August 26th, 2024 **JDE** Project 21192

2226553 Ontario Inc.
8485 Montrose Road
Niagara Falls, ON L2H 3L7

RE: Traffic Impact Study Addendum
700 Paris Street, City of Sudbury

This letter was prepared by **JD Northcote Engineering Inc.** [JD Engineering] for the account of **2226553 Ontario Inc.** [The Client].

1.0 BACKGROUND

The subject site is municipally known as 700 Paris Street, located on the east side of Paris Street between Boland Avenue and Facer Street, in the City of Greater Sudbury [City]. The proposed development includes a 16-storey building with 198 residential units, a 20-storey building with 250 residential units and a ground-floor restaurant (500 sq.m. of GFA) and a 10-storey retirement home with 100 rooms.

JD Engineering prepared a traffic impact study for the proposed development (dated December 2022) [TIS]. Subsequently, the City has provided comments related to their review of the TIS [City Comments], which are included in the **Appendix.**

This letter is intended as an update the TIS to review the impact on the revised driveway layout and address the City Comments.

The following intersections will be analysed as part of the TIS Addendum:

- Paris Street / Brady Street;
- Paris Street / John Street;
- Paris Street / McNaughton Street;
- Paris Street / Facer Street;
- Paris Steet / Boland Ave & Paris Driveway; and
- Facer Street / Bell Park Road.

2.0 SITE PLAN

A revised Site Plan is provided the **Appendix**. The development statistics in the revised Site Plan have not changed; however, the driveway layout has been revised. Access to the development is proposed via full-movement connection to Paris Street, opposite Boland Avenue [Paris Driveway]. The Paris Driveway will provide ingress and egress access to the underground parking and surface parking.

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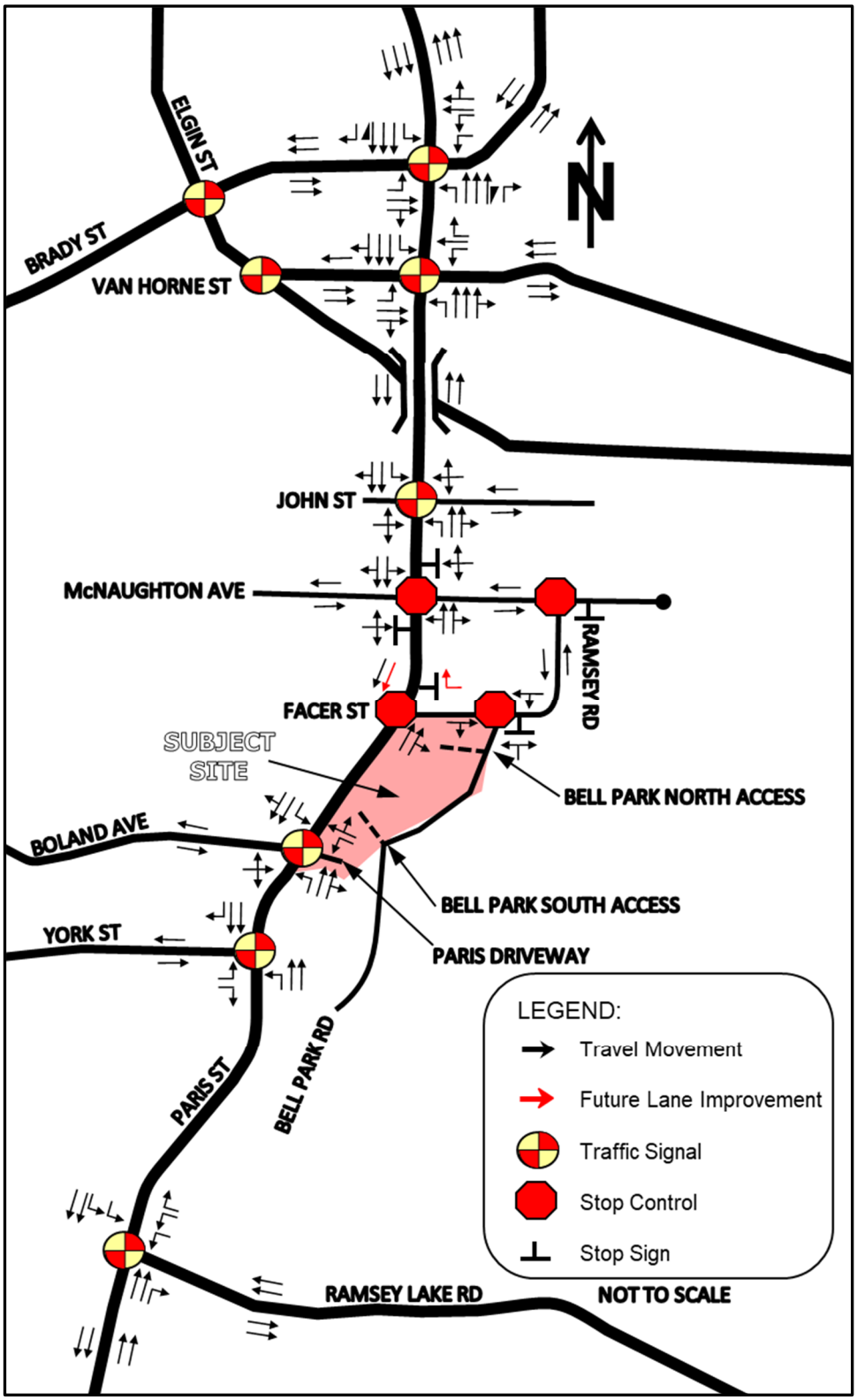
The proposed development will include a full-movement access driveway onto Bell Park Road [Bell Park North Access]. The Bell Park North Access will provide ingress and egress access to surface parking only. A secondary full-movement access driveway onto Bell Park Road [Bell Park South Access] will be limited to service vehicles only.

As part of the proposed development, Facer Street will be converted from an unsignalized full-movement intersection at Paris Street into a unsignalized right-in right-out [RIRO] intersection, for westbound movements.

The future intersection lane configuration within the study area is illustrated in **Figure 1**.

Figure 1 – Future Lane Configuration within Study Area



3.0 BACKGROUND (2032) TRAFFIC VOLUMES - PARIS STREET / FACER STREET

As noted in Section 2, as part of the proposed development, Facer Street will be converted from an unsignalized full-movement intersection at Paris Street into a unsignalized RIRO intersection. For the background (2032) scenario, the unsignalized full-movement configuration at Paris Street / Facer Street has been maintained in our analysis. The resulting background (2032) horizon year traffic volumes for the AM and PM peak hour is illustrated in **Figure 2**.

4.0 PROPOSED DEVELOPMENT

The trip generation and distribution for the proposed development was obtained from Table 8 and 9 in the TIS (excerpts provided in the **Appendix**). The traffic assignment was updated based on the driveway configuration noted in Section 2 and the RIRO restriction at the Paris Street / Facer Street intersection.

Figures 3 to **5** illustrates the traffic assignment for the residential and restaurant (primary and pass-by trips) components for the proposed development, during the AM and PM peak hour.

5.0 TOTAL HORIZON YEAR TRAFFIC VOLUMES WITH THE PROPOSED DEVELOPMENT

As noted in Section 2, as part of the proposed development, Facer Street will be converted from an unsignalized full-movement intersection at Paris Street into a unsignalized RIRO intersection. The traffic movements at the Paris Street / Facer Street intersection in the background (2032) traffic volumes were adjusted in the analysis to reflect this revised traffic restriction. The existing southbound left and westbound left movements at the Paris Street / Facer Street intersection have been redistributed to the Paris Street / McNaughton Street intersection. **Figure 6** illustrates the redistributed traffic for the background (2032) scenario.

For the total (2032) horizon year traffic volumes, the development traffic was added to the redistributed background (2032) traffic volumes and adjacent traffic volumes from the TIS (excerpts provided in the **Appendix**). The resulting total (2032) horizon year traffic volumes for the AM and PM peak hour is illustrated in **Figure 7**.

Figure 2 – Background (2032) Traffic Volumes

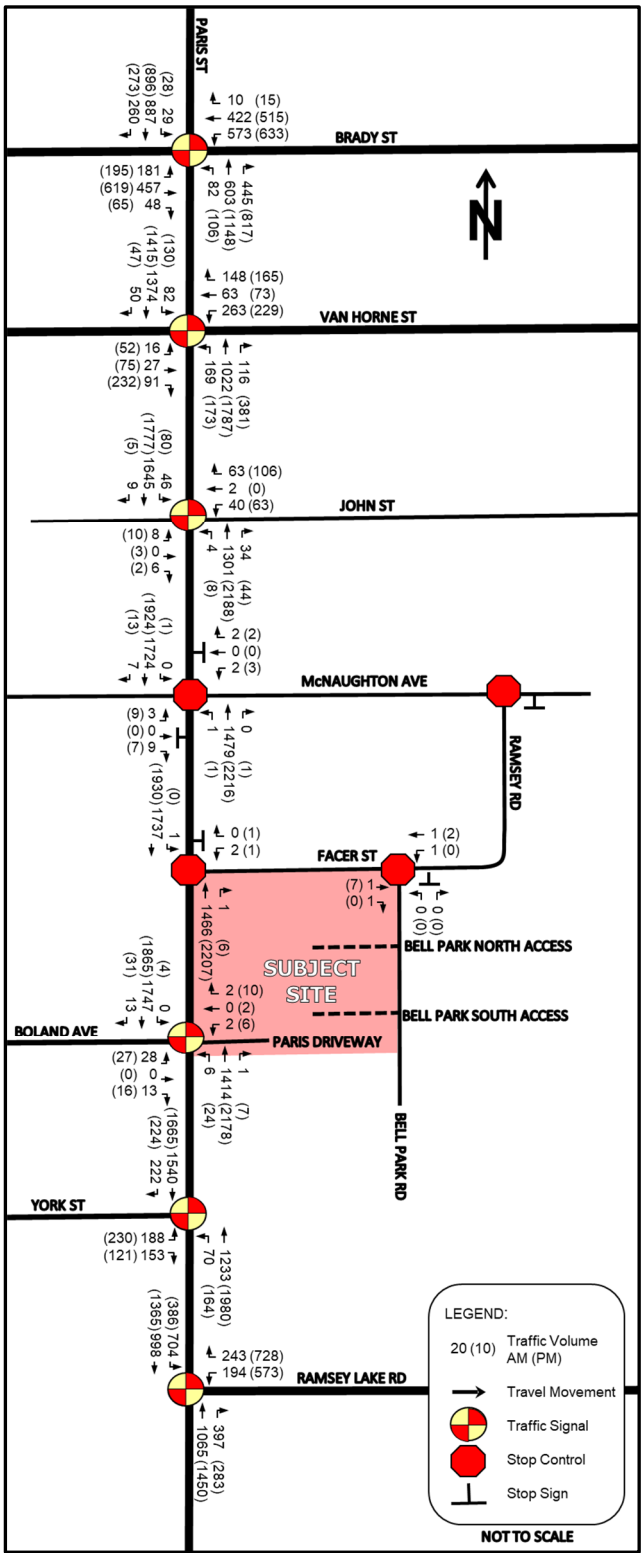


Figure 3 – Proposed Development Traffic Assignment - Residential Trips

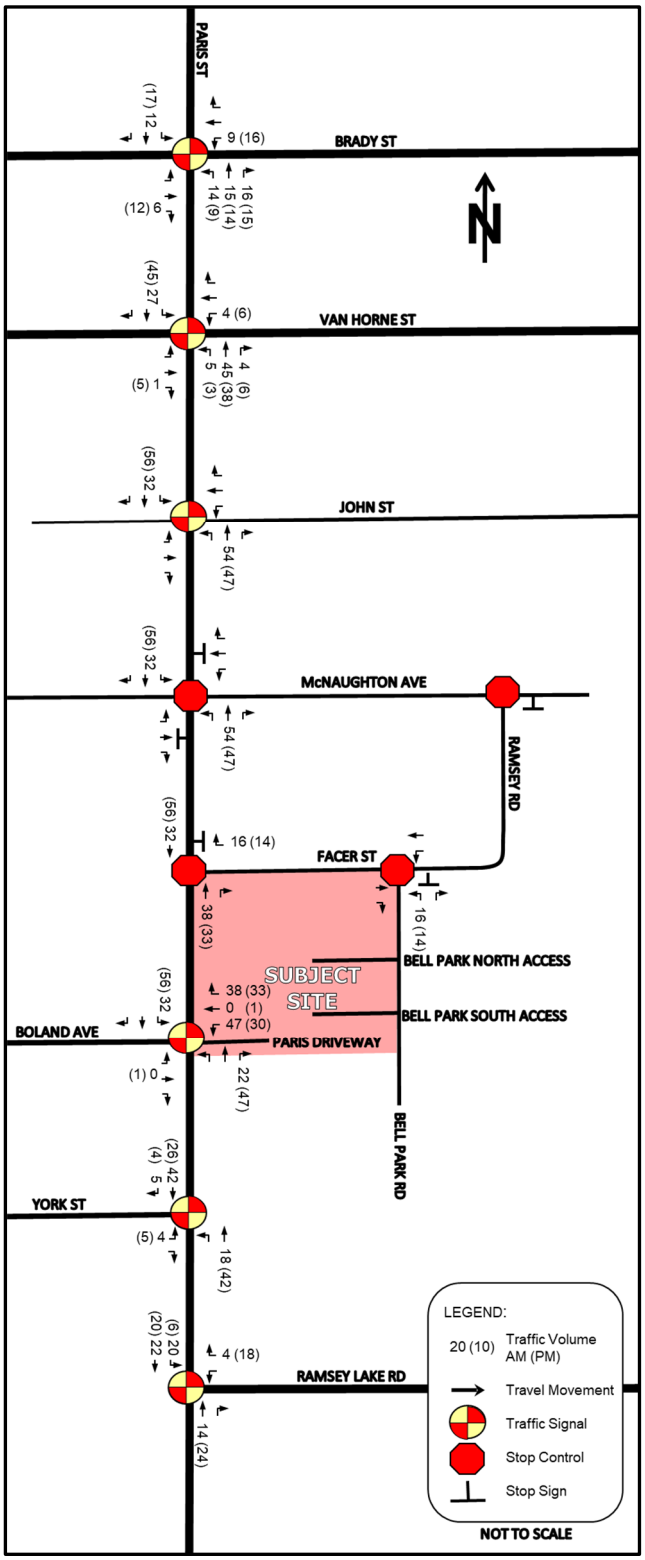


Figure 4 – Proposed Development Traffic Assignment - Restaurant Primary Trips

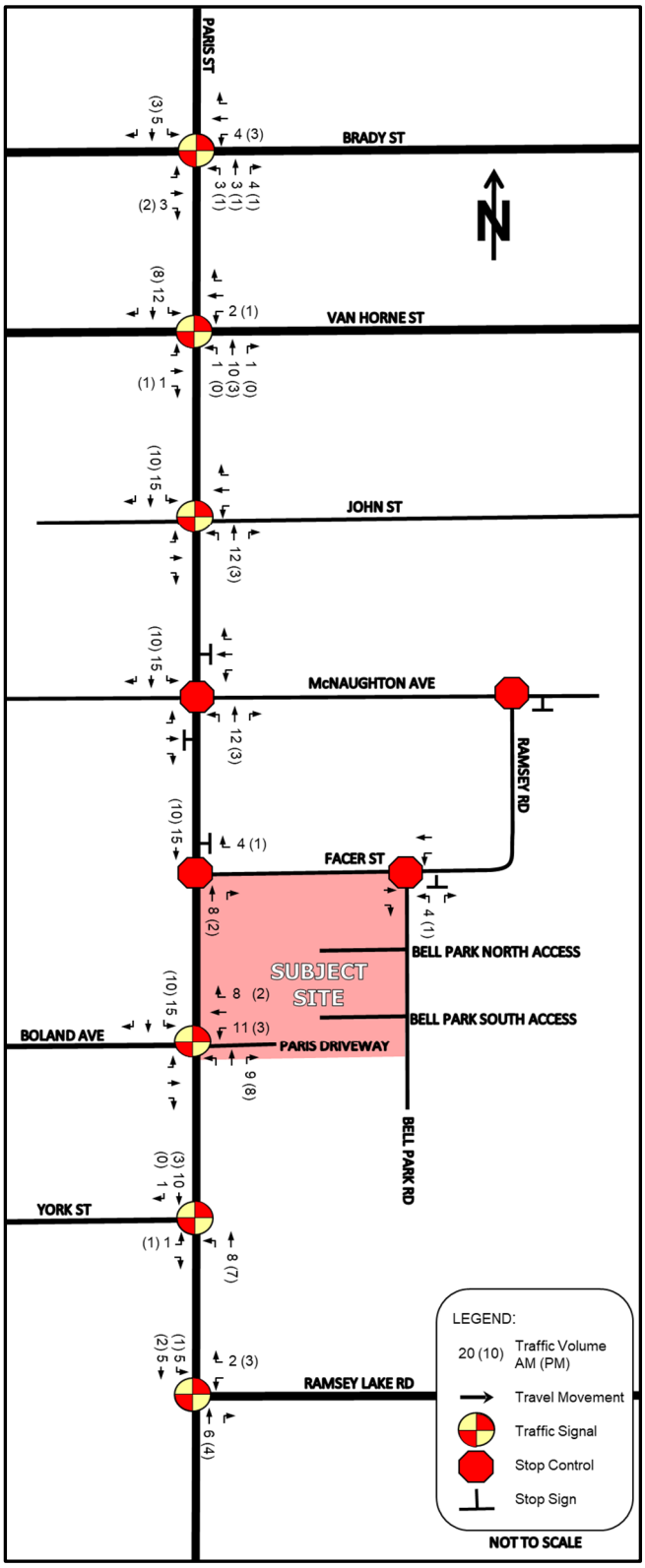


Figure 5 – Proposed Development Traffic Assignment - Restaurant Pass-by Trips

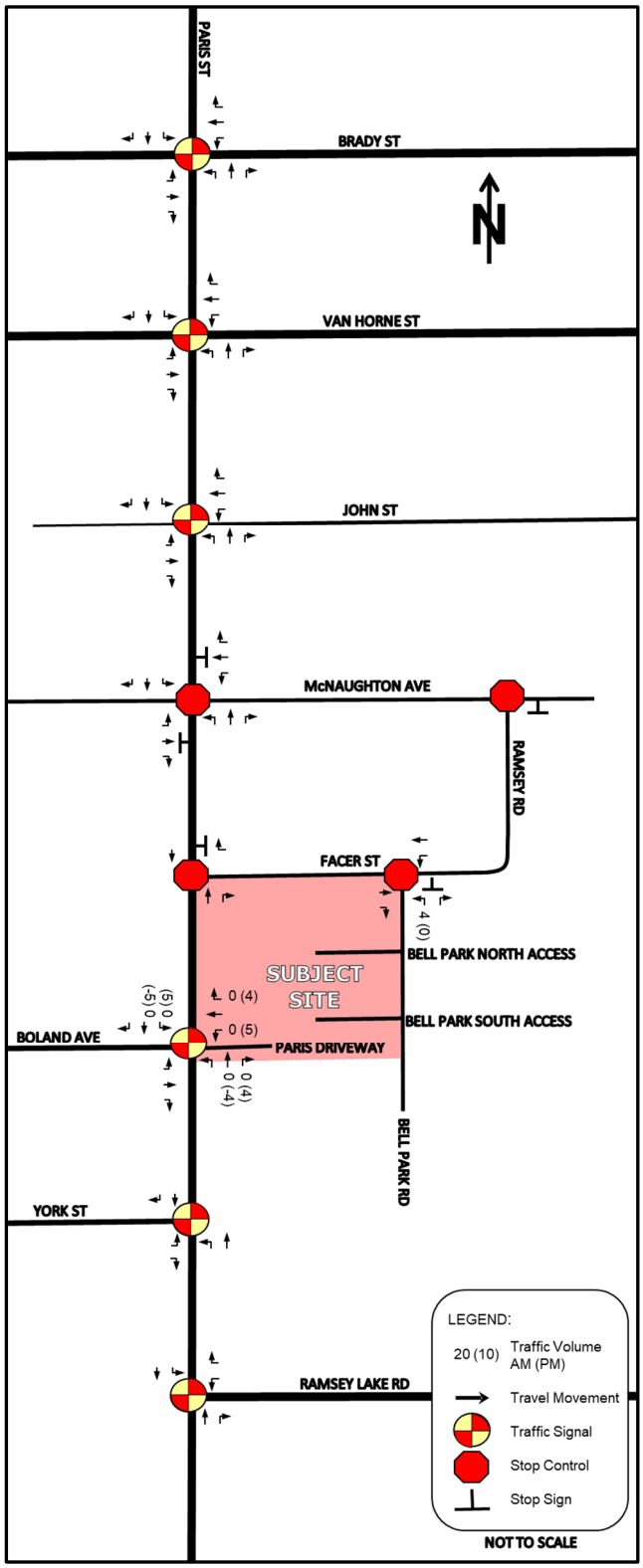


Figure 6 – Background (2032) Traffic Redistribution

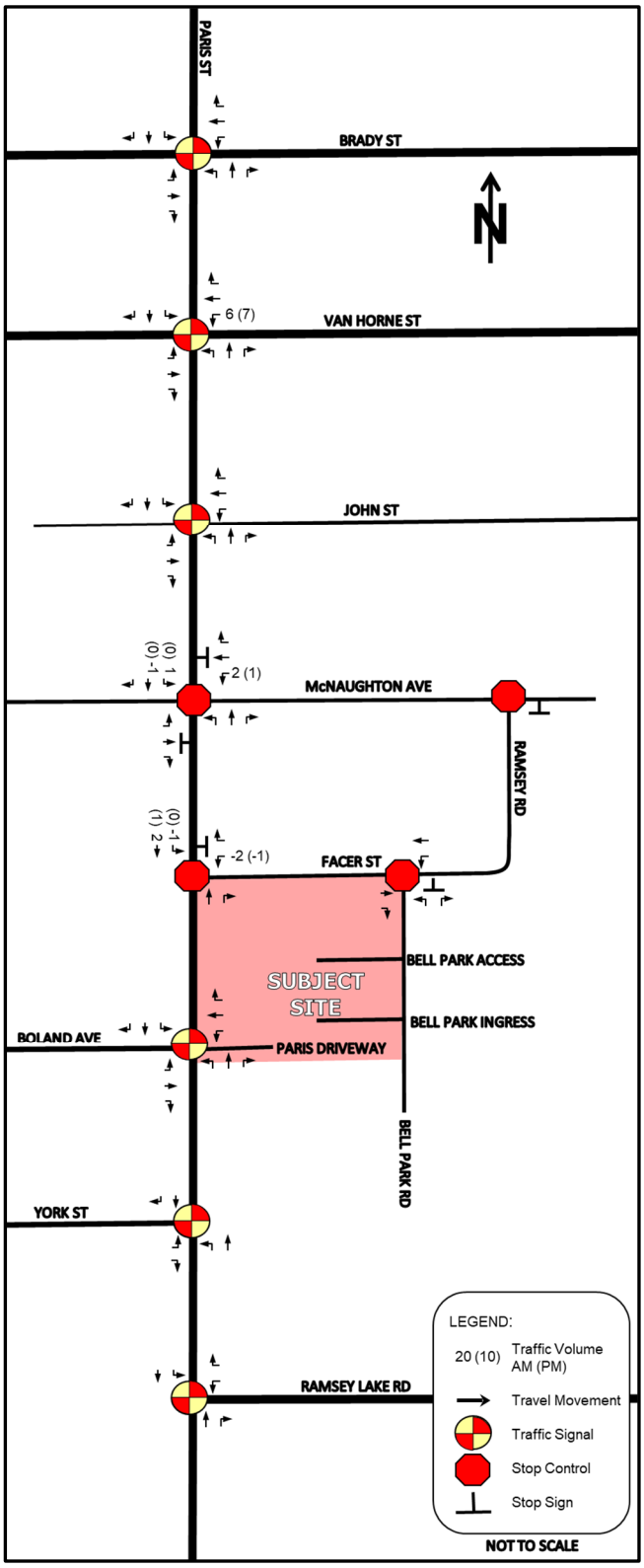
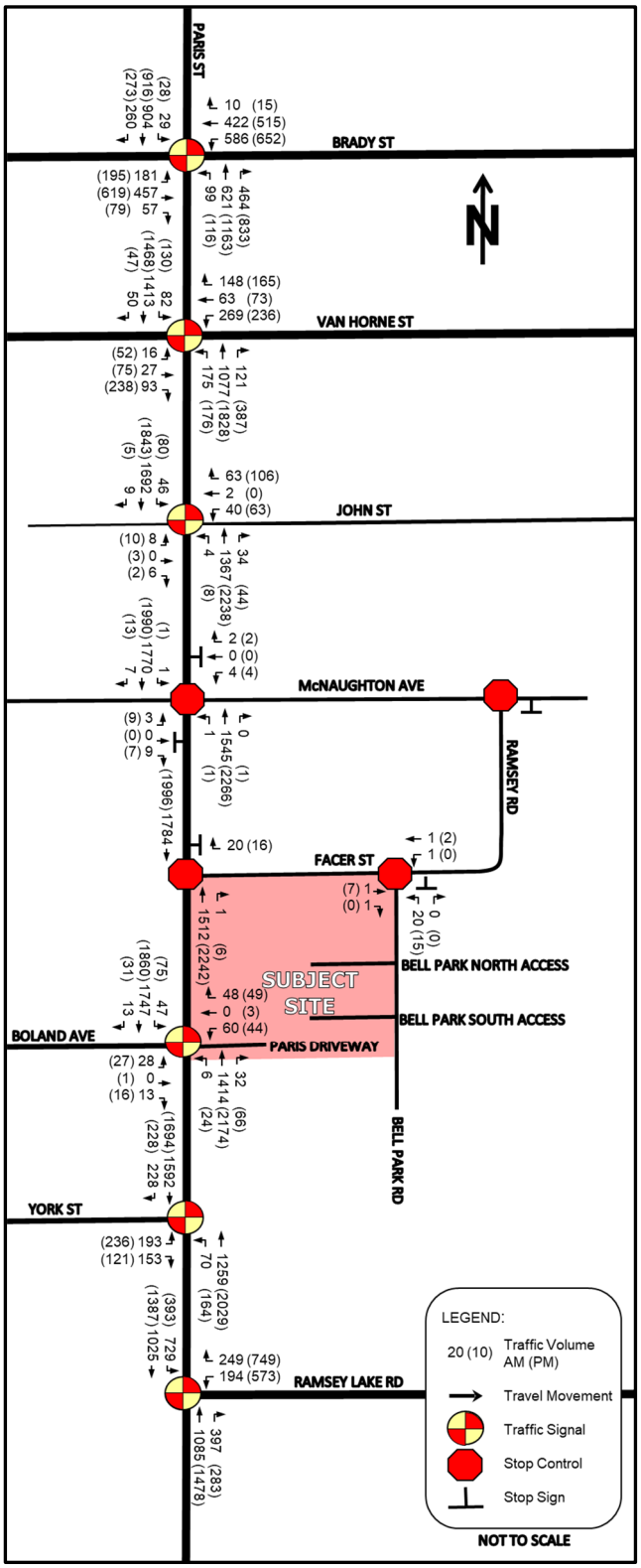


Figure 7 – Total (2032) Traffic Volumes



6.0 INTERSECTION OPERATION WITH PROPOSED DEVELOPMENT

6.1 INTERSECTION CAPACITY ANALYSIS CRITERIA

The same intersection methodology used in Section 3.1 of the TIS (excerpts provided in the **Appendix**), was applied to analyse the traffic at the study area intersections. The scope of intersection included in this TIS Addendum is based on addressing the comments from the City and the changes to the traffic volumes as detailed in Sections 3.0 – 5.0. The traffic volumes and recommendations for all other study area intersections in the TIS have not changed.

6.2 BACKGROUND (2032) INTERSECTION OPERATION

The results of the LOS analysis under background (2032) traffic volumes during the AM and PM peak hours can be found below in **Table 1**. The recommended improvements noted in Section 3.2, 3.3 and 3.4 in the TIS have been utilized for this scenario (excerpts provided in the **Appendix**). The recommendations in the TIS were as follows:

Existing (2022)

- Paris Street / John Street
  - Optimize signal timing plan.

Background (2027)

- Paris Street / McNaughton Street, Paris Street / Boland Avenue & Paris Driveway and Paris Street / York Street
  - Optimize signal timing plan.

Background (2032)

- Paris Street / Brady Street
  - Adjust eastbound pavement markings to accommodate a double left-turn lane.
  - Adjust eastbound signal heads to accommodate a protected eastbound left turn phase.
  - Optimize signal timing plan.

The signal timing optimization at the intersections of Paris Street / Brady Street and Paris Street / John Street were adjusted in this TIS Addendum. Detailed output of the Synchro analysis can be found in the **Appendix**.

Table 1 – Background (2032) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Model	Storage				Model	Storage
Paris Street / Brady Street (signalized)	0.73	33.1	C	-	-	0.85	34.9	C	-	-
EBL	0.53	46.4	D	38	57	0.57	53.1	D	41	57
EBTR	0.78	46.3	D	93	-	0.81	49.4	D	119	-
WBL	0.79	43.9	D	101	85	0.79	48.7	D	111	85
WBTR	0.41	28.4	C	68	-	0.42	29.7	C	78	-
NBL	0.44	24.2	C	25	70	0.45	27.3	C	33	70
NBT	0.42	28.4	C	61	-	0.58	29.7	C	109	-
NBR	0.41	11.3	B	57	-	0.73	15.5	B	193	-
SBL	0.13	26.0	C	11	24	0.25	36.8	D	17	75
SBT	0.71	36.8	D	99	-	0.68	41.8	D	103	-
SBR	0.31	19.3	B	49	-	0.33	23.8	C	59	-
Paris Street / John Street (signalized)	0.69	8.6	A	-	-	0.89	17.5	B	-	-
EB	0.01	24.5	C	0	-	0.07	42.8	D	9	-
WB	0.30	26.3	C	21	-	0.65	53.5	D	50	-
NBL	0.03	5.6	A	2	33	0.06	5.6	A	3	33
NBTR	0.68	9.9	A	102	-	0.94	22.3	C	361	-
SBL	0.20	5.6	A	5	23	0.65	39.0	D	26	23
SBTR	0.70	6.3	A	93	-	0.68	6.9	A	150	-
Paris Street / McNaughton Street (unsignalized)	-	0.1	A	-	-	-	0.2	A	-	-
EB	0.06	22.2	C	2	-	0.04	13.3	B	1	-
WB	0.03	29.2	D	1	-	0.02	21.0	C	1	-
Paris Street / Facer Street (unsignalized)	-	0.1	A	-	-	-	0.0	A	-	-
WB	0.01	31.0	D	1	-	0.01	17.6	C	1	-
NB	0.64	0.0	A	0	-	0.91	0.0	A	0	-
Bell Park Road / Facer Street (unsignalized)	-	1.8	A	-	-	-	0.0	A	-	-
WB	0.04	0.0	A	0	-	0.00	0.0	A	0	-
Paris Street / Boland Avenue & Paris Driveway (signalized)	0.65	4.9	A	-	-	0.79	7.2	A	-	-
EB	0.07	28.8	C	9	-	0.23	41.4	D	17	-
WBL	0.02	28.4	C	3	-	0.07	40.0	D	7	-
WBTR	0.00	28.3	C	0	-	0.02	39.6	D	7	-
NBL	0.05	2.3	A	2	40	0.25	3.6	A	6	40
NBTR	0.57	3.8	A	58	-	0.84	7.9	A	180	-
SBL	0.00	0.0	A	0	100	0.05	2.1	A	1	100
SBTR	0.70	5.2	A	202	-	0.73	5.4	A	121	-

Similar to the conclusions in the TIS, the LOS analysis indicate that the intersections of Paris Street / Brady Street and Paris Street / John Street operates outside the typical design limits noted in Section 3.1 in the PM peak hour; however, no improvements are recommended as the intersection is still operating within theoretical capacity (V/C < 1.0). The northbound and southbound movements in the PM peak hour exceeds the capacity for a two-lane roadway in each direction (1800 vph); it is recommended the City monitor the traffic volumes and queuing on Paris Street to determine if further improvements are warranted and prioritize TDM strategies and promote active transportation to reduce automobile traffic along Paris Street in the downtown area.

The results of the LOS analysis indicate that the northbound movement at the Paris Street / Facer Street intersection is operating outside the typical design limits as noted in Section 3.1; however, since there are no queuing issues and the V/C ratio only marginally exceeds the typical design limits, no improvements are recommended.

The anticipated queue for northbound and southbound movements at the intersections of Paris Street / John Street, Paris Street / Facer Street and Paris Street / McNaughton Street intersection will marginally extend past intersections along Paris Street. As noted above, northbound traffic volumes are approaching the capacity for a two-lane roadway; it is recommended the City monitor the queuing at the intersections and prioritize TDM strategies and promote active transportation to reduce automobile traffic along Paris Street in the downtown area.

The anticipated queue for all other highlighted auxiliary left turn movements exceed the existing storage, however, the excess queue can be accommodated by the taper length.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS. Based on the above noted criteria a left-turn lane is not warranted at the unsignalized intersections in the study area (results are provided in the **Appendix**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 Signal Justification, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in the **Appendix**).

No further improvements are recommended for the background (2032) scenario.

6.3 TOTAL (2032) INTERSECTION OPERATION

The results of the LOS analysis under total (2032) traffic volumes during the AM and PM peak hours can be found below in **Table 2**. The recommended improvements noted in Section 3.2, 3.3, 3.4 and 5.1 in the TIS have been utilized for this scenario (excerpts provided in the **Appendix**). The recommendations in the TIS were as follows:

Total (2027)

- Paris Street / Boland Avenue & Paris Driveway
  - Shift the Paris Driveway to align with Boland Avenue.
  - The westbound configuration of Paris Driveway at the intersection shall include a left turn lane and through-right lane.
- Facer Street
  - Construct a sidewalk on the south side of the road between Paris Street and Bell Park Road.
- Bell Park Road
  - Reconstruct Bell Park Road south of Facer Street to a 6.0 metre wide paved condominium road.
  - Bell Park Road shall have a posted speed limit of 20 km/h once Bell Park Road is reconstructed.

In addition to the improvements noted above, the following improvements are recommended prior to build-out of the proposed development:

Opening Day (2027)

- Paris Street / Facer Street
  - Convert the Facer Street approach from full-movement to a right-in / right-out [RIRO].
- Paris Street / Boland Avenue & Paris Driveway
  - Adjust southbound signal heads to accommodate a southbound left turn protected + permissive phase.
  - Optimize signal timing plan.

Detailed output of the Synchro analysis can be found in the **Appendix**.

Table 2 – Total (2032) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Model	Storage				Model	Storage
Paris Street / Brady Street (signalized)	0.75	35.4	D	-	-	0.86	35.9	D	-	-
EBL	0.56	50.2	D	38	57	0.58	54.3	D	41	57
EBTR	0.83	52.7	D	100	-	0.83	51.1	D	122	-
WBL	0.82	49.0	D	105	85	0.80	53.9	D	115	85
WBTR	0.43	30.8	C	69	-	0.42	29.7	C	78	-
NBL	0.45	23.8	C	29	70	0.50	28.4	C	36	70
NBT	0.40	28.6	C	63	-	0.59	30.4	C	111	-
NBR	0.43	11.2	B	61	-	0.75	16.2	B	201	-
SBL	0.13	27.3	C	11	24	0.26	37.8	D	17	75
SBT	0.72	38.7	D	102	-	0.70	43.2	D	106	-
SBR	0.31	20.9	C	50	-	0.33	24.6	C	60	-
Paris Street / John Street (signalized)	0.71	8.7	A	-	-	0.91	19.1	B	-	-
EB	0.01	25.2	C	0	-	0.07	42.8	D	19	-
WB	0.31	27.2	C	21	-	0.65	53.5	D	50	-
NBL	0.03	5.4	A	2	33	0.07	5.7	A	3	33
NBTR	0.70	10.1	B	111	-	0.96	25.2	C	375	-
SBL	0.22	6.0	A	5	23	0.65	40.9	D	26	23
SBTR	0.71	6.3	A	99	-	0.70	7.4	A	162	-
Paris Street / McNaughton Street (unsignalized)	-	0.4	A	-	-	-	0.2	A	-	-
EB	0.03	13.9	B	1	-	0.04	14.5	B	1	-
WB	0.02	17.6	C	1	-	0.03	22.3	C	1	-
Paris Street / Facer Street (unsignalized)	-	0.1	A	-	-	-	0.1	A	-	-
WBR	0.03	10.1	B	1	-	0.05	17.2	C	2	-
NB	0.66	0.0	A	0	-	0.93	0.0	A	0	-
Bell Park Road / Facer Street (unsignalized)	-	7.6	A	-	-	-	5.4	A	-	-
NB	0.04	8.7	A	1	-	0.02	8.6	A	1	-
Paris Street / Boland Avenue & Paris Driveway (signalized)	0.75	9.3	A	-	-	0.88	13.4	B	-	-
EB	0.03	27.0	C	3	-	0.33	50.7	D	19	-
WBL	0.41	29.8	C	22	-	0.39	50.9	D	23	-
WBTR	0.03	26.9	C	0	-	0.06	47.9	D	13	-
NBL	0.05	5.4	A	3	40	0.23	5.3	A	8	40
NBTR	0.71	10.0	B	114	-	0.92	17.4	B	351	-
SBL	0.25	6.7	A	5	100	0.62	36.3	C	21	100
SBTR	0.74	7.2	A	114	-	0.71	5.1	A	135	-

Similar to the conclusions in the TIS, the results of the LOS analysis indicate that the intersections of Paris Street / Brady Street, Paris Street / John Street and Paris Street / Boland Avenue & Paris Driveway operates outside the typical design limits noted in Section 3.1 in the PM peak hour; however, no improvements are recommended as the intersection is still operating within the theoretical capacity (V/C < 1.0). The northbound and southbound movements in the PM peak hour exceeds the capacity for a two-lane roadway in each direction (1800 vph); it is recommended the City monitor the traffic volumes and queuing on Paris Street to determine if further improvements are warranted and prioritize TDM strategies and promote active transportation to reduce automobile traffic along Paris Street in the downtown area.

The results of the LOS analysis indicate that the northbound movement at the Paris Street / Facer Street intersection is operating outside the typical design limits as noted in Section 3.1; however, since there are no queuing issues and the V/C ratio only marginally exceeds the typical design limits, no improvements are recommended.

The anticipated queue for northbound and southbound movements at the intersections of Paris Street / John Street, Paris Street / Facer Street and Paris Street / McNaughton Street will marginally extend past intersections along Paris Street. As noted above, northbound traffic volumes are approaching the capacity for a two-lane roadway; it is recommended the City monitor the queuing at the intersections and prioritize TDM strategies and promote active transportation to reduce automobile traffic along Paris Street in the downtown area.

The anticipated queue for northbound movements at the Paris Street / Boland Avenue & Paris Driveway intersection will also extend past intersections along Paris Street in the PM peak hour. A SimTraffic queuing analysis was completed to assess the impact of the queuing. Based on our review, the northbound queue along with the queue for all other movements at the intersection, are anticipated to clear after each cycle and will not block any adjacent intersections. Consequently, no additional improvements are required. Signal timing coordination can be reviewed by the City in the future to minimize the impact of queuing on corridor capacity.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS. Based on the above noted criteria a left-turn lane is not warranted at the unsignalized intersections in the study area (results are provided in the **Appendix**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 Signal Justification, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in the **Appendix**).

No further improvements are recommended for the total (2032) scenario.

6.4 PARIS STREET / BOLAND AVENUE & PARIS DRIVEWAY

The proposed development will shift the location of the Paris Driveway slightly further north at the intersection to align with Boland Avenue. It is recommended the westbound lane configuration at the Paris Street / Boland Avenue & Paris Driveway intersection include a left turn lane and through-right lane, as noted in Section 5.1. A single ingress and egress lane at the Paris Driveway will provide the necessary capacity to service the proposed development. The Paris Driveway will provide ingress and egress access to the underground parking and surface parking.

As illustrated in Sections 6.2 and 6.3, there are no operational or queuing issues at the Paris Street / Boland Avenue & Paris Driveway intersection.

The addition of the proposed development traffic warrants the construction of a southbound left turn protected + permissive phase at the intersection. There are no queuing issues related to the ingress and egress traffic of the proposed development.

6.5 BELL PARK NORTH ACCESS & BELL PARK SOUTH ACCESS

The Bell Park North Access driveway will operate as a full-movement access driveway onto Bell Park Road. A single ingress and egress lane at the Bell Park North Access will provide the necessary capacity to service the proposed development. Bell Park North Access will provide ingress and egress access to the surface parking only.

The Bell Park South Access driveway will operate as a full-movement access driveway onto Bell Park Road. A single ingress and egress lane at the Bell Park South Access will provide the necessary capacity to service the proposed development. Bell Park South Access will have access to the underground parking and will be limited to service vehicles only.

7.0 SUPPLEMENTARY ANALYSIS – FORMER ST. JOSPEPH HEALTH CENTRE TRAFFIC REVIEW

As noted in the TIS, proposed development is located on the site which was formerly occupied by the St. Joseph Health Centre. The St. Joseph Health Centre has been closed since 2012. The following section provides a review of traffic generation for the full operation of the St. Joseph Health Centre building.

Traffic count data is not available from 2012 or earlier, during the full operation of the St. Joseph Health Centre. Consequently, the estimated traffic generation for the St. Joseph Health Centre has been based on the Institute of Transportation Engineers [ITE] Trip Generation Manual (11th Edition) [ITE Trip Generation Manual]. The following ITE land uses have been applied to estimate the traffic from the proposed development:

- ITE land use 610 (Hospital) – General Urban / Suburban Setting

The estimated trip generation of the St. Joseph Health Centre is illustrated below in **Table 3**. The traffic generation for the St. Joseph Health Centre is based on the typical daily traffic on a weekday. For comparative purposes the daily weekday traffic generated by the proposed development was also estimated in Table 3. Building statistics for the St. Joseph Health Centre are based on data provided by the City.

Table 3 – Estimated Traffic Generation of St. Joseph Health Centre

Land Use	Size	Daily Weekday Trips		
		IN	OUT	TOTAL
Hospital Traffic Generation				
Hospital ITE Land Use: 610	218,084 sq.ft.	2312	2312	4624
Proposed Development Traffic Generation				
Multi-Family Housing High-Rise ITE Land Use: 222	448 units	1031	1031	2062
Senior Adult Housing - Single-Family ITE Land Use: 251	100 units	297	297	594
High-Turnover (Sit-Down) Restaurant ITE Land Use: 932	500 sq.m. (5,382 sq.ft).	289	289	578
Proposed Development Traffic Generation*		**1617**	**1617**	**3234**
NET TRAFFIC GENERATION FOR HOSPITAL USE		**-695**	**-695**	**-1390**

* Internal capture and pass-by trip reduction was not applied to be conservative for the trips generated by the proposed development.

Consequently, the proposed development will generate approximately 1,390 fewer trips during a typical weekday compared with the full operation of the St. Joseph Health Centre.

8.0 CONCLUSION

This chapter summarizes the conclusions and recommendations from the study.

1) The following improvements are recommended in addition to the recommendations made in the TIS:

Existing (2022) Traffic Volumes

Paris Street / John Street

- Adjust signal optimization improvement from the TIS.

Background (2032) Traffic Volumes

Paris Street / Brady Street

- Adjust signal optimization improvement from the TIS.

Opening Day (2027) Traffic Volumes

Paris Street / Facer Street

- Convert the Facer Street approach from full-movement to a right-in / right-out.

Paris Street / Boland Avenue & Paris Driveway

- Adjust southbound signal heads to accommodate a southbound left turn protected + permissive phase.

2) All other recommendations from the TIS remain applicable.

3) The proposed development will shift the location of the Paris Driveway slightly further north at the intersection to align with Boland Avenue. It is recommended the westbound lane configuration at the Paris Street / Boland Avenue & Paris Driveway intersection include a left turn lane and through-right lane. A single ingress and egress lane at the Paris Driveway will

provide the necessary capacity to service the proposed development. The Paris Driveway will provide ingress and egress access to the underground parking and surface parking.

4) The Bell Park North Access will operate as a full-movement access driveway onto Bell Park Road The Bell Park North Access will provide ingress and egress access to surface parking only.

5) Bell Park South Access will operate as a full-movement access driveway onto Bell Park and will have access to the underground parking and will be limited to service vehicles only.

6) There are no additional revisions to the recommendations and conclusions presented in the TIS, as a result of the City's Comments.

We trust you will find this submission acceptable. Should you have any questions or concerns or require any additional information in this regard, please contact our office.

Yours truly,
JD Northcote Engineering Inc.

John Northcote, P.Eng.
President

Appendix

JD Engineering
705.725.4035
Admin@JDEngineering.ca

City Comments

Appendix 1

Departmental & Agency Comments

File: 701-6/23-04 & 751-6/23-25

RE: Application for Official Plan Amendment & Rezoning – 2226553 Ontario Inc.
PINs 73584-0652 & 73591-0047, Part 2, Plan 53R-3947, Part of Lot 5, Concessions 2 & 3, Township of McKim (700 Paris Street, Sudbury)

Development Engineering

A water and sewer capacity analysis was performed and municipal water and sewer are available within the road right of way and is able to facilitate the requested development.

There is a registered site plan control agreement dated October 7, 2014. This agreement will need to be amended to reflect the newly proposed development.

It is our understanding that there are upgrades to the transportation network as a result of this development. It is our opinion that a holding designation be placed on the zoning such that the required upgrades would need to be made at the time of development of the site plan by way of an offsite servicing agreement.

Based on the requested rezoning and amendment to the Official Plan, Development Engineering has no objection provided that development proceed by way of amendment to the site plan control agreement. This amendment will address, but not limited to, the upgrades required to the transportation network, site servicing, site grading, and stormwater management.

Infrastructure Capital Planning Services (ICPS):

Roads
Bell Park Road is currently a service road and not a publicly maintained roadway. Staff have no concerns with the proposed reconstruction of the road or the use of the road to service the proposed site. Staff however do not support this road becoming a publicly maintained road.

The owner should be aware that as part of the site plan an irregular piece of property will need to be transferred to the City along the frontage of Paris Street and Facer Street. The provided sketch appears to show this new right-of-way limit. As well, Facer Street will be required to be upgraded to an urban standard, on the south side, from Paris Street to Bell Park Road.

Transportation and Innovation Support
Staff has reviewed the provided Traffic Impact Study and has concerns with vehicles trying to access Facer Street or McNaughton Street via Paris Street as no left turn lane is provided on Paris Street. When the Hospital site was in operation both intersections had a high instance of collisions due to left turning vehicles. For this reason, the access to the site from Bell Park Road shall be limited to service vehicles only. All residents, visitors and patrons must access the parking garage from the intersection of Boland Avenue and Paris Street. In addition, Facer Street at Paris Street is required to be modified to permit right-in, right-out turning movements only.

It is noted that in the 2032 total traffic projections (with improvements) the following movements

are operating at LOS ‘E’. The City requires that any movement with LOS ‘E’ be addressed further.

- Paris Street @ Brady Street: EBL PM Peak (LOS ‘C’ in 2032 background)
- Paris Street @ John Street: WBT PM Peak (LOS ‘D’ in 2032 background)
- Paris Street @ Boland Avenue: SBL PM Peak (LOS ‘A’ in 2032 background)

In addition to the Paris Street at Boland Avenue intersection operating at LOS ‘E’ for the SBL movement, it is also noted that the projected 95th percentile queue exceeds the available storage capacity of the left turn lane. Staff are concerned this will result in motorists choosing to use Facer Street as an alternative access to the site, as well, the left turn queue will block through movements at the intersection. For these reasons the south bound left turn lane storage length must be extended to match the anticipated queue lengths.

Active Transportation
In addition to the information provided on the information display board that is recommended as part of the transportation demand management measures, the board shall also include information regarding the City’s ride share program “Smart Commute”.

This site is within the limits of the City’s Paris/Notre Dame Bikeway project. While it appears the bike way has been shown on the provided sketch of the site, the owner should be aware that the bike way design will need to be incorporated as part of the site plan.

Roads Operations
No concerns.

Drainage
No concerns.

Building Services

We have reviewed the application and documents for the requested Zoning By-law Amendment and have the following comment:

- A loading space meeting the dimensional requirements of 5.6.4. has not been provided for Building C.

Applicant to be advised of the following:

- At time of Building Permit review and Site Plan Agreement review, verification will be required for the construction of the Retirement Home in conformance with the Retirement Homes Act and the Zoning By-law.
- Further By-law requirements may need to be addressed upon submission of complete building plans.

Leisure Services

The City will be seeking cash-in-lieu for parkland dedication as permitted under the Planning Act.

Strategic and Environmental Planning

The applications listed in the subject line do not pose an elevated risk to species protected by the Endangered Species Act or to their habitat.

The proposed developments are anticipated to either have only minor negative effects on the overall natural environment or to have potential negative effects that are to be adequately mitigated as indicated on the relevant site plans and sketches. As such, specific environmental studies are not required beyond those that may have been requested previously.

Water/Wastewater - Source Water Protection

No activity or activities engaged in or proposed to be engaged in on the above noted property are considered to be significant drinking water threats at this time. You may undertake the activity or activities described in your application and proceed to apply for a Building Permit or Planning Approval as they are neither prohibited nor restricted for the purpose of Part IV of the Clean Water Act, 2006.

Conservation Sudbury (Nickel District Conservation Sudbury)

The subject property is located outside of any regulated hazards and Conservation Sudbury has no objection to the Official Plan Amendment and Zoning By-law Amendments as described in the circulation.

Greater Sudbury Transit

Transit do not have comments or concerns related to this application.

Allister Aresta

From: David Knutson <David.Knutson@greatersudbury.ca>
Sent: May 29, 2024 1:26 PM
To: Kevin Jarus
Cc: Wendy Kaufman
Subject: Re: 700 Paris - TIS revisions

Kevin,

As per our conversation this morning, we will be looking to have the main Paris Street southbound access to the surface lot to be via the Bolland Street intersection. Having the main access point to the surface lot for southbound Paris Street be via McNaughton Street will not be acceptable.

The LOS 'E' at both Brady and Bolland are acceptable, provided as you mentioned, the left turn queue at Bolland Street can fit within the provided storage lane for the left turn lane.

Should you require any other clarification or confirmation please let me know.

Best,

David Knutson, C.E.T.
Traffic and Transportation Engineering Analyst
Transportation and Innovation Services

P: (705) 674-4455 ext. 3634
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From: Kevin Jarus <kevin.jarus@tulloch.ca>
Sent: Friday, May 10, 2024 1:31 PM
To: David Knutson <David.Knutson@greatersudbury.ca>
Cc: Wendy Kaufman <Wendy.Kaufman@greatersudbury.ca>
Subject: FW: 700 Paris - TIS revisions

Sorry Dave, got your email wrong below.

Have a great weekend,
Kevin

Kevin Jarus, M.Pl., RPP
Planning Manager
Sr. Associate

Phone: 705-671-2295 ext 606
Mobile: 416-856-7935
Sudbury Office | www.TULLOCH.ca

From: Kevin Jarus <kevin.jarus@tulloch.ca>
Sent: Friday, May 10, 2024 1:30 PM
To: Wendy Kaufman <Wendy.Kaufman@greatersudbury.ca>; alex.singbush@greatersudbury.ca; robert.webb@greatersudbury.ca; Ryan Purdy <Ryan.Purdy@greatersudbury.ca>; dave.knutson@greatersudbury.ca
Cc: Vanessa Smith <vanessa.smith@tulloch.ca>; Kevin Jarus <kevin.jarus@tulloch.ca>
Subject: RE: 700 Paris - TIS revisions

Good afternoon all,

Thanks for the discussion this morning. As discussed, we can offer the following preliminary response and information further to the CGS TIS comments received.

1. Regarding the requirement that Facer St be made a right-in right-out, we are amenable to this.

2. Regarding access to the site from Bell Park Road being for service vehicles only, we propose that:
    - Public vehicle traffic utilizing Bell Park Road be limited to accessing the surface-level parking (all types of vehicles)
    - That access to the below-grade parking from Bell Park Road be limited to service vehicles (maintaining prior approval scenario)

    Given Facer St will be limited to right-in right-out, and given anyone egressing the site from the surface parking to go southbound would naturally use the Boland intersection, we feel these cumulative mitigation measures address Facer St access/conflict concerns. If this scenario is generally agreeable, we will provide updated TIS reflecting the right-in right-out reality.

3. Regarding Paris & Boland queue exceeding available storage capacity of SBL lane:
    - we will update the syncro analysis with true storage length and provide revised analysis.

4. With regard to 2032 traffic projects & intersection operational analysis:
    - Regarding Paris @ Brady 2032 EBL:
        - With signal improvements the 2032 controlled delay is 55.2 seconds (only 0.2 seconds beyond range deemed acceptable). However, it was concluded that the intersection would have a delay of 55.5 seconds (LOSS E) in 2034 even without our development, meaning the subject development brings this intersection to LOSS E only 2 years earlier than it would regardless.
    - Regarding Paris @ John 2032 WBT:
        - We note the delay is only 55.9 seconds in 2032 (9 seconds beyond LOSS E).
        - We will have our consultant review LOSS E results and revise/respond as discussed.
    - Regarding Paris @ Boland 2032 SBL:
        - As discussed, the TIS prioritized northbound through movements for the benefit of the 'greater city's transportation network.
        - We agree queue length appropriateness must be satisfied (further to comment #3 above), prior-to determining acceptance of SBL LOSS E for those entering the site southbound from Paris.

5. As discussed we will provide a high-level review of past traffic generation from when the Hospital was operational. This will include (if data is available) EMS trips and public trips (based on projections from bed count) on a 'total day' basis.

Prior to our preparing a formal response/TIS addendum, we look forward to your response regarding:

- Surface parking access from Bell Park Rd;
- Paris @ Brady 2032 EBL LOSS 'E';
- Paris @ Boland 2032 SBL LOSS 'E' (with assumption that appropriate SBL queue will be provided so as to avoid SBT conflicts).

If anyone requires any additional information or clarification before responding do not hesitate to ask. Once we receive your response we will provide a formal response through updated and/or addendum TIS.

Best,
Kevin

Site Plan

TIS Excerpts

JD Engineering
705.725.4035
Admin@JDEngineering.ca

700 Paris Street
City of Greater Sudbury

Traffic Impact Study for
2226553 Ontario Inc.

Type of Document:
Final Report

Project Number:
JDE – 21192

Date Submitted:
December 23rd, 2022

John Northcote, P.Eng.
Professional License #: 100124071

ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

Figure 3 – Manitou Residential Development Traffic Assignment

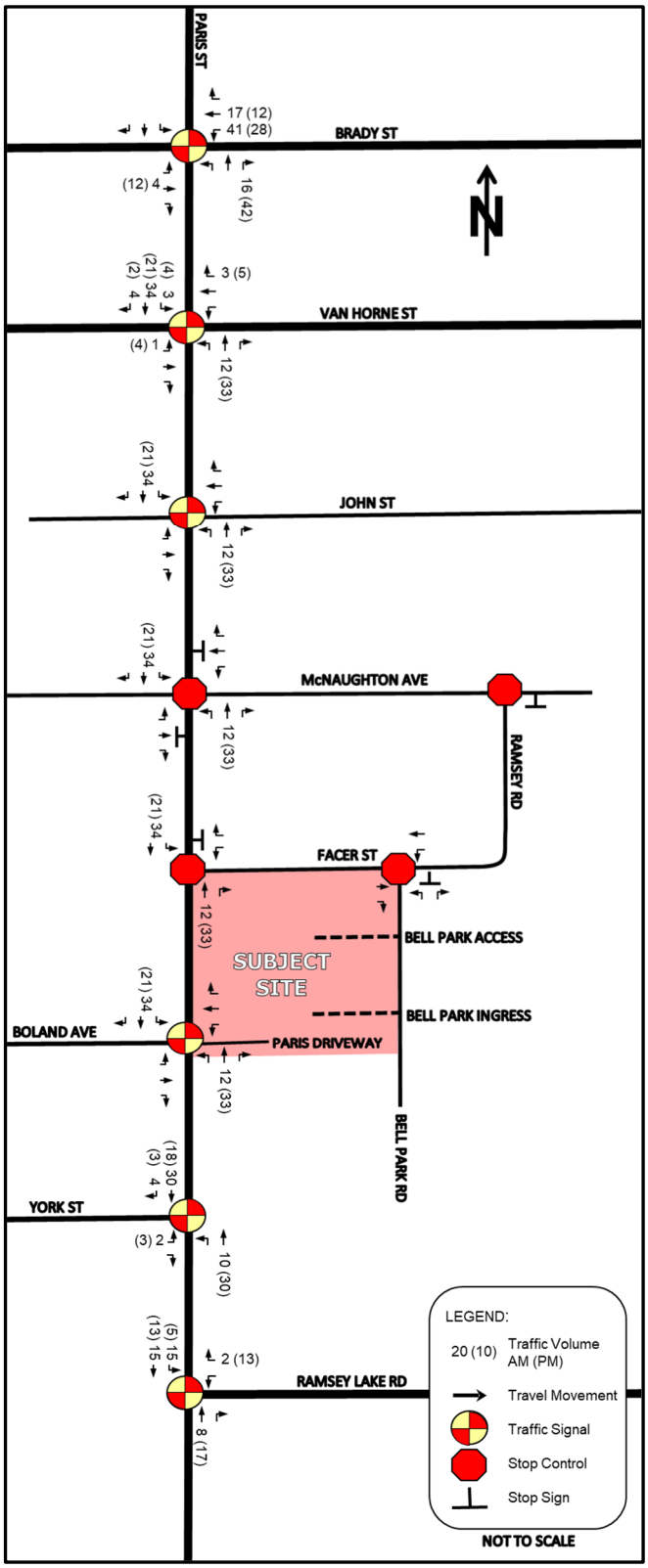
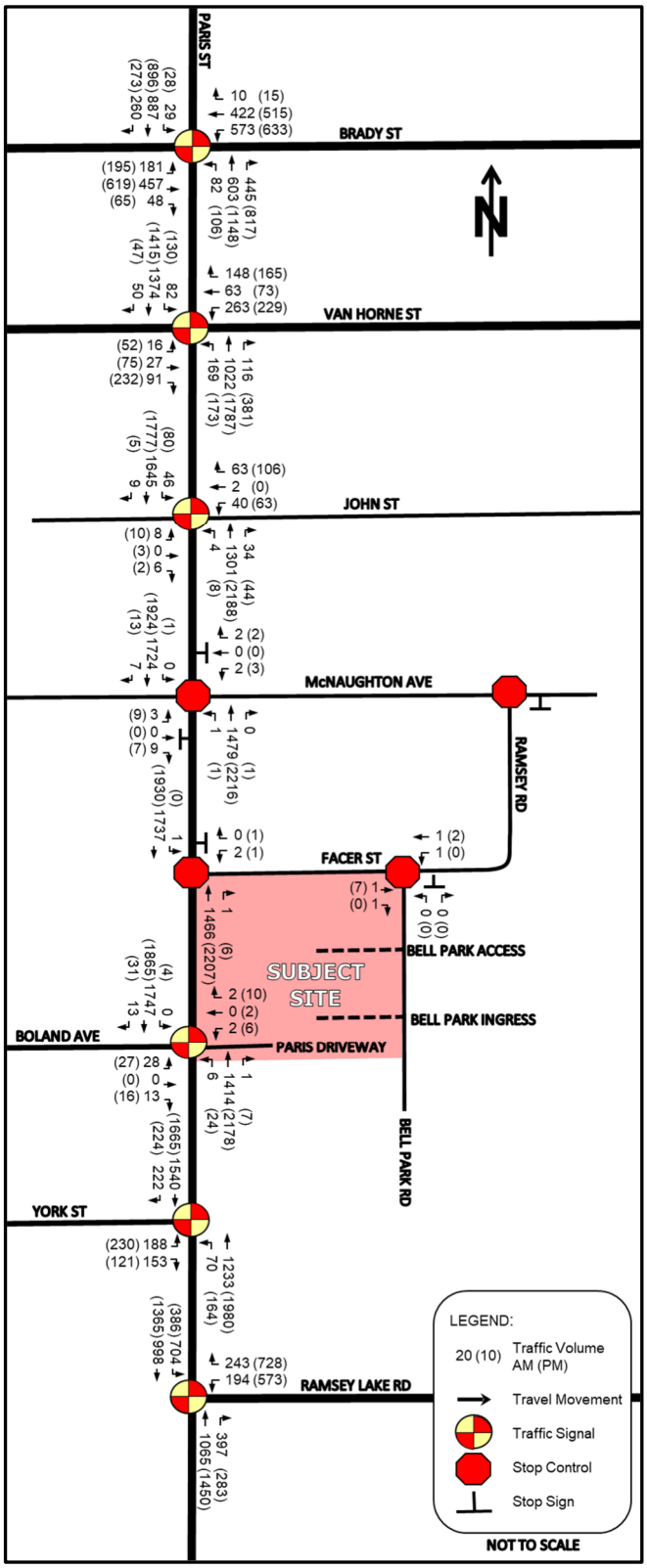


Figure 6 – Background (2032) Traffic Volumes



3 Intersection Operation with Proposed Development

3.1 Intersection Capacity Analysis Criteria

Intersection performance was measured using the traffic analysis software, Synchro 11, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analysing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 11 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

Individual turning movements with a volume-to-capacity [V/C] ratio of 0.85 or greater are considered to be critical movements and have been highlighted in the LOS tables.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign controlled intersections are shown in **Table 2.** A description of traffic performance characteristics is included for each LOS.

Table 2 – Level of Service Criteria for Intersections

LOS	LOS Description	Control Delay (seconds per vehicle)	
		Signalized Intersections	**Stop Controlled Intersections**
A	Very low delay; most vehicles do not stop (**Excellent**)	less than 10.0	less than 10.0
B	Higher delay; more vehicles stop (**Very Good**)	between 10.0 and 20.0	between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping **(Good**)	between 20.0 and 35.0	between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (**Satisfactory**)	between 35.0 and 55.0	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of **acceptable** delay	between 55.0 and 80.0	between 35.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (**Unacceptable**)	greater than 80.0	greater than 50.0

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS. Based on the above noted criteria a left-turn lane is not warranted at the unsignalized intersections in the study area (results are provided in **Appendix G**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in **Appendix H**).

No further improvements are recommended for the background (2032) scenario.

4 Proposed Development Traffic Generation and Assignment

4.1 Traffic Generation

The traffic generation for the proposed development has been based on the ITE Trip Generation Manual. The following ITE land uses have been applied to estimate the traffic from the proposed development:

- ITE land use 222 (Multi-Family Housing (High-Rise)) – General Urban / Suburban Setting
- ITE land use 251 (Senior Adult Housing - Single-Family) – General Urban / Suburban Setting
- ITE land use 932 (High-Turnover (Sit-Down) Restaurant) – General Urban / Suburban Setting

The estimated trip generation of the proposed development is illustrated below in **Table 8**. The AM and PM peak hour traffic generation for the proposed development is not expected to exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

Table 8 – Estimated Traffic Generation of Proposed Development

Land Use	Size	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multi-Family Housing High-Rise ITE Land Use: 222	448 units	41	80	121	81	63	144
Senior Adult Housing - Single-Family ITE Land Use: 251	100 rooms	13	26	39	27	18	45
High-Turnover (Sit-Down) Restaurant ITE Land Use: 932	500 sq.m. (5,382 sq.ft).	29	23	52	30	19	49
TOTAL TRIP GENERATION		**83**	**129**	**212**	**138**	**100**	**228**
INTERNAL CAPTURE*		-5	-5	-10	-7	-7	-14
NET GENERATION		**78**	**124**	**202**	**131**	**93**	**224**
PASS-BY TRIPS (ITE Land Use: 932)**		0	0	0	-9	-9	-18
TOTAL TRAFFIC GENERATION		**78**	**124**	**202**	**122**	**84**	**206**

* The internal capture rate has been calculated using the methodology outlined in the National Cooperative Highway Research Program (NCHRP) Report 684. Internal capture reports are provided in **Appendix I**.
** Pass-by trips for the AM and PM peak hour are 0% and 43% respectively, according to the ITE data for ITE land use 932.

In order to be conservative, no transportation modal split reduction has been applied to the above-noted traffic generation calculation.

4.2 Traffic Assignment

For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed.

The distribution of traffic for the proposed development is assumed to follow the existing trip distribution of the traffic counts in Section 2.6. The distribution of trips is illustrated in **Table 9** using the methodology outlined above.

Table 9 – Proposed Development Traffic Distribution Summary

Scenario	Direction	Ingress / Egress Traffic Direction								
		North via Paris Street	**South** via Paris Street	**West** via Brady Street	**East** via Brady Street	**West** via Van Horne Street	**East** via Van Horne Street	**West** via Boland Avenue	**West** via York Street	**East** via Ramsey Lake Road
AM	In	21%	25%	12%	17%	2%	8%	1%	6%	8%
	Out	14%	21%	14%	17%	5%	4%	0%	5%	20%
PM	In	16%	23%	12%	15%	5%	6%	1%	5%	17%
	Out	18%	25%	12%	18%	4%	8%	1%	5%	9%

Figures 7 to **9** illustrates the traffic assignment for the residential and restaurant (primary and pass-by trips) components for the proposed development, during the AM and PM peak hour.

Figure 7 – Traffic Assignment for Proposed Development (Residential Trips)

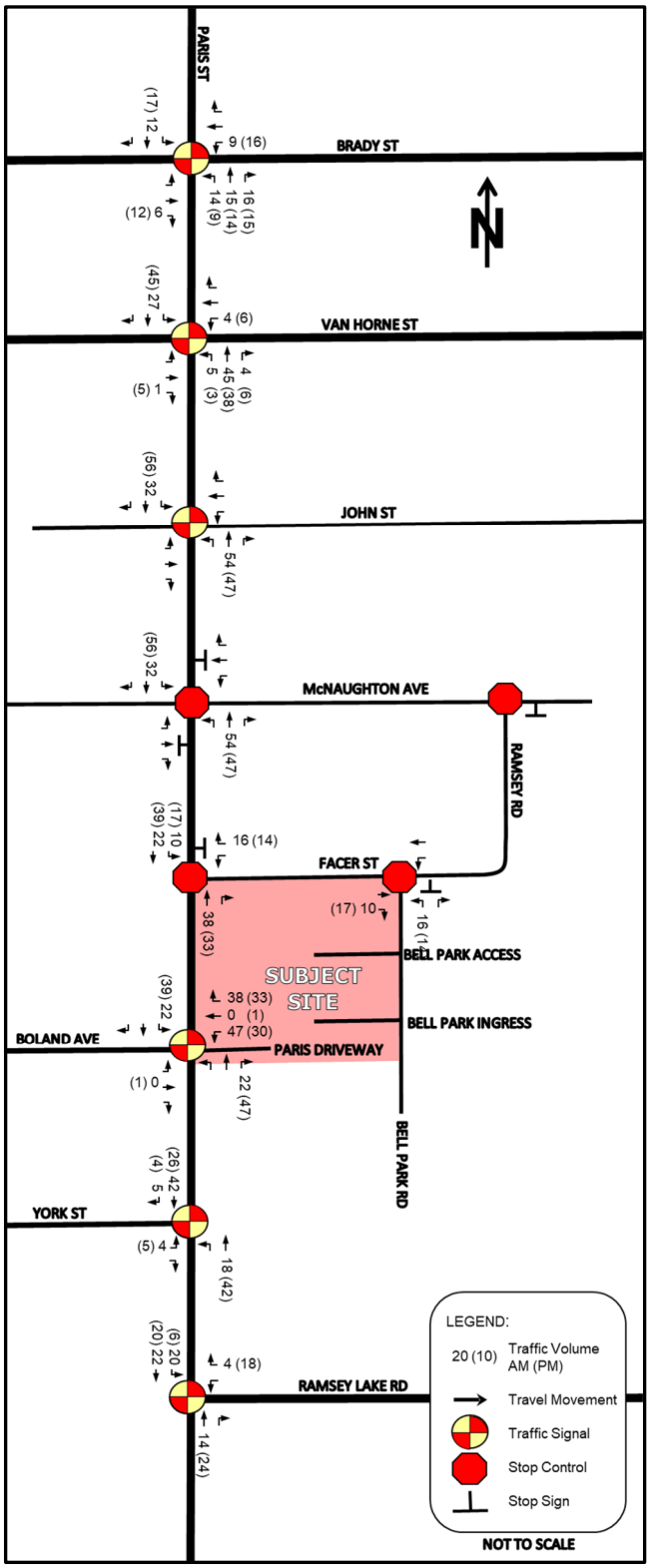


Figure 8 – Traffic Assignment for Proposed Development (Restaurant Primary Trips)

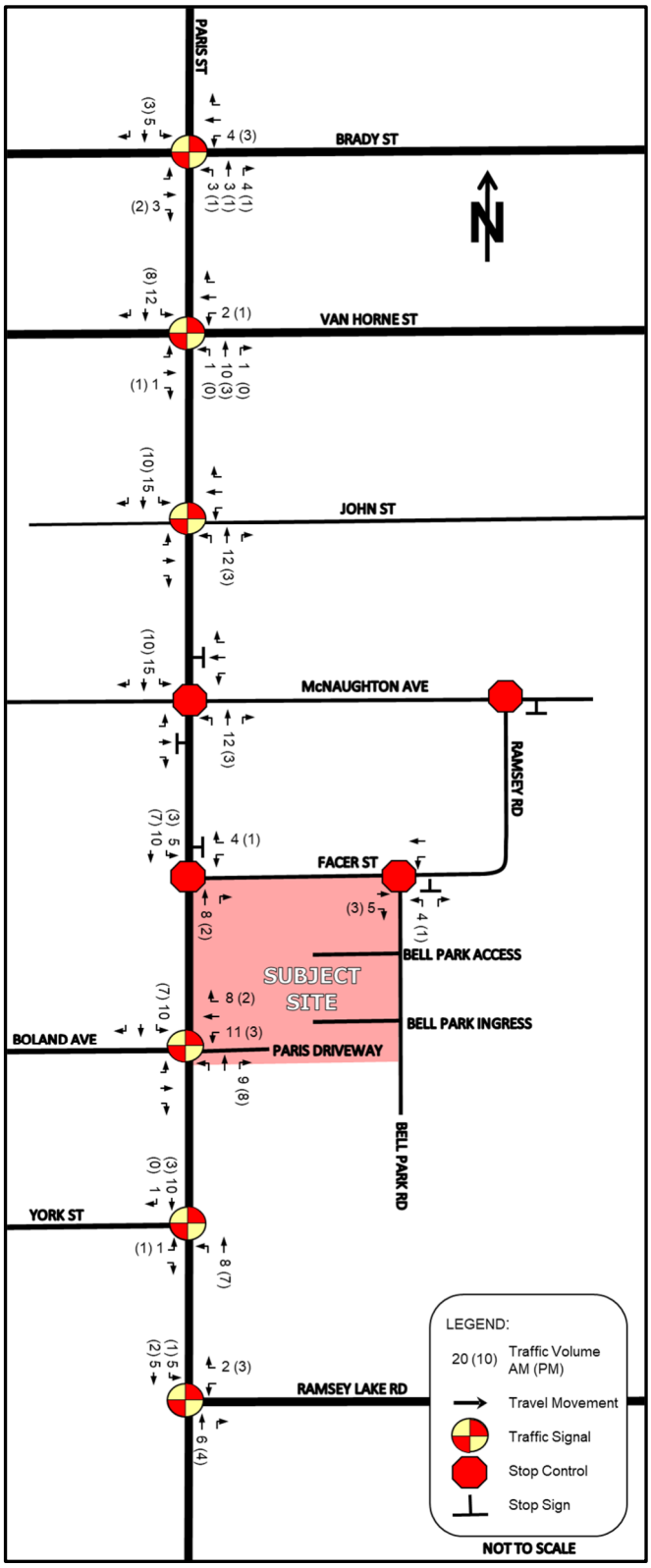
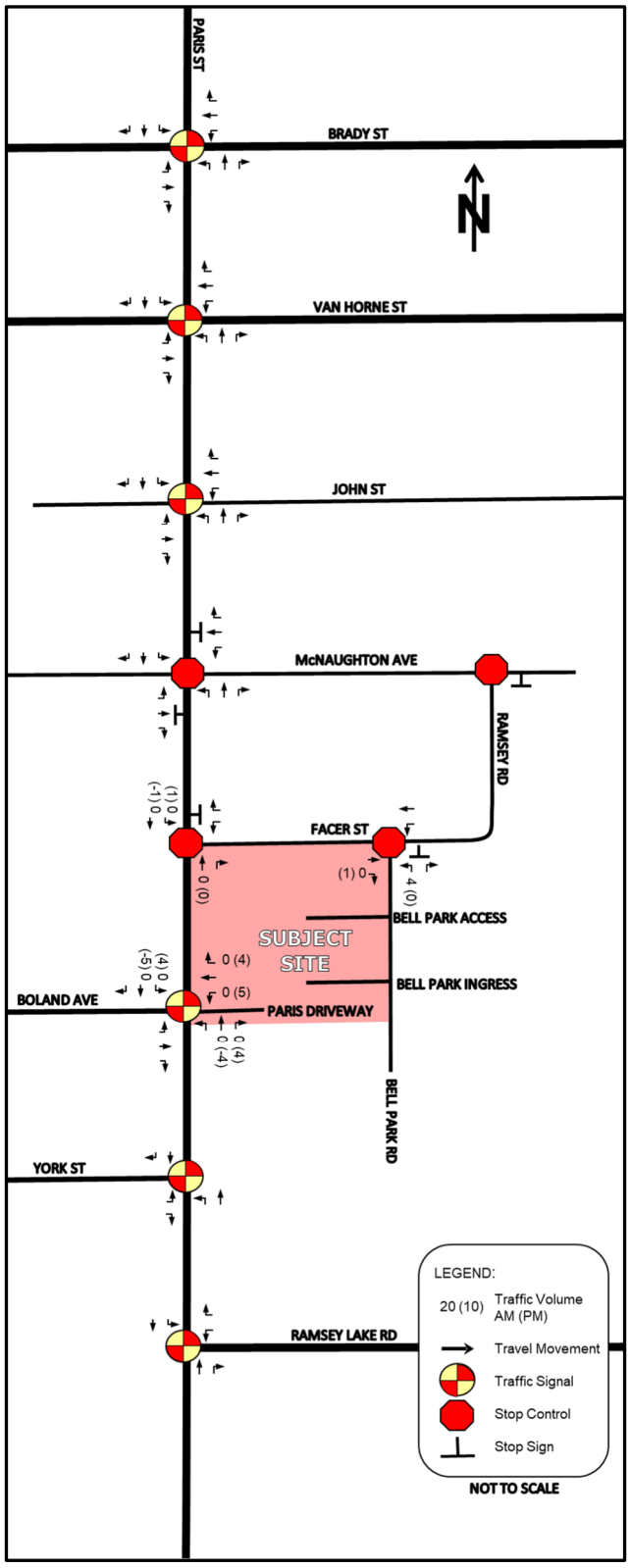


Figure 9 – Traffic Assignment for Proposed Development (Restaurant Pass-by Trips)



7 Summary

2226553 Ontario Inc. retained **JD Engineering** to prepare this traffic impact study in support of the proposed development on a site municipally known as 700 Paris Street, located on the east side of Paris Street between Boland Avenue and Facer Street, in the City of Greater Sudbury. The proposed Draft Plan by ACK Architects is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

The proposed development is anticipated to consist of a 16-storey building with 198 units, a 20-storey building with 250 units and a ground-floor restaurant (500 sq.m. of GFA) and a 10-storey retirement home with 100 rooms.

1. The proposed development is expected to generate a total of 202 AM and 206 PM peak hour primary trips and 18 PM peak hour pass-by trips.
2. Background traffic and pedestrian counts were commissioned for the existing intersections of Paris Street / Van Horne Street, Paris Street / McNaughton Street, Paris Street / Facer Street, Facer Street / Bell Park Road and Paris Street / York Street completed on Wednesday, April 20th 2022. Background traffic and pedestrian counts at the study area intersections were also obtained from the City.
3. An intersection operation analysis was completed at the study area intersections, using the existing (2022) and background (2027 & 2032) traffic volumes, with the adjacent development traffic. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. These improvements are warranted based on the anticipated growth in the City and traffic generated by future developments in the study area without the proposed development. The following improvements are recommended:

Existing (2022) Traffic Volumes

- **Paris Street / John Street and Paris Street / Ramsey Lake Road**
  - Optimize signal timing plan.

Background (2027) Traffic Volumes

- **Paris Street / Van Horne Street, Paris Street / McNaughton Street, Paris Street / Boland Avenue & Paris Driveway and Paris Street / York Street**
  - Optimize signal timing plan.

Background (2032) Traffic Volumes

- **Paris Street / Brady Street**
  - Adjust eastbound pavement markings to accommodate a double left-turn lane.
  - Adjust eastbound signal heads to accommodate a protected eastbound left turn phase.
  - Optimize signal timing plan.
- **Paris Street / Ramsey Lake Road**
  - Widen Ramsey Lake Road to accommodate westbound double right turn lane with a 100 metre storage length and 60 metre taper length
  - Optimize signal timing plan.

4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area streets and intersections.
5. An intersection operation analysis was completed under total (2027 & 2032) traffic volumes with the proposed development operational at the study area intersections. The following improvements are recommended prior to build-out of the proposed development:

   Opening Day (2027) Traffic Volumes

   Paris Street / Boland Avenue & Paris Driveway

   - Shift the Paris Driveway to align with Boland Avenue.
   - The westbound configuration of Paris Driveway at the intersection shall include a left turn lane and through-right lane.

   Facer Street

   - Construct a sidewalk on the south side of the road between Paris Street and Bell Park Road.

   Bell Park Road

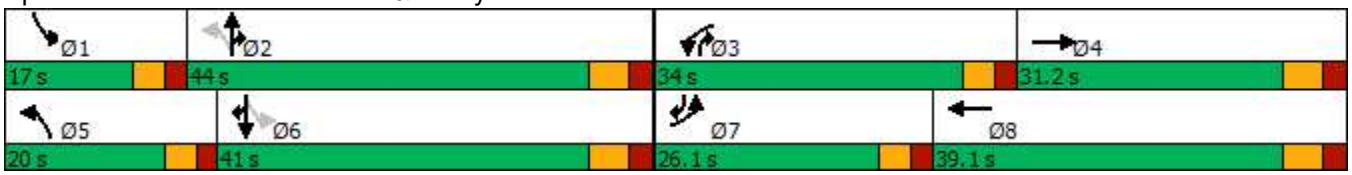
   - Reconstruct Bell Park Road south of Facer Street to a 6.0 metre wide paved condominium road.
   - Bell Park Road shall have a posted speed limit of 20 km/h once Bell Park Road is reconstructed.
6. The proposed development will shift the location of the Paris Driveway slightly further north at the intersection to align with Boland Avenue. It is recommended the westbound lane configuration at the Paris Street / Boland Avenue & Paris Driveway intersection include a left turn lane and through-right lane. A single ingress and egress lane at the Paris Driveway will provide the necessary capacity to service the proposed development. The Paris Driveway will provide ingress and egress access to the underground parking and surface parking.
7. The Bell Park Access will operate as full-movement access driveway. A single ingress and egress lane at the Bell Park Access will provide the necessary capacity to service the proposed development. The Bell Park Ingress will operate efficiently with a single ingress only driveway. A single ingress lane at the Bell Park Ingress will provide the necessary capacity to service the proposed development. Bell Park Access will provide ingress and egress access to the surface parking and the Bell Park Ingress will provide ingress only access to the underground parking.
8. There are no issues regarding the sight distance available for the proposed Paris Driveway and Bell Park Access.
9. The proposed parking supply for the proposed development meets the minimum parking requirement specified in the City's Zoning By-law 2010–100Z.
10. In summary the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

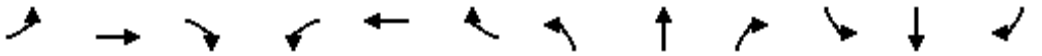
Synchro Analysis Output – Background Traffic Volumes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	181	457	573	422	82	603	445	29	887	260
Future Volume (vph)	181	457	573	422	82	603	445	29	887	260
Lane Group Flow (vph)	197	549	623	470	89	655	484	32	964	283
Turn Type	Prot	NA	Prot	NA	pm+pt	NA	pt+ov	pm+pt	NA	pt+ov
Protected Phases	7	4	3	8	5	2	2 3	1	6	6 7
Permitted Phases					2			6		
Detector Phase	7	4	3	8	5	2	2 3	1	6	6 7
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	15.0		5.0	15.0	
Minimum Split (s)	10.0	31.2	10.0	31.2	10.0	40.1		10.0	40.1	
Total Split (s)	26.1	31.2	34.0	39.1	20.0	44.0		17.0	41.0	
Total Split (%)	20.7%	24.7%	26.9%	31.0%	15.8%	34.9%		13.5%	32.5%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7		3.0	3.7	
All-Red Time (s)	2.0	2.5	2.0	2.5	2.0	2.4		2.0	2.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.2	5.0	6.2	5.0	6.1		5.0	6.1	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	Min		None	Min	
v/c Ratio	0.52	0.78	0.78	0.41	0.38	0.41	0.46	0.11	0.73	0.38
Control Delay	52.7	49.7	47.4	30.6	25.8	30.3	7.7	21.5	40.0	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	52.7	49.7	47.4	30.6	25.8	30.3	8.0	21.5	40.0	14.3
Queue Length 50th (m)	22.9	63.3	70.6	43.6	12.9	45.6	29.4	4.5	76.0	25.8
Queue Length 95th (m)	37.1	92.1	100.7	67.9	24.4	60.5	56.5	11.0	98.3	48.6
Internal Link Dist (m)		364.5		324.4		160.9			177.4	
Turn Bay Length (m)	57.0		85.0		70.0		6.0	24.0		6.0
Base Capacity (vph)	682	838	965	1230	308	1900	1105	371	1688	875
Starvation Cap Reductn	0	0	0	0	0	0	195	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.66	0.65	0.38	0.29	0.34	0.53	0.09	0.57	0.32

Intersection Summary
Cycle Length: 126.2
Actuated Cycle Length: 106
Natural Cycle: 105
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Paris St & Brady St





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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Future Volume (vph)	181	457	48	573	422	10	82	603	445	29	887	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.2		5.0	6.2		5.0	6.1	6.1	5.0	6.1	6.1
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	3369		3367	3461		1671	4988	1568	1717	4893	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.14	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)	3273	3369		3367	3461		250	4988	1568	681	4893	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	197	497	52	623	459	11	89	655	484	32	964	283
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	92	0	0	63
Lane Group Flow (vph)	197	543	0	623	469	0	89	655	392	32	964	220
Confl. Peds. (#/hr)	7		4	4		7	19		10	10		19
Heavy Vehicles (%)	7%	5%	10%	4%	4%	0%	8%	4%	3%	5%	6%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pt+ov	pm+pt	NA	pt+ov
Protected Phases	7	4		3	8		5	2	2 3	1	6	6 7
Permitted Phases							2			6		
Actuated Green, G (s)	12.2	22.1		25.2	35.1		42.0	33.9	65.2	33.8	29.8	48.1
Effective Green, g (s)	12.2	22.1		25.2	35.1		42.0	33.9	65.2	33.8	29.8	48.1
Actuated g/C Ratio	0.11	0.21		0.23	0.33		0.39	0.32	0.61	0.31	0.28	0.45
Clearance Time (s)	5.0	6.2		5.0	6.2		5.0	6.1		5.0	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	371	692		789	1130		204	1572	951	252	1356	708
v/s Ratio Prot	0.06	c0.16		c0.19	0.14		c0.03	0.13	0.25	0.00	c0.20	0.14
v/s Ratio Perm							0.14			0.04		
v/c Ratio	0.53	0.78		0.79	0.41		0.44	0.42	0.41	0.13	0.71	0.31
Uniform Delay, d1	45.0	40.4		38.7	28.2		22.7	29.0	11.1	25.7	35.0	19.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	5.8		5.3	0.2		1.5	0.2	0.3	0.2	1.8	0.3
Delay (s)	46.4	46.3		43.9	28.4		24.2	29.2	11.4	26.0	36.8	19.3
Level of Service	D	D		D	C		C	C	B	C	D	B
Approach Delay (s)		46.3			37.3			21.8			32.6	
Approach LOS		D			D			C			C	

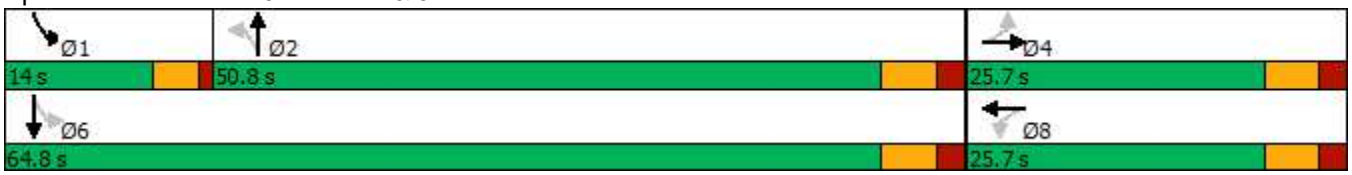
Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	22.3
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	0	40	2	4	1301	46	1645
Future Volume (vph)	8	0	40	2	4	1301	46	1645
Lane Group Flow (vph)	0	14	0	110	4	1390	48	1723
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	20.0	20.0	5.0	20.0
Minimum Split (s)	25.7	25.7	25.7	25.7	34.8	34.8	9.0	34.8
Total Split (s)	25.7	25.7	25.7	25.7	50.8	50.8	14.0	64.8
Total Split (%)	28.4%	28.4%	28.4%	28.4%	56.1%	56.1%	15.5%	71.6%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.1	2.1	1.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.7		5.7	5.8	5.8	4.0	5.8
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
v/c Ratio		0.05		0.38	0.03	0.62	0.15	0.67
Control Delay		0.3		18.0	8.2	11.4	4.0	7.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		0.3		18.0	8.2	11.4	4.0	7.6
Queue Length 50th (m)		0.0		4.7	0.2	63.0	1.3	53.1
Queue Length 95th (m)		0.0		20.6	1.6	101.7	4.4	92.8
Internal Link Dist (m)		561.8		431.0		175.2		478.0
Turn Bay Length (m)					33.0		23.0	
Base Capacity (vph)		586		578	172	2735	437	3245
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		0.02		0.19	0.02	0.51	0.11	0.53

Intersection Summary
Cycle Length: 90.5
Actuated Cycle Length: 59.3
Natural Cycle: 70
Control Type: Semi Act-Uncoord

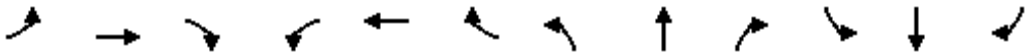
Splits and Phases: 3: Paris St & John St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	6	40	2	63	4	1301	34	46	1645	9
Future Volume (vph)	8	0	6	40	2	63	4	1301	34	46	1645	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1726			1696		1803	3492		1770	3536	
Flt Permitted		0.84			0.87		0.12	1.00		0.12	1.00	
Satd. Flow (perm)		1496			1501		220	3492		218	3536	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	0	6	42	2	66	4	1355	35	48	1714	9
RTOR Reduction (vph)	0	12	0	0	58	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	52	0	4	1388	0	48	1723	0
Confl. Peds. (#/hr)	5		5	5		5	8		4	4		8
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	2%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.1			7.1		36.3	36.3		43.6	43.6	
Effective Green, g (s)		7.1			7.1		36.3	36.3		43.6	43.6	
Actuated g/C Ratio		0.11			0.11		0.58	0.58		0.70	0.70	
Clearance Time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170			171		128	2037		235	2478	
v/s Ratio Prot								0.40		0.01	c0.49	
v/s Ratio Perm		0.00			c0.03		0.02			0.13		
v/c Ratio		0.01			0.30		0.03	0.68		0.20	0.70	
Uniform Delay, d1		24.4			25.3		5.5	9.0		5.2	5.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			1.0		0.1	1.0		0.4	0.9	
Delay (s)		24.5			26.3		5.6	9.9		5.6	6.3	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		24.5			26.3			9.9			6.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	9	2	0	2	1	1479	0	0	1724	7
Future Volume (Veh/h)	3	0	9	2	0	2	1	1479	0	0	1724	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	0	10	2	0	2	1	1643	0	0	1916	8
Pedestrians		2			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								347			199	
pX, platoon unblocked	0.75	0.75	0.65	0.75	0.75	0.80	0.65			0.80		
vC, conflicting volume	2748	3568	964	2614	3572	822	1926			1644		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1465	2559	0	1287	2564	279	1348			1306		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.8	2.2			2.2		
p0 queue free %	96	100	99	98	100	100	100			100		
cM capacity (veh/h)	68	20	708	91	20	474	336			429		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	13	4	822	822	958	966
Volume Left	3	2	1	0	0	0
Volume Right	10	2	0	0	0	8
cSH	222	152	336	1700	429	1700
Volume to Capacity	0.06	0.03	0.00	0.48	0.00	0.57
Queue Length 95th (m)	1.5	0.6	0.1	0.0	0.0	0.0
Control Delay (s)	22.2	29.2	0.1	0.0	0.0	0.0
Lane LOS	C	D	A			
Approach Delay (s)	22.2	29.2	0.1		0.0	
Approach LOS	C	D				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	0	1466	1	1	1737
Future Volume (Veh/h)	2	0	1466	1	1	1737
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	0	1629	1	1	1930
Pedestrians						1
Lane Width (m)						3.6
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			226			321
pX, platoon unblocked	0.74	0.79			0.79	
vC, conflicting volume	2596	816			1630	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1157	231			1263	
tC, single (s)	6.8	6.9			6.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			3.2	
p0 queue free %	99	100			99	
cM capacity (veh/h)	141	613			174	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	1086	544	644	1287
Volume Left	2	0	0	1	0
Volume Right	0	0	1	0	0
cSH	141	1700	1700	174	1700
Volume to Capacity	0.01	0.64	0.32	0.01	0.76
Queue Length 95th (m)	0.3	0.0	0.0	0.1	0.0
Control Delay (s)	31.0	0.0	0.0	0.3	0.0
Lane LOS	D			A	
Approach Delay (s)	31.0	0.0		0.1	
Approach LOS	D				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1	1	1	1	0	0
Future Volume (Veh/h)	1	1	1	1	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	2	2	2	2	0	0
Pedestrians	1			2	2	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			6		12	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		12	7
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1625		1009	1078

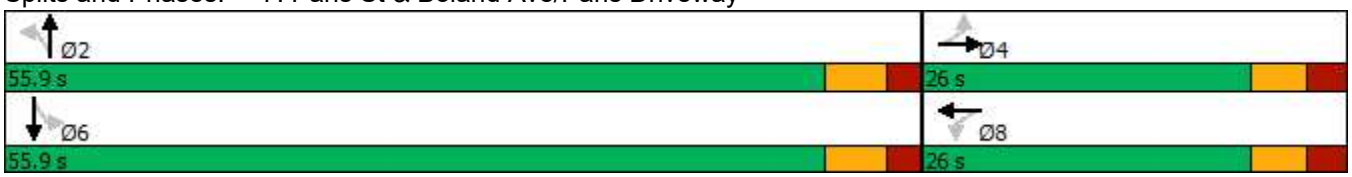
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	4	4	0
Volume Left	0	2	0
Volume Right	2	0	0
cSH	1700	1625	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	3.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	3.6	0.0
Approach LOS			A

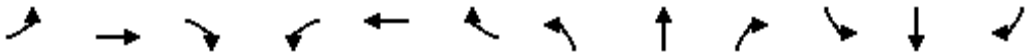
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	14.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	28	0	2	0	6	1414	1747
Future Volume (vph)	28	0	2	0	6	1414	1747
Lane Group Flow (vph)	0	43	2	2	6	1489	1853
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		4		8		2	6
Permitted Phases	4		8		2		
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	30.0	30.0	30.0
Minimum Split (s)	26.0	26.0	26.0	26.0	35.9	35.9	35.9
Total Split (s)	26.0	26.0	26.0	26.0	55.9	55.9	55.9
Total Split (%)	31.7%	31.7%	31.7%	31.7%	68.3%	68.3%	68.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.7	3.7	3.7
All-Red Time (s)	2.5	2.5	2.5	2.5	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)		6.0	6.0	6.0	5.9	5.9	5.9
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Min	Min	Min
v/c Ratio		0.19	0.01	0.01	0.04	0.51	0.64
Control Delay		13.8	27.0	0.0	4.0	4.4	5.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		13.8	27.0	0.0	4.0	4.4	5.8
Queue Length 50th (m)		0.6	0.3	0.0	0.2	42.0	64.0
Queue Length 95th (m)		9.0	2.1	0.0	1.3	57.8	89.2
Internal Link Dist (m)		198.2		192.5		314.0	201.8
Turn Bay Length (m)					40.0		
Base Capacity (vph)		502	581	559	139	2927	2924
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		0.09	0.00	0.00	0.04	0.51	0.63

Intersection Summary
Cycle Length: 81.9
Actuated Cycle Length: 62.4
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 7: Paris St & Boland Ave/Paris Driveway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	0	13	2	0	2	6	1414	1	0	1747	13
Future Volume (vph)	28	0	13	2	0	2	6	1414	1	0	1747	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		5.9	5.9			5.9	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95			0.95	
Frt		0.96		1.00	0.85		1.00	1.00			1.00	
Flt Protected		0.97		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		1757		1805	1615		1805	3505			3502	
Flt Permitted		0.80		0.93	1.00		0.09	1.00			1.00	
Satd. Flow (perm)		1448		1767	1615		167	3505			3502	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	0	14	2	0	2	6	1488	1	0	1839	14
RTOR Reduction (vph)	0	36	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	7	0	2	0	0	6	1489	0	0	1853	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		4.3		4.3	4.3		48.8	48.8			48.8	
Effective Green, g (s)		4.3		4.3	4.3		48.8	48.8			48.8	
Actuated g/C Ratio		0.07		0.07	0.07		0.75	0.75			0.75	
Clearance Time (s)		6.0		6.0	6.0		5.9	5.9			5.9	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		95		116	106		125	2631			2629	
v/s Ratio Prot					0.00			0.42			c0.53	
v/s Ratio Perm		c0.00		0.00			0.04					
v/c Ratio		0.07		0.02	0.00		0.05	0.57			0.70	
Uniform Delay, d1		28.5		28.4	28.3		2.1	3.5			4.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.3		0.1	0.0		0.2	0.3			0.9	
Delay (s)		28.8		28.4	28.3		2.3	3.8			5.2	
Level of Service		C		C	C		A	A			A	
Approach Delay (s)		28.8			28.4			3.8			5.2	
Approach LOS		C			C			A			A	

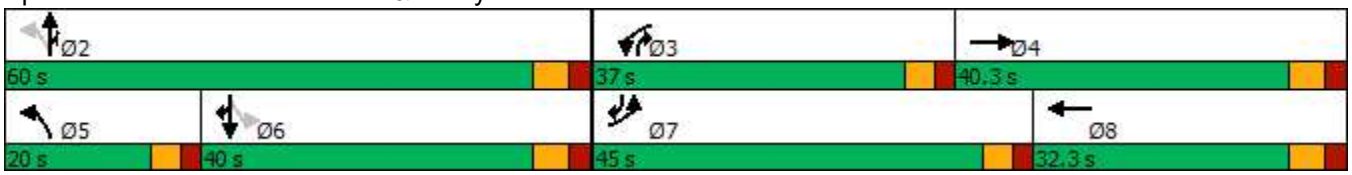
Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

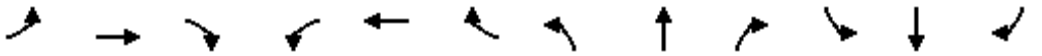
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	195	619	633	515	106	1148	817	28	896	273
Future Volume (vph)	195	619	633	515	106	1148	817	28	896	273
Lane Group Flow (vph)	195	684	633	530	106	1148	817	28	896	273
Turn Type	Prot	NA	Prot	NA	pm+pt	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	7	4	3	8	5	2	2 3		6	6 7
Permitted Phases					2			6		
Detector Phase	7	4	3	8	5	2	2 3	6	6	6 7
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	15.0		15.0	15.0	
Minimum Split (s)	10.0	31.2	10.0	31.2	10.0	40.1		40.1	40.1	
Total Split (s)	45.0	40.3	37.0	32.3	20.0	60.0		40.0	40.0	
Total Split (%)	32.8%	29.4%	26.9%	23.5%	14.6%	43.7%		29.1%	29.1%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.5	2.0	2.5	2.0	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.2	5.0	6.2	5.0	6.1		6.1	6.1	
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	Min		Min	Min	
v/c Ratio	0.57	0.82	0.79	0.43	0.45	0.58	0.75	0.26	0.69	0.38
Control Delay	60.9	53.4	53.5	31.8	31.5	31.4	18.4	46.9	44.7	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0
Total Delay	60.9	53.4	53.5	31.8	31.5	31.4	22.5	46.9	44.7	18.7
Queue Length 50th (m)	27.3	95.1	85.8	57.5	18.5	90.2	126.1	6.0	79.8	33.5
Queue Length 95th (m)	40.2	118.9	110.9	77.8	32.7	108.9	192.1	16.8	102.3	58.2
Internal Link Dist (m)		364.5		324.4		160.9			177.4	
Turn Bay Length (m)	57.0		85.0		70.0		6.0	24.0		6.0
Base Capacity (vph)	1046	1033	945	1242	296	2333	1152	127	1524	1061
Starvation Cap Reductn	0	0	0	0	0	0	251	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.66	0.67	0.43	0.36	0.49	0.91	0.22	0.59	0.26

Intersection Summary

Cycle Length: 137.3
Actuated Cycle Length: 121.4
Natural Cycle: 105
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Paris St & Brady St





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	619	65	633	515	15	106	1148	817	28	896	273
Future Volume (vph)	195	619	65	633	515	15	106	1148	817	28	896	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.2		5.0	6.2		5.0	6.1	6.1	6.1	6.1	6.1
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3072	3539		3467	3491		1751	5085	1615	1775	5085	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.15	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	3072	3539		3467	3491		270	5085	1615	427	5085	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	195	619	65	633	515	15	106	1148	817	28	896	273
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	21	0	0	52
Lane Group Flow (vph)	195	678	0	633	529	0	106	1148	796	28	896	221
Confl. Peds. (#/hr)	9		6	6		9	25		33	33		25
Heavy Vehicles (%)	14%	0%	4%	1%	3%	0%	3%	2%	0%	1%	2%	0%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	7	4		3	8		5	2	2 3		6	6 7
Permitted Phases							2			6		
Actuated Green, G (s)	13.5	28.6		28.1	43.2		46.9	46.9	81.1	31.3	31.3	50.9
Effective Green, g (s)	13.5	28.6		28.1	43.2		46.9	46.9	81.1	31.3	31.3	50.9
Actuated g/C Ratio	0.11	0.24		0.23	0.36		0.39	0.39	0.67	0.26	0.26	0.42
Clearance Time (s)	5.0	6.2		5.0	6.2		5.0	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	343	837		805	1247		234	1972	1083	110	1316	679
v/s Ratio Prot	0.06	c0.19		c0.18	0.15		0.04	0.23	c0.49		0.18	0.14
v/s Ratio Perm							0.14			0.07		
v/c Ratio	0.57	0.81		0.79	0.42		0.45	0.58	0.73	0.25	0.68	0.33
Uniform Delay, d1	50.9	43.6		43.6	29.4		25.9	29.3	12.9	35.5	40.3	23.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	5.8		5.1	0.2		1.4	0.4	2.6	1.2	1.5	0.3
Delay (s)	53.1	49.4		48.7	29.7		27.3	29.7	15.5	36.8	41.8	23.8
Level of Service	D	D		D	C		C	C	B	D	D	C
Approach Delay (s)		50.2			40.0			24.0			37.5	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.9	Sum of lost time (s)	22.3
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		

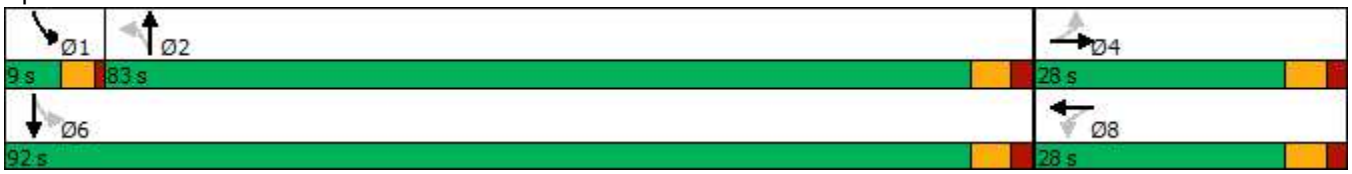
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	3	63	0	8	2188	80	1777
Future Volume (vph)	10	3	63	0	8	2188	80	1777
Lane Group Flow (vph)	0	15	0	174	8	2301	82	1837
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	20.0	20.0	5.0	20.0
Minimum Split (s)	25.7	25.7	25.7	25.7	34.8	34.8	9.0	34.8
Total Split (s)	28.0	28.0	28.0	28.0	83.0	83.0	9.0	92.0
Total Split (%)	23.3%	23.3%	23.3%	23.3%	69.2%	69.2%	7.5%	76.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.1	2.1	1.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.7		5.7	5.8	5.8	4.0	5.8
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
v/c Ratio		0.08		0.72	0.06	0.93	0.57	0.68
Control Delay		38.7		46.6	8.8	24.2	28.5	8.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		38.7		46.6	8.8	24.2	28.5	8.6
Queue Length 50th (m)		2.7		25.0	0.6	222.5	3.4	88.5
Queue Length 95th (m)		9.0		49.4	2.9	#360.3	#25.2	149.8
Internal Link Dist (m)		561.8		431.0		175.2		478.0
Turn Bay Length (m)					33.0		23.0	
Base Capacity (vph)		279		341	129	2477	145	2773
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		0.05		0.51	0.06	0.93	0.57	0.66

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 110.6
Natural Cycle: 110
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Paris St & John St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	3	2	63	0	106	8	2188	44	80	1777	5
Future Volume (vph)	10	3	2	63	0	106	8	2188	44	80	1777	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1799			1627		1802	3528		1736	3537	
Flt Permitted		0.74			0.87		0.10	1.00		0.05	1.00	
Satd. Flow (perm)		1373			1443		184	3528		90	3537	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	10	3	2	65	0	109	8	2256	45	82	1832	5
RTOR Reduction (vph)	0	2	0	0	54	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	120	0	8	2300	0	82	1837	0
Confl. Peds. (#/hr)	3		4	4		3	14		2	2		14
Heavy Vehicles (%)	0%	0%	0%	0%	0%	6%	0%	2%	0%	4%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.4			14.4		77.6	77.6		85.5	85.5	
Effective Green, g (s)		14.4			14.4		77.6	77.6		85.5	85.5	
Actuated g/C Ratio		0.13			0.13		0.70	0.70		0.77	0.77	
Clearance Time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		177			186		128	2457		126	2714	
v/s Ratio Prot								c0.65		0.02	c0.52	
v/s Ratio Perm		0.01			c0.08		0.04			0.48		
v/c Ratio		0.07			0.65		0.06	0.94		0.65	0.68	
Uniform Delay, d1		42.6			46.1		5.4	14.7		27.5	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			7.5		0.2	7.6		11.4	0.7	
Delay (s)		42.8			53.5		5.6	22.3		39.0	6.9	
Level of Service		D			D		A	C		D	A	
Approach Delay (s)		42.8			53.5			22.2			8.3	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	15.5
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	7	3	0	2	1	2216	1	1	1924	13
Future Volume (Veh/h)	9	0	7	3	0	2	1	2216	1	1	1924	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	0	7	3	0	2	1	2308	1	1	2004	14
Pedestrians		3			2							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								347			199	
pX, platoon unblocked	0.41	0.41	0.69	0.41	0.41	0.26	0.69			0.26		
vC, conflicting volume	3174	4329	1012	3324	4336	1156	2021			2311		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75	2880	134	438	2895	0	1589			336		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	99	100	99	100			100		
cM capacity (veh/h)	369	7	620	204	7	282	290			319		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	5	1155	1155	1003	1016
Volume Left	9	3	1	0	1	0
Volume Right	7	2	0	1	0	14
cSH	449	230	290	1700	319	1700
Volume to Capacity	0.04	0.02	0.00	0.68	0.00	0.60
Queue Length 95th (m)	0.9	0.5	0.1	0.0	0.1	0.0
Control Delay (s)	13.3	21.0	0.2	0.0	0.1	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	13.3	21.0	0.1		0.1	
Approach LOS	B	C				

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	72.0%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	1	2207	6	0	1930
Future Volume (Veh/h)	1	1	2207	6	0	1930
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	2323	6	0	2032
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			225			321
pX, platoon unblocked	0.40	0.24			0.24	
vC, conflicting volume	3343	1166			2330	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	177	0			194	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	323	260			332	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	1549	780	677	1355
Volume Left	1	0	0	0	0
Volume Right	1	0	6	0	0
cSH	288	1700	1700	332	1700
Volume to Capacity	0.01	0.91	0.46	0.00	0.80
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	17.6	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	17.6	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	7	0	0	2	0	0
Future Volume (Veh/h)	7	0	0	2	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Hourly flow rate (vph)	10	0	0	3	0	0
Pedestrians	1			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			10		14	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			10		14	12
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1009	1073

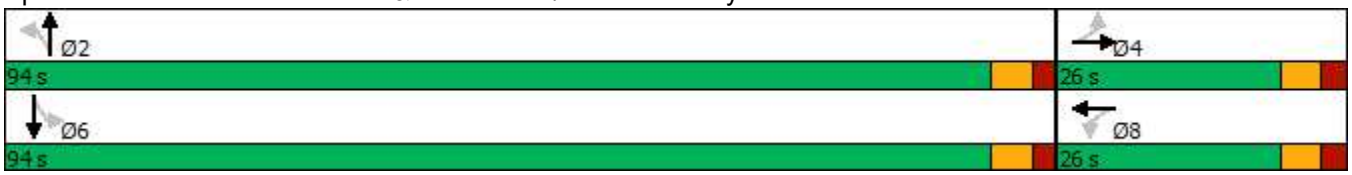
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	10	3	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1623	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

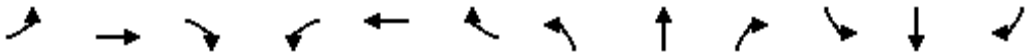
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	27	0	6	2	24	2178	4	1865
Future Volume (vph)	27	0	6	2	24	2178	4	1865
Lane Group Flow (vph)	0	46	7	13	26	2375	4	2061
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)	8.0	8.0	8.0	8.0	30.0	30.0	30.0	30.0
Minimum Split (s)	26.0	26.0	26.0	26.0	35.9	35.9	35.9	35.9
Total Split (s)	26.0	26.0	26.0	26.0	94.0	94.0	94.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	78.3%	78.3%	78.3%	78.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.7	3.7	3.7	3.7
All-Red Time (s)	2.5	2.5	2.5	2.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	5.9	5.9	5.9	5.9
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio		0.29	0.05	0.07	0.24	0.81	0.05	0.70
Control Delay		30.0	44.8	25.9	8.9	8.8	3.5	6.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		30.0	44.8	25.9	8.9	8.8	3.5	6.2
Queue Length 50th (m)		3.4	1.2	0.3	1.0	117.6	0.1	80.5
Queue Length 95th (m)		16.1	6.2	6.6	5.2	179.8	1.0	120.1
Internal Link Dist (m)		192.5		282.1		313.9		201.2
Turn Bay Length (m)					40.0		100.0	
Base Capacity (vph)		340	330	400	117	3223	94	3219
Starvation Cap Reductn		0	0	0	0	21	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0
Reduced v/c Ratio		0.14	0.02	0.03	0.22	0.74	0.04	0.64

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 90.1
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 7: Paris St & Boland Ave/Paris Driveway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	0	16	6	2	10	24	2178	7	4	1865	31
Future Volume (vph)	27	0	16	6	2	10	24	2178	7	4	1865	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.87		1.00	1.00		1.00	1.00	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1623		1805	1639		1805	3537		1805	3530	
Flt Permitted		0.80		0.73	1.00		0.07	1.00		0.05	1.00	
Satd. Flow (perm)		1341		1381	1639		130	3537		104	3530	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	0	17	7	2	11	26	2367	8	4	2027	34
RTOR Reduction (vph)	0	24	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	22	0	7	3	0	26	2375	0	4	2060	0
Confl. Peds. (#/hr)	2					2	4		2	2		4
Heavy Vehicles (%)	4%	0%	14%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.4		6.4	6.4		73.0	73.0		73.0	73.0	
Effective Green, g (s)		6.4		6.4	6.4		73.0	73.0		73.0	73.0	
Actuated g/C Ratio		0.07		0.07	0.07		0.80	0.80		0.80	0.80	
Clearance Time (s)		6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		94		96	114		103	2828		83	2822	
v/s Ratio Prot					0.00			c0.67			0.58	
v/s Ratio Perm		c0.02		0.01			0.20			0.04		
v/c Ratio		0.23		0.07	0.02		0.25	0.84		0.05	0.73	
Uniform Delay, d1		40.1		39.7	39.5		2.3	5.6		1.9	4.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3		0.3	0.1		1.3	2.4		0.2	1.0	
Delay (s)		41.4		40.0	39.6		3.6	7.9		2.1	5.4	
Level of Service		D		D	D		A	A		A	A	
Approach Delay (s)		41.4			39.8			7.9			5.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	11.9
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Synchro Analysis Output – Total Traffic Volumes

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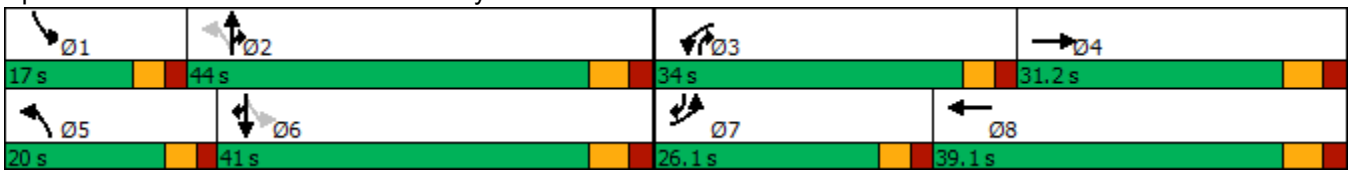
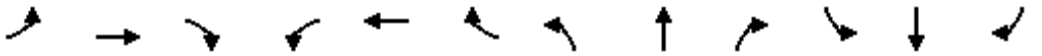
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	181	457	586	422	99	621	465	29	904	260
Future Volume (vph)	181	457	586	422	99	621	465	29	904	260
Lane Group Flow (vph)	197	559	637	470	108	675	505	32	983	283
Turn Type	Prot	NA	Prot	NA	pm+pt	NA	pt+ov	pm+pt	NA	pt+ov
Protected Phases	7	4	3	8	5	2	2 3	1	6	6 7
Permitted Phases					2			6		
Detector Phase	7	4	3	8	5	2	2 3	1	6	6 7
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	15.0		5.0	15.0	
Minimum Split (s)	10.0	31.2	10.0	31.2	10.0	40.1		10.0	40.1	
Total Split (s)	26.1	31.2	34.0	39.1	20.0	44.0		17.0	41.0	
Total Split (%)	20.7%	24.7%	26.9%	31.0%	15.8%	34.9%		13.5%	32.5%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7		3.0	3.7	
All-Red Time (s)	2.0	2.5	2.0	2.5	2.0	2.4		2.0	2.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.2	5.0	6.2	5.0	6.1		5.0	6.1	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	Min		None	Min	
v/c Ratio	0.55	0.82	0.81	0.42	0.45	0.39	0.47	0.11	0.76	0.39
Control Delay	55.2	54.2	51.1	32.0	27.3	30.0	7.9	21.6	42.9	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	55.2	54.2	51.1	32.0	27.3	30.0	8.2	21.6	42.9	15.0
Queue Length 50th (m)	23.9	67.2	75.0	44.8	16.5	48.9	33.2	4.7	81.5	27.5
Queue Length 95th (m)	37.5	#99.3	104.3	68.8	28.6	62.3	61.0	11.0	101.8	49.3
Internal Link Dist (m)		364.5		324.4		160.9			177.4	
Turn Bay Length (m)	57.0		85.0		70.0		6.0	24.0		6.0
Base Capacity (vph)	631	774	892	1167	294	1804	1099	378	1560	832
Starvation Cap Reductn	0	0	0	0	0	0	210	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.72	0.71	0.40	0.37	0.37	0.57	0.08	0.63	0.34

Intersection Summary

Cycle Length: 126.2
Actuated Cycle Length: 111.6
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Paris St & Brady St





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	457	57	586	422	10	99	621	465	29	904	260
Future Volume (vph)	181	457	57	586	422	10	99	621	465	29	904	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.2		5.0	6.2		5.0	6.1	6.1	5.0	6.1	6.1
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	3357		3367	3461		1671	4988	1568	1717	4893	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.13	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)	3273	3357		3367	3461		233	4988	1568	693	4893	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	197	497	62	637	459	11	108	675	505	32	983	283
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	89	0	0	64
Lane Group Flow (vph)	197	551	0	637	469	0	108	675	416	32	983	219
Confl. Peds. (#/hr)	7		4	4		7	19		10	10		19
Heavy Vehicles (%)	7%	5%	10%	4%	4%	0%	8%	4%	3%	5%	6%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pt+ov	pm+pt	NA	pt+ov
Protected Phases	7	4		3	8		5	2	2 3	1	6	6 7
Permitted Phases							2			6		
Actuated Green, G (s)	12.2	22.4		26.0	36.2		47.9	38.8	70.9	35.9	31.8	50.1
Effective Green, g (s)	12.2	22.4		26.0	36.2		47.9	38.8	70.9	35.9	31.8	50.1
Actuated g/C Ratio	0.11	0.20		0.23	0.32		0.42	0.34	0.62	0.32	0.28	0.44
Clearance Time (s)	5.0	6.2		5.0	6.2		5.0	6.1		5.0	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	351	661		770	1102		238	1703	978	255	1369	698
v/s Ratio Prot	0.06	c0.16		c0.19	0.14		c0.04	0.14	0.27	0.00	c0.20	0.14
v/s Ratio Perm							0.15			0.03		
v/c Ratio	0.56	0.83		0.83	0.43		0.45	0.40	0.43	0.13	0.72	0.31
Uniform Delay, d1	48.2	43.8		41.7	30.5		22.4	28.5	10.9	27.1	36.9	20.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	8.9		7.3	0.3		1.4	0.2	0.3	0.2	1.8	0.3
Delay (s)	50.2	52.7		49.0	30.8		23.8	28.6	11.2	27.3	38.7	20.9
Level of Service	D	D		D	C		C	C	B	C	D	C
Approach Delay (s)		52.0			41.2			21.4			34.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	113.6	Sum of lost time (s)	22.3
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	0	40	2	4	1367	46	1692
Future Volume (vph)	8	0	40	2	4	1367	46	1692
Lane Group Flow (vph)	0	14	0	110	4	1459	48	1772
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	20.0	20.0	5.0	20.0
Minimum Split (s)	25.7	25.7	25.7	25.7	34.8	34.8	9.0	34.8
Total Split (s)	25.7	25.7	25.7	25.7	50.8	50.8	14.0	64.8
Total Split (%)	28.4%	28.4%	28.4%	28.4%	56.1%	56.1%	15.5%	71.6%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.1	2.1	1.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.7		5.7	5.8	5.8	4.0	5.8
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
v/c Ratio		0.05		0.38	0.03	0.64	0.16	0.68
Control Delay		0.3		18.4	8.2	11.6	4.0	7.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		0.3		18.4	8.2	11.6	4.0	7.7
Queue Length 50th (m)		0.0		4.9	0.2	68.5	1.3	56.2
Queue Length 95th (m)		0.0		20.6	1.7	110.6	4.4	98.5
Internal Link Dist (m)		561.8		431.0		175.2		478.0
Turn Bay Length (m)					33.0		23.0	
Base Capacity (vph)		574		566	157	2673	421	3198
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		0.02		0.19	0.03	0.55	0.11	0.55

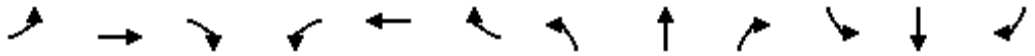
Intersection Summary
Cycle Length: 90.5
Actuated Cycle Length: 60.6
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 3: Paris St & John St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	6	40	2	63	4	1367	34	46	1692	9
Future Volume (vph)	8	0	6	40	2	63	4	1367	34	46	1692	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1726			1696		1803	3492		1770	3536	
Flt Permitted		0.84			0.87		0.11	1.00		0.11	1.00	
Satd. Flow (perm)		1493			1501		204	3492		197	3536	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	0	6	42	2	66	4	1424	35	48	1762	9
RTOR Reduction (vph)	0	12	0	0	59	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	51	0	4	1457	0	48	1772	0
Confl. Peds. (#/hr)	5		5	5		5	8		4	4		8
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	2%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.0			7.0		37.8	37.8		45.1	45.1	
Effective Green, g (s)		7.0			7.0		37.8	37.8		45.1	45.1	
Actuated g/C Ratio		0.11			0.11		0.59	0.59		0.71	0.71	
Clearance Time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		164			165		121	2075		221	2507	
v/s Ratio Prot								0.42		0.01	c0.50	
v/s Ratio Perm		0.00			c0.03		0.02			0.14		
v/c Ratio		0.01			0.31		0.03	0.70		0.22	0.71	
Uniform Delay, d1		25.2			26.1		5.3	9.0		5.5	5.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			1.1		0.1	1.1		0.5	0.9	
Delay (s)		25.2			27.2		5.4	10.1		6.0	6.3	
Level of Service		C			C		A	B		A	A	
Approach Delay (s)		25.2			27.2			10.1			6.3	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	63.6	Sum of lost time (s)	15.5
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	9	4	0	2	1	1545	0	1	1770	7
Future Volume (Veh/h)	3	0	9	4	0	2	1	1545	0	1	1770	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	0	10	4	0	2	1	1717	0	1	1967	8
Pedestrians		2			1							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								347			199	
pX, platoon unblocked	0.80	0.80	0.63	0.80	0.80	0.67	0.63			0.67		
vC, conflicting volume	2838	3695	990	2716	3699	860	1977			1718		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	924	1997	0	771	2002	0	1383			1079		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.8	2.2			2.2		
p0 queue free %	98	100	99	98	100	100	100			100		
cM capacity (veh/h)	180	48	689	229	48	632	317			436		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	13	6	860	858	984	992
Volume Left	3	4	1	0	1	0
Volume Right	10	2	0	0	0	8
cSH	417	291	317	1700	436	1700
Volume to Capacity	0.03	0.02	0.00	0.51	0.00	0.58
Queue Length 95th (m)	0.8	0.5	0.1	0.0	0.1	0.0
Control Delay (s)	13.9	17.6	0.1	0.0	0.1	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	13.9	17.6	0.1		0.0	
Approach LOS	B	C				

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	59.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	20	1512	1	0	1784
Future Volume (Veh/h)	0	20	1512	1	0	1784
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	22	1680	1	0	1982
Pedestrians						1
Lane Width (m)						3.6
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			226			321
pX, platoon unblocked	0.77	0.67			0.67	
vC, conflicting volume	2672	842			1681	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664	0			1041	
tC, single (s)	6.8	6.9			6.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			3.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	307	734			199	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	22	1120	561	991	991
Volume Left	0	0	0	0	0
Volume Right	22	0	1	0	0
cSH	734	1700	1700	1700	1700
Volume to Capacity	0.03	0.66	0.33	0.58	0.58
Queue Length 95th (m)	0.7	0.0	0.0	0.0	0.0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1	1	1	1	20	0
Future Volume (Veh/h)	1	1	1	1	20	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	2	2	2	2	40	0
Pedestrians	1			2	2	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			6		12	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		12	7
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	100
cM capacity (veh/h)			1625		1009	1078

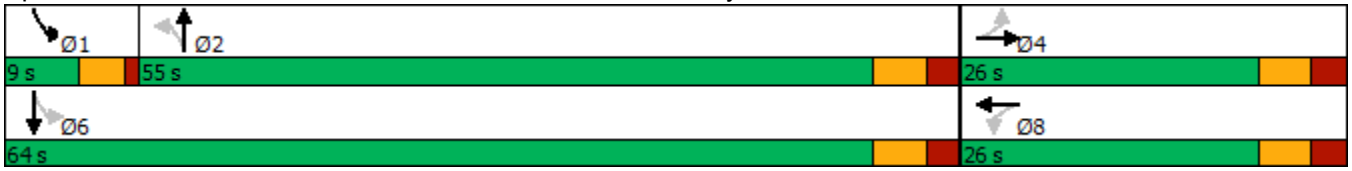
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	4	4	40
Volume Left	0	2	40
Volume Right	2	0	0
cSH	1700	1625	1009
Volume to Capacity	0.00	0.00	0.04
Queue Length 95th (m)	0.0	0.0	1.0
Control Delay (s)	0.0	3.6	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	3.6	8.7
Approach LOS			A

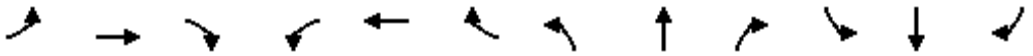
Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	14.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	28	0	60	0	6	1414	47	1747
Future Volume (vph)	28	0	60	0	6	1414	47	1747
Lane Group Flow (vph)	0	43	63	51	6	1522	49	1853
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	30.0	30.0	5.0	30.0
Minimum Split (s)	26.0	26.0	26.0	26.0	35.9	35.9	9.0	35.9
Total Split (s)	26.0	26.0	26.0	26.0	55.0	55.0	9.0	64.0
Total Split (%)	28.9%	28.9%	28.9%	28.9%	61.1%	61.1%	10.0%	71.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.7
All-Red Time (s)	2.5	2.5	2.5	2.5	2.2	2.2	1.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	5.9	5.9	4.0	5.9
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
v/c Ratio		0.16	0.31	0.15	0.05	0.65	0.18	0.71
Control Delay		3.1	32.7	0.9	8.5	11.4	4.6	8.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		3.1	32.7	0.9	8.5	11.4	4.6	8.6
Queue Length 50th (m)		0.0	7.4	0.0	0.3	74.2	1.4	67.2
Queue Length 95th (m)		2.8	21.1	0.0	2.2	113.6	4.5	113.3
Internal Link Dist (m)		198.2		192.5		314.0		201.8
Turn Bay Length (m)					40.0		100.0	
Base Capacity (vph)		501	442	600	142	2742	269	3077
Starvation Cap Reductn		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0
Reduced v/c Ratio		0.09	0.14	0.09	0.04	0.56	0.18	0.60

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 64.8
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 7: Paris St & Boland Ave/Paris Driveway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	0	13	60	0	48	6	1414	32	47	1747	13
Future Volume (vph)	28	0	13	60	0	48	6	1414	32	47	1747	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		5.9	5.9		4.0	5.9	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.85		1.00	1.00		1.00	1.00	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1757		1805	1615		1805	3495		1805	3502	
Flt Permitted		0.77		0.73	1.00		0.10	1.00		0.10	1.00	
Satd. Flow (perm)		1392		1385	1615		182	3495		187	3502	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	0	14	63	0	51	6	1488	34	49	1839	14
RTOR Reduction (vph)	0	38	0	0	45	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	5	0	63	6	0	6	1520	0	49	1852	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.6		7.6	7.6		41.7	41.7		48.4	48.4	
Effective Green, g (s)		7.6		7.6	7.6		41.7	41.7		48.4	48.4	
Actuated g/C Ratio		0.11		0.11	0.11		0.61	0.61		0.71	0.71	
Clearance Time (s)		6.0		6.0	6.0		5.9	5.9		4.0	5.9	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		155		155	180		111	2146		197	2496	
v/s Ratio Prot					0.00			0.43		0.01	c0.53	
v/s Ratio Perm		0.00		c0.05			0.03			0.17		
v/c Ratio		0.03		0.41	0.03		0.05	0.71		0.25	0.74	
Uniform Delay, d1		26.9		28.1	26.9		5.2	8.9		6.0	5.9	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		1.7	0.1		0.2	1.1		0.7	1.2	
Delay (s)		27.0		29.8	26.9		5.4	10.0		6.7	7.2	
Level of Service		C		C	C		A	B		A	A	
Approach Delay (s)		27.0			28.5			10.0			7.2	
Approach LOS		C			C			B			A	

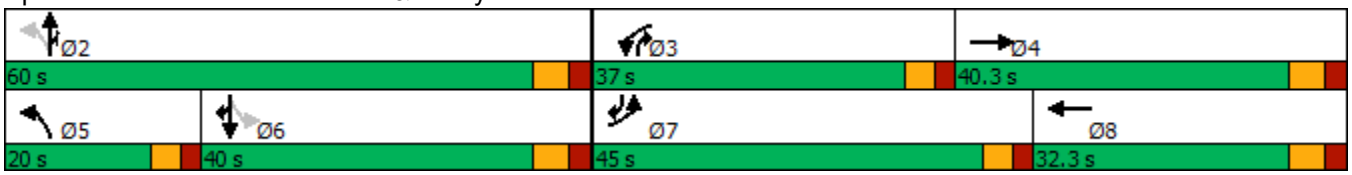
Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	15.9
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

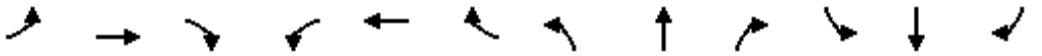
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	195	619	652	515	116	1163	833	28	916	273
Future Volume (vph)	195	619	652	515	116	1163	833	28	916	273
Lane Group Flow (vph)	195	698	652	530	116	1163	833	28	916	273
Turn Type	Prot	NA	Prot	NA	pm+pt	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	7	4	3	8	5	2	2 3		6	6 7
Permitted Phases					2			6		
Detector Phase	7	4	3	8	5	2	2 3	6	6	6 7
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	15.0		15.0	15.0	
Minimum Split (s)	10.0	31.2	10.0	31.2	10.0	40.1		40.1	40.1	
Total Split (s)	45.0	40.3	37.0	32.3	20.0	60.0		40.0	40.0	
Total Split (%)	32.8%	29.4%	26.9%	23.5%	14.6%	43.7%		29.1%	29.1%	
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.5	2.0	2.5	2.0	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.2	5.0	6.2	5.0	6.1		6.1	6.1	
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	Min		Min	Min	
v/c Ratio	0.58	0.83	0.80	0.42	0.50	0.59	0.76	0.27	0.71	0.39
Control Delay	61.6	54.6	54.6	31.8	33.1	32.0	19.2	48.0	46.1	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0
Total Delay	61.6	54.6	54.6	31.8	33.1	32.0	24.5	48.0	46.1	19.3
Queue Length 50th (m)	27.5	97.4	89.5	57.6	20.6	92.6	134.2	6.1	83.4	34.6
Queue Length 95th (m)	40.2	121.6	114.4	77.8	35.3	110.6	200.4	17.0	105.4	59.1
Internal Link Dist (m)		364.5		324.4		160.9			177.4	
Turn Bay Length (m)	57.0		85.0		70.0		6.0	24.0		6.0
Base Capacity (vph)	1024	1009	925	1259	286	2286	1140	121	1481	1042
Starvation Cap Reductn	0	0	0	0	0	0	244	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.69	0.70	0.42	0.41	0.51	0.93	0.23	0.62	0.26

Intersection Summary

Cycle Length: 137.3
Actuated Cycle Length: 123.2
Natural Cycle: 105
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Paris St & Brady St





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	619	79	652	515	15	116	1163	833	28	916	273
Future Volume (vph)	195	619	79	652	515	15	116	1163	833	28	916	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.2		5.0	6.2		5.0	6.1	6.1	6.1	6.1	6.1
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3072	3526		3467	3491		1752	5085	1615	1775	5085	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.14	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	3072	3526		3467	3491		251	5085	1615	417	5085	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	195	619	79	652	515	15	116	1163	833	28	916	273
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	21	0	0	51
Lane Group Flow (vph)	195	690	0	652	529	0	116	1163	812	28	916	222
Confl. Peds. (#/hr)	9		6	6		9	25		33	33		25
Heavy Vehicles (%)	14%	0%	4%	1%	3%	0%	3%	2%	0%	1%	2%	0%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pt+ov	Perm	NA	pt+ov
Protected Phases	7	4		3	8		5	2	2 3		6	6 7
Permitted Phases							2			6		
Actuated Green, G (s)	13.5	29.1		28.8	44.4		47.5	47.5	82.4	31.4	31.4	51.0
Effective Green, g (s)	13.5	29.1		28.8	44.4		47.5	47.5	82.4	31.4	31.4	51.0
Actuated g/C Ratio	0.11	0.24		0.23	0.36		0.39	0.39	0.67	0.26	0.26	0.42
Clearance Time (s)	5.0	6.2		5.0	6.2		5.0	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	337	836		813	1263		232	1968	1084	106	1301	671
v/s Ratio Prot	0.06	c0.20		c0.19	0.15		0.05	0.23	c0.50		0.18	0.14
v/s Ratio Perm							0.15			0.07		
v/c Ratio	0.58	0.83		0.80	0.42		0.50	0.59	0.75	0.26	0.70	0.33
Uniform Delay, d1	51.9	44.4		44.3	29.4		26.7	29.9	13.3	36.4	41.4	24.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	6.7		5.7	0.2		1.7	0.5	2.9	1.3	1.8	0.3
Delay (s)	54.3	51.1		50.0	29.7		28.4	30.4	16.2	37.8	43.2	24.6
Level of Service	D	D		D	C		C	C	B	D	D	C
Approach Delay (s)		51.8			40.9			24.7			38.9	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	122.7	Sum of lost time (s)	22.3
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	3	63	0	8	2238	80	1843
Future Volume (vph)	10	3	63	0	8	2238	80	1843
Lane Group Flow (vph)	0	15	0	174	8	2352	82	1905
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	20.0	20.0	5.0	20.0
Minimum Split (s)	25.7	25.7	25.7	25.7	34.8	34.8	9.0	34.8
Total Split (s)	28.0	28.0	28.0	28.0	83.0	83.0	9.0	92.0
Total Split (%)	23.3%	23.3%	23.3%	23.3%	69.2%	69.2%	7.5%	76.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	2.1	2.1	1.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.7		5.7	5.8	5.8	4.0	5.8
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
v/c Ratio		0.08		0.72	0.07	0.95	0.57	0.70
Control Delay		38.7		46.6	9.1	26.7	28.5	9.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		38.7		46.6	9.1	26.7	28.5	9.1
Queue Length 50th (m)		2.7		25.0	0.6	238.0	3.4	95.6
Queue Length 95th (m)		9.0		49.4	3.0	#374.1	#25.2	161.6
Internal Link Dist (m)		561.8		431.0		175.2		478.0
Turn Bay Length (m)					33.0		23.0	
Base Capacity (vph)		279		341	115	2477	145	2773
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		0.05		0.51	0.07	0.95	0.57	0.69

Intersection Summary

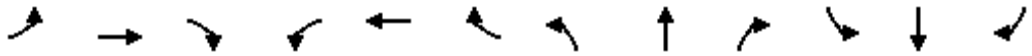
Cycle Length: 120
Actuated Cycle Length: 110.6
Natural Cycle: 120
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Paris St & John St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	3	2	63	0	106	8	2238	44	80	1843	5
Future Volume (vph)	10	3	2	63	0	106	8	2238	44	80	1843	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1799			1627		1802	3529		1736	3537	
Flt Permitted		0.74			0.87		0.09	1.00		0.05	1.00	
Satd. Flow (perm)		1373			1443		164	3529		90	3537	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	10	3	2	65	0	109	8	2307	45	82	1900	5
RTOR Reduction (vph)	0	2	0	0	54	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	120	0	8	2351	0	82	1905	0
Confl. Peds. (#/hr)	3		4	4		3	14		2	2		14
Heavy Vehicles (%)	0%	0%	0%	0%	0%	6%	0%	2%	0%	4%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.4			14.4		77.6	77.6		85.5	85.5	
Effective Green, g (s)		14.4			14.4		77.6	77.6		85.5	85.5	
Actuated g/C Ratio		0.13			0.13		0.70	0.70		0.77	0.77	
Clearance Time (s)		5.7			5.7		5.8	5.8		4.0	5.8	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		177			186		114	2458		126	2714	
v/s Ratio Prot								c0.67		0.02	c0.54	
v/s Ratio Perm		0.01			c0.08		0.05			0.48		
v/c Ratio		0.07			0.65		0.07	0.96		0.65	0.70	
Uniform Delay, d1		42.6			46.1		5.4	15.4		29.5	6.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			7.5		0.3	9.9		11.4	0.8	
Delay (s)		42.8			53.5		5.7	25.2		40.9	7.4	
Level of Service		D			D		A	C		D	A	
Approach Delay (s)		42.8			53.5			25.2			8.7	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	15.5
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	7	4	0	2	1	2266	1	1	1990	13
Future Volume (Veh/h)	9	0	7	4	0	2	1	2266	1	1	1990	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	0	7	4	0	2	1	2360	1	1	2073	14
Pedestrians		3			2							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								347			199	
pX, platoon unblocked	0.47	0.47	0.66	0.47	0.47	0.30	0.66			0.30		
vC, conflicting volume	3269	4450	1046	3410	4456	1182	2090			2363		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	298	2789	20	596	2803	0	1612			890		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	98	100	99	100			100		
cM capacity (veh/h)	296	9	693	182	9	329	268			232		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	6	1181	1181	1038	1050
Volume Left	9	4	1	0	1	0
Volume Right	7	2	0	1	0	14
cSH	395	214	268	1700	232	1700
Volume to Capacity	0.04	0.03	0.00	0.69	0.00	0.62
Queue Length 95th (m)	1.0	0.7	0.1	0.0	0.1	0.0
Control Delay (s)	14.5	22.3	0.2	0.0	0.2	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	14.5	22.3	0.1		0.1	
Approach LOS	B	C				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	16	2242	6	0	1996
Future Volume (Veh/h)	0	16	2242	6	0	1996
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	17	2360	6	0	2101
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			225			321
pX, platoon unblocked	0.47	0.29			0.29	
vC, conflicting volume	3414	1184			2367	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	311	0			782	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			100	
cM capacity (veh/h)	313	311			241	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	1573	793	1050	1050
Volume Left	0	0	0	0	0
Volume Right	17	0	6	0	0
cSH	311	1700	1700	1700	1700
Volume to Capacity	0.05	0.93	0.47	0.62	0.62
Queue Length 95th (m)	1.4	0.0	0.0	0.0	0.0
Control Delay (s)	17.2	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	17.2	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	7	0	0	2	15	0
Future Volume (Veh/h)	7	0	0	2	15	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Hourly flow rate (vph)	10	0	0	3	22	0
Pedestrians	1			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			10		14	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			10		14	12
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1623		1009	1073

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	10	3	22
Volume Left	0	0	22
Volume Right	0	0	0
cSH	1700	1623	1009
Volume to Capacity	0.01	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.5
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	27	1	44	3	24	2174	75	1860
Future Volume (vph)	27	1	44	3	24	2174	75	1860
Lane Group Flow (vph)	0	47	48	56	26	2435	82	2056
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	30.0	30.0	5.0	30.0
Minimum Split (s)	26.0	26.0	26.0	26.0	35.9	35.9	9.0	35.9
Total Split (s)	26.0	26.0	26.0	26.0	85.0	85.0	9.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	70.8%	70.8%	7.5%	78.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.7	3.7	3.0	3.7
All-Red Time (s)	2.5	2.5	2.5	2.5	2.2	2.2	1.0	2.2
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	5.9	5.9	4.0	5.9
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
v/c Ratio		0.35	0.32	0.29	0.22	0.89	0.54	0.69
Control Delay		40.8	52.4	17.8	11.5	18.3	25.3	6.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		40.8	52.4	17.8	11.5	18.3	25.3	6.4
Queue Length 50th (m)		6.4	10.3	0.6	1.7	220.6	2.5	86.1
Queue Length 95th (m)		18.5	22.4	13.0	7.4	#351.0	#20.7	135.0
Internal Link Dist (m)		192.5		282.1		313.9		201.2
Turn Bay Length (m)					40.0		100.0	
Base Capacity (vph)		255	311	340	116	2729	153	2965
Starvation Cap Reductn		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0
Reduced v/c Ratio		0.18	0.15	0.16	0.22	0.89	0.54	0.69

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 108.2
Natural Cycle: 130
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Paris St & Boland Ave/Paris Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1	16	44	3	49	24	2174	66	75	1860	31
Future Volume (vph)	27	1	16	44	3	49	24	2174	66	75	1860	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		5.9	5.9		4.0	5.9	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.95		1.00	0.86		1.00	1.00		1.00	1.00	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1628		1805	1608		1804	3523		1805	3530	
Flt Permitted		0.78		0.89	1.00		0.08	1.00		0.05	1.00	
Satd. Flow (perm)		1307		1683	1608		150	3523		88	3530	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	1	17	48	3	53	26	2363	72	82	2022	34
RTOR Reduction (vph)	0	16	0	0	49	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	31	0	48	7	0	26	2434	0	82	2055	0
Confl. Peds. (#/hr)	2					2	4		2	2		4
Heavy Vehicles (%)	4%	0%	14%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.0		8.0	8.0		82.5	82.5		90.4	90.4	
Effective Green, g (s)		8.0		8.0	8.0		82.5	82.5		90.4	90.4	
Actuated g/C Ratio		0.07		0.07	0.07		0.75	0.75		0.82	0.82	
Clearance Time (s)		6.0		6.0	6.0		5.9	5.9		4.0	5.9	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		94		122	116		112	2635		132	2893	
v/s Ratio Prot					0.00			c0.69		0.02	c0.58	
v/s Ratio Perm		0.02		c0.03			0.17			0.48		
v/c Ratio		0.33		0.39	0.06		0.23	0.92		0.62	0.71	
Uniform Delay, d1		48.6		48.8	47.6		4.2	11.3		27.6	4.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1		2.1	0.2		1.1	6.1		8.8	0.8	
Delay (s)		50.7		50.9	47.9		5.3	17.4		36.3	5.1	
Level of Service		D		D	D		A	B		D	A	
Approach Delay (s)		50.7			49.3			17.3			6.3	
Approach LOS		D			D			B			A	

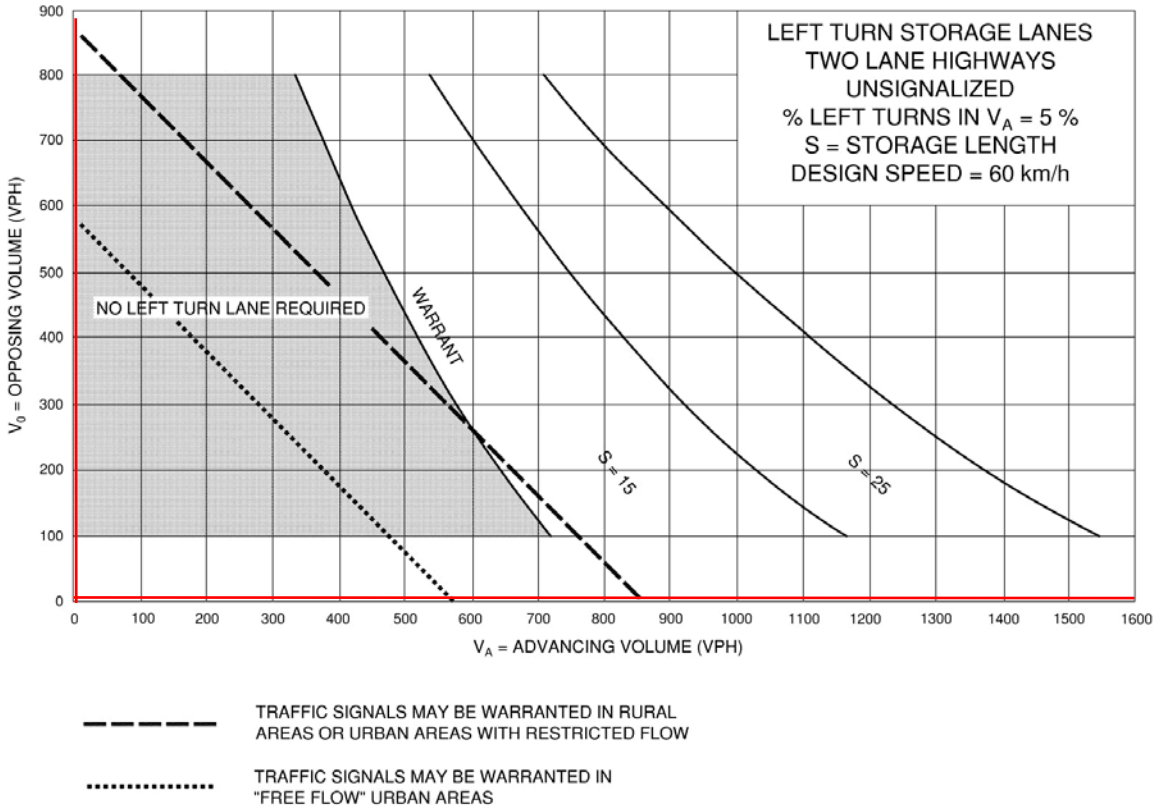
Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.3	Sum of lost time (s)	15.9
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

MTO Left-Turn Analysis

Bell Park Road / Facer Street
2032 Total - Westbound
Critical Case - AM Peak Hour

Exhibit 9A-6



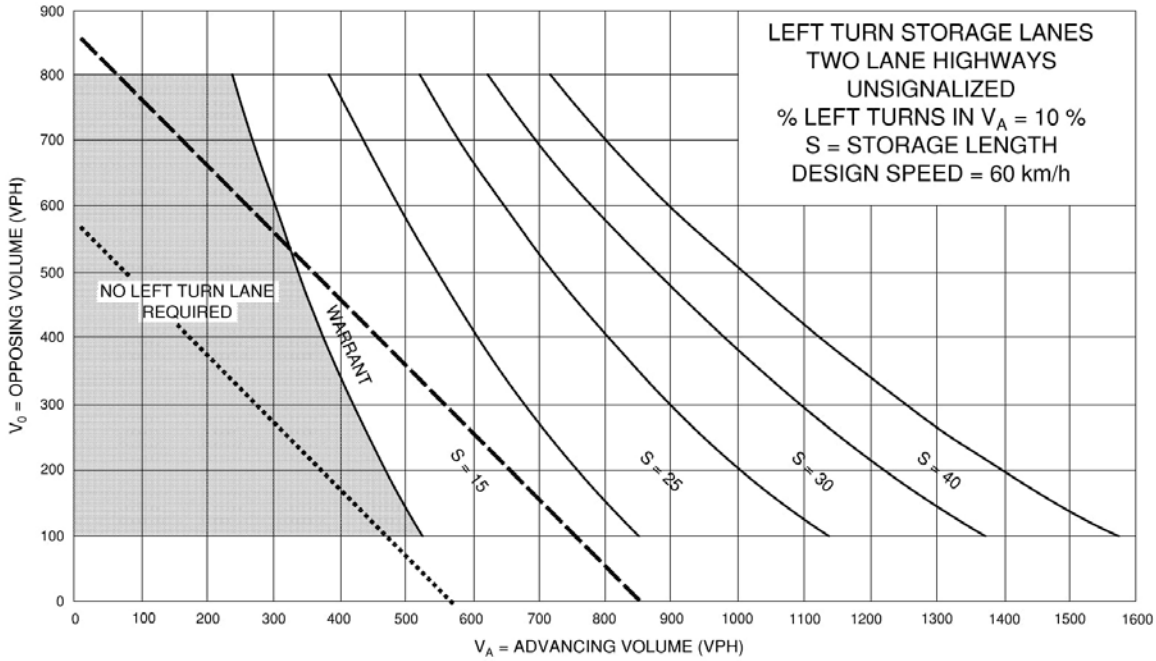
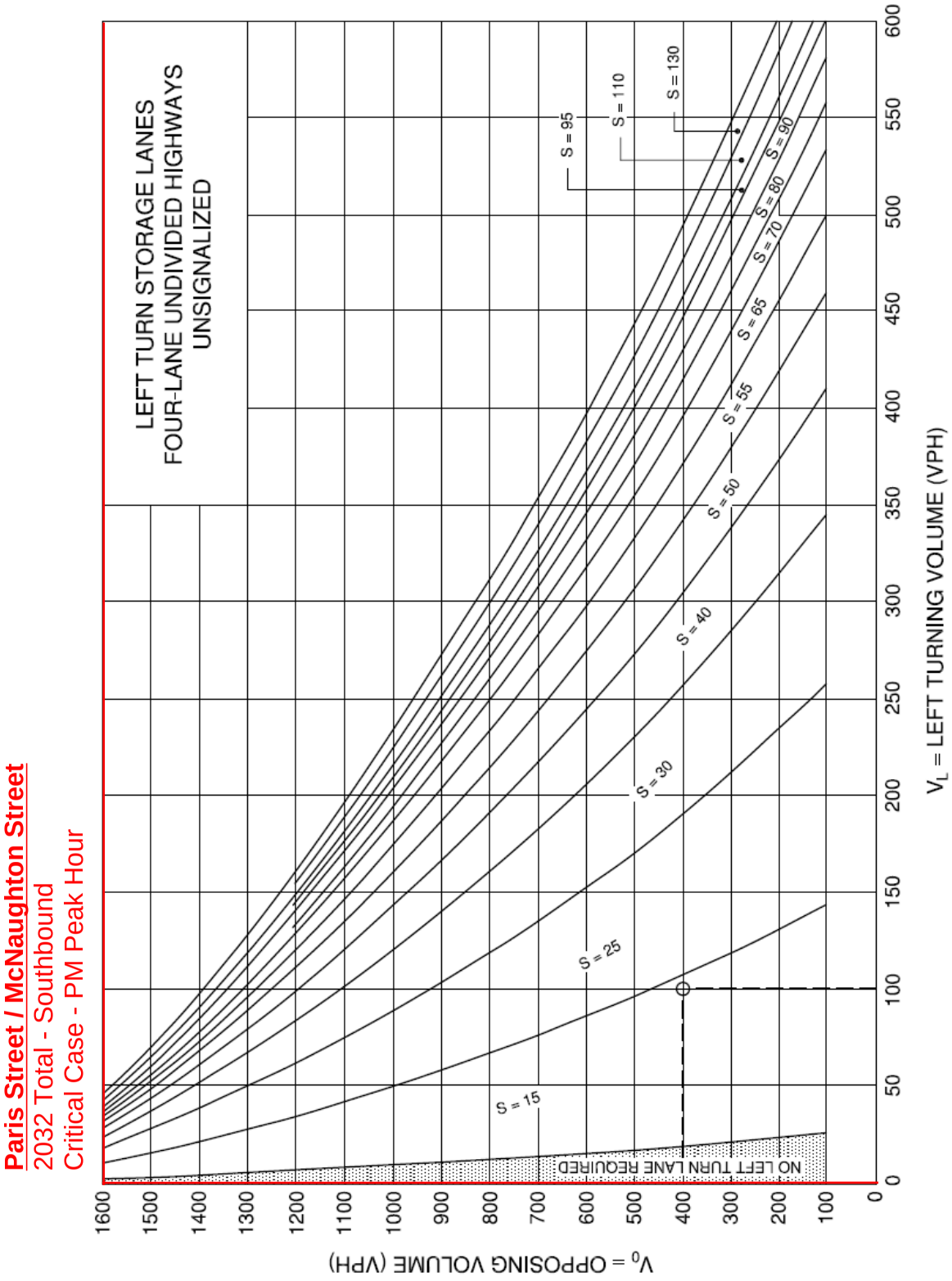


Exhibit 9A-30



Paris Street / McNaughton Street
2032 Total - Southbound
Critical Case - PM Peak Hour

Exhibit 9A-30

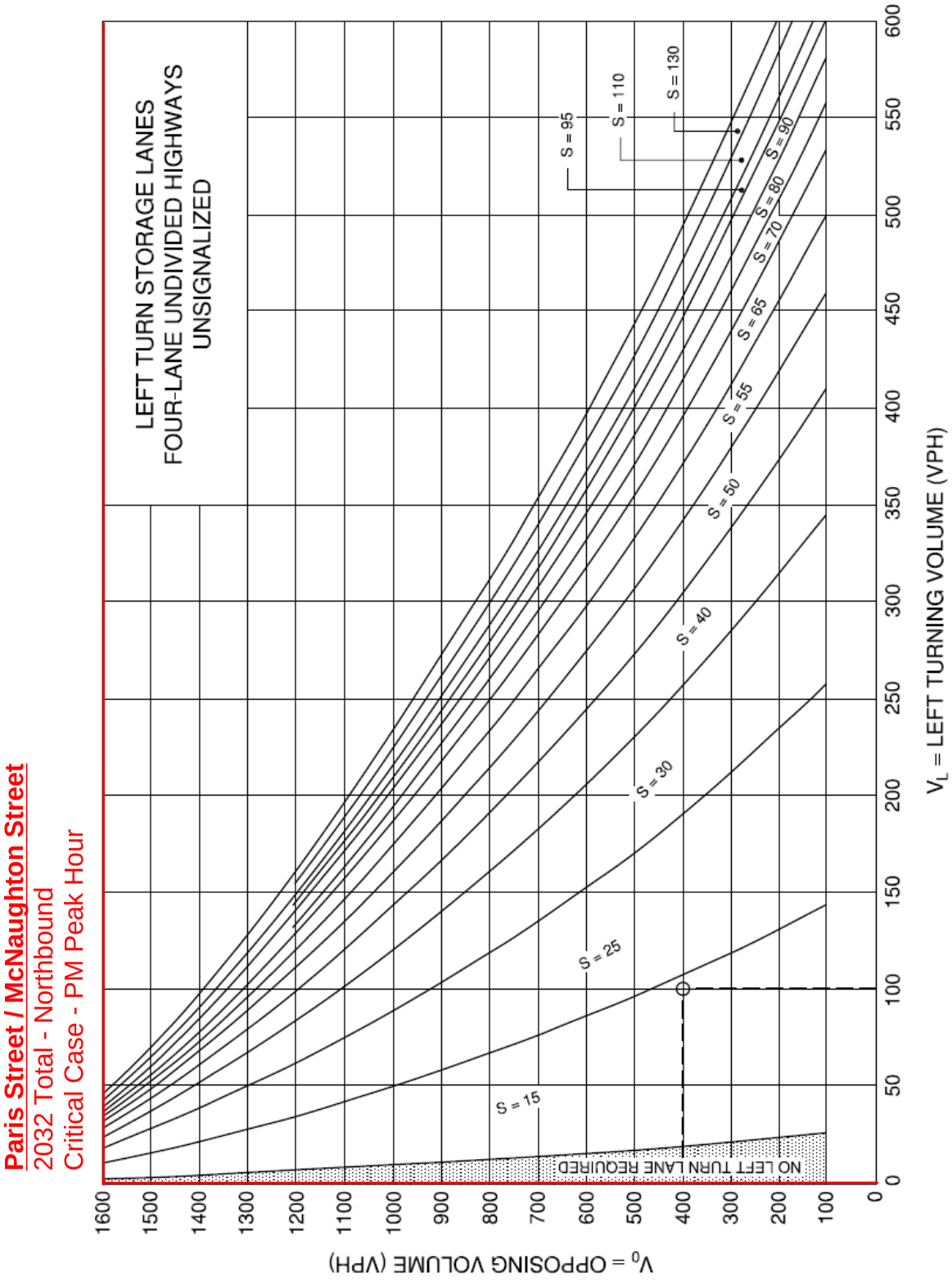
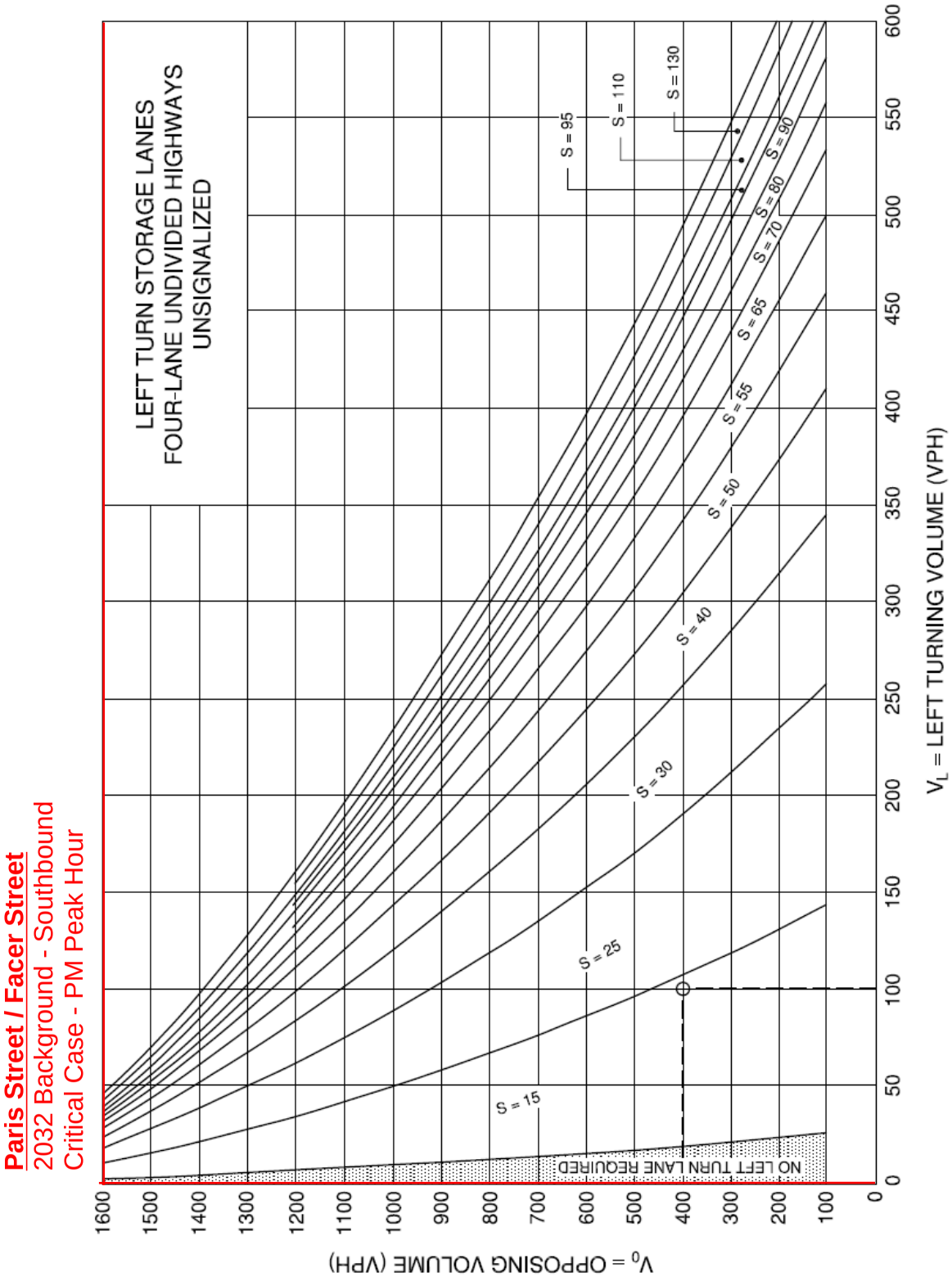


Exhibit 9A-30



Paris Street / Facer Street
2032 Background - Southbound
Critical Case - PM Peak Hour

OTM Signal Justification Sheets

Justification No. 7 - 2032 Total Traffic (Critical Case)

Paris Street / McNaughton Street

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	900	1909	212%	5%	YES	YES
	B. Vehicle volume, along minor streets (average hour)	170	10	6%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	900	1894	210%	2%	YES	YES
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	170	5	3%		NO	NO

Justification No. 7 - 2032 Total Traffic (Critical Case)

Paris Street / Facer Street

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	900	1894	210%	3%	YES	YES
	B. Vehicle volume, along minor streets (average hour)	255	9	4%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	900	1883	209%	0%	YES	YES
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	170	0	0%		NO	NO

Justification No. 7 - 2032 Total Traffic (Critical Case)

Bell Park Road / Facer Street

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	720	12	2%	1%	NO	NO
	B. Vehicle volume, along minor streets (average hour)	255	9	3%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	720	3	0%	0%	NO	NO
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75	10	14%		NO	NO