**-**	**19.3**	**-**	**C**	**-**	**24.5**	**-**
O'Connor Street & Gilmour Street *Signalized*	EB	A	0.41	23.7	26.1	B	0.66	33.0	40.2
	SB	A	0.30	3.7	18.7	A	0.57	7.2	67.7
	Overall	**A**	**-**	**6.5**	**-**	**B**	**-**	**10.4**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
O'Connor Street & Gladstone Avenue *Signalized*	EB	D	0.87	47.4	#96.5	E	0.96	58.7	#121.3
	WB	B	0.70	41.3	#54.4	B	0.61	36.2	#45.4
	SB	A	0.37	5.2	17.0	C	0.73	10.2	109.5
	Overall	**C**	**-**	**22.8**	**-**	**C**	**-**	**23.1**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 0.90

The existing intersection operations operate well during the peak hours. Queuing during the peak periods may block adjacent accesses and intersections throughout the study area, consistent within urban areas. At the Kent Street and James Street, and Bank Street and James Street intersections, bicycle movements were noted on all approaches. Bank Streets heavy vehicle volumes were predominantly OC Transpo buses.

2.2.8 Collision Analysis

Collision data has been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study are road network. Table 3 summarizes the collisions types and conditions in the study area, Figure 8 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data is included in Appendix D.

Table 3: Study Area Collision Summary, 2013-2017

		Number	%
Total Collisions		**105**	**100%**
Classification	Fatality	0	0%
	Non-Fatal Injury	30	29%
	Property Damage Only	75	71%
Initial Impact Type	Approaching	1	1%
	Angled	19	18%
	Rear end	18	17%
	Sideswipe	23	22%
	Turning Movement	20	19%
	SMV Unattended	8	8%
	SMV Other	12	11%
	Other	4	4%
Road Surface Condition	Dry	72	69%
	Wet	15	14%
	Loose Snow	9	9%
	Slush	5	5%
	Packed Snow	2	2%
	Ice	2	2%
Pedestrian Involved		12	11%
Cyclists Involved		11	10%

Figure 8: Study Area Collision Records – Representation of 2014-2016

Table 4: Summary of Collision Locations, 2013-2017

	Number	%
Intersections / Segments	**105**	**100%**
Bank St @ Florence St	4	4%
Bank St @ Frank St	2	2%
Bank St @ Gilmour St	9	9%
Bank St @ Gladstone Ave	29	28%
Bank St @ Lewis St	1	1%
Bank St @ Maclaren St	2	2%
Bank St @ Somerset St	23	22%
James St @ Bank St	2	2%
James St @ Kent St	15	14%
Bank St btwn Florence St & Frank St	2	2%
Bank St btwn Gilmour St & Lewis St	2	2%
Bank St btwn Maclaren St & Gilmour St	7	7%
Bank St btwn Somerset St W & Maclaren St	3	3%
Bank St btwn Waverley St & Florence St	1	1%
James St btwn Kent St & Bank St	3	3%

Within the study area, the intersections of Bank Street at Gladstone Avenue, Bank Street at Somerset Street, and Kent Street at James Street. Table 5, Table 6 and Table 7 summarize the collision types and conditions for each of the Bank Street at Gladstone Avenue, Bank Street at Somerset Street and Kent Street at James Street intersections.

Table 5: Bank Street at Gladstone Avenue Collision Summary

		Number	%
Total Collisions		**29**	**100%**
Classification	Fatality	0	0%
	Non-Fatal Injury	11	34%
	Property Damage Only	19	66%
Initial Impact Type	Angle	6	21%
	Rear end	5	17%
	Sideswipe	5	17%
	Turning Movement	5	17%
	SMV Other	7	24%
	Other	1	3%
Road Surface Condition	Dry	16	55%
	Wet	7	24%
	Loose Snow	3	10%
	Slush	2	7%
	Ice	1	3%
Pedestrian Involved		7	24%
Cyclists Involved		1	3%

The Bank Street at Gladstone Avenue intersection had a total of 29 collisions during the 2013-2017 time period, with 19 involving property damage only, and the remaining 11 having non-fatal injuries. The collision types are split between 5 to 7 collisions of angled, rear end, sideswipe, turning movement and SMV other. This intersection is a very active intersection with a few geometric differences on each leg. On the southbound approach, Bank Street transitions to 2 lanes at the intersection, and the northbound approach used to have a left-turn lane trap (e.g. one of the 2 lanes became a left turn) until 2017. Additionally, the intersection is slightly skewed in the north-south direction. The eastbound approach is a 4-lane cross section, and the westbound approach is a 2-lane cross-section. Outside of the geometry, the gas station on the southwest quadrant introduces additional movements in proximity to the intersection. The combination of all modes (auto, transit, bicycle and pedestrian) at the intersection and the above noted issues, a more intensive review may be required by the City. It is noted that the pedestrian collisions are high in relation to the total collisions, and the collisions predominantly occur during dry road conditions.

Table 6: Bank Street at Somerset Street Collision Summary

		Number	%
Total Collisions		**23**	**100%**
Classification	Fatality	0	0%
	Non-Fatal Injury	9	30%
	Property Damage Only	14	61%
Initial Impact Type	Angle	1	4%
	Rear end	6	26%
	Sideswipe	5	22%
	Turning Movement	5	22%
	SMV Other	5	22%
	Other	1	4%
Road Surface Condition	Dry	16	70%
	Wet	3	13%
	Loose Snow	2	9%
	Slush	1	4%
	Ice	1	4%
Pedestrian Involved		5	22%
Cyclists Involved		3	13%

The Bank Street at Somerset Street intersection had a total of 23 collisions during the 2013-2017 time period, with 14 involving property damage only, and the remaining 9 having non-fatal injuries. The collision types are split between rear end, sideswipe, turning movement and SMV other. This intersection is a very active intersection, reflected in the pedestrian and cyclist collisions. The single northbound and southbound lanes frequently require cars to maneuver around left-turning vehicles, similarly on the eastbound approach with the shared left-turn/through lane, may also influence the rear-end, sideswipe and turning movement collisions. Weather conditions do not influence the collisions at this location.

Table 7: Kent Street at James Street Collision Summary

		Number	%
Total Collisions		**15**	**100%**
Classification	Fatality	0	0%
	Non-Fatal Injury	1	7%
	Property Damage Only	14	93%
Initial Impact Type	Angle	4	27%
	Sideswipe	7	47%
	Turning Movement	4	27%
Road Surface Condition	Dry	9	60%
	Wet	1	7%
	Loose Snow	3	20%
	Slush	1	7%
	Packed Snow	1	7%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The Kent Street and James Street intersection had a total of 15 collisions during the 2013-2017 time period, with 14 involving property damage only, and the remaining 1 having non-fatal injuries. The collisions are limited to angled, sideswipe and turning movement, which is the function of the one-way road at a minor stop-controlled intersection. Weather conditions are not considered to have a major impact on the collisions.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

No roadway improvements are included within the Ottawa TMP for the Study Area road network. Isolated transit priority measures are identified as part of the Affordable Network along Bank Street, on Gladstone Avenue to support the LRT stations, and along Somerset Street between Woodroffe Avenue and Bank Street.

2.3.2 Other Study Area Developments

384 Frank Street

The proposed development includes a zoning amendment to rezone to traditional mainstreet and a site plan for a nine-storey mixed-use building. The site consists of 18 apartment units and ground floor commercial. A TIA is not available as part of the submission package for this site.

406-408 Bank Street

The proposed development includes a site plan for a five-storey mixed use building, which includes 14 apartment units and ground floor commercial. This file was last updated in 2013.

267 O'Connor Street

The proposed development includes a zoning amendment to permit two-high-rise buildings of 27 storeys. Both towers will include a total of 510 condo units and ground floor commercial. A park is included within the site. This file was last updated in 2014.

429 MacLaren Street

The proposed site includes a zoning amendment to permit professional offices and personal services at the existing residential building. This application has been approved and the rezoning is in effect.

443-447 Kent Street & 423-425 McLeod Street

The proposed development includes a site plan for a four-storey residential building, with 31 apartment units. This application has been approved. A TIA is not available as part of the submission package for this site.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersection will include:

- Kent Street at:
  - Somerset Street
  - Gilmour Street
  - James Street
  - Gladstone Avenue
- Bank Street at:
  - Somerset Street
  - Gilmour Street
  - James Street

    - Gladstone Avenue
- O'Connor Street at:
    - Somerset Street
    - Gilmour Street
    - Gladstone Avenue

The intersections of Bank Street and Flora Street, Lyon Street and Gladstone Avenue, Lyon Street and James Street, Metcalfe Street and Gilmour Street, and O'Connor Street and McLeod Street have been excluded from the analysis prescribed within the TIA Guidelines. While they are within 400 metres of the site, they are not anticipated to be impacted by the development that is anticipated to generate less than 50 two-way vehicle trips during the peak hours.

The boundary roads are Bank Street and James Street. No screenlines are present near the proposed site and none will be reviewed as part of this study.

3.2 Time Periods

The AM and PM peak hours will be examined for the proposed development.

3.3 Horizon Years

The anticipated build-out year is 2023. As a result, the full build-out plus five years horizon year is 2028.

4 Exemption Review

Table 8 summarizes the exemptions for this TIA.

Table 8: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	Exempt – Will be completed during the Site Plan Application process		
4.2 Parking			
4.3 Boundary Street Design			
4.4 Access Intersections Design			
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Required
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

5 Development Generated Travel Demand

5.1 Trip Generation and Travel Modes

This TIA has been prepared using the vehicle and person trip rates for the mid-rise apartment using the TRANS Trip Generation Study Report (2009) and shopping centre for the ground floor retail using the ITE Trip Generation Manual 10th Edition (2017). Table 9 summarizes the person trip rates for the proposed land uses.

Table 9: Trip Generation Person Trip Rates

Dwelling Type	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Mid-rise Apartments	233 (TRANS)	AM	0.24	0.65
		PM	0.28	0.70
Shopping Centre	820 (ITE)	AM	0.94	1.20
		PM	3.81	4.88

Using the above Person Trip rates, the total person trip generation has been estimated. Table 10 below illustrates the total person trip generation by dwelling type.

Table 10: Total Person Trip Generation

Land Use	Units/ sq ft	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Mid-rise Apartments	128	20	63	83	56	34	90
Shopping Centre	7,138	6	3	9	17	18	35
Total Person Trips		**26**	**66**	**92**	**73**	**52**	**125**

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Ottawa Inner have been summarized in Table 11.

Table 11: Mode Share – Ottawa Inner

Travel Mode	Ottawa Inner
Auto Driver	40%
Auto Passenger	10%
Transit	25%
Non-Auto	25%
Total	**100%**

Using the above mode shares and person trip rates the person trips by mode have been projected. Table 12 summarizes the trip generation by mode.

Table 12: Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto Driver	40%	10	26	37	29	21	50
Auto Passenger	10%	3	6	9	8	5	13
Transit	25%	7	17	23	18	14	32
Non-Auto Modes	25%	7	17	23	18	14	32
Total	**100%**	**27**	**66**	**92**	**73**	**53**	**126**

As shown above, 37 AM and 50 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.2 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the travel for the residential development patterns were applied based on the build-out of Ottawa Inner. Table 13 below summarizes the distributions.

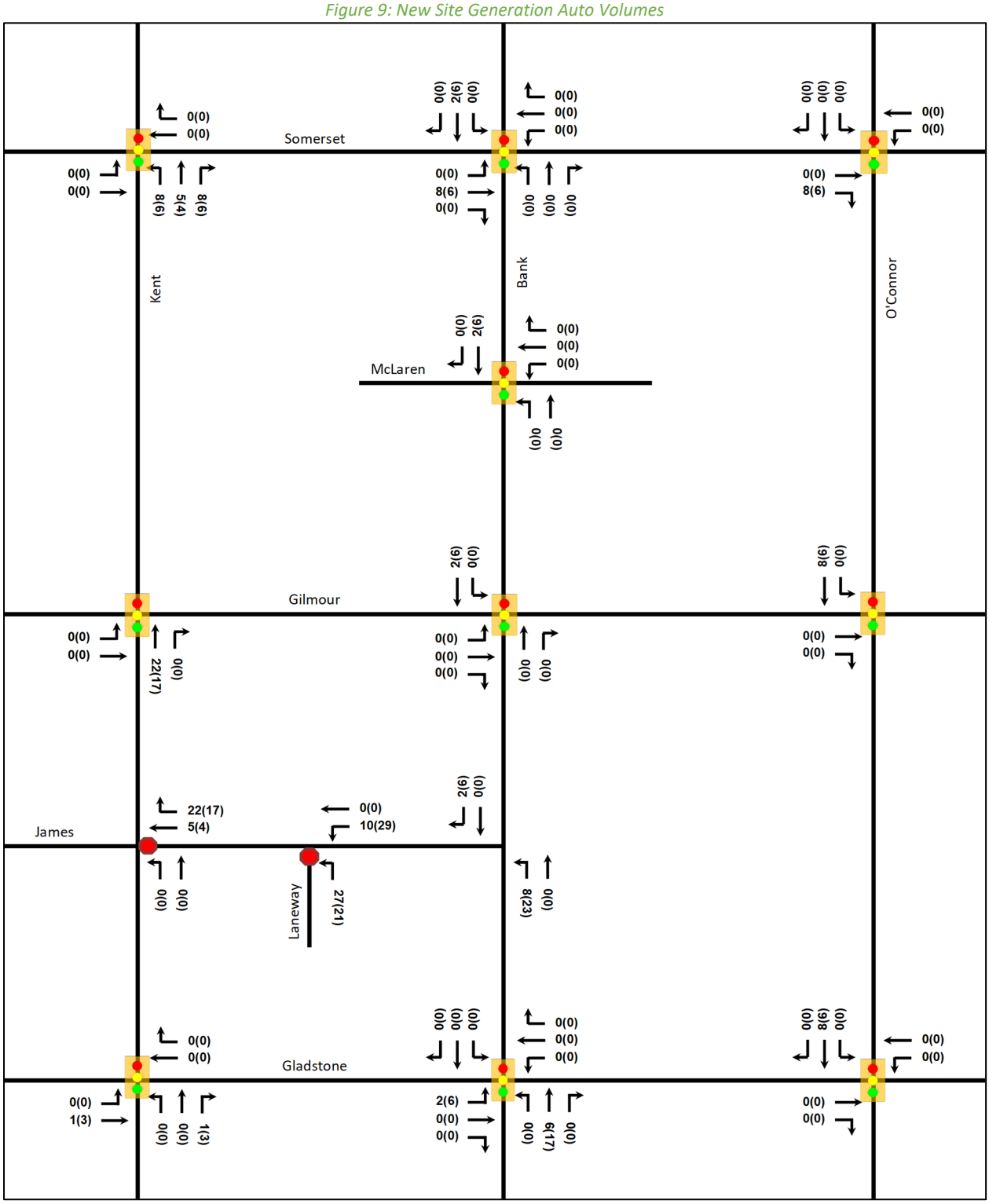
Table 13: OD Survey Existing Mode Share – Ottawa Inner

To/From	% of Trips
North	20%
South	35%
East	25%
West	20%
Total	100%

5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. Figure 9 illustrates the new site generated volumes.

Figure 9: New Site Generation Auto Volumes


Somerset
Kent
Bank
O'Connor
McLaren
Gilmour
James
Laneway
Gladstone
0(0)
0(0)
0(0)
2(6)
0(0)
0(0)
0(0)
0(0)
0(0)
0(0)
0(0)
0(0)
0(0)
8(6)
0(0)
8(6)
5(4)
8(6)
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6 Background Network Travel Demand

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3 and are not anticipated to impact to site, trip generation, or distribution.

6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. Table 14 summarizes the results of the model and the projections are provided in Appendix E.

Table 14: TRANS Regional Model Projections – Study Area Growth Rates

Street	Direction Growth Percentage	
	Eastbound	**Westbound**
Somerset	-1.16%	-2.75%
MacLaren	n/a	
Gilmour	-2.08%	n/a
James	n/a	-6.98%
Gladstone	-0.93%	-2.73%
	Northbound	**Southbound**
Kent	0.29%	n/a
Bank	-2.54%	-0.56%
O'Connor	n/a	1.59%

In general, the growth rates in the study area are projected to be negative on all road segments with the exception of O'Connor Street that has a projected growth rate of 1.5% growth rate. The negative growth rates will be applied at a 0% for this study and O'Connor Street at 1.5%.

6.3 Other Developments

The other area developments are noted in Section 2.3.2. Either due to the development size, inactivity on the file or lack of site plan application, these developments are not anticipated to unduly impact the study area intersections beyond the applied background growth.

7 Demand Rationalization

7.1 2023 Future Background Intersection Operations

Figure 10 illustrates the 2023 background volumes and Table 15 summarizes the background intersection operations for O'Connor Street, the only street with a growth rate applied and differs from the existing condition operations. The level of service for signalized intersections is based on the TIA Guidelines for the lane movements and HCM average delay for the overall intersection. The synchro worksheets for the 2023 are provided in Appendix F.

Figure 10: 2023 Future Background Volumes

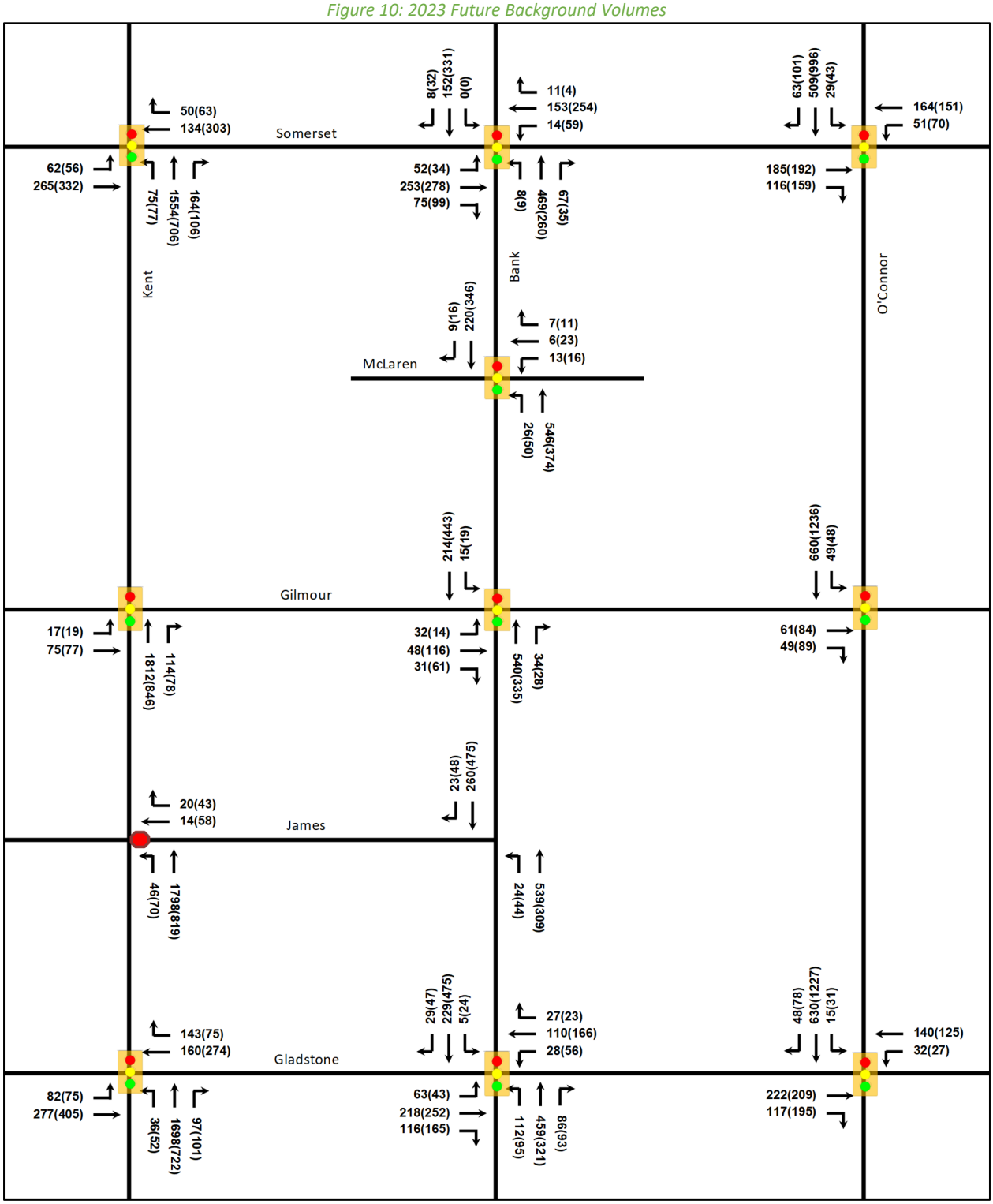


Table 15: 2023 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
O'Connor Street & Somerset Street *Signalized*	EBT/R	C	0.71	32.9	58.8	C	0.74	31.9	68.1
	WBL/T	B	0.69	38.1	48.9	B	0.65	33.4	49.4
	SB	A	0.32	8.8	38.4	B	0.66	16.6	109.6
	Overall	**C**	**-**	**20.9**	**-**	**C**	**-**	**21.9**	**-**
O'Connor Street & Gilmour Street *Signalized*	EB	A	0.37	21.9	23.0	B	0.61	30.1	35.4
	SB	A	0.28	3.9	18.0	A	0.54	6.6	62.3
	Overall	**A**	**-**	**6.3**	**-**	**A**	**-**	**9.4**	**-**
O'Connor Street & Gladstone Avenue *Signalized*	EB	D	0.81	41.1	#81.3	D	0.90	49.3	#103.4
	WB	A	0.58	34.1	42.8	A	0.52	31.7	38.7
	SB	A	0.35	5.1	16.6	B	0.68	9.0	100.3
	Overall	**B**	**-**	**19.4**	**-**	**B**	**-**	**19.4**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

The intersection operations for the 2023 future background horizon along O'Connor Street generally operate satisfactorily during the peak hours. At the Gladstone Avenue intersection, the eastbound approach is noted to have a v/c of 0.90 during the PM peak. No other capacity issues are noted.

7.2 2028 Future Background Intersection Operations

Figure 11 illustrates the 2028 background volumes and Table 16 summarizes the background intersection operations for O'Connor Street, the only street with a growth rate applied and differs from the existing conditions operations. The level of service for signalized intersections is based on the TIA Guidelines for the lane movements and HCM average delay for the overall intersection. The synchro worksheets for the 2028 horizons are provided in Appendix G.

Figure 11: 2028 Future Background Volumes

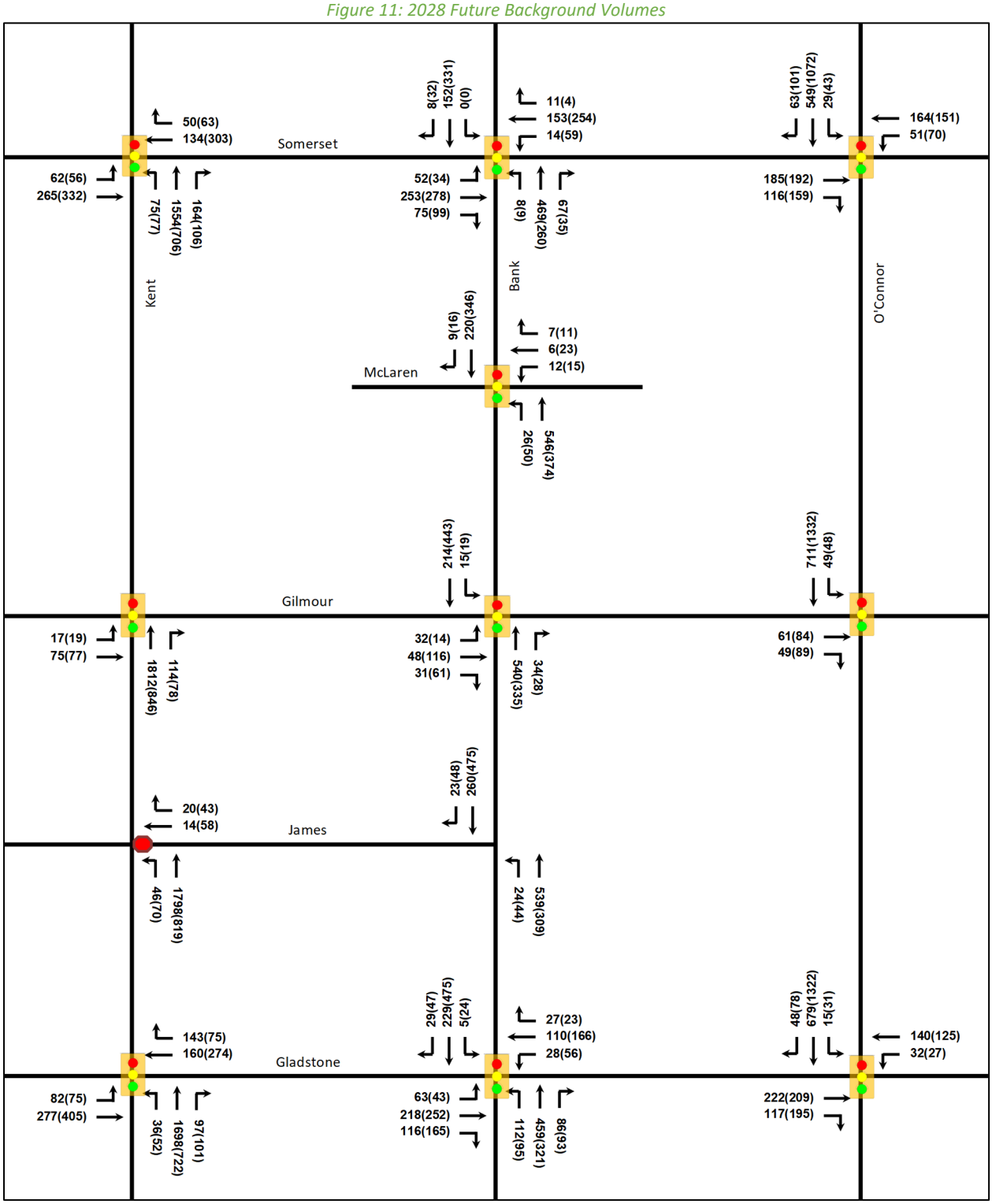


Table 16: 2028 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
O'Connor Street & Somerset Street *Signalized*	EBT/R	C	0.71	32.9	58.8	C	0.74	31.9	68.1
	WBL/T	B	0.69	38.1	48.9	B	0.65	33.4	49.4
	SB	A	0.34	9.0	41.5	B	0.70	17.8	121.1
	Overall	**C**	**-**	**20.6**	**-**	**C**	**-**	**22.5**	**-**
O'Connor Street & Gilmour Street *Signalized*	EB	A	0.37	21.9	23.0	B	0.61	30.1	35.4
	SB	A	0.31	3.8	18.1	A	0.58	7.1	70.7
	Overall	**A**	**-**	**6.1**	**-**	**A**	**-**	**9.7**	**-**
O'Connor Street & Gladstone Avenue *Signalized*	EB	D	0.81	41.1	#81.3	D	0.90	49.3	#103.4
	WB	A	0.58	34.1	42.8	A	0.52	31.7	38.7
	SB	A	0.37	5.3	18.4	C	0.73	9.6	112.4
	Overall	**B**	**-**	**18.9**	**-**	**B**	**-**	**19.4**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

The intersection operations for the 2028 future background horizon along O'Connor Street generally operate satisfactorily during the peak hours. At the Gladstone Avenue intersection, the eastbound approach is noted to have a v/c of 0.90 during the PM peak. No other capacity issues are noted. The southbound queues along O'Connor Street are noted to block side street and accesses between signalized intersections.

8 Transportation Demand Management

8.1 Context for TDM

The mode shares used within the TIA represent this area of the City and have not been altered. The modal shares are likely to be achieved.

A total of 128 apartment units with 201 bedrooms and approximately 7,100 sq. ft. of ground floor retail space are anticipated within the development.

8.2 Need and Opportunity

The subject site has been assumed to rely predominantly on all travel modes and those assumptions have been carried through the analysis.

8.3 TDM Program

The "suite of post occupancy TDM measures" has been summarized in the TDM checklists for both the residential and non-residential land uses. The checklist is provided in Appendix H.

The key TDM measures recommended include:

- Provide on-site coordinator for trip planning for new or existing residents
- Provide bike repair station for site and public use
- Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits
- Inclusion of a 1-month Presto card for first time new residential and retail tenants, along with a set time frame for this offer (e.g. 6-months) from the 'opening' of the building/tower
- Unbundle parking from rental costs

9 Transit

9.1 Route Capacity

The transit ridership in the area was provided by OC Transpo for the study area routes, including boarding, alighting and average loads. Table 17 summarizes the OC Transpo data.

Table 17: OC Transpo Peak Ridership Summary

Routes/Locations				AM Peak Period			PM Peak Period		
Intersection	**Stop**	**Route**	**Direction**	**Total Boarding**	**Total Alighting**	**Average Load at Departure**	**Total Boarding**	**Total Alighting**	**Average Load at Departure**
Bank Street / Lewis Street	2483	6	North	28	22	30	18	30	27
		7	East	27	3	23	46	25	22
Bank Street/ Gilmour Street	7665	6	South	16	20	23	35	60	34
		7	West	17	15	22	15	28	32

The typical bus used on these transit routes is a standard 40-ft bus with an occasional articulated bus assigned to the routes.

The proposed development is anticipated to generate an additional 23 AM peak hour transit trips and 32 PM peak hour transit trips. Of these trips, 17 outbound AM trips and 18 inbound PM trips are anticipated. Capacity is noted on all routes and can accommodate the forecasted development in this area.

9.2 Transit Priority

No transit priority is required/considered for the study area.

10 Network Intersection Design

10.1 Network Intersection Control

The network intersections include all the existing study area intersections, which are signalized except for the unsignalized intersections on James Street at Bank Street and at Kent Street.

10.2 Network Intersection Design

10.2.1 2023 Future Total Network Conditions

The 2023 future total future traffic volumes are illustrated in Figure 12 and the intersection operations are summarized in Table 18. The level of service for signalized intersections is based on the TIA Guidelines for the lane movements and HCM average delay for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix I.

Figure 12: 2023 Future Total Network Intersection Volumes

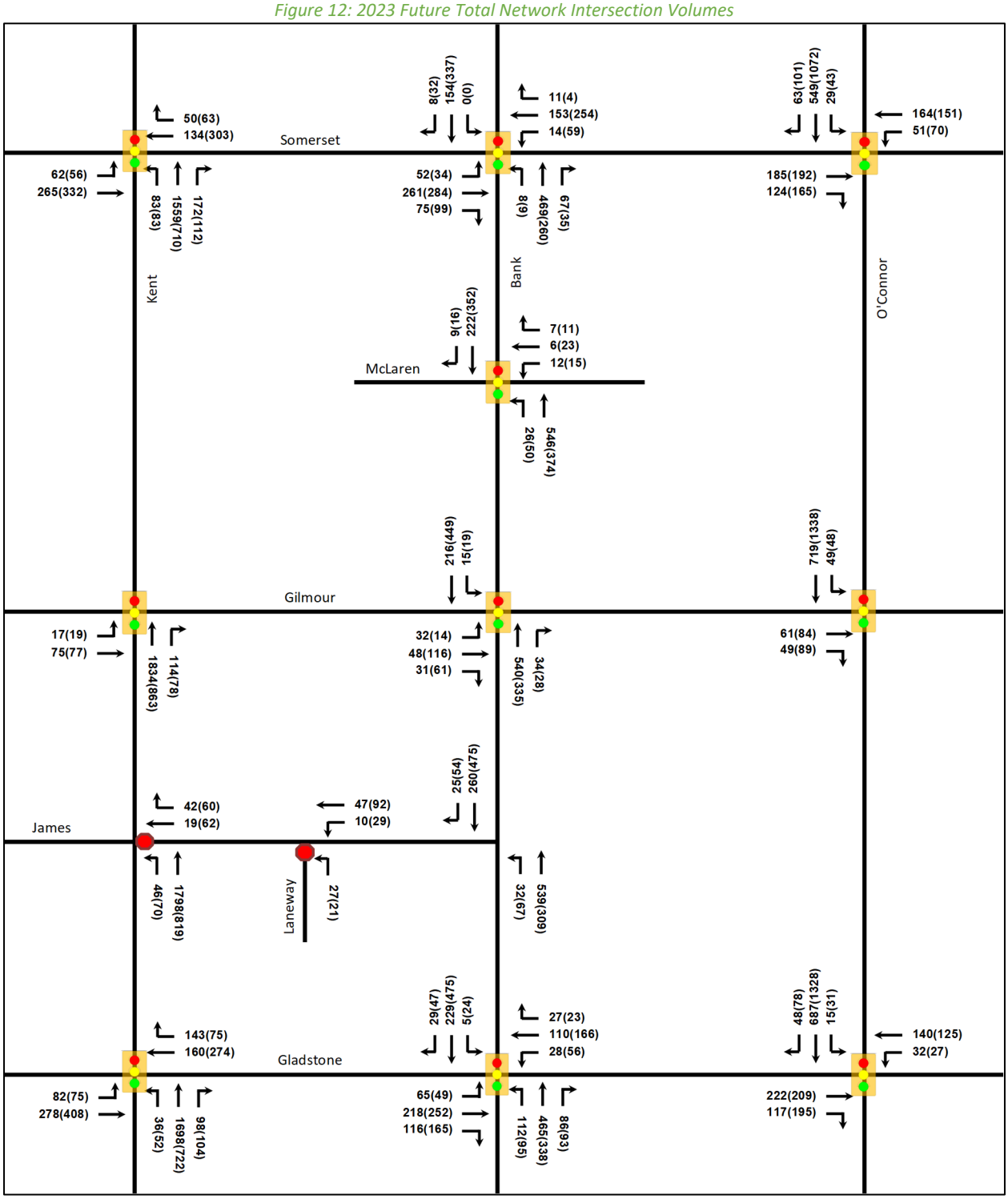


Table 18: 2023 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Kent Street & Somerset Street *Signalized*	EBL	A	0.30	26.6	16.9	A	0.35	25.0	14.3
	EBT	B	0.69	35.8	56.1	B	0.65	28.2	58.0
	WBT/R	A	0.50	32.0	m47.2	C	0.75	36.2	80.0
	NBL	A	0.12	10.6	m13.6	A	0.14	9.4	9.6
	NBT/R	A	0.60	11.1	66.8	A	0.34	9.1	20.2
	Overall	**B**	**-**	**16.0**	**-**	**B**	**-**	**19.4**	**-**
Kent Street & Gilmour Street *Signalized*	EB	A	0.27	20.0	19.4	A	0.37	25.1	21.8
	NB	A	0.57	15.1	123.4	A	0.26	2.3	10.6
	Overall	**B**	**-**	**15.3**	**-**	**A**	**-**	**4.4**	**-**
Kent Street & James Street *Unsignalized*	WB	C	0.25	25.0	1.0	A	0.25	14.8	1.0
	NB	A	0.04	8.4	0.1	A	0.07	1.0	0.1
	Overall	**A**	**-**	**3.4**	**-**	**A**	**-**	**2.7**	**-**
Kent Street & Gladstone Avenue *Signalized*	EBL	A	0.50	33.1	22.2	A	0.35	22.0	16.4
	EBT	B	0.64	31.0	55.2	C	0.74	29.9	68.7
	WBT/R	C	0.77	34.0	67.8	B	0.64	29.5	m50.7
	NBL	A	0.04	7.9	6.6	A	0.07	11.4	11.1
	NBT/R	B	0.63	11.7	86.2	A	0.33	11.1	39.7
	Overall	**B**	**-**	**17.2**	**-**	**B**	**-**	**19.8**	**-**
Bank Street & Somerset Street *Signalized*	EBL	A	0.20	15.8	m11.5	A	0.19	15.7	m11.6
	EBR/T	C	0.73	25.7	70.5	D	0.83	32.9	#87.5
	WBL	A	0.08	19.7	5.5	A	0.42	30.3	17.7
	WBT/R	A	0.33	21.8	32.3	A	0.52	25.9	50.8
	NB	B	0.62	6.9	16.3	A	0.35	13.8	36.8
	SB	A	0.17	8.8	21.3	A	0.41	11.4	50.9
	Overall	**B**	**-**	**14.5**	**-**	**C**	**-**	**21.3**	**-**
Bank Street & MacLaren Street *Signalized*	WB	A	0.06	17.8	8.0	A	0.07	7.4	6.5
	NB	A	0.55	11.0	70.6	B	0.66	17.3	#52.7
	SB	A	0.22	7.0	23.4	A	0.53	13.5	40.7
	Overall	**B**	**-**	**10.1**	**-**	**B**	**-**	**15.0**	**-**
Bank Street & Gilmour Street *Signalized*	EB	A	0.34	20.8	m19.1	B	0.62	37.1	42.8
	NB	A	0.47	6.4	55.7	A	0.32	5.3	m29.4
	SB	A	0.20	4.2	m16.4	A	0.42	5.8	m34.6
	Overall	**A**	**-**	**7.6**	**-**	**B**	**-**	**11.5**	**-**
Bank Street & Gladstone Avenue *Signalized*	EB	A	0.60	21.1	39.0	B	0.69	26.5	26.0
	WB	A	0.48	26.6	36.1	D	0.88	57.4	#65.4
	NBL	A	0.22	8.5	15.4	A	0.26	10.3	16.1
	NBT/R	A	0.58	12.1	76.2	A	0.48	10.4	58.2
	SB	A	0.15	7.9	18.3	A	0.32	4.2	14.0
	Overall	**B**	**-**	**15.1**	**-**	**B**	**-**	**19.2**	**-**
O'Connor Street & Somerset Street *Signalized*	EBT/R	C	0.71	32.0	60.0	C	0.74	31.1	69.4
	WBL/T	B	0.66	35.6	48.3	B	0.62	31.6	49.0
	SB	A	0.32	9.2	39.0	B	0.67	17.2	109.6
	Overall	**C**	**-**	**20.5**	**-**	**C**	**-**	**21.9**	**-**
O'Connor Street & Gilmour Street *Signalized*	EB	A	0.37	21.9	23.0	B	0.61	30.1	35.4
	SB	A	0.29	3.9	18.8	A	0.55	6.6	62.7
	Overall	**A**	**-**	**6.3**	**-**	**A**	**-**	**9.4**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
O'Connor Street & Gladstone Avenue *Signalized*	EB	D	0.81	41.1	#81.3	D	0.90	49.3	#103.4
	WB	A	0.58	34.1	42.8	A	0.52	31.7	38.7
	SB	A	0.35	5.1	16.7	B	0.68	9.0	101.1
	Overall	**B**	**-**	**19.2**	**-**	**B**	**-**	**19.4**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

The 2023 future total intersection operations are similar to the existing conditions. No mitigation is recommended.

10.2.2 2028 Future Total Network Conditions

The 2028 future total future traffic volumes are illustrated in Figure 13 and the intersection operations for O'Connor Street, the only street with a growth rate applied and differs from the 2023 future total conditions, are summarized in Table 19. The level of service for signalized intersections is based on the TIA Guidelines for the lane movements and HCM average delay for the overall intersection. The synchro worksheets have been provided in Appendix J.

Figure 13: 2028 Future Total Network Intersection Volumes

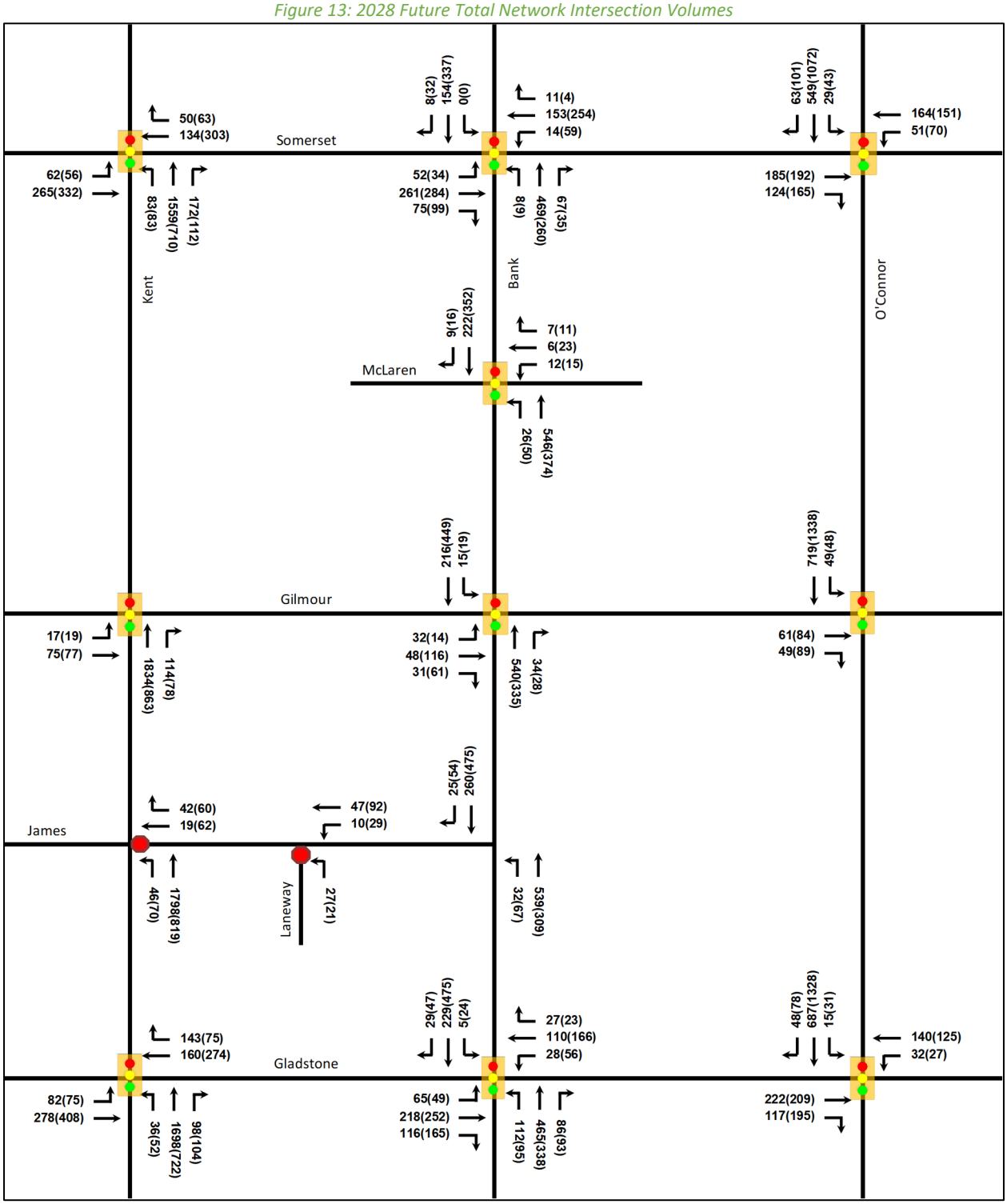


Table 19: 2028 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
O'Connor Street & Somerset Street *Signalized*	EBT/R	C	0.71	32.0	60.0	C	0.74	31.1	69.4
	WBL/T	B	0.66	35.6	48.3	B	0.62	31.6	49.0
	SB	A	0.34	9.4	42.1	C	0.71	18.4	121.1
	Overall	**C**	**-**	**20.2**	**-**	**C**	**-**	**22.5**	**-**
O'Connor Street & Gilmour Street *Signalized*	EB	A	0.37	21.9	23.0	B	0.61	30.1	35.4
	SB	A	0.31	3.8	18.9	A	0.59	7.2	71.3
	Overall	**A**	**-**	**6.1**	**-**	**A**	**-**	**9.7**	**-**
O'Connor Street & Gladstone Avenue *Signalized*	EB	D	0.81	41.1	#81.3	D	0.90	49.3	#103.4
	WB	A	0.58	34.1	42.8	A	0.52	31.7	38.7
	SB	A	0.37	5.3	18.5	C	0.73	9.6	113.2
	Overall	**B**	**-**	**18.8**	**-**	**B**	**-**	**19.4**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00

The 2028 future total network intersection operations are similar to the 2028 future background conditions. No mitigation is recommended.

10.2.3 Network Intersection MMLOS

Table 20 summarizes the MMLOS analysis for the network intersections in the study area. The existing and future conditions will be the same and are considered in one row. The analysis is based on Traditional Main Street for Somerset Street, Bank Street and Gladstone Avenue at Bank Street to the west, and the remaining intersections are based on Central Area. The MMLOS worksheets has been provided in Appendix K.

Table 20: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Kent Street & Somerset Street	**C**	B	**E**	C	**E**	D	**F**	D	A	D
Kent Street & Gilmour Street	**B**	A	D	D	N/A		**F**	D	A	E
Kent Street & Gladstone Avenue	**C**	B	**E**	C	**E**	D	D	D	A	D
Bank Street & Somerset Street	**D**	B	**D**	C	D	D	**F**	D	B	D
Bank Street & MacLaren Street	**C**	B	D	D	C	D	**F**	E	A	D
Bank Street & Gilmour Street	B	B	D	D	B	D	D	E	A	D
Bank Street & Gladstone Avenue	**D**	B	**D**	C	**F**	D	**F**	D	B	D
O'Connor Street & Somerset Street	**C**	B	**D**	C	N/A		**F**	D	B	D
O'Connor Street & Gilmour Street	**B**	A	D	D	N/A		D	D	A	E

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
O'Connor Street & Gladstone Avenue	C	A	D	D	F	D	F	D	B	E

Throughout the study area, pedestrian, bicycle, transit and truck level of service targets are noted to have issues at many of the area intersections. For the pedestrian LOS, primary reasons for not meeting the targets are intersections with crossing distances greater than 7.0 metres. The bicycle LOS are generally limited by mixed traffic operations and would require facilities placed through out the study area to meet the targets. The transit LOS is limited due to signal delays, which would require delay reductions on the transit routes (e.g. along Somerset Street and Gladstone Avenue). The truck LOS would require road widening to increase the turning radii and receiving lanes throughout the study area.

Given the limitations of the MMLOS framework, the central location of the study area, and limited impact of the proposed site, no mitigation of the existing conditions is recommended as part of this study.

10.2.4 Design Elements

No access intersection design elements are proposed as part of this study for the network intersections.

11 Summary of Improvements Indicated and Modification Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed site includes 128 apartment units with a mix of single and two-bedrooms, and 7,100 sq. ft. of ground floor retail space
- Access will be provided along a private Laneway to James Street
- The development is proposed to be completed as a single phase by 2023
- The Trip Generation, Location, and Safety triggers were all met through the TIA Screening
- The application for the proposed site is for a Zoning By-Law Amendment

Existing Conditions

- Kent Street, Bank Street, O'Connor Street and Somerset Street form the arterial road network, Gladstone Avenue is a collector road and the remaining study area roadways are local roads
- The study area roads have sidewalks on both sides of the collectors and arterials
- Separated bike lanes are provided along O'Connor Street and the remaining study area roadways are mixed traffic conditions
- The existing transit routes #6 and #7 stop on Bank Street, route #11 runs along Somerset Street and #14 along Gladstone Avenue
- No operational issues are noted for the study area intersections

Development Generated Travel Demand

- The proposed development is forecasted to generate 92 people two-way trips during the AM peak and 126 people two-way trips during the PM peak
- Based on the area mode shares, a total of 37 two-way vehicle trips will be generated during the AM peak and 50 two-way vehicle trips during the PM peak

- The distribution of the site trips is estimated to be 20% to the north, 35% to the south, 25% to the east, and 20% to the west

Background Conditions

- Adjacent developments that have either been completed or are under construction have been accounted for in the existing and background conditions
- Additionally, the background growth was identified along O'Connor Street only and was applied at a rate of 1.5% for the corridor and 0% on all other study area intersections
- The future background intersection operations are similar to the existing conditions

TDM

- Supportive TDM measures to be included within the proposed development should include:
  - Provide on-site coordinator for trip planning for new or existing residents
  - Provide bike repair station for site and public use
  - Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits
  - Inclusion of a 1-month Presto card for first time new residential and retail tenants, along with a set time frame for this offer (e.g. 6-months) from the 'opening' of the building/tower
  - Unbundle parking from rental costs

Transit

- A total of 23 AM peak hour transit trips (6 inbound, 17 outbound) and 32 PM peak hour transit trips (18
- inbound, 14 outbound) are forecasted from the site
- Existing capacity is noted on the adjacent transit routes and can accommodate the additional trips
- No additional transit priority measures are recommended

Network Intersection Design

- The future total intersection operations are similar to the background and existing conditions
- No improvements for the study area intersection are required to support the proposed development
- The existing study area signalized intersections will not meet a combination of pedestrian, bicycle, transit, or truck MMLOS targets due to road widths, mixed traffic conditions, intersection delays, and single receiving lanes/smaller curb corner radii
- Given the limitations of the MMLOS framework, the central location of the study area, and limited impact of the proposed site, no mitigation of the existing conditions is recommended as part of this study

12 Conclusion

It is recommended that, from a transportation perspective, the proposed development zoning amendment application proceed.

Prepared By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Christopher Gordon, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

13 Markham Avenue
Ottawa ON K2G 3Z1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date:	27-Jun-19
Project Number:	2019-31
Project Reference:	Urban Capital 390 Bank St

1.1 Description of Proposed Development	
Municipal Address	390 Bank Street
Description of Location	Existing pub/restaurant, PIN: 041190139
Land Use Classification	Traditional Mainstreet - TM(1219) S236
Development Size	7,139 sq ft ground floor retail , 125 apartment units
Accesses	Single access, existing rear lane
Phase of Development	Single Phase
Buildout Year	2023
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	129	Units
Trip Generation Trigger	Yes	

1.3 Location Triggers		
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	No	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	Yes	Bank St Traditional Mainstreet
Location Trigger	Yes	

1.4. Safety Triggers	
Are posted speed limits on a boundary street are 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway 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)?	Yes
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	Yes

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering √ or transportation planning □.

[1,2] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at ___Ottawa_____ this __20__ day of _____September_____, 2018.
(City)

Name: _____Andrew Harte_____
(Please Print)

Professional Title: _____Professional Engineer_____

_____
Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 13 Markham Avenue
City / Postal Code: Ottawa / K2G 3Z1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

Appendix B

Turning Movement Counts

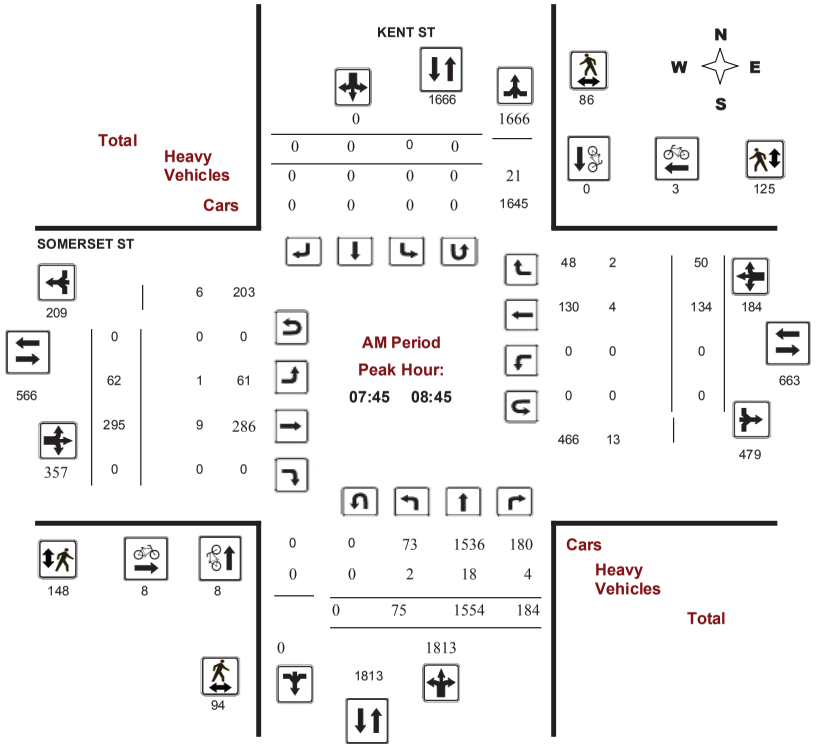
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36850

Start Time: 07:00 **Device:** Miovision



Comments

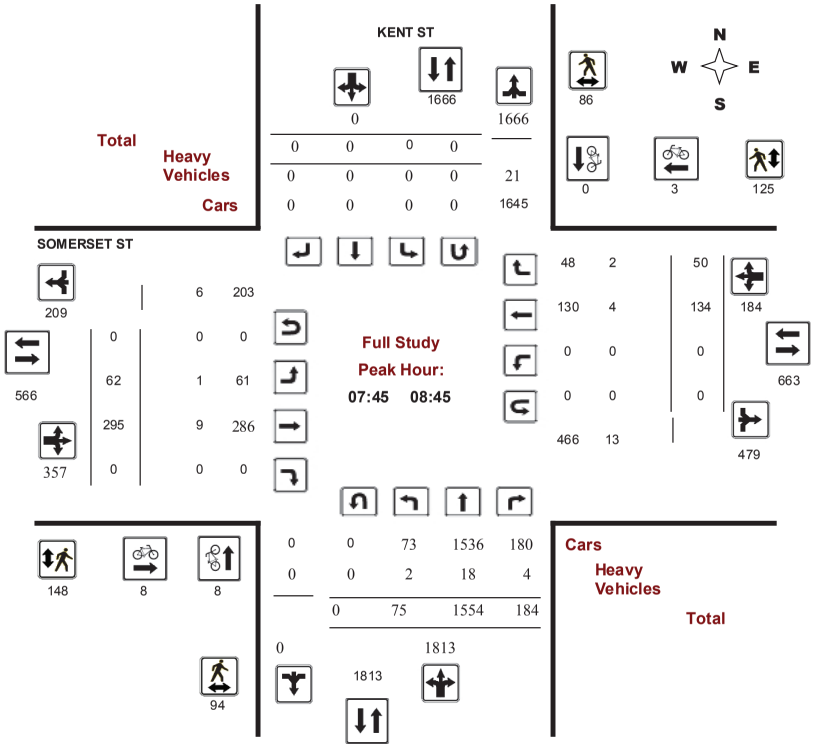
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36850

Start Time: 07:00 **Device:** Miovision



Comments

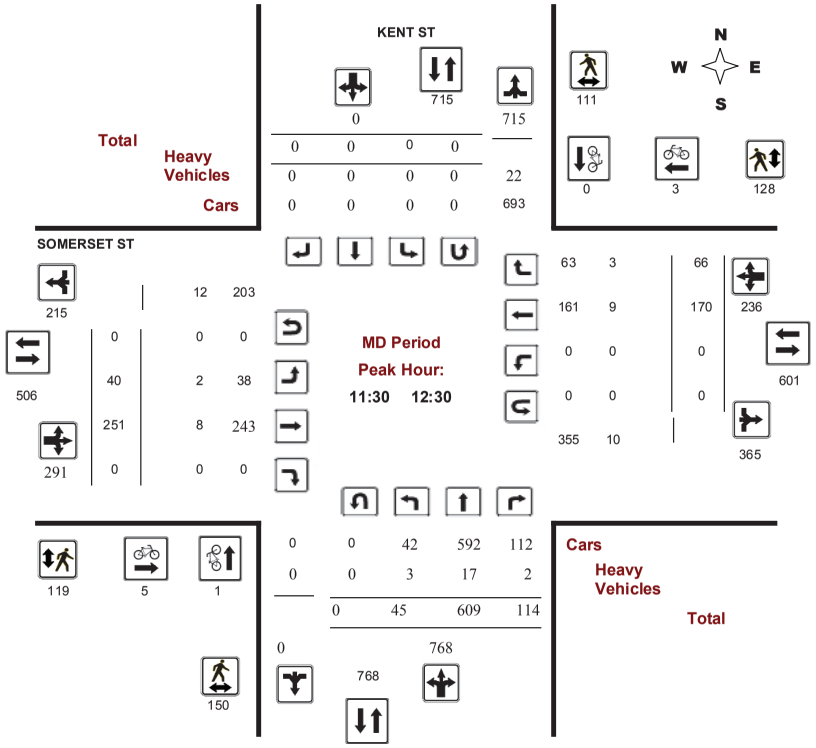
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36850

Start Time: 07:00 **Device:** Miovision



Comments

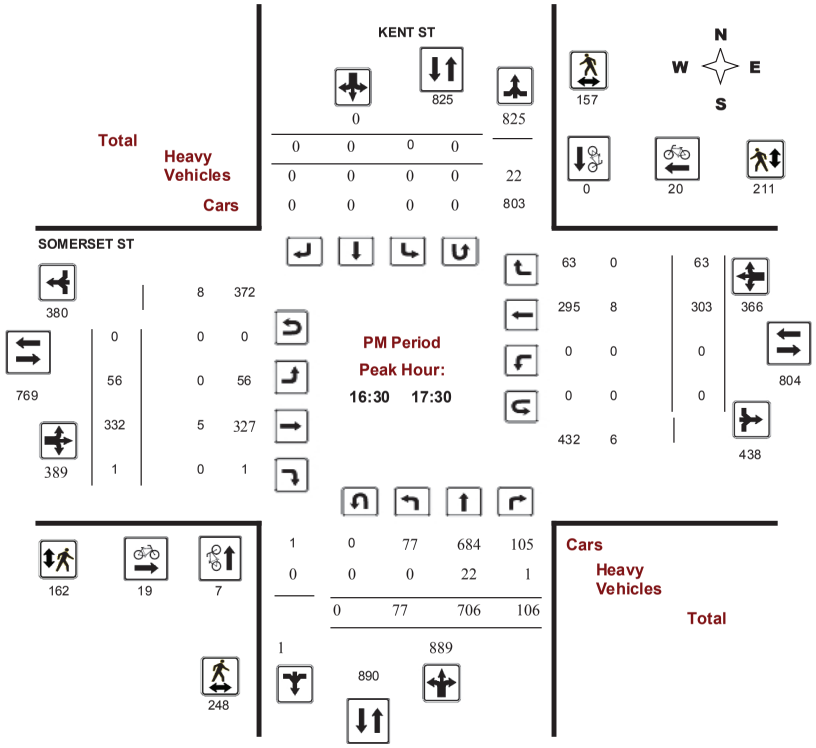
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36850

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

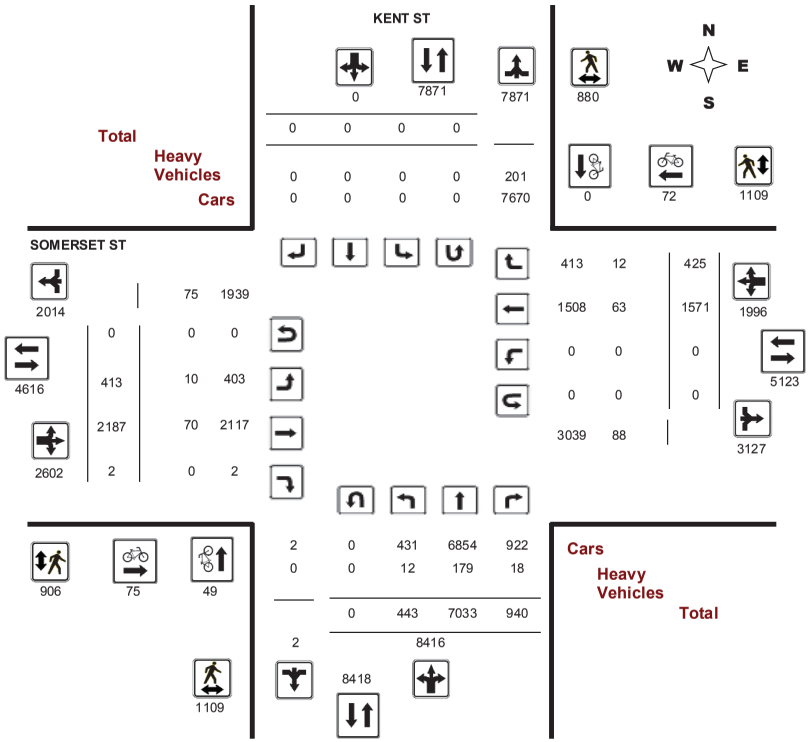
Turning Movement Count - Full Study Diagram

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017

WO#: 36850

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 36850

Turning Movement Count - Full Study Summary Report

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	KENT ST									SOMERSET ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	53	1393	126	**1572**	0	0	0	**0**	**1572**	46	245	0	**291**	0	93	44	**137**	**428**	**2000**
08:00 09:00	69	1516	190	**1775**	0	0	0	**0**	**1775**	68	301	0	**369**	0	152	48	**200**	**569**	**2344**
09:00 10:00	48	944	106	**1098**	0	0	0	**0**	**1098**	56	233	0	**289**	0	166	40	**206**	**495**	**1593**
11:30 12:30	45	609	114	**768**	0	0	0	**0**	**768**	40	251	0	**291**	0	170	66	**236**	**527**	**1295**
12:30 13:30	42	530	90	**662**	0	0	0	**0**	**662**	45	242	1	**288**	0	161	41	**202**	**490**	**1152**
15:00 16:00	56	651	113	**820**	0	0	0	**0**	**820**	35	305	0	**340**	0	251	56	**307**	**647**	**1467**
16:00 17:00	64	682	96	**842**	0	0	0	**0**	**842**	61	330	1	**392**	0	318	66	**384**	**776**	**1618**
17:00 18:00	66	708	105	**879**	0	0	0	**0**	**879**	62	280	0	**342**	0	260	64	**324**	**666**	**1545**
Sub Total	443	7033	940	**8416**	0	0	0	**0**	**8416**	413	2187	2	**2602**	0	1571	425	**1996**	**4598**	**13014**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	443	7033	940	**8416**	0	0	0	**0**	**8416**	413	2187	2	**2602**	0	1571	425	**1996**	**4598**	**13014**
EQ 12Hr	616	9776	1307	**11698**	0	0	0	**0**	**11698**	574	3040	3	**3617**	0	2184	591	**2774**	**6391**	**18089**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	554	8798	1176	**10528**	0	0	0	**0**	**10528**	517	2736	3	**3255**	0	1965	532	**2497**	**5752**	**16280**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	726	11526	1540	**13792**	0	0	0	**0**	**13792**	677	3584	3	**4264**	0	2575	696	**3271**	**7535**	**21327**
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

W.O. 36850

Turning Movement Count - 15 Minute Summary Report

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

		KENT ST								SOMERSET ST									
		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	Grand Total
07:00	07:15	8	312	26	**346**	0	0	0	**0**	**346**	6	61	0	**67**	0	14	12	**26**	**93**	**439**
07:15	07:30	8	335	33	**376**	0	0	0	**0**	**376**	7	46	0	**53**	0	22	9	**31**	**84**	**460**
07:30	07:45	12	348	30	**390**	0	0	0	**0**	**390**	16	65	0	**81**	0	35	11	**46**	**127**	**517**
07:45	08:00	25	398	37	**460**	0	0	0	**0**	**460**	17	73	0	**90**	0	22	12	**34**	**124**	**584**
08:00	08:15	17	373	39	**429**	0	0	0	**0**	**429**	14	68	0	**82**	0	29	12	**41**	**123**	**552**
08:15	08:30	18	416	46	**480**	0	0	0	**0**	**480**	12	67	0	**79**	0	41	15	**56**	**135**	**615**
08:30	08:45	15	367	62	**444**	0	0	0	**0**	**444**	19	87	0	**106**	0	42	11	**53**	**159**	**603**
08:45	09:00	19	360	43	**422**	0	0	0	**0**	**422**	23	79	0	**102**	0	40	10	**50**	**152**	**574**
09:00	09:15	9	306	34	**349**	0	0	0	**0**	**349**	14	59	0	**73**	0	42	11	**53**	**126**	**475**
09:15	09:30	16	250	20	**286**	0	0	0	**0**	**286**	13	60	0	**73**	0	42	9	**51**	**124**	**410**
09:30	09:45	10	202	27	**239**	0	0	0	**0**	**239**	13	55	0	**68**	0	38	13	**51**	**119**	**358**
09:45	10:00	13	186	25	**224**	0	0	0	**0**	**224**	16	59	0	**75**	0	44	7	**51**	**126**	**350**
11:30	11:45	12	145	31	**188**	0	0	0	**0**	**188**	10	61	0	**71**	0	40	22	**62**	**133**	**321**
11:45	12:00	9	197	28	**234**	0	0	0	**0**	**234**	12	63	0	**75**	0	49	12	**61**	**136**	**370**
12:00	12:15	15	125	27	**167**	0	0	0	**0**	**167**	9	66	0	**75**	0	47	17	**64**	**139**	**306**
12:15	12:30	9	142	28	**179**	0	0	0	**0**	**179**	9	61	0	**70**	0	34	15	**49**	**119**	**298**
12:30	12:45	9	139	23	**171**	0	0	0	**0**	**171**	13	56	0	**69**	0	48	9	**57**	**126**	**297**
12:45	13:00	14	121	24	**159**	0	0	0	**0**	**159**	8	64	0	**72**	0	37	9	**46**	**118**	**277**
13:00	13:15	8	141	21	**170**	0	0	0	**0**	**170**	8	68	0	**76**	0	44	19	**63**	**139**	**309**
13:15	13:30	11	129	22	**162**	0	0	0	**0**	**162**	16	54	1	**71**	0	32	4	**36**	**107**	**269**
15:00	15:15	11	144	30	**185**	0	0	0	**0**	**185**	3	80	0	**83**	0	53	20	**73**	**156**	**341**
15:15	15:30	16	183	26	**225**	0	0	0	**0**	**225**	13	78	0	**91**	0	60	8	**68**	**159**	**384**
15:30	15:45	15	175	17	**207**	0	0	0	**0**	**207**	9	72	0	**81**	0	70	13	**83**	**164**	**371**
15:45	16:00	14	149	40	**203**	0	0	0	**0**	**203**	10	75	0	**85**	0	68	15	**83**	**168**	**371**
16:00	16:15	18	158	21	**197**	0	0	0	**0**	**197**	18	88	0	**106**	0	73	16	**89**	**195**	**392**
16:15	16:30	13	172	17	**202**	0	0	0	**0**	**202**	15	64	0	**79**	0	85	22	**107**	**186**	**388**
16:30	16:45	14	181	26	**221**	0	0	0	**0**	**221**	12	85	0	**97**	0	82	11	**93**	**190**	**411**
16:45	17:00	19	171	32	**222**	0	0	0	**0**	**222**	16	93	1	**110**	0	78	17	**95**	**205**	**427**
17:00	17:15	24	167	29	**220**	0	0	0	**0**	**220**	9	76	0	**85**	0	76	12	**88**	**173**	**393**
17:15	17:30	20	187	19	**226**	0	0	0	**0**	**226**	19	78	0	**97**	0	67	23	**90**	**187**	**413**
17:30	17:45	7	193	24	**224**	0	0	0	**0**	**224**	16	69	0	**85**	0	68	18	**86**	**171**	**395**
17:45	18:00	15	161	33	**209**	0	0	0	**0**	**209**	18	57	0	**75**	0	49	11	**60**	**135**	**344**
TOTAL:		443	7033	940	**8416**	0	0	0	**0**	**8416**	413	2187	2	**2602**	0	1571	425	**1996**	**4598**	**13014**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36850

KENT ST @ SOMERSET ST

Count Date: Wednesday, April 05, 2017

Start Time: 07:00

	KENT ST			SOMERSET ST			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	8	0	**8**	12	4	**16**	**24**
08:00 09:00	10	0	**10**	8	5	**13**	**23**
09:00 10:00	7	0	**7**	7	6	**13**	**20**
11:30 12:30	1	0	**1**	5	3	**8**	**9**
12:30 13:30	4	0	**4**	11	8	**19**	**23**
15:00 16:00	4	0	**4**	8	10	**18**	**22**
16:00 17:00	8	0	**8**	18	20	**38**	**46**
17:00 18:00	7	0	**7**	6	16	**22**	**29**
Total	49	0	**49**	75	72	**147**	**196**

Comment:

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. 36850

Turning Movement Count - Heavy Vehicle Report

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017

	KENT ST								SOMERSET ST										
	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	Grand Total
07:00 08:00	2	18	1	**21**	0	0	0	**0**	**21**	2	10	0	**12**	0	7	2	**9**	**21**	**42**
08:00 09:00	3	20	5	**28**	0	0	0	**0**	**28**	2	13	0	**15**	0	6	2	**8**	**23**	**51**
09:00 10:00	2	30	3	**35**	0	0	0	**0**	**35**	1	15	0	**16**	0	13	1	**14**	**30**	**65**
11:30 12:30	3	17	2	**22**	0	0	0	**0**	**22**	2	8	0	**10**	0	9	3	**12**	**22**	**44**
12:30 13:30	1	14	0	**15**	0	0	0	**0**	**15**	2	5	0	**7**	0	6	2	**8**	**15**	**30**
15:00 16:00	0	34	5	**39**	0	0	0	**0**	**39**	0	7	0	**7**	0	8	0	**8**	**15**	**54**
16:00 17:00	1	27	1	**29**	0	0	0	**0**	**29**	1	7	0	**8**	0	7	1	**8**	**16**	**45**
17:00 18:00	0	19	1	**20**	0	0	0	**0**	**20**	0	5	0	**5**	0	7	1	**8**	**13**	**33**
Sub Total	12	179	18	**209**	0	0	0	**0**	**209**	10	70	0	**80**	0	63	12	**75**	**155**	**364**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	12	179	18	**0**	0	0	0	**0**	**209**	10	70	0	**80**	0	63	12	**75**	**155**	**364**

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 36850

Turning Movement Count - Pedestrian Volume Report

KENT ST @ SOMERSET ST

Count Date: Wednesday, April 05, 2017 **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	2	7	**9**	3	12	**15**	**24**
07:15 07:30	11	13	**24**	14	14	**28**	**52**
07:30 07:45	5	15	**20**	10	24	**34**	**54**
07:45 08:00	23	21	**44**	36	27	**63**	**107**
07:00 08:00	41	56	**97**	63	77	**140**	**237**
08:00 08:15	22	18	**40**	27	27	**54**	**94**
08:15 08:30	17	22	**39**	32	38	**70**	**109**
08:30 08:45	32	25	**57**	53	33	**86**	**143**
08:45 09:00	26	22	**48**	35	29	**64**	**112**
08:00 09:00	97	87	**184**	147	127	**274**	**458**
09:00 09:15	30	17	**47**	33	22	**55**	**102**
09:15 09:30	22	16	**38**	30	30	**60**	**98**
09:30 09:45	20	16	**36**	19	14	**33**	**69**
09:45 10:00	23	16	**39**	18	25	**43**	**82**
09:00 10:00	95	65	**160**	100	91	**191**	**351**
11:30 11:45	36	17	**53**	12	22	**34**	**87**
11:45 12:00	42	24	**66**	36	32	**68**	**134**
12:00 12:15	35	33	**68**	43	39	**82**	**150**
12:15 12:30	37	37	**74**	28	35	**63**	**137**
11:30 12:30	150	111	**261**	119	128	**247**	**508**
12:30 12:45	27	38	**65**	28	35	**63**	**128**
12:45 13:00	40	33	**73**	33	36	**69**	**142**
13:00 13:15	32	29	**61**	29	37	**66**	**127**
13:15 13:30	23	29	**52**	12	32	**44**	**96**
12:30 13:30	122	129	**251**	102	140	**242**	**493**
15:00 15:15	28	32	**60**	30	31	**61**	**121**
15:15 15:30	19	30	**49**	29	27	**56**	**105**
15:30 15:45	55	27	**82**	32	45	**77**	**159**
15:45 16:00	30	40	**70**	18	39	**57**	**127**
15:00 16:00	132	129	**261**	109	142	**251**	**512**
16:00 16:15	49	29	**78**	19	56	**75**	**153**
16:15 16:30	60	38	**98**	38	53	**91**	**189**
16:30 16:45	66	45	**111**	51	70	**121**	**232**
16:45 17:00	55	32	**87**	46	54	**100**	**187**
16:00 17:00	230	144	**374**	154	233	**387**	**761**
17:00 17:15	71	40	**111**	33	45	**78**	**189**
17:15 17:30	56	40	**96**	32	42	**74**	**170**
17:30 17:45	50	27	**77**	16	44	**60**	**137**
17:45 18:00	65	52	**117**	31	40	**71**	**188**
17:00 18:00	242	159	**401**	112	171	**283**	**684**
Total	1109	880	**1989**	906	1109	**2015**	**4004**

Comment:

Transportation Services - Traffic Services

Work Order 36850

Turning Movement Count - 15 Min U-Turn Total Report

KENT ST @ SOMERSET ST

Survey Date: Wednesday, April 05, 2017

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
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
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		0	0	0	0	0

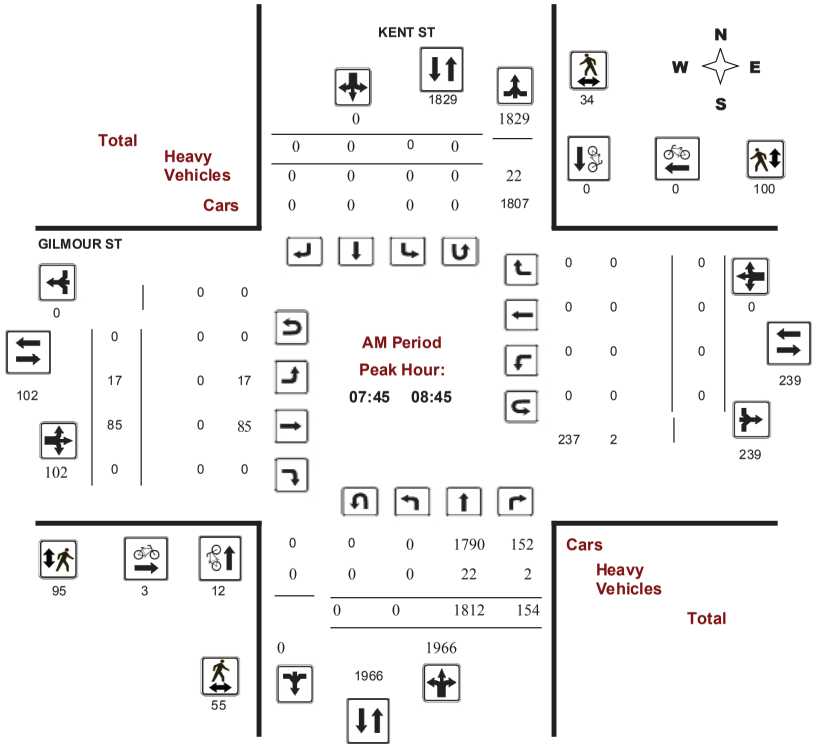
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36849

Start Time: 07:00 **Device:** Miovision



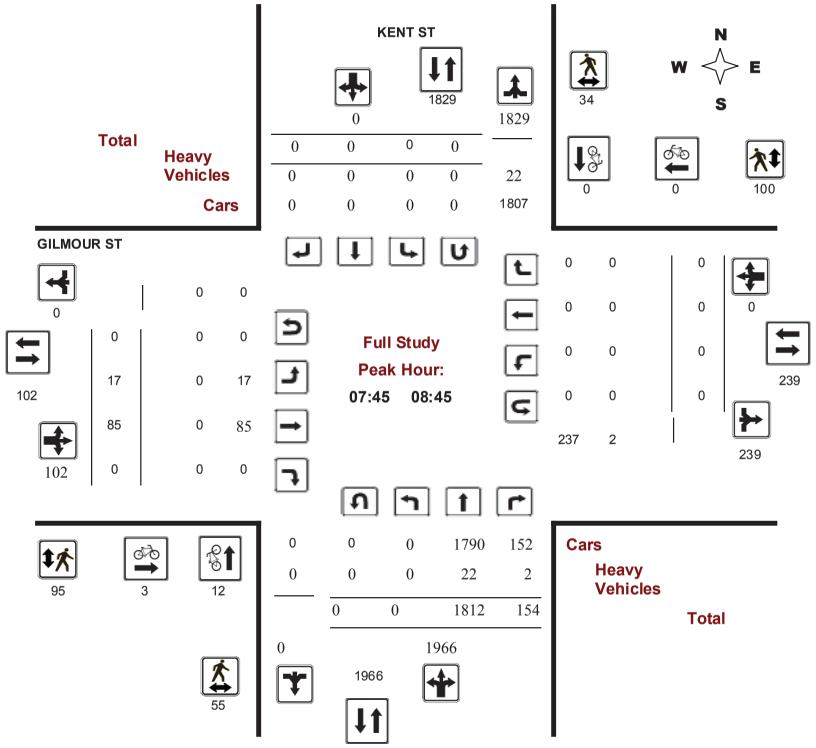
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36849

Start Time: 07:00 **Device:** Miovision



Comments

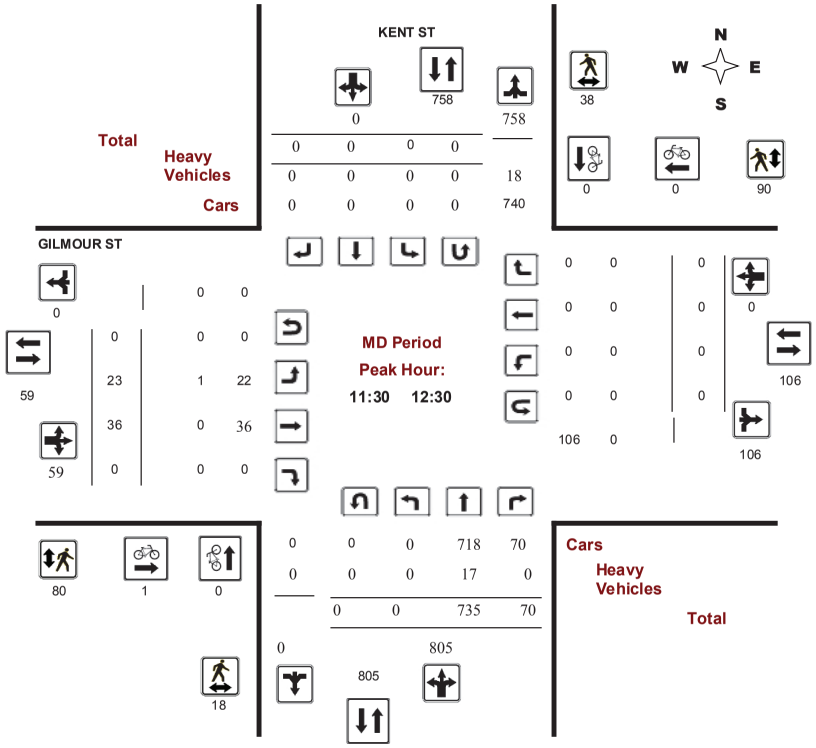
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36849

Start Time: 07:00 **Device:** Miovision



Comments

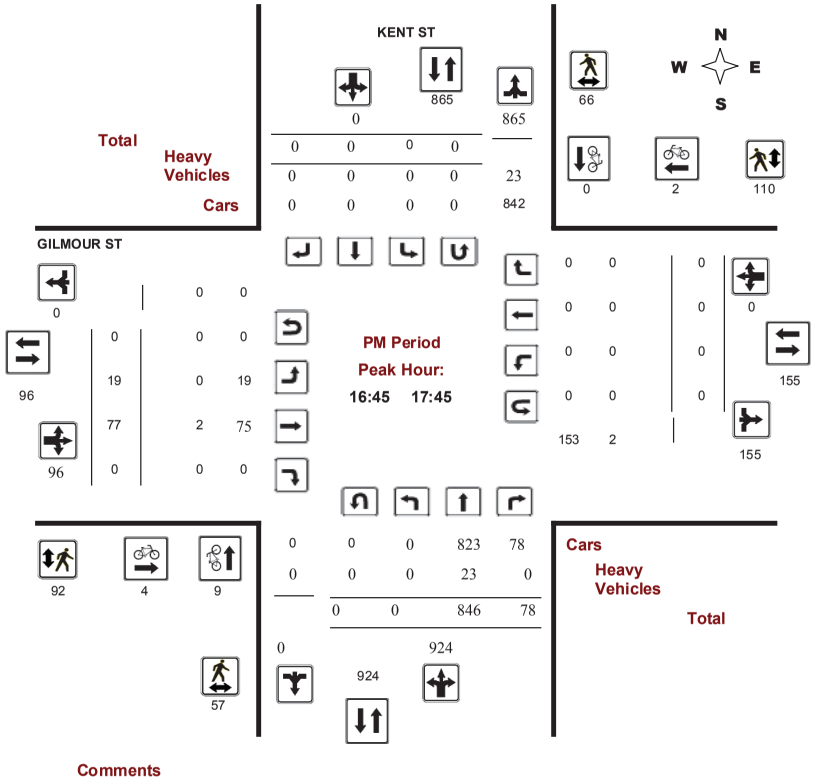
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017 **WO No:** 36849

Start Time: 07:00 **Device:** Miovision


KENT ST
GILMOUR ST
N
W
E
S
Total
Heavy Vehicles
Cars
PM Period
Peak Hour:
16:45 17:45
865
865
0
66
0
2
110
23
842
96
19
77
0
96
0
0
0

Transportation Services - Traffic Services

Work Order 36849

Turning Movement Count - Full Study Summary Report

GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	KENT ST									GILMOUR ST										
	Northbound				Southbound					Eastbound				Westbound						
Period	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	0	1629	91	**1720**	0	0	0	**0**	**1720**	14	41	0	**55**	0	0	0	**0**	**55**	**1775**
08:00 09:00	0	1767	156	**1923**	0	0	0	**0**	**1923**	19	98	0	**117**	0	0	0	**0**	**117**	**2040**
09:00 10:00	0	1075	123	**1198**	0	0	0	**0**	**1198**	30	46	0	**76**	0	0	1	**1**	**77**	**1275**
11:30 12:30	0	735	70	**805**	0	0	0	**0**	**805**	23	36	0	**59**	0	0	0	**0**	**59**	**864**
12:30 13:30	0	638	86	**724**	0	0	0	**0**	**724**	18	60	0	**78**	0	0	0	**0**	**78**	**802**
15:00 16:00	0	777	83	**860**	0	0	0	**0**	**860**	24	45	0	**69**	0	0	0	**0**	**69**	**929**
16:00 17:00	0	792	86	**878**	0	0	0	**0**	**878**	15	60	0	**75**	0	0	0	**0**	**75**	**953**
17:00 18:00	0	850	69	**919**	0	0	0	**0**	**919**	18	73	0	**91**	0	0	0	**0**	**91**	**1010**
Sub Total	0	8263	764	**9027**	0	0	0	**0**	**9027**	161	459	0	**620**	0	0	1	**1**	**621**	**9648**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	8263	764	**9027**	0	0	0	**0**	**9027**	161	459	0	**620**	0	0	1	**1**	**621**	**9648**
EQ 12Hr	0	11486	1062	**12548**	0	0	0	**0**	**12548**	224	638	0	**862**	0	0	1	**1**	**863**	**13411**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**																			
AVG 12Hr	0	10337	956	**11293**	0	0	0	**0**	**11293**	201	574	0	**776**	0	0	1	**1**	**777**	**12070**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**																			
AVG 24Hr	0	13541	1252	**14794**	0	0	0	**0**	**14794**	264	752	0	**1016**	0	0	2	**2**	**1018**	**15812**
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

W.O. 36849

Turning Movement Count - 15 Minute Summary Report

GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

	KENT ST									GILMOUR ST									
	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	Grand Total
07:00 07:15	0	361	16	**377**	0	0	0	**0**	**377**	2	8	0	**10**	0	0	0	**0**	**10**	**387**
07:15 07:30	0	394	21	**415**	0	0	0	**0**	**415**	3	10	0	**13**	0	0	0	**0**	**13**	**428**
07:30 07:45	0	409	23	**432**	0	0	0	**0**	**432**	3	10	0	**13**	0	0	0	**0**	**13**	**445**
07:45 08:00	0	465	31	**496**	0	0	0	**0**	**496**	6	13	0	**19**	0	0	0	**0**	**19**	**515**
08:00 08:15	0	430	43	**473**	0	0	0	**0**	**473**	7	30	0	**37**	0	0	0	**0**	**37**	**510**
08:15 08:30	0	480	43	**523**	0	0	0	**0**	**523**	3	19	0	**22**	0	0	0	**0**	**22**	**545**
08:30 08:45	0	437	37	**474**	0	0	0	**0**	**474**	1	23	0	**24**	0	0	0	**0**	**24**	**498**
08:45 09:00	0	420	33	**453**	0	0	0	**0**	**453**	8	26	0	**34**	0	0	0	**0**	**34**	**487**
09:00 09:15	0	351	26	**377**	0	0	0	**0**	**377**	7	17	0	**24**	0	0	0	**0**	**24**	**401**
09:15 09:30	0	276	30	**306**	0	0	0	**0**	**306**	8	12	0	**20**	0	0	0	**0**	**20**	**326**
09:30 09:45	0	248	30	**278**	0	0	0	**0**	**278**	8	12	0	**20**	0	0	1	**1**	**21**	**299**
09:45 10:00	0	200	37	**237**	0	0	0	**0**	**237**	7	5	0	**12**	0	0	0	**0**	**12**	**249**
11:30 11:45	0	179	23	**202**	0	0	0	**0**	**202**	4	5	0	**9**	0	0	0	**0**	**9**	**211**
11:45 12:00	0	220	21	**241**	0	0	0	**0**	**241**	6	14	0	**20**	0	0	0	**0**	**20**	**261**
12:00 12:15	0	165	16	**181**	0	0	0	**0**	**181**	5	9	0	**14**	0	0	0	**0**	**14**	**195**
12:15 12:30	0	171	10	**181**	0	0	0	**0**	**181**	8	8	0	**16**	0	0	0	**0**	**16**	**197**
12:30 12:45	0	169	12	**181**	0	0	0	**0**	**181**	4	13	0	**17**	0	0	0	**0**	**17**	**198**
12:45 13:00	0	154	26	**180**	0	0	0	**0**	**180**	4	12	0	**16**	0	0	0	**0**	**16**	**196**
13:00 13:15	0	161	25	**186**	0	0	0	**0**	**186**	6	14	0	**20**	0	0	0	**0**	**20**	**206**
13:15 13:30	0	154	23	**177**	0	0	0	**0**	**177**	4	21	0	**25**	0	0	0	**0**	**25**	**202**
15:00 15:15	0	178	17	**195**	0	0	0	**0**	**195**	7	13	0	**20**	0	0	0	**0**	**20**	**215**
15:15 15:30	0	205	23	**228**	0	0	0	**0**	**228**	5	10	0	**15**	0	0	0	**0**	**15**	**243**
15:30 15:45	0	206	22	**228**	0	0	0	**0**	**228**	4	13	0	**17**	0	0	0	**0**	**17**	**245**
15:45 16:00	0	188	21	**209**	0	0	0	**0**	**209**	8	9	0	**17**	0	0	0	**0**	**17**	**226**
16:00 16:15	0	179	24	**203**	0	0	0	**0**	**203**	5	13	0	**18**	0	0	0	**0**	**18**	**221**
16:15 16:30	0	191	18	**209**	0	0	0	**0**	**209**	4	17	0	**21**	0	0	0	**0**	**21**	**230**
16:30 16:45	0	215	19	**234**	0	0	0	**0**	**234**	2	14	0	**16**	0	0	0	**0**	**16**	**250**
16:45 17:00	0	207	25	**232**	0	0	0	**0**	**232**	4	16	0	**20**	0	0	0	**0**	**20**	**252**
17:00 17:15	0	200	13	**213**	0	0	0	**0**	**213**	6	21	0	**27**	0	0	0	**0**	**27**	**240**
17:15 17:30	0	226	26	**252**	0	0	0	**0**	**252**	7	18	0	**25**	0	0	0	**0**	**25**	**277**
17:30 17:45	0	213	14	**227**	0	0	0	**0**	**227**	2	22	0	**24**	0	0	0	**0**	**24**	**251**
17:45 18:00	0	211	16	**227**	0	0	0	**0**	**227**	3	12	0	**15**	0	0	0	**0**	**15**	**242**
TOTAL:	0	8263	764	**9027**	0	0	0	**0**	**9027**	161	459	0	**620**	0	0	1	**1**	**621**	**9648**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36849

GILMOUR ST @ KENT ST

Count Date: Wednesday, April 05, 2017 **Start Time:** 07:00

	KENT ST			GILMOUR ST			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	7	0	**7**	3	0	**3**	**10**
08:00 09:00	13	0	**13**	2	0	**2**	**15**
09:00 10:00	3	0	**3**	5	0	**5**	**8**
11:30 12:30	0	0	**0**	1	0	**1**	**1**
12:30 13:30	3	0	**3**	3	0	**3**	**6**
15:00 16:00	5	0	**5**	4	0	**4**	**9**
16:00 17:00	9	0	**9**	1	0	**1**	**10**
17:00 18:00	11	0	**11**	4	2	**6**	**17**
Total	51	0	**51**	23	2	**25**	**76**

Comment:

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

Turning Movement Count - Heavy Vehicle Report

W.O. 36849

GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017

	KENT ST									GILMOUR ST									
	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**	**Grand Total**
07:00 08:00	0	22	2	**24**	0	0	0	**0**	**24**	0	0	0	**0**	0	0	0	**0**	**0**	**24**
08:00 09:00	0	24	2	**26**	0	0	0	**0**	**26**	0	1	0	**1**	0	0	0	**0**	**1**	**27**
09:00 10:00	0	28	5	**33**	0	0	0	**0**	**33**	1	0	0	**1**	0	0	0	**0**	**1**	**34**
11:30 12:30	0	17	0	**17**	0	0	0	**0**	**17**	1	0	0	**1**	0	0	0	**0**	**1**	**18**
12:30 13:30	0	17	1	**18**	0	0	0	**0**	**18**	0	1	0	**1**	0	0	0	**0**	**1**	**19**
15:00 16:00	0	33	4	**37**	0	0	0	**0**	**37**	2	3	0	**5**	0	0	0	**0**	**5**	**42**
16:00 17:00	0	30	3	**33**	0	0	0	**0**	**33**	0	1	0	**1**	0	0	0	**0**	**1**	**34**
17:00 18:00	0	18	0	**18**	0	0	0	**0**	**18**	0	2	0	**2**	0	0	0	**0**	**2**	**20**
Sub Total	0	189	17	**206**	0	0	0	**0**	**206**	4	8	0	**12**	0	0	0	**0**	**12**	**218**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	189	17	**0**	0	0	0	**0**	**206**	4	8	0	**12**	0	0	0	**0**	**12**	**218**

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 36849

Turning Movement Count - Pedestrian Volume Report

GILMOUR ST @ KENT ST

Count Date: Wednesday, April 05, 2017 **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	3	9	**12**	3	13	**16**	**28**
07:15 07:30	5	7	**12**	9	6	**15**	**27**
07:30 07:45	1	5	**6**	5	18	**23**	**29**
07:45 08:00	12	8	**20**	14	22	**36**	**56**
07:00 08:00	21	29	**50**	31	59	**90**	**140**
08:00 08:15	10	8	**18**	21	22	**43**	**61**
08:15 08:30	15	7	**22**	32	24	**56**	**78**
08:30 08:45	18	11	**29**	28	32	**60**	**89**
08:45 09:00	18	9	**27**	17	21	**38**	**65**
08:00 09:00	61	35	**96**	98	99	**197**	**293**
09:00 09:15	11	6	**17**	19	17	**36**	**53**
09:15 09:30	15	10	**25**	14	11	**25**	**50**
09:30 09:45	9	7	**16**	17	19	**36**	**52**
09:45 10:00	8	13	**21**	14	20	**34**	**55**
09:00 10:00	43	36	**79**	64	67	**131**	**210**
11:30 11:45	3	9	**12**	12	17	**29**	**41**
11:45 12:00	4	10	**14**	22	30	**52**	**66**
12:00 12:15	4	9	**13**	19	23	**42**	**55**
12:15 12:30	7	10	**17**	27	20	**47**	**64**
11:30 12:30	18	38	**56**	80	90	**170**	**226**
12:30 12:45	11	14	**25**	27	30	**57**	**82**
12:45 13:00	8	13	**21**	16	23	**39**	**60**
13:00 13:15	9	15	**24**	12	16	**28**	**52**
13:15 13:30	9	12	**21**	8	17	**25**	**46**
12:30 13:30	37	54	**91**	63	86	**149**	**240**
15:00 15:15	8	9	**17**	16	20	**36**	**53**
15:15 15:30	13	20	**33**	18	18	**36**	**69**
15:30 15:45	13	13	**26**	25	24	**49**	**75**
15:45 16:00	9	17	**26**	13	31	**44**	**70**
15:00 16:00	43	59	**102**	72	93	**165**	**267**
16:00 16:15	6	11	**17**	14	22	**36**	**53**
16:15 16:30	8	16	**24**	17	28	**45**	**69**
16:30 16:45	11	17	**28**	28	31	**59**	**87**
16:45 17:00	15	21	**36**	23	45	**68**	**104**
16:00 17:00	40	65	**105**	82	126	**208**	**313**
17:00 17:15	15	17	**32**	18	29	**47**	**79**
17:15 17:30	20	11	**31**	28	19	**47**	**78**
17:30 17:45	7	17	**24**	23	17	**40**	**64**
17:45 18:00	8	6	**14**	15	14	**29**	**43**
17:00 18:00	50	51	**101**	84	79	**163**	**264**
Total	313	367	**680**	574	699	**1273**	**1953**

Comment:

Transportation Services - Traffic Services

Work Order 36849

Turning Movement Count - 15 Min U-Turn Total Report

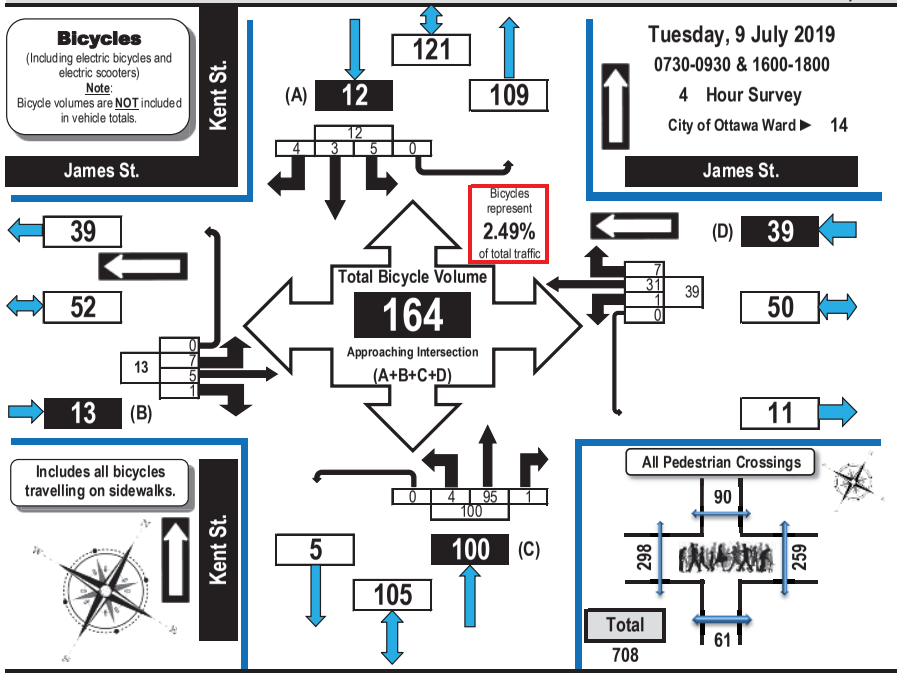
GILMOUR ST @ KENT ST

Survey Date: Wednesday, April 05, 2017

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
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
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		0	0	0	0	0

Turning Movement Count
Bicycle Summary
Flow Diagram

James Street & Kent Street — **Ottawa, ON**



	James St. Eastbound					James St. Westbound					Kent St. Northbound					Kent St. Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0730-0800	0	0	1	0	1	0	1	2	0	3	1	11	0	0	12	1	0	0	0	1	17
0800-0900	5	1	0	0	6	0	4	2	0	6	2	48	0	0	50	2	0	0	0	2	64
0900-0930	2	0	0	0	2	0	0	0	0	0	0	9	0	0	9	1	0	0	0	1	12
1600-1700	0	2	0	0	2	1	10	1	0	12	0	13	0	0	13	1	1	4	0	6	33
1700-1800	0	2	0	0	2	0	16	2	0	18	1	14	1	0	16	0	2	0	0	2	38
Totals	7	5	1	0	13	1	31	7	0	39	4	95	1	0	100	5	3	4	0	12	164

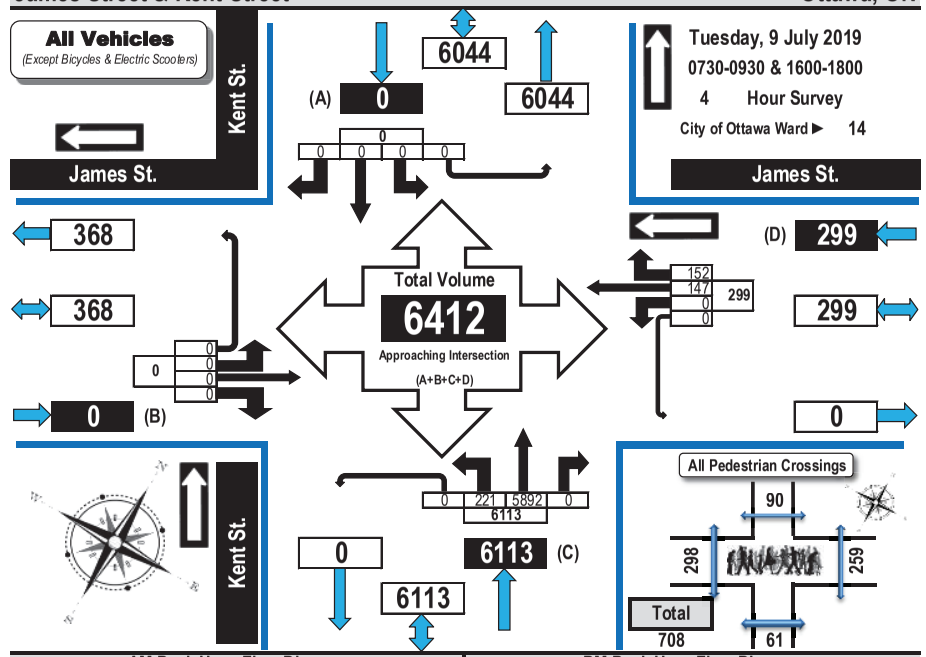
Comments:

Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. Kent Street is one way northbound and James Street is one way westbound. Bicycle volumes were counted on all approaches.

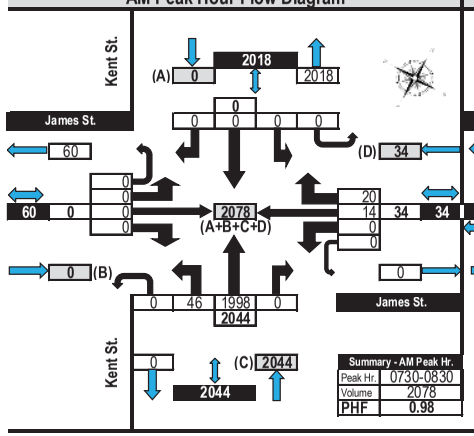
Turning Movement Count
Summary, AM and PM Peak Hour
Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

James Street & Kent Street — **Ottawa, ON**

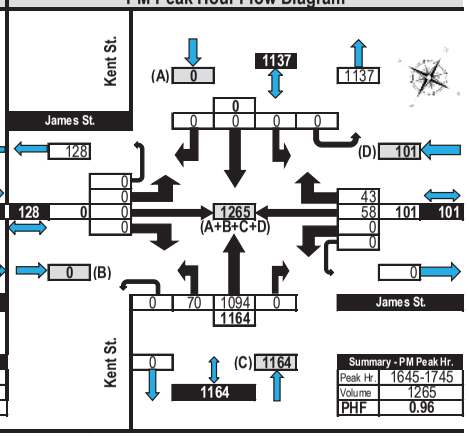


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0730-0830
Volume	2078
PHF	0.98

PM Peak Hour Flow Diagram



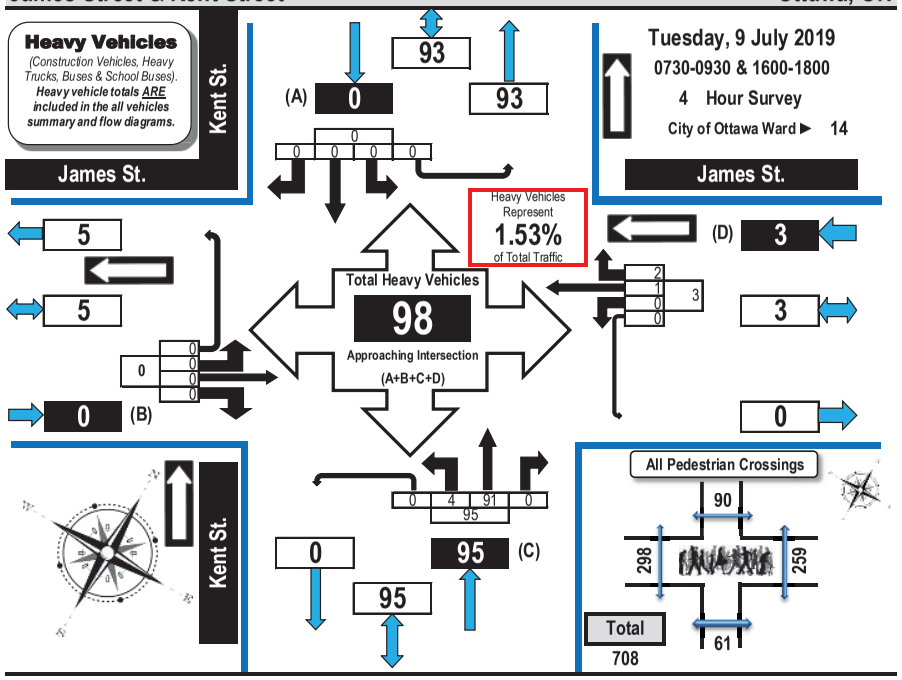
Summary - PM Peak Hr.	
Peak Hr.	1645-1745
Volume	1265
PHF	0.96

Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

James Street & Kent Street — **Ottawa, ON**

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Tuesday, 9 July 2019
0730-0930 & 1600-1800
4 Hour Survey
City of Ottawa Ward ► 14



	James St. Eastbound					James St. Westbound					Kent St. Northbound					Kent St. Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0730-0800	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	10
0800-0900	0	0	0	0	0	0	1	1	0	2	3	33	0	0	36	0	0	0	0	0	38
0900-0930	0	0	0	0	0	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	15
1600-1700	0	0	0	0	0	0	0	0	0	0	1	24	0	0	25	0	0	0	0	0	25
1700-1800	0	0	0	0	0	0	0	1	0	1	0	9	0	0	9	0	0	0	0	0	10
Totals	0	0	0	0	0	0	1	2	0	3	4	91	0	0	95	0	0	0	0	0	98

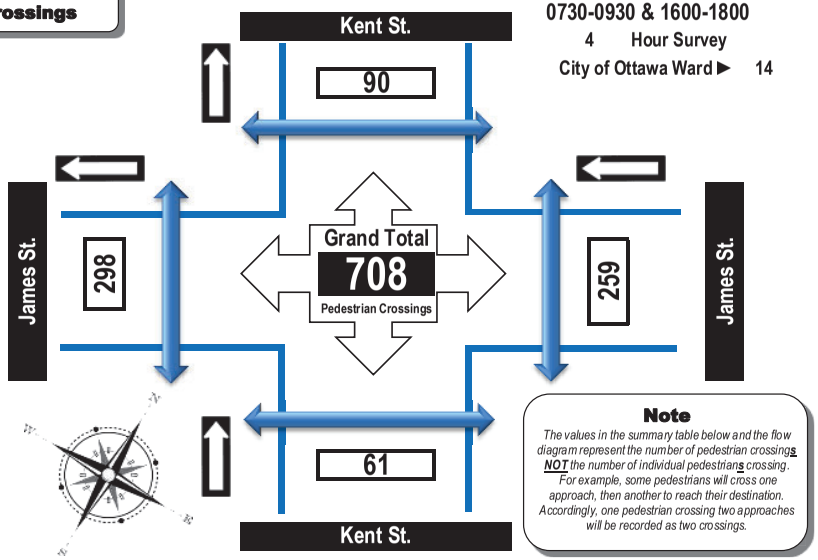
Comments:
Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. Kent Street is one way northbound and James Street is one way westbound. Bicycle volumes were counted on all approaches.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

James Street & Kent Street — **Ottawa, ON**

Pedestrian Crossings

Tuesday, 9 July 2019
0730-0930 & 1600-1800
4 Hour Survey
City of Ottawa Ward ► 14



Note
*The values in the summary table below and the flow diagram represent the number of pedestrian crossings **NOT** the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing James St.	East Side Crossing James St.	Street Total	South Side Crossing Kent St.	North Side Crossing Kent St.	Street Total	Grand Total
0730-0800	26	28	54	1	10	11	65
0800-0900	72	77	149	11	23	34	183
0900-0930	21	38	59	11	8	19	78
1600-1700	95	63	158	17	25	42	200
1700-1800	84	53	137	21	24	45	182
Totals	298	259	557	61	90	151	708

Comments:
Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. Kent Street is one way northbound and James Street is one way westbound. Bicycle volumes were counted on all approaches.

Turning Movement Count
Summary Report
AADT and Expansion Factors

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

James Street & Kent Street — Ottawa, ON

Survey Date: Tuesday, 9 July 2019 **Start Time:** 0730 **AADT Factor:** 0.9
Weather AM: Clear + 16ºC **Survey Duration:** 4 Hrs. **Survey Hours:** 0730-0930 & 1600-1800
Weather PM: Partly Cloudy +30ºC **Surveyor(s):** Carmody

	James St. Eastbound					James St. Westbound						Kent St. Northbound					Kent St. Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0730-0800	0	0	0	0	0	0	7	8	0	15	15	17	1024	0	0	1041	0	0	0	0	0	1041	1056
0800-0900	0	0	0	0	0	0	18	33	0	51	51	49	1904	0	0	1953	0	0	0	0	0	1953	2004
0900-0930	0	0	0	0	0	0	11	17	0	28	28	29	826	0	0	855	0	0	0	0	0	855	883
1600-1700	0	0	0	0	0	0	61	53	0	114	114	56	1045	0	0	1101	0	0	0	0	0	1101	1215
1700-1800	0	0	0	0	0	0	50	41	0	91	91	70	1093	0	0	1163	0	0	0	0	0	1163	1254
Totals	0	0	0	0	0	0	147	152	0	299	299	221	5892	0	0	6113	0	0	0	0	0	6113	6412

Equivalent 12 & 24-hour Vehicle Volumes including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9

AADT 12-hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.98 — Highest Hourly Vehicle Volume Between 0700h & 1000h

AM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
0730-0830	0	0	0	0	0	0	14	20	0	34	34	46	1998	0	0	2044	0	0	0	0	0	2044	2078

PM Peak Hour Factor ➡ 0.96 — Highest Hourly Vehicle Volume Between 1500h & 1800h

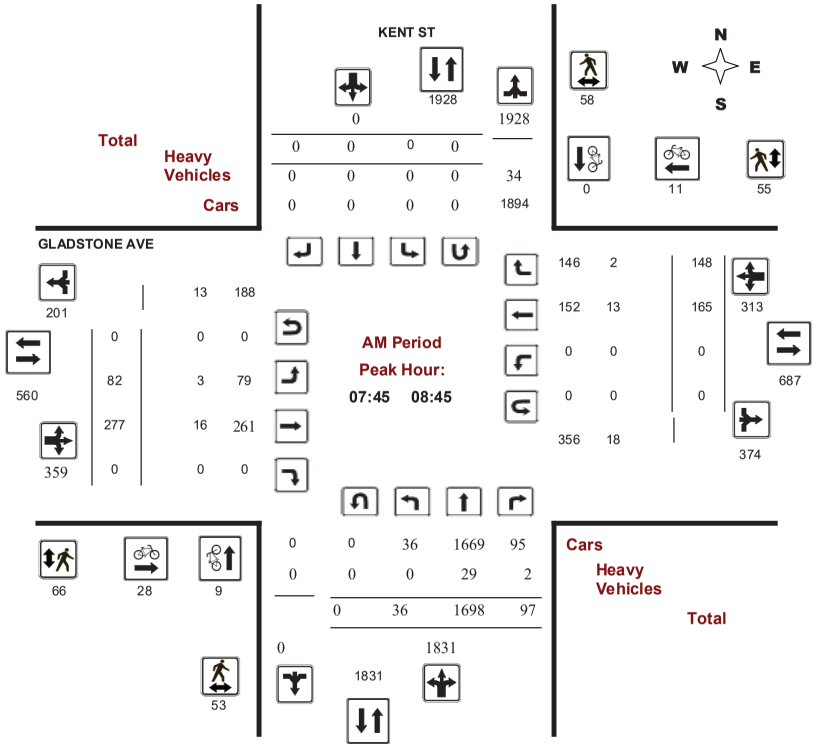
PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
1645-1745	0	0	0	0	0	0	58	43	0	101	101	70	1094	0	0	1164	0	0	0	0	0	1164	1265

Comments:
Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. Kent Street is one way northbound and James Street is one way westbound. Bicycle volumes were counted on all approaches.

Notes:
1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2.When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Transportation Services - Traffic Services
Turning Movement Count - Full Study Peak Hour Diagram
GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017 **WO No:** 36848
Start Time: 07:00 **Device:** Miovision



Comments

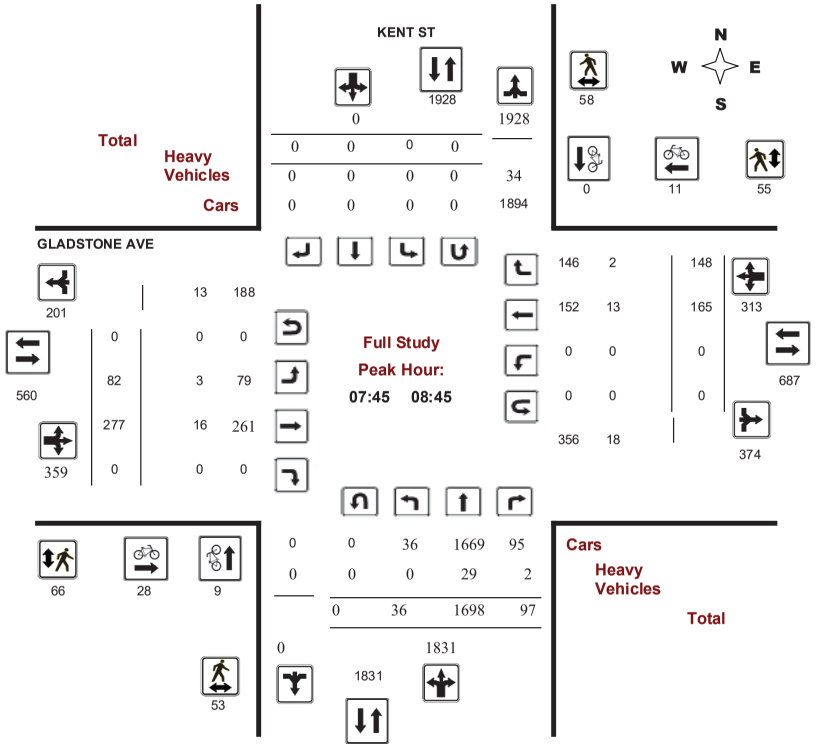
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017 **WO No:** 36848

Start Time: 07:00 **Device:** Miovision



Comments

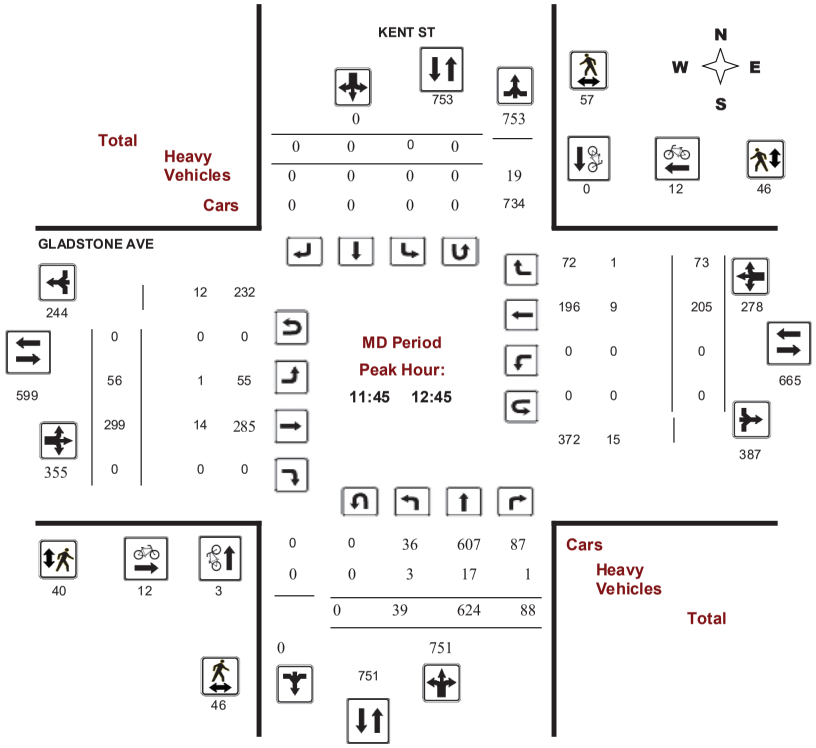
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017 **WO No:** 36848

Start Time: 07:00 **Device:** Miovision



Comments

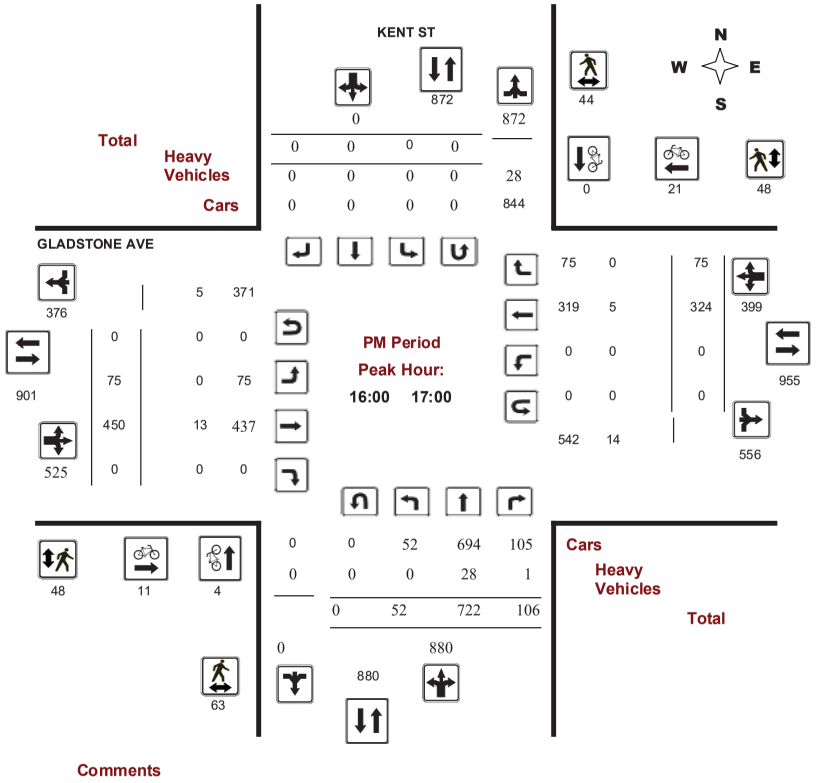
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017 **WO No:** 36848

Start Time: 07:00 **Device:** Miovision



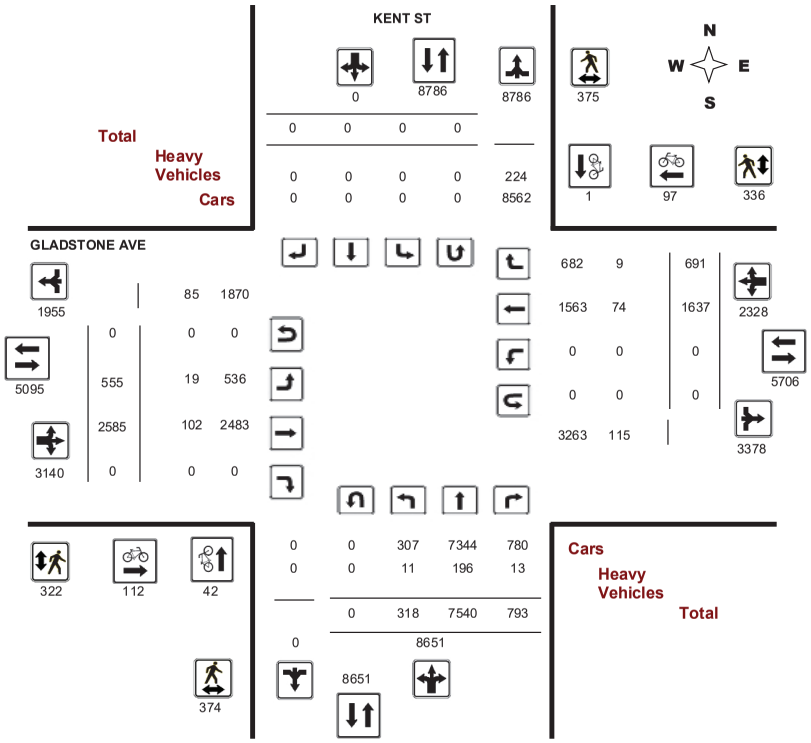
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017 **WO#:** 36848

Device: Miovision



Transportation Services - Traffic Services

Work Order 36848

Turning Movement Count - Full Study Summary Report

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	KENT ST									GLADSTONE AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	14	1536	96	**1646**	0	0	0	**0**	**1646**	61	214	0	**275**	0	100	104	**204**	**479**	**2125**
08:00 09:00	42	1679	98	**1819**	0	0	0	**0**	**1819**	82	291	0	**373**	0	172	130	**302**	**675**	**2494**
09:00 10:00	34	943	107	**1084**	0	0	0	**0**	**1084**	76	256	0	**332**	0	173	76	**249**	**581**	**1665**
11:30 12:30	36	633	80	**749**	0	0	0	**0**	**749**	55	288	0	**343**	0	182	77	**259**	**602**	**1351**
12:30 13:30	33	569	97	**699**	0	0	0	**0**	**699**	54	321	0	**375**	0	201	74	**275**	**650**	**1349**
15:00 16:00	47	667	108	**822**	0	0	0	**0**	**822**	66	394	0	**460**	0	237	72	**309**	**769**	**1591**
16:00 17:00	52	722	106	**880**	0	0	0	**0**	**880**	75	450	0	**525**	0	324	75	**399**	**924**	**1804**
17:00 18:00	60	791	101	**952**	0	0	0	**0**	**952**	86	371	0	**457**	0	248	83	**331**	**788**	**1740**
Sub Total	318	7540	793	**8651**	0	0	0	**0**	**8651**	555	2585	0	**3140**	0	1637	691	**2328**	**5468**	**14119**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	318	7540	793	**8651**	0	0	0	**0**	**8651**	555	2585	0	**3140**	0	1637	691	**2328**	**5468**	**14119**
EQ 12Hr	442	10481	1102	**12025**	0	0	0	**0**	**12025**	771	3593	0	**4365**	0	2275	960	**3236**	**7601**	**19626**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**																			
AVG 12Hr	398	9433	992	**10822**	0	0	0	**0**	**10822**	694	3234	0	**3928**	0	2048	864	**2912**	**6840**	**17662**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**																			
AVG 24Hr	521	12357	1300	**14177**	0	0	0	**0**	**14177**	910	4236	0	**5146**	0	2683	1132	**3815**	**8961**	**23138**
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

W.O. 36848

Turning Movement Count - 15 Minute Summary Report

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

	KENT ST									GLADSTONE AVE									
	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	Grand Total
07:00 07:15	1	319	24	**344**	0	0	0	**0**	**344**	17	51	0	**68**	0	20	10	**30**	**98**	**442**
07:15 07:30	2	382	24	**408**	0	0	0	**0**	**408**	13	40	0	**53**	0	18	21	**39**	**92**	**500**
07:30 07:45	6	402	25	**433**	0	0	0	**0**	**433**	15	64	0	**79**	0	22	31	**53**	**132**	**565**
07:45 08:00	5	433	23	**461**	0	0	0	**0**	**461**	16	59	0	**75**	0	40	42	**82**	**157**	**618**
08:00 08:15	8	428	33	**469**	0	0	0	**0**	**469**	22	79	0	**101**	0	31	42	**73**	**174**	**643**
08:15 08:30	7	435	19	**461**	0	0	0	**0**	**461**	22	70	0	**92**	0	50	28	**78**	**170**	**631**
08:30 08:45	16	402	22	**440**	0	0	0	**0**	**440**	22	69	0	**91**	0	44	36	**80**	**171**	**611**
08:45 09:00	11	414	24	**449**	0	0	0	**0**	**449**	16	73	0	**89**	0	47	24	**71**	**160**	**609**
09:00 09:15	6	319	28	**353**	0	0	0	**0**	**353**	17	66	0	**83**	0	51	31	**82**	**165**	**518**
09:15 09:30	14	243	26	**283**	0	0	0	**0**	**283**	27	66	0	**93**	0	33	17	**50**	**143**	**426**
09:30 09:45	4	177	29	**210**	0	0	0	**0**	**210**	15	61	0	**76**	0	41	15	**56**	**132**	**342**
09:45 10:00	10	204	24	**238**	0	0	0	**0**	**238**	17	63	0	**80**	0	48	13	**61**	**141**	**379**
11:30 11:45	6	158	12	**176**	0	0	0	**0**	**176**	14	67	0	**81**	0	33	18	**51**	**132**	**308**
11:45 12:00	8	167	28	**203**	0	0	0	**0**	**203**	17	82	0	**99**	0	55	25	**80**	**179**	**382**
12:00 12:15	14	153	25	**192**	0	0	0	**0**	**192**	13	65	0	**78**	0	44	19	**63**	**141**	**333**
12:15 12:30	8	155	15	**178**	0	0	0	**0**	**178**	11	74	0	**85**	0	50	15	**65**	**150**	**328**
12:30 12:45	9	149	20	**178**	0	0	0	**0**	**178**	15	78	0	**93**	0	56	14	**70**	**163**	**341**
12:45 13:00	6	153	19	**178**	0	0	0	**0**	**178**	12	66	0	**78**	0	47	22	**69**	**147**	**325**
13:00 13:15	15	141	32	**188**	0	0	0	**0**	**188**	16	96	0	**112**	0	48	19	**67**	**179**	**367**
13:15 13:30	3	126	26	**155**	0	0	0	**0**	**155**	11	81	0	**92**	0	50	19	**69**	**161**	**316**
15:00 15:15	11	154	15	**180**	0	0	0	**0**	**180**	20	85	0	**105**	0	59	19	**78**	**183**	**363**
15:15 15:30	14	157	28	**199**	0	0	0	**0**	**199**	18	102	0	**120**	0	56	21	**77**	**197**	**396**
15:30 15:45	9	167	21	**197**	0	0	0	**0**	**197**	16	107	0	**123**	0	65	14	**79**	**202**	**399**
15:45 16:00	13	189	44	**246**	0	0	0	**0**	**246**	12	100	0	**112**	0	57	18	**75**	**187**	**433**
16:00 16:15	14	172	23	**209**	0	0	0	**0**	**209**	14	118	0	**132**	0	86	25	**111**	**243**	**452**
16:15 16:30	9	195	28	**232**	0	0	0	**0**	**232**	24	111	0	**135**	0	71	19	**90**	**225**	**457**
16:30 16:45	16	167	18	**201**	0	0	0	**0**	**201**	19	116	0	**135**	0	89	18	**107**	**242**	**443**
16:45 17:00	13	188	37	**238**	0	0	0	**0**	**238**	18	105	0	**123**	0	78	13	**91**	**214**	**452**
17:00 17:15	19	176	29	**224**	0	0	0	**0**	**224**	20	99	0	**119**	0	69	17	**86**	**205**	**429**
17:15 17:30	14	201	27	**242**	0	0	0	**0**	**242**	26	109	0	**135**	0	53	25	**78**	**213**	**455**
17:30 17:45	15	215	26	**256**	0	0	0	**0**	**256**	25	93	0	**118**	0	69	21	**90**	**208**	**464**
17:45 18:00	12	199	19	**230**	0	0	0	**0**	**230**	15	70	0	**85**	0	57	20	**77**	**162**	**392**
TOTAL:	318	7540	793	**8651**	0	0	0	**0**	**8651**	555	2585	0	**3140**	0	1637	691	**2328**	**5468**	**14119**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36848

GLADSTONE AVE @ KENT ST

Count Date: Tuesday, April 25, 2017 **Start Time:** 07:00

	KENT ST			GLADSTONE AVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	5	0	**5**	15	12	**27**	**32**
08:00 09:00	13	0	**13**	29	13	**42**	**55**
09:00 10:00	8	0	**8**	13	6	**19**	**27**
11:30 12:30	2	0	**2**	12	11	**23**	**25**
12:30 13:30	8	0	**8**	8	13	**21**	**29**
15:00 16:00	0	1	**1**	8	5	**13**	**14**
16:00 17:00	4	0	**4**	11	21	**32**	**36**
17:00 18:00	2	0	**2**	16	16	**32**	**34**
Total	42	1	**43**	112	97	**209**	**252**

Comment:

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. 36848

Turning Movement Count - Heavy Vehicle Report

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017

	KENT ST									GLADSTONE AVE									
	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**	**Grand Total**
07:00 08:00	2	17	2	**21**	0	0	0	**0**	**21**	5	12	0	**17**	0	11	1	**12**	**29**	**50**
08:00 09:00	2	31	1	**34**	0	0	0	**0**	**34**	5	16	0	**21**	0	10	2	**12**	**33**	**67**
09:00 10:00	2	24	5	**31**	0	0	0	**0**	**31**	2	12	0	**14**	0	15	2	**17**	**31**	**62**
11:30 12:30	2	20	1	**23**	0	0	0	**0**	**23**	2	12	0	**14**	0	8	1	**9**	**23**	**46**
12:30 13:30	2	12	0	**14**	0	0	0	**0**	**14**	2	16	0	**18**	0	8	0	**8**	**26**	**40**
15:00 16:00	0	45	3	**48**	0	0	0	**0**	**48**	2	13	0	**15**	0	12	3	**15**	**30**	**78**
16:00 17:00	0	28	1	**29**	0	0	0	**0**	**29**	0	13	0	**13**	0	5	0	**5**	**18**	**47**
17:00 18:00	1	19	0	**20**	0	0	0	**0**	**20**	1	8	0	**9**	0	5	0	**5**	**14**	**34**
Sub Total	11	196	13	**220**	0	0	0	**0**	**220**	19	102	0	**121**	0	74	9	**83**	**204**	**424**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	11	196	13	**0**	0	0	0	**0**	**220**	19	102	0	**121**	0	74	9	**83**	**204**	**424**

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 36848

Turning Movement Count - Pedestrian Volume Report

GLADSTONE AVE @ KENT ST

Count Date: Tuesday, April 25, 2017 **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	2	4	**6**	3	4	**7**	**13**
07:15 07:30	3	9	**12**	9	5	**14**	**26**
07:30 07:45	8	5	**13**	16	5	**21**	**34**
07:45 08:00	9	8	**17**	13	8	**21**	**38**
07:00 08:00	22	26	**48**	41	22	**63**	**111**
08:00 08:15	10	11	**21**	18	12	**30**	**51**
08:15 08:30	17	24	**41**	21	17	**38**	**79**
08:30 08:45	17	15	**32**	14	18	**32**	**64**
08:45 09:00	12	10	**22**	13	10	**23**	**45**
08:00 09:00	56	60	**116**	66	57	**123**	**239**
09:00 09:15	6	11	**17**	7	14	**21**	**38**
09:15 09:30	6	6	**12**	8	6	**14**	**26**
09:30 09:45	6	13	**19**	4	4	**8**	**27**
09:45 10:00	6	15	**21**	8	7	**15**	**36**
09:00 10:00	24	45	**69**	27	31	**58**	**127**
11:30 11:45	9	6	**15**	11	5	**16**	**31**
11:45 12:00	5	13	**18**	4	8	**12**	**30**
12:00 12:15	13	16	**29**	8	12	**20**	**49**
12:15 12:30	12	13	**25**	14	17	**31**	**56**
11:30 12:30	39	48	**87**	37	42	**79**	**166**
12:30 12:45	16	15	**31**	14	9	**23**	**54**
12:45 13:00	14	10	**24**	3	9	**12**	**36**
13:00 13:15	15	16	**31**	4	13	**17**	**48**
13:15 13:30	12	16	**28**	6	8	**14**	**42**
12:30 13:30	57	57	**114**	27	39	**66**	**180**
15:00 15:15	10	14	**24**	5	12	**17**	**41**
15:15 15:30	12	6	**18**	17	15	**32**	**50**
15:30 15:45	13	11	**24**	2	16	**18**	**42**
15:45 16:00	12	9	**21**	5	11	**16**	**37**
15:00 16:00	47	40	**87**	29	54	**83**	**170**
16:00 16:15	12	11	**23**	9	10	**19**	**42**
16:15 16:30	17	12	**29**	17	14	**31**	**60**
16:30 16:45	18	10	**28**	9	12	**21**	**49**
16:45 17:00	16	11	**27**	13	12	**25**	**52**
16:00 17:00	63	44	**107**	48	48	**96**	**203**
17:00 17:15	23	13	**36**	13	13	**26**	**62**
17:15 17:30	8	17	**25**	13	14	**27**	**52**
17:30 17:45	20	12	**32**	9	10	**19**	**51**
17:45 18:00	15	13	**28**	12	6	**18**	**46**
17:00 18:00	66	55	**121**	47	43	**90**	**211**
Total	374	375	**749**	322	336	**658**	**1407**

Comment:

Transportation Services - Traffic Services

Work Order 36848

Turning Movement Count - 15 Min U-Turn Total Report

GLADSTONE AVE @ KENT ST

Survey Date: Tuesday, April 25, 2017

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
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
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		0	0	0	0	0

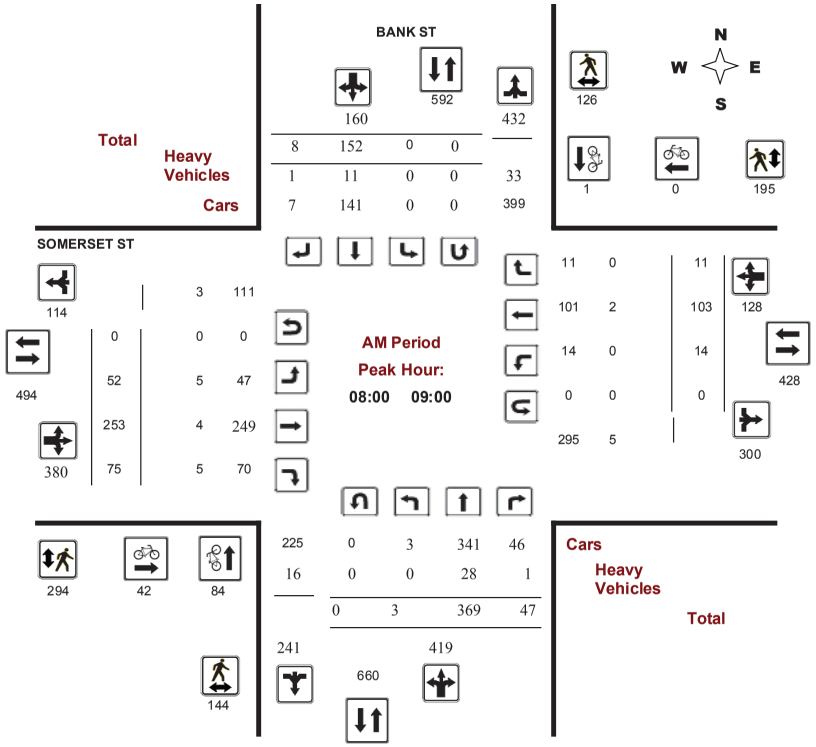
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015
Start Time: 07:00

WO No: 34727
Device: Jamar Technologies, Inc



Comments

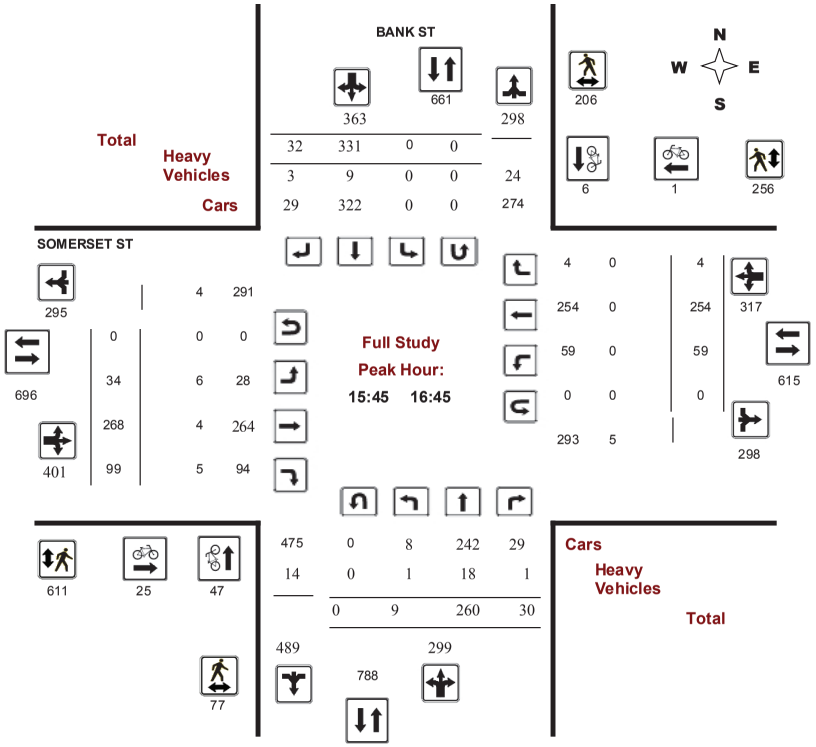
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015
Start Time: 07:00

WO No: 34727
Device: Jamar Technologies, Inc



Comments

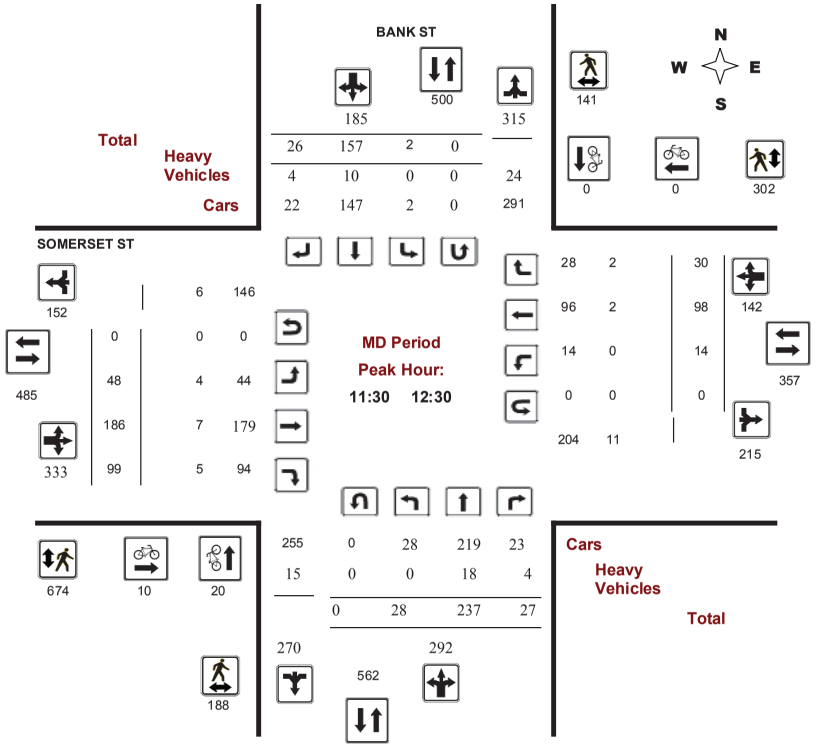
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015
Start Time: 07:00

WO No: 34727
Device: Jamar Technologies, Inc



Comments

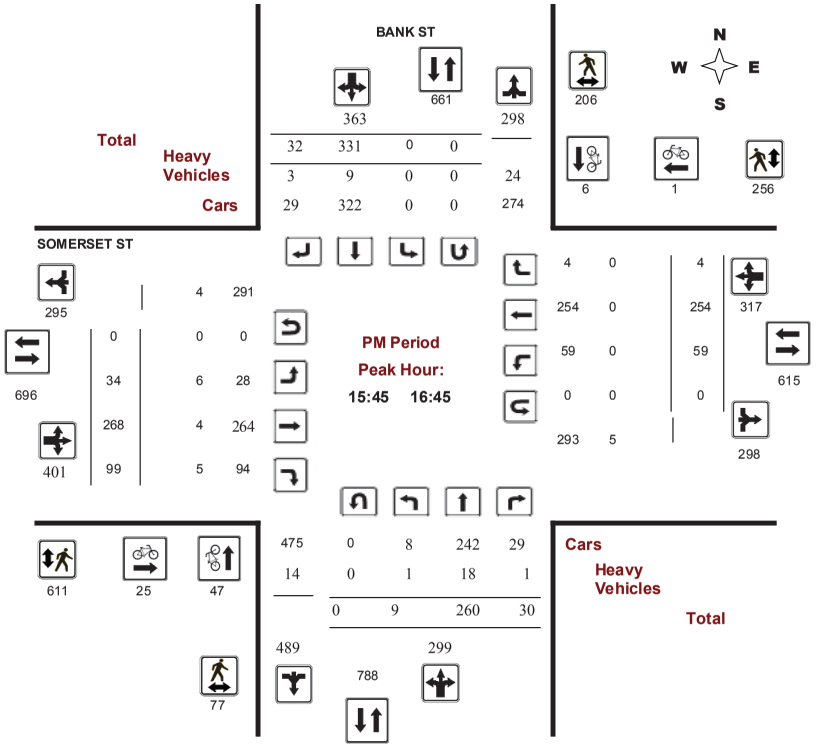
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015
Start Time: 07:00

WO No: 34727
Device: Jamar Technologies, Inc



Comments

Transportation Services - Traffic Services

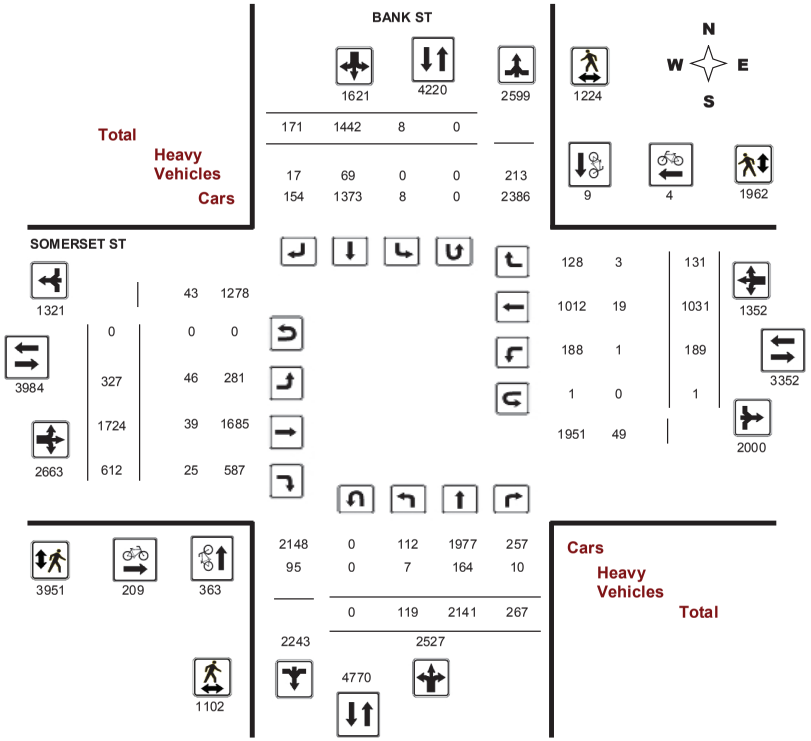
Turning Movement Count - Full Study Diagram

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015

WO#: 34727

Device: Jamar Technologies, Inc



Comments

Transportation Services - Traffic Services

Work Order 34727

Turning Movement Count - Full Study Summary Report

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 1

AADT Factor .90

Full Study

	BANK ST									SOMERSET ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	3	251	36	**290**	0	103	13	**116**	**406**	46	160	39	**245**	14	58	11	**83**	**328**	**734**
08:00 09:00	3	369	47	**419**	0	152	8	**160**	**579**	52	253	75	**380**	14	103	11	**128**	**508**	**1087**
09:00 10:00	25	266	44	**335**	1	133	23	**157**	**492**	46	199	60	**305**	15	100	9	**124**	**429**	**921**
11:30 12:30	28	237	27	**292**	2	157	26	**185**	**477**	48	186	99	**333**	14	98	30	**142**	**475**	**952**
12:30 13:30	24	240	23	**287**	0	147	22	**169**	**456**	30	196	83	**309**	8	114	38	**160**	**469**	**925**
15:00 16:00	14	253	24	**291**	3	247	19	**269**	**560**	30	228	83	**341**	41	191	8	**240**	**581**	**1141**
16:00 17:00	7	260	30	**297**	0	287	29	**316**	**613**	38	253	96	**387**	39	222	10	**271**	**658**	**1271**
17:00 18:00	15	265	36	**316**	2	216	31	**249**	**565**	37	249	77	**363**	44	145	14	**203**	**566**	**1131**
Sub Total	119	2141	267	**2527**	8	1442	171	**1621**	**4148**	327	1724	612	**2663**	189	1031	131	**1351**	**4014**	**8162**
U Turns				**0**				**0**	**0**				**0**				**1**	**1**	**1**
Total	119	2141	267	**2527**	8	1442	171	**1621**	**4148**	327	1724	612	**2663**	189	1031	131	**1352**	**4015**	**8163**
EQ 12Hr	165	2976	371	**3513**	11	2004	238	**2253**	**5766**	455	2396	851	**3702**	263	1433	182	**1879**	**5581**	**11347**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**																			
AVG 12Hr	149	2678	334	**3161**	10	1804	214	**2028**	**5189**	409	2157	766	**3331**	236	1290	164	**1691**	**5022**	**10211**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**																			
AVG 24Hr	195	3509	438	**4141**	13	2363	280	**2657**	**6798**	536	2825	1003	**4364**	310	1690	215	**2216**	**6580**	**13378**
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

W.O. 34727

Turning Movement Count - 15 Minute Summary Report

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 1

		BANK ST								SOMERSET ST									
		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	Grand Total
07:00	07:15	1	49	6	**56**	0	27	4	**31**	**87**	5	30	10	**45**	4	10	4	**19**	**64**	**151**
07:15	07:30	0	55	11	**66**	0	24	4	**28**	**94**	11	30	11	**52**	6	16	5	**27**	**79**	**173**
07:30	07:45	2	72	9	**83**	0	28	2	**30**	**113**	17	52	12	**81**	3	17	1	**21**	**102**	**215**
07:45	08:00	0	75	10	**85**	0	24	3	**27**	**112**	13	48	6	**67**	1	15	1	**17**	**84**	**196**
08:00	08:15	0	91	15	**106**	0	44	1	**45**	**151**	10	65	25	**100**	5	23	2	**30**	**130**	**281**
08:15	08:30	0	88	9	**97**	0	21	1	**22**	**119**	18	60	13	**91**	1	38	1	**40**	**131**	**250**
08:30	08:45	2	95	11	**108**	0	46	1	**47**	**155**	13	69	13	**95**	3	28	7	**38**	**133**	**288**
08:45	09:00	1	95	12	**108**	0	41	5	**46**	**154**	11	59	24	**94**	5	14	1	**20**	**114**	**268**
09:00	09:15	7	72	13	**92**	0	26	1	**27**	**119**	13	43	14	**70**	1	11	1	**13**	**83**	**202**
09:15	09:30	3	65	8	**76**	0	24	1	**25**	**101**	9	53	19	**81**	4	42	3	**49**	**130**	**231**
09:30	09:45	7	64	10	**81**	0	40	13	**53**	**134**	13	50	15	**78**	4	18	1	**23**	**101**	**235**
09:45	10:00	8	65	13	**86**	1	43	8	**52**	**138**	11	53	12	**76**	6	29	4	**39**	**115**	**253**
11:30	11:45	6	81	4	**91**	0	57	10	**67**	**158**	17	48	22	**87**	5	23	7	**35**	**122**	**280**
11:45	12:00	9	41	7	**57**	2	44	8	**54**	**111**	10	44	23	**77**	1	15	2	**18**	**95**	**206**
12:00	12:15	6	57	11	**74**	0	9	2	**11**	**85**	9	52	25	**86**	5	35	3	**43**	**129**	**214**
12:15	12:30	7	58	5	**70**	0	47	6	**53**	**123**	12	42	29	**83**	3	25	18	**46**	**129**	**252**
12:30	12:45	6	40	5	**51**	0	34	7	**41**	**92**	8	44	21	**73**	0	33	7	**40**	**113**	**205**
12:45	13:00	7	65	9	**81**	0	11	12	**23**	**104**	7	51	19	**77**	4	41	11	**56**	**133**	**237**
13:00	13:15	4	68	4	**76**	0	50	1	**51**	**127**	6	52	22	**80**	1	21	8	**30**	**110**	**237**
13:15	13:30	7	67	5	**79**	0	52	2	**54**	**133**	9	49	21	**79**	3	19	12	**34**	**113**	**246**
15:00	15:15	2	68	4	**74**	0	29	0	**29**	**103**	5	44	7	**56**	4	40	4	**48**	**104**	**207**
15:15	15:30	6	67	7	**80**	1	48	7	**56**	**136**	5	64	23	**92**	7	38	0	**45**	**137**	**273**
15:30	15:45	2	55	3	**60**	2	82	7	**91**	**151**	11	54	30	**95**	7	37	4	**48**	**143**	**294**
15:45	16:00	4	63	10	**77**	0	88	5	**93**	**170**	9	66	23	**98**	23	76	0	**99**	**197**	**367**
16:00	16:15	2	48	5	**55**	0	70	10	**80**	**135**	7	72	23	**102**	16	58	2	**76**	**178**	**313**
16:15	16:30	1	76	7	**84**	0	95	10	**105**	**189**	10	64	21	**95**	7	71	1	**79**	**174**	**363**
16:30	16:45	2	73	8	**83**	0	78	7	**85**	**168**	8	66	32	**106**	13	49	1	**63**	**169**	**337**
16:45	17:00	2	63	10	**75**	0	44	2	**46**	**121**	13	51	20	**84**	3	44	6	**53**	**137**	**258**
17:00	17:15	1	76	9	**86**	0	42	4	**46**	**132**	4	71	16	**91**	3	60	7	**70**	**161**	**293**
17:15	17:30	2	69	15	**86**	0	54	8	**62**	**148**	10	81	20	**111**	22	47	2	**71**	**182**	**330**
17:30	17:45	7	58	6	**71**	0	54	6	**60**	**131**	12	53	20	**85**	11	17	0	**28**	**113**	**244**
17:45	18:00	5	62	6	**73**	2	66	13	**81**	**154**	11	44	21	**76**	8	21	5	**34**	**110**	**264**
TOTAL:		119	2141	267	**2527**	8	1442	171	**1621**	**4148**	327	1724	612	**2663**	189	1031	131	**1352**	**4015**	**8163**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 34727

BANK ST @ SOMERSET ST

Count Date: Wednesday, August 05, 2015

Start Time: 07:00

	BANK ST			SOMERSET ST			
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 08:00	42	1	**43**	25	0	**25**	**68**
08:00 09:00	84	1	**85**	42	0	**42**	**127**
09:00 10:00	69	0	**69**	34	2	**36**	**105**
11:30 12:30	20	0	**20**	10	0	**10**	**30**
12:30 13:30	42	0	**42**	17	0	**17**	**59**
15:00 16:00	34	3	**37**	18	0	**18**	**55**
16:00 17:00	48	4	**52**	23	1	**24**	**76**
17:00 18:00	24	0	**24**	40	1	**41**	**65**
Total	363	9	**372**	209	4	**213**	**585**

Comment:

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. 34727

Turning Movement Count - Heavy Vehicle Report

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 2015

	BANK ST								SOMERSET ST										
	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	Grand Total
07:00 08:00	3	23	0	**26**	0	13	3	**16**	**42**	7	6	1	**14**	0	2	1	**3**	**17**	**59**
08:00 09:00	0	28	1	**29**	0	11	1	**12**	**41**	5	4	5	**14**	0	2	0	**2**	**16**	**57**
09:00 10:00	1	22	3	**26**	0	3	2	**5**	**31**	7	6	5	**18**	1	2	0	**3**	**21**	**52**
11:30 12:30	0	18	4	**22**	0	10	4	**14**	**36**	4	7	5	**16**	0	2	2	**4**	**20**	**56**
12:30 13:30	2	21	1	**24**	0	6	2	**8**	**32**	5	5	3	**13**	0	7	0	**7**	**20**	**52**
15:00 16:00	0	17	1	**18**	0	11	1	**12**	**30**	6	5	2	**13**	0	2	0	**2**	**15**	**45**
16:00 17:00	1	21	0	**22**	0	9	4	**13**	**35**	6	3	4	**13**	0	1	0	**1**	**14**	**49**
17:00 18:00	0	14	0	**14**	0	6	0	**6**	**20**	6	3	0	**9**	0	1	0	**1**	**10**	**30**
Sub Total	7	164	10	**181**	0	69	17	**86**	**267**	46	39	25	**110**	1	19	3	**23**	**133**	**400**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	7	164	10	**0**	0	69	17	**86**	**267**	46	39	25	**110**	1	19	3	**23**	**133**	**400**

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 34727

Turning Movement Count - Pedestrian Volume Report

BANK ST @ SOMERSET ST

Count Date: Wednesday, August 05, 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	16	21	**37**	25	22	**47**	**84**
07:15 07:30	15	17	**32**	27	46	**73**	**105**
07:30 07:45	17	10	**27**	38	41	**79**	**106**
07:45 08:00	27	21	**48**	45	50	**95**	**143**
07:00 08:00	75	69	**144**	135	159	**294**	**438**
08:00 08:15	22	30	**52**	55	56	**111**	**163**
08:15 08:30	36	30	**66**	78	50	**128**	**194**
08:30 08:45	29	32	**61**	73	41	**114**	**175**
08:45 09:00	57	34	**91**	88	48	**136**	**227**
08:00 09:00	144	126	**270**	294	195	**489**	**759**
09:00 09:15	32	29	**61**	79	42	**121**	**182**
09:15 09:30	33	22	**55**	61	23	**84**	**139**
09:30 09:45	31	50	**81**	78	38	**116**	**197**
09:45 10:00	33	43	**76**	66	35	**101**	**177**
09:00 10:00	129	144	**273**	284	138	**422**	**695**
11:30 11:45	24	42	**66**	108	80	**188**	**254**
11:45 12:00	42	50	**92**	159	32	**191**	**283**
12:00 12:15	61	19	**80**	194	108	**302**	**382**
12:15 12:30	61	30	**91**	213	82	**295**	**386**
11:30 12:30	188	141	**329**	674	302	**976**	**1305**
12:30 12:45	70	37	**107**	209	58	**267**	**374**
12:45 13:00	58	37	**95**	202	61	**263**	**358**
13:00 13:15	58	34	**92**	182	115	**297**	**389**
13:15 13:30	61	35	**96**	187	96	**283**	**379**
12:30 13:30	247	143	**390**	780	330	**1110**	**1500**
15:00 15:15	51	17	**68**	83	50	**133**	**201**
15:15 15:30	12	22	**34**	118	45	**163**	**197**
15:30 15:45	28	52	**80**	129	44	**173**	**253**
15:45 16:00	21	48	**69**	133	54	**187**	**256**
15:00 16:00	112	139	**251**	463	193	**656**	**907**
16:00 16:15	12	40	**52**	146	101	**247**	**299**
16:15 16:30	19	63	**82**	169	44	**213**	**295**
16:30 16:45	25	55	**80**	163	57	**220**	**300**
16:45 17:00	11	65	**76**	164	78	**242**	**318**
16:00 17:00	67	223	**290**	642	280	**922**	**1212**
17:00 17:15	31	83	**114**	179	88	**267**	**381**
17:15 17:30	39	72	**111**	186	86	**272**	**383**
17:30 17:45	34	44	**78**	160	93	**253**	**331**
17:45 18:00	36	40	**76**	154	98	**252**	**328**
17:00 18:00	140	239	**379**	679	365	**1044**	**1423**
Total	1102	1224	**2326**	3951	1962	**5913**	**8239**

Comment:

Transportation Services - Traffic Services

Work Order 34727

Turning Movement Count - 15 Min U-Turn Total Report

BANK ST @ SOMERSET ST

Survey Date: Wednesday, August 05, 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	1	1
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
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
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		0	0	0	1	1

Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

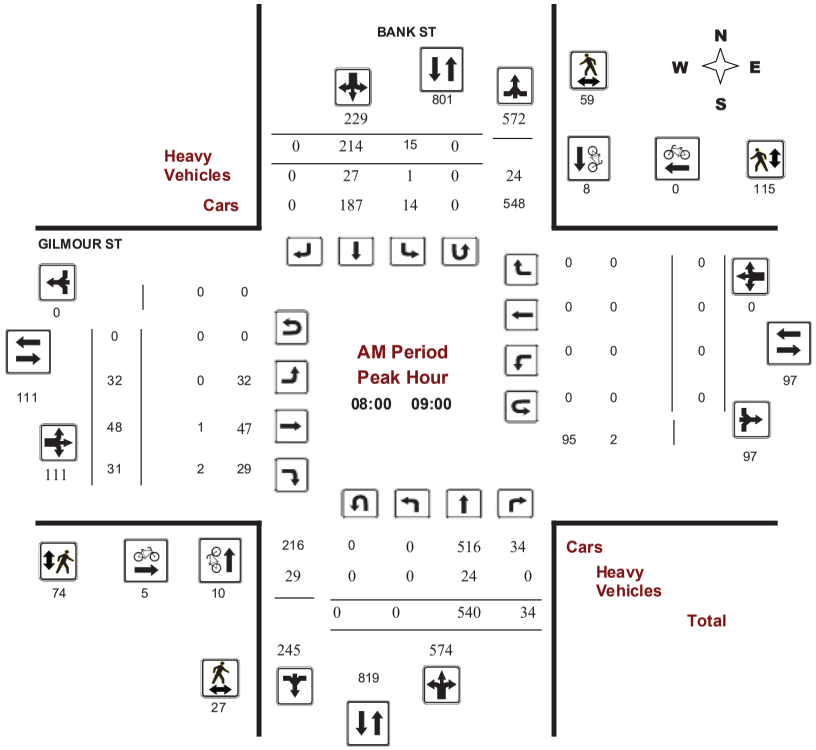
BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 2015

Start Time: 07:00

WO No: 35291

Device: Jamar Technologies, Inc



Comments

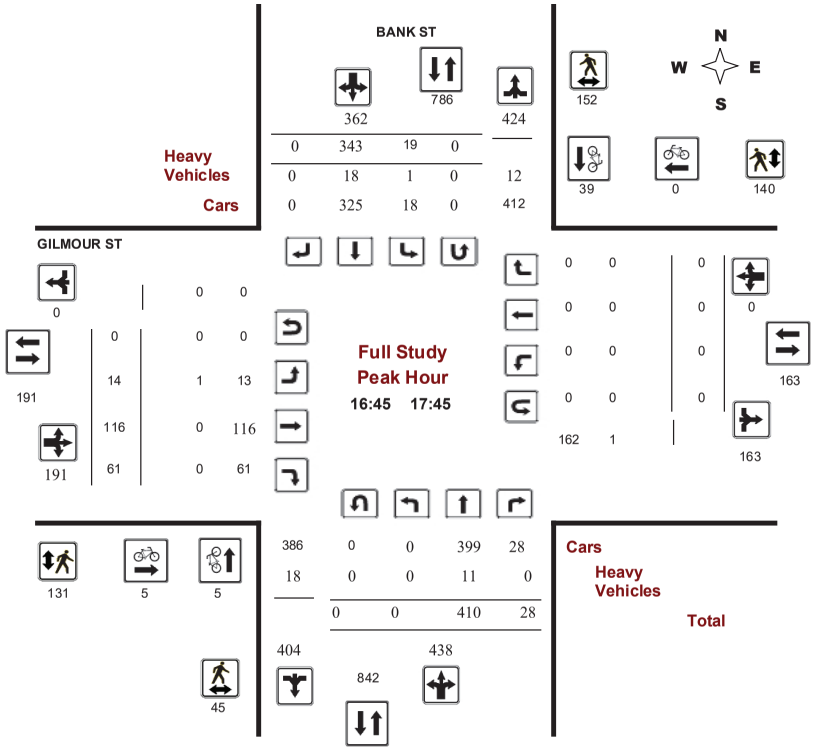
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 2015
Start Time: 07:00

WO No: 35291
Device: Jamar Technologies, Inc


BANK ST
GILMOUR ST
N
W
E
S
Heavy Vehicles
Cars
362
786
424
152
39
0
140
0 343 19 0
0 18 1 0 12
0 325 18 0 412
191
191
0
63
63
0
0 0
0 0
0

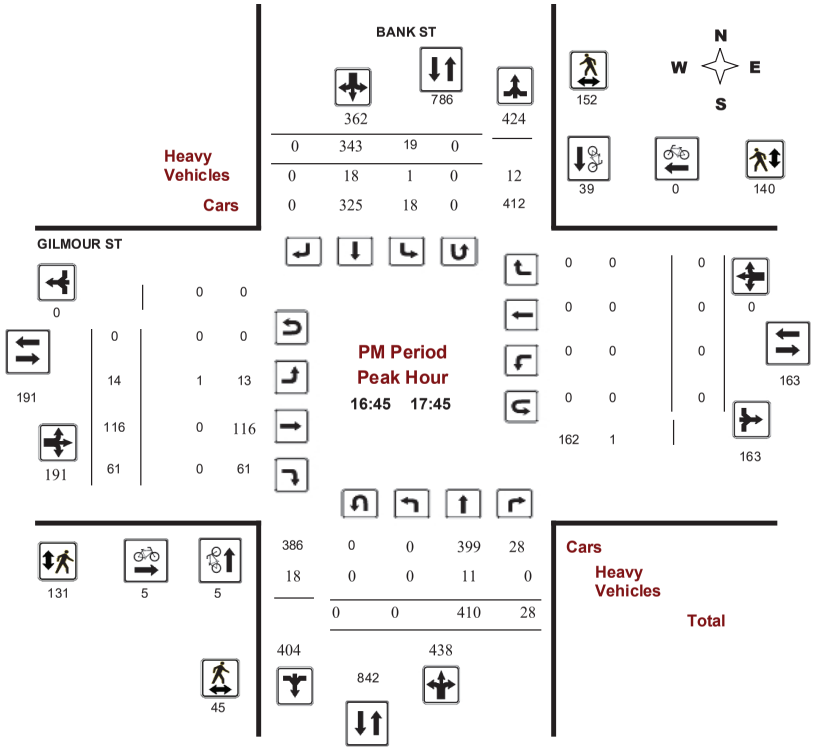
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 2015
Start Time: 07:00

WO No: 35291
Device: Jamar Technologies, Inc



Comments

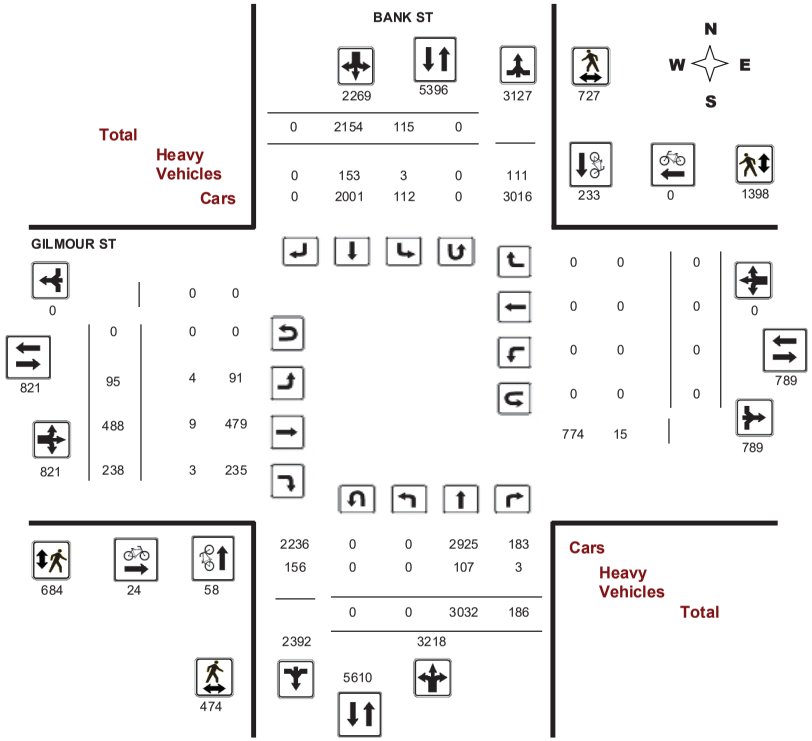
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 2015

WO#: 35291
Device: Jamar Technologies, Inc



Comments

Transportation Services - Traffic Services

Work Order 35291

Turning Movement Count - Full Study Summary Report

BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 2015

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	BANK ST									GILMOUR ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	0	277	22	**299**	12	174	0	**186**	**485**	8	51	13	**72**	0	0	0	**0**	**72**	**557**
08:00 09:00	0	540	34	**574**	15	214	0	**229**	**803**	32	48	31	**111**	0	0	0	**0**	**111**	**914**
09:00 10:00	0	362	21	**383**	12	209	0	**221**	**604**	11	31	17	**59**	0	0	0	**0**	**59**	**663**
11:30 12:30	0	381	6	**387**	8	271	0	**279**	**666**	5	40	23	**68**	0	0	0	**0**	**68**	**734**
12:30 13:30	0	342	24	**366**	10	280	0	**290**	**656**	6	26	22	**54**	0	0	0	**0**	**54**	**710**
15:00 16:00	0	376	29	**405**	23	352	0	**375**	**780**	7	62	36	**105**	0	0	0	**0**	**105**	**885**
16:00 17:00	0	389	26	**415**	23	326	0	**349**	**764**	10	103	29	**142**	0	0	0	**0**	**142**	**906**
17:00 18:00	0	365	24	**389**	12	328	0	**340**	**729**	16	127	67	**210**	0	0	0	**0**	**210**	**939**
Sub Total	0	3032	186	**3218**	115	2154	0	**2269**	**5487**	95	488	238	**821**	0	0	0	**0**	**821**	**6308**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	3032	186	**3218**	115	2154	0	**2269**	**5487**	95	488	238	**821**	0	0	0	**0**	**821**	**6308**
EQ 12Hr	0	4214	259	**4473**	160	2994	0	**3154**	**7627**	132	678	331	**1141**	0	0	0	**0**	**1141**	**8768**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**																			
AVG 12Hr	0	3793	233	**4026**	144	2695	0	**2839**	**6865**	119	610	298	**1027**	0	0	0	**0**	**1027**	**7892**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**																			
AVG 24Hr	0	4969	305	**5274**	188	3530	0	**3718**	**8992**	156	800	390	**1345**	0	0	0	**0**	**1345**	**10337**
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

W.O. 35291

Turning Movement Count - 15 Minute Summary Report

BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 2015

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

	BANK ST									GILMOUR ST									
	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	Grand Total
07:00 07:15	0	49	7	**56**	3	37	0	**40**	**96**	3	7	2	**12**	0	0	0	**0**	**12**	**108**
07:15 07:30	0	71	7	**78**	0	52	0	**52**	**130**	2	12	5	**19**	0	0	0	**0**	**19**	**149**
07:30 07:45	0	78	4	**82**	6	44	0	**50**	**132**	2	10	2	**14**	0	0	0	**0**	**14**	**146**
07:45 08:00	0	79	4	**83**	3	41	0	**44**	**127**	1	22	4	**27**	0	0	0	**0**	**27**	**154**
08:00 08:15	0	146	3	**149**	3	58	0	**61**	**210**	9	10	7	**26**	0	0	0	**0**	**26**	**236**
08:15 08:30	0	150	9	**159**	4	57	0	**61**	**220**	10	20	2	**32**	0	0	0	**0**	**32**	**252**
08:30 08:45	0	128	11	**139**	4	63	0	**67**	**206**	11	10	16	**37**	0	0	0	**0**	**37**	**243**
08:45 09:00	0	116	11	**127**	4	36	0	**40**	**167**	2	8	6	**16**	0	0	0	**0**	**16**	**183**
09:00 09:15	0	82	11	**93**	3	44	0	**47**	**140**	5	12	4	**21**	0	0	0	**0**	**21**	**161**
09:15 09:30	0	85	1	**86**	3	51	0	**54**	**140**	6	11	1	**18**	0	0	0	**0**	**18**	**158**
09:30 09:45	0	106	2	**108**	4	52	0	**56**	**164**	0	3	6	**9**	0	0	0	**0**	**9**	**173**
09:45 10:00	0	89	7	**96**	2	62	0	**64**	**160**	0	5	6	**11**	0	0	0	**0**	**11**	**171**
11:30 11:45	0	110	2	**112**	0	45	0	**45**	**157**	0	8	10	**18**	0	0	0	**0**	**18**	**175**
11:45 12:00	0	77	1	**78**	2	58	0	**60**	**138**	1	13	3	**17**	0	0	0	**0**	**17**	**155**
12:00 12:15	0	88	3	**91**	4	75	0	**79**	**170**	3	6	3	**12**	0	0	0	**0**	**12**	**182**
12:15 12:30	0	106	0	**106**	2	93	0	**95**	**201**	1	13	7	**21**	0	0	0	**0**	**21**	**222**
12:30 12:45	0	102	8	**110**	1	54	0	**55**	**165**	1	7	6	**14**	0	0	0	**0**	**14**	**179**
12:45 13:00	0	120	8	**128**	5	71	0	**76**	**204**	2	9	4	**15**	0	0	0	**0**	**15**	**219**
13:00 13:15	0	86	5	**91**	4	78	0	**82**	**173**	2	6	5	**13**	0	0	0	**0**	**13**	**186**
13:15 13:30	0	34	3	**37**	0	77	0	**77**	**114**	1	4	7	**12**	0	0	0	**0**	**12**	**126**
15:00 15:15	0	79	1	**80**	4	66	0	**70**	**150**	2	7	5	**14**	0	0	0	**0**	**14**	**164**
15:15 15:30	0	124	4	**128**	8	96	0	**104**	**232**	3	13	5	**21**	0	0	0	**0**	**21**	**253**
15:30 15:45	0	87	15	**102**	6	103	0	**109**	**211**	1	17	7	**25**	0	0	0	**0**	**25**	**236**
15:45 16:00	0	86	9	**95**	5	87	0	**92**	**187**	1	25	19	**45**	0	0	0	**0**	**45**	**232**
16:00 16:15	0	67	5	**72**	2	91	0	**93**	**165**	2	26	12	**40**	0	0	0	**0**	**40**	**205**
16:15 16:30	0	67	8	**75**	4	73	0	**77**	**152**	5	30	7	**42**	0	0	0	**0**	**42**	**194**
16:30 16:45	0	110	3	**113**	10	64	0	**74**	**187**	1	28	4	**33**	0	0	0	**0**	**33**	**220**
16:45 17:00	0	145	10	**155**	7	98	0	**105**	**260**	2	19	6	**27**	0	0	0	**0**	**27**	**287**
17:00 17:15	0	128	9	**137**	4	78	0	**82**	**219**	4	35	11	**50**	0	0	0	**0**	**50**	**269**
17:15 17:30	0	49	3	**52**	5	63	0	**68**	**120**	5	46	20	**71**	0	0	0	**0**	**71**	**191**
17:30 17:45	0	88	6	**94**	3	104	0	**107**	**201**	3	16	24	**43**	0	0	0	**0**	**43**	**244**
17:45 18:00	0	100	6	**106**	0	83	0	**83**	**189**	4	30	12	**46**	0	0	0	**0**	**46**	**235**
TOTAL:	0	3032	186	**3218**	115	2154	0	**2269**	**5487**	95	488	238	**821**	0	0	0	**0**	**821**	**6308**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 35291

BANK ST @ GILMOUR ST

Count Date: Tuesday, August 25, 2015 **Start Time:** 07:00

	BANK ST			GILMOUR ST			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	11	4	**15**	2	0	**2**	**17**
08:00 09:00	10	8	**18**	5	0	**5**	**23**
09:00 10:00	8	16	**24**	1	0	**1**	**25**
11:30 12:30	3	32	**35**	5	0	**5**	**40**
12:30 13:30	5	13	**18**	1	0	**1**	**19**
15:00 16:00	5	42	**47**	4	0	**4**	**51**
16:00 17:00	6	69	**75**	1	0	**1**	**76**
17:00 18:00	10	49	**59**	5	0	**5**	**64**
Total	58	233	**291**	24	0	**24**	**315**

Comment:

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. 35291

Turning Movement Count - Heavy Vehicle Report

BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 2015

	BANK ST									GILMOUR ST									
	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**	**Grand Total**
07:00 08:00	0	10	2	**12**	0	18	0	**18**	**30**	0	4	0	**4**	0	0	0	**0**	**4**	**34**
08:00 09:00	0	24	0	**24**	1	27	0	**28**	**52**	0	1	2	**3**	0	0	0	**0**	**3**	**55**
09:00 10:00	0	14	0	**14**	0	21	0	**21**	**35**	1	1	0	**2**	0	0	0	**0**	**2**	**37**
11:30 12:30	0	13	0	**13**	1	16	0	**17**	**30**	2	1	1	**4**	0	0	0	**0**	**4**	**34**
12:30 13:30	0	15	0	**15**	0	18	0	**18**	**33**	0	0	0	**0**	0	0	0	**0**	**0**	**33**
15:00 16:00	0	11	0	**11**	0	20	0	**20**	**31**	0	1	0	**1**	0	0	0	**0**	**1**	**32**
16:00 17:00	0	9	0	**9**	1	15	0	**16**	**25**	0	1	0	**1**	0	0	0	**0**	**1**	**26**
17:00 18:00	0	11	1	**12**	0	18	0	**18**	**30**	1	0	0	**1**	0	0	0	**0**	**1**	**31**
Sub Total	0	107	3	**110**	3	153	0	**156**	**266**	4	9	3	**16**	0	0	0	**0**	**16**	**282**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	107	3	**0**	3	153	0	**156**	**266**	4	9	3	**16**	0	0	0	**0**	**16**	**282**

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 35291

Turning Movement Count - Pedestrian Volume Report

BANK ST @ GILMOUR ST

Count Date: Tuesday, August 25, 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	7	9	**16**	6	5	**11**	**27**
07:15 07:30	6	5	**11**	16	13	**29**	**40**
07:30 07:45	7	3	**10**	9	16	**25**	**35**
07:45 08:00	13	12	**25**	29	28	**57**	**82**
07:00 08:00	33	29	**62**	60	62	**122**	**184**
08:00 08:15	4	13	**17**	6	7	**13**	**30**
08:15 08:30	7	20	**27**	50	29	**79**	**106**
08:30 08:45	3	12	**15**	10	42	**52**	**67**
08:45 09:00	13	14	**27**	8	37	**45**	**72**
08:00 09:00	27	59	**86**	74	115	**189**	**275**
09:00 09:15	11	21	**32**	9	21	**30**	**62**
09:15 09:30	4	17	**21**	6	32	**38**	**59**
09:30 09:45	5	8	**13**	21	15	**36**	**49**
09:45 10:00	23	21	**44**	8	43	**51**	**95**
09:00 10:00	43	67	**110**	44	111	**155**	**265**
11:30 11:45	15	9	**24**	23	34	**57**	**81**
11:45 12:00	21	24	**45**	11	64	**75**	**120**
12:00 12:15	38	45	**83**	29	143	**172**	**255**
12:15 12:30	21	46	**67**	31	115	**146**	**213**
11:30 12:30	95	124	**219**	94	356	**450**	**669**
12:30 12:45	18	15	**33**	42	79	**121**	**154**
12:45 13:00	23	29	**52**	51	91	**142**	**194**
13:00 13:15	19	22	**41**	24	31	**55**	**96**
13:15 13:30	15	32	**47**	22	45	**67**	**114**
12:30 13:30	75	98	**173**	139	246	**385**	**558**
15:00 15:15	18	17	**35**	7	32	**39**	**74**
15:15 15:30	35	24	**59**	21	33	**54**	**113**
15:30 15:45	10	14	**24**	27	11	**38**	**62**
15:45 16:00	38	18	**56**	10	49	**59**	**115**
15:00 16:00	101	73	**174**	65	125	**190**	**364**
16:00 16:15	20	32	**52**	14	72	**86**	**138**
16:15 16:30	11	38	**49**	13	75	**88**	**137**
16:30 16:45	9	22	**31**	1	45	**46**	**77**
16:45 17:00	9	39	**48**	11	48	**59**	**107**
16:00 17:00	49	131	**180**	39	240	**279**	**459**
17:00 17:15	16	54	**70**	51	58	**109**	**179**
17:15 17:30	5	27	**32**	27	10	**37**	**69**
17:30 17:45	15	32	**47**	42	24	**66**	**113**
17:45 18:00	15	33	**48**	49	51	**100**	**148**
17:00 18:00	51	146	**197**	169	143	**312**	**509**
Total	474	727	**1201**	684	1398	**2082**	**3283**

Comment:

Transportation Services - Traffic Services

Work Order 35291

Turning Movement Count - 15 Min U-Turn Total Report

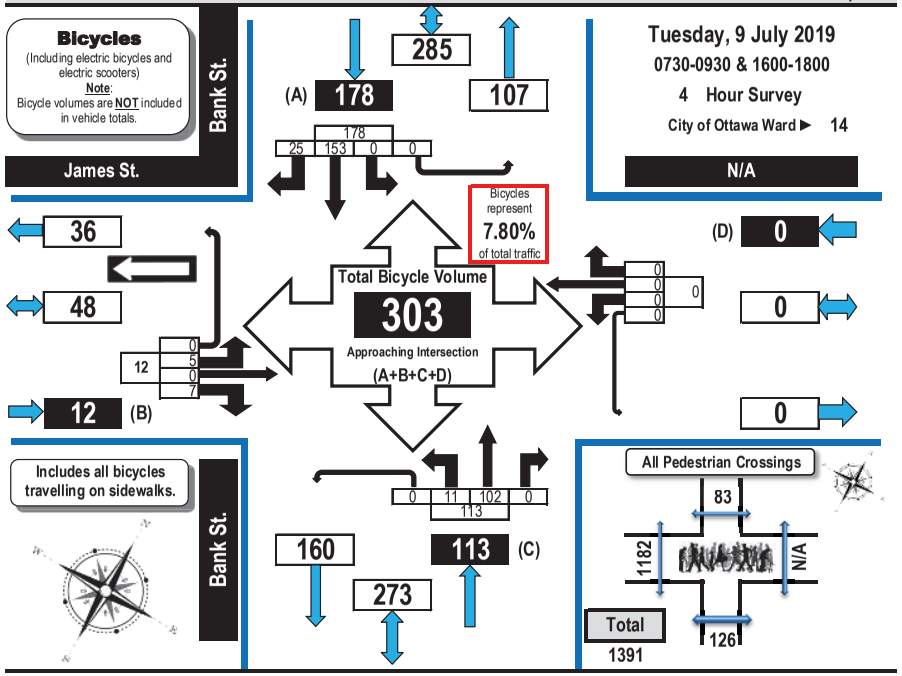
BANK ST @ GILMOUR ST

Survey Date: Tuesday, August 25, 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
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
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		0	0	0	0	0

Turning Movement Count
Bicycle Summary
Flow Diagram

Bank Street & James Street — **Ottawa, ON**



	James St. Eastbound					N/A Westbound					Bank St. Northbound					Bank St. Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0730-0800	0	0	1	0	1	0	0	0	0	0	2	16	0	0	18	0	6	4	0	10	29
0800-0900	3	0	3	0	6	0	0	0	0	0	2	25	0	0	27	0	9	2	0	11	44
0900-0930	0	0	1	0	1	0	0	0	0	0	0	12	0	0	12	0	7	0	0	7	20
1600-1700	1	0	1	0	2	0	0	0	0	0	4	25	0	0	29	0	63	8	0	71	102
1700-1800	1	0	1	0	2	0	0	0	0	0	3	24	0	0	27	0	68	11	0	79	108
Totals	5	0	7	0	12	0	0	0	0	0	11	102	0	0	113	0	153	25	0	178	303

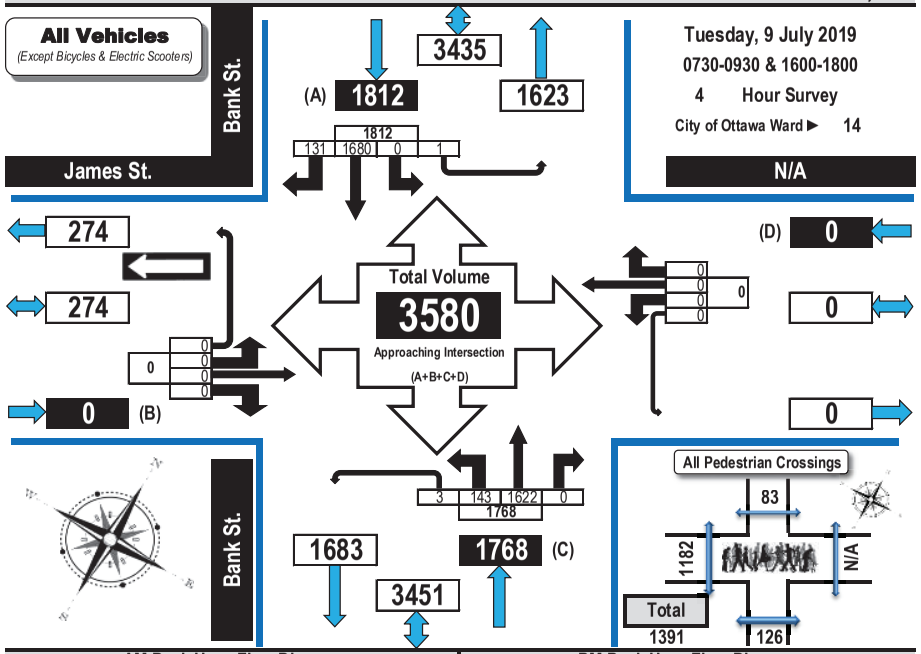
Comments:

Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. James Street is one way westbound. Bicycles were counted on all approaches. Pedestrians using the sidewalk on the east side of Bank Street were not counted; however, all bicycles driving on it were and are included in the bicycle summary. There were two eastbound vehicles from James Street but they are not included in the summary. The majority of heavy vehicle traffic consists of OC Transpo buses.

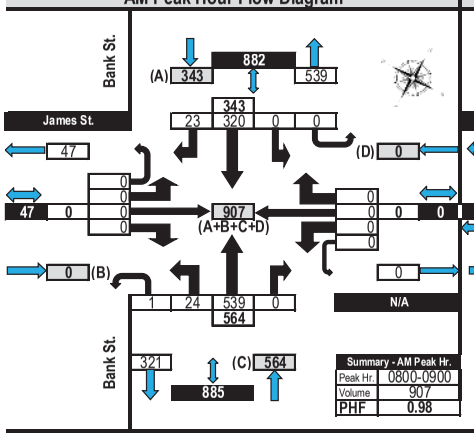
Turning Movement Count
Summary, AM and PM Peak Hour
Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

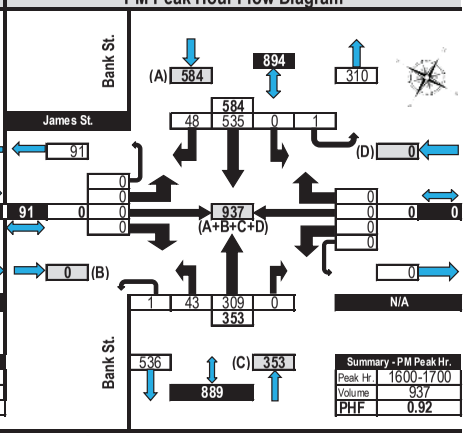
Bank Street & James Street — **Ottawa, ON**



AM Peak Hour Flow Diagram



PM Peak Hour Flow Diagram

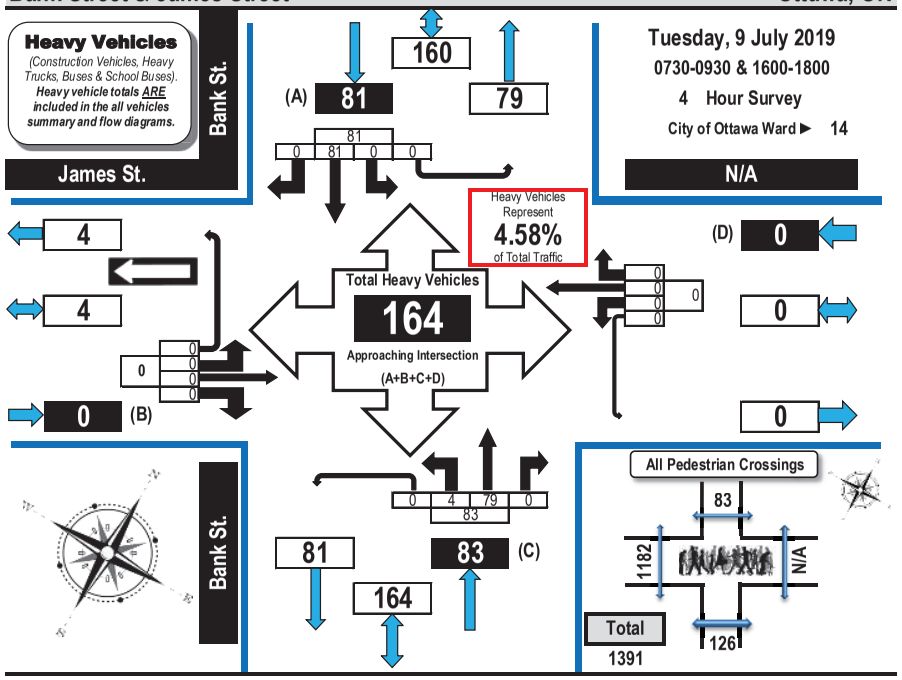


Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Bank Street & James Street — **Ottawa, ON**

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Tuesday, 9 July 2019
0730-0930 & 1600-1800
4 Hour Survey
City of Ottawa Ward ► 14



	James St. Eastbound					N/A Westbound					Bank St. Northbound					Bank St. Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0730-0800	0	0	0	0	0	0	0	0	0	0	0	13	0	0	13	0	13	0	0	13	26
0800-0900	0	0	0	0	0	0	0	0	0	0	2	26	0	0	28	0	25	0	0	25	53
0900-0930	0	0	0	0	0	0	0	0	0	0	0	15	0	0	15	0	12	0	0	12	27
1600-1700	0	0	0	0	0	0	0	0	0	0	1	13	0	0	14	0	10	0	0	10	24
1700-1800	0	0	0	0	0	0	0	0	0	0	1	12	0	0	13	0	21	0	0	21	34
Totals	0	0	0	0	0	0	0	0	0	0	4	79	0	0	83	0	81	0	0	81	164

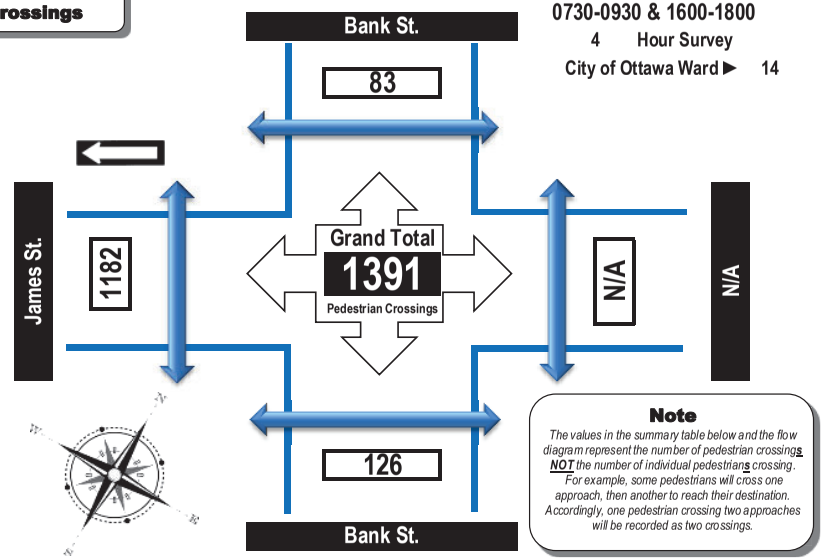
Comments:
Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. James Street is one way westbound. Bicycles were counted on all approaches. Pedestrians using the sidewalk on the east side of Bank Street were not counted; however, all bicycles driving on it were and are included in the bicycle summary. There were two eastbound vehicles from James Street but they are not included in the summary. The majority of heavy vehicle traffic consists of OC Transpo buses.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

Bank Street & James Street — **Ottawa, ON**

Pedestrian Crossings

Tuesday, 9 July 2019
0730-0930 & 1600-1800
4 Hour Survey
City of Ottawa Ward ► 14



Note
*The values in the summary table below and the flow diagram represent the number of pedestrian crossings **NOT** the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing James St.	East Side Crossing N/A	Street Total	South Side Crossing Bank St.	North Side Crossing Bank St.	Street Total	Grand Total
0730-0800	78	0	78	4	4	8	86
0800-0900	174	0	174	9	15	24	198
0900-0930	49	0	49	17	9	26	75
1600-1700	439	0	439	43	30	73	512
1700-1800	442	0	442	53	25	78	520
Totals	1182	0	1182	126	83	209	1391

Comments:
Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. James Street is one way westbound. Bicycles were counted on all approaches. Pedestrians using the sidewalk on the east side of Bank Street were not counted; however, all bicycles driving on it were and are included in the bicycle summary. There were two eastbound vehicles from James Street but they are not included in the summary. The majority of heavy vehicle traffic consists of OC Transpo buses.

Turning Movement Count
Summary Report
AADT and Expansion Factors

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Bank Street & James Street — Ottawa, ON

Survey Date: Tuesday, 9 July 2019 **Start Time:** 0730 **AADT Factor:** 0.9
Weather AM: Clear +16°C **Survey Duration:** 4 Hrs. **Survey Hours:** 0730-0930 & 1600-1800
Weather PM: Partly Cloudy +30°C **Surveyor(s):** Carmody

	James St.					N/A						Bank St.					Bank St.						
	Eastbound					Westbound						Northbound					Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0730-0800	0	0	0	0	0	0	0	0	0	0	0	12	261	0	0	273	0	161	6	0	167	440	440
0800-0900	0	0	0	0	0	0	0	0	0	0	0	24	539	0	1	564	0	320	23	0	343	907	907
0900-0930	0	0	0	0	0	0	0	0	0	0	0	16	194	0	0	210	0	150	15	0	165	375	375
1600-1700	0	0	0	0	0	0	0	0	0	0	0	43	309	0	1	353	0	535	48	1	584	937	937
1700-1800	0	0	0	0	0	0	0	0	0	0	0	48	319	0	1	368	0	514	39	0	553	921	921
Totals	0	0	0	0	0	0	0	0	0	0	0	143	1622	0	3	1768	0	1680	131	1	1812	3580	3580

Equivalent 12 & 24-hour Vehicle Volumes including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9

AADT 12-hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.98 — Highest Hourly Vehicle Volume Between 0700h & 1000h

AM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
0800-0900	0	0	0	0	0	0	0	0	0	0	0	24	539	0	1	564	0	320	23	0	343	907	907

PM Peak Hour Factor ➡ 0.92 — Highest Hourly Vehicle Volume Between 1500h & 1800h

PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
1600-1700	0	0	0	0	0	0	0	0	0	0	0	43	309	0	1	353	0	535	48	1	584	937	937

Comments:

Bronson Avenue, northbound, is closed due to construction between Catherine Street and Chamberlain Avenue. James Street is one way westbound. Bicycles were counted on all approaches. Pedestrians using the sidewalk on the east side of Bank Street were not counted; however, all bicycles driving on it were and are included in the bicycle summary. There were two eastbound vehicles from James Street but they are not included in the summary. The majority of heavy vehicle traffic consists of OC Transpo buses.

Notes:

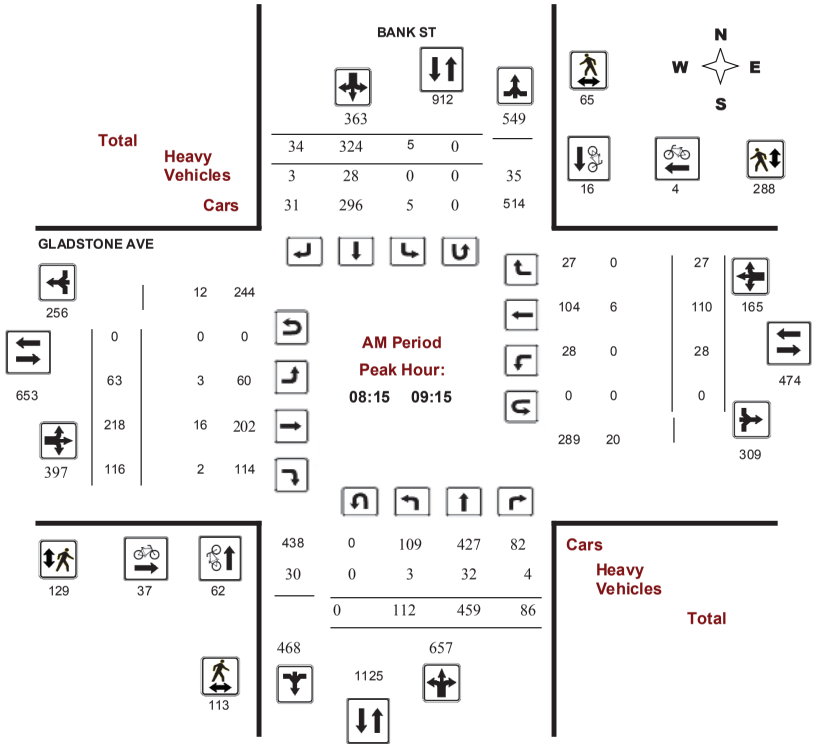
1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36101
Start Time: 07:00 **Device:** Miovision



Comments

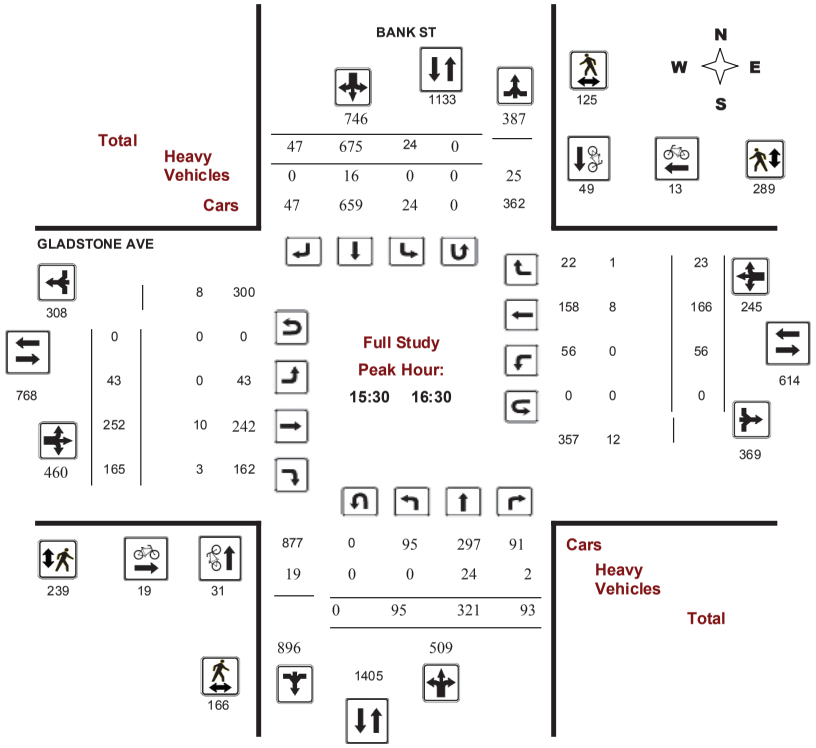
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36101

Start Time: 07:00 **Device:** Miovision



Comments

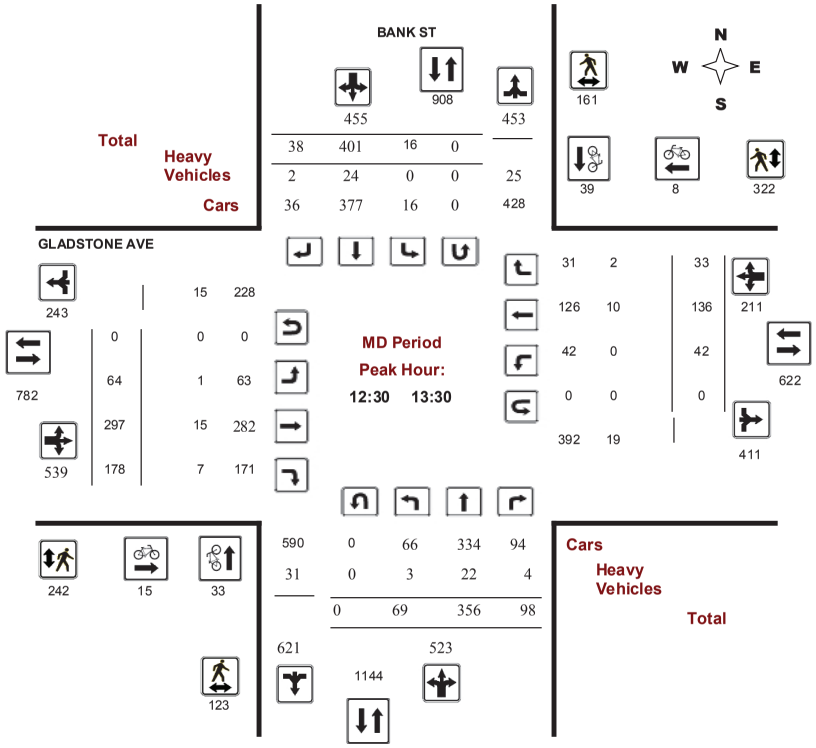
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36101

Start Time: 07:00 **Device:** Miovision



Comments

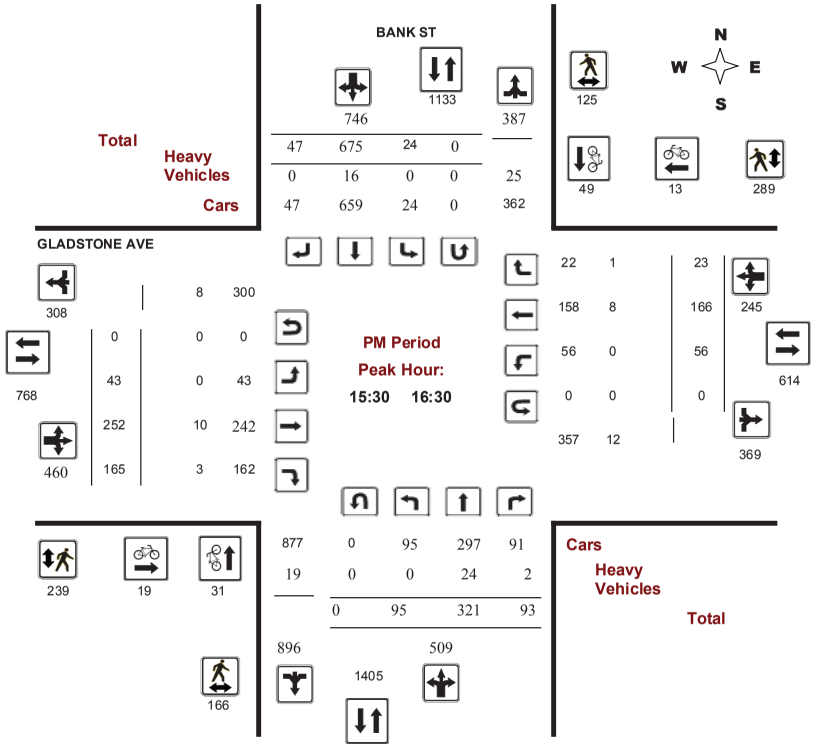
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36101

Start Time: 07:00 **Device:** Miovision



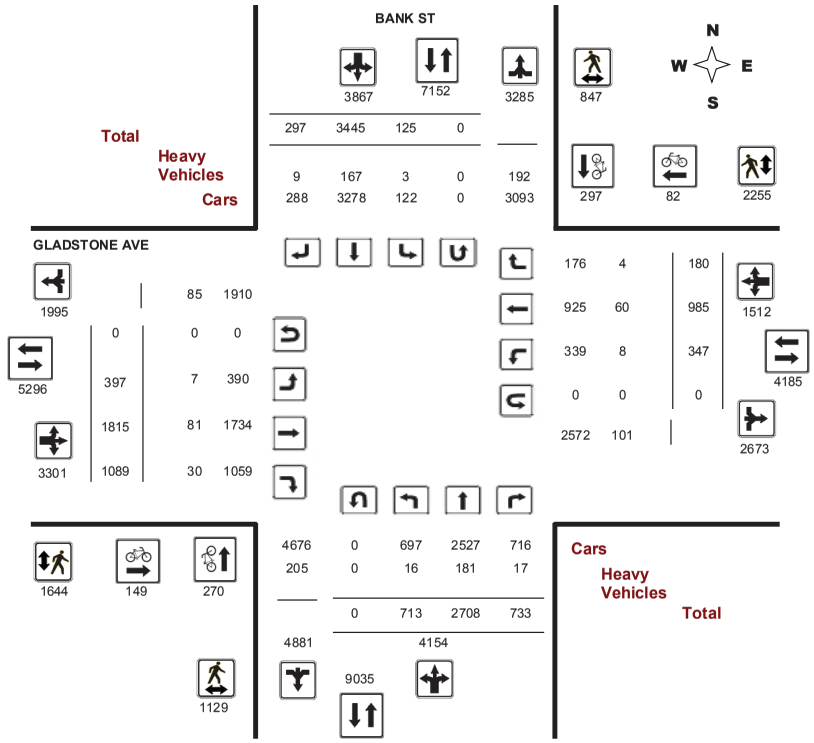
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO#:** 36101

Device: Miovision



Transportation Services - Traffic Services

Work Order 36101

Turning Movement Count - Full Study Summary Report

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	BANK ST									GLADSTONE AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	98	363	86	**547**	4	252	23	**279**	**826**	38	126	89	**253**	21	73	8	**102**	**355**	**1181**
08:00 09:00	113	476	91	**680**	1	306	32	**339**	**1019**	56	213	122	**391**	31	113	25	**169**	**560**	**1579**
09:00 10:00	71	322	101	**494**	12	347	32	**391**	**885**	54	188	107	**349**	39	89	24	**152**	**501**	**1386**
11:30 12:30	78	342	84	**504**	18	411	51	**480**	**984**	65	223	152	**440**	65	123	20	**208**	**648**	**1632**
12:30 13:30	69	356	98	**523**	16	401	38	**455**	**978**	64	297	178	**539**	42	136	33	**211**	**750**	**1728**
15:00 16:00	75	316	90	**481**	19	602	43	**664**	**1145**	34	251	153	**438**	72	131	25	**228**	**666**	**1811**
16:00 17:00	97	264	79	**440**	27	585	40	**652**	**1092**	50	254	156	**460**	38	177	24	**239**	**699**	**1791**
17:00 18:00	112	269	104	**485**	28	541	38	**607**	**1092**	36	263	132	**431**	39	143	21	**203**	**634**	**1726**
Sub Total	713	2708	733	**4154**	125	3445	297	**3867**	**8021**	397	1815	1089	**3301**	347	985	180	**1512**	**4813**	**12834**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	713	2708	733	**4154**	125	3445	297	**3867**	**8021**	397	1815	1089	**3301**	347	985	180	**1512**	**4813**	**12834**
EQ 12Hr	991	3764	1019	**5774**	174	4789	413	**5375**	**11149**	552	2523	1514	**4588**	482	1369	250	**2102**	**6690**	**17839**

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr	892	3388	917	**5197**	156	4310	372	**4838**	**10035**	497	2271	1362	**4130**	434	1232	225	**1892**	**6022**	**16057**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr	1168	4438	1201	**6808**	205	5646	487	**6337**	**13145**	651	2974	1785	**5410**	569	1614	295	**2478**	**7888**	**21033**

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

W.O. 36101

Turning Movement Count - 15 Minute Summary Report

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

	BANK ST									GLADSTONE AVE									
	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	Grand Total
07:00 07:15	17	71	17	**105**	1	55	7	**63**	**168**	7	24	16	**47**	6	18	1	**25**	**72**	**240**
07:15 07:30	23	76	20	**119**	1	54	6	**61**	**180**	8	29	27	**64**	4	18	1	**23**	**87**	**267**
07:30 07:45	26	102	22	**150**	0	68	2	**70**	**220**	13	36	19	**68**	7	18	3	**28**	**96**	**316**
07:45 08:00	32	114	27	**173**	2	75	8	**85**	**258**	10	37	27	**74**	4	19	3	**26**	**100**	**358**
08:00 08:15	25	110	26	**161**	0	76	7	**83**	**244**	10	40	27	**77**	7	24	5	**36**	**113**	**357**
08:15 08:30	33	130	25	**188**	0	79	9	**88**	**276**	18	51	25	**94**	6	26	9	**41**	**135**	**411**
08:30 08:45	26	132	20	**178**	0	71	5	**76**	**254**	13	64	34	**111**	10	20	3	**33**	**144**	**398**
08:45 09:00	29	104	20	**153**	1	80	11	**92**	**245**	15	58	36	**109**	8	43	8	**59**	**168**	**413**
09:00 09:15	24	93	21	**138**	4	94	9	**107**	**245**	17	45	21	**83**	4	21	7	**32**	**115**	**360**
09:15 09:30	18	69	31	**118**	1	75	7	**83**	**201**	12	50	22	**84**	15	25	8	**48**	**132**	**333**
09:30 09:45	17	76	24	**117**	2	83	8	**93**	**210**	15	46	30	**91**	9	24	4	**37**	**128**	**338**
09:45 10:00	12	84	25	**121**	5	95	8	**108**	**229**	10	47	34	**91**	11	19	5	**35**	**126**	**355**
11:30 11:45	14	94	23	**131**	5	74	12	**91**	**222**	23	54	39	**116**	15	26	4	**45**	**161**	**383**
11:45 12:00	19	84	25	**128**	5	112	15	**132**	**260**	11	64	25	**100**	17	35	2	**54**	**154**	**414**
12:00 12:15	21	82	21	**124**	4	115	14	**133**	**257**	19	53	35	**107**	17	27	5	**49**	**156**	**413**
12:15 12:30	24	82	15	**121**	4	110	10	**124**	**245**	12	52	53	**117**	16	35	9	**60**	**177**	**422**
12:30 12:45	22	84	26	**132**	2	96	8	**106**	**238**	11	70	48	**129**	14	35	5	**54**	**183**	**421**
12:45 13:00	15	89	28	**132**	1	103	8	**112**	**244**	17	74	55	**146**	3	27	5	**35**	**181**	**425**
13:00 13:15	15	92	23	**130**	4	101	11	**116**	**246**	17	79	34	**130**	12	30	10	**52**	**182**	**428**
13:15 13:30	17	91	21	**129**	9	101	11	**121**	**250**	19	74	41	**134**	13	44	13	**70**	**204**	**454**
15:00 15:15	20	80	25	**125**	5	138	6	**149**	**274**	6	52	30	**88**	16	27	10	**53**	**141**	**415**
15:15 15:30	12	85	16	**113**	5	163	10	**178**	**291**	9	73	43	**125**	16	25	6	**47**	**172**	**463**
15:30 15:45	25	77	25	**127**	5	143	15	**163**	**290**	10	61	37	**108**	23	36	3	**62**	**170**	**460**
15:45 16:00	18	74	24	**116**	4	158	12	**174**	**290**	9	65	43	**117**	17	43	6	**66**	**183**	**473**
16:00 16:15	24	80	21	**125**	12	172	9	**193**	**318**	6	70	43	**119**	8	37	9	**54**	**173**	**491**
16:15 16:30	28	90	23	**141**	3	202	11	**216**	**357**	18	56	42	**116**	8	50	5	**63**	**179**	**536**
16:30 16:45	18	49	16	**83**	5	140	7	**152**	**235**	13	58	42	**113**	15	46	7	**68**	**181**	**416**
16:45 17:00	27	45	19	**91**	7	71	13	**91**	**182**	13	70	29	**112**	7	44	3	**54**	**166**	**348**
17:00 17:15	44	74	28	**146**	7	68	12	**87**	**233**	7	81	23	**111**	10	40	3	**53**	**164**	**397**
17:15 17:30	23	73	31	**127**	9	180	7	**196**	**323**	6	68	36	**110**	7	46	7	**60**	**170**	**493**
17:30 17:45	24	65	24	**113**	4	183	10	**197**	**310**	9	75	41	**125**	12	28	6	**46**	**171**	**481**
17:45 18:00	21	57	21	**99**	8	110	9	**127**	**226**	14	39	32	**85**	10	29	5	**44**	**129**	**355**
TOTAL:	713	2708	733	**4154**	125	3445	297	**3867**	**8021**	397	1815	1089	**3301**	347	985	180	**1512**	**4813**	**12834**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36101

BANK ST @ GLADSTONE AVE

Count Date: Wednesday, July 27, 2016 **Start Time:** 07:00

	BANK ST			GLADSTONE AVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	44	10	**54**	18	9	**27**	**81**
08:00 09:00	48	13	**61**	38	6	**44**	**105**
09:00 10:00	57	24	**81**	21	7	**28**	**109**
11:30 12:30	4	42	**46**	12	13	**25**	**71**
12:30 13:30	33	39	**72**	15	8	**23**	**95**
15:00 16:00	22	21	**43**	14	8	**22**	**65**
16:00 17:00	31	67	**98**	23	20	**43**	**141**
17:00 18:00	31	81	**112**	8	11	**19**	**131**
Total	270	297	**567**	149	82	**231**	**798**

Comment:

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. 36101

Turning Movement Count - Heavy Vehicle Report

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

	BANK ST									GLADSTONE AVE									
	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**	**Grand Total**
07:00 08:00	1	27	2	**30**	1	25	0	**26**	**56**	2	7	2	**11**	1	7	0	**8**	**19**	**75**
08:00 09:00	2	31	3	**36**	0	22	3	**25**	**61**	2	17	3	**22**	1	6	0	**7**	**29**	**90**
09:00 10:00	6	30	4	**40**	1	32	1	**34**	**74**	1	9	5	**15**	2	4	0	**6**	**21**	**95**
11:30 12:30	2	16	2	**20**	0	15	3	**18**	**38**	1	9	5	**15**	2	13	0	**15**	**30**	**68**
12:30 13:30	3	22	4	**29**	0	24	2	**26**	**55**	1	15	7	**23**	0	10	2	**12**	**35**	**90**
15:00 16:00	1	21	1	**23**	0	15	0	**15**	**38**	0	11	5	**16**	1	6	2	**9**	**25**	**63**
16:00 17:00	0	14	1	**15**	1	17	0	**18**	**33**	0	7	3	**10**	0	6	0	**6**	**16**	**49**
17:00 18:00	1	20	0	**21**	0	17	0	**17**	**38**	0	6	0	**6**	1	8	0	**9**	**15**	**53**
Sub Total	16	181	17	**214**	3	167	9	**179**	**393**	7	81	30	**118**	8	60	4	**72**	**190**	**583**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	16	181	17	**0**	3	167	9	**179**	**393**	7	81	30	**118**	8	60	4	**72**	**190**	**583**

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 36101

Turning Movement Count - Pedestrian Volume Report

BANK ST @ GLADSTONE AVE

Count Date: Wednesday, July 27, 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	11	3	**14**	16	7	**23**	**37**
07:15 07:30	11	7	**18**	11	22	**33**	**51**
07:30 07:45	19	14	**33**	27	29	**56**	**89**
07:45 08:00	27	16	**43**	29	44	**73**	**116**
07:00 08:00	68	40	**108**	83	102	**185**	**293**
08:00 08:15	33	12	**45**	32	65	**97**	**142**
08:15 08:30	25	18	**43**	32	63	**95**	**138**
08:30 08:45	29	20	**49**	34	74	**108**	**157**
08:45 09:00	32	19	**51**	32	89	**121**	**172**
08:00 09:00	119	69	**188**	130	291	**421**	**609**
09:00 09:15	27	8	**35**	31	62	**93**	**128**
09:15 09:30	36	14	**50**	40	59	**99**	**149**
09:30 09:45	21	16	**37**	23	50	**73**	**110**
09:45 10:00	36	25	**61**	29	71	**100**	**161**
09:00 10:00	120	63	**183**	123	242	**365**	**548**
11:30 11:45	25	35	**60**	39	87	**126**	**186**
11:45 12:00	35	18	**53**	45	68	**113**	**166**
12:00 12:15	35	48	**83**	46	85	**131**	**214**
12:15 12:30	40	34	**74**	55	64	**119**	**193**
11:30 12:30	135	135	**270**	185	304	**489**	**759**
12:30 12:45	30	47	**77**	73	87	**160**	**237**
12:45 13:00	40	39	**79**	75	81	**156**	**235**
13:00 13:15	26	45	**71**	48	80	**128**	**199**
13:15 13:30	27	30	**57**	46	74	**120**	**177**
12:30 13:30	123	161	**284**	242	322	**564**	**848**
15:00 15:15	31	20	**51**	44	56	**100**	**151**
15:15 15:30	36	23	**59**	54	73	**127**	**186**
15:30 15:45	33	33	**66**	59	67	**126**	**192**
15:45 16:00	35	36	**71**	50	68	**118**	**189**
15:00 16:00	135	112	**247**	207	264	**471**	**718**
16:00 16:15	40	24	**64**	60	74	**134**	**198**
16:15 16:30	58	32	**90**	70	80	**150**	**240**
16:30 16:45	31	22	**53**	63	69	**132**	**185**
16:45 17:00	55	42	**97**	85	99	**184**	**281**
16:00 17:00	184	120	**304**	278	322	**600**	**904**
17:00 17:15	79	41	**120**	115	117	**232**	**352**
17:15 17:30	62	44	**106**	117	116	**233**	**339**
17:30 17:45	53	32	**85**	86	96	**182**	**267**
17:45 18:00	51	30	**81**	78	79	**157**	**238**
17:00 18:00	245	147	**392**	396	408	**804**	**1196**
Total	1129	847	**1976**	1644	2255	**3899**	**5875**

Comment:

Transportation Services - Traffic Services

Work Order 36101

Turning Movement Count - 15 Min U-Turn Total Report

BANK ST @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 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	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
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
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		0	0	0	0	0

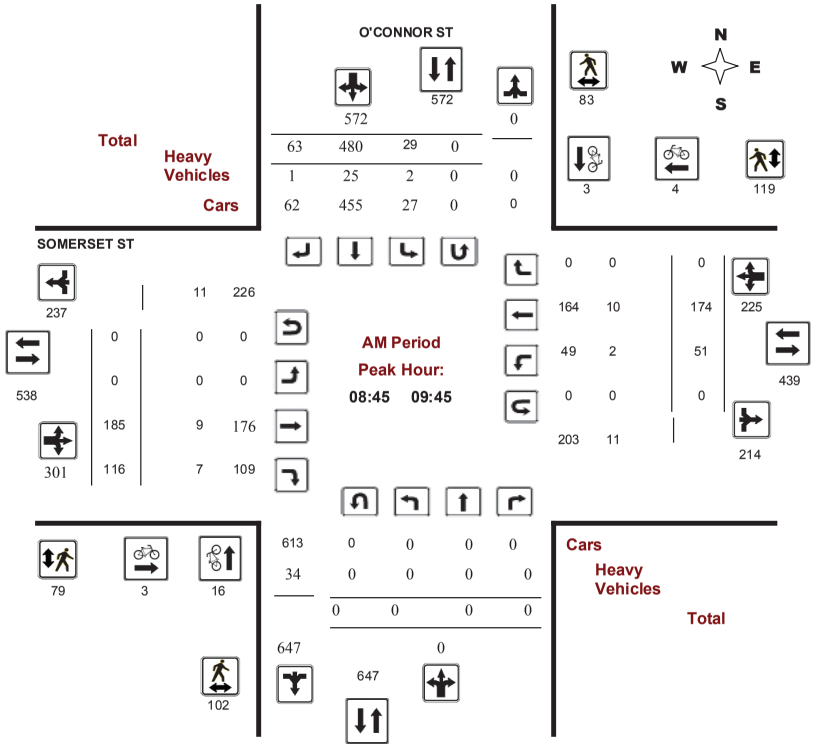
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36787

Start Time: 07:00 **Device:** Miovision



Comments

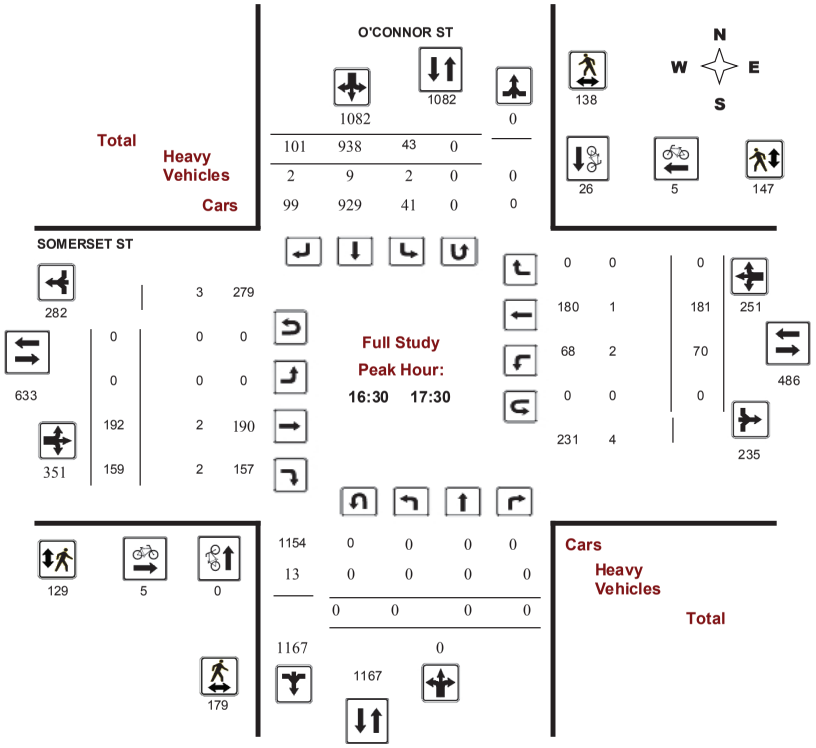
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36787

Start Time: 07:00 **Device:** Miovision



Comments

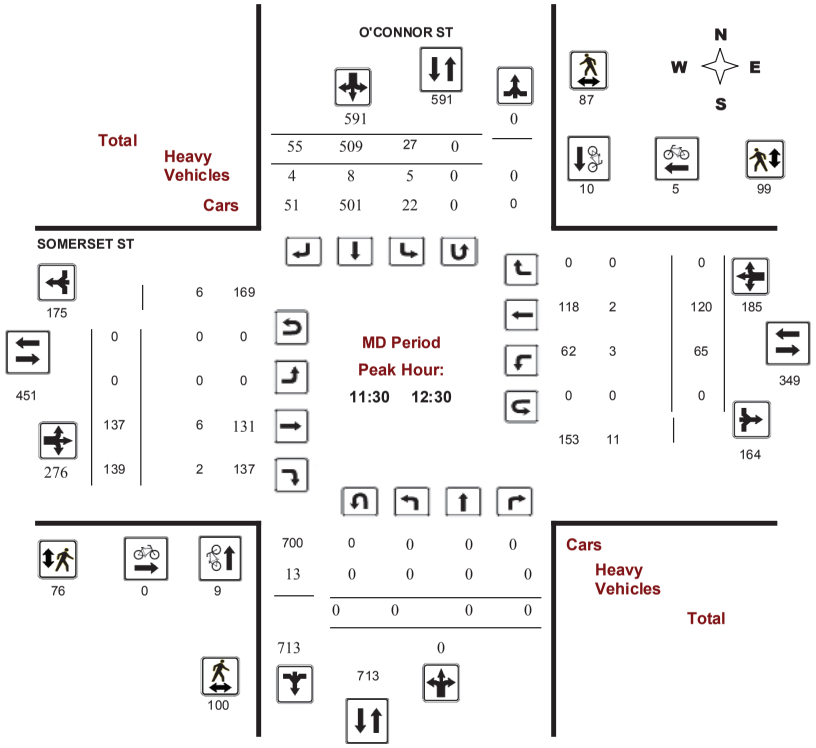
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36787

Start Time: 07:00 **Device:** Miovision



Comments

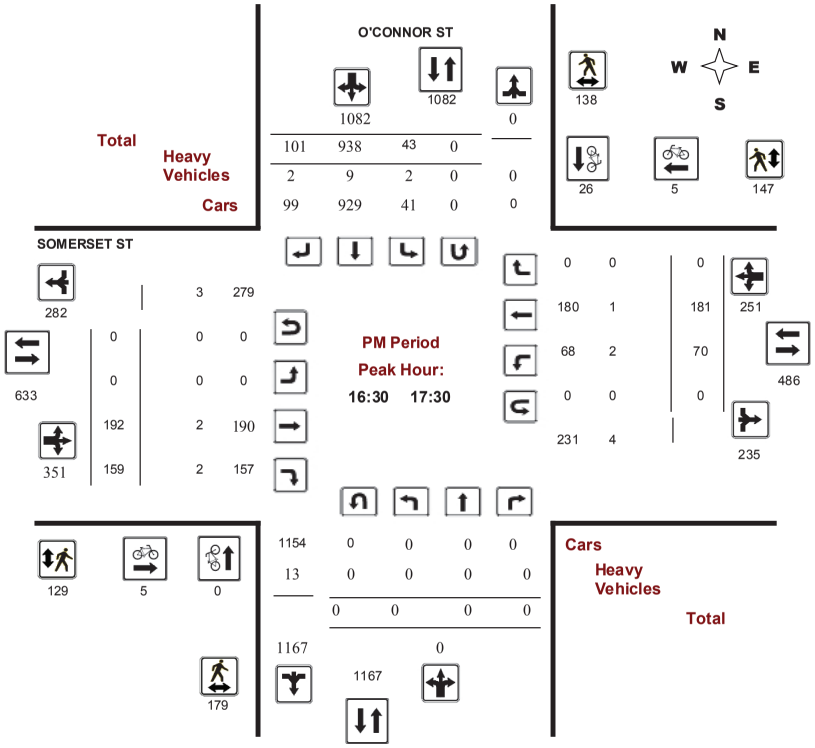
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36787

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

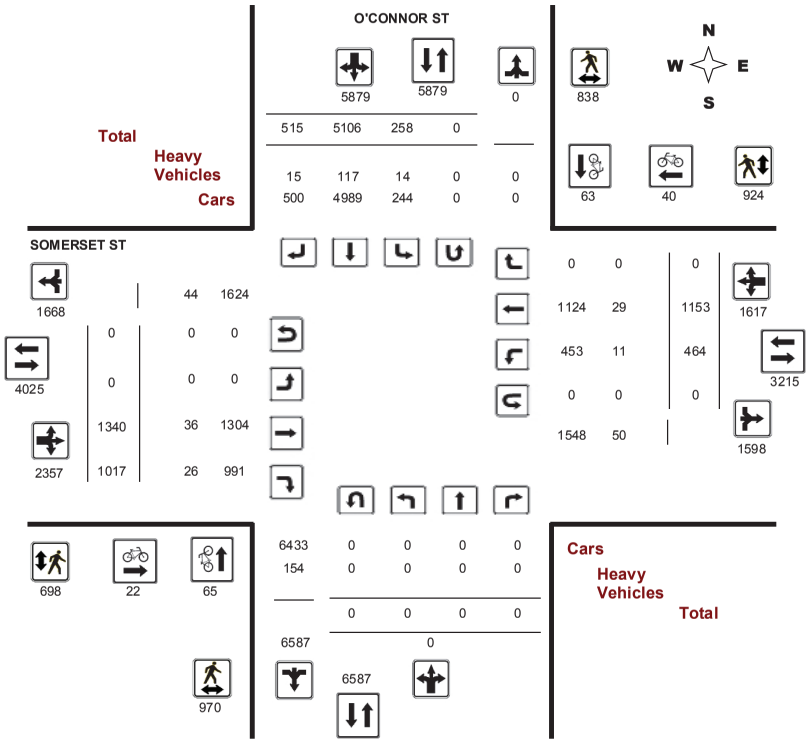
Turning Movement Count - Full Study Diagram

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017

WO#: 36787

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 36787

Turning Movement Count - Full Study Summary Report

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor 1.00

Full Study

	O'CONNOR ST									SOMERSET ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	0	0	0	**0**	19	443	45	**507**	**507**	0	143	78	**221**	36	109	0	**145**	**366**	**873**
08:00 09:00	0	0	0	**0**	42	466	50	**558**	**558**	0	197	110	**307**	57	164	0	**221**	**528**	**1086**
09:00 10:00	0	0	0	**0**	20	484	68	**572**	**572**	0	170	108	**278**	56	165	0	**221**	**499**	**1071**
11:30 12:30	0	0	0	**0**	27	509	55	**591**	**591**	0	137	139	**276**	65	120	0	**185**	**461**	**1052**
12:30 13:30	0	0	0	**0**	31	497	57	**585**	**585**	0	145	105	**250**	41	116	0	**157**	**407**	**992**
15:00 16:00	0	0	0	**0**	37	872	64	**973**	**973**	0	168	181	**349**	79	142	0	**221**	**570**	**1543**
16:00 17:00	0	0	0	**0**	45	916	88	**1049**	**1049**	0	198	155	**353**	60	161	0	**221**	**574**	**1623**
17:00 18:00	0	0	0	**0**	37	919	88	**1044**	**1044**	0	182	141	**323**	70	176	0	**246**	**569**	**1613**
Sub Total	0	0	0	**0**	258	5106	515	**5879**	**5879**	0	1340	1017	**2357**	464	1153	0	**1617**	**3974**	**9853**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	0	0	**0**	258	5106	515	**5879**	**5879**	0	1340	1017	**2357**	464	1153	0	**1617**	**3974**	**9853**
EQ 12Hr	0	0	0	**0**	359	7097	716	**8172**	**8172**	0	1863	1414	**3276**	645	1603	0	**2248**	**5524**	**13696**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	0	0	0	**0**	359	7097	716	**8172**	**8172**	0	1863	1414	**3276**	645	1603	0	**2248**	**5524**	**13696**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**1.00**						
AVG 24Hr	0	0	0	**0**	470	9298	938	**10705**	**10705**	0	2440	1852	**4292**	845	2099	0	**2944**	**7236**	**17941**
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

W.O. 36787

Turning Movement Count - 15 Minute Summary Report

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

	O'CONNOR ST									SOMERSET ST									
	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	Grand Total
07:00 07:15	0	0	0	**0**	4	90	9	**103**	**103**	0	21	12	**33**	3	13	0	**16**	**49**	**152**
07:15 07:30	0	0	0	**0**	2	102	8	**112**	**112**	0	37	16	**53**	6	21	0	**27**	**80**	**192**
07:30 07:45	0	0	0	**0**	6	127	5	**138**	**138**	0	37	27	**64**	17	45	0	**62**	**126**	**264**
07:45 08:00	0	0	0	**0**	7	124	23	**154**	**154**	0	48	23	**71**	10	30	0	**40**	**111**	**265**
08:00 08:15	0	0	0	**0**	8	134	14	**156**	**156**	0	60	25	**85**	13	40	0	**53**	**138**	**294**
08:15 08:30	0	0	0	**0**	7	99	15	**121**	**121**	0	41	23	**64**	18	41	0	**59**	**123**	**244**
08:30 08:45	0	0	0	**0**	12	113	10	**135**	**135**	0	52	29	**81**	17	38	0	**55**	**136**	**271**
08:45 09:00	0	0	0	**0**	15	120	11	**146**	**146**	0	44	33	**77**	9	45	0	**54**	**131**	**277**
09:00 09:15	0	0	0	**0**	8	127	13	**148**	**148**	0	52	31	**83**	13	41	0	**54**	**137**	**285**
09:15 09:30	0	0	0	**0**	4	104	16	**124**	**124**	0	45	26	**71**	16	44	0	**60**	**131**	**255**
09:30 09:45	0	0	0	**0**	2	129	23	**154**	**154**	0	44	26	**70**	13	44	0	**57**	**127**	**281**
09:45 10:00	0	0	0	**0**	6	124	16	**146**	**146**	0	29	25	**54**	14	36	0	**50**	**104**	**250**
11:30 11:45	0	0	0	**0**	3	130	21	**154**	**154**	0	29	31	**60**	17	31	0	**48**	**108**	**262**
11:45 12:00	0	0	0	**0**	9	123	14	**146**	**146**	0	46	50	**96**	19	31	0	**50**	**146**	**292**
12:00 12:15	0	0	0	**0**	7	125	11	**143**	**143**	0	26	34	**60**	20	29	0	**49**	**109**	**252**
12:15 12:30	0	0	0	**0**	8	131	9	**148**	**148**	0	36	24	**60**	9	29	0	**38**	**98**	**246**
12:30 12:45	0	0	0	**0**	4	115	16	**135**	**135**	0	45	29	**74**	12	23	0	**35**	**109**	**244**
12:45 13:00	0	0	0	**0**	13	134	15	**162**	**162**	0	34	25	**59**	11	37	0	**48**	**107**	**269**
13:00 13:15	0	0	0	**0**	11	129	9	**149**	**149**	0	33	28	**61**	9	26	0	**35**	**96**	**245**
13:15 13:30	0	0	0	**0**	3	119	17	**139**	**139**	0	33	23	**56**	9	30	0	**39**	**95**	**234**
15:00 15:15	0	0	0	**0**	13	227	17	**257**	**257**	0	35	48	**83**	24	32	0	**56**	**139**	**396**
15:15 15:30	0	0	0	**0**	10	224	11	**245**	**245**	0	37	47	**84**	18	35	0	**53**	**137**	**382**
15:30 15:45	0	0	0	**0**	6	210	25	**241**	**241**	0	51	39	**90**	20	32	0	**52**	**142**	**383**
15:45 16:00	0	0	0	**0**	8	211	11	**230**	**230**	0	45	47	**92**	17	43	0	**60**	**152**	**382**
16:00 16:15	0	0	0	**0**	7	230	16	**253**	**253**	0	52	34	**86**	11	44	0	**55**	**141**	**394**
16:15 16:30	0	0	0	**0**	9	236	24	**269**	**269**	0	53	41	**94**	16	38	0	**54**	**148**	**417**
16:30 16:45	0	0	0	**0**	14	240	27	**281**	**281**	0	51	38	**89**	16	43	0	**59**	**148**	**429**
16:45 17:00	0	0	0	**0**	15	210	21	**246**	**246**	0	42	42	**84**	17	36	0	**53**	**137**	**383**
17:00 17:15	0	0	0	**0**	7	242	24	**273**	**273**	0	47	40	**87**	24	56	0	**80**	**167**	**440**
17:15 17:30	0	0	0	**0**	7	246	29	**282**	**282**	0	52	39	**91**	13	46	0	**59**	**150**	**432**
17:30 17:45	0	0	0	**0**	13	238	18	**269**	**269**	0	31	30	**61**	12	45	0	**57**	**118**	**387**
17:45 18:00	0	0	0	**0**	10	193	17	**220**	**220**	0	52	32	**84**	21	29	0	**50**	**134**	**354**
TOTAL:	0	0	0	**0**	258	5106	515	**5879**	**5879**	0	1340	1017	**2357**	464	1153	0	**1617**	**3974**	**9853**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36787

O'CONNOR ST @ SOMERSET ST

Count Date: Tuesday, March 21, 2017

Start Time: 07:00

	O'CONNOR ST			SOMERSET ST			
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 08:00	8	1	**9**	3	3	**6**	**15**
08:00 09:00	30	1	**31**	2	6	**8**	**39**
09:00 10:00	10	3	**13**	3	2	**5**	**18**
11:30 12:30	9	10	**19**	0	5	**5**	**24**
12:30 13:30	5	1	**6**	0	3	**3**	**9**
15:00 16:00	2	10	**12**	3	3	**6**	**18**
16:00 17:00	1	18	**19**	6	5	**11**	**30**
17:00 18:00	0	19	**19**	5	13	**18**	**37**
Total	65	63	**128**	22	40	**62**	**190**

Comment:

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. 36787

Turning Movement Count - Heavy Vehicle Report

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017

	O'CONNOR ST								SOMERSET ST										
	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	Grand Total
07:00 08:00	0	0	0	**0**	1	20	3	**24**	**24**	0	8	3	**11**	0	4	0	**4**	**15**	**39**
08:00 09:00	0	0	0	**0**	1	15	2	**18**	**18**	0	5	2	**7**	3	3	0	**6**	**13**	**31**
09:00 10:00	0	0	0	**0**	1	26	1	**28**	**28**	0	6	6	**12**	1	9	0	**10**	**22**	**50**
11:30 12:30	0	0	0	**0**	5	8	4	**17**	**17**	0	6	2	**8**	3	2	0	**5**	**13**	**30**
12:30 13:30	0	0	0	**0**	1	16	2	**19**	**19**	0	3	4	**7**	1	4	0	**5**	**12**	**31**
15:00 16:00	0	0	0	**0**	1	8	1	**10**	**10**	0	5	3	**8**	1	3	0	**4**	**12**	**22**
16:00 17:00	0	0	0	**0**	3	15	2	**20**	**20**	0	3	5	**8**	2	3	0	**5**	**13**	**33**
17:00 18:00	0	0	0	**0**	1	9	0	**10**	**10**	0	0	1	**1**	0	1	0	**1**	**2**	**12**
Sub Total	0	0	0	**0**	14	117	15	**146**	**146**	0	36	26	**62**	11	29	0	**40**	**102**	**248**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	0	0	**0**	14	117	15	**146**	**146**	0	36	26	**62**	11	29	0	**40**	**102**	**248**

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 36787

Turning Movement Count - Pedestrian Volume Report

O'CONNOR ST @ SOMERSET ST

Count Date: Tuesday, March 21, 2017 **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	7	4	**11**	13	3	**16**	**27**
07:15 07:30	11	14	**25**	8	16	**24**	**49**
07:30 07:45	11	22	**33**	19	22	**41**	**74**
07:45 08:00	27	22	**49**	25	34	**59**	**108**
07:00 08:00	56	62	**118**	65	75	**140**	**258**
08:00 08:15	36	27	**63**	31	42	**73**	**136**
08:15 08:30	39	16	**55**	26	47	**73**	**128**
08:30 08:45	34	39	**73**	35	53	**88**	**161**
08:45 09:00	44	37	**81**	28	58	**86**	**167**
08:00 09:00	153	119	**272**	120	200	**320**	**592**
09:00 09:15	24	22	**46**	18	34	**52**	**98**
09:15 09:30	19	18	**37**	21	15	**36**	**73**
09:30 09:45	15	6	**21**	12	12	**24**	**45**
09:45 10:00	19	9	**28**	13	18	**31**	**59**
09:00 10:00	77	55	**132**	64	79	**143**	**275**
11:30 11:45	27	22	**49**	16	15	**31**	**80**
11:45 12:00	22	22	**44**	17	27	**44**	**88**
12:00 12:15	30	21	**51**	19	28	**47**	**98**
12:15 12:30	21	22	**43**	24	29	**53**	**96**
11:30 12:30	100	87	**187**	76	99	**175**	**362**
12:30 12:45	32	23	**55**	16	28	**44**	**99**
12:45 13:00	27	43	**70**	13	28	**41**	**111**
13:00 13:15	29	30	**59**	14	24	**38**	**97**
13:15 13:30	24	18	**42**	23	18	**41**	**83**
12:30 13:30	112	114	**226**	66	98	**164**	**390**
15:00 15:15	29	26	**55**	18	15	**33**	**88**
15:15 15:30	23	21	**44**	13	20	**33**	**77**
15:30 15:45	37	23	**60**	19	19	**38**	**98**
15:45 16:00	31	27	**58**	7	26	**33**	**91**
15:00 16:00	120	97	**217**	57	80	**137**	**354**
16:00 16:15	33	32	**65**	24	34	**58**	**123**
16:15 16:30	37	34	**71**	38	43	**81**	**152**
16:30 16:45	47	36	**83**	32	34	**66**	**149**
16:45 17:00	41	37	**78**	27	34	**61**	**139**
16:00 17:00	158	139	**297**	121	145	**266**	**563**
17:00 17:15	52	36	**88**	44	38	**82**	**170**
17:15 17:30	39	29	**68**	26	41	**67**	**135**
17:30 17:45	53	39	**92**	35	34	**69**	**161**
17:45 18:00	50	61	**111**	24	35	**59**	**170**
17:00 18:00	194	165	**359**	129	148	**277**	**636**
Total	970	838	**1808**	698	924	**1622**	**3430**

Comment:

Transportation Services - Traffic Services

Work Order 36787

Turning Movement Count - 15 Min U-Turn Total Report

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017

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
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
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		0	0	0	0	0

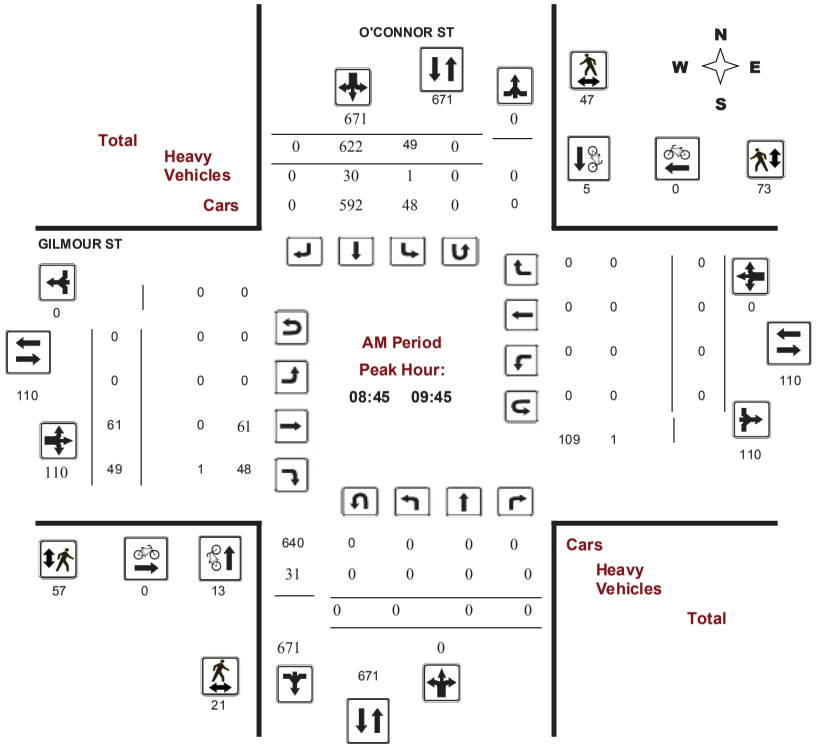
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36785

Start Time: 07:00 **Device:** Miovision



Comments

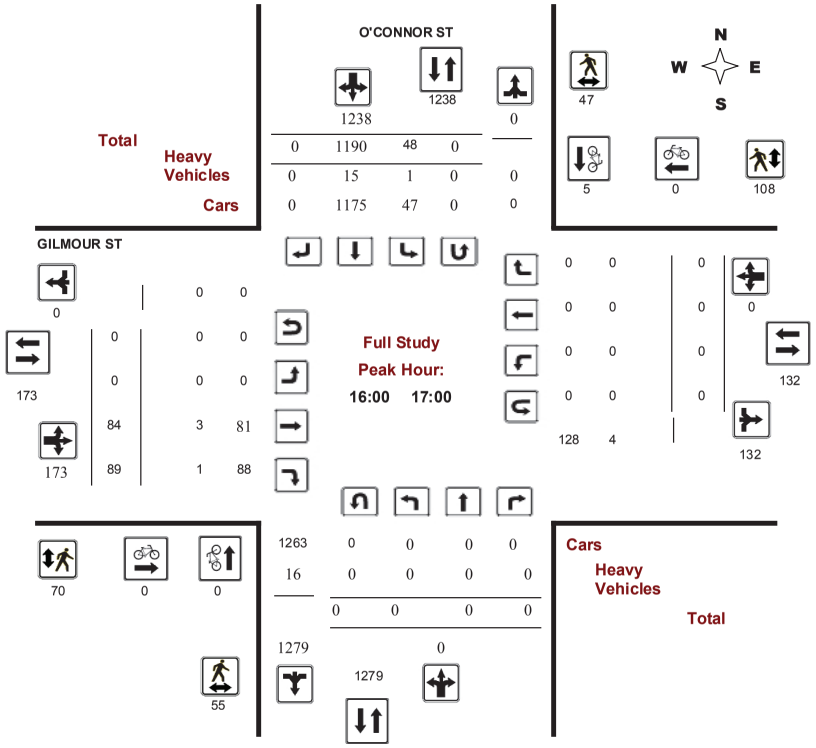
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36785

Start Time: 07:00 **Device:** Miovision


O'CONNOR ST
GILMOUR ST
N
W
E
S
Total
Heavy Vehicles
Cars
1238
1238
0
0 1190 48 0
0 15 1 0
0 1175 47 0
47
5
0
108
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

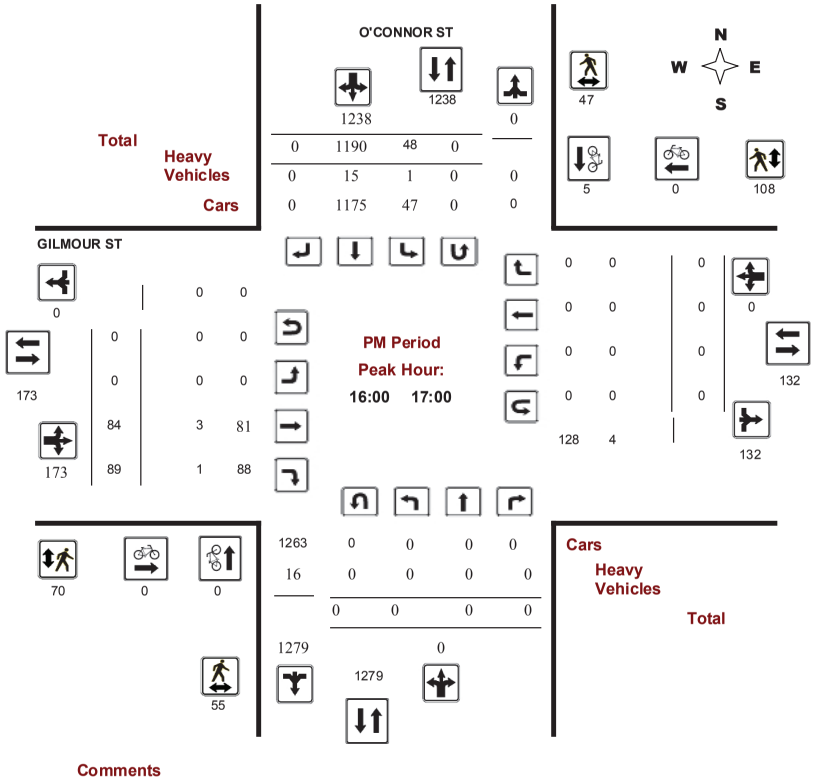
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36785

Start Time: 07:00 **Device:** Miovision


O'CONNOR ST
GILMOUR ST
N
W
E
S
Total
Heavy Vehicles
Cars
1238
1238
0
0 1190 48 0
0 15 1 0
0 1175 47 0
0
0
47
5
0
108
0
0
0

Transportation Services - Traffic Services

Work Order 36785

Turning Movement Count - Full Study Summary Report

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AADT Factor 1.00

Full Study

	O'CONNOR ST									GILMOUR ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	0	0	0	**0**	39	555	0	**594**	**594**	0	39	26	**65**	0	0	0	**0**	**65**	**659**
08:00 09:00	0	0	0	**0**	45	601	0	**646**	**646**	0	79	43	**122**	0	0	0	**0**	**122**	**768**
09:00 10:00	0	0	0	**0**	51	619	0	**670**	**670**	0	52	41	**93**	0	0	0	**0**	**93**	**763**
11:30 12:30	0	0	0	**0**	39	711	0	**750**	**750**	0	52	37	**89**	0	0	0	**0**	**89**	**839**
12:30 13:30	0	0	0	**0**	25	615	0	**640**	**640**	0	41	50	**91**	0	0	0	**0**	**91**	**731**
15:00 16:00	0	0	0	**0**	38	1192	0	**1230**	**1230**	0	54	96	**150**	0	0	0	**0**	**150**	**1380**
16:00 17:00	0	0	0	**0**	48	1190	0	**1238**	**1238**	0	84	89	**173**	0	0	0	**0**	**173**	**1411**
17:00 18:00	0	0	0	**0**	46	1119	0	**1165**	**1165**	0	73	91	**164**	0	0	0	**0**	**164**	**1329**
Sub Total	0	0	0	**0**	331	6602	0	**6933**	**6933**	0	474	473	**947**	0	0	0	**0**	**947**	**7880**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	0	0	**0**	331	6602	0	**6933**	**6933**	0	474	473	**947**	0	0	0	**0**	**947**	**7880**
EQ 12Hr	0	0	0	**0**	460	9177	0	**9637**	**9637**	0	659	657	**1316**	0	0	0	**0**	**1316**	**10953**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**																			
AVG 12Hr	0	0	0	**0**	460	9177	0	**9637**	**9637**	0	659	657	**1316**	0	0	0	**0**	**1316**	**10953**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **1.00**																			
AVG 24Hr	0	0	0	**0**	603	12022	0	**12624**	**12624**	0	863	861	**1724**	0	0	0	**0**	**1724**	**14348**
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

W.O. 36785

Turning Movement Count - 15 Minute Summary Report

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

	O'CONNOR ST									GILMOUR ST									
	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	Grand Total
07:00 07:15	0	0	0	**0**	8	103	0	**111**	**111**	0	1	2	**3**	0	0	0	**0**	**3**	**114**
07:15 07:30	0	0	0	**0**	12	129	0	**141**	**141**	0	9	3	**12**	0	0	0	**0**	**12**	**153**
07:30 07:45	0	0	0	**0**	10	162	0	**172**	**172**	0	15	12	**27**	0	0	0	**0**	**27**	**199**
07:45 08:00	0	0	0	**0**	9	161	0	**170**	**170**	0	14	9	**23**	0	0	0	**0**	**23**	**193**
08:00 08:15	0	0	0	**0**	14	156	0	**170**	**170**	0	24	9	**33**	0	0	0	**0**	**33**	**203**
08:15 08:30	0	0	0	**0**	13	127	0	**140**	**140**	0	19	10	**29**	0	0	0	**0**	**29**	**169**
08:30 08:45	0	0	0	**0**	7	159	0	**166**	**166**	0	14	7	**21**	0	0	0	**0**	**21**	**187**
08:45 09:00	0	0	0	**0**	11	159	0	**170**	**170**	0	22	17	**39**	0	0	0	**0**	**39**	**209**
09:00 09:15	0	0	0	**0**	13	158	0	**171**	**171**	0	15	9	**24**	0	0	0	**0**	**24**	**195**
09:15 09:30	0	0	0	**0**	11	137	0	**148**	**148**	0	20	11	**31**	0	0	0	**0**	**31**	**179**
09:30 09:45	0	0	0	**0**	14	168	0	**182**	**182**	0	4	12	**16**	0	0	0	**0**	**16**	**198**
09:45 10:00	0	0	0	**0**	13	156	0	**169**	**169**	0	13	9	**22**	0	0	0	**0**	**22**	**191**
11:30 11:45	0	0	0	**0**	6	184	0	**190**	**190**	0	13	5	**18**	0	0	0	**0**	**18**	**208**
11:45 12:00	0	0	0	**0**	17	178	0	**195**	**195**	0	9	11	**20**	0	0	0	**0**	**20**	**215**
12:00 12:15	0	0	0	**0**	8	179	0	**187**	**187**	0	19	9	**28**	0	0	0	**0**	**28**	**215**
12:15 12:30	0	0	0	**0**	8	170	0	**178**	**178**	0	11	12	**23**	0	0	0	**0**	**23**	**201**
12:30 12:45	0	0	0	**0**	7	152	0	**159**	**159**	0	11	15	**26**	0	0	0	**0**	**26**	**185**
12:45 13:00	0	0	0	**0**	10	160	0	**170**	**170**	0	11	15	**26**	0	0	0	**0**	**26**	**196**
13:00 13:15	0	0	0	**0**	3	154	0	**157**	**157**	0	7	9	**16**	0	0	0	**0**	**16**	**173**
13:15 13:30	0	0	0	**0**	5	149	0	**154**	**154**	0	12	11	**23**	0	0	0	**0**	**23**	**177**
15:00 15:15	0	0	0	**0**	5	335	0	**340**	**340**	0	19	30	**49**	0	0	0	**0**	**49**	**389**
15:15 15:30	0	0	0	**0**	14	288	0	**302**	**302**	0	14	20	**34**	0	0	0	**0**	**34**	**336**
15:30 15:45	0	0	0	**0**	7	277	0	**284**	**284**	0	10	23	**33**	0	0	0	**0**	**33**	**317**
15:45 16:00	0	0	0	**0**	12	292	0	**304**	**304**	0	11	23	**34**	0	0	0	**0**	**34**	**338**
16:00 16:15	0	0	0	**0**	16	298	0	**314**	**314**	0	22	29	**51**	0	0	0	**0**	**51**	**365**
16:15 16:30	0	0	0	**0**	13	305	0	**318**	**318**	0	18	22	**40**	0	0	0	**0**	**40**	**358**
16:30 16:45	0	0	0	**0**	7	291	0	**298**	**298**	0	19	14	**33**	0	0	0	**0**	**33**	**331**
16:45 17:00	0	0	0	**0**	12	296	0	**308**	**308**	0	25	24	**49**	0	0	0	**0**	**49**	**357**
17:00 17:15	0	0	0	**0**	16	303	0	**319**	**319**	0	21	24	**45**	0	0	0	**0**	**45**	**364**
17:15 17:30	0	0	0	**0**	11	288	0	**299**	**299**	0	28	23	**51**	0	0	0	**0**	**51**	**350**
17:30 17:45	0	0	0	**0**	13	285	0	**298**	**298**	0	13	23	**36**	0	0	0	**0**	**36**	**334**
17:45 18:00	0	0	0	**0**	6	243	0	**249**	**249**	0	11	21	**32**	0	0	0	**0**	**32**	**281**
TOTAL:	0	0	0	**0**	331	6602	0	**6933**	**6933**	0	474	473	**947**	0	0	0	**0**	**947**	**7880**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36785

GILMOUR ST @ O'CONNOR ST

Count Date: Tuesday, March 21, 2017 **Start Time:** 07:00

	O'CONNOR ST			GILMOUR ST			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	5	0	**5**	1	0	**1**	**6**
08:00 09:00	26	1	**27**	2	0	**2**	**29**
09:00 10:00	8	5	**13**	0	0	**0**	**13**
11:30 12:30	0	3	**3**	2	0	**2**	**5**
12:30 13:30	3	0	**3**	1	1	**2**	**5**
15:00 16:00	5	2	**7**	0	0	**0**	**7**
16:00 17:00	0	5	**5**	0	0	**0**	**5**
17:00 18:00	2	21	**23**	2	0	**2**	**25**
Total	49	37	**86**	8	1	**9**	**95**

Comment:

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. 36785

Turning Movement Count - Heavy Vehicle Report

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

	O'CONNOR ST									GILMOUR ST									
	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**	**Grand Total**
07:00 08:00	0	0	0	**0**	0	18	0	**18**	**18**	0	0	0	**0**	0	0	0	**0**	**0**	**18**
08:00 09:00	0	0	0	**0**	1	22	0	**23**	**23**	0	2	1	**3**	0	0	0	**0**	**3**	**26**
09:00 10:00	0	0	0	**0**	0	29	0	**29**	**29**	0	0	1	**1**	0	0	0	**0**	**1**	**30**
11:30 12:30	0	0	0	**0**	5	19	0	**24**	**24**	0	3	1	**4**	0	0	0	**0**	**4**	**28**
12:30 13:30	0	0	0	**0**	2	16	0	**18**	**18**	0	4	3	**7**	0	0	0	**0**	**7**	**25**
15:00 16:00	0	0	0	**0**	0	8	0	**8**	**8**	0	1	3	**4**	0	0	0	**0**	**4**	**12**
16:00 17:00	0	0	0	**0**	1	15	0	**16**	**16**	0	3	1	**4**	0	0	0	**0**	**4**	**20**
17:00 18:00	0	0	0	**0**	1	9	0	**10**	**10**	0	1	4	**5**	0	0	0	**0**	**5**	**15**
Sub Total	0	0	0	**0**	10	136	0	**146**	**146**	0	14	14	**28**	0	0	0	**0**	**28**	**174**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	0	0	**0**	10	136	0	**146**	**146**	0	14	14	**28**	0	0	0	**0**	**28**	**174**

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 36785

Turning Movement Count - Pedestrian Volume Report

GILMOUR ST @ O'CONNOR ST

Count Date: Tuesday, March 21, 2017 **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	3	2	**5**	9	7	**16**	**21**
07:15 07:30	3	2	**5**	9	12	**21**	**26**
07:30 07:45	6	8	**14**	9	22	**31**	**45**
07:45 08:00	4	10	**14**	15	16	**31**	**45**
07:00 08:00	16	22	**38**	42	57	**99**	**137**
08:00 08:15	18	12	**30**	16	17	**33**	**63**
08:15 08:30	4	18	**22**	29	33	**62**	**84**
08:30 08:45	6	16	**22**	31	37	**68**	**90**
08:45 09:00	8	18	**26**	19	30	**49**	**75**
08:00 09:00	36	64	**100**	95	117	**212**	**312**
09:00 09:15	5	8	**13**	16	18	**34**	**47**
09:15 09:30	2	8	**10**	13	15	**28**	**38**
09:30 09:45	6	13	**19**	9	10	**19**	**38**
09:45 10:00	2	6	**8**	5	12	**17**	**25**
09:00 10:00	15	35	**50**	43	55	**98**	**148**
11:30 11:45	6	6	**12**	15	12	**27**	**39**
11:45 12:00	3	8	**11**	8	11	**19**	**30**
12:00 12:15	5	18	**23**	15	20	**35**	**58**
12:15 12:30	5	18	**23**	19	15	**34**	**57**
11:30 12:30	19	50	**69**	57	58	**115**	**184**
12:30 12:45	13	16	**29**	18	31	**49**	**78**
12:45 13:00	4	11	**15**	10	17	**27**	**42**
13:00 13:15	5	10	**15**	10	9	**19**	**34**
13:15 13:30	5	14	**19**	4	16	**20**	**39**
12:30 13:30	27	51	**78**	42	73	**115**	**193**
15:00 15:15	13	12	**25**	13	14	**27**	**52**
15:15 15:30	8	12	**20**	15	12	**27**	**47**
15:30 15:45	9	13	**22**	21	18	**39**	**61**
15:45 16:00	15	10	**25**	5	19	**24**	**49**
15:00 16:00	45	47	**92**	54	63	**117**	**209**
16:00 16:15	17	15	**32**	14	29	**43**	**75**
16:15 16:30	10	8	**18**	18	20	**38**	**56**
16:30 16:45	13	10	**23**	19	23	**42**	**65**
16:45 17:00	15	14	**29**	19	36	**55**	**84**
16:00 17:00	55	47	**102**	70	108	**178**	**280**
17:00 17:15	14	18	**32**	19	34	**53**	**85**
17:15 17:30	25	9	**34**	16	33	**49**	**83**
17:30 17:45	13	11	**24**	22	30	**52**	**76**
17:45 18:00	13	9	**22**	15	46	**61**	**83**
17:00 18:00	65	47	**112**	72	143	**215**	**327**
Total	278	363	**641**	475	674	**1149**	**1790**

Comment:

Transportation Services - Traffic Services

Work Order 36785

Turning Movement Count - 15 Min U-Turn Total Report

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

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
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
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		0	0	0	0	0

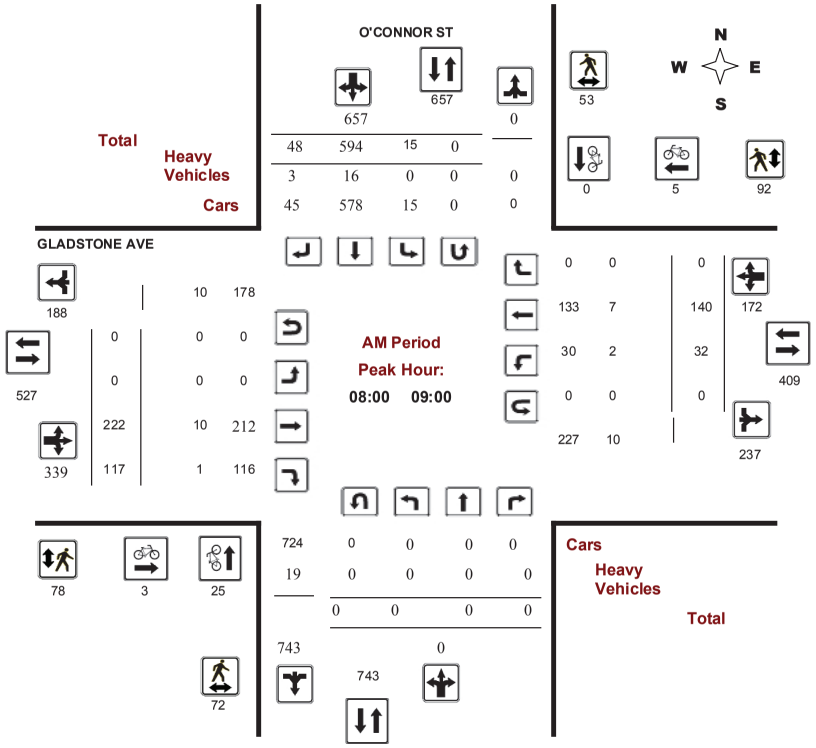
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36793

Start Time: 07:00 **Device:** Miovision



Comments

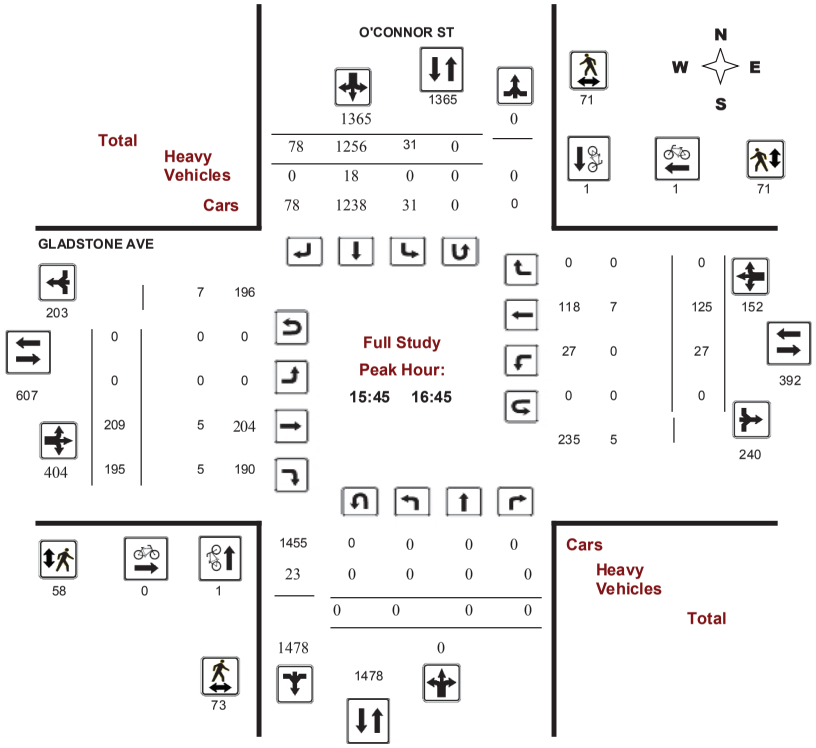
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36793

Start Time: 07:00 **Device:** Miovision



Comments

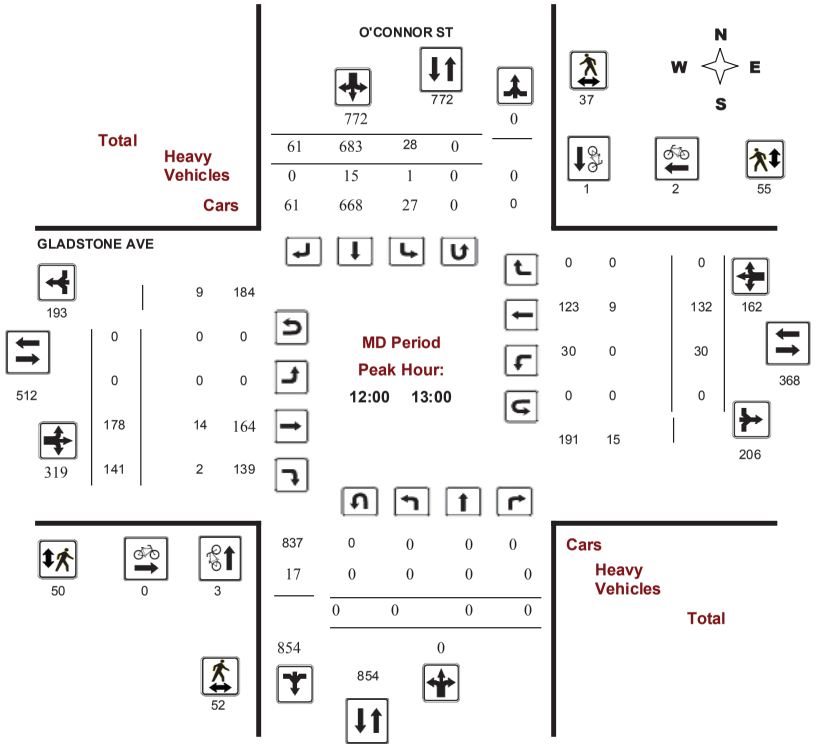
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36793

Start Time: 07:00 **Device:** Miovision



Comments

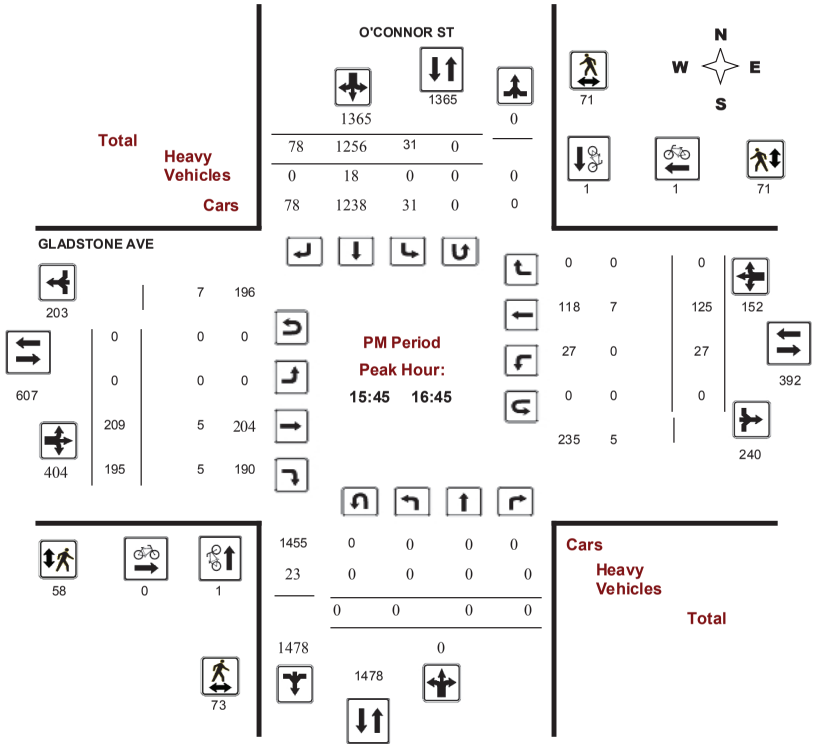
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36793

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

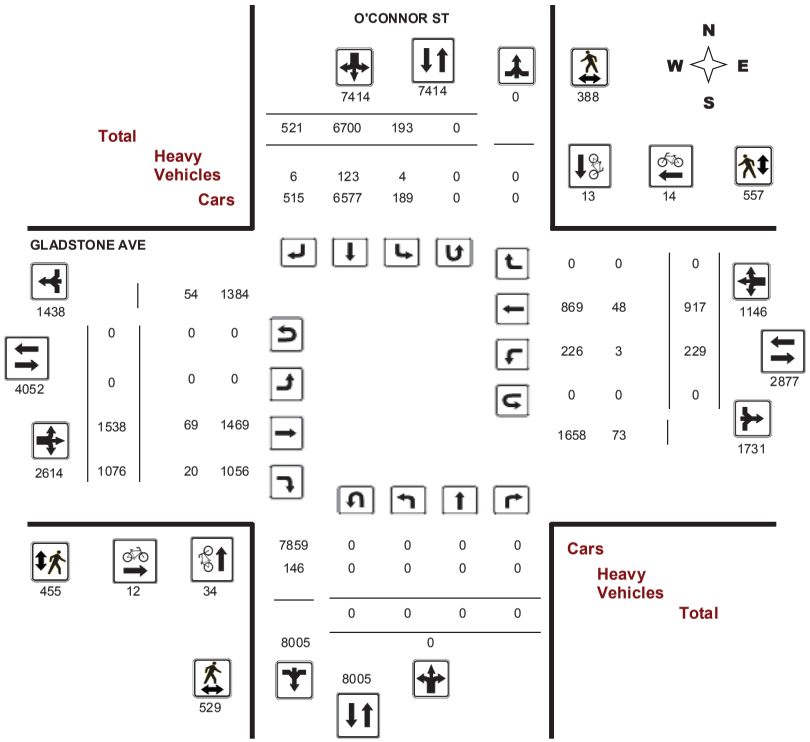
Turning Movement Count - Full Study Diagram

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

WO#: 36793

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 36793

Turning Movement Count - Full Study Summary Report

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor 1.00

Full Study

	O'CONNOR ST									GLADSTONE AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	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	0	0	0	**0**	7	528	43	**578**	**578**	0	151	80	**231**	35	67	0	**102**	**333**	**911**
08:00 09:00	0	0	0	**0**	15	594	48	**657**	**657**	0	222	117	**339**	32	140	0	**172**	**511**	**1168**
09:00 10:00	0	0	0	**0**	18	609	51	**678**	**678**	0	190	123	**313**	28	132	0	**160**	**473**	**1151**
11:30 12:30	0	0	0	**0**	25	691	57	**773**	**773**	0	192	134	**326**	24	117	0	**141**	**467**	**1240**
12:30 13:30	0	0	0	**0**	20	656	74	**750**	**750**	0	171	129	**300**	34	128	0	**162**	**462**	**1212**
15:00 16:00	0	0	0	**0**	31	1228	77	**1336**	**1336**	0	182	173	**355**	25	97	0	**122**	**477**	**1813**
16:00 17:00	0	0	0	**0**	36	1236	73	**1345**	**1345**	0	207	182	**389**	25	116	0	**141**	**530**	**1875**
17:00 18:00	0	0	0	**0**	41	1158	98	**1297**	**1297**	0	223	138	**361**	26	120	0	**146**	**507**	**1804**
Sub Total	0	0	0	**0**	193	6700	521	**7414**	**7414**	0	1538	1076	**2614**	229	917	0	**1146**	**3760**	**11174**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	0	0	**0**	193	6700	521	**7414**	**7414**	0	1538	1076	**2614**	229	917	0	**1146**	**3760**	**11174**
EQ 12Hr	0	0	0	**0**	268	9313	724	**10305**	**10305**	0	2138	1496	**3633**	318	1275	0	**1593**	**5226**	**15531**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	0	0	0	**0**	268	9313	724	**10305**	**10305**	0	2138	1496	**3633**	318	1275	0	**1593**	**5226**	**15531**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**1.00**						
AVG 24Hr	0	0	0	**0**	351	12200	949	**13500**	**13500**	0	2801	1959	**4760**	417	1670	0	**2087**	**6847**	**20347**
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

W.O. 36793

Turning Movement Count - 15 Minute Summary Report

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

	O'CONNOR ST									GLADSTONE AVE									
	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	Grand Total
07:00 07:15	0	0	0	**0**	0	92	6	**98**	**98**	0	33	13	**46**	8	15	0	**23**	**69**	**167**
07:15 07:30	0	0	0	**0**	2	109	9	**120**	**120**	0	36	10	**46**	11	14	0	**25**	**71**	**191**
07:30 07:45	0	0	0	**0**	1	168	15	**184**	**184**	0	32	27	**59**	8	11	0	**19**	**78**	**262**
07:45 08:00	0	0	0	**0**	4	159	13	**176**	**176**	0	50	30	**80**	8	27	0	**35**	**115**	**291**
08:00 08:15	0	0	0	**0**	4	162	17	**183**	**183**	0	56	28	**84**	12	24	0	**36**	**120**	**303**
08:15 08:30	0	0	0	**0**	3	125	7	**135**	**135**	0	60	27	**87**	7	37	0	**44**	**131**	**266**
08:30 08:45	0	0	0	**0**	4	163	7	**174**	**174**	0	45	38	**83**	8	38	0	**46**	**129**	**303**
08:45 09:00	0	0	0	**0**	4	144	17	**165**	**165**	0	61	24	**85**	5	41	0	**46**	**131**	**296**
09:00 09:15	0	0	0	**0**	6	156	15	**177**	**177**	0	52	34	**86**	3	34	0	**37**	**123**	**300**
09:15 09:30	0	0	0	**0**	3	132	10	**145**	**145**	0	43	27	**70**	10	35	0	**45**	**115**	**260**
09:30 09:45	0	0	0	**0**	4	173	10	**187**	**187**	0	50	35	**85**	5	34	0	**39**	**124**	**311**
09:45 10:00	0	0	0	**0**	5	148	16	**169**	**169**	0	45	27	**72**	10	29	0	**39**	**111**	**280**
11:30 11:45	0	0	0	**0**	8	173	13	**194**	**194**	0	53	31	**84**	5	30	0	**35**	**119**	**313**
11:45 12:00	0	0	0	**0**	5	165	19	**189**	**189**	0	48	32	**80**	6	23	0	**29**	**109**	**298**
12:00 12:15	0	0	0	**0**	6	184	15	**205**	**205**	0	49	31	**80**	6	42	0	**48**	**128**	**333**
12:15 12:30	0	0	0	**0**	6	169	10	**185**	**185**	0	42	40	**82**	7	22	0	**29**	**111**	**296**
12:30 12:45	0	0	0	**0**	4	168	18	**190**	**190**	0	49	38	**87**	10	32	0	**42**	**129**	**319**
12:45 13:00	0	0	0	**0**	12	162	18	**192**	**192**	0	38	32	**70**	7	36	0	**43**	**113**	**305**
13:00 13:15	0	0	0	**0**	3	164	23	**190**	**190**	0	31	25	**56**	6	34	0	**40**	**96**	**286**
13:15 13:30	0	0	0	**0**	1	162	15	**178**	**178**	0	53	34	**87**	11	26	0	**37**	**124**	**302**
15:00 15:15	0	0	0	**0**	11	296	27	**334**	**334**	0	32	34	**66**	7	30	0	**37**	**103**	**437**
15:15 15:30	0	0	0	**0**	5	340	20	**365**	**365**	0	51	43	**94**	4	19	0	**23**	**117**	**482**
15:30 15:45	0	0	0	**0**	10	275	11	**296**	**296**	0	46	44	**90**	6	20	0	**26**	**116**	**412**
15:45 16:00	0	0	0	**0**	5	317	19	**341**	**341**	0	53	52	**105**	8	28	0	**36**	**141**	**482**
16:00 16:15	0	0	0	**0**	9	316	19	**344**	**344**	0	54	55	**109**	6	34	0	**40**	**149**	**493**
16:15 16:30	0	0	0	**0**	8	321	21	**350**	**350**	0	50	43	**93**	5	28	0	**33**	**126**	**476**
16:30 16:45	0	0	0	**0**	9	302	19	**330**	**330**	0	52	45	**97**	8	35	0	**43**	**140**	**470**
16:45 17:00	0	0	0	**0**	10	297	14	**321**	**321**	0	51	39	**90**	6	19	0	**25**	**115**	**436**
17:00 17:15	0	0	0	**0**	4	311	20	**335**	**335**	0	60	43	**103**	7	40	0	**47**	**150**	**485**
17:15 17:30	0	0	0	**0**	16	316	27	**359**	**359**	0	57	36	**93**	3	34	0	**37**	**130**	**489**
17:30 17:45	0	0	0	**0**	13	279	22	**314**	**314**	0	50	30	**80**	7	23	0	**30**	**110**	**424**
17:45 18:00	0	0	0	**0**	8	252	29	**289**	**289**	0	56	29	**85**	9	23	0	**32**	**117**	**406**
TOTAL:	0	0	0	**0**	193	6700	521	**7414**	**7414**	0	1538	1076	**2614**	229	917	0	**1146**	**3760**	**11174**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36793

GLADSTONE AVE @ O'CONNOR ST

Count Date: Tuesday, March 21, 2017

Start Time: 07:00

	O'CONNOR ST			GLADSTONE AVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	0	**0**	2	2	**4**	**4**
08:00 09:00	25	0	**25**	3	5	**8**	**33**
09:00 10:00	0	2	**2**	3	0	**3**	**5**
11:30 12:30	0	3	**3**	0	0	**0**	**3**
12:30 13:30	3	0	**3**	0	2	**2**	**5**
15:00 16:00	0	4	**4**	1	0	**1**	**5**
16:00 17:00	4	1	**5**	0	3	**3**	**8**
17:00 18:00	2	3	**5**	3	2	**5**	**10**
Total	34	13	**47**	12	14	**26**	**73**

Comment:

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. 36793

Turning Movement Count - Heavy Vehicle Report

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

	O'CONNOR ST								GLADSTONE AVE										
	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	Grand Total
07:00 08:00	0	0	0	**0**	0	21	0	**21**	**21**	0	10	1	**11**	0	7	0	**7**	**18**	**39**
08:00 09:00	0	0	0	**0**	0	16	3	**19**	**19**	0	10	1	**11**	2	7	0	**9**	**20**	**39**
09:00 10:00	0	0	0	**0**	1	21	0	**22**	**22**	0	11	5	**16**	1	8	0	**9**	**25**	**47**
11:30 12:30	0	0	0	**0**	0	13	0	**13**	**13**	0	10	2	**12**	0	5	0	**5**	**17**	**30**
12:30 13:30	0	0	0	**0**	1	16	1	**18**	**18**	0	12	1	**13**	0	8	0	**8**	**21**	**39**
15:00 16:00	0	0	0	**0**	1	9	2	**12**	**12**	0	7	8	**15**	0	1	0	**1**	**16**	**28**
16:00 17:00	0	0	0	**0**	0	16	0	**16**	**16**	0	5	2	**7**	0	7	0	**7**	**14**	**30**
17:00 18:00	0	0	0	**0**	1	11	0	**12**	**12**	0	4	0	**4**	0	5	0	**5**	**9**	**21**
Sub Total	0	0	0	**0**	4	123	6	**133**	**133**	0	69	20	**89**	3	48	0	**51**	**140**	**273**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	0	0	**0**	4	123	6	**133**	**133**	0	69	20	**89**	3	48	0	**51**	**140**	**273**

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 36793

Turning Movement Count - Pedestrian Volume Report

GLADSTONE AVE @ O'CONNOR ST

Count Date: Tuesday, March 21, 2017 **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	4	2	**6**	4	4	**8**	**14**
07:15 07:30	6	2	**8**	6	13	**19**	**27**
07:30 07:45	15	5	**20**	11	11	**22**	**42**
07:45 08:00	14	7	**21**	15	15	**30**	**51**
07:00 08:00	39	16	**55**	36	43	**79**	**134**
08:00 08:15	17	13	**30**	17	19	**36**	**66**
08:15 08:30	15	9	**24**	17	17	**34**	**58**
08:30 08:45	21	19	**40**	20	29	**49**	**89**
08:45 09:00	19	12	**31**	24	27	**51**	**82**
08:00 09:00	72	53	**125**	78	92	**170**	**295**
09:00 09:15	14	7	**21**	9	19	**28**	**49**
09:15 09:30	14	11	**25**	14	15	**29**	**54**
09:30 09:45	11	6	**17**	11	11	**22**	**39**
09:45 10:00	10	9	**19**	5	11	**16**	**35**
09:00 10:00	49	33	**82**	39	56	**95**	**177**
11:30 11:45	8	9	**17**	11	5	**16**	**33**
11:45 12:00	6	14	**20**	9	10	**19**	**39**
12:00 12:15	16	7	**23**	8	6	**14**	**37**
12:15 12:30	8	9	**17**	17	14	**31**	**48**
11:30 12:30	38	39	**77**	45	35	**80**	**157**
12:30 12:45	11	11	**22**	16	15	**31**	**53**
12:45 13:00	17	10	**27**	9	20	**29**	**56**
13:00 13:15	10	10	**20**	12	8	**20**	**40**
13:15 13:30	27	11	**38**	7	15	**22**	**60**
12:30 13:30	65	42	**107**	44	58	**102**	**209**
15:00 15:15	4	16	**20**	11	13	**24**	**44**
15:15 15:30	24	17	**41**	13	13	**26**	**67**
15:30 15:45	19	21	**40**	12	20	**32**	**72**
15:45 16:00	15	15	**30**	14	14	**28**	**58**
15:00 16:00	62	69	**131**	50	60	**110**	**241**
16:00 16:15	13	22	**35**	17	31	**48**	**83**
16:15 16:30	22	21	**43**	16	11	**27**	**70**
16:30 16:45	23	13	**36**	11	15	**26**	**62**
16:45 17:00	34	22	**56**	26	20	**46**	**102**
16:00 17:00	92	78	**170**	70	77	**147**	**317**
17:00 17:15	28	12	**40**	20	33	**53**	**93**
17:15 17:30	26	9	**35**	29	31	**60**	**95**
17:30 17:45	29	21	**50**	23	21	**44**	**94**
17:45 18:00	29	16	**45**	21	51	**72**	**117**
17:00 18:00	112	58	**170**	93	136	**229**	**399**
Total	529	388	**917**	455	557	**1012**	**1929**

Comment:

Transportation Services - Traffic Services

Work Order
36793

Turning Movement Count - 15 Min U-Turn Total Report

GLADSTONE AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017

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
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
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		0	0	0	0	0

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	265	0	0	134	50	75	1554	164	0	0	0
Future Volume (vph)	62	265	0	0	134	50	75	1554	164	0	0	0
Satd. Flow (prot)	1642	1728	0	0	1589	0	1658	4558	0	0	0	0
Flt Permitted	0.560						0.950					
Satd. Flow (perm)	884	1728	0	0	1589	0	1083	4558	0	0	0	0
Satd. Flow (RTOR)					9			39				
Lane Group Flow (vph)	69	294	0	0	205	0	83	1909	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.5	21.5			21.5		21.4	21.4				
Total Split (s)	27.0	27.0			27.0		48.0	48.0				
Total Split (%)	36.0%	36.0%			36.0%		64.0%	64.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.2	2.2			2.2		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.5	5.5			5.5		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	17.4	17.4			17.4		46.7	46.7				
Actuated g/C Ratio	0.23	0.23			0.23		0.62	0.62				
v/c Ratio	0.34	0.73			0.55		0.12	0.67				
Control Delay	27.4	37.4			33.6		11.6	12.6				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	27.4	37.4			33.6		11.6	12.6				
LOS	C	D			C		B	B				
Approach Delay		35.5			33.6			12.6				
Approach LOS		D			C			B				
Queue Length 50th (m)	8.5	40.3			31.4		5.7	58.2				
Queue Length 95th (m)	18.8	62.4			m51.7		m13.3	76.8				
Internal Link Dist (m)		61.7			174.8			152.2			110.1	
Turn Bay Length (m)	25.0						40.0					
Base Capacity (vph)	253	495			461		673	2850				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.27	0.59			0.44		0.12	0.67				

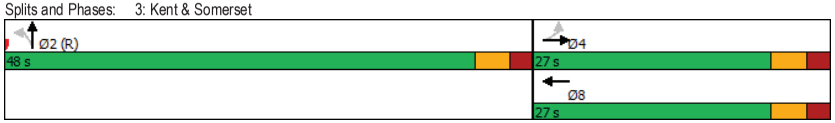
Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 14 (19%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 17.5	Intersection LOS: B
Intersection Capacity Utilization 71.4%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 3: Kent & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	253	75	14	153	11	8	469	67	0	152	8
Future Volume (vph)	52	253	75	14	153	11	8	469	67	0	152	8
Satd. Flow (prot)	1626	1533	0	1658	1699	0	0	1550	0	0	1639	0
Flt Permitted	0.630			0.351				0.996				
Satd. Flow (perm)	881	1533	0	531	1699	0	0	1537	0	0	1639	0
Satd. Flow (RTOR)		21			5			14			5	
Lane Group Flow (vph)	58	364	0	16	182	0	0	604	0	0	178	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Total Split (s)	30.0	30.0		30.0	30.0		45.0	45.0		45.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		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)	5.5	5.5		5.5	5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	22.2	22.2		22.2	22.2			41.8			41.8	
Actuated g/C Ratio	0.30	0.30		0.30	0.30			0.56			0.56	
v/c Ratio	0.22	0.78		0.10	0.36			0.70			0.19	
Control Delay	16.7	28.2		19.9	22.0			8.6			9.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	16.7	28.2		19.9	22.0			8.6			9.2	
LOS	B	C		B	C			A			A	
Approach Delay		26.6			21.8			8.6			9.2	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	7.7	48.3		1.7	20.6			9.3			11.7	
Queue Length 95th (m)	m11.2	#80.1		6.2	35.7			21.4			23.3	
Internal Link Dist (m)		174.8			160.0			150.5			106.3	
Turn Bay Length (m)	25.0			15.0								
Base Capacity (vph)	287	514		173	558			862			914	
Starvation Cap Reductn	0	0		0	0			1			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	0.71		0.09	0.33			0.70			0.19	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 46 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

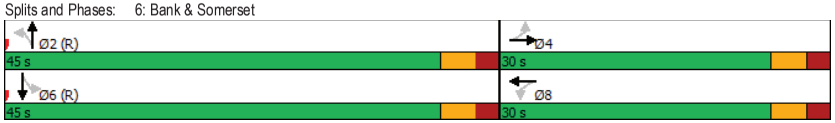
Maximum v/c Ratio: 0.78

Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Bank & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	185	116	51	164	0	0	0	0	29	480	63
Future Volume (vph)	0	185	116	51	164	0	0	0	0	29	480	63
Satd. Flow (prot)	0	1528	0	0	1724	0	0	0	0	0	3158	0
Flt Permitted					0.739						0.997	
Satd. Flow (perm)	0	1528	0	0	1273	0	0	0	0	0	3104	0
Satd. Flow (RTOR)		36									20	
Lane Group Flow (vph)	0	335	0	0	239	0	0	0	0	0	635	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		15.0	20.4					19.5	19.5	
Total Split (s)		22.0		15.0	37.0					38.0	38.0	
Total Split (%)		27.5%		18.8%	46.3%					47.5%	47.5%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		25.2			25.2						43.9	
Actuated g/C Ratio		0.32			0.32						0.55	
v/c Ratio		0.66			0.60						0.37	
Control Delay		27.2			28.9						11.5	
Queue Delay		0.0			0.0						0.0	
Total Delay		27.2			28.9						11.5	
LOS		C			C						B	
Approach Delay		27.2			28.9						11.5	
Approach LOS		C			C						B	
Queue Length 50th (m)		41.9			32.7						25.9	
Queue Length 95th (m)		61.0			49.0						46.4	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		505			502						1713	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.66			0.48						0.37	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

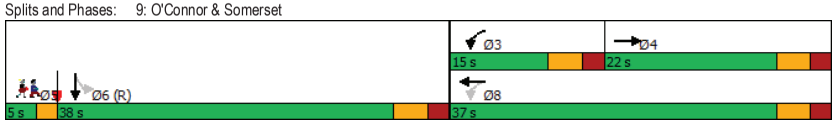
Intersection Summary

Lanes, Volumes, Timings
9: O'Connor & Somerset

07-11-2019

Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: O'Connor & Somerset



Lanes, Volumes, Timings
12: Kent & Gladstone

07-11-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	277	0	0	160	143	36	1698	97	0	0	0
Future Volume (vph)	82	277	0	0	160	143	36	1698	97	0	0	0
Satd. Flow (prot)	1626	1712	0	0	1524	0	1658	4703	0	0	0	0
Flt Permitted	0.363						0.950					
Satd. Flow (perm)	594	1712	0	0	1524	0	1401	4703	0	0	0	0
Satd. Flow (RTOR)					6			18				
Lane Group Flow (vph)	91	308	0	0	337	0	40	1995	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.4	21.4			20.4		21.4	21.4				
Total Split (s)	30.0	30.0			30.0		45.0	45.0				
Total Split (%)	40.0%	40.0%			40.0%		60.0%	60.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.1	2.1			2.1		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.4	5.4			5.4		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	20.5	20.5			20.5		43.7	43.7				
Actuated g/C Ratio	0.27	0.27			0.27		0.58	0.58				
v/c Ratio	0.57	0.66			0.80		0.05	0.73				
Control Delay	36.5	30.8			35.9		8.4	14.0				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	36.5	30.8			35.9		8.4	14.0				
LOS	D	C			D		A	B				
Approach Delay		32.1			35.9			13.9				
Approach LOS		C			D			B				
Queue Length 50th (m)	11.4	39.7			47.8		2.4	73.1				
Queue Length 95th (m)	25.5	61.5			74.8		7.1	102.8				
Internal Link Dist (m)		96.8			173.9			90.5			221.4	
Turn Bay Length (m)	30.0						40.0					
Base Capacity (vph)	194	561			503		817	2750				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.47	0.55			0.67		0.05	0.73				

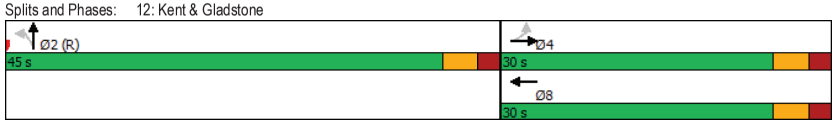
Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 58 (77%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
12: Kent & Gladstone

07-11-2019

Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 79.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 12: Kent & Gladstone



Lanes, Volumes, Timings
13: Bank & Gladstone

07-11-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	218	116	28	110	27	112	459	86	5	229	29
Future Volume (vph)	63	218	116	28	110	27	112	459	86	5	229	29
Satd. Flow (prot)	0	2941	0	0	1606	0	1610	1514	0	0	3045	0
Flt Permitted		0.846			0.867		0.573				0.946	
Satd. Flow (perm)	0	2474	0	0	1388	0	815	1514	0	0	2874	0
Satd. Flow (RTOR)		86			13			20			28	
Lane Group Flow (vph)	0	441	0	0	183	0	124	606	0	0	292	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.2	25.2		25.5	25.5	
Total Split (s)	28.0	28.0		28.0	28.0		47.0	47.0		47.0	47.0	
Total Split (%)	37.3%	37.3%		37.3%	37.3%		62.7%	62.7%		62.7%	62.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5		5.2	5.2			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		18.4			18.4		45.9	45.9			45.6	
Actuated g/C Ratio		0.25			0.25		0.61	0.61			0.61	
v/c Ratio		0.66			0.52		0.25	0.65			0.17	
Control Delay		22.8			27.7		9.2	14.0			8.8	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		22.8			27.7		9.2	14.0			8.8	
LOS		C			C		A	B			A	
Approach Delay		22.8			27.7			13.2			8.8	
Approach LOS		C			C			B			A	
Queue Length 50th (m)		27.6			21.1		8.0	53.3			10.2	
Queue Length 95th (m)		m43.4			39.0		18.2	95.0			21.3	
Internal Link Dist (m)		173.9			165.8			108.7			220.3	
Turn Bay Length (m)							38.0					
Base Capacity (vph)		802			425		499	935			1759	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.55			0.43		0.25	0.65			0.17	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 20 (27%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
13: Bank & Gladstone

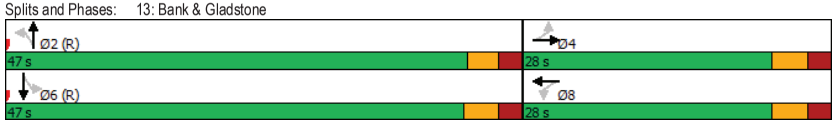
07-11-2019

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 13: Bank & Gladstone



Lanes, Volumes, Timings
14: O'Connor & Gladstone

07-11-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	222	117	32	140	0	0	0	0	15	594	48
Future Volume (vph)	0	222	117	32	140	0	0	0	0	15	594	48
Satd. Flow (prot)	0	1591	0	0	1696	0	0	0	0	0	3239	0
Flt Permitted					0.628						0.999	
Satd. Flow (perm)	0	1591	0	0	1067	0	0	0	0	0	3229	0
Satd. Flow (RTOR)		33									15	
Lane Group Flow (vph)	0	377	0	0	192	0	0	0	0	0	730	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		20.6			20.6						48.6	
Actuated g/C Ratio		0.26			0.26						0.61	
v/c Ratio		0.87			0.70						0.37	
Control Delay		47.4			41.3						5.2	
Queue Delay		0.0			0.0						0.0	
Total Delay		47.4			41.3						5.2	
LOS		D			D						A	
Approach Delay		47.4			41.3						5.2	
Approach LOS		D			D						A	
Queue Length 50th (m)		51.0			26.8						13.8	
Queue Length 95th (m)		#96.5			#54.4						17.0	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		471			300						1969	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.80			0.64						0.37	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

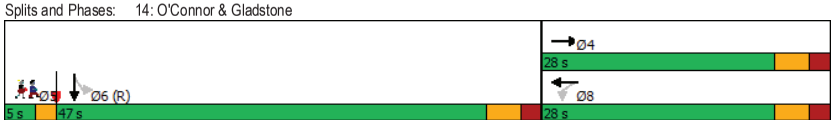
Intersection Summary

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 68.9%	ICU Level of Service C
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: O'Connor & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	75	0	0	0	0	0	1812	78	0	0	0
Future Volume (vph)	17	75	0	0	0	0	0	1812	78	0	0	0
Satd. Flow (prot)	0	1729	0	0	0	0	0	4706	0	0	0	0
Flt Permitted		0.991										
Satd. Flow (perm)	0	1714	0	0	0	0	0	4706	0	0	0	0
Satd. Flow (RTOR)		31						17				
Lane Group Flow (vph)	0	102	0	0	0	0	0	2100	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		4						2				
Permitted Phases	4											
Detector Phase	4	4						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0				
Minimum Split (s)	21.5	21.5						35.1				
Total Split (s)	22.0	22.0						53.0				
Total Split (%)	29.3%	29.3%						70.7%				
Yellow Time (s)	3.3	3.3						3.3				
All-Red Time (s)	2.2	2.2						1.8				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.1				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max				
Act Effct Green (s)		13.6						54.9				
Actuated g/C Ratio		0.18						0.73				
v/c Ratio		0.30						0.61				
Control Delay		20.9						16.6				
Queue Delay		0.0						0.0				
Total Delay		20.9						16.6				
LOS		C						B				
Approach Delay		20.9						16.6				
Approach LOS		C						B				
Queue Length 50th (m)		8.7						103.5				
Queue Length 95th (m)		21.3						133.7				
Internal Link Dist (m)		69.3			174.3			221.4			152.2	
Turn Bay Length (m)												
Base Capacity (vph)		401						3450				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.25						0.61				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 28 (37%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 16.8	Intersection LOS: B
Intersection Capacity Utilization 61.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Kent & Gilmour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	48	31	0	0	0	0	540	34	15	214	0
Future Volume (vph)	32	48	31	0	0	0	0	540	34	15	214	0
Satd. Flow (prot)	0	1620	0	0	0	0	0	1683	0	0	1659	0
Flt Permitted		0.986									0.955	
Satd. Flow (perm)	0	1561	0	0	0	0	0	1683	0	0	1581	0
Satd. Flow (RTOR)		25						8				
Lane Group Flow (vph)	0	123	0	0	0	0	0	638	0	0	255	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	23.2	23.2						20.1		20.1	20.1	
Total Split (s)	25.0	25.0						50.0		50.0	50.0	
Total Split (%)	33.3%	33.3%						66.7%		66.7%	66.7%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9						1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.2						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max		C-Max	C-Max	
Act Effct Green (s)		14.8						54.0			54.0	
Actuated g/C Ratio		0.20						0.72			0.72	
v/c Ratio		0.38						0.53			0.22	
Control Delay		18.8						6.6			4.2	
Queue Delay		0.0						0.0			0.0	
Total Delay		18.8						6.6			4.2	
LOS		B						A			A	
Approach Delay		18.8						6.6			4.2	
Approach LOS		B						A			A	
Queue Length 50th (m)		9.1						44.6			13.0	
Queue Length 95th (m)		m17.5						50.0			m17.5	
Internal Link Dist (m)		174.3			162.5			220.3			150.5	
Turn Bay Length (m)												
Base Capacity (vph)		430						1212			1137	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.29						0.53			0.22	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 41 (55%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 21: Bank & Gilmour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	61	49	0	0	0	0	0	0	49	622	0
Future Volume (vph)	0	61	49	0	0	0	0	0	0	49	622	0
Satd. Flow (prot)	0	1592	0	0	0	0	0	0	0	0	3302	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	1592	0	0	0	0	0	0	0	0	3269	0
Satd. Flow (RTOR)		44									63	
Lane Group Flow (vph)	0	122	0	0	0	0	0	0	0	0	745	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		13.0									60.4	
Actuated g/C Ratio		0.16									0.76	
v/c Ratio		0.41									0.30	
Control Delay		23.7									3.7	
Queue Delay		0.0									0.0	
Total Delay		23.7									3.7	
LOS		C									A	
Approach Delay		23.7									3.7	
Approach LOS		C									A	
Queue Length 50th (m)		10.8									15.1	
Queue Length 95th (m)		26.1									18.7	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		341									2485	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.36									0.30	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 46 (58%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

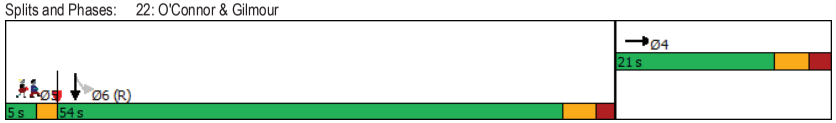
Intersection Summary

Lanes, Volumes, Timings
22: O'Connor & Gilmour

07-11-2019

Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 42.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 22: O'Connor & Gilmour



HCM 2010 TWSC
3: Kent & James

08-19-2019

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	14	20	46	1798	0	0	0	0
Future Vol, veh/h	0	0	0	0	14	20	46	1798	0	0	0	0
Conflicting Peds, #/hr	6	0	16	16	0	6	49	0	53	53	0	149
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	16	22	51	1998	0	0	0	0

Major/Minor	Minor1			Major1		
Conflicting Flow All	-	2149	1005	49	0	-
Stage 1	-	2100	-	-	-	-
Stage 2	-	49	-	-	-	-
Critical Hdwy	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	0	48	206	1096	-	0
Stage 1	0	92	-	-	-	0
Stage 2	0	-	-	-	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	-	0	206	1096	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	26.4	0.2
HCM LOS	D	

Minor Lane/Major Mvmt	NBL	NBT	WBLn1
Capacity (veh/h)	1096	-	206
HCM Lane V/C Ratio	0.047	-	0.183
HCM Control Delay (s)	8.4	0	26.4
HCM Lane LOS	A	A	D
HCM 95th %tile Q(veh)	0.1	-	0.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	12	6	7	26	532	0	0	220	9
Future Volume (vph)	0	0	0	12	6	7	26	532	0	0	220	9
Satd. Flow (prot)	0	0	0	0	1606	0	0	1742	0	0	1706	0
Flt Permitted					0.977			0.979				
Satd. Flow (perm)	0	0	0	0	1575	0	0	1684	0	0	1706	0
Satd. Flow (RTOR)					8						5	
Lane Group Flow (vph)	0	0	0	0	28	0	0	620	0	0	254	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Minimum Split (s)				24.2	24.2		23.0	23.0			23.0	
Total Split (s)				24.2	24.2		50.8	50.8			50.8	
Total Split (%)				32.3%	32.3%		67.7%	67.7%			67.7%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				1.9	1.9		1.7	1.7			1.7	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.2			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					19.0			45.8			45.8	
Actuated g/C Ratio					0.25			0.61			0.61	
v/c Ratio					0.07			0.60			0.24	
Control Delay					17.6			12.1			7.3	
Queue Delay					0.0			0.0			0.0	
Total Delay					17.6			12.1			7.3	
LOS					B			B			A	
Approach Delay					17.6			12.1			7.3	
Approach LOS					B			B			A	
Queue Length 50th (m)					2.3			50.8			15.1	
Queue Length 95th (m)					8.3			81.3			25.9	
Internal Link Dist (m)		75.3			83.3			53.0			129.3	
Turn Bay Length (m)												
Base Capacity (vph)					404			1028			1043	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.07			0.60			0.24	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 42 (56%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 72.6%	ICU Level of Service C
Analysis Period (min) 15	

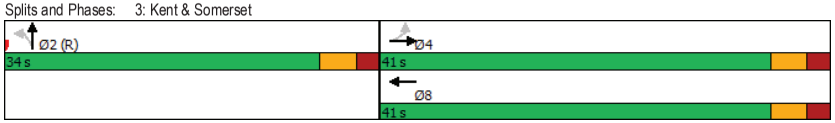
Splits and Phases: 13: Bank & MacLaren

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	332	0	0	303	63	77	706	106	0	0	0
Future Volume (vph)	56	332	0	0	303	63	77	706	106	0	0	0
Satd. Flow (prot)	1642	1728	0	0	1605	0	1658	4359	0	0	0	0
Flt Permitted	0.324						0.950					
Satd. Flow (perm)	503	1728	0	0	1605	0	1028	4359	0	0	0	0
Satd. Flow (RTOR)					14			43				
Lane Group Flow (vph)	62	369	0	0	407	0	86	902	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.5	21.5			21.5		21.4	21.4				
Total Split (s)	41.0	41.0			41.0		34.0	34.0				
Total Split (%)	54.7%	54.7%			54.7%		45.3%	45.3%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.2	2.2			2.2		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.5	5.5			5.5		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	24.4	24.4			24.4		39.7	39.7				
Actuated g/C Ratio	0.33	0.33			0.33		0.53	0.53				
v/c Ratio	0.38	0.66			0.77		0.16	0.39				
Control Delay	24.4	26.6			36.5		9.9	10.3				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	24.4	26.6			36.5		9.9	10.3				
LOS	C	C			D		A	B				
Approach Delay		26.3			36.5			10.2				
Approach LOS		C			D			B				
Queue Length 50th (m)	7.0	46.3			62.4		4.7	17.0				
Queue Length 95th (m)	15.2	61.5			87.7		10.0	22.0				
Internal Link Dist (m)		61.7			174.8			152.2			110.1	
Turn Bay Length (m)	25.0						40.0					
Base Capacity (vph)	238	817			767		544	2328				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.26	0.45			0.53		0.16	0.39				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 51 (68%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Kent & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	278	99	59	254	4	9	260	35	0	331	32
Future Volume (vph)	34	278	99	59	254	4	9	260	35	0	331	32
Satd. Flow (prot)	1626	1565	0	1658	1732	0	0	1540	0	0	1580	0
Flt Permitted	0.469			0.276				0.987				
Satd. Flow (perm)	615	1565	0	452	1732	0	0	1507	0	0	1580	0
Satd. Flow (RTOR)		18			1			13			10	
Lane Group Flow (vph)	38	419	0	66	286	0	0	338	0	0	404	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Total Split (s)	30.0	30.0		30.0	30.0		45.0	45.0		45.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		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)	5.5	5.5		5.5	5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	22.4	22.4		22.4	22.4			41.6			41.6	
Actuated g/C Ratio	0.30	0.30		0.30	0.30			0.55			0.55	
v/c Ratio	0.21	0.87		0.49	0.55			0.40			0.46	
Control Delay	16.8	37.2		34.5	26.0			14.3			12.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	16.8	37.2		34.5	26.0			14.3			12.5	
LOS	B	D		C	C			B			B	
Approach Delay		35.5			27.6			14.3			12.5	
Approach LOS		D			C			B			B	
Queue Length 50th (m)	4.5	55.7		7.7	33.7			32.0			34.5	
Queue Length 95th (m)	m12.2	#103.0		20.7	56.6			37.8			57.3	
Internal Link Dist (m)		174.8			160.0			150.5			106.3	
Turn Bay Length (m)	25.0			15.0								
Base Capacity (vph)	200	523		147	566			841			880	
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	0.19	0.80		0.45	0.51			0.40			0.46	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 71 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

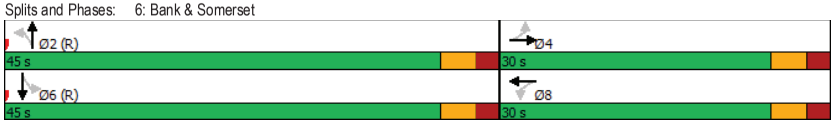
Maximum v/c Ratio: 0.87

Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 70.7%	ICU Level of Service C
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Bank & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	192	159	70	151	0	0	0	0	43	938	101
Future Volume (vph)	0	192	159	70	151	0	0	0	0	43	938	101
Satd. Flow (prot)	0	1395	0	0	1717	0	0	0	0	0	3136	0
Flt Permitted					0.662						0.998	
Satd. Flow (perm)	0	1395	0	0	1155	0	0	0	0	0	3080	0
Satd. Flow (RTOR)		46									15	
Lane Group Flow (vph)	0	390	0	0	246	0	0	0	0	0	1202	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		10.5	20.4					19.5	19.5	
Total Split (s)		21.0		14.0	40.0					40.0	40.0	
Total Split (%)		24.7%		16.5%	47.1%					47.1%	47.1%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		32.9			32.9						41.2	
Actuated g/C Ratio		0.39			0.39						0.48	
v/c Ratio		0.69			0.55						0.80	
Control Delay		26.0			25.5						23.8	
Queue Delay		0.0			0.0						0.0	
Total Delay		26.0			25.5						23.8	
LOS		C			C						C	
Approach Delay		26.0			25.5						23.8	
Approach LOS		C			C						C	
Queue Length 50th (m)		47.0			31.4						88.2	
Queue Length 95th (m)		78.8			54.3						119.6	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		568			470						1500	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.69			0.52						0.80	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 58 (68%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

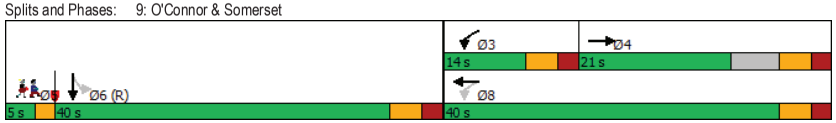
Intersection Summary

Lanes, Volumes, Timings
9: O'Connor & Somerset

07-12-2019

Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: O'Connor & Somerset



Lanes, Volumes, Timings
12: Kent & Gladstone

07-12-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	405	0	0	274	75	52	722	101	0	0	0
Future Volume (vph)	75	405	0	0	274	75	52	722	101	0	0	0
Satd. Flow (prot)	1626	1712	0	0	1632	0	1658	4632	0	0	0	0
Flt Permitted	0.372						0.950					
Satd. Flow (perm)	616	1712	0	0	1632	0	1471	4632	0	0	0	0
Satd. Flow (RTOR)					27			36				
Lane Group Flow (vph)	83	450	0	0	387	0	58	914	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.4	21.4			20.4		21.4	21.4				
Total Split (s)	45.0	45.0			45.0		30.0	30.0				
Total Split (%)	60.0%	60.0%			60.0%		40.0%	40.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.1	2.1			2.1		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.4	5.4			5.4		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	26.3	26.3			26.3		37.9	37.9				
Actuated g/C Ratio	0.35	0.35			0.35		0.51	0.51				
v/c Ratio	0.39	0.75			0.66		0.08	0.39				
Control Delay	21.6	29.0			27.4		12.7	12.7				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	21.6	29.0			27.4		12.7	12.7				
LOS	C	C			C		B	B				
Approach Delay		27.8			27.4			12.7				
Approach LOS		C			C			B				
Queue Length 50th (m)	9.1	58.0			45.5		4.2	27.4				
Queue Length 95th (m)	17.3	73.5			m47.4		12.8	47.2				
Internal Link Dist (m)		96.8			173.9			90.5			221.4	
Turn Bay Length (m)	30.0						40.0					
Base Capacity (vph)	325	903			874		743	2359				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.26	0.50			0.44		0.08	0.39				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 23 (31%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
12: Kent & Gladstone

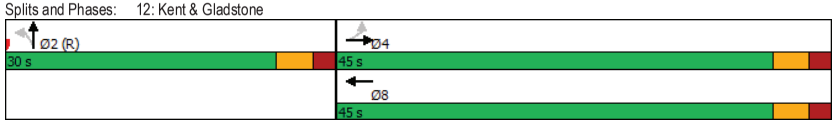
07-12-2019

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 12: Kent & Gladstone



Lanes, Volumes, Timings
13: Bank & Gladstone

07-12-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	252	165	56	166	23	95	321	93	24	475	47
Future Volume (vph)	43	252	165	56	166	23	95	321	93	24	475	47
Satd. Flow (prot)	0	2837	0	0	1613	0	1610	1444	0	0	3014	0
Flt Permitted		0.880			0.688		0.411				0.924	
Satd. Flow (perm)	0	2478	0	0	1101	0	568	1444	0	0	2763	0
Satd. Flow (RTOR)		98			7			31			21	
Lane Group Flow (vph)	0	511	0	0	272	0	106	460	0	0	607	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.2	25.2		25.5	25.5	
Total Split (s)	28.0	28.0		28.0	28.0		47.0	47.0		47.0	47.0	
Total Split (%)	37.3%	37.3%		37.3%	37.3%		62.7%	62.7%		62.7%	62.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5		5.2	5.2			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		19.9			19.9		44.4	44.4			44.1	
Actuated g/C Ratio		0.27			0.27		0.59	0.59			0.59	
v/c Ratio		0.70			0.92		0.32	0.53			0.37	
Control Delay		24.7			62.3		12.0	11.9			4.7	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		24.7			62.3		12.0	11.9			4.7	
LOS		C			E		B	B			A	
Approach Delay		24.7			62.3			12.0			4.7	
Approach LOS		C			E			B			A	
Queue Length 50th (m)		14.5			36.5		7.8	37.0			11.5	
Queue Length 95th (m)		31.4			#77.7		18.8	64.4			15.2	
Internal Link Dist (m)		173.9			165.8			108.7			220.3	
Turn Bay Length (m)							38.0					
Base Capacity (vph)		812			335		336	868			1634	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.63			0.81		0.32	0.53			0.37	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 11 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
13: Bank & Gladstone

07-12-2019

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 20.0	Intersection LOS: C
Intersection Capacity Utilization 94.2%	ICU Level of Service F
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Bank & Gladstone

Lanes, Volumes, Timings
14: O'Connor & Gladstone

07-12-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	209	195	27	125	0	0	0	0	31	1156	78
Future Volume (vph)	0	209	195	27	125	0	0	0	0	31	1156	78
Satd. Flow (prot)	0	1539	0	0	1696	0	0	0	0	0	3261	0
Flt Permitted					0.582						0.999	
Satd. Flow (perm)	0	1539	0	0	991	0	0	0	0	0	3253	0
Satd. Flow (RTOR)		59									13	
Lane Group Flow (vph)	0	449	0	0	169	0	0	0	0	0	1405	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		22.2			22.2						47.0	
Actuated g/C Ratio		0.28			0.28						0.59	
v/c Ratio		0.96			0.61						0.73	
Control Delay		58.7			36.2						10.2	
Queue Delay		0.0			0.0						0.0	
Total Delay		58.7			36.2						10.2	
LOS		E			D						B	
Approach Delay		58.7			36.2						10.2	
Approach LOS		E			D						B	
Queue Length 50th (m)		62.0			23.4						82.4	
Queue Length 95th (m)		#121.3			#45.4						109.5	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		475			278						1915	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.95			0.61						0.73	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 13 (16%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

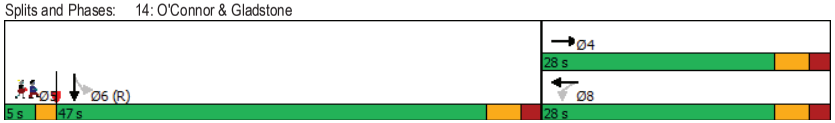
Intersection Summary

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: O'Connor & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	77	0	0	0	0	0	846	78	0	0	0
Future Volume (vph)	19	77	0	0	0	0	0	846	78	0	0	0
Satd. Flow (prot)	0	1728	0	0	0	0	0	4639	0	0	0	0
Flt Permitted		0.990										
Satd. Flow (perm)	0	1696	0	0	0	0	0	4639	0	0	0	0
Satd. Flow (RTOR)		31						40				
Lane Group Flow (vph)	0	107	0	0	0	0	0	1027	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		4						2				
Permitted Phases	4											
Detector Phase	4	4						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0				
Minimum Split (s)	21.5	21.5						35.1				
Total Split (s)	22.0	22.0						53.0				
Total Split (%)	29.3%	29.3%						70.7%				
Yellow Time (s)	3.3	3.3						3.3				
All-Red Time (s)	2.2	2.2						1.8				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.1				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max				
Act Effct Green (s)		10.6						57.9				
Actuated g/C Ratio		0.14						0.77				
v/c Ratio		0.40						0.29				
Control Delay		26.0						2.3				
Queue Delay		0.0						0.0				
Total Delay		26.0						2.3				
LOS		C						A				
Approach Delay		26.0						2.3				
Approach LOS		C						A				
Queue Length 50th (m)		10.4						8.6				
Queue Length 95th (m)		24.0						12.2				
Internal Link Dist (m)		69.3			174.3			221.4			152.2	
Turn Bay Length (m)												
Base Capacity (vph)		397						3589				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.27						0.29				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 5 (7%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 4.6	Intersection LOS: A
Intersection Capacity Utilization 47.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 20: Kent & Gilmour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	116	61	0	0	0	0	335	28	19	443	0
Future Volume (vph)	14	116	61	0	0	0	0	335	28	19	443	0
Satd. Flow (prot)	0	1601	0	0	0	0	0	1663	0	0	1660	0
Flt Permitted		0.996									0.979	
Satd. Flow (perm)	0	1563	0	0	0	0	0	1663	0	0	1617	0
Satd. Flow (RTOR)		31						10				
Lane Group Flow (vph)	0	213	0	0	0	0	0	403	0	0	513	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	23.2	23.2						20.1		20.1	20.1	
Total Split (s)	25.0	25.0						50.0		50.0	50.0	
Total Split (%)	33.3%	33.3%						66.7%		66.7%	66.7%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9						1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.2						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max		C-Max	C-Max	
Act Effct Green (s)		14.4						50.3			50.3	
Actuated g/C Ratio		0.19						0.67			0.67	
v/c Ratio		0.66						0.36			0.47	
Control Delay		37.7						6.1			6.5	
Queue Delay		0.0						0.0			0.0	
Total Delay		37.7						6.1			6.5	
LOS		D						A			A	
Approach Delay		37.7						6.1			6.5	
Approach LOS		D						A			A	
Queue Length 50th (m)		27.6						16.8			26.2	
Queue Length 95th (m)		42.2						m36.8			m37.3	
Internal Link Dist (m)		174.3			162.5			220.3			150.5	
Turn Bay Length (m)												
Base Capacity (vph)		435						1118			1084	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.49						0.36			0.47	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 3 (4%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 68.5%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 21: Bank & Gilmour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	84	89	0	0	0	0	0	0	48	1165	0
Future Volume (vph)	0	84	89	0	0	0	0	0	0	48	1165	0
Satd. Flow (prot)	0	1526	0	0	0	0	0	0	0	0	3309	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1526	0	0	0	0	0	0	0	0	3282	0
Satd. Flow (RTOR)		59									63	
Lane Group Flow (vph)	0	192	0	0	0	0	0	0	0	0	1347	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		12.6									56.7	
Actuated g/C Ratio		0.16									0.71	
v/c Ratio		0.66									0.57	
Control Delay		33.0									6.9	
Queue Delay		0.0									0.3	
Total Delay		33.0									7.2	
LOS		C									A	
Approach Delay		33.0									7.2	
Approach LOS		C									A	
Queue Length 50th (m)		19.9									43.1	
Queue Length 95th (m)		40.2									67.7	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		341									2345	
Starvation Cap Reductn		0									376	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.56									0.68	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

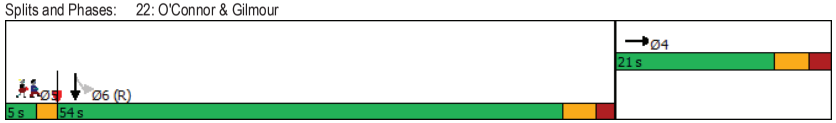
Lanes, Volumes, Timings
22: O'Connor & Gilmour

07-12-2019

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 22: O'Connor & Gilmour



HCM 2010 TWSC
3: Kent & James

08-19-2019

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	58	43	70	819	0	0	0	0
Future Vol, veh/h	0	0	0	0	58	43	70	819	0	0	0	0
Conflicting Peds, #/hr	24	0	21	21	0	24	84	0	53	53	0	84
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	64	48	78	910	0	0	0	0

Major/Minor	Minor1			Major1		
Conflicting Flow All	-	1150	479	84	0	-
Stage 1	-	1066	-	-	-	-
Stage 2	-	84	-	-	-	-
Critical Hdwy	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	0	197	456	1056	-	0
Stage 1	0	297	-	-	-	0
Stage 2	0	-	-	-	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	-	0	456	1056	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	15.5	1
HCM LOS	C	

Minor Lane/Major Mvmt	NBL	NBT	WBLn1
Capacity (veh/h)	1056	-	456
HCM Lane V/C Ratio	0.074	-	0.246
HCM Control Delay (s)	8.7	0.3	15.5
HCM Lane LOS	A	A	C
HCM 95th %tile Q(veh)	0.2	-	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	15	23	11	50	374	0	0	346	16
Future Volume (vph)	0	0	0	15	23	11	50	374	0	0	346	16
Satd. Flow (prot)	0	0	0	0	1598	0	0	1735	0	0	1690	0
Flt Permitted					0.985			0.918				
Satd. Flow (perm)	0	0	0	0	1530	0	0	1550	0	0	1690	0
Satd. Flow (RTOR)					12						6	
Lane Group Flow (vph)	0	0	0	0	55	0	0	472	0	0	402	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Minimum Split (s)				24.2	24.2		23.0	23.0			23.0	
Total Split (s)				24.2	24.2		50.8	50.8			50.8	
Total Split (%)				32.3%	32.3%		67.7%	67.7%			67.7%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				1.9	1.9		1.7	1.7			1.7	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.2			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					19.0			45.8			45.8	
Actuated g/C Ratio					0.25			0.61			0.61	
v/c Ratio					0.14			0.50			0.39	
Control Delay					19.1			10.5			8.7	
Queue Delay					0.0			0.0			0.0	
Total Delay					19.1			10.5			8.7	
LOS					B			B			A	
Approach Delay					19.1			10.5			8.7	
Approach LOS					B			B			A	
Queue Length 50th (m)					4.9			35.0			26.6	
Queue Length 95th (m)					13.7			57.5			43.6	
Internal Link Dist (m)		53.6			44.3			48.6			46.6	
Turn Bay Length (m)												
Base Capacity (vph)					396			946			1034	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.14			0.50			0.39	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 72.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Bank & MacLaren

Appendix D

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition
2017-08-01	2017	21:40	BANK ST @ FLORENCE ST	01 - Clear	07 - Dark	02 - Stop sign		02 - Non-fatal injury	02 - Angle	01 - Dry
2014-09-09	2014	11:32	BANK ST @ FLORENCE ST	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	01 - Dry
2014-10-25	2014	16:47	BANK ST @ FLORENCE ST	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	02 - Wet
2013-04-20	2013	16:30	BANK ST @ FLORENCE ST	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	02 - Angle	01 - Dry
2014-03-04	2014	10:22	BANK ST @ FRANK ST	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	02 - Wet
2013-10-03	2013	8:49	BANK ST @ FRANK ST	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-06-03	2016	18:00	BANK ST @ GILMOUR ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2015-07-17	2015	14:13	BANK ST @ GILMOUR ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
2015-11-27	2015	0:50	BANK ST @ GILMOUR ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-12-02	2015	3:00	BANK ST @ GILMOUR ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2014-01-29	2014	14:19	BANK ST @ GILMOUR ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2014-04-01	2014	0:38	BANK ST @ GILMOUR ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	99 - Other	01 - Dry
2013-08-21	2013	16:22	BANK ST @ GILMOUR ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2013-12-09	2013	10:20	BANK ST @ GILMOUR ST	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
2013-02-10	2013	4:15	BANK ST @ GILMOUR ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	05 - Turning movement	04 - Slush
2017-06-04	2017	15:16	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2017-06-13	2017	8:33	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2017-08-08	2017	17:37	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2017-11-02	2017	19:13	BANK ST @ GLADSTONE AVE	02 - Rain	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	02 - Wet
2017-11-03	2017	21:09	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
2017-04-22	2017	12:04	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-01-13	2016	13:25	BANK ST @ GLADSTONE AVE	03 - Snow	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	03 - Loose snow
2016-10-06	2016	8:05	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2016-03-02	2016	19:38	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	02 - Wet
2016-12-06	2016	19:16	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2015-01-13	2015	17:24	BANK ST @ GLADSTONE AVE	01 - Clear	05 - Dusk	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	06 - Ice
2015-08-31	2015	20:30	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-10-16	2015	21:07	BANK ST @ GLADSTONE AVE	02 - Rain	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	02 - Wet
2015-02-14	2015	0:07	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
2015-03-20	2015	12:27	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2015-10-07	2015	7:30	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2015-10-23	2015	19:39	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2014-01-21	2014	13:47	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2014-01-12	2014	13:14	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	03 - Loose snow
2014-01-26	2014	22:33	BANK ST @ GLADSTONE AVE	05 - Drifting Snow	07 - Dark	01 - Traffic signal		03 - P.D. only	05 - Turning movement	04 - Slush
2014-03-19	2014	14:39	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2014-10-03	2014	15:19	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2013-01-02	2013	18:00	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	02 - Wet
2013-01-02	2013	18:14	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	99 - Other	02 - Wet
2013-01-29	2013	19:30	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	04 - Slush
2013-05-31	2013	11:28	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2013-06-28	2013	15:35	BANK ST @ GLADSTONE AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	02 - Wet
2013-07-16	2013	21:07	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2013-10-01	2013	19:33	BANK ST @ GLADSTONE AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2017-01-30	2017	13:17	BANK ST @ LEWIS ST	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	99 - Other	05 - Packed snow
2017-10-17	2017	16:39	BANK ST @ MACLAREN ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
2013-12-13	2013	22:24	BANK ST @ MACLAREN ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2017-10-05	2017	9:54	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2017-09-21	2017	16:22	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2017-01-20	2017	22:35	BANK ST @ SOMERSET ST	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	02 - Wet
2016-09-21	2016	7:22	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2016-02-14	2016	17:20	BANK ST @ SOMERSET ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2016-02-17	2016	13:25	BANK ST @ SOMERSET ST	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
2016-12-12	2016	14:03	BANK ST @ SOMERSET ST	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	04 - Slush
2015-11-16	2015	11:02	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-01-26	2015	18:33	BANK ST @ SOMERSET ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2015-01-30	2015	16:15	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2014-02-14	2014	22:24	BANK ST @ SOMERSET ST	02 - Rain	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	06 - Ice
2014-05-02	2014	17:51	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2014-08-16	2014	2:41	BANK ST @ SOMERSET ST	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2014-08-09	2014	22:44	BANK ST @ SOMERSET ST	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2014-04-17	2014	23:01	BANK ST @ SOMERSET ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2014-07-02	2014	17:21	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2014-07-03	2014	17:10	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2014-03-07	2014	19:47	BANK ST @ SOMERSET ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	99 - Other	01 - Dry
2013-01-06	2013	14:15	BANK ST @ SOMERSET ST	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
2013-02-13	2013	11:31	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2013-05-24	2013	21:01	BANK ST @ SOMERSET ST	01 - Clear	05 - Dusk	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2013-06-07	2013	1:39	BANK ST @ SOMERSET ST	02 - Rain	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2013-10-21	2013	11:12	BANK ST @ SOMERSET ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2014-12-21	2014	13:00	BANK ST btwn FLORENCE ST & FRANK ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2013-03-06	2013	13:54	BANK ST btwn FLORENCE ST & FRANK ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2017-04-07	2017	11:32	BANK ST btwn GILMOUR ST & LEWIS ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2014-05-23	2014	19:15	BANK ST btwn GILMOUR ST & LEWIS ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2017-05-05	2017	0:00	BANK ST btwn MACLAREN ST & GILMOUR ST	01 - Clear	00 - Unknown	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2017-03-26	2017	3:04	BANK ST btwn MACLAREN ST & GILMOUR ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-09-12	2016	0:35	BANK ST btwn MACLAREN ST & GILMOUR ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2015-05-16	2015	8:10	BANK ST btwn MACLAREN ST & GILMOUR ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2014-07-27	2014	16:00	BANK ST btwn MACLAREN ST & GILMOUR ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	01 - Approaching	01 - Dry
2014-08-15	2014	18:25	BANK ST btwn MACLAREN ST & GILMOUR ST	02 - Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	02 - Wet
2014-05-22	2014	23:21	BANK ST btwn MACLAREN ST & GILMOUR ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-02-21	2016	8:15	BANK ST btwn SOMERSET ST W & MACLAREN ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2014-05-15	2014	11:08	BANK ST btwn SOMERSET ST W & MACLAREN ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2013-04-19	2013	7:46	BANK ST btwn SOMERSET ST W & MACLAREN ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2013-08-21	2013	21:56	BANK ST btwn WAVERLEY ST & FLORENCE ST	01 - Clear	07 - Dark	10 - No control		02 - Non-fatal injury	04 - Sideswipe	01 - Dry
2014-08-06	2014	17:07	JAMES ST @ BANK ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	05 - Turning movement	01 - Dry

2013-01-27	2013	13:21	JAMES ST @ BANK ST	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	05 - Turning movement	01 - Dry
2017-05-29	2017	10:20	JAMES ST @ KENT ST	02 - Rain	01 - Daylight	02 - Stop sign	03 - P.D. only	02 - Angle	02 - Wet
2017-08-29	2017	13:44	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	05 - Turning movement	01 - Dry
2016-03-03	2016	17:12	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	02 - Non-fatal injury	02 - Angle	05 - Packed snow
2016-05-02	2016	13:52	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	04 - Sideswipe	01 - Dry
2016-06-26	2016	11:00	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	05 - Turning movement	01 - Dry
2016-12-31	2016	14:12	JAMES ST @ KENT ST	03 - Snow	01 - Daylight	02 - Stop sign	03 - P.D. only	04 - Sideswipe	03 - Loose snow
2015-01-29	2015	19:32	JAMES ST @ KENT ST	03 - Snow	07 - Dark	02 - Stop sign	03 - P.D. only	02 - Angle	03 - Loose snow
2015-02-27	2015	18:30	JAMES ST @ KENT ST	01 - Clear	07 - Dark	02 - Stop sign	03 - P.D. only	04 - Sideswipe	01 - Dry
2014-05-11	2014	15:16	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	05 - Turning movement	01 - Dry
2014-09-25	2014	9:00	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	04 - Sideswipe	01 - Dry
2014-10-22	2014	11:00	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	04 - Sideswipe	01 - Dry
2013-02-08	2013	9:15	JAMES ST @ KENT ST	03 - Snow	01 - Daylight	02 - Stop sign	03 - P.D. only	02 - Angle	03 - Loose snow
2013-12-13	2013	11:50	JAMES ST @ KENT ST	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	04 - Sideswipe	01 - Dry
2013-12-14	2013	16:30	JAMES ST @ KENT ST	01 - Clear	05 - Dusk	02 - Stop sign	03 - P.D. only	04 - Sideswipe	01 - Dry
2013-12-20	2013	12:03	JAMES ST @ KENT ST	03 - Snow	01 - Daylight	02 - Stop sign	03 - P.D. only	05 - Turning movement	04 - Slush
2016-06-23	2016	12:07	JAMES ST btwn KENT ST & BANK ST	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	02 - Angle	01 - Dry
2015-11-17	2015	0:00	JAMES ST btwn KENT ST & BANK ST	01 - Clear	00 - Unknown	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2013-08-29	2013	16:30	JAMES ST btwn KENT ST & BANK ST	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry

Appendix E

TRANS Model Projections, 2011 and 2031

TRANS Regional Model

Version 2.13 - Assigned February 07, 2019

AM Peak Hour Total Traffic Volume

390 Bank Street

2011 Model - Base Scenario

No Modifications

User Initials: SG
Plot Prepared: July 29, 2019
EMME Scenario: 21311

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

100 200 300 400 500

N

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

TRANS Regional Model

Version 2.11 - Assigned July 26, 2019

AM Peak Hour Total Traffic Volume

390 Bank Street

2031 Model - Affordable Network

No Modifications

User Initials: SG
Plot Prepared: July 29, 2019
EMME Scenario: 21131

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

100 200 300 400 500

N

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

Appendix F

Synchro Intersection Worksheets – 2022 Background Conditions

Lanes, Volumes, Timings
9: O'Connor & Somerset

08-08-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	185	116	51	164	0	0	0	0	29	509	63
Future Volume (vph)	0	185	116	51	164	0	0	0	0	29	509	63
Satd. Flow (prot)	0	1528	0	0	1724	0	0	0	0	0	3169	0
Flt Permitted					0.700						0.998	
Satd. Flow (perm)	0	1528	0	0	1204	0	0	0	0	0	3117	0
Satd. Flow (RTOR)		36									19	
Lane Group Flow (vph)	0	301	0	0	215	0	0	0	0	0	601	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		15.0	20.4					19.5	19.5	
Total Split (s)		22.0		15.0	37.0					38.0	38.0	
Total Split (%)		27.5%		18.8%	46.3%					47.5%	47.5%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		20.7			20.7						48.4	
Actuated g/C Ratio		0.26			0.26						0.60	
v/c Ratio		0.71			0.69						0.32	
Control Delay		32.9			38.1						8.8	
Queue Delay		0.0			0.0						0.0	
Total Delay		32.9			38.1						8.8	
LOS		C			D						A	
Approach Delay		32.9			38.1						8.8	
Approach LOS		C			D						A	
Queue Length 50th (m)		38.2			30.8						21.8	
Queue Length 95th (m)		58.8			48.9						38.4	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		432			475						1894	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.70			0.45						0.32	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
9: O'Connor & Somerset

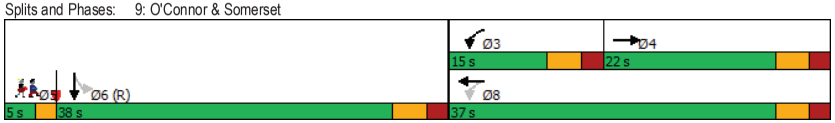
08-08-2019

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 20.9	Intersection LOS: C
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	61	49	0	0	0	0	0	0	49	660	0
Future Volume (vph)	0	61	49	0	0	0	0	0	0	49	660	0
Satd. Flow (prot)	0	1592	0	0	0	0	0	0	0	0	3306	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	1592	0	0	0	0	0	0	0	0	3274	0
Satd. Flow (RTOR)		45									63	
Lane Group Flow (vph)	0	110	0	0	0	0	0	0	0	0	709	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		13.0									60.4	
Actuated g/C Ratio		0.16									0.76	
v/c Ratio		0.37									0.28	
Control Delay		21.9									3.9	
Queue Delay		0.0									0.0	
Total Delay		21.9									3.9	
LOS		C									A	
Approach Delay		21.9									3.9	
Approach LOS		C									A	
Queue Length 50th (m)		8.9									13.9	
Queue Length 95th (m)		23.0									18.0	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		342									2489	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.32									0.28	

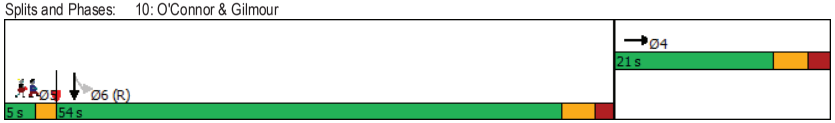
Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 46 (58%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 43.4%	ICU Level of Service A
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	222	117	32	140	0	0	0	0	15	630	48
Future Volume (vph)	0	222	117	32	140	0	0	0	0	15	630	48
Satd. Flow (prot)	0	1591	0	0	1696	0	0	0	0	0	3244	0
Flt Permitted					0.708						0.999	
Satd. Flow (perm)	0	1591	0	0	1202	0	0	0	0	0	3235	0
Satd. Flow (RTOR)		33									14	
Lane Group Flow (vph)	0	339	0	0	172	0	0	0	0	0	693	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		19.8			19.8						49.4	
Actuated g/C Ratio		0.25			0.25						0.62	
v/c Ratio		0.81			0.58						0.35	
Control Delay		41.1			34.1						5.1	
Queue Delay		0.0			0.0						0.0	
Total Delay		41.1			34.1						5.1	
LOS		D			C						A	
Approach Delay		41.1			34.1						5.1	
Approach LOS		D			C						A	
Queue Length 50th (m)		45.3			23.7						13.4	
Queue Length 95th (m)		#81.3			42.8						16.6	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		471			338						2001	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.72			0.51						0.35	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

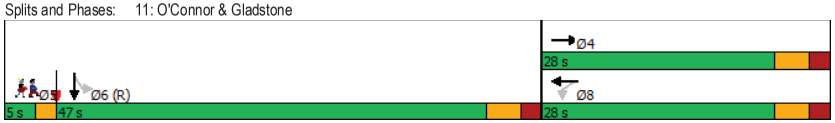
Maximum v/c Ratio: 0.81

Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 70.0%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	192	159	70	151	0	0	0	0	43	996	101
Future Volume (vph)	0	192	159	70	151	0	0	0	0	43	996	101
Satd. Flow (prot)	0	1396	0	0	1717	0	0	0	0	0	3145	0
Flt Permitted					0.621						0.998	
Satd. Flow (perm)	0	1396	0	0	1084	0	0	0	0	0	3092	0
Satd. Flow (RTOR)		46									14	
Lane Group Flow (vph)	0	351	0	0	221	0	0	0	0	0	1140	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		10.5	20.4					19.5	19.5	
Total Split (s)		21.0		14.0	40.0					40.0	40.0	
Total Split (%)		24.7%		16.5%	47.1%					47.1%	47.1%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		26.8			26.8						47.3	
Actuated g/C Ratio		0.32			0.32						0.56	
v/c Ratio		0.74			0.65						0.66	
Control Delay		31.9			33.4						16.6	
Queue Delay		0.0			0.0						0.0	
Total Delay		31.9			33.4						16.6	
LOS		C			C						B	
Approach Delay		31.9			33.4						16.6	
Approach LOS		C			C						B	
Queue Length 50th (m)		46.6			32.3						65.7	
Queue Length 95th (m)		68.1			49.4						109.6	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		476			441						1725	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.74			0.50						0.66	

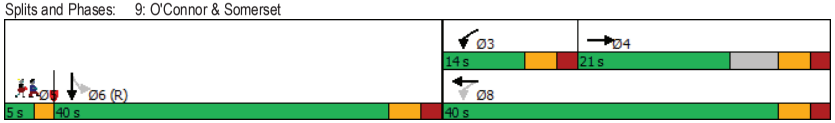
Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 58 (68%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 88.1%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	84	89	0	0	0	0	0	0	48	1236	0
Future Volume (vph)	0	84	89	0	0	0	0	0	0	48	1236	0
Satd. Flow (prot)	0	1528	0	0	0	0	0	0	0	0	3309	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1528	0	0	0	0	0	0	0	0	3284	0
Satd. Flow (RTOR)		59									63	
Lane Group Flow (vph)	0	173	0	0	0	0	0	0	0	0	1284	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		12.2									57.1	
Actuated g/C Ratio		0.15									0.71	
v/c Ratio		0.61									0.54	
Control Delay		30.1									6.4	
Queue Delay		0.0									0.3	
Total Delay		30.1									6.6	
LOS		C									A	
Approach Delay		30.1									6.6	
Approach LOS		C									A	
Queue Length 50th (m)		17.1									37.3	
Queue Length 95th (m)		35.4									62.3	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		341									2363	
Starvation Cap Reductn		0									406	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.51									0.66	

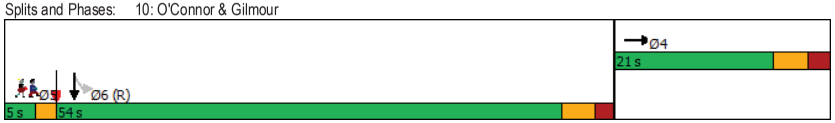
Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 62.4%	ICU Level of Service B
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lanes, Volumes, Timings
11: O'Connor & Gladstone

08-08-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	209	195	27	125	0	0	0	0	31	1227	78
Future Volume (vph)	0	209	195	27	125	0	0	0	0	31	1227	78
Satd. Flow (prot)	0	1540	0	0	1696	0	0	0	0	0	3262	0
Flt Permitted					0.655						0.999	
Satd. Flow (perm)	0	1540	0	0	1114	0	0	0	0	0	3254	0
Satd. Flow (RTOR)		58									12	
Lane Group Flow (vph)	0	404	0	0	152	0	0	0	0	0	1336	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		21.1			21.1						48.1	
Actuated g/C Ratio		0.26			0.26						0.60	
v/c Ratio		0.90			0.52						0.68	
Control Delay		49.3			31.7						9.0	
Queue Delay		0.0			0.0						0.0	
Total Delay		49.3			31.7						9.0	
LOS		D			C						A	
Approach Delay		49.3			31.7						9.0	
Approach LOS		D			C						A	
Queue Length 50th (m)		52.7			20.2						75.5	
Queue Length 95th (m)		#103.4			38.7						100.3	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		474			313						1960	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.85			0.49						0.68	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 13 (16%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
11: O'Connor & Gladstone

08-08-2019

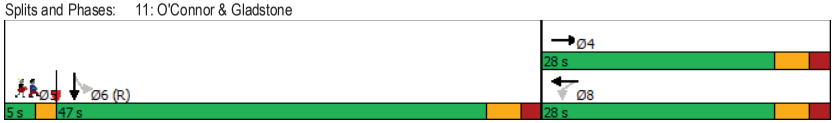
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



Appendix G

Synchro Intersection Worksheets – 2027 Background Conditions

Lanes, Volumes, Timings
9: O'Connor & Somerset

08-08-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	185	116	51	164	0	0	0	0	29	549	63
Future Volume (vph)	0	185	116	51	164	0	0	0	0	29	549	63
Satd. Flow (prot)	0	1528	0	0	1724	0	0	0	0	0	3178	0
Flt Permitted					0.700						0.998	
Satd. Flow (perm)	0	1528	0	0	1204	0	0	0	0	0	3129	0
Satd. Flow (RTOR)		36									17	
Lane Group Flow (vph)	0	301	0	0	215	0	0	0	0	0	641	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		15.0	20.4					19.5	19.5	
Total Split (s)		22.0		15.0	37.0					38.0	38.0	
Total Split (%)		27.5%		18.8%	46.3%					47.5%	47.5%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		20.7			20.7						48.4	
Actuated g/C Ratio		0.26			0.26						0.60	
v/c Ratio		0.71			0.69						0.34	
Control Delay		32.9			38.1						9.0	
Queue Delay		0.0			0.0						0.0	
Total Delay		32.9			38.1						9.0	
LOS		C			D						A	
Approach Delay		32.9			38.1						9.0	
Approach LOS		C			D						A	
Queue Length 50th (m)		38.2			30.8						23.7	
Queue Length 95th (m)		58.8			48.9						41.5	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		432			475						1901	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.70			0.45						0.34	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
9: O'Connor & Somerset

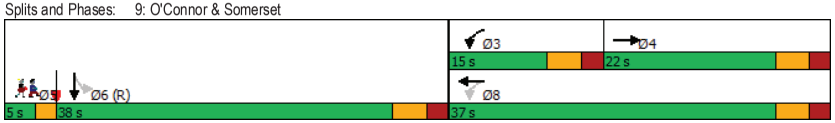
08-08-2019

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 20.6	Intersection LOS: C
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	61	49	0	0	0	0	0	0	49	711	0
Future Volume (vph)	0	61	49	0	0	0	0	0	0	49	711	0
Satd. Flow (prot)	0	1592	0	0	0	0	0	0	0	0	3306	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	1592	0	0	0	0	0	0	0	0	3276	0
Satd. Flow (RTOR)		45									63	
Lane Group Flow (vph)	0	110	0	0	0	0	0	0	0	0	760	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		13.0									60.4	
Actuated g/C Ratio		0.16									0.76	
v/c Ratio		0.37									0.31	
Control Delay		21.9									3.8	
Queue Delay		0.0									0.0	
Total Delay		21.9									3.8	
LOS		C									A	
Approach Delay		21.9									3.8	
Approach LOS		C									A	
Queue Length 50th (m)		8.9									14.2	
Queue Length 95th (m)		23.0									18.1	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		342									2490	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.32									0.31	

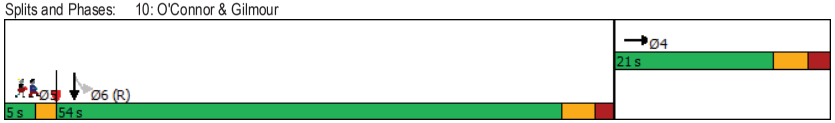
Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 46 (58%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 44.9%	ICU Level of Service A
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	222	117	32	140	0	0	0	0	15	679	48
Future Volume (vph)	0	222	117	32	140	0	0	0	0	15	679	48
Satd. Flow (prot)	0	1591	0	0	1696	0	0	0	0	0	3247	0
Flt Permitted					0.708						0.999	
Satd. Flow (perm)	0	1591	0	0	1202	0	0	0	0	0	3237	0
Satd. Flow (RTOR)		33									13	
Lane Group Flow (vph)	0	339	0	0	172	0	0	0	0	0	742	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		19.8			19.8						49.4	
Actuated g/C Ratio		0.25			0.25						0.62	
v/c Ratio		0.81			0.58						0.37	
Control Delay		41.1			34.1						5.3	
Queue Delay		0.0			0.0						0.0	
Total Delay		41.1			34.1						5.3	
LOS		D			C						A	
Approach Delay		41.1			34.1						5.3	
Approach LOS		D			C						A	
Queue Length 50th (m)		45.3			23.7						14.8	
Queue Length 95th (m)		#81.3			42.8						18.4	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		471			338						2002	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.72			0.51						0.37	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

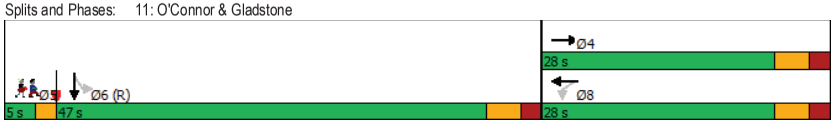
Maximum v/c Ratio: 0.81

Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 71.4%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	192	159	70	151	0	0	0	0	43	1072	101
Future Volume (vph)	0	192	159	70	151	0	0	0	0	43	1072	101
Satd. Flow (prot)	0	1396	0	0	1717	0	0	0	0	0	3156	0
Flt Permitted					0.621						0.998	
Satd. Flow (perm)	0	1396	0	0	1084	0	0	0	0	0	3106	0
Satd. Flow (RTOR)		46									13	
Lane Group Flow (vph)	0	351	0	0	221	0	0	0	0	0	1216	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		10.5	20.4					19.5	19.5	
Total Split (s)		21.0		14.0	40.0					40.0	40.0	
Total Split (%)		24.7%		16.5%	47.1%					47.1%	47.1%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		26.8			26.8						47.3	
Actuated g/C Ratio		0.32			0.32						0.56	
v/c Ratio		0.74			0.65						0.70	
Control Delay		31.9			33.4						17.8	
Queue Delay		0.0			0.0						0.0	
Total Delay		31.9			33.4						17.8	
LOS		C			C						B	
Approach Delay		31.9			33.4						17.8	
Approach LOS		C			C						B	
Queue Length 50th (m)		46.6			32.3						73.0	
Queue Length 95th (m)		68.1			49.4						121.1	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		476			441						1732	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.74			0.50						0.70	

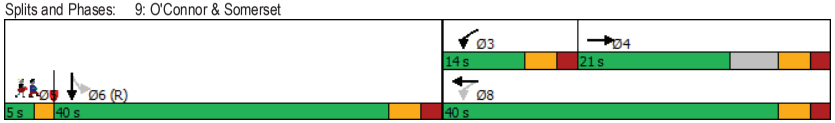
Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 58 (68%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 90.3%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	84	89	0	0	0	0	0	0	48	1332	0
Future Volume (vph)	0	84	89	0	0	0	0	0	0	48	1332	0
Satd. Flow (prot)	0	1528	0	0	0	0	0	0	0	0	3309	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1528	0	0	0	0	0	0	0	0	3285	0
Satd. Flow (RTOR)		59									63	
Lane Group Flow (vph)	0	173	0	0	0	0	0	0	0	0	1380	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		12.2									57.1	
Actuated g/C Ratio		0.15									0.71	
v/c Ratio		0.61									0.58	
Control Delay		30.1									6.8	
Queue Delay		0.0									0.3	
Total Delay		30.1									7.1	
LOS		C									A	
Approach Delay		30.1									7.1	
Approach LOS		C									A	
Queue Length 50th (m)		17.1									42.3	
Queue Length 95th (m)		35.4									70.7	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		341									2364	
Starvation Cap Reductn		0									385	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.51									0.70	

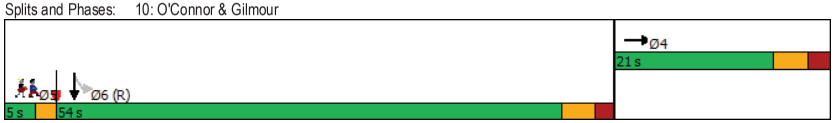
Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	209	195	27	125	0	0	0	0	31	1322	78
Future Volume (vph)	0	209	195	27	125	0	0	0	0	31	1322	78
Satd. Flow (prot)	0	1540	0	0	1696	0	0	0	0	0	3267	0
Flt Permitted					0.655						0.999	
Satd. Flow (perm)	0	1540	0	0	1114	0	0	0	0	0	3259	0
Satd. Flow (RTOR)		58									11	
Lane Group Flow (vph)	0	404	0	0	152	0	0	0	0	0	1431	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		21.1			21.1						48.1	
Actuated g/C Ratio		0.26			0.26						0.60	
v/c Ratio		0.90			0.52						0.73	
Control Delay		49.3			31.7						9.6	
Queue Delay		0.0			0.0						0.0	
Total Delay		49.3			31.7						9.6	
LOS		D			C						A	
Approach Delay		49.3			31.7						9.6	
Approach LOS		D			C						A	
Queue Length 50th (m)		52.7			20.2						84.4	
Queue Length 95th (m)		#103.4			38.7						112.4	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		474			313						1963	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.85			0.49						0.73	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 13 (16%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

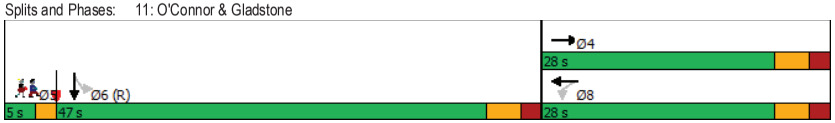
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 86.1%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



Appendix H

TDM Checklist

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

- BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users
- BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance
- ★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☑
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	☑
	2.2	**Bicycle skills training**	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
	2.3	**Valet bike parking**	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	3.	**TRANSIT**	
	3.1	**Transit information**	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances	☑
BASIC	3.1.2	Provide online links to OC Transpo and STO information	☐
BETTER	3.1.3	Provide real-time arrival information display at entrances	☐
	3.2	**Transit fare incentives**	
		Commuter travel	
BETTER	3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER ★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
		Visitor travel	
BETTER	3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
	3.3	**Enhanced public transit service**	
		Commuter travel	
BETTER	3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER	3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
	3.4	**Private transit service**	
		Commuter travel	
BETTER	3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER	3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☐
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☑
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☑
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

- BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users
- BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance
- ★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☑
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
	2.2	**Bicycle skills training**	
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

		TDM measures: *Residential developments*	Check if proposed & add descriptions
	3.	**TRANSIT**	
	3.1	**Transit information**	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☑
BETTER	3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
	3.2	**Transit fare incentives**	
BASIC ★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☑
BETTER	3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
	3.3	**Enhanced public transit service**	
BETTER ★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
	3.4	**Private transit service**	
BETTER	3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
	4.	**CARSHARING & BIKESHARING**	
	4.1	**Bikeshare stations & memberships**	
BETTER	4.1.1	Contract with provider to install on-site bikeshare station *(multi-family)*	☐
BETTER	4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
	4.2	**Carshare vehicles & memberships**	
BETTER	4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER	4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
	5.	**PARKING**	
	5.1	**Priced parking**	
BASIC ★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☑
BASIC ★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☑

		TDM measures: *Residential developments*	Check if proposed & add descriptions
	6.	**TDM MARKETING & COMMUNICATIONS**	
	6.1	**Multimodal travel information**	
BASIC ★	6.1.1	Provide a multimodal travel option information package to new residents	☑
	6.2	**Personalized trip planning**	
BETTER ★	6.2.1	Offer personalized trip planning to new residents	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☐
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☐
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

Appendix I

Synchro Intersection Worksheets – 2023 Future Total Conditions

Lanes, Volumes, Timings
1: Kent & Somerset

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	265	0	0	134	50	83	1559	172	0	0	0
Future Volume (vph)	62	265	0	0	134	50	83	1559	172	0	0	0
Satd. Flow (prot)	1642	1728	0	0	1589	0	1658	4548	0	0	0	0
Flt Permitted	0.598						0.950					
Satd. Flow (perm)	943	1728	0	0	1589	0	1083	4548	0	0	0	0
Satd. Flow (RTOR)					14			41				
Lane Group Flow (vph)	62	265	0	0	184	0	83	1731	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.5	21.5			21.5		21.4	21.4				
Total Split (s)	27.0	27.0			27.0		48.0	48.0				
Total Split (%)	36.0%	36.0%			36.0%		64.0%	64.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.2	2.2			2.2		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.5	5.5			5.5		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	16.7	16.7			16.7		47.4	47.4				
Actuated g/C Ratio	0.22	0.22			0.22		0.63	0.63				
v/c Ratio	0.30	0.69			0.50		0.12	0.60				
Control Delay	26.6	35.8			32.0		10.6	11.1				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	26.6	35.8			32.0		10.6	11.1				
LOS	C	D			C		B	B				
Approach Delay		34.1			32.0			11.1				
Approach LOS		C			C			B				
Queue Length 50th (m)	7.7	36.4			27.4		4.3	48.7				
Queue Length 95th (m)	16.9	56.1			m47.2		m13.6	66.8				
Internal Link Dist (m)		61.7			174.8			152.2			110.1	
Turn Bay Length (m)	25.0						40.0					
Base Capacity (vph)	270	495			465		683	2887				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.23	0.54			0.40		0.12	0.60				

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 14 (19%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
1: Kent & Somerset

09-23-2019

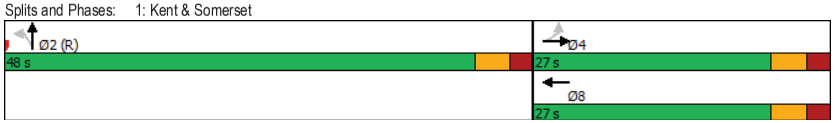
Maximum v/c Ratio: 0.69

Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

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

Splits and Phases: 1: Kent & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	75	0	0	0	0	0	1834	114	0	0	0
Future Volume (vph)	17	75	0	0	0	0	0	1834	114	0	0	0
Satd. Flow (prot)	0	1729	0	0	0	0	0	4680	0	0	0	0
Flt Permitted		0.991										
Satd. Flow (perm)	0	1714	0	0	0	0	0	4680	0	0	0	0
Satd. Flow (RTOR)		31						25				
Lane Group Flow (vph)	0	92	0	0	0	0	0	1948	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		4						2				
Permitted Phases	4											
Detector Phase	4	4						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0				
Minimum Split (s)	21.5	21.5						35.1				
Total Split (s)	22.0	22.0						53.0				
Total Split (%)	29.3%	29.3%						70.7%				
Yellow Time (s)	3.3	3.3						3.3				
All-Red Time (s)	2.2	2.2						1.8				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.1				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max				
Act Effct Green (s)		13.6						54.9				
Actuated g/C Ratio		0.18						0.73				
v/c Ratio		0.27						0.57				
Control Delay		20.0						15.1				
Queue Delay		0.0						0.0				
Total Delay		20.0						15.1				
LOS		C						B				
Approach Delay		20.0						15.1				
Approach LOS		C						B				
Queue Length 50th (m)		7.5						85.3				
Queue Length 95th (m)		19.4						123.4				
Internal Link Dist (m)		69.3			174.3			221.4			152.2	
Turn Bay Length (m)												
Base Capacity (vph)		401						3434				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.23						0.57				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 28 (37%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 62.4%	ICU Level of Service B
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 2: Kent & Gilmour

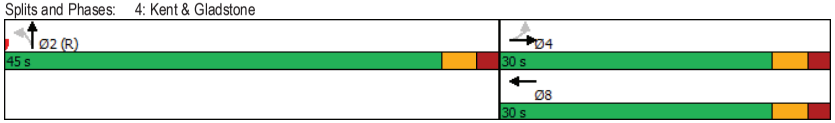
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	278	0	0	160	143	36	1698	98	0	0	0
Future Volume (vph)	82	278	0	0	160	143	36	1698	98	0	0	0
Satd. Flow (prot)	1626	1712	0	0	1524	0	1658	4703	0	0	0	0
Flt Permitted	0.397						0.950					
Satd. Flow (perm)	650	1712	0	0	1524	0	1401	4703	0	0	0	0
Satd. Flow (RTOR)					10			18				
Lane Group Flow (vph)	82	278	0	0	303	0	36	1796	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.4	21.4			20.4		21.4	21.4				
Total Split (s)	30.0	30.0			30.0		45.0	45.0				
Total Split (%)	40.0%	40.0%			40.0%		60.0%	60.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.1	2.1			2.1		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.4	5.4			5.4		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	19.1	19.1			19.1		45.1	45.1				
Actuated g/C Ratio	0.25	0.25			0.25		0.60	0.60				
v/c Ratio	0.50	0.64			0.77		0.04	0.63				
Control Delay	33.1	31.0			34.0		7.9	11.7				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	33.1	31.0			34.0		7.9	11.7				
LOS	C	C			C		A	B				
Approach Delay		31.5			34.0			11.6				
Approach LOS		C			C			B				
Queue Length 50th (m)	10.3	36.4			35.9		2.0	57.2				
Queue Length 95th (m)	22.2	55.2			67.8		6.6	86.2				
Internal Link Dist (m)		96.8			173.9			90.5			221.4	
Turn Bay Length (m)	30.0						40.0					
Base Capacity (vph)	213	561			506		841	2832				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.38	0.50			0.60		0.04	0.63				

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 58 (77%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77
Intersection Signal Delay: 17.2 Intersection LOS: B
Intersection Capacity Utilization 79.2% ICU Level of Service D
Analysis Period (min) 15
Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 4: Kent & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	261	75	14	153	11	8	469	67	0	154	8
Future Volume (vph)	52	261	75	14	153	11	8	469	67	0	154	8
Satd. Flow (prot)	1626	1537	0	1658	1699	0	0	1550	0	0	1640	0
Flt Permitted	0.653			0.386				0.997				
Satd. Flow (perm)	913	1537	0	577	1699	0	0	1538	0	0	1640	0
Satd. Flow (RTOR)		20			5			14			5	
Lane Group Flow (vph)	52	336	0	14	164	0	0	544	0	0	162	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Total Split (s)	30.0	30.0		30.0	30.0		45.0	45.0		45.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		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)	5.5	5.5		5.5	5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	21.8	21.8		21.8	21.8			42.2			42.2	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.56			0.56	
v/c Ratio	0.20	0.73		0.08	0.33			0.62			0.17	
Control Delay	15.8	25.7		19.7	21.8			6.9			8.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	15.8	25.7		19.7	21.8			6.9			8.8	
LOS	B	C		B	C			A			A	
Approach Delay		24.4			21.7			6.9			8.8	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	6.7	44.1		1.6	18.9			8.6			9.9	
Queue Length 95th (m)	m11.5	70.5		5.5	32.3			16.3			21.3	
Internal Link Dist (m)		174.8			160.0			150.5			106.3	
Turn Bay Length (m)	25.0			15.0								
Base Capacity (vph)	298	515		188	558			872			926	
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	0.17	0.65		0.07	0.29			0.62			0.17	

Intersection Summary

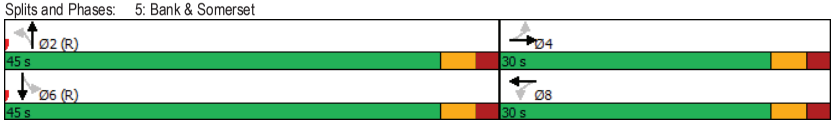
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 46 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 5: Bank & Somerset



Lanes, Volumes, Timings
6: Bank & Gilmour

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	48	31	0	0	0	0	540	34	15	216	0
Future Volume (vph)	32	48	31	0	0	0	0	540	34	15	216	0
Satd. Flow (prot)	0	1617	0	0	0	0	0	1683	0	0	1659	0
Flt Permitted		0.986									0.962	
Satd. Flow (perm)	0	1560	0	0	0	0	0	1683	0	0	1591	0
Satd. Flow (RTOR)		25						8				
Lane Group Flow (vph)	0	111	0	0	0	0	0	574	0	0	231	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	23.2	23.2						20.1		20.1	20.1	
Total Split (s)	25.0	25.0						50.0		50.0	50.0	
Total Split (%)	33.3%	33.3%						66.7%		66.7%	66.7%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9						1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.2						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max		C-Max	C-Max	
Act Effct Green (s)		14.8						54.0			54.0	
Actuated g/C Ratio		0.20						0.72			0.72	
v/c Ratio		0.34						0.47			0.20	
Control Delay		20.8						6.4			4.2	
Queue Delay		0.0						0.0			0.0	
Total Delay		20.8						6.4			4.2	
LOS		C						A			A	
Approach Delay		20.8						6.4			4.2	
Approach LOS		C						A			A	
Queue Length 50th (m)		8.4						34.9			12.1	
Queue Length 95th (m)		m19.1						55.7			m16.4	
Internal Link Dist (m)		174.3			162.5			220.3			150.5	
Turn Bay Length (m)												
Base Capacity (vph)		430						1212			1144	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.26						0.47			0.20	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 41 (55%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
6: Bank & Gilmour

09-23-2019

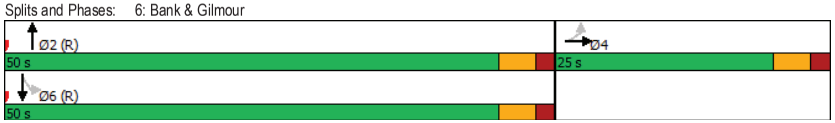
Maximum v/c Ratio: 0.47

Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

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

Splits and Phases: 6: Bank & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	218	116	28	110	27	112	465	86	5	229	29
Future Volume (vph)	65	218	116	28	110	27	112	465	86	5	229	29
Satd. Flow (prot)	0	2942	0	0	1606	0	1610	1517	0	0	3042	0
Flt Permitted		0.860			0.878		0.589				0.948	
Satd. Flow (perm)	0	2515	0	0	1404	0	838	1517	0	0	2876	0
Satd. Flow (RTOR)		85			13			20			29	
Lane Group Flow (vph)	0	399	0	0	165	0	112	551	0	0	263	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.2	25.2		25.5	25.5	
Total Split (s)	28.0	28.0		28.0	28.0		47.0	47.0		47.0	47.0	
Total Split (%)	37.3%	37.3%		37.3%	37.3%		62.7%	62.7%		62.7%	62.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5		5.2	5.2			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		18.0			18.0		46.3	46.3			46.0	
Actuated g/C Ratio		0.24			0.24		0.62	0.62			0.61	
v/c Ratio		0.60			0.48		0.22	0.58			0.15	
Control Delay		21.1			26.6		8.5	12.1			7.9	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		21.1			26.6		8.5	12.1			7.9	
LOS		C			C		A	B			A	
Approach Delay		21.1			26.6			11.5			7.9	
Approach LOS		C			C			B			A	
Queue Length 50th (m)		23.7			18.6		7.1	45.3			8.2	
Queue Length 95th (m)		39.0			36.1		15.4	76.2			18.3	
Internal Link Dist (m)		173.9			165.8			108.7			220.3	
Turn Bay Length (m)							38.0					
Base Capacity (vph)		814			430		516	944			1775	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.49			0.38		0.22	0.58			0.15	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 20 (27%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 97.4%	ICU Level of Service F
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 8: Bank & Gladstone

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	185	124	51	164	0	0	0	0	29	509	63
Future Volume (vph)	0	185	124	51	164	0	0	0	0	29	509	63
Satd. Flow (prot)	0	1521	0	0	1724	0	0	0	0	0	3169	0
Flt Permitted					0.707						0.998	
Satd. Flow (perm)	0	1521	0	0	1216	0	0	0	0	0	3117	0
Satd. Flow (RTOR)		38									19	
Lane Group Flow (vph)	0	309	0	0	215	0	0	0	0	0	601	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		15.0	20.4					19.5	19.5	
Total Split (s)		22.0		15.0	37.0					38.0	38.0	
Total Split (%)		27.5%		18.8%	46.3%					47.5%	47.5%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		21.4			21.4						47.7	
Actuated g/C Ratio		0.27			0.27						0.60	
v/c Ratio		0.71			0.66						0.32	
Control Delay		32.0			35.6						9.2	
Queue Delay		0.0			0.0						0.0	
Total Delay		32.0			35.6						9.2	
LOS		C			D						A	
Approach Delay		32.0			35.6						9.2	
Approach LOS		C			D						A	
Queue Length 50th (m)		38.9			30.3						22.3	
Queue Length 95th (m)		60.0			48.3						39.0	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		442			480						1867	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.70			0.45						0.32	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
9: O'Connor & Somerset

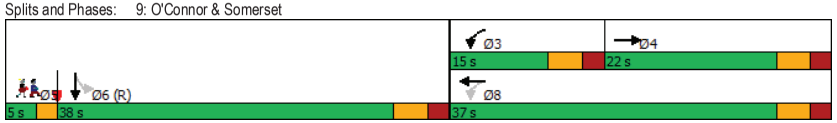
09-23-2019

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 20.5	Intersection LOS: C
Intersection Capacity Utilization 68.5%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lanes, Volumes, Timings
10: O'Connor & Gilmour

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	61	49	0	0	0	0	0	0	49	668	0
Future Volume (vph)	0	61	49	0	0	0	0	0	0	49	668	0
Satd. Flow (prot)	0	1592	0	0	0	0	0	0	0	0	3306	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	1592	0	0	0	0	0	0	0	0	3274	0
Satd. Flow (RTOR)		45									63	
Lane Group Flow (vph)	0	110	0	0	0	0	0	0	0	0	717	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		13.0									60.4	
Actuated g/C Ratio		0.16									0.76	
v/c Ratio		0.37									0.29	
Control Delay		21.9									3.9	
Queue Delay		0.0									0.0	
Total Delay		21.9									3.9	
LOS		C									A	
Approach Delay		21.9									3.9	
Approach LOS		C									A	
Queue Length 50th (m)		8.9									14.5	
Queue Length 95th (m)		23.0									18.8	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		342									2489	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.32									0.29	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 46 (58%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

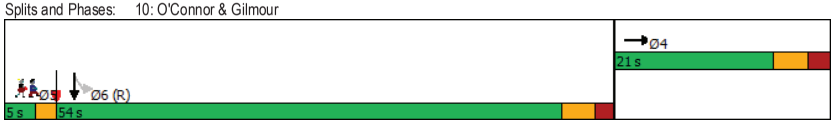
Intersection Summary

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 43.7%	ICU Level of Service A
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	222	117	32	140	0	0	0	0	15	638	48
Future Volume (vph)	0	222	117	32	140	0	0	0	0	15	638	48
Satd. Flow (prot)	0	1591	0	0	1696	0	0	0	0	0	3245	0
Flt Permitted					0.708						0.999	
Satd. Flow (perm)	0	1591	0	0	1202	0	0	0	0	0	3235	0
Satd. Flow (RTOR)		33									14	
Lane Group Flow (vph)	0	339	0	0	172	0	0	0	0	0	701	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		19.8			19.8						49.4	
Actuated g/C Ratio		0.25			0.25						0.62	
v/c Ratio		0.81			0.58						0.35	
Control Delay		41.1			34.1						5.1	
Queue Delay		0.0			0.0						0.0	
Total Delay		41.1			34.1						5.1	
LOS		D			C						A	
Approach Delay		41.1			34.1						5.1	
Approach LOS		D			C						A	
Queue Length 50th (m)		45.3			23.7						13.5	
Queue Length 95th (m)		#81.3			42.8						16.7	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		471			338						2001	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.72			0.51						0.35	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
11: O'Connor & Gladstone

09-23-2019

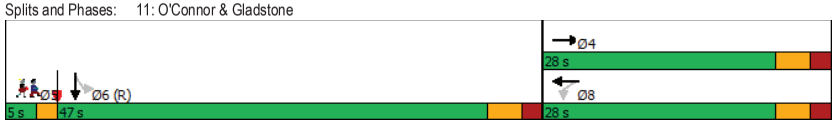
Maximum v/c Ratio: 0.81

Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 70.2%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



HCM 2010 TWSC
3: Kent & James

09-23-2019

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	19	42	46	1798	0	0	0	0
Future Vol, veh/h	0	0	0	0	19	42	46	1798	0	0	0	0
Conflicting Peds, #/hr	6	0	16	16	0	6	49	0	53	53	0	149
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	19	42	46	1798	0	0	0	0

Major/Minor	Minor1			Major1		
Conflicting Flow All	-	1939	905	49	0	-
Stage 1	-	1890	-	-	-	-
Stage 2	-	49	-	-	-	-
Critical Hdwy	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	0	65	240	1096	-	0
Stage 1	0	117	-	-	-	0
Stage 2	0	-	-	-	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	-	0	240	1096	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	25	2.7
HCM LOS	D	

Minor Lane/Major Mvmt	NBL	NBT	WBLn1
Capacity (veh/h)	1096	-	240
HCM Lane V/C Ratio	0.042	-	0.254
HCM Control Delay (s)	8.4	2.6	25
HCM Lane LOS	A	A	D
HCM 95th %tile Q(veh)	0.1	-	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	13	6	7	26	546	0	0	222	9
Future Volume (vph)	0	0	0	13	6	7	26	546	0	0	222	9
Satd. Flow (prot)	0	0	0	0	1642	0	0	1742	0	0	1736	0
Flt Permitted					0.976			0.982				
Satd. Flow (perm)	0	0	0	0	1642	0	0	1714	0	0	1736	0
Satd. Flow (RTOR)					7						5	
Lane Group Flow (vph)	0	0	0	0	26	0	0	572	0	0	231	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Detector Phase				8	8		2	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0			10.0	
Minimum Split (s)				24.2	24.2		18.0	18.0			18.0	
Total Split (s)				24.2	24.2		50.8	50.8			50.8	
Total Split (%)				32.3%	32.3%		67.7%	67.7%			67.7%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				1.9	1.9		1.7	1.7			1.7	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.2			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode				Max	Max		C-Max	C-Max			C-Max	
Act Effct Green (s)					19.0			45.8			45.8	
Actuated g/C Ratio					0.25			0.61			0.61	
v/c Ratio					0.06			0.55			0.22	
Control Delay					17.8			11.0			7.0	
Queue Delay					0.0			0.0			0.0	
Total Delay					17.8			11.0			7.0	
LOS					B			B			A	
Approach Delay					17.8			11.0			7.0	
Approach LOS					B			B			A	
Queue Length 50th (m)					2.2			44.3			13.4	
Queue Length 95th (m)					8.0			70.6			23.4	
Internal Link Dist (m)		104.8			85.7			147.5			39.9	
Turn Bay Length (m)												
Base Capacity (vph)					421			1046			1062	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.06			0.55			0.22	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 10.1	Intersection LOS: B
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

Description: As per timings provided on August 9, 2019 (North/South adjusted for extra time required for West)

Splits and Phases: 13: Bank & MacLaren

Lanes, Volumes, Timings
1: Kent & Somerset

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	332	0	0	303	63	83	710	112	0	0	0
Future Volume (vph)	56	332	0	0	303	63	83	710	112	0	0	0
Satd. Flow (prot)	1642	1728	0	0	1605	0	1658	4346	0	0	0	0
Flt Permitted	0.348						0.950					
Satd. Flow (perm)	533	1728	0	0	1605	0	1028	4346	0	0	0	0
Satd. Flow (RTOR)					19			46				
Lane Group Flow (vph)	56	332	0	0	366	0	83	822	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.5	21.5			21.5		21.4	21.4				
Total Split (s)	41.0	41.0			41.0		34.0	34.0				
Total Split (%)	54.7%	54.7%			54.7%		45.3%	45.3%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.2	2.2			2.2		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.5	5.5			5.5		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	22.2	22.2			22.2		41.9	41.9				
Actuated g/C Ratio	0.30	0.30			0.30		0.56	0.56				
v/c Ratio	0.35	0.65			0.75		0.14	0.34				
Control Delay	25.0	28.2			36.2		9.4	9.1				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	25.0	28.2			36.2		9.4	9.1				
LOS	C	C			D		A	A				
Approach Delay		27.7			36.2			9.1				
Approach LOS		C			D			A				
Queue Length 50th (m)	6.5	42.7			55.5		4.6	15.4				
Queue Length 95th (m)	14.3	58.0			80.0		9.6	20.2				
Internal Link Dist (m)		61.7			174.8			152.2			110.1	
Turn Bay Length (m)	25.0						40.0					
Base Capacity (vph)	252	817			769		573	2445				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.22	0.41			0.48		0.14	0.34				

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 51 (68%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
1: Kent & Somerset

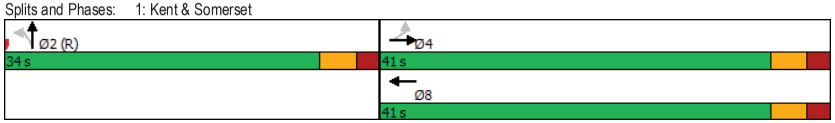
09-23-2019

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 62.3%	ICU Level of Service B
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 1: Kent & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	77	0	0	0	0	0	846	78	0	0	0
Future Volume (vph)	19	77	0	0	0	0	0	846	78	0	0	0
Satd. Flow (prot)	0	1728	0	0	0	0	0	4639	0	0	0	0
Flt Permitted		0.990										
Satd. Flow (perm)	0	1696	0	0	0	0	0	4639	0	0	0	0
Satd. Flow (RTOR)		31						40				
Lane Group Flow (vph)	0	96	0	0	0	0	0	924	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		4						2				
Permitted Phases	4											
Detector Phase	4	4						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0				
Minimum Split (s)	21.5	21.5						35.1				
Total Split (s)	22.0	22.0						53.0				
Total Split (%)	29.3%	29.3%						70.7%				
Yellow Time (s)	3.3	3.3						3.3				
All-Red Time (s)	2.2	2.2						1.8				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.1				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max				
Act Effct Green (s)		10.4						58.1				
Actuated g/C Ratio		0.14						0.77				
v/c Ratio		0.37						0.26				
Control Delay		25.1						2.3				
Queue Delay		0.0						0.0				
Total Delay		25.1						2.3				
LOS		C						A				
Approach Delay		25.1						2.3				
Approach LOS		C						A				
Queue Length 50th (m)		8.9						7.6				
Queue Length 95th (m)		21.8						10.6				
Internal Link Dist (m)		69.3			174.3			221.4			152.2	
Turn Bay Length (m)												
Base Capacity (vph)		397						3602				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.24						0.26				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 5 (7%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 47.0%	ICU Level of Service A
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 2: Kent & Gilmour

Lanes, Volumes, Timings
4: Kent & Gladstone

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	408	0	0	274	75	52	722	104	0	0	0
Future Volume (vph)	75	408	0	0	274	75	52	722	104	0	0	0
Satd. Flow (prot)	1626	1712	0	0	1632	0	1658	4626	0	0	0	0
Flt Permitted	0.397						0.950					
Satd. Flow (perm)	655	1712	0	0	1632	0	1471	4626	0	0	0	0
Satd. Flow (RTOR)					28			37				
Lane Group Flow (vph)	75	408	0	0	349	0	52	826	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	21.4	21.4			20.4		21.4	21.4				
Total Split (s)	45.0	45.0			45.0		30.0	30.0				
Total Split (%)	60.0%	60.0%			60.0%		40.0%	40.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.1	2.1			2.1		2.1	2.1				
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0				
Total Lost Time (s)	5.4	5.4			5.4		5.4	5.4				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None			None		C-Max	C-Max				
Act Effct Green (s)	24.3	24.3			24.3		39.9	39.9				
Actuated g/C Ratio	0.32	0.32			0.32		0.53	0.53				
v/c Ratio	0.35	0.74			0.64		0.07	0.33				
Control Delay	22.0	29.9			29.5		11.4	11.1				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	22.0	29.9			29.5		11.4	11.1				
LOS	C	C			C		B	B				
Approach Delay		28.7			29.5			11.1				
Approach LOS		C			C			B				
Queue Length 50th (m)	8.4	53.2			42.3		3.5	22.5				
Queue Length 95th (m)	16.4	68.7			m50.7		11.1	39.7				
Internal Link Dist (m)		96.8			173.9			90.5			221.4	
Turn Bay Length (m)	30.0						40.0					
Base Capacity (vph)	345	903			874		781	2475				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.22	0.45			0.40		0.07	0.33				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 23 (31%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
4: Kent & Gladstone

09-23-2019

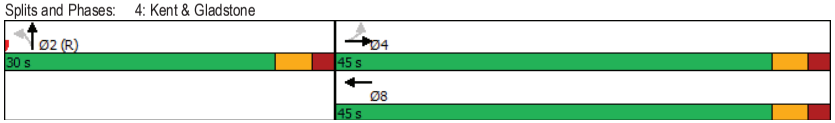
Maximum v/c Ratio: 0.74

Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

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

Splits and Phases: 4: Kent & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	284	99	59	254	4	9	260	35	0	337	32
Future Volume (vph)	34	284	99	59	254	4	9	260	35	0	337	32
Satd. Flow (prot)	1626	1566	0	1658	1731	0	0	1540	0	0	1582	0
Flt Permitted	0.502			0.308				0.989				
Satd. Flow (perm)	644	1566	0	501	1731	0	0	1509	0	0	1582	0
Satd. Flow (RTOR)		19			1			13			10	
Lane Group Flow (vph)	34	383	0	59	258	0	0	304	0	0	369	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Total Split (s)	30.0	30.0		30.0	30.0		45.0	45.0		45.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		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)	5.5	5.5		5.5	5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	21.3	21.3		21.3	21.3			42.7			42.7	
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.57			0.57	
v/c Ratio	0.19	0.83		0.42	0.52			0.35			0.41	
Control Delay	15.7	32.9		30.3	25.9			13.8			11.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	15.7	32.9		30.3	25.9			13.8			11.4	
LOS	B	C		C	C			B			B	
Approach Delay		31.5			26.7			13.8			11.4	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	4.1	49.3		6.9	30.9			28.4			29.0	
Queue Length 95th (m)	m11.6	#87.5		17.7	50.8			36.8			50.9	
Internal Link Dist (m)		174.8			160.0			150.5			106.3	
Turn Bay Length (m)	25.0			15.0								
Base Capacity (vph)	210	524		163	566			863			904	
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	0.16	0.73		0.36	0.46			0.35			0.41	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 71 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

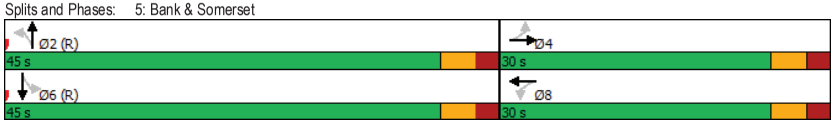
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 71.0%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Bank & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	116	61	0	0	0	0	335	28	19	449	0
Future Volume (vph)	14	116	61	0	0	0	0	335	28	19	449	0
Satd. Flow (prot)	0	1601	0	0	0	0	0	1663	0	0	1660	0
Flt Permitted		0.996									0.981	
Satd. Flow (perm)	0	1563	0	0	0	0	0	1663	0	0	1619	0
Satd. Flow (RTOR)		31						10				
Lane Group Flow (vph)	0	191	0	0	0	0	0	363	0	0	468	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	23.2	23.2						20.1		20.1	20.1	
Total Split (s)	25.0	25.0						50.0		50.0	50.0	
Total Split (%)	33.3%	33.3%						66.7%		66.7%	66.7%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	1.9	1.9						1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.2						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Max		C-Max	C-Max	
Act Effct Green (s)		13.6						51.1			51.1	
Actuated g/C Ratio		0.18						0.68			0.68	
v/c Ratio		0.62						0.32			0.42	
Control Delay		37.1						5.3			5.8	
Queue Delay		0.0						0.0			0.0	
Total Delay		37.1						5.3			5.8	
LOS		D						A			A	
Approach Delay		37.1						5.3			5.8	
Approach LOS		D						A			A	
Queue Length 50th (m)		24.1						14.2			23.6	
Queue Length 95th (m)		42.8						m29.4			m34.6	
Internal Link Dist (m)		174.3			162.5			220.3			150.5	
Turn Bay Length (m)												
Base Capacity (vph)		435						1136			1102	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.44						0.32			0.42	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 3 (4%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

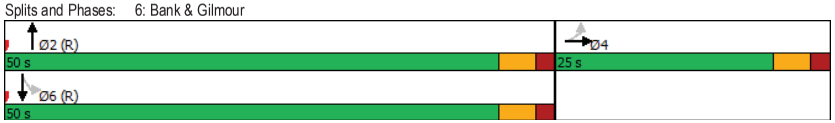
Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 68.8%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

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

Splits and Phases: 6: Bank & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	252	165	56	166	23	95	338	93	24	475	47
Future Volume (vph)	49	252	165	56	166	23	95	338	93	24	475	47
Satd. Flow (prot)	0	2842	0	0	1614	0	1610	1454	0	0	3014	0
Flt Permitted		0.869			0.709		0.448				0.928	
Satd. Flow (perm)	0	2445	0	0	1133	0	603	1454	0	0	2772	0
Satd. Flow (RTOR)		112			7			30			21	
Lane Group Flow (vph)	0	466	0	0	245	0	95	431	0	0	546	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		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	
Minimum Split (s)	25.5	25.5		25.5	25.5		25.2	25.2		25.5	25.5	
Total Split (s)	28.0	28.0		28.0	28.0		47.0	47.0		47.0	47.0	
Total Split (%)	37.3%	37.3%		37.3%	37.3%		62.7%	62.7%		62.7%	62.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5		5.2	5.2			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		18.1			18.1		46.2	46.2			45.9	
Actuated g/C Ratio		0.24			0.24		0.62	0.62			0.61	
v/c Ratio		0.69			0.88		0.26	0.48			0.32	
Control Delay		26.5			57.4		10.3	10.4			4.2	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		26.5			57.4		10.3	10.4			4.2	
LOS		C			E		B	B			A	
Approach Delay		26.5			57.4			10.4			4.2	
Approach LOS		C			E			B			A	
Queue Length 50th (m)		12.3			33.7		6.0	29.5			9.8	
Queue Length 95th (m)		26.0			#65.4		16.1	58.2			14.0	
Internal Link Dist (m)		173.9			165.8			108.7			220.3	
Turn Bay Length (m)							38.0					
Base Capacity (vph)		811			344		371	907			1704	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.57			0.71		0.26	0.48			0.32	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 11 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

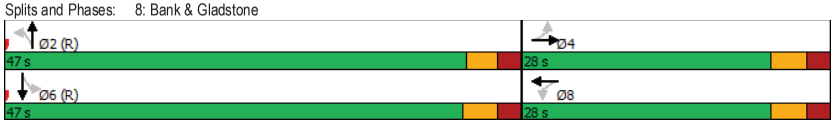
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 95.2%	ICU Level of Service F
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Bank & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	192	165	70	151	0	0	0	0	43	996	101
Future Volume (vph)	0	192	165	70	151	0	0	0	0	43	996	101
Satd. Flow (prot)	0	1389	0	0	1717	0	0	0	0	0	3145	0
Flt Permitted					0.630						0.998	
Satd. Flow (perm)	0	1389	0	0	1099	0	0	0	0	0	3092	0
Satd. Flow (RTOR)		48									14	
Lane Group Flow (vph)	0	357	0	0	221	0	0	0	0	0	1140	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		10.5	20.4					19.5	19.5	
Total Split (s)		21.0		14.0	40.0					40.0	40.0	
Total Split (%)		24.7%		16.5%	47.1%					47.1%	47.1%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		27.6			27.6						46.5	
Actuated g/C Ratio		0.32			0.32						0.55	
v/c Ratio		0.74			0.62						0.67	
Control Delay		31.1			31.6						17.2	
Queue Delay		0.0			0.0						0.0	
Total Delay		31.1			31.6						17.2	
LOS		C			C						B	
Approach Delay		31.1			31.6						17.2	
Approach LOS		C			C						B	
Queue Length 50th (m)		47.0			31.8						67.0	
Queue Length 95th (m)		69.4			49.0						109.6	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		483			447						1697	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.74			0.49						0.67	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 58 (68%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
9: O'Connor & Somerset

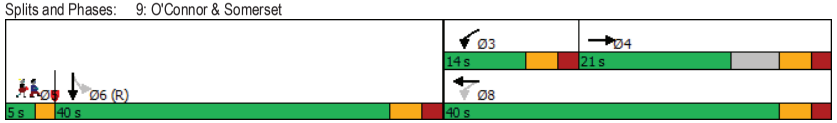
09-23-2019

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lanes, Volumes, Timings
10: O'Connor & Gilmour

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	84	89	0	0	0	0	0	0	48	1242	0
Future Volume (vph)	0	84	89	0	0	0	0	0	0	48	1242	0
Satd. Flow (prot)	0	1528	0	0	0	0	0	0	0	0	3309	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1528	0	0	0	0	0	0	0	0	3284	0
Satd. Flow (RTOR)		59									63	
Lane Group Flow (vph)	0	173	0	0	0	0	0	0	0	0	1290	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		12.2									57.1	
Actuated g/C Ratio		0.15									0.71	
v/c Ratio		0.61									0.55	
Control Delay		30.1									6.4	
Queue Delay		0.0									0.3	
Total Delay		30.1									6.6	
LOS		C									A	
Approach Delay		30.1									6.6	
Approach LOS		C									A	
Queue Length 50th (m)		17.1									37.6	
Queue Length 95th (m)		35.4									62.7	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		341									2363	
Starvation Cap Reductn		0									405	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.51									0.66	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

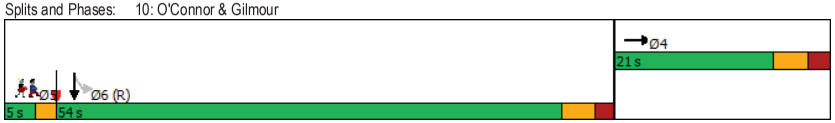
Intersection Summary

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 62.5%	ICU Level of Service B
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	209	195	27	125	0	0	0	0	31	1233	78
Future Volume (vph)	0	209	195	27	125	0	0	0	0	31	1233	78
Satd. Flow (prot)	0	1540	0	0	1696	0	0	0	0	0	3263	0
Flt Permitted					0.655						0.999	
Satd. Flow (perm)	0	1540	0	0	1114	0	0	0	0	0	3254	0
Satd. Flow (RTOR)		58									12	
Lane Group Flow (vph)	0	404	0	0	152	0	0	0	0	0	1342	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		21.1			21.1						48.1	
Actuated g/C Ratio		0.26			0.26						0.60	
v/c Ratio		0.90			0.52						0.68	
Control Delay		49.3			31.7						9.0	
Queue Delay		0.0			0.0						0.0	
Total Delay		49.3			31.7						9.0	
LOS		D			C						A	
Approach Delay		49.3			31.7						9.0	
Approach LOS		D			C						A	
Queue Length 50th (m)		52.7			20.2						75.9	
Queue Length 95th (m)		#103.4			38.7						101.1	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		474			313						1960	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.85			0.49						0.68	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 13 (16%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
11: O'Connor & Gladstone

09-23-2019

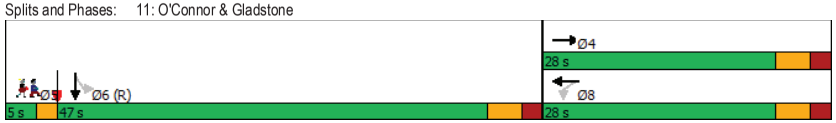
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



HCM 2010 TWSC
3: Kent & James

09-23-2019

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	62	60	70	819	0	0	0	0
Future Vol, veh/h	0	0	0	0	62	60	70	819	0	0	0	0
Conflicting Peds, #/hr	24	0	21	21	0	24	84	0	53	53	0	84
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	62	60	70	819	0	0	0	0

Major/Minor	Minor1			Major1		
Conflicting Flow All	-	1043	434	84	0	-
Stage 1	-	959	-	-	-	-
Stage 2	-	84	-	-	-	-
Critical Hdwy	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	0	228	487	1056	-	0
Stage 1	0	334	-	-	-	0
Stage 2	0	-	-	-	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	-	0	487	1056	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	14.8	1
HCM LOS	B	

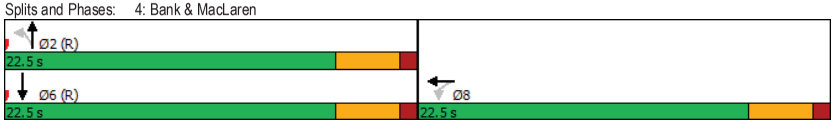
Minor Lane/Major Mvmt	NBL	NBT	WBLn1
Capacity (veh/h)	1056	-	487
HCM Lane V/C Ratio	0.066	-	0.251
HCM Control Delay (s)	8.7	0.3	14.8
HCM Lane LOS	A	A	B
HCM 95th %tile Q(veh)	0.2	-	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	16	23	11	50	374	0	0	352	16
Future Volume (vph)	0	0	0	16	23	11	50	374	0	0	352	16
Satd. Flow (prot)	0	0	0	0	1666	0	0	1735	0	0	1735	0
Flt Permitted					0.984			0.923				
Satd. Flow (perm)	0	0	0	0	1666	0	0	1611	0	0	1735	0
Satd. Flow (RTOR)					11						6	
Lane Group Flow (vph)	0	0	0	0	50	0	0	424	0	0	368	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Minimum Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (%)				50.0%	50.0%		50.0%	50.0%			50.0%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)					18.0			18.0			18.0	
Actuated g/C Ratio					0.40			0.40			0.40	
v/c Ratio					0.07			0.66			0.53	
Control Delay					7.4			17.3			13.5	
Queue Delay					0.0			0.0			0.0	
Total Delay					7.4			17.3			13.5	
LOS					A			B			B	
Approach Delay					7.4			17.3			13.5	
Approach LOS					A			B			B	
Queue Length 50th (m)					1.9			26.9			21.4	
Queue Length 95th (m)					6.5			#52.7			40.7	
Internal Link Dist (m)		74.5			59.0			148.5			41.5	
Turn Bay Length (m)												
Base Capacity (vph)					673			644			697	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.07			0.66			0.53	

Intersection Summary	
Cycle Length: 45	
Actuated Cycle Length: 45	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Bank & MacLaren



Appendix J

Synchro Intersection Worksheets – 2028 Future Total Conditions

Lanes, Volumes, Timings
9: O'Connor & Somerset

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	185	124	51	164	0	0	0	0	29	549	63
Future Volume (vph)	0	185	124	51	164	0	0	0	0	29	549	63
Satd. Flow (prot)	0	1521	0	0	1724	0	0	0	0	0	3178	0
Flt Permitted					0.707						0.998	
Satd. Flow (perm)	0	1521	0	0	1216	0	0	0	0	0	3129	0
Satd. Flow (RTOR)		38									17	
Lane Group Flow (vph)	0	309	0	0	215	0	0	0	0	0	641	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		15.0	20.4					19.5	19.5	
Total Split (s)		22.0		15.0	37.0					38.0	38.0	
Total Split (%)		27.5%		18.8%	46.3%					47.5%	47.5%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		21.4			21.4						47.7	
Actuated g/C Ratio		0.27			0.27						0.60	
v/c Ratio		0.71			0.66						0.34	
Control Delay		32.0			35.6						9.4	
Queue Delay		0.0			0.0						0.0	
Total Delay		32.0			35.6						9.4	
LOS		C			D						A	
Approach Delay		32.0			35.6						9.4	
Approach LOS		C			D						A	
Queue Length 50th (m)		38.9			30.3						24.4	
Queue Length 95th (m)		60.0			48.3						42.1	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		442			480						1873	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.70			0.45						0.34	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
9: O'Connor & Somerset

09-23-2019

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
9: O'Connor & Somerset

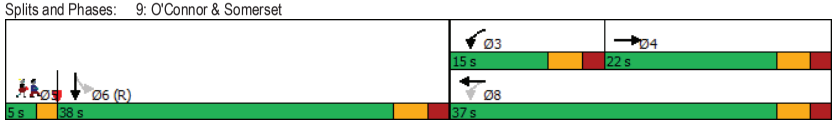
09-23-2019

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lanes, Volumes, Timings
10: O'Connor & Gilmour

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	61	49	0	0	0	0	0	0	49	719	0
Future Volume (vph)	0	61	49	0	0	0	0	0	0	49	719	0
Satd. Flow (prot)	0	1592	0	0	0	0	0	0	0	0	3306	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	1592	0	0	0	0	0	0	0	0	3276	0
Satd. Flow (RTOR)		45									63	
Lane Group Flow (vph)	0	110	0	0	0	0	0	0	0	0	768	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		13.0									60.4	
Actuated g/C Ratio		0.16									0.76	
v/c Ratio		0.37									0.31	
Control Delay		21.9									3.8	
Queue Delay		0.0									0.0	
Total Delay		21.9									3.8	
LOS		C									A	
Approach Delay		21.9									3.8	
Approach LOS		C									A	
Queue Length 50th (m)		8.9									14.8	
Queue Length 95th (m)		23.0									18.9	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		342									2490	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.32									0.31	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 46 (58%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

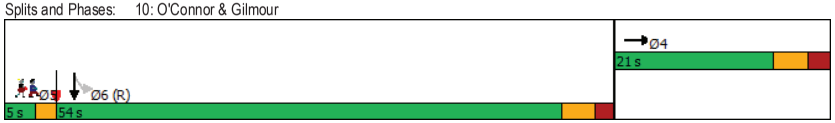
Intersection Summary

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 45.2%	ICU Level of Service A
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	222	117	32	140	0	0	0	0	15	687	48
Future Volume (vph)	0	222	117	32	140	0	0	0	0	15	687	48
Satd. Flow (prot)	0	1591	0	0	1696	0	0	0	0	0	3247	0
Flt Permitted					0.708						0.999	
Satd. Flow (perm)	0	1591	0	0	1202	0	0	0	0	0	3238	0
Satd. Flow (RTOR)		33									13	
Lane Group Flow (vph)	0	339	0	0	172	0	0	0	0	0	750	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		19.8			19.8						49.4	
Actuated g/C Ratio		0.25			0.25						0.62	
v/c Ratio		0.81			0.58						0.37	
Control Delay		41.1			34.1						5.3	
Queue Delay		0.0			0.0						0.0	
Total Delay		41.1			34.1						5.3	
LOS		D			C						A	
Approach Delay		41.1			34.1						5.3	
Approach LOS		D			C						A	
Queue Length 50th (m)		45.3			23.7						14.8	
Queue Length 95th (m)		#81.3			42.8						18.5	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		471			338						2002	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.72			0.51						0.37	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 44 (55%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
11: O'Connor & Gladstone

09-23-2019

Maximum v/c Ratio: 0.81

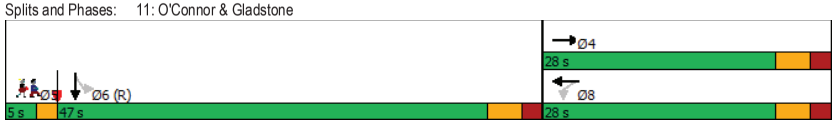
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

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

Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



Lanes, Volumes, Timings
9: O'Connor & Somerset

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	192	165	70	151	0	0	0	0	43	1072	101
Future Volume (vph)	0	192	165	70	151	0	0	0	0	43	1072	101
Satd. Flow (prot)	0	1389	0	0	1717	0	0	0	0	0	3156	0
Flt Permitted					0.630						0.998	
Satd. Flow (perm)	0	1389	0	0	1099	0	0	0	0	0	3106	0
Satd. Flow (RTOR)		48									13	
Lane Group Flow (vph)	0	357	0	0	221	0	0	0	0	0	1216	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		20.4		10.5	20.4					19.5	19.5	
Total Split (s)		21.0		14.0	40.0					40.0	40.0	
Total Split (%)		24.7%		16.5%	47.1%					47.1%	47.1%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.1		2.2	2.1					2.2	2.2	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.5	
Lead/Lag		Lag		Lead						Lag	Lag	
Lead-Lag Optimize?		Yes		Yes						Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		27.6			27.6						46.5	
Actuated g/C Ratio		0.32			0.32						0.55	
v/c Ratio		0.74			0.62						0.71	
Control Delay		31.1			31.6						18.4	
Queue Delay		0.0			0.0						0.0	
Total Delay		31.1			31.6						18.4	
LOS		C			C						B	
Approach Delay		31.1			31.6						18.4	
Approach LOS		C			C						B	
Queue Length 50th (m)		47.0			31.8						74.4	
Queue Length 95th (m)		69.4			49.0						121.1	
Internal Link Dist (m)		160.0			133.2			149.0			71.3	
Turn Bay Length (m)												
Base Capacity (vph)		483			447						1704	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.74			0.49						0.71	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 58 (68%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

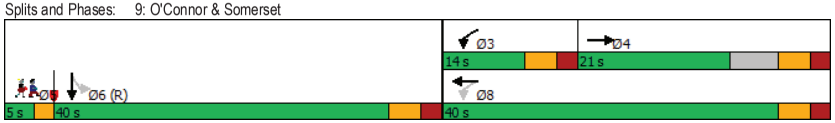
Intersection Summary

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 90.7%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 9: O'Connor & Somerset



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	84	89	0	0	0	0	0	0	48	1338	0
Future Volume (vph)	0	84	89	0	0	0	0	0	0	48	1338	0
Satd. Flow (prot)	0	1528	0	0	0	0	0	0	0	0	3309	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1528	0	0	0	0	0	0	0	0	3285	0
Satd. Flow (RTOR)		59									63	
Lane Group Flow (vph)	0	173	0	0	0	0	0	0	0	0	1386	0
Turn Type		NA								Perm	NA	
Protected Phases		4									6	
Permitted Phases										6		
Detector Phase		4								6	6	
Switch Phase												
Minimum Initial (s)		10.0								10.0	10.0	
Minimum Split (s)		20.6								26.1	26.1	
Total Split (s)		21.0								54.0	54.0	
Total Split (%)		26.3%								67.5%	67.5%	
Yellow Time (s)		3.3								3.3	3.3	
All-Red Time (s)		2.3								1.8	1.8	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.6									5.1	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None								C-Max	C-Max	
Act Effct Green (s)		12.2									57.1	
Actuated g/C Ratio		0.15									0.71	
v/c Ratio		0.61									0.59	
Control Delay		30.1									6.9	
Queue Delay		0.0									0.3	
Total Delay		30.1									7.2	
LOS		C									A	
Approach Delay		30.1									7.2	
Approach LOS		C									A	
Queue Length 50th (m)		17.1									42.6	
Queue Length 95th (m)		35.4									71.3	
Internal Link Dist (m)		162.5			68.5			219.3			149.0	
Turn Bay Length (m)												
Base Capacity (vph)		341									2364	
Starvation Cap Reductn		0									384	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.51									0.70	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
10: O'Connor & Gilmour

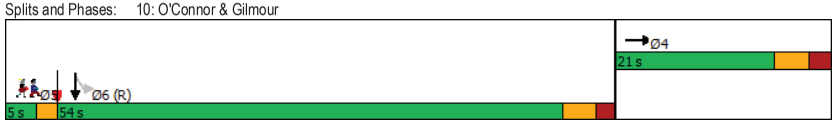
09-23-2019

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 65.3%	ICU Level of Service C
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

Splits and Phases: 10: O'Connor & Gilmour



Lanes, Volumes, Timings
11: O'Connor & Gladstone

09-23-2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	209	195	27	125	0	0	0	0	31	1328	78
Future Volume (vph)	0	209	195	27	125	0	0	0	0	31	1328	78
Satd. Flow (prot)	0	1540	0	0	1696	0	0	0	0	0	3267	0
Flt Permitted					0.655						0.999	
Satd. Flow (perm)	0	1540	0	0	1114	0	0	0	0	0	3259	0
Satd. Flow (RTOR)		58									11	
Lane Group Flow (vph)	0	404	0	0	152	0	0	0	0	0	1437	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		10.0		10.0	10.0					10.0	10.0	
Minimum Split (s)		25.5		25.5	25.5					31.3	31.3	
Total Split (s)		28.0		28.0	28.0					47.0	47.0	
Total Split (%)		35.0%		35.0%	35.0%					58.8%	58.8%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.2		2.2	2.2					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.3	
Lead/Lag										Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		21.1			21.1						48.1	
Actuated g/C Ratio		0.26			0.26						0.60	
v/c Ratio		0.90			0.52						0.73	
Control Delay		49.3			31.7						9.6	
Queue Delay		0.0			0.0						0.0	
Total Delay		49.3			31.7						9.6	
LOS		D			C						A	
Approach Delay		49.3			31.7						9.6	
Approach LOS		D			C						A	
Queue Length 50th (m)		52.7			20.2						85.1	
Queue Length 95th (m)		#103.4			38.7						113.2	
Internal Link Dist (m)		165.8			72.3			77.4			219.3	
Turn Bay Length (m)												
Base Capacity (vph)		474			313						1963	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.85			0.49						0.73	

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 13 (16%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

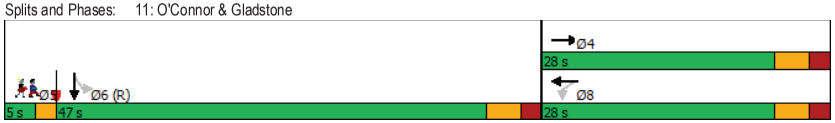
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 86.3%	ICU Level of Service E
Analysis Period (min) 15	

Description: Timing as per 2019-06-29 plans received from City of Ottawa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: O'Connor & Gladstone



Appendix K

MMLOS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	**CGH Transportation Inc.**	**Project**	**2019-31**
Scenario	**Existing/Future**	**Date**	**Feb. 6, 2020**
Comments	**Effective corner radius for trucks used for left-turn at: Kent/Gilmour, O'Connor/Gilmour**		

INTERSECTIONS		Kent & Somerset				Kent & Gilmour				Kent & Gladstone		
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST
Pedestrian	Lanes	3	4	4	3	3	3	0 - 2	0 - 2	3	4	4
	Median	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m
	Conflicting Left Turns	Permissive	No left turn / Prohib.	No left turn / Prohib.	Permissive	Permissive	No left turn / Prohib.	No left turn / Prohib.	No left turn / Prohib.	Permissive	No left turn / Prohib.	No left turn / Prohib.
	Conflicting Right Turns	Permissive or yield control	No right turn	Permissive or yield control	No right turn	No right turn	Permissive or yield control	No right turn	No right turn	Permissive or yield control	No right turn	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No	No	No
	Right Turn Channel	No Right Turn	No Channel	No Channel	No Right Turn	No Right Turn	No Channel	No Right Turn	No Right Turn	No Right Turn	No Channel	No Channel
	Corner Radius	No Right Turn	3-5m	3-5m	No Right Turn	No Right Turn	5-10m	No Right Turn	No Right Turn	No Right Turn	3-5m	3-5m
	Crosswalk Type	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings	Std transverse markings	Textured/coloured pavement
	PETSI Score	**83**	**68**	**68**	**91**	**88**	**79**	**114**	**114**	**83**	**68**	**68**
	Ped. Exposure to Traffic LoS	**B**	**C**	**C**	**A**	**B**	**B**	**A**	**A**	**B**	**C**	**C**
	Cycle Length											
	Effective Walk Time											
	Average Pedestrian Delay											
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	**B**	**C**	**C**	**A**	**B**	**B**	**A**	**A**	**B**	**C**	**C**
		C				**B**				**C**		
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST
Bicycle	Bicycle Lane Arrangement on Approach		Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic				Mixed Traffic	Mixed Traffic
	Right Turn Lane Configuration		≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m				≤ 50 m	≤ 50 m
	Right Turning Speed		≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				≤ 25 km/h	≤ 25 km/h
	Cyclist relative to RT motorists	-	D	D	D	-	D	-	-	-	D	D
	Separated or Mixed Traffic	-	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	-	**Mixed Traffic**	-	-	-	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach		≥ 2 lanes crossed		No lane crossed				No lane crossed		≥ 2 lanes crossed	
	Operating Speed		> 40 to ≤ 50 km/h		> 40 to ≤ 50 km/h				≤ 40 km/h		> 40 to ≤ 50 km/h	
	Left Turning Cyclist	-	E	-	B	-	-	-	B	-	E	-
	Level of Service	-	E	-	D	-	-	-	-	-	E	-
		E				**-**				**#N/A**		
Transit	Average Signal Delay			≤ 40 sec	≤ 40 sec							≤ 40 sec
	Level of Service	-	-	E	E	-	-	-	-	-	-	E
		E				**-**				**E**		
Truck	Effective Corner Radius		< 10 m	< 10 m			< 10 m		< 10 m		< 10 m	< 10 m
	Number of Receiving Lanes on Departure from Intersection		1	≥ 2			1		≥ 2		≥ 2	≥ 2
	Level of Service	-	F	D	-	-	F	-	D	-	D	D
		F				**F**				**D**		
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60				0.61 - 0.70		
	Level of Service	**A**				**A**				**B**		

	Bank & Somerset				Bank & MacLaren				Bank & Gilmour				Bank & G	
WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH
4	4	0 - 2	3	3	3	3	0 - 2	0 - 2	3	3	0 - 2	0 - 2	4	4
No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
Permissive	Permissive	Permissive	No left turn / Prohib.	No left turn / Prohib.	Permissive	Permissive	Permissive	Permissive	Permissive	No left turn / Prohib.	Permissive	No left turn / Prohib.	Permissive	Permissive
No right turn	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control	No right turn	No right turn	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control	Permissive or yield control
RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed
No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
No Right Turn	No Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel	No Right Turn	No Right Turn	No Channel	No Right Turn	No Channel	No Channel	No Channel
No Right Turn	10-15m	5-10m	3-5m	5-10m	5-10m	No Right Turn	5-10m	No Right Turn	No Right Turn	5-10m	No Right Turn	5-10m	3-5m	3-5m
Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings	Std transverse markings
74	**56**	**90**	**82**	**82**	**71**	**88**	**89**	**106**	**88**	**79**	**101**	**102**	**55**	**55**
C	**D**	**A**	**B**	**B**	**C**	**B**	**B**	**A**	**B**	**B**	**A**	**A**	**D**	**D**
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
C	**D**	**A**	**B**	**B**	**C**	**B**	**B**	**A**	**B**	**B**	**A**	**A**	**D**	**D**
	D				**C**				**B**					**D**
WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH
Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic
	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m		≤ 50 m	≤ 50 m		≤ 50 m	≤ 50 m	≤ 50 m
	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h	≤ 25 km/h		≤ 25 km/h	≤ 25 km/h	≤ 25 km/h
#N/A	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**-**	**D**	**D**	**-**	**D**	**D**	**D**
Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**-**	**Mixed Traffic**	**Mixed Traffic**	**-**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
No lane crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed	No lane crossed		No lane crossed			No lane crossed	No lane crossed	No lane crossed
> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h		> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h		> 40 to ≤ 50 km/h			> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h
B	**B**	**B**	**B**	**B**	**-**	**B**	**B**	**-**	**B**	**-**	**-**	**B**	**B**	**B**
#N/A	**D**	**D**	**D**	**D**	**-**	**D**	**D**	**-**	**D**	**-**	**-**	**D**	**D**	**D**
	D				**D**				**D**					**D**
≤ 40 sec	≤ 20 sec	≤ 20 sec	≤ 30 sec	≤ 30 sec	≤ 20 sec	≤ 10 sec			≤ 10 sec	≤ 10 sec			≤ 20 sec	≤ 20 sec
E	**C**	**C**	**D**	**D**	**C**	**B**	**-**	**-**	**B**	**B**	**-**	**-**	**C**	**C**
	D				**C**				**B**					**F**
	10 - 15 m	< 10 m	< 10 m	< 10 m	< 10 m		< 10 m			< 10 m		< 10 m	< 10 m	< 10 m
	≥ 2	1	1	1	≥ 2		1			≥ 2			1	≥ 2
-	**B**	**F**	**F**	**F**	**D**	**-**	**F**	**-**	**-**	**D**	**-**	**-**	**F**	**D**
	F				**F**				**D**					**F**
	0.61 - 0.70				0.0 - 0.60				0.0 - 0.60				0.61 -	
	B				**A**				**A**					**B**

ladstone		O'Connor & Somerset				O'Connor & Gilmour				O'Connor & Gladstone			
EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
3	4	3	4	3	0 - 2	4	4	0 - 2	0 - 2	4	4	0 - 2	3
No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
Permissive	Permissive	No left turn / Prohib.	Protected	Permissive	No left turn / Prohib.	No left turn / Prohib.	No left turn / Prohib.	Permissive	No left turn / Prohib.	No left turn / Prohib.	Protected/ Permissive	Permissive	No left turn / Prohib.
Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Permissive or yield control	No right turn	No right turn	No right turn	Permissive or yield control	No right turn	Permissive or yield control
RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed
No	No	No	No	No	No	No	No	No	No	No	No	No	No
No Channel	No Channel	No Channel	No Right Turn	No Right Turn	No Channel	No Right Turn	No Right Turn	No Right Turn	No Channel	No Channel	No Right Turn	No Right Turn	No Channel
3-5m	3-5m	5-10m	No Right Turn	No Right Turn	5-10m	No Right Turn	No Right Turn	No Right Turn	3-5m	5-10m	No Right Turn	No Right Turn	5-10m
Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement
72	**55**	**84**	**74**	**91**	**97**	**82**	**77**	**106**	**100**	**67**	**66**	**106**	**82**
C	**D**	**B**	**C**	**A**	**A**	**B**	**B**	**A**	**A**	**C**	**C**	**A**	**B**
-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	**D**	**B**	**C**	**A**	**A**	**B**	**B**	**A**	**A**	**C**	**C**	**A**	**B**
)		**C**				**B**				**C**			
EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP		Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic
≤ 50 m	≤ 50 m			≤ 50 m	≤ 50 m				≤ 50 m			≤ 50 m	≤ 50 m
≤ 25 km/h	≤ 25 km/h			≤ 25 km/h	≤ 25 km/h				≤ 25 km/h			≤ 25 km/h	≤ 25 km/h
D	**D**	**Not Applicable**	**Not Applicable**	**D**	**D**	**Not Applicable**	**Not Applicable**	**-**	**D**	**Not Applicable**	**Not Applicable**	**D**	**D**
Mixed Traffic	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**-**	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**
No lane crossed	No lane crossed	2-stage, LT box	2-stage, LT box	No lane crossed	No lane crossed	No lane crossed	No lane crossed		No lane crossed	2-stage, LT box	No lane crossed	No lane crossed	No lane crossed
> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h		> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h
B	**B**	**A**	**A**	**B**	**B**	**B**	**B**	**-**	**B**	**A**	**B**	**B**	**B**
D	**D**	**A**	**A**	**D**	**D**	**B**	**B**	**-**	**D**	**A**	**B**	**D**	**D**
)		**D**				**D**				**D**			
> 40 sec	≤ 30 sec											≤ 40 sec	> 40 sec
F	**D**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**E**	**F**
F		**-**				**-**				**F**			
< 10 m	< 10 m	< 10 m			< 10 m	< 10 m			< 10 m	< 10 m			< 10 m
≥ 2	≥ 2	1			≥ 2	≥ 2			≥ 2	1			≥ 2
D	**D**	**F**	**-**	**-**	**D**	**D**	**-**	**-**	**D**	**F**	**-**	**-**	**D**
F		**F**				**D**				**F**			
- 0.70		0.61 - 0.70				0.0 - 0.60				0.61 - 0.70			
B		**B**				**A**				**B**			

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc.**	**Project**	**2019-31**
Scenario	**Existing/Future**	**Date**	**Feb. 6, 2020**
Comments			

SEGMENTS		**Street A**	Bank St 1	James St 2	Section 3	Section 4
Pedestrian	Sidewalk Width Boulevard Width	**E**	≥ 2 m 0.5 - 2 m	1.5 m < 0.5 m		
	Avg Daily Curb Lane Traffic Volume		> 3000	≤ 3000		
	Operating Speed On-Street Parking		> 30 to 50 km/h yes	> 30 to 50 km/h yes		
	Exposure to Traffic PLoS		**B**	**E**	**-**	**-**
	Effective Sidewalk Width		2.0 m	1.2 m		
	Pedestrian Volume		500 ped /hr	250 ped/hr		
	Crowding PLoS		**B**	**B**	**-**	**-**
	Level of Service		**B**	**E**	**-**	**-**
Bicycle	Type of Cycling Facility	**D**	Mixed Traffic	Mixed Traffic		
	Number of Travel Lanes		2-3 lanes total	≤ 2 (no centreline)		
	Operating Speed		>40 to <50 km/h	>40 to <50 km/h		
	# of Lanes & Operating Speed LoS		**D**	**B**	**-**	**-**
	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	≥ 1.8 m refuge		
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes		
	Sidestreet Operating Speed		>40 to 50 km/h	>40 to 50 km/h		
	Unsignalized Crossing - Lowest LoS		**B**	**B**	**-**	**-**
	Level of Service		**D**	**B**	**-**	**-**
Transit	Facility Type	**D**	Mixed Traffic			
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8			
	Level of Service		**D**	**-**	**-**	**-**
Truck	Truck Lane Width	**B**	> 3.7 m	> 3.7 m		
	Travel Lanes per Direction		1	1		
	Level of Service		**B**	**B**	**-**	**-**
Auto	**Level of Service**	**Not Applicable**				