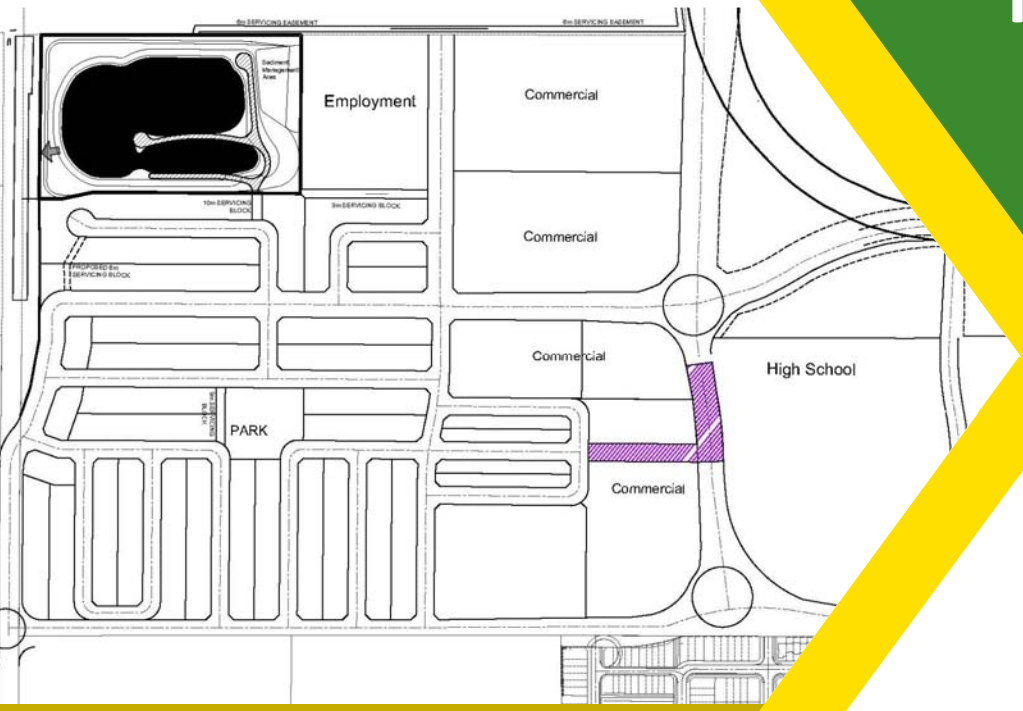
Shenkman Corporation

195 Huntmar



Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Analysis Report

C|G|H
TRANSPORTATION

195 Huntmar Road

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

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Step 4 Analysis Report

Prepared for:

Shenkman Corporation
C/O Peter Hume
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Prepared by:

13 Markham Avenue
Ottawa, ON K2G 3Z1

September 2019

PN: 2018-29

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1 Screening

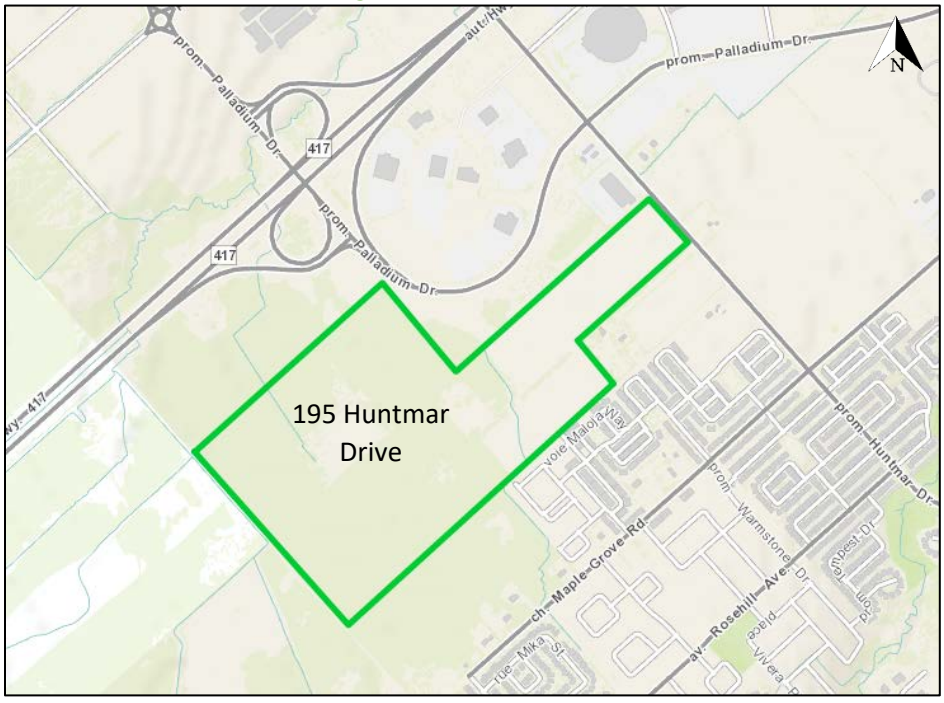
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component.

2 Existing and Planned Conditions

2.1 Proposed Development

The proposed development, located at 195 Huntmar, is currently a greenfield property, a portion of which is within the Kanata West Mixed-Use Centre. The site is in an area that is currently zoned Development Reserve. The current development application would modify the zoning to allow for low-rise residential uses, with commercial areas along the future north-south arterial road. The residential portion of the development will include a mixture of detached homes and townhouses. The concept plan currently considers a total of 155 single-detached and 418 townhouse units. The commercial properties, split across three parcels, will contain 13,747 square metres of various land uses. There will be two car dealerships, the size of these car dealerships has been estimated based on the parcel size, reviewing the building size of dealerships in the nearby Palladium Drive, and adding an additional 10% to account for any variance once the design of each building is completed, for an estimated building size of 4,000 square meters per dealership. This development will also include a 41,948 square metre office building. Access to the proposed development will be via a new north-south arterial road that will tie into Palladium Drive, which will be realigned to meet the arterial road at a future roundabout. While this site has a Huntmar municipal address there are no proposed accesses on Huntmar Drive. A temporary secondary access will be provided to the south leg of the future roundabout. No direct access from the commercial developments onto Palladium Drive are proposed. The anticipated full build-out horizon is 2024, with a plus five years horizon of 2029. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

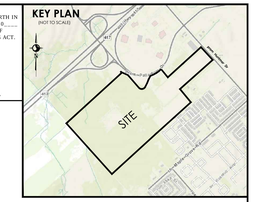
Figure 1: Area Context Plan



SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED _____ 20____.
THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT. THIS ____ DAY OF _____ 2019.

DERRICK MOQUIN
MANAGER, DEVELOPMENT REVIEW-WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

KEY PLAN
(NOT TO SCALE)



DRAFT PLAN OF SUBDIVISION OF

PART OF LOTS 1 AND 2
CONCESSION 1
(GEOGRAPHIC TOWNSHIP OF HUNTLEY)
CITY OF OTTAWA

Scale 1:1250
20 0 10 20 30 40 50 METRES

METRIC CONVERSION

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

SCHEDULE OF LAND USE			
LOT/BLOCK	USE	UNITS	AREA (Ha)/(ac)
1 TO 155	RESIDENTIAL SINGLES	155	4.62 / 11.35
156 TO 229	RESIDENTIAL TOWNS	332	6.80 / 16.79
240 TO 247	R28	64	0.71 / 1.75
248	CONDO	143	1.75 / 4.33
249 TO 251	SERVICING/EASEMENT		0.19 / 0.48
252 AND 253	PARK		6.28 / 15.76
254 AND 255	SCHOOL		7.46 / 18.44
256 TO 260	COMMERCIAL		9.30 / 22.97
261	EMPLOYMENT		2.00 / 4.94
262	STORM POND		4.21 / 10.40
263 AND 264	OPEN SPACE		0.65 / 1.60
264	PROPOSED STREET		0.41 / 1.03
265	STREET WIDENING		0.13 / 0.32
STREETS	STREETS		13.52 / 33.43
TOTAL		714	58.72 / 145.02

INFORMATION: REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT R.S.O. 1990

a. SEE PLAN
b. SEE PLAN
c. SEE PLAN
d. SEE PROPOSED LAND USE SCHEDULE (ABOVE)
e. SEE PLAN
f. SEE PLAN
g. SEE PLAN
h. CITY WATER AVAILABLE - WELL
i. SEE SOIL REPORT
j. SEE TOPOGRAPHICAL INFORMATION
k. ALL CITY SERVICES AVAILABLE
l. NO EASEMENTS REGISTERED ON TITLE

SURVEYOR'S CERTIFICATE

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

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL. (613)722-4420 FAX. (613)722-2799
stantec.com

DRAWN: CSC | CHECKED: FP | PM: BP | FIELD: N.A. | PROJECT NO.: 161410445-101

2.2 Existing Conditions

2.2.1 Area Road Network

Huntmar Drive

Huntmar Drive is a City of Ottawa arterial road with a two-lane rural cross-section including gravel shoulders and a 50 km/h posted speed limit along the frontage of the site. At the intersection with Palladium Drive, Huntmar Drive has an urban cross-section. The Ottawa Official Plan reserves a 37.5 metre right of way along the Huntmar Drive frontage.

Palladium Drive

Palladium Drive is a City of Ottawa arterial road with a four-lane rural cross-section including gravel shoulders and a 70 km/h posted speed limit. At the intersection with Huntmar Drive, Palladium Drive has an urban cross-section and the speed limit drops to 60 km/h. The Ottawa Official Plan reserves a 44.5 metre right of way between Highway 417 and First Line / Silver Seven.

Highway 417

Highway 417 is a Ministry of Transportation Ontario divided freeway with a 100 km/h posted speed limit. There is an eastbound and westbound ramp terminal on Palladium Drive.

2.2.2 Existing Intersections

Huntmar Drive / Palladium Drive

The intersection of Huntmar Drive at Palladium Drive is a signalized intersection with auxiliary left turn lanes on every approach and auxiliary right turn lanes on the northbound and southbound approaches. The southbound approach also includes a smart channel on the right turn lane. No turn restrictions were noted, but trucks are restricted from proceeding southbound through the intersection. Figure 3 is an aerial photograph of the subject intersection.

Figure 3: Intersection of Huntmar Drive at Palladium Drive

Highway 417 South Ramp Terminal / Palladium Drive

The intersection of the Highway 417 South Ramp Terminal at Palladium Drive is an unsignalized intersection with no auxiliary lanes. As this is a ramp terminal the right turns are large channelized ramps to allow for acceleration onto the highway. Figure 4 is an aerial photograph of the subject intersection.

Figure 4: Highway 417 South Ramp Terminal at Palladium Drive

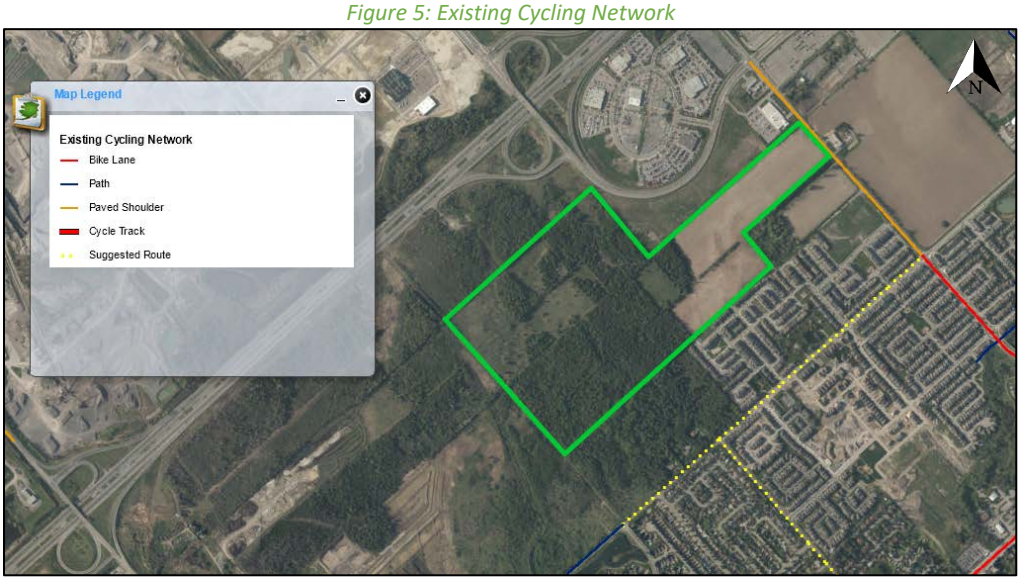
2.2.3 Existing Driveways

There are no existing driveways within 200 metres of the proposed site access as the access road to this development does not yet exist.

2.2.4 Cycling and Pedestrian Facilities

The access road to the proposed development does not yet exist and therefore there are no existing cycling facilities on the access road to the proposed development. Along the Huntmar Drive frontage of the proposed development, there is currently a paved shoulder. Figure 5 illustrates the existing cycling network

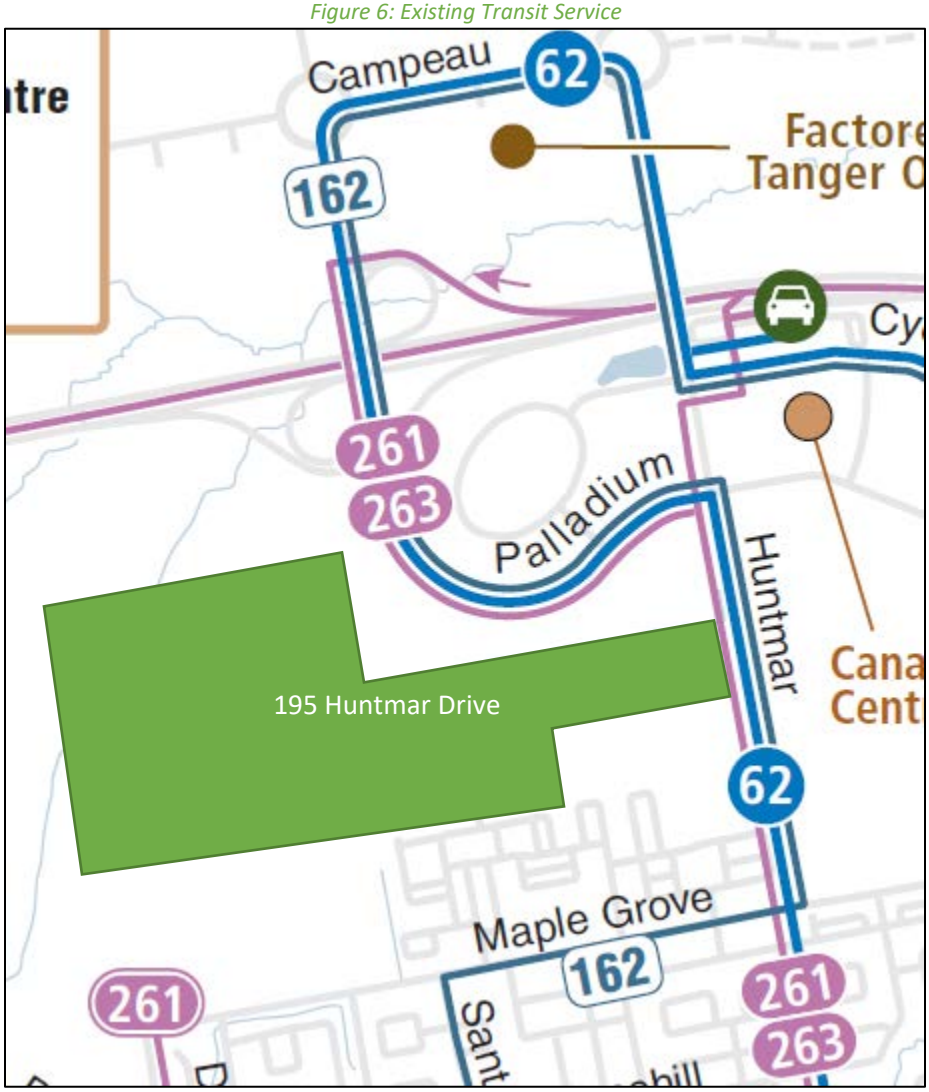
Figure 5: Existing Cycling Network



2.2.5 Existing Transit

Transit service is currently provided along Huntmar Drive and Palladium Drive via Routes 62, 162, 261, and 263. Figure 6 illustrates the existing transit network.

Figure 6: Existing Transit Service



2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

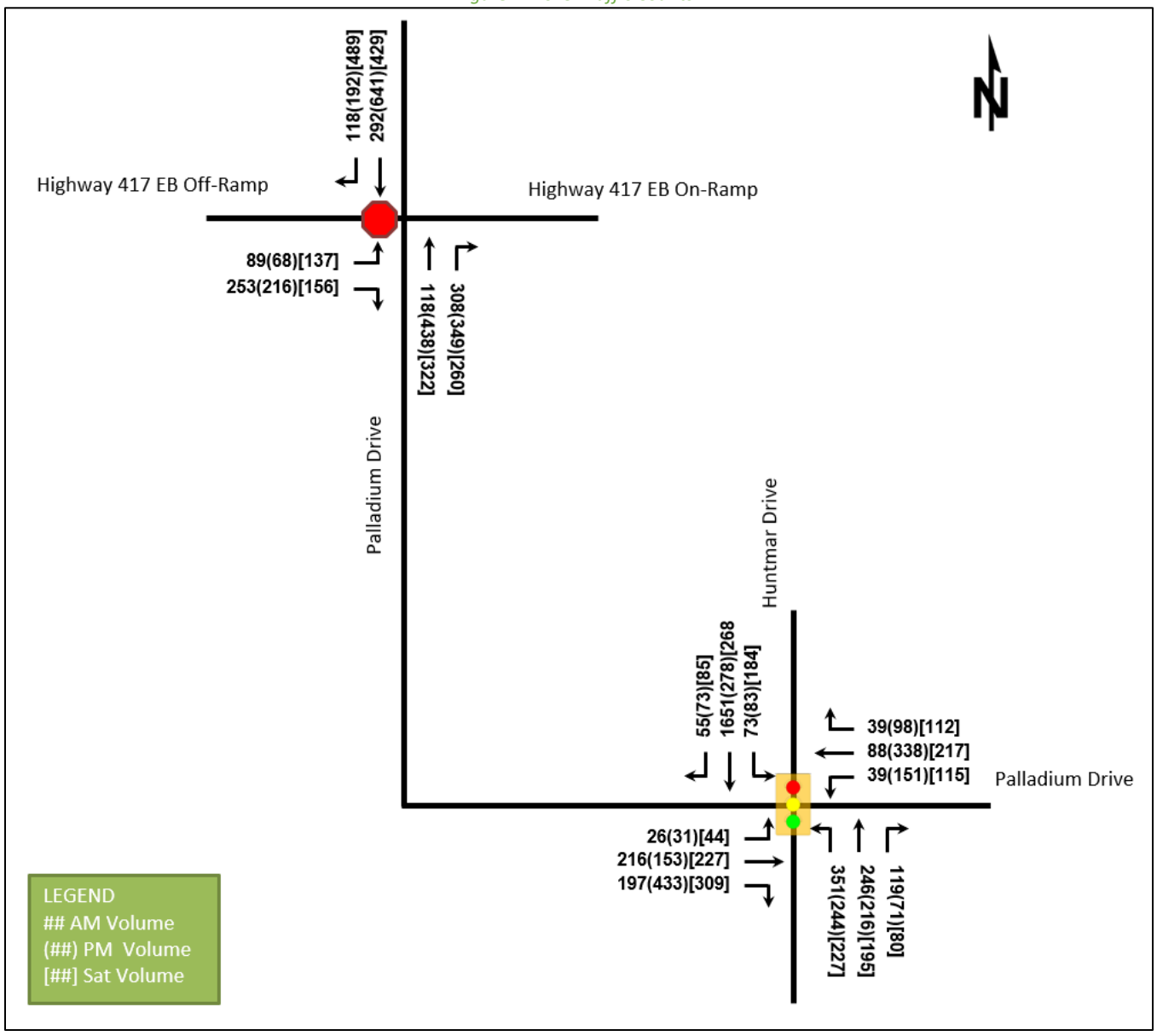
2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were requested from the City of Ottawa. It was determined that these counts were too old to be usable for this TIA. Therefore, new counts have been undertaken at the Study Area intersections. Table 1 summarizes the intersection count dates and locations. Figure 7 illustrates the 2019 traffic counts. Detailed turning movement count data is included in Appendix B.

Table 1: Intersection Count Date

Intersection	Count Date	
Huntmar Drive at Palladium Drive	Tuesday April 2, 2019	Saturday April 6, 2019
Highway 417 at Palladium Drive	Wednesday April 3, 2019	Saturday April 6, 2019

Figure 7: 2019 Traffic Counts



2.2.8 Collision Analysis

Collision data has been acquired from the City of Ottawa for five years prior to the commencement of this TIA at each of the Study Area intersections. Table 2 summarizes the collisions at the intersection of Palladium Drive at Huntmar Drive.

Table 2:Collision Summary – Palladium Drive at Huntmar Drive

		Number	%
Total Collisions		**31**	**100%**
Classification	Fatality	0	0%
	Non-Fatal Injury	5	16%
	Property Damage Only	25	81%
Initial Impact Type	Angle	3	10%
	Rear end	11	35%
	Sideswipe	4	13%
	Turning Movement	10	32%
	SMV Other	2	6%
	Other	0	0%
Road Surface Condition	Dry	14	45%
	Wet	5	16%
	Loose Snow	5	16%
	Slush	0	0%
	Packed Snow	2	6%
	Ice	4	13%
Pedestrian Involved		**0**	
Cyclists Involved		**1**	

Collisions at the intersection of Palladium Drive at Huntmar Drive were primarily on the east and west legs, and 40% of the collisions involved a turning movement. It was also noted that 60% of the collisions only involved property damage, indicating low speed collisions, with no fatalities. Collision data is included in Appendix C.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

Access to the proposed development will be provided via a new north south arterial road. As illustrated on Figure 2, Palladium Drive will be realigned between Huntmar Drive and the Highway 417 interchange. This realignment will include a new intersection with a roundabout control. The south and west legs will provide access to the proposed development. This TIA has been prepared to examine the impact of the proposed changes and to understand how the proposed roundabout on Palladium Drive would operate prior to the completion of the north-south arterial road.

In the fullness of time Stittsville Main Street will connect to the east-west Kanata Arterial Road that will run along the southern edge of the subject development. This is not anticipated to receive funding within the study horizons and therefore no traffic from Stittsville Main Street will be considered in the projections for this TIA.

2.3.2 Other Study Area Developments

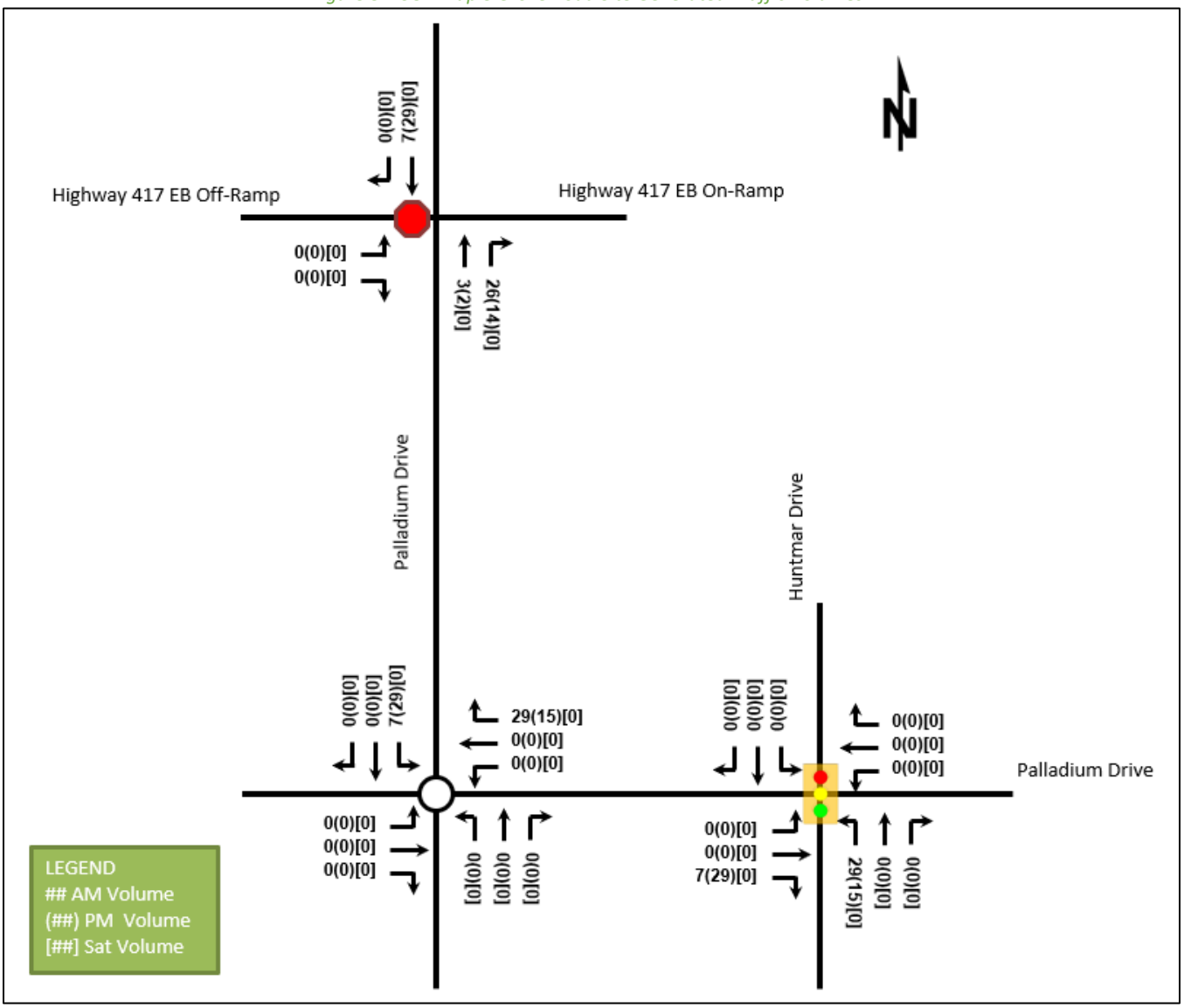
To understand the changes in the Study Area, network the City of Ottawa's Development Applications webtool has been used to identify relevant background developments and download the traffic studies associated with each development.

1981 Maple Grove Road

Adjacent to the site, along the southern edge, is the proposed residential development of 1981 Maple Grove Road. This proposed development includes 139 townhouse / semi-detached residential units and 57 single detached residential units. This development would have access to Maple Grove Drive and the Stittsville Main Street

Extension. Figure 8 is an excerpt from the 1981 Maple Grove Road TIA, illustrating the site generated traffic volumes. This TIA assumes that the Stittsville Main Street Extension does not connect through to Palladium Drive.

Figure 8: 1981 Maple Grove Road Site Generated Traffic Volumes



173 Huntmar Drive

173 Huntmar Drive is a mixed-use development fronting Huntmar Drive and the east-west portion of the Future North-South Arterial Road. The development includes a retail and office component along Huntmar Drive that includes 65,930 ft^2 of office space and 21,960 ft^2 of retail space. The residential portion of the development includes 52 townhomes and 156 apartment units. This development would have direct access onto Huntmar Drive and the Future North-South Arterial Road. The TIA for 173 Huntmar Drive assumes that the Future North-South Arterial Road connects all the way through to Palladium Drive. However, this portion of the road may not be constructed within the Study horizons. Therefore, the traffic from this development has been assumed to access directly onto Huntmar Drive only. Figure 9 is an excerpt from the 173 Huntmar Drive CTS. Figure 10 illustrates the redistributed traffic that will be included in the analysis herein.

Figure 9: 173 Huntmar CTS Site Generated Traffic Volumes

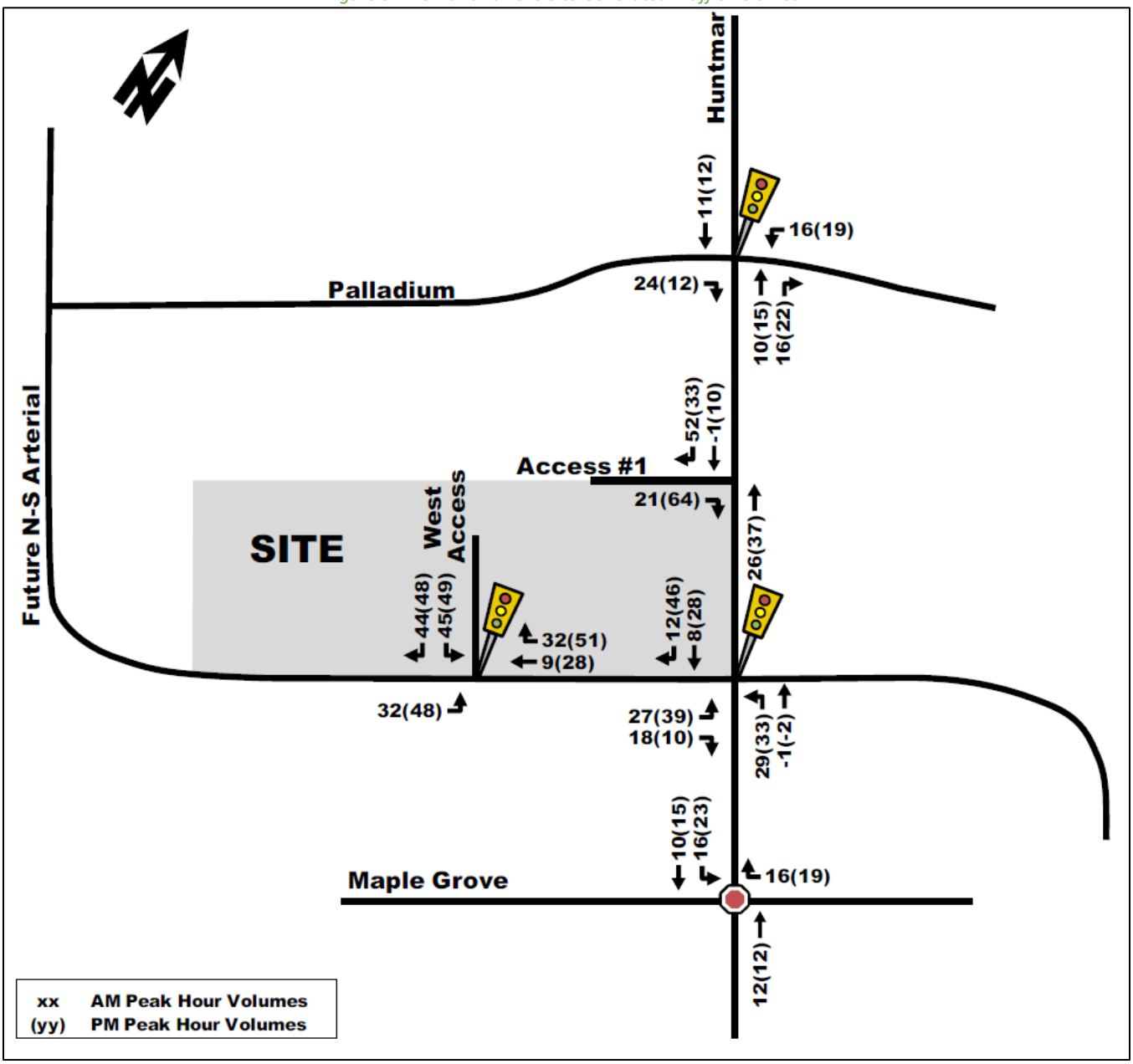
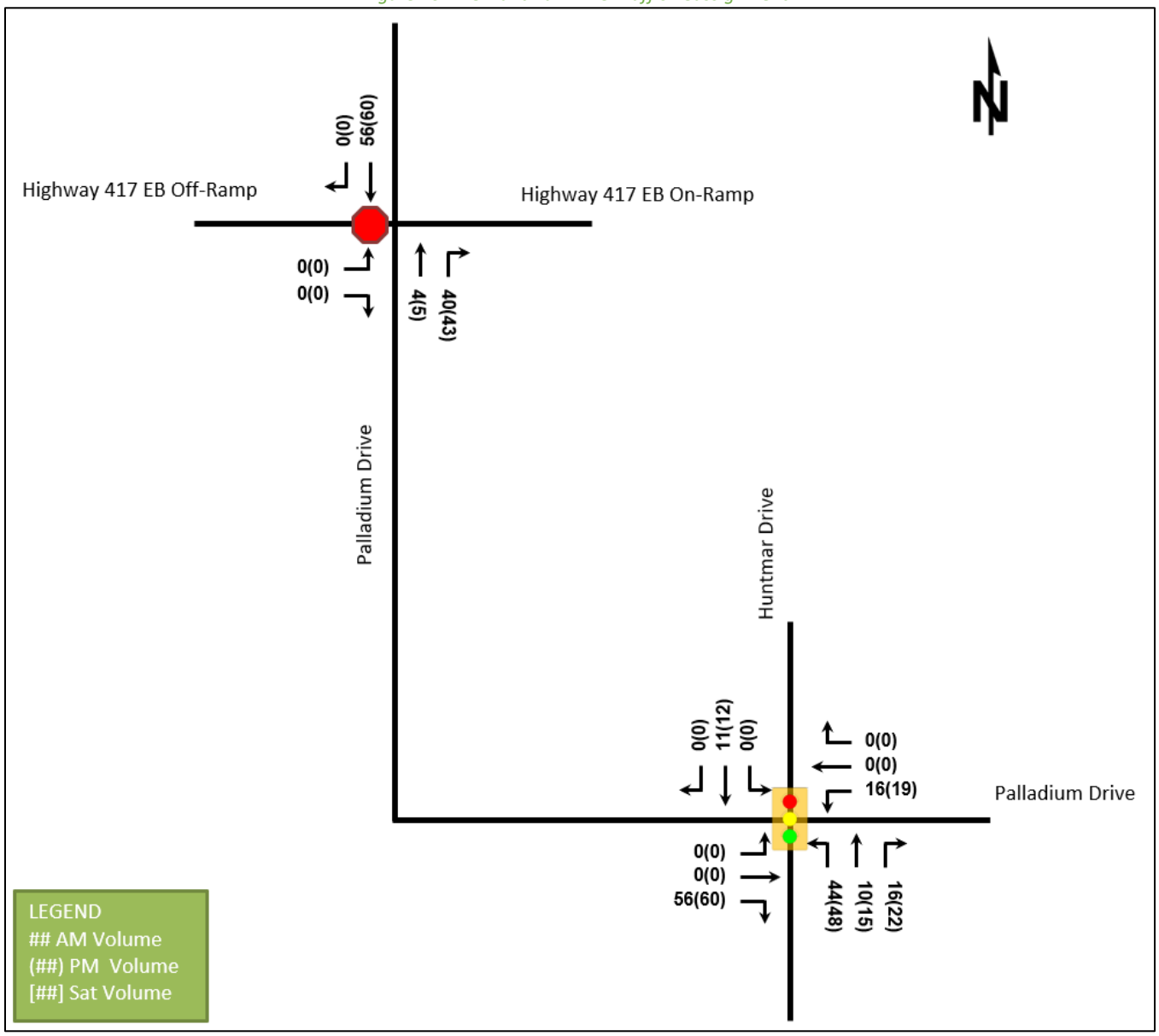


Figure 10: 173 Huntmar Drive Traffic Reassignment



180 Huntmar Drive

This development is for a small two-storey school. This development application does not include a TIA and therefore it is assumed that it will not generate a significant amount of traffic through the Study Area intersections.

2499 Palladium Drive

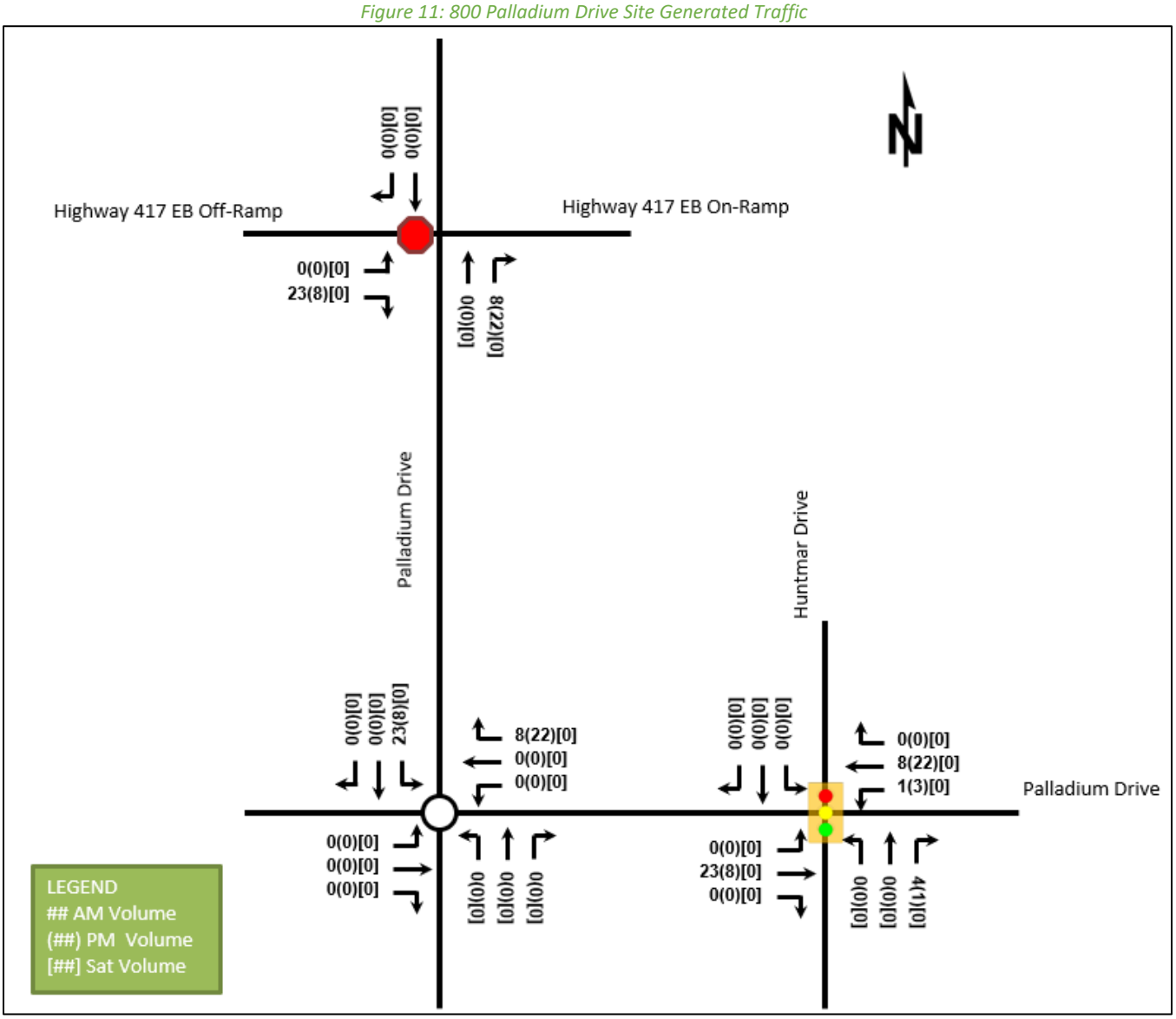
This development is a series of small commercial developments accessing directly onto Palladium Drive. This development application does not include a TIA and therefore it is assumed that it will not generate a significant amount of traffic through the Study Area intersections.

800 Palladium Drive

This development, at the north-east corner of the Palladium Drive and Cyclone Taylor Boulevard intersection, is a mixed-use development including 1,000 square metres of commercial space, 7,400 square metres of office space,

and a 465 square metre restaurant. Figure 11 illustrates the site generated traffic associated with the proposed development at 800 Palladium Drive. No Saturday projections were included in the TIA for 800 Palladium Drive and given the land use (primarily office space) no significant Saturday trip generation is anticipated.

Figure 11: 800 Palladium Drive Site Generated Traffic



2.3.3 Background Growth Rate

This study will consider the significant trip generators that will access the proposed road network. For this exercise, no background growth rate has been applied.

2.4 Study Area and Time Periods

2.4.1 Study Area

The study area will include the intersections of Huntmar Drive and Palladium Drive, the southern Palladium Drive at Highway 417, and the future intersection of Palladium Drive and the new north-south arterial road.

2.4.2 Time Periods

As the proposed development includes several land uses including residential, office, and retail components, therefore the weekday AM and PM peak hours along with the Saturday peak hour will be examined.

2.4.3 Horizon Years

The anticipated build-out year is 2024. As a result, the full build-out plus five years horizon year is 2029.

2.5 Exemption Review

Table 3 summarizes the exemptions for this TIA.

Table 3: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Exempt
	4.2.3 New Street Networks	Only required for plans of subdivision	Required
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Exempt
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt. The development will not rely on local or collector streets for access.
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Required

3 Forecasting

3.1 Development-Generated Travel Demand

3.1.1 Trip Generation and Mode Shares

The proposed development contains several land uses, including residential, commercial, and office spaces. For the residential units the AM and PM peak hour trip generation rates have been estimated using the City of Ottawa's preferred Trans Study trip generation rates. For all other land uses, and the Saturday peak hour for the residential land uses, ITE Trip Generation Manual (10th Edition) Rates have been applied. Trans Trip Rates have been converted to person trips using the Trans Mode Shares. For the ITE rates, a factor of 1.28 has been applied to estimate the person trip generation rates. Table 4 summarizes the person trip rates for the proposed land uses.

Table 4: Trip Generation Person Trip Rates

Dwelling Type	ITE LUC	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Single Detached	210	AM	0.70	1.27
		PM	0.90	1.41
		Sat	0.96	1.19
Townhouse	220	AM	0.54	0.98
		PM	0.71	1.16
		Sat	0.70	0.90
Shopping Center	820	AM	0.94	1.20
		PM	3.81	4.88
		Sat	4.50	5.76
General Office Building	710	AM	1.00	1.28
		PM	1.06	1.35
		Sat	0.53	0.68
Automobile Sales (New)	840	AM	1.87	2.39
		PM	2.43	3.11
		Sat	4.02	5.15

LUC – Land Use Code

Using the above Person Trip rates, the total person trip generation has been estimated. Table 5 below summarizes the total person trip generation by land use type.

Table 5: Total Person Trip Generation

Land Use	Units / GFA (s.m.)	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Single Detached	155 units	57	140	197	134	85	219	99	85	184
Townhouse	418 units	152	258	410	257	228	485	188	188	376
Shopping Center	13,747	81	51	132	260	281	541	332	308	639
General Office Building	41,948	497	81	578	98	512	610	166	141	307
Automobile Sales (New) 1	4,000	75	28	103	51	76	127	111	111	222
Automobile Sales (New) 2	4,000	75	28	103	51	76	127	111	111	222
Total Person Trips		**937**	**586**	**1523**	**851**	**1258**	**2109**	**1007**	**944**	**1950**

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Kanata/Stittsville have been determined.

Table 6: OD Survey Existing Mode Share – Kanata Stittsville

Travel Mode	Existing Mode Share
Auto Driver	65%
Auto Passenger	15%
Transit	10%
Non-Auto	10%
Total	100%

The City of Ottawa 2013 Transportation Master Plan, Map 3 Rapid Transit and Transit Priority Network – Ultimate Network, includes a Light Rail Transit Station near the Canadian Tire Centre area, near the proposed development. However, as this is not within the 2031 Affordable Network, or the 2031 Network Concept the existing mode shares will be carried forward for the purposes of this TIA.

Using the above mode shares and person trip generation, the person trip generation by mode has been projected. Additionally, as the retail uses will serve the other uses (in particular the residential and office uses) a synergy reduction of 25% has been applied to the retail trip generation to account for this. Table 7 summarizes the trip generation by mode for all land uses combined.

Table 7: Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour Person Trips			PM Peak Hour Person Trips			SAT Peak Hour Person Trips		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto Driver	65%	610	381	991	553	817	1372	654	613	1267
Auto Passenger	15%	141	88	229	129	188	317	152	142	292
Transit	10%	95	59	152	85	127	212	101	95	195
Non-Auto Modes	10%	95	59	152	85	127	212	101	95	195
Total	**100%**	**937**	**586**	**1523**	**851**	**1258**	**2109**	**1007**	**944**	**1950**

As shown above, 1523 AM, 2109 PM, and 1950 Saturday peak hour two-way trips are projected as a result of the proposed development.

3.1.2 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the existing travel patterns. Table 8 below summarizes the distribution.

Table 8: OD Survey Existing Mode Share – Kanata/Stittsville

To/From	Percent of Trips
North	15%
South	30%
East	50%
West	5%
Total	100%

3.1.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. Figure 12 illustrates the percent traffic assignment. Figure 13 illustrates the site generated traffic volumes.

Figure 12: Traffic Assignment (Percent)

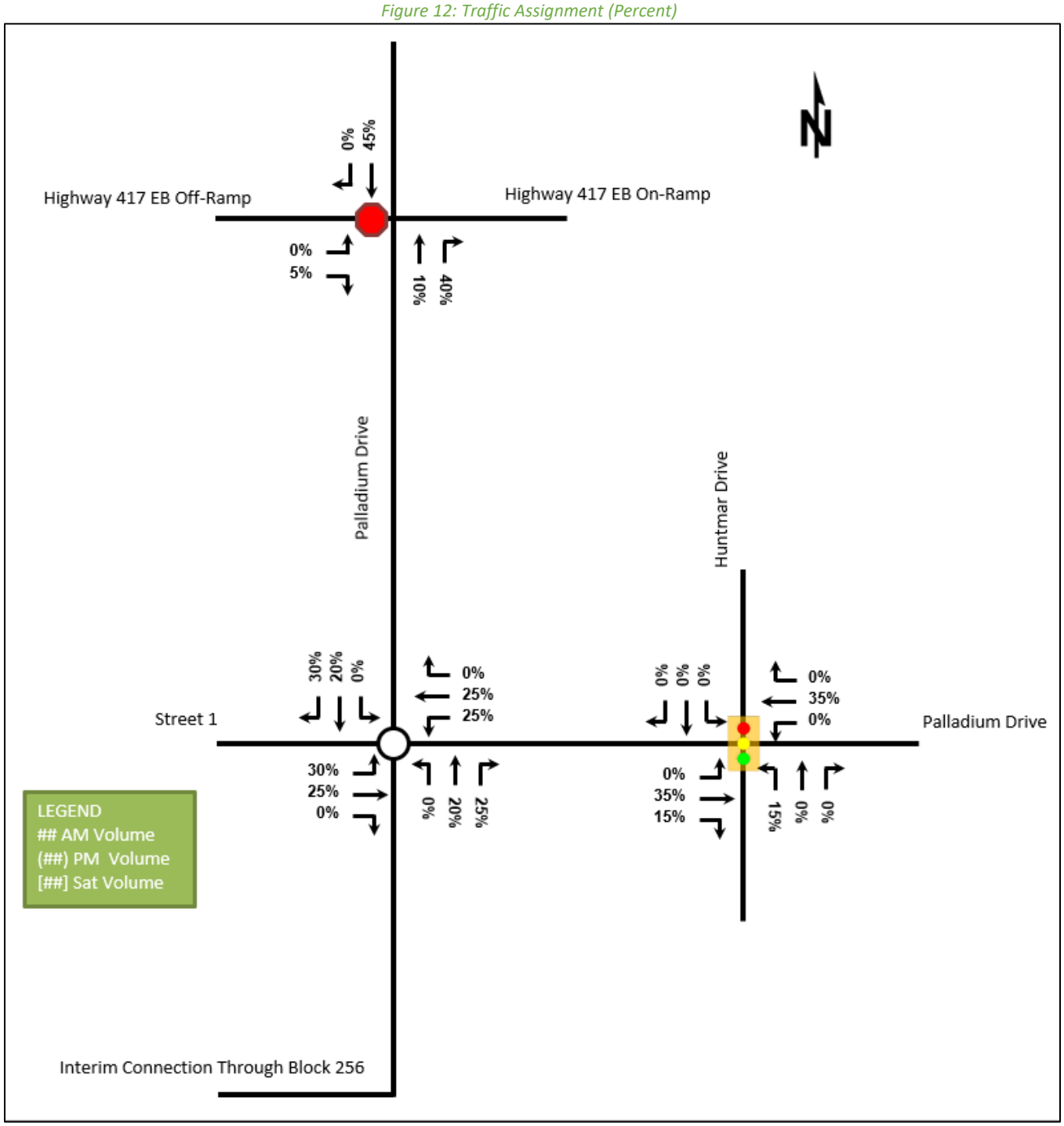
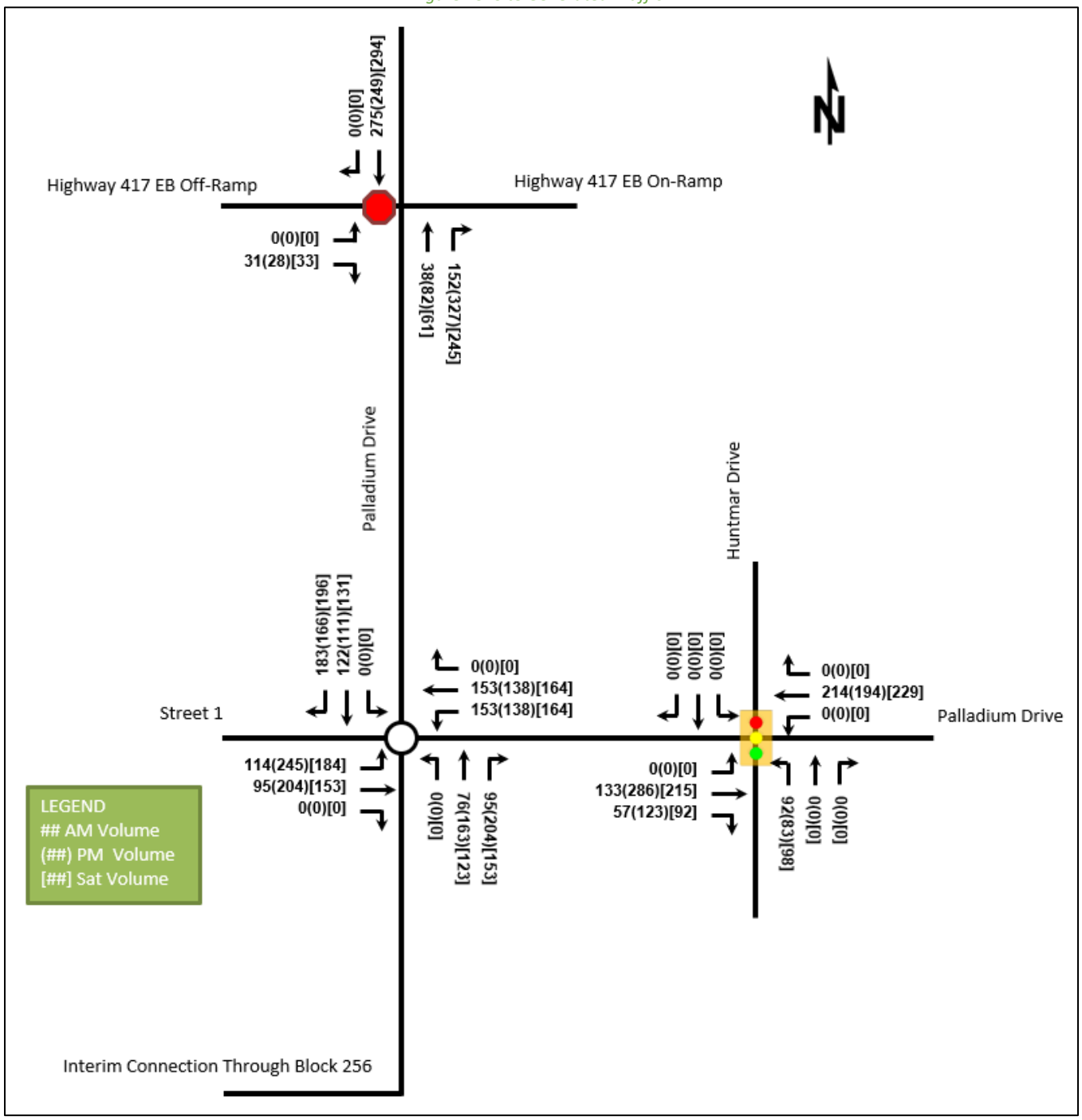


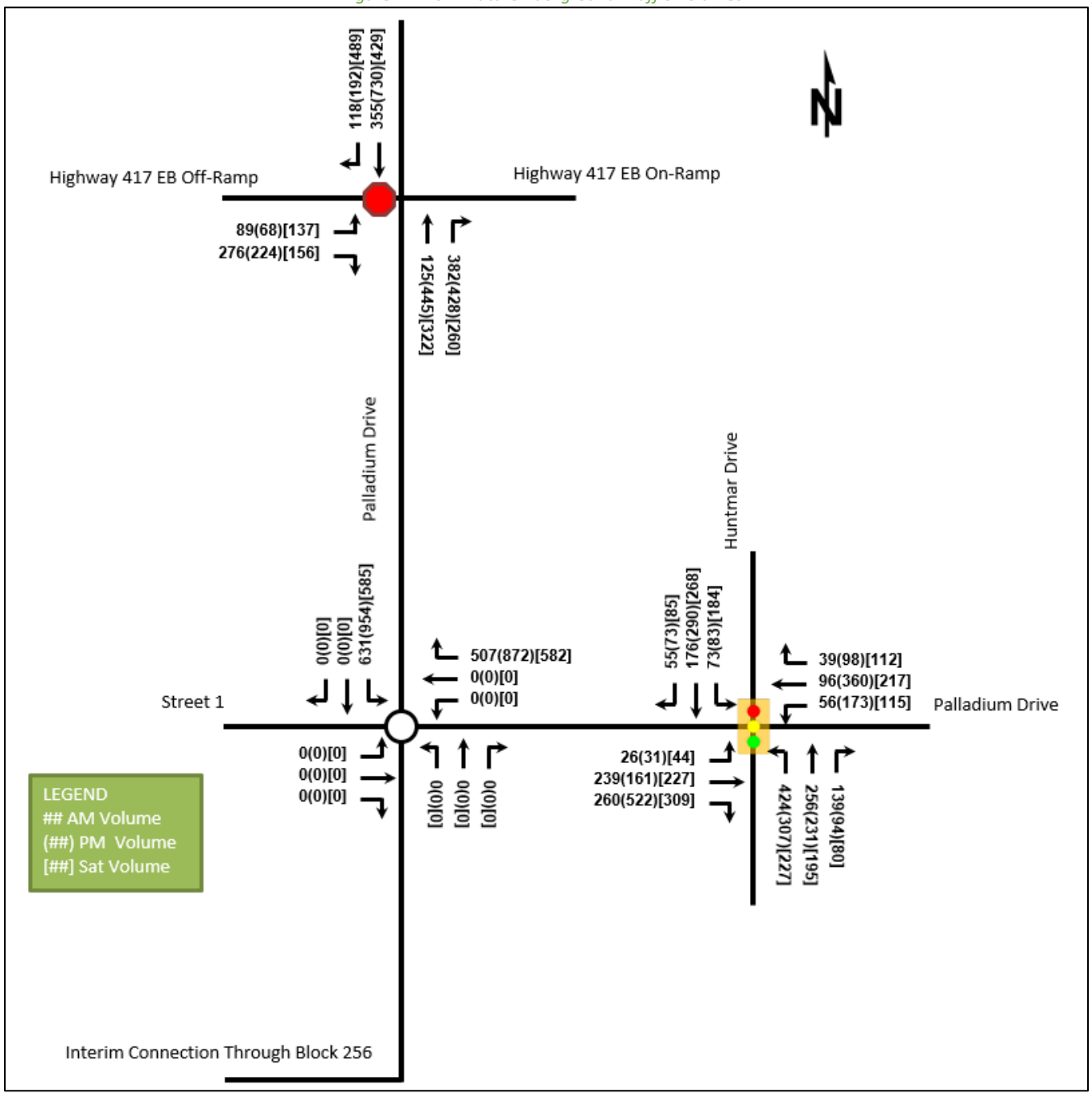
Figure 13: Site Generated Traffic



3.2 Background Network Travel Demands

The background traffic generated by nearby developments has been combined with the traffic counts. Figure 14 illustrates the 2024 future background traffic volumes. All of the background developments are anticipated to be built-out by 2024. As no background growth rate is being applied the, 2024 traffic volumes are anticipated to be similar to the 2029 traffic volumes, therefore no additional figure has been created for 2029 traffic volumes.

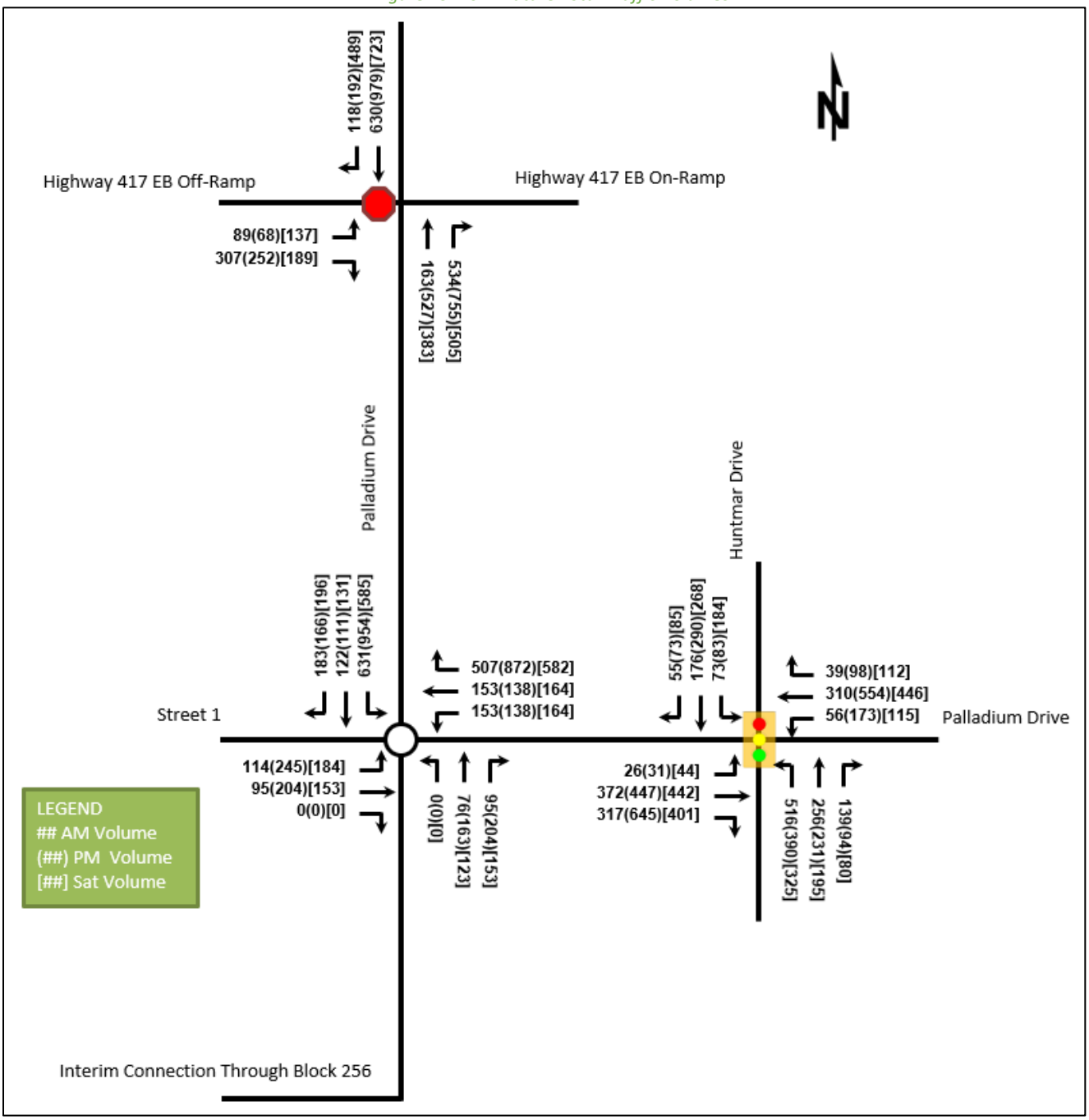
Figure 14: 2024 Future Background Traffic Volumes



3.3 Future Total Travel Demands

The site generated traffic volumes have been combined with the future background traffic volumes. As the background traffic volumes are the same for both horizons, Figure 15 illustrates the 2024 and 2029 future total traffic volumes.

Figure 15: 2024 Future Total Traffic Volumes



4 Analysis

4.1 Development Design

4.1.1 Design for Sustainable Modes

The proposed development is a residential subdivision and therefore auto and bicycle parking areas will be within each resident's home.

Sidewalks are included as needed to provide access to transit, local amenities, and the adjacent road network. Bus stops are proposed at three locations along the collector and arterial roads. By providing transit in this manner 98% of the subject development would be within 400-metre walking distance to a transit stop. The remaining 2% would be within a 500-metre walking distance to a transit stop. Figure 16 illustrates the transit walking distance and the transit stop locations.

The TDM-supportive Development Design and Infrastructure Checklist for the residential subdivision and commercial properties are included in Appendix D. The elements checked off in the TDM Checklist are suggested measures that will improve the non-auto mode share but are not an obligation as part of the approval of the development application. For the commercial properties, the preliminary land uses have been assumed for the purposes of the TIA. At this time the final land uses for the commercial properties are not confirmed. Once site plans are put forward for the individual properties the TDM checklist will be updated for each property as part of the TIA for each of those properties. At a high level, the subject properties would be best served by providing high quality easily accessed transit and non-auto facilities. This will be provided by a good road network layout with pedestrian and cycling connectivity to major facilities. The commercial properties could also promote flexible work hours or telecommuting. For the residential properties a contract with OC Transpo to provide early transit service until regular services are warranted by occupancy levels could be entered in to encourage the use of transit from the initial phases of the development.

4.1.2 Circulation and Access

This TIA is exempt from this element (see Table 3).

4.1.3 New Street Networks

Primary access to the development will be via the proposed roundabout intersection on the new north-south arterial / Palladium Drive. The west and south legs will provide access. Street No. 1, a collector road will form the west leg of the roundabout. A secondary, interim, access will be provided through Bock 256, connection Street No. 13 to a future portion of the new north-south arterial, connecting to the roundabout intersection via the south leg of the future roundabout. The collector roads will have a 26-metre right of way standard collector cross-section. All local roads will have an 18-metre right of way, except for a small portion of Street No. 9, which will be a single loaded "window street". Additionally, Street No. 2, running along the southern edge of the property. This right of way will be split with the adjacent property. Street No. 2 will ultimately become a collector road, connecting to the new north-south arterial road at a second roundabout. In advance of that, the portion of this street within the boundary of the development will be constructed to provide access along the southern edge of the property, and to allow transit to circulate the site.

4.2 Parking

This TIA is exempt from this element (see Table 3).

4.3 Boundary Street Design

The subject development is primarily bounded by the new north-south arterial. This road has not yet been designed and will not be completed for the initial opening of the development. Once the north-south arterial road receives funding a design exercise will determine the appropriate cross-section at that time. The cross-section noted in the Kanata West Environmental Study for the North-South Arterial has been included in Appendix E. A 37.5 metre ROW has been reserved for the North-South Arterial and therefore an appropriate cross-section can be accommodated within the ROW.

4.4 Access Intersections

4.4.1 Location and Design of Access

The primary access to the development will be via the future north-south arterial road. As an interim condition a secondary access will be provided via a temporary road through Block 256, connecting to the south leg of the future intersection. It has been proposed that a two-lane roundabout be provided at the intersection between Palladium Drive and the new north-south arterial road. This TIA will analyze the roundabout intersection and determine the required roundabout features to accommodate the projected traffic volumes. A plan has been created illustrating the proposed interim connection through Block 256. This has been included in Appendix F.

4.4.2 Intersection Control

The 2024 total future volumes have been analyzed using the OTM Book 12 Justification 7 warrant analysis and the roundabout feasibility tool has been used to evaluate the appropriate intersection control at the intersection of the new North-South arterial road at Street 1. The roundabout feasibility tool shows one contra-indicator (significant differences in directional flows or situations of sudden high demand), and four suitability factors. With respect to the traffic signal warrant, it was found that for urban conditions the warrant was met at 148% and for rural conditions it was met at 222%. For a future new intersection, the warrant is considered met where it reaches 150%. Therefore, for urban conditions the volumes are 2% from meeting the warrant. Given the approach angles of the roads, and the results of the roundabout feasibility tool a roundabout is appropriate at the intersection of Street 1 / New N-S Arterial / Palladium Drive. The roundabout feasibility tool and signal warrant sheets are included in Appendix G. It is acknowledged that events at the nearby Canadian Tire Centre may delay residents during peak event traffic, however, inbound event traffic will be more spread out than the outbound event traffic, and will allow residents of the proposed development to enter the roundabout and circulate to their destination. To facilitate the outbound peak a westbound to northbound right turn bypass lane is proposed. This will keep most of the event traffic from interfering with other roundabout movements.

Notes:

Legend
- 400m Walking Distance
- 500m Walking Distance
- Transit Stop (Proposed)

REV:	DESCRIPTION:	BY:	DATE:
		by	

STATUS:

CGH Transportation
13 Markham Ave
Ottawa, ON
K2G 3Z1
(343) 999-9117

CLIENT:

ARCHITECT:

SITE:
195 Huntmar

TITLE:
Transit Walking Distance

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2019-04-11		
PROJECT NO:	DRAWING NO:		REVISION:
2018-29	017		

4.5 Transportation Demand Management

Transportation Demand Management measures are implemented to encourage the use of non-auto modes of travel. This is aimed at reducing the reliance on single occupant auto trips in the City of Ottawa. The proposed development adheres to the City's TDM principles by providing direct connections to adjacent pedestrian, cycling, and transit facilities. The existing mode share for Kanata/Stittsville has been used for all study horizons.

4.6 Neighbourhood Traffic Management

This TIA is exempt from this Module (see Table 3).

4.7 Transit

In Section 3.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 9 summarizes the transit trip generation.

Table 9: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour Person Trips			PM Peak Hour Person Trips			SAT Peak Hour Person Trips		
		In	Out	Total	In	Out	Total	In	Out	Total
Transit	10%	95	59	152	85	127	212	101	95	195

The anticipated increase in travel demand will require additional bus service to accommodate. It is recommended that OC Transpo provide additional transit capacity as needed once the development is completed.

4.8 Review of Network Concept

This development accesses directly onto the arterial road network and will primarily use the new north-south arterial road for access to Highway 417 and the broader City of Ottawa transportation network. Given the size of the study area road network and the access routes there is no logical screenline location. Instead the peak hour travel demand on each major road has been examined to determine if there is adequate roadway capacity. Table 10 summarizes the 2024 future background roadway volumes along key segments of the study area road network.

Table 10: 2024 Future Background Roadway Volumes

Road	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
	N	S	Cap.	V/C	N	S	Cap.	V/C	N	S	Cap.	V/C
Huntmar (N-S) (South of Palladium)	819	492	900	0.91	632	985	900	1.09	502	692	900	0.77
Palladium (N-S) (North of Access)	507	631	1800	0.35	872	954	1800	0.53	582	585	1800	0.33
	E	W	Cap.	V/C	E	W	Cap.	V/C	E	W	Cap.	V/C
Palladium (E-W) (West of Huntmar)	525	575	1800	0.32	714	740	1800	0.41	580	529	1800	0.32

Table 11 summarizes the 2024 total future roadway volumes along key segments of the study area road network.

Table 11: 2024 Total Future Roadway Volumes

Road	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
	N	S	Cap.	V/C	N	S	Cap.	V/C	N	S	Cap.	V/C
Huntmar (N-S) (South of Palladium)	911	549	900	1.01	715	1108	900	1.23	600	784	900	0.87
Palladium (N-S) (North of Access)	697	936	1800	0.52	1280	1231	1800	0.71	889	912	1800	0.51
	E	W	Cap.	V/C	E	W	Cap.	V/C	E	W	Cap.	V/C
Palladium (E-W) (West of Huntmar)	715	881	1800	0.49	1123	1017	1800	0.62	887	856	1800	0.49

It has been assumed that each lane would have a nominal capacity of 900 vph. The v/c ratio has been calculated by divided the maximum peak direction volume by the capacity. It has been found that for the 2024 horizon (both in future background and total future conditions), Huntmar Drive, south of Palladium Drive, would be over capacity during the PM peak hour. However, the 2013 TMP shows a new north-south arterial running from the existing Palladium Drive Highway 417 interchange, to south of Hazeldean Drive. This will provide an alternate north-south corridor for traffic, alleviating the projected deficiency. It has been indicated by the City of Ottawa that this upgrade may not take place until beyond 2031. Without the site traffic this leg would operate with a V/C of 1.09. Therefore, the widening of Huntmar Drive will be required prior to the timing projected in the TMP and should be accelerated to meet the growth in traffic on Huntmar Drive, regardless of the addition of the proposed development.

4.9 Intersection Design

4.9.1 Intersection Control

As discussed in Section 4.4.2 a roundabout will be analysed at the intersection of Street No. 1 at Palladium Drive for both 2024 and 2029 future total horizons.

4.9.2 Intersection design

To understand the intersection design, an MMLOS analysis of existing, future background, and future total travel demands is required. The following sections will discuss the vehicle LOS at the Study Area intersections, followed by a discussion of the intersection MMLOS for other modes.

4.9.2.1 Existing Conditions

The existing intersection volumes have been analyzed to establish a baseline condition to compare all future horizons to and determine the impact of the subject development on the Study Area road network. Table 11 summarizes the operational analysis of 2019 existing conditions.

Table 12: 2019 Existing Conditions Operational Analysis

Intersection	Lane	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
		LOS	Del.	V/C	Q	LOS	Del.	V/C	Q	LOS	Del.	V/C	Q
Palladium Drive at Highway 417 Eastbound Ramp Terminal *Unsignalized*	EBL	B	12	0.17	1	C	25	0.30	1	C	20	0.38	2
Huntmar Drive at Palladium Drive *Signalized*	NBL	D	52	0.90	115	F	145	1.18	101	E	63	0.91	76
	Overall	**C**	**26**	-	-	**D**	**37**	-	-	**C**	**26**	-	-

The existing intersections have been shown to operate with good LOS and no operational concerns. No mitigation measures are required or recommended. Appendix H contains the 2019 Existing Conditions Synchro sheets.

4.9.2.2 2024 Future Background

The 2024 future background intersection volumes have been analyzed to allow a comparison between the future volumes with and without the proposed development. Table 12 summarizes the operational analysis of 2024 future background conditions.

Table 13: 2024 Future Background Conditions Operational Analysis

Intersection	Lane	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
		LOS	Del.	V/C	Q	LOS	Del.	V/C	Q	LOS	Del.	V/C	Q
Palladium Drive at Highway 417 Eastbound Ramp Terminal *Unsignalized*	EBL	B	13	0.19	1	D	30	0.34	2	C	20	0.38	2
Huntmar Drive at Palladium Drive *Signalized*	NBL	E	60	0.95	168	E	67	0.96	127	E	68	0.93	77
	Overall	**C**	**31**	-	-	**E**	**80**	-	-	**C**	**26**	-	-
	Mitigation Measures: Based on City of Ottawa Comments Dual Northbound Left Turn Lanes have been Analysed												
	Overall	**C**	**32**	-	-	**E**	**70**	-	-	**C**	**35**	-	-

With the addition of background growth to reflect the 2024 horizon the existing intersection is anticipated to operate with slightly worse operational characteristics than existing conditions, and within the City of Ottawa operational thresholds. Appendix I contains the 2024 Future Background Synchro Sheets. As no background growth, beyond the developments explicitly accounted for in this analysis, these results would be the same for the 2029 future background scenario.

4.9.2.3 2024 Total Future

The 2024 total future intersection volumes, including the site generated traffic, have been analyzed to understand the impact of the subject development on the Study Area intersections. Table 13 summarizes the operational analysis of 2024 total future conditions. The proposed roundabout has been analyzed as a single lane roundabout.

Table 14: 2024 Total Future Conditions Operational Analysis

Intersection	Lane	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
		LOS	Del.	V/C	Q	LOS	Del.	V/C	Q	LOS	Del.	V/C	Q
Palladium Drive at Highway 417 Eastbound Ramp Terminal *Unsignalized*	EBL	C	21	0.30	1	F	61	0.56	3	E	45	0.65	4
Site Access at Palladium Drive *Roundabout*	NB	A	7	0.12	1	B	14	0.42	22	A	7	0.19	7
	WB	A	6	0.40	2	A	9	0.80	78	A	6	0.50	24
	SB	A	9	0.58	4	B	11	0.79	77	A	9	0.58	33
	EB	B	10	0.15	1	B	15	0.45	24	B	11	0.24	10
	Overall	A	8	0.58	4	B	12	0.80	78	A	8	0.58	33
Huntmar Drive at Palladium Drive *Signalized*	EBT/R	C	32	0.71	94	F	123	1.19	197	D	39	0.87	142
	NBL	F	95	1.09	222	F	82	1.03	174	E	65	0.95	132
	Overall	**D**	**43**	-	-	**F**	**133**	-	-	**D**	**45**	-	-
	Mitigation Measures: Eastbound Right Turn Lane and, Based on City of Ottawa Comments Dual Northbound Left Turn Lanes have been Analysed												
	Overall	**C**	**32**	-	-	**E**	**58**	-	-	**C**	**33**	-	-

With the addition of site generated traffic, the existing intersection of Palladium Drive at Highway 417 Eastbound Ramp Terminal begins to experience higher delays on the eastbound left movement. This is the only movement at the intersection that is not a free-flow movement as all the right turn movements are facilitated by large ramps to and from the highway. The intersection volumes have been examined using the OTM Book 12 Signal Warrant Justification 7 for projected peak hour conditions. As there are large northbound and southbound ramps providing access to the eastbound Highway 417 those volumes have been removed from the warrant calculation as these volumes do not conflict with the intersection turning movements. It was found that signals are not warranted.

With the construction of the proposed development a new roundabout intersection will be created to provide access to the proposed development. This proposed roundabout intersection has been analyzed using Sidra analysis software as a two-lane roundabout. The analysis has shown that the proposed roundabout would operate with good LOS during all peak hours. Some queuing is anticipated during the PM peak hour, but this is expected to clear quickly as the delay on those movements is low.

Appendix J contains the 2024 Future Total Synchro and Sidra Sheets. As no background growth has been included, beyond the developments explicitly accounted for in this analysis, these results would be the same for the 2029 total future scenario.

4.9.2.4 Intersection MMLOS

Intersection MMLOS is undertaken at signalized intersections. Pedestrian LOS (PLOS) is evaluated using the PETSI score methodology which examines the various intersection geometry elements and assigns those values a score. For this TIA only the intersection MMLOS of Palladium Drive at Huntmar Drive will be examined as it is the only signalized intersection, with the implementation of reassigned traffic.

The intersection of Palladium Drive at Huntmar Drive has been evaluated using the proposed geometry including the existing geometry plus an eastbound right turn lane and northbound dual left turn lanes. Table 16 summarizes the PETSI score evaluation for the signalized intersection of Huntmar Drive at Palladium Drive.

Table 15: PETSI Score Huntmar Drive at Palladium Drive

	Crossing East West			**Crossing North South**		
Element	**Condition**	**Points**		**Condition**	**Points**	
Crossing Distance	5 Lanes – No Median	72		6 Lanes – No Median	55	
Island Refuge	Yes	0		Yes	0	
Signal Phasing / Timing						
Left Turn Type	Protected	0		Protected	0	
Right Turn Conflict	Permissive	-5		Permissive	-5	
Right Turn on Red	RTOR Allowed	-3		RTOR Allowed	-3	
Leading Ped. Interval	No	-2		No	-2	
Corner Radius	15m to 25m	-8		15m to 25m	-8	
Crosswalk	Standard Transverse	-7		Standard Transverse	-7	
PETSI LOS	Actual	47	D	Actual	30	E
	Target		C	Target		C

Neither the north-south, nor the east-west pedestrian crossings meet the target PLOS for an arterial road in a developing community. This is primarily due to the low initial score, caused by the number of lanes required for vehicle traffic along this corridor. It is not feasible to achieve and therefore the LOS F should be tolerated as it is not reasonable to achieve the target PLOS.

Bicycle LOS (BLOS) is evaluated by examining elements that impact the level of traffic stress (LTS). For the intersection of Huntmar Drive at Palladium Drive the Mixed Traffic on a Signalized Intersection Approach has been applied for all approaches. Table 17 summarizes the BLOS for the intersection of Huntmar Drive at Palladium Drive.

Table 16: Bicycle LOS Criteria Huntmar Drive at Palladium Drive

	East-West		**North-South**	
Right-turn Lane and Turning Speed of Motorists	Right-turn lane longer than 50 m	F	Right-turn lane longer than 50 m	F
Cyclist Making a Left-turn and Operating Speed of Motorists	2 or more lanes crossed, ≥ 50 km/h	F	2 or more lanes crossed, ≥ 50 km/h	F

A southbound cycling lane is provided south of the intersection, but no cycling lanes are provided through the intersection. Adding cycling lanes in all directions would improve the BLOS. When Palladium Drive is realigned consideration should be given to including cycling lanes along Palladium Drive in order to improve the BLOS and try to achieve the target BLOS of C for a developing community.

Transit LOS (TLOS) is evaluated by examining the average signal delay and the relative attractiveness of transit compared to automobile trips. While local transit service is anticipated to be extended to the subject development, the TMP Affordable Network does not include higher order transit facilities or transit signal priority (TSP) measures through the intersection of Huntmar Drive at Palladium Drive. The TMP 2031 Network Concept includes a Bus Rapid Transit with Grade Separated Crossings along Huntmar Drive through the subject intersection. Therefore, the TLOS for this intersection is F, until the BRT is implemented.

Truck LOS (TkLOS) is based on the effective corner radius. For this intersection the effective corner radius is greater than 15m, the south leg only has a single receiving lane, therefore the TkLOS is C for this intersection, exceeding the target TkLOS for a developing community.

4.9.2.5 Access Intersection Design

The new access intersection on Palladium Drive is a two-lane roundabout. The west leg will be the main access to the proposed development and will have a one-lane approach. The remaining three legs will be two-lane approaches.

5 Conclusions

This Transportation Impact Assessment has documented the existing and future transportation conditions, for all travel modes, in the study Area. The following conclusions can be offered based on the foregoing:

A. The proposed development, located at 195 Huntmar Drive, is a greenfield development that will include 155 single-detached homes, 418 townhouse units, 13,747 square metres of commercial spaces across three parcels, and two car dealerships (4,000 square metres GFA each).
B. Access to the proposed development will be via the new roundabout intersection on realigned Palladium Drive.
C. The Study Area is served by transit along Palladium Drive and Huntmar Drive via Routes 62, 162, 261, and 263.
D. The previous five years of collision data at the intersection of Palladium Drive at Huntmar Drive has been reviewed. No patterns emerged that indicated that mitigation measures or further monitoring is required.
E. Using a combination of Trans Trip Generation Rates (for the AM and PM peak hour residential land uses) and ITE Trip Generation 10th Edition Trip Rates (for all other uses and peak hours). The existing mode shares from the OD Survey were tabulated and using these factors, the person trip by mode was calculated. It was found that the proposed development can be anticipated to generate 1523 AM, 2109 PM, and 1950 Saturday peak hour person trips.
F. By providing transit stops at appropriate locations along the collector road (Street 1), and having transit loop through the development via Street 2 it was shown that more than 95% of the proposed development units would be within a 400m walking distance to transit, with the remaining less than 5% no more than 500m from transit. Therefore, the transit stops, as proposed, will provide appropriate transit coverage for the proposed development.
G. Traffic signal warrants have been examined for the intersection of Palladium Drive at Highway 417 Eastbound ramp terminal. It was found that signals are not warranted at this intersection, using OTM Book 12 Justification 7 for the projected volumes.
H. The interim access solution proposed through this TIA would allow this development to proceed in advance of the completion of the new north-south arterial.

I. It is acknowledged that further update is required to address CTC comments as well as the ultimate configuration of the N-S arterial, however, this should not preclude to draft plan approval of the 195 Huntmar Subdivision. These elements will be further examined as part of the RMA process.

The proposed development, with the intersection control discussed herein, will function within the Study Area Road Network. It is recommended that, from a transportation perspective, the proposed development application proceed.

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Appendix A

TIA Screening Form and PM Certification Form

13 Markham Avenue
Nepean ON K2G 3Z1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 27-Mar-19
Project Number: 2018-29
Project Reference: 195 Huntmar

1.1 Description of Proposed Development	
Municipal Address	195 Huntmar
Description of Location	PIN 044872611 Ward 6
Land Use Classification	Residential and Commercial
Development Size	155 Single; 418 Townhomes; Commercial Parcels
Accesses	New access intersection with realigned Palladium Drive
Phase of Development	Phasing Unknown at this time
Buildout Year	2024
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	418	Units
Trip Generation Trigger	Yes	

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

1.4. Safety Triggers	
Are posted speed limits on a boundary street are 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	No
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	No

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

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

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

Dated at Newmarket (City) this 03 day of December, 2018.

Name: Mark Crockford
(Please Print)

Professional Title: Professional Engineer

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

Office Contact Information (Please Print)
Address: 628 Haines Road
City / Postal Code: Newmarket / L3Y 6V5
Telephone / Extension: (905) 251-4070
E-Mail Address: Mark.Crockford@CGHTransportation.com

Appendix B

Turning Movement Counts

ACCURATE TRUSTED TRAFFIC DATA

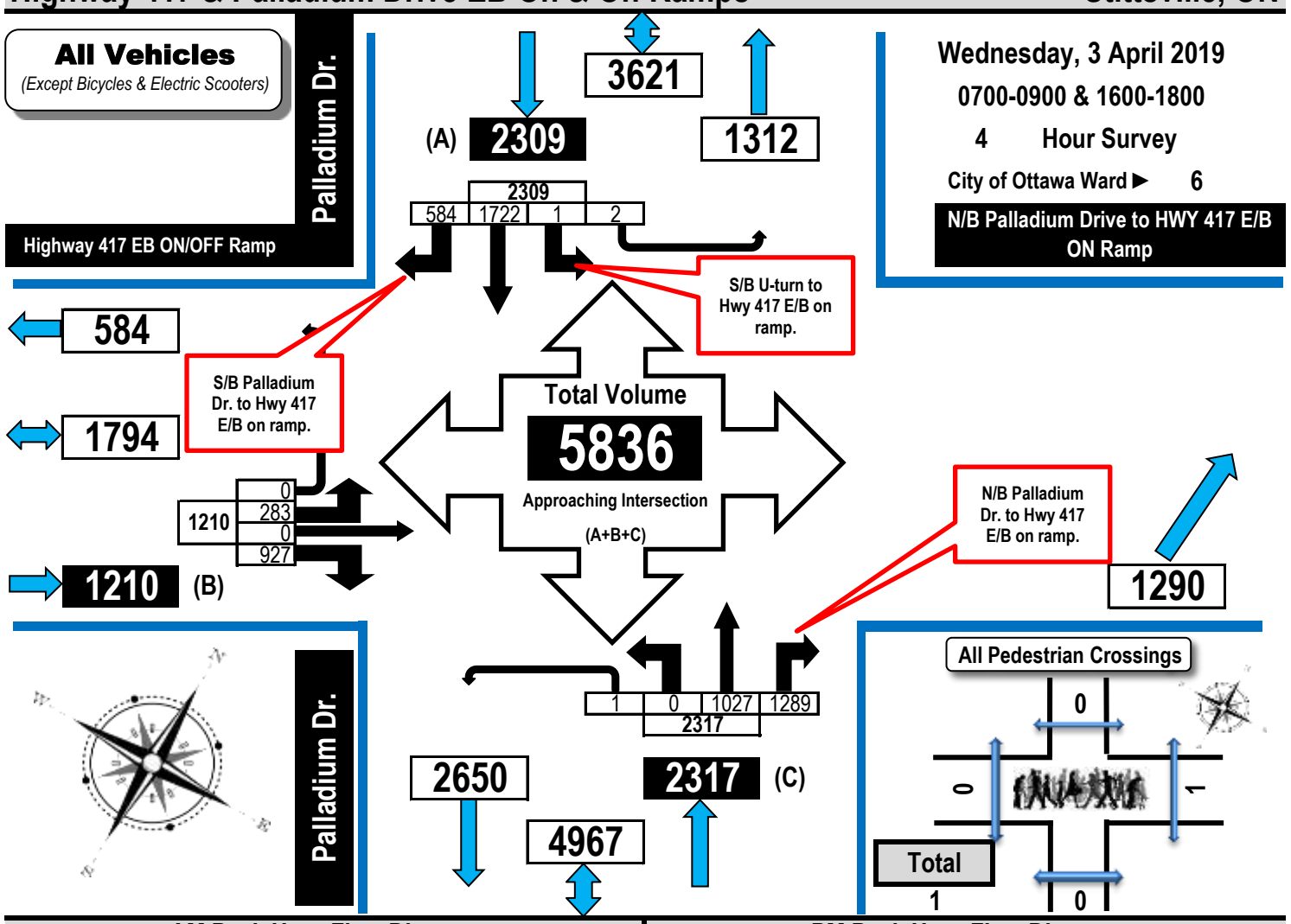
Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams

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

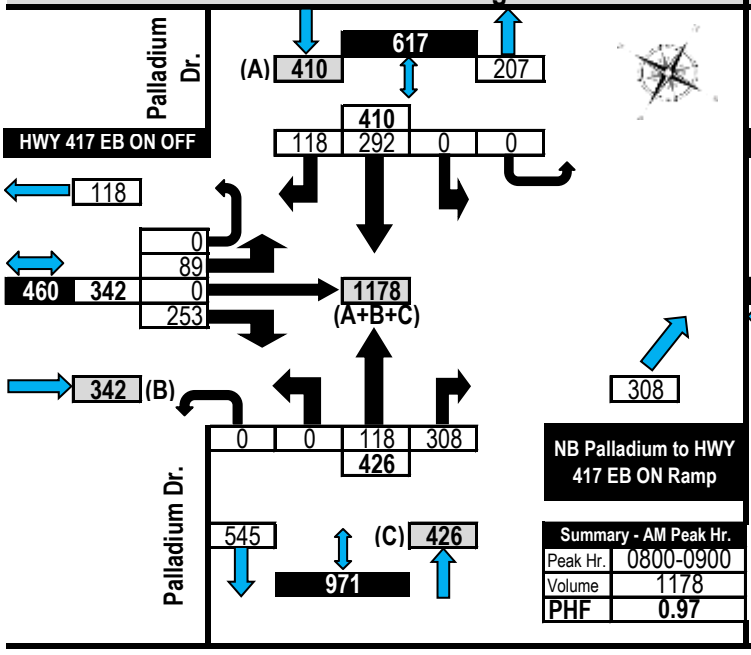
Highway 417 & Palladium Drive EB On & Off Ramps — Stittsville, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Wednesday, 3 April 2019
0700-0900 & 1600-1800
4 Hour Survey
City of Ottawa Ward ▶ 6

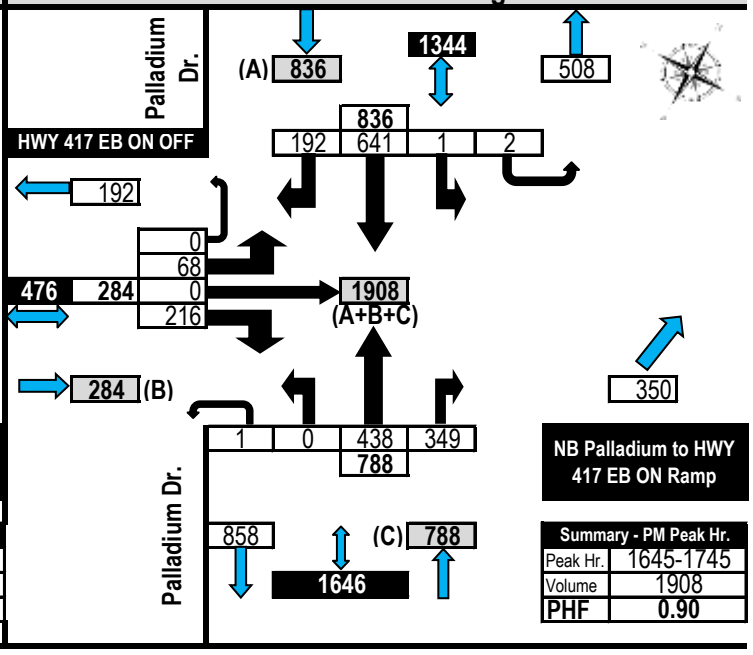


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0800-0900
Volume	1178
PHF	0.97

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1645-1745
Volume	1908
PHF	0.90

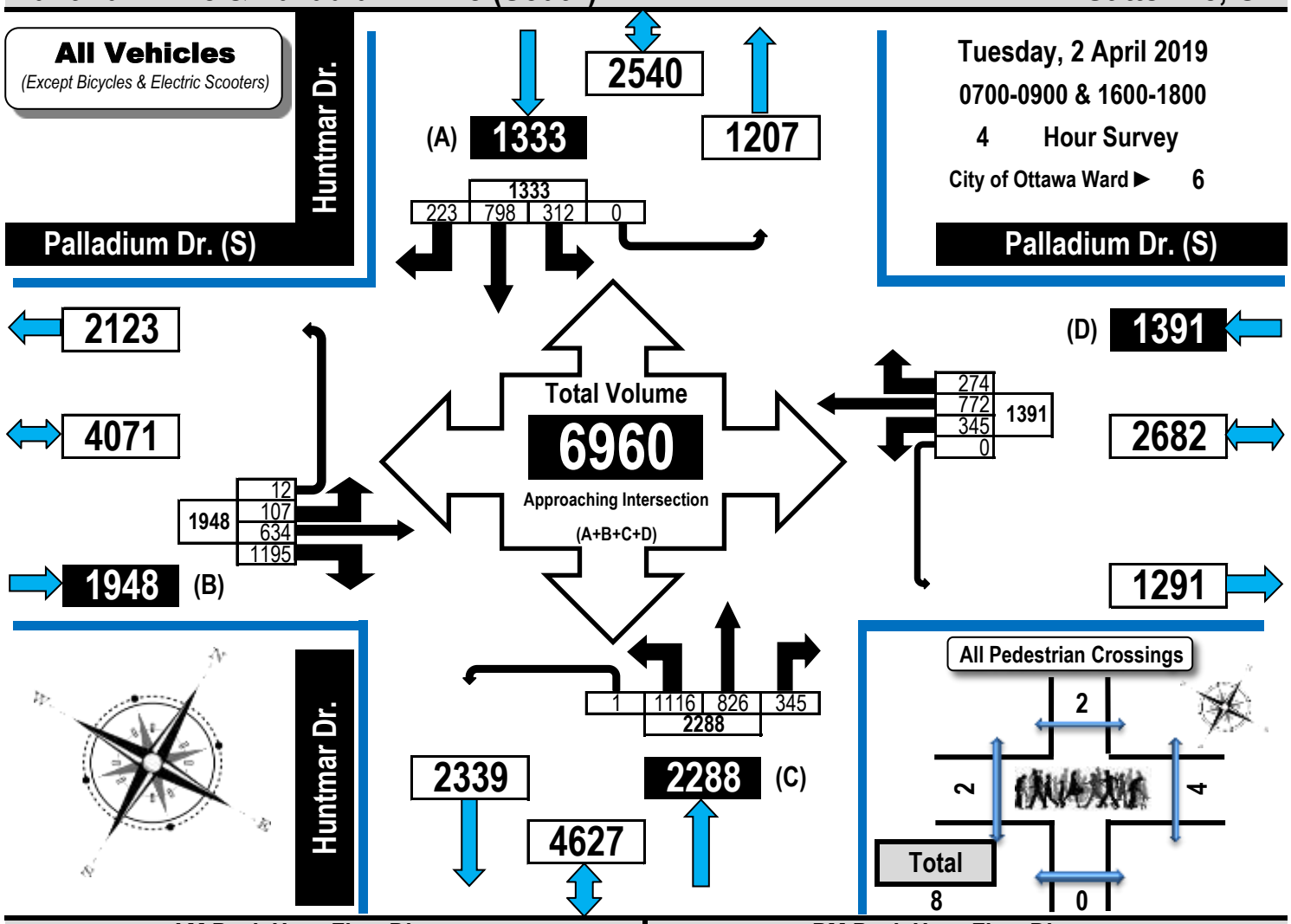
Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams

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

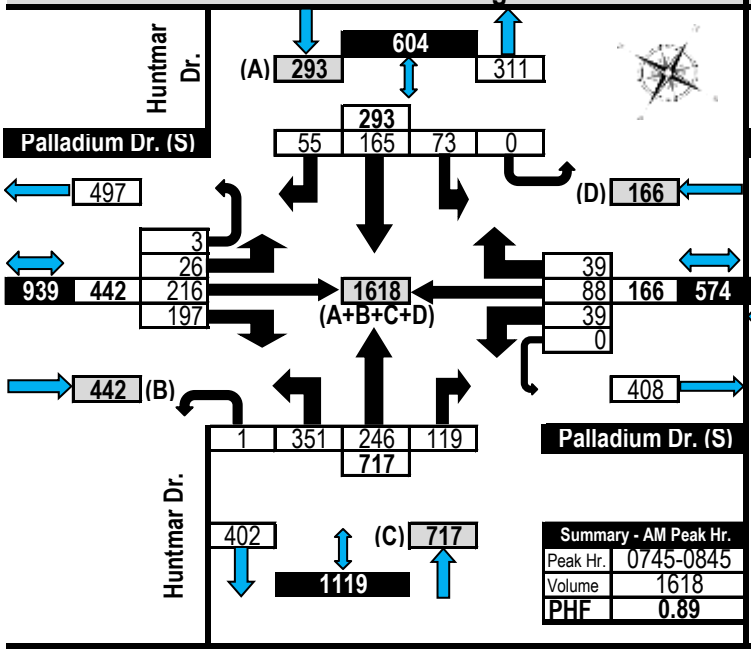
Huntmar Drive & Palladium Drive (South) — Stittsville, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Tuesday, 2 April 2019
0700-0900 & 1600-1800
4 Hour Survey
City of Ottawa Ward ▶ 6

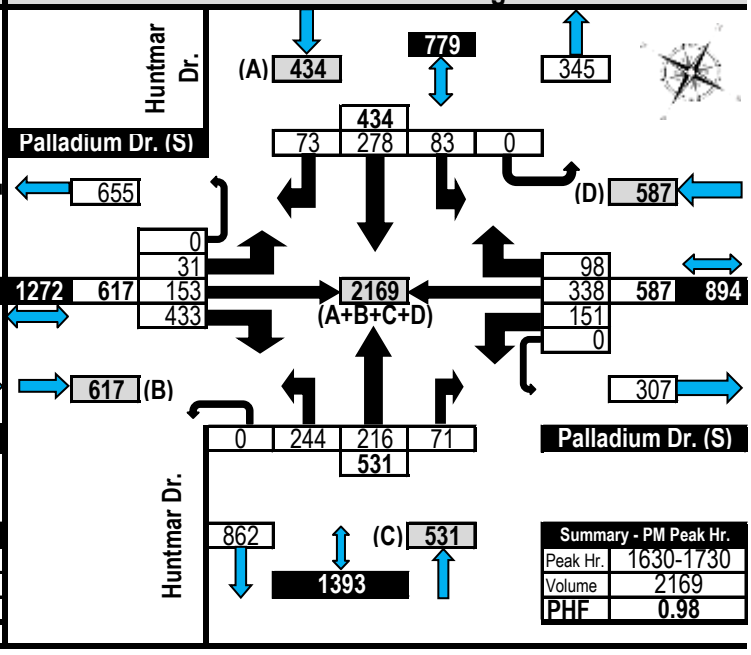


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0745-0845
Volume	1618
PHF	0.89

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1630-1730
Volume	2169
PHF	0.98

ACCURATE TRUSTED TRAFFIC DATA

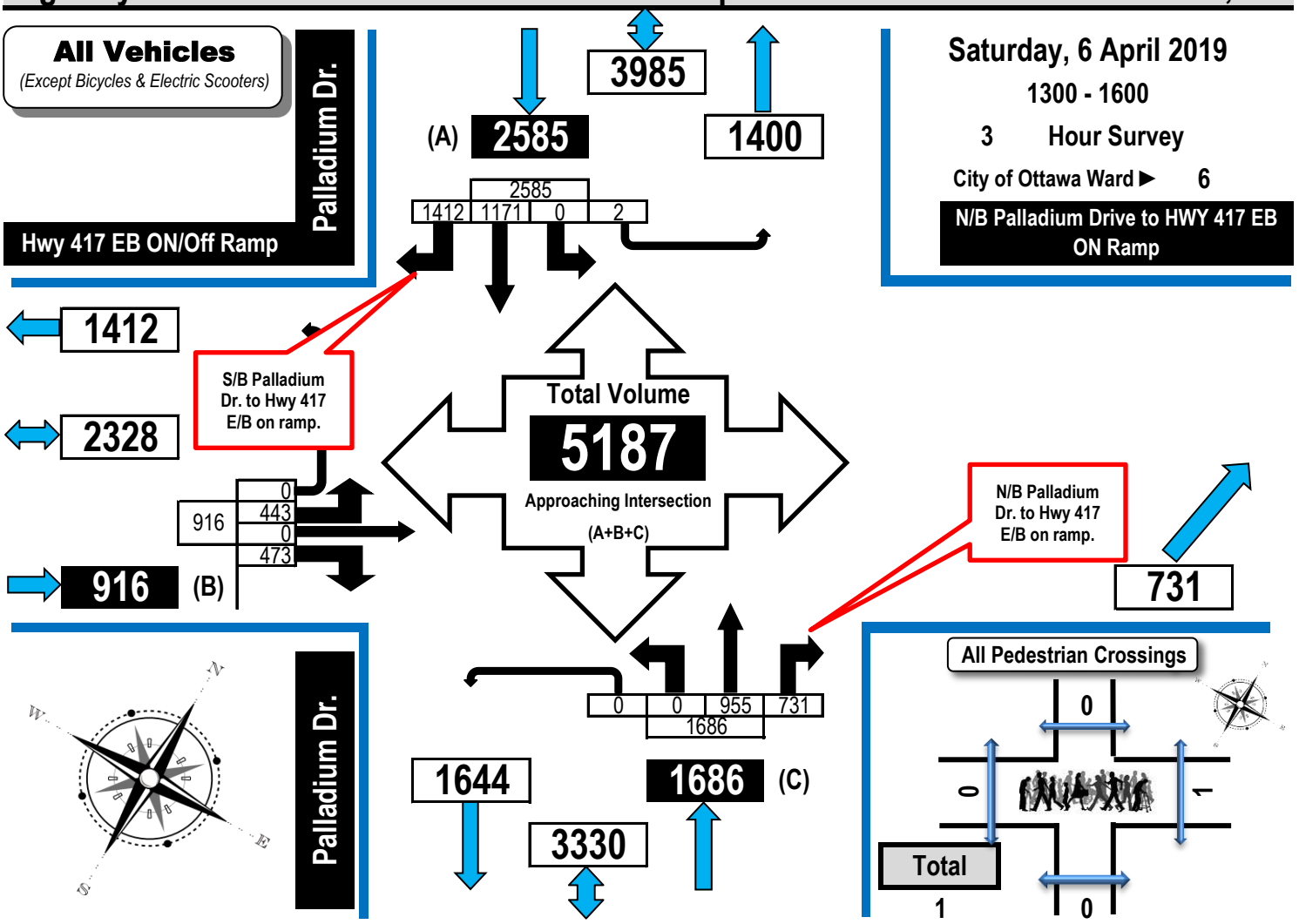
Turning Movement Count
Summary, OFF and PM Peak Hour Flow Diagrams

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

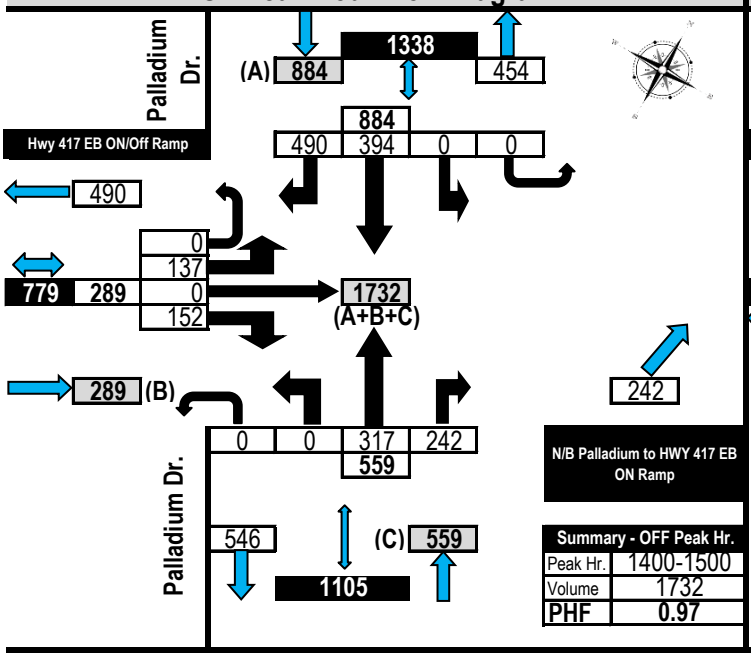
Highway 417 & Palladium Drive EB On & Off Ramps — Stittsville, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Saturday, 6 April 2019
1300 - 1600
3 Hour Survey
City of Ottawa Ward ▶ 6

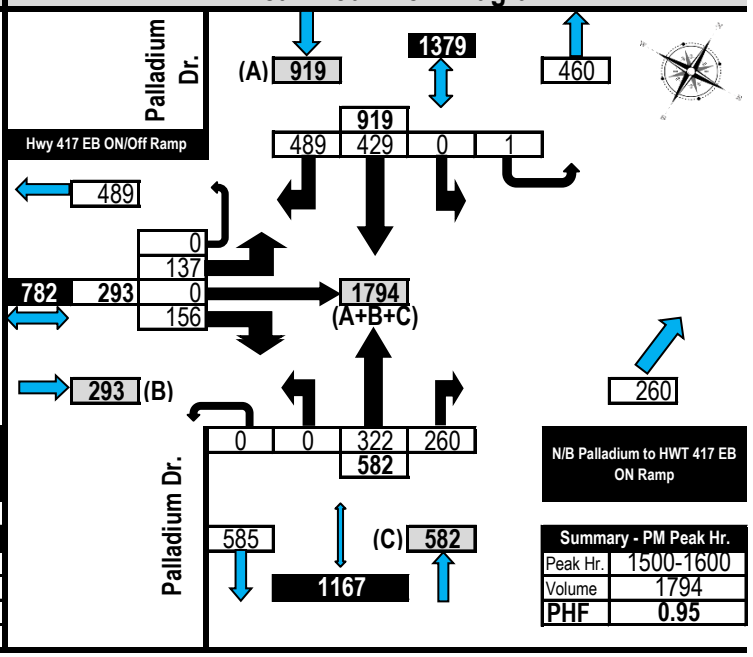


Off Peak Hour Flow Diagram



Summary - OFF Peak Hr.	
Peak Hr.	1400-1500
Volume	1732
PHF	0.97

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1500-1600
Volume	1794
PHF	0.95

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

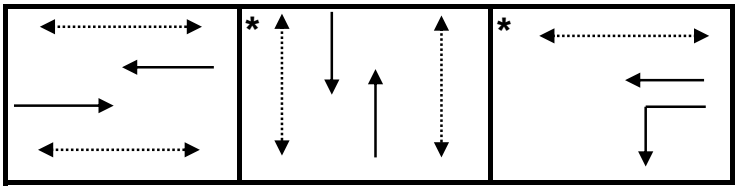
Intersection:	***Main:***	Palladium	***Side:***	Huntmar	
Controller:	MS-3200			**TSD:**	6267
Author:	R. Doueidar			**Date:**	28-Mar-2019

Existing Timing Plans†

	Plan	**Ped Minimum Time**		
	Regular 4	***Walk***	***DW***	***A+R***
Cycle	115			
Offset	X			
EB Thru	36	7	23	3.7+2.6
WB Thru	53	7	23	3.7+2.6
NB Thru	62	7	24	3.3+3.1
SB Thru	62	7	24	3.3+3.1
WB Left	17	-	-	3.7+2.5

Phasing Sequence‡

Plan: 4



Schedule

Weekday

Time	Plan
All Day	4

Weekend

Time	Plan
All Day	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $57.63 ($51 + HST)

Appendix C

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition
2015-03-20	2015	9:01	CARDEVCO RD @ CARP RD	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	99 - Other	01 - Dry
2017-10-05	2017	13:45	CARDEVCO RD @ CARP RD	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	03 - Rear end	01 - Dry
2017-09-28	2017	12:30	CARDEVCO RD @ CARP RD	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	03 - Rear end	01 - Dry
2015-10-16	2015	10:55	CARP RD @ CAVANMORE RD	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2014-03-27	2014	21:30	CARP RD @ RICHARDSON SIDE RD	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2014-04-29	2014	13:30	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2014-08-28	2014	17:51	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2014-11-07	2014	11:22	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2015-01-28	2015	8:28	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2016-09-03	2016	17:03	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	07 - SMV other	01 - Dry
2016-06-13	2016	8:08	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2016-06-29	2016	17:15	CARP RD @ RICHARDSON SIDE RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2017-11-17	2017	13:45	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2017-03-19	2017	1:18	CARP RD @ RICHARDSON SIDE RD	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	07 - SMV other	01 - Dry
2013-05-16	2013	16:09	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2013-06-23	2013	8:30	CARP RD @ RICHARDSON SIDE RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2013-10-09	2013	19:00	CARP RD @ RICHARDSON SIDE RD	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-05-11	2015	16:15	CARP RD @ WESTHUNT RD	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	01 - Dry
2016-06-20	2016	8:37	CARP RD btwn CARDEVCO RD & WESTHUNT RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2016-06-22	2016	22:00	CARP RD btwn CARDEVCO RD & WESTHUNT RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-07-16	2013	4:50	CARP RD btwn CAVANMORE RD & CARDEVCO RD	01 - Clear	03 - Dawn	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2017-08-04	2017	22:00	CARP RD btwn REIS RD & CAVANMORE RD	02 - Rain	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2013-02-06	2013	8:41	CARP RD btwn REIS RD & CAVANMORE RD	05 - Drifting Snow	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	03 - Loose snow
2013-06-19	2013	15:23	CARP RD btwn REIS RD & CAVANMORE RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-10-31	2013	6:55	CARP RD btwn REIS RD & CAVANMORE RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	99 - Other	02 - Wet
2014-04-16	2014	7:44	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
2015-07-07	2015	12:59	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2015-12-30	2015	6:11	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	04 - Freezing Rain	07 - Dark	10 - No control		03 - P.D. only	03 - Rear end	06 - Ice
2017-09-11	2017	11:17	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2017-10-30	2017	11:33	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2017-11-29	2017	6:30	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	02 - Rain	03 - Dawn	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2017-12-14	2017	10:01	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2017-01-22	2017	13:45	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
2017-04-18	2017	7:45	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2013-01-10	2013	12:00	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	99 - Other	02 - Wet
2013-02-28	2013	6:20	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	03 - Snow	07 - Dark	10 - No control		03 - P.D. only	01 - Approaching	03 - Loose snow
2013-03-28	2013	14:10	CARP RD btwn RICHARDSON SIDE RD & HWY417 IC144 RAMP62	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2014-01-27	2014	13:08	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	03 - Snow	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	03 - Loose snow
2014-05-08	2014	20:11	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	02 - Rain	05 - Dusk	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2015-11-29	2015	17:09	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-05-19	2013	15:57	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	02 - Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	01 - Approaching	02 - Wet
2013-11-28	2013	6:42	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	01 - Clear	03 - Dawn	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-12-05	2013	20:11	RICHARDSON SIDE RD btwn CARDEVCO RD & CARP RD	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	02 - Wet
2014-03-13	2014	2:01	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	05 - Drifting Snow	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	05 - Packed snow
2014-08-09	2014	9:34	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2015-11-13	2015	13:46	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	02 - Wet
2016-01-18	2016	10:08	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	03 - Loose snow
2016-10-27	2016	7:36	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2016-05-13	2016	17:17	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2017-09-29	2017	0:00	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	00 - Unknown	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2017-03-06	2017	22:30	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	04 - Freezing Rain	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	06 - Ice
2013-08-12	2013	16:35	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
2013-10-28	2013	9:42	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2013-12-09	2013	7:50	RICHARDSON SIDE RD btwn CARP RD & OAK CREEK RD	03 - Snow	03 - Dawn	10 - No control		03 - P.D. only	01 - Approaching	03 - Loose snow

Appendix D

TDM Checklist

Introduction

The City of Ottawa's *Transportation Impact Assessment (TIA) Guidelines* (specifically Module 4.3—Transportation Demand Management) requires proponents of qualifying developments to assess the context, need and opportunity for transportation demand management (TDM) measures at their development. The guidelines require that proponents complete the City's **TDM Measures Checklist**, at a minimum, to identify any TDM measures being proposed.

The remaining sections of this document are:

- Using the Checklist
- Glossary
- TDM Measures Checklist: Non-Residential Developments
- TDM Measures Checklist: Residential developments

Readers are encouraged to contact the City of Ottawa's TDM Officer for any guidance and assistance they require to complete this checklist.

Using the Checklist

The City's *TIA Guidelines* are designed so that *Module 3.1—Development-Generated Travel Demand*, *Module 4.1—Development Design*, and *Module 4.2—Parking* are complete before a proponent begins *Module 4.3—Transportation Demand Management*.

Within Module 4.3, *Element 4.3.1—Context for TDM* and *Element 4.3.2—Need and Opportunity* are intended to create an understanding of the need for any TDM measures, and of the results they are expected to achieve or support. Once those two elements are complete, proponents begin *Element 4.3.3—TDM Program* that requires proponents to identify proposed TDM measures using the **TDM Measures Checklist**, at a minimum. The *TIA Guidelines* note that the City may require additional analysis for large or complex development proposals, or those that represent a higher degree of performance risk; as well, proponents proposing TDM measures for a new development must also propose an implementation plan that addresses planning and coordination, funding and human resources, timelines for action, performance targets and monitoring requirements.

This **TDM Measures Checklist** document includes two actual checklists, one for non-residential developments (office, institutional, retail or industrial) and one for residential developments (multi-family, condominium or subdivision). Readers may download the applicable checklist in electronic format and complete it electronically, or print it out and complete it by hand. As an alternative, they may create a freestanding document that lists the TDM measures being proposed and provides additional detail on them, including an implementation plan as required by the City's *TIA Guidelines*.

Each measure in the checklist is numbered for easy reference. Each measure is also flagged as:

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

Glossary

This glossary defines and describes the following measures that are identified in the **TDM Measures Checklist**:

TDM program management
- Program coordinator
- Travel surveys

Parking
- Priced parking

Walking & cycling
- Information on walking/cycling routes & destinations
- Bicycle skills training
- Valet bike parking

Transit
- Transit information
- Transit fare incentives
- Enhanced public transit service
- Private transit service

Ridesharing
- Ridematching service
- Carpool parking price incentives
- Vanpool service

Carsharing & bikesharing
- Bikeshare stations & memberships
- Carshare vehicles & memberships

TDM marketing & communications
- Multimodal travel information
- Personalized trip planning
- Promotions

Other incentives & amenities
- Emergency ride home
- Alternative work arrangements
- Local business travel options
- Commuter incentives
- On-site amenities

For further information on selecting and implementing TDM measures (particularly as they apply to non-residential developments, with a focus on workplaces), readers may find it helpful to consult Transport Canada's *Workplace Travel Plans: Guidance for Canadian Employers*, which can be

downloaded in English and French from the ACT Canada website at
www.actcanada.com/resources/act-resources.

▶ *TDM program management*

While some TDM measures can be implemented with a minimum of effort through routine channels (e.g. parking or human resources), more complex measures or a larger development site may warrant assigning responsibility for TDM program coordination to a designated person either inside or outside the implementing organization. Similarly, some TDM measures are more effective if they are targeted or customized for specific audiences, and would benefit from the collection of related information.

Program coordinator. This person is charged with day-to-day TDM program development and implementation. Only in very large employers with thousands of workers is this likely to be a full-time, dedicated position. Usually, it is added to an existing role in parking, real estate, human resources or environmental management. In practice, this role may be called TDM coordinator, commute trip reduction coordinator or employee transportation coordinator. The City of Ottawa can identify external resources (e.g. non-profit organizations or consultants) that could provide these services.

Travel surveys. Travel surveys are most commonly conducted at workplaces, but can be helpful in other settings. They identify how and why people travel the way they do, and what barriers and opportunities exist for different behaviours. They usually capture the following information:

- *Personal data* including home address or postal code, destination, job type or function, employment status (full-time, part-time and/or teleworker), gender, age and hours of work
- *Commute information* including distance or time for the trip between home and work, usual methods of commuting, and reasons for choosing them
- *Barriers and opportunities* including why other commuting methods are unattractive, willingness to consider other options, and what improvements to other options could make them more attractive

▶ *Parking*

Priced parking. Charging for parking is typically among the most effective ways of getting drivers to consider other travel options. While drivers may not support parking fees, they can be more accepting if the revenues are used to improve other travel options (e.g. new showers and change rooms, improved bicycle parking or subsidized transit passes). At workplaces or daytime destinations, parking discounts (e.g. early bird specials, daily passes that cost significantly less than the equivalent hourly charge, monthly passes that cost significantly less than the equivalent daily charge) encourage long-term parking and discourage the use of other travel options. For residential uses, unbundling parking costs from dwelling purchase, lease or rental costs provides an incentive for residents to own fewer cars, and can reduce car use and the costs of parking provision.

▶ *Walking & cycling*

Active transportation options like cycling and walking are particularly attractive for short trips (typically up to 5 km and 2 km, respectively). Other supportive factors include an active, health-conscious audience, and development proximity to high-quality walking and cycling networks. Common challenges to active transportation include rain, darkness, snowy or icy conditions, personal safety concerns, the potential for bicycle theft, and a lack of shower and change facilities for those making longer trips.

Information on walking/cycling routes & destinations. Ottawa, Gatineau and the National Capital Commission all publish maps to help people identify the most convenient and comfortable walking or cycling routes.

Bicycle skills training. Potential cyclists can be intimidated by the need to ride on roads shared with motor vehicles. This barrier can be reduced or eliminated by offering cycling skills training to interested cyclists (e.g. CAN-BIKE certification courses).

Valet bike parking. For large events, temporary “valet parking” areas can be easily set up to maximize convenience and security for cyclists. Experienced local non-profit groups can help.

▶ *Transit*

Transit information. Difficulty in finding or understanding basic information on transit fares, routes and schedules can prevent people from trying transit. Employers can help by providing online links to OC Transpo and STO websites. Transit users also appreciate visible maps and schedules of transit routes that serve the site; even better, a screen that shows real-time transit arrival information is particularly useful at sites with many transit users and an adjacent transit stop or station.

Transit fare incentives. Free or subsidized transit fares are an attractive incentive for non-transit riders to try transit. Many non-users are unsure of how to pay a fare, and providing tickets or a preloaded PRESTO card (or, for special events, pre-arranging with OC Transpo that transit fares are included with event tickets) overcome that barrier.

Enhanced public transit service. OC Transpo may adjust transit routes, stop locations, service hours or frequencies for an agreed fee under contract, or at no cost where warranted by the potential ridership increase. Information provided by a survey of people who travel to a given development can support these decisions.

Private transit service. At remote suburban or rural workplaces, a poor transit connection to the nearest rapid transit station can be an obstacle for potential transit users, and an employer in this situation could initiate a private shuttle service to make transit use more feasible or attractive. Other circumstances where a shuttle makes sense include large special events, or a residential development for people with limited independent mobility who still require regular access to shops and services.

▶ *Ridesharing*

Ridesharing's potential is greatest in situations where transit ridership is low, where parking costs are high, and/or where large numbers of car commuters (e.g. employees or full-time students) live reasonably far from the workplace.

Ridematching service. Potential carpoolers in Ottawa are served by www.OttawaRideMatch.com, an online service to help people find carpool partners. Employers can arrange for a dedicated portal where their employees can search for potential carpool partners only among their colleagues, if they desire. Some very large employers may establish internal ridematching services, to maximize employee uptake and corporate control. Ridematching service providers typically include a waiver to relieve employers of liability when their employees start carpooling through a ridematching service. Ridesharing with co-workers also tends to eliminate security concerns.

Carpool parking price incentives. Discounted parking fees for carpools can be an extra incentive to rideshare.

Vanpool service. Vanpools operate in the Toronto and Vancouver metropolitan areas, where vans that carry up to about ten occupants are driven by one of the vanpool members. Vanpools tend to operate on a cost-recovery basis, and are most practical for long-distance commutes where transit is not an option. Current legislation in Ontario does not permit third-party (i.e. private or non-profit) vanpool services, but does permit employers to operate internal vanpools.

▶ *Carsharing & bikesharing*

Bikeshare station & memberships. VeloGO Bike Share and Right Bike both operate bikesharing services in Ottawa. Developments that would benefit from having a bikeshare station installed at or near their development may negotiate directly with either service provider.

Carshare vehicles & memberships. VRTUCAR and Zipcar both operate carsharing services in Ottawa, for use by the general public or by businesses as an alternative to corporate fleets. Carsharing services offer 24-hour access, self-serve reservation systems, itemized monthly billings, and outsourcing of all financing, insurance, maintenance and administrative responsibilities.

▶ *TDM marketing & communications*

Multimodal travel information. Aside from mode-specific information discussed elsewhere in this document, multimodal information that identifies and explains the full range of travel options available to people can be very influential—especially when provided at times and locations where individuals are actively choosing among those options. Examples include: employees when their employer is relocating, or when they are joining a new employer; students when they are starting a program at a new institution; visitors or customers travelling to an unfamiliar destination, or when faced with new options (e.g. shuttle services or parking restrictions); and residents when they purchase or occupy a residence that is new to them.

Personalized trip planning. As an extension to the simple provision of information, this technique (also known as *individualized marketing*) is effective in helping people make more sustainable travel choices. The approach involves identifying who is most likely to change their travel choices (notably relocating employees, students or residents) giving them customized information, training and incentives to support them in making that change. It may be conducted with assistance from an external service provider with the necessary skills, and delivered in a variety of settings including workplaces and homes.

Promotions. Special events and incentives can raise awareness and encourage individuals to examine and try new travel options.

- *Special events* can help attract attention, build participation and celebrate successes. Events that have been held in Ottawa include Earth Day (in April) Bike to Work Month (in May), Environment Week (early June), International Car Free Day (September 22), and Canadian Ridesharing Week (October). At workplaces or educational institutions, similarly effective internal events could include workshops, lunch-and-learns, inter-departmental challenges, pancake breakfasts, and so on.
- *Incentives* can encourage trial of sustainable modes, and might include loyalty rewards for duration or consistency of activity (e.g. 1,000 km commuted by bicycle), participation prizes (e.g. for completing a survey or joining a special event), or personal recognition that highlights individual accomplishments.

▶ *Other incentives & amenities*

Emergency ride home. This measure assures non-driving commuters that they will be able to get home quickly and conveniently in case of family emergency (or in some workplaces, in case of unexpected overtime, severe weather conditions, or the early departure of a carpool driver) by offering a chit or reimbursement for taxi, carshare or rental car usage. Limits on annual usage or cost per employee may be set, although across North America the actual rates of usage are typically very low.

Alternative work arrangements. A number of alternatives to the standard 9-to-5, Monday-to-Friday workweek can support sustainable commuting (and work-life balance) at workplaces:

- *Flexible working hours* allow transit commuters to take advantage of the fastest and most convenient transit services, and allow potential carpoolers to include people who work slightly different schedules in their search for carpool partners. They also allow active commuters to travel at least one direction in daylight, either in the morning or the afternoon, during the winter.
- *Compressed workweeks* allow employees to work their required hours over fewer days (e.g. five days in four, or ten days in nine), eliminating the need to commute on certain days. For employees, this can promote work-life balance and gives flexibility for appointments. For employers, this can permit extended service hours as well as reduced parking demands if employees stagger their days off.
- *Telework* is a normal part of many workplaces. It helps reduce commuting activity, and can lead to significant cost savings through workspace sharing. Telework initiatives involve many stakeholders, and may face as much resistance as support within an organization. Consultation, education and training are helpful.

Local business travel options. A common obstacle for people who might prefer to not drive to work is that their employer requires them to bring a car to work so they can make business trips during the day. Giving employees convenient alternatives to private cars for local business travel during the workday makes walking, cycling, transit or carpooling in someone else's car more practical.

- *Walking and cycling*—Active transportation can be a convenient and enjoyable way to make short business trips. They can also reduce employer expenses, although they may require extra travel time. Providing a fleet of shared bikes, or reimbursing cyclists for the kilometres they ride, are inexpensive ways to validate their choice.
- *Public transit*—Transit can be convenient and inexpensive compared to driving. OC Transpo's PRESTO cards are transferable among employees and automatically reloadable, making them the perfect tool for enabling transit use during the day.
- *Ridesharin*g—When multiple employees attend the same off-site meeting or event, they can be reminded to carpool whenever possible.
- *Taxis or ride-hailing*—Taxis and ride-hailing can eliminate parking costs, save time and eliminate collision liability concerns. Taxi chits eliminate cash transactions and minimize paperwork.
    - *Fleet vehicles or carsharing*—Fleet vehicles can be cost-effective for high travel volumes, while carsharing is a great option for less frequent trips.
    - *Interoffice shuttles*—Employers with multiple worksites in the region could use a shuttle service to move people as well as mail or supplies.
    - *Videoconferencing*—New technologies mean that staying in the office to hold meetings electronically is more viable, affordable and productive than ever.

Commuter incentives. Financial incentives can help create a level playing field and support commuting by sustainable modes. A "commuting allowance" given to all employees as a taxable benefit is one such incentive; employees who choose to drive could then be charged for parking, while other employees could use the allowance for transit fares or cycling equipment, or for spending or saving. (Note that in the United States this practice is known as "parking cash-out," and is popular because commuting allowances are not taxable up to a certain limit). Alternatively, a monthly commuting allowance for non-driving employees would give drivers an incentive to choose a different commuting mode. Another practical incentive for active commuters or transit users is to offer them discounted "rainy day" parking passes for a small number of days each month.

On-site amenities. Developments that offer services to limit employees' need for a car during their commute (e.g. to drop off clothing at the dry cleaners) or during their workday (e.g. to buy lunch) can free employees to make the commuting decision that otherwise works best for them.

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

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

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

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

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

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

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

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

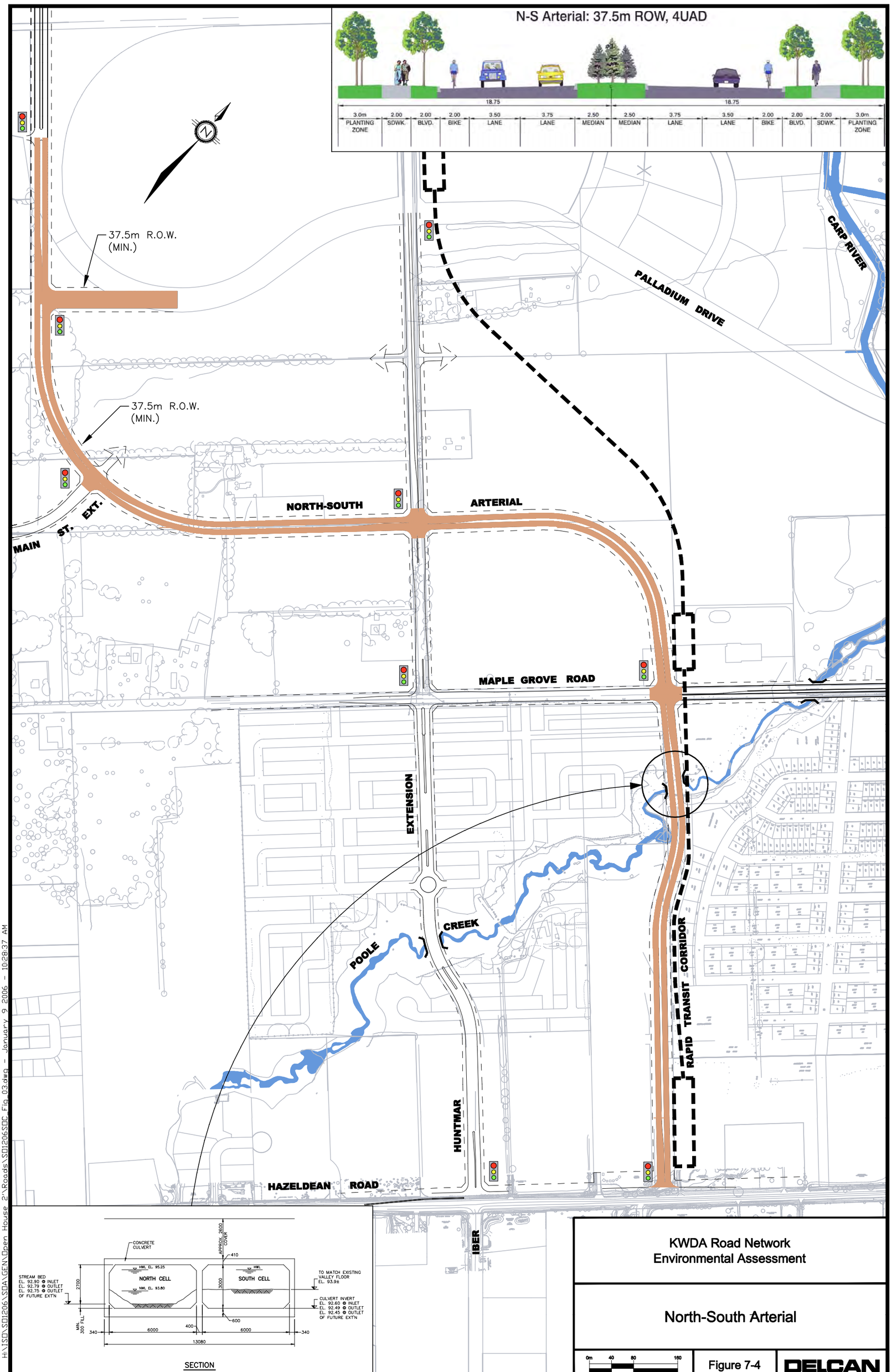
		TDM measures: *Residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☒
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify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

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

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

Appendix E

Kanata West Master Plan Cross-Section


N-S Arterial: 37.5m ROW, 4UAD
18.75
18.75
3.0m PLANTING ZONE
2.00 SDWK.
2.00 BLVD.
2.00 BIKE
3.50 LANE
3.75 LANE
2.50 MEDIAN
2.50 MEDIAN
3.75 LANE
3.50 LANE
2.00 BIKE
2.00 BLVD.
2.00 SDWK.
3.0m PLANTING ZONE
37.5m R.O.W. (MIN.)
37.5m R.O.W. (MIN.)
CARP RIVER
PALLADIUM DRIVE
MAIN ST. EXT.
NORTH-SOUTH ARTERIAL
MAPLE GROVE ROAD
EXTENSION
POOLE CREEK
RAPID TRANSIT CORRIDOR
HUNTMAR
IBER
HAZELDEAN ROAD
CONCRETE CULVERT
APPROX. 2600 COVER
410
HWL EL. 95.25
NORTH CELL
NWL EL. 93.80
SOUTH CELL
HWL
TO MATCH EXISTING VALLEY FLOOR EL. 93.9±
STREAM BED EL. 92.90 ⊕ INLET EL. 92.75 ⊕ OUTLET EL. 92.75 ⊕ OUTLET OF FUTURE EXTN
CULVERT INVERT EL. 92.60 ⊕ INLET EL. 92.49 ⊕ OUTLET EL. 92.45 ⊕ OUTLET OF FUTURE EXTN
2700
3000
MIN. 300 FILL
600
340
6000
400
6000
340
13080
SECTION
N.T.S.
KWDA Road Network
Environmental Assessment
North-South Arterial
0m 40 80 160
Figure 7-4
DELCAN
H:\TSD\SD1206\SDA\GEN\Open House 2\Roads\SD1206SDC_Fig_03.dwg - January 9, 2006 - 10:28:37 AM

Appendix F

Interim Road Connection Plan

HIGHWAY 417

Eastbound Off Ramp

Eastbound On Ramp

HEADWALL

Eastbound On Ramp

Autopark

CANADIAN TIRE CENTRE

FUNDED BY DEVELOPMENT CHARGES, ULTIMATE CONFIGURATION

6m SERVICING EASEMENT

6m SERVICING EASEMENT

Sediment Management Area

Employment

Commercial

Commercial

10m SERVICING BLOCK

9m SERVICING BLOCK

PROPOSED 6m SERVICING BLOCK

PALLADIUM DRIVE

HUNTMAR DRIVE

Commercial

High School

6m SERVICING BLOCK

PARK

Park

6m SERVICING EASEMENT

FUNDED BY DEVELOPER, RURAL CROSS SECTION, TEMPORARY CONFIGURATION

Commercial

Future Development

FUTURE WORK

Future Development

MAPLE GROVE ROAD

SCALE 1:5000

Appendix G

Roundabout Feasibility Tool and Signal Warrant Sheets

3. Roundabout Implementation Policy

The following sections describe a roundabout implementation policy developed for the City of Ottawa, in consultation with a Project Working Group, that is consistent with existing Ottawa City Council policy.

3.1 Background

There are a number of roundabout implementation policies in place in certain Canadian provinces, U.S. states, and other jurisdictions. The most common type is a policy that simply states a roundabout should be "considered" when a new road or highway is built or an existing facility is widening or reconstructed. It is usually left to the service provider to determine in what manner a roundabout is considered.

Another is a "roundabouts first" policy, where a roundabout is deemed preferred unless it can be demonstrated that another alternative is preferred because it will operate better or be significantly less costly. This type of policy is in place in the provinces of British Columbia and Alberta, and in several U.S. states.

Another type is a policy that has been approved by Council in the Region of Waterloo, where roundabouts are considered under the following conditions:

- At any new Regional Road intersection.
- Where traffic signals are warranted.
- Where capacity or safety problems are being experienced.

If one or more of the conditions is met then the location is subjected to an initial screening. Should a roundabout pass the initial screening then an Intersection Control Study (ICS) is undertaken that compares a roundabout and one or more alternatives in terms of several economic and non-economic criteria. The economic criteria comprise construction costs and study period costs (which include maintenance costs and the human capital costs of motor vehicle collisions). The non-economic criteria may include peak hour traffic operations, speed control, access management, conditions for pedestrians and cyclists, impacts to transit services, environmental benefits, etc. After comparing the economic and non-economic evaluation the technically preferred alternative is recommended for implementation.

Similar Intersection Control Studies have been undertaken elsewhere, although they may not necessarily be a requirement of the road authority.

In consultation with the Project Working Group it was decided that a roundabout policy similar to the one in the Region of Waterloo would be most appropriate for the City of Ottawa.

3.2 The Roundabout Screening Tool

Similar to the Region of Waterloo, an initial screening tool was developed for the City. The intent of the tool is to provide a relatively quick assessment of the feasibility of a roundabout at a particular intersection in comparison to other appropriate forms of traffic control or road modifications. The intended outcome is to provide enough information to assist City staff in deciding whether or not to proceed with an ICS to investigate the feasibility of a roundabout in more detail.

The Roundabout Initial Feasibility Screening Tool asks some questions about the intersection, what traditional modifications are being proposed (i.e. installation of traffic signals, addition of auxiliary lanes, etc.), the type of roundabout that would be implemented, and why a roundabout is being considered. It then asks a series of questions related to suitability factors and contra-indications for roundabouts to aid in the decision-making process.

The suitability factor questions are:

- Does the intersection currently experience an average collision frequency of more than 1.5 injury crashes per year, or a collision rate in excess of 1 injury crash per 1 million vehicles entering (MVE)?
- Has there been a fatal crash at the intersection in the last 10 years?
- Are capacity problems currently being experienced, or expected in the future?
- Are traffic signals warranted, or expected to be warranted in the future?
- Does the intersection have more than 4 legs, or unusual geometry?
- Will planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left-turn lanes)?
- Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?

If "Yes" is indicated for two or more of the suitability factors, then the tool states that a roundabout should be technically feasible at the subject intersection.

The contra-indication questions are:

- Is there insufficient property at the intersection (i.e. less than 44 metres diameter if considering a single-lane roundabout, and less than 60 metres if considering a two-lane roundabout) or property constraints that would require demolition of adjacent structures?
- Are there any instances where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?
- Is there an existing uncontrolled approach with a grade in excess of 4 percent?
- Is the intersection located within a coordinated signal system?
- Is there a closely-spaced traffic signal or railway crossing that could not be controlled with a nearby roundabout?
- Are significant differences in directional flows or any situations of sudden high demand expected?
- Are there known visually-impaired pedestrians that cross this intersection?

If "Yes" is indicated for one or more of the contra-indications, then the tool states that a roundabout may be problematic at the subject intersection. That is not to say that a roundabout is not possible, just that there may be difficulties or high costs.

At its conclusion the tool asks for a recommendation whether to proceed with an ICS. An example of the City of Ottawa Roundabout Initial Feasibility Screening Tool, as of May 14, 2013, is provided in **Appendix A**.

3.3 Intersection Control Studies

3.3.1 The Decision Matrix

The means of conducting an Intersection Control Study in the City of Ottawa was discussed with the Project Working Group. It was decided to go with a matrix style approach that would compare economic and non-economic criteria, and be responsive to the needs of individual locations. The rationale for this was brought forward in a memo dated May 16, 2013, which is included in **Appendix B**.

The criteria to be examined should be relevant to the general environment, although additional criteria relevant to the specific location could be incorporated. The base criteria for rural, semi-urban/suburban and urban intersections are listed in **Table 1**.

Table 1 Roundabout Evaluation Criteria

Rural Intersections	Semi-Urban/Suburban Intersections	Urban Intersections
Construction Cost	Construction Cost	Construction Cost
Safety	Safety	Safety
Capacity	Capacity	Capacity
	Pedestrians and Cyclists	Pedestrians and Cyclists
	Environmental	Environmental
	Property Impacts	Access Management
		Transit
		Property Impacts

It was decided that each criteria would be assigned a weight from 1 to 4 based on its subjective importance to the particular location (with 1 being “important enough that the criteria must be considered”, and 4 being “very important for intersection control selection”). The weights would be established by a project team at the start of the ICS. Then, during the course of the ICS each criteria would be assigned a score from 1 to 5, such that the score for both alternatives would have to add to 6.

An example of this evaluation for an urban intersection is seen in **Table 2**.

Table 2 Roundabout Evaluation Matrix – Example Urban Intersection

Criteria	Weight	Signalized Intersection	Roundabout
Construction Cost	2	5	1
Safety	4	3	3
Capacity	3	2	4
Pedestrians and Cyclists	4	4	2
Environmental	1	2	4
Access Management	2	2	4
Transit	2	4	2
Property Impacts	4	5	1
Total		**78**	**54**

3.3.2 Evaluating the Criteria

Some of the criteria, namely Construction Cost, Property Impacts and Capacity, can be evaluated objectively using cost estimation techniques and intersection capacity analysis software.

The Safety criterion should be evaluated using models to predict the frequency and severity of collisions that would occur at the intersection during a specified study period following implementation of the alternatives. A score between 1 and 5 would be assigned based on their performance relative to each other. It is suggested that the scores be based on "fatal+injury" collisions only, or be weighted to account for injury severity. The collision predictions could be further weighted by assigning human capital costs to motor vehicle collisions, as is done by the MTO and some other agencies.

The Environmental criterion could be evaluated subjectively, although reasons for assigning collective scores for components of the criterion (such as vehicle noise, fuel consumption and emissions, quantity of impermeable pavement, and area available for landscaping) should be documented.

The Pedestrians & Cyclists criterion would also need to be evaluated subjectively. Collisions involving pedestrians and cyclists are infrequent, as is information regarding statistical levels of safety at roundabouts. Perceived level of safety would be difficult to incorporate into a comparison. Therefore this criterion should be scored based on the "quality" of the facilities for pedestrians and cyclists proposed for each alternative. Quality should be considered a combination of convenience and accessibility. Again, reasons for assigning scores should be documented.

In urban locations the criteria of Access Management and Transit could be evaluated subjectively based on locations of existing or proposed driveways, corridor operating speeds, the type and frequency of transit service, locations for bus stops, and whether there is or are plans for transit priority.

3.3.3 The Roundabout Implementation Process

Similar to the Region of Waterloo, a roundabout should be considered in the City of Ottawa under the following conditions:

- At any new City intersection.
- Where traffic signals are warranted.
- At intersections where capacity or safety problems are being experienced.

If any of these conditions are met then screening for the possibility of a roundabout should be undertaken using the Roundabout Initial Feasibility Screening Tool. If the tool indicates that the feasibility of a roundabout should be investigated in more detail, City staff should proceed with an Intersection Control Study (ICS) to determine whether a roundabout or another alternative is preferred at the subject intersection.

City of Ottawa
Roundabout Initial Feasibility Screening Tool

The intent of this screening tool is to provide a relatively quick assessment of the feasibility of a roundabout at a particular intersection in comparison to other appropriate forms of traffic control or road modifications including all-way stop control, traffic signals, auxiliary lanes, etc. The intended outcome of this tool is to provide enough information to assist staff in deciding whether or not to proceed with an Intersection Control Study to investigate the feasibility of a roundabout in more detail.

1	Project Name:	195 Huntmar
2	Intersection:	Street 1 / Palladium Drive
3	Location and Description of Intersection: Lane configuration, total or approach AADT, distance to nearby intersection(s), etc. Attach or sketch a diagram and include existing and/or horizon-year turning movements. If an existing intersection then indicate type of control.	New intersection along Palladium Drive, including a realignment of a portion of Palladium Drive between Huntmar Drive and Highway 417.
4	What traditional modifications are proposed? All-way stop control, traffic signals, auxiliary lanes, etc. Attach or sketch a diagram if necessary.	As part of a previous analysis a roundabout was considered. This form has been prepared to confirm the findings of the previous report.
5	What size of roundabout is being considered? Describe, and attach a Roundabout Traffic Flow Worksheet.	Two-lane roundabout
6	Why is a roundabout being considered?	due to non-conventional approach geometry

7 Are there contra-indications for a roundabout?

If "Yes" is indicated for one or more of the contra-indications then a roundabout may be problematic at the subject intersection. That is not to say that a roundabout is not possible, just that there may be difficulties or high costs.

No.	Contra-Indication	Outcome
1	Is there insufficient property at the intersection (i.e. less than 44 metres diameter if considering a single-lane roundabout, and less than 60 metres if considering a two-lane roundabout) or property constraints that would require demolition of adjacent structures?	Yes ☐ No ☑
2	Are there any instances where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?	Yes ☐ No ☑
3	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	Yes ☐ No ☑
4	Is the intersection located within a coordinated signal system?	Yes ☐ No ☑
5	Is there a closely-spaced traffic signal or railway crossing that could not be controlled with a nearby roundabout?	Yes ☐ No ☑
6	Are significant differences in directional flows or any situations of sudden high demand expected?	Yes ☑ No ☐
7	Are there known visually-impaired pedestrians that cross this intersection?	Yes ☐ No ☑

8 Are there suitability factors for a roundabout?

If "Yes" is indicated for two or more of the suitability factors then a roundabout should be technically feasible at the subject intersection.

No.	Suitability Factor	Outcome
1	Does the intersection currently experience an average collision frequency of more than 1.5 injury crashes per year, or a collision rate in excess of 1injury crash per 1 million vehicles entering (MVE)?	Yes ☐ No ☑
2	Has there been a fatal crash at the intersection in the last 10 years?	Yes ☐ No ☑
3	Are capacity problems currently being experienced, or expected in the future?	Yes ☑ No ☐
4	Are traffic signals warranted, or expected to be warranted in the future?	Yes ☑ No ☐
5	Does the intersection have more than 4 legs, or unusual geometry?	Yes ☑ No ☐
6	Will planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left-turn lanes)?	Yes ☐ No ☑
7	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Yes ☑ No ☐

9	Conclusions/recommendation whether to proceed with an Intersection Control Study:	A roundabout is recommended and has been considered in the TIS to support 195 Huntmar.

Street 1 / Palladium Drive
2024 Total Future (Urban)

Justification #7

Justification	Description	Minimum Requirement		Minimum		Compliance			Signal
		1 Lane Highway		2 or More Lanes		Sectional		Entire %	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1331	148%	148%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	655	385%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	420	600	900	676	75%	75%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	435	581%		

Notes

1. Refer to OTM Book 12, pg 88, Nov 2007

2. Lowest section percentage governs justification

3. Average hourly volumes estiamted from peak hour volumes, AHV = PM/2 or (AM + PM) / 4

Street 1 / Palladium Drive
2024 Total Future (Rural)

Justification #7

Justification	Description	Minimum Requirement		Minimum		Compliance			
		1 Lane Highway		2 or More Lanes		Sectional		Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	1331	222%	222%	Yes
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	655	546%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	420	600	900	676	113%	113%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	435	871%		

Notes

1. Refer to OTM Book 12, pg 88, Nov 2007

2. Lowest section percentage governs justification

3. Average hourly volumes estiamted from peak hour volumes, AHV = PM/2 or (AM + PM) / 4

Palladium Drive / Highway 417 EB Ramp
2024 Total Future (Urban)

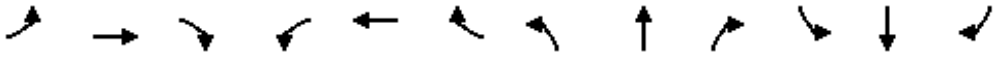
Justification #7

Justification	Description	Minimum Requirement		Minimum		Compliance			
		1 Lane Highway		2 or More Lanes		Sectional		Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	754	84%	84%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	269	158%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	420	600	900	575	64%	52%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	39	52%		

Notes
1. Refer to OTM Book 12, pg 88, Nov 2007
2. Lowest section percentage governs justification
3. Average hourly volumes estiamted from peak hour volumes, AHV = PM/2 or (AM + PM) / 4

Appendix H

2019 Existing Conditions Synchro



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	0	253	0	0	0	0	118	308	0	292	118
Future Volume (vph)	89	0	253	0	0	0	0	118	308	0	292	118
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	99	0	281	0	0	0	0	131	342	0	324	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	0	281	0	0	0	0	131	342	0	324	131
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			

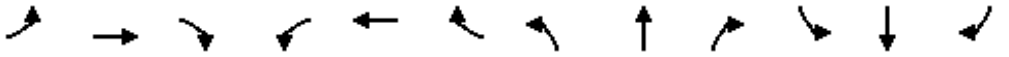
Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	0	253	0	0	0	0	118	308	0	292	118
Future Vol, veh/h	89	0	253	0	0	0	0	118	308	0	292	118
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	99	0	281	0	0	0	0	131	342	0	324	131

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	390	-	-			-	0	-	-	-	0
Stage 1	324	-	-			-	-	-	-	-	-
Stage 2	66	-	-			-	-	-	-	-	-
Critical Hdwy	6.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-			-	-	-	-	-	-
Pot Cap-1 Maneuver	586	0	0			0	-	0	0	-	0
Stage 1	705	0	0			0	-	0	0	-	0
Stage 2	949	0	0			0	-	0	0	-	0
Platoon blocked, %							-			-	
Mov Cap-1 Maneuver	586	0	-			-	-	-	-	-	-
Mov Cap-2 Maneuver	586	0	-			-	-	-	-	-	-
Stage 1	705	0	-			-	-	-	-	-	-
Stage 2	949	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	586	-	-
HCM Lane V/C Ratio	-	0.169	-	-
HCM Control Delay (s)	-	12.4	0	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.6	-	-



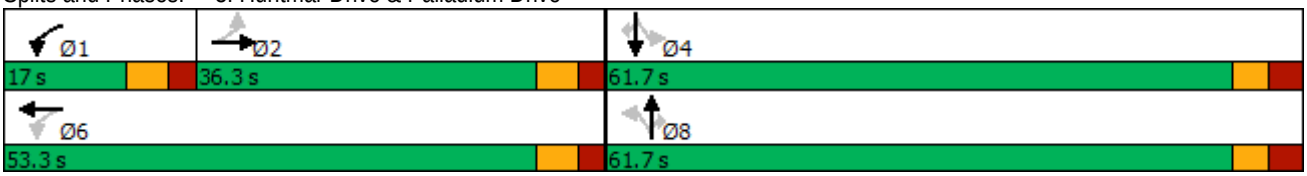
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	216	197	39	88	39	351	246	119	73	165	55
Future Volume (vph)	26	216	197	39	88	39	351	246	119	73	165	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.928			0.954				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3112	0	1676	3199	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.663			0.387			0.630			0.517		
Satd. Flow (perm)	1170	3112	0	683	3199	0	1112	1765	1500	912	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		193			43				132			90
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	29	240	219	43	98	43	390	273	132	81	183	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	459	0	43	141	0	390	273	132	81	183	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	39.8	39.8		47.7	47.6		38.7	38.7	38.7	38.7	38.7	38.7
Actuated g/C Ratio	0.40	0.40		0.48	0.48		0.39	0.39	0.39	0.39	0.39	0.39
v/c Ratio	0.06	0.34		0.11	0.09		0.90	0.40	0.20	0.23	0.27	0.10
Control Delay	27.5	15.6		18.3	12.3		52.4	22.7	3.7	20.6	20.5	1.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	15.6		18.3	12.3		52.4	22.7	3.7	20.6	20.5	1.7
LOS	C	B		B	B		D	C	A	C	C	A
Approach Delay		16.3			13.7			34.1			17.0	
Approach LOS		B			B			C			B	
Queue Length 50th (m)	3.9	20.1		4.5	5.4		71.7	38.6	0.0	10.6	24.4	0.0
Queue Length 95th (m)	13.0	42.7		13.5	14.0		114.5	58.4	10.4	21.1	39.2	3.7
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	469	1363		438	1558		628	997	904	515	997	886
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.34		0.10	0.09		0.62	0.27	0.15	0.16	0.18	0.07

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 99.2
Natural Cycle: 85
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 24.1 Intersection LOS: C
Intersection Capacity Utilization 67.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Huntmar Drive & Palladium Drive



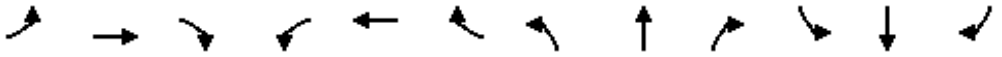
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	216	197	39	88	39	351	246	119	73	165	55
Future Volume (veh/h)	26	216	197	39	88	39	351	246	119	73	165	55
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	29	240	219	43	98	43	390	273	132	81	183	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	509	601	526	351	1034	430	506	762	647	388	762	647
Arrive On Green	0.35	0.35	0.35	0.03	0.45	0.45	0.43	0.43	0.43	0.43	0.43	0.00
Sat Flow, veh/h	1243	1696	1484	1681	2310	962	1196	1765	1500	976	1765	1500
Grp Volume(v), veh/h	29	237	222	43	70	71	390	273	132	81	183	0
Grp Sat Flow(s),veh/h/ln	1243	1676	1503	1681	1676	1595	1196	1765	1500	976	1765	1500
Q Serve(g_s), s	1.6	11.2	11.7	1.6	2.5	2.7	32.2	10.9	5.8	6.4	6.9	0.0
Cycle Q Clear(g_c), s	1.6	11.2	11.7	1.6	2.5	2.7	39.1	10.9	5.8	17.3	6.9	0.0
Prop In Lane	1.00		0.99	1.00		0.60	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	509	594	533	351	750	714	506	762	647	388	762	647
V/C Ratio(X)	0.06	0.40	0.42	0.12	0.09	0.10	0.77	0.36	0.20	0.21	0.24	0.00
Avail Cap(c_a), veh/h	509	594	533	467	750	714	620	929	790	481	929	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	25.5	25.7	19.9	16.7	16.8	31.3	20.1	18.6	25.9	18.9	0.0
Incr Delay (d2), s/veh	0.2	2.0	2.4	0.2	0.2	0.3	4.8	0.3	0.2	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.5	5.2	0.8	1.2	1.2	11.3	5.4	2.4	1.8	3.4	0.0
LnGrp Delay(d),s/veh	22.6	27.5	28.1	20.0	17.0	17.1	36.1	20.4	18.8	26.2	19.1	0.0
LnGrp LOS	C	C	C	C	B	B	D	C	B	C	B	
Approach Vol, veh/h		488			184			795			264	
Approach Delay, s/veh		27.5			17.7			27.8			21.3	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	9.8	43.5		51.7		53.3		51.7
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	3.6	13.7		19.3		4.7		41.1
Green Ext Time (p_c), s	0.0	3.1		1.9		1.0		4.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	0	216	0	0	0	0	438	349	0	641	192
Future Volume (vph)	68	0	216	0	0	0	0	438	349	0	641	192
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	76	0	240	0	0	0	0	487	388	0	712	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	0	240	0	0	0	0	487	388	0	712	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.5%		ICU Level of Service A	
Analysis Period (min) 15			

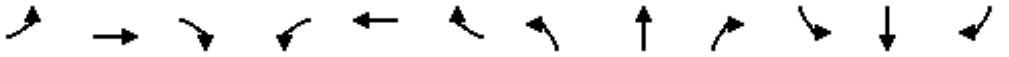
Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	0	216	0	0	0	0	438	349	0	641	192
Future Vol, veh/h	68	0	216	0	0	0	0	438	349	0	641	192
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	0	240	0	0	0	0	487	388	0	712	213

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	956	-	-				-	0	-	-	-	0
Stage 1	712	-	-				-	-	-	-	-	-
Stage 2	244	-	-				-	-	-	-	-	-
Critical Hdwy	6.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	256	0	0				0	-	0	0	-	0
Stage 1	447	0	0				0	-	0	0	-	0
Stage 2	774	0	0				0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	256	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	256	0	-				-	-	-	-	-	-
Stage 1	447	0	-				-	-	-	-	-	-
Stage 2	774	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	256	-	-
HCM Lane V/C Ratio	-	0.295	-	-
HCM Control Delay (s)	-	24.8	0	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	1.2	-	-

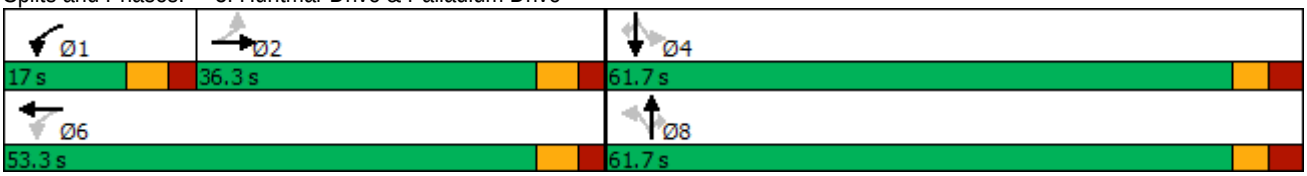


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	153	433	151	338	98	244	216	71	83	278	73
Future Volume (vph)	31	153	433	151	338	98	244	216	71	83	278	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.889			0.966				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	2981	0	1676	3239	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.476			0.253			0.466			0.556		
Satd. Flow (perm)	840	2981	0	446	3239	0	822	1765	1500	981	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		451			40				90			90
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	34	170	481	168	376	109	271	240	79	92	309	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	651	0	168	485	0	271	240	79	92	309	81
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	32.0	32.0		47.9	47.8		33.1	33.1	33.1	33.1	33.1	33.1
Actuated g/C Ratio	0.34	0.34		0.51	0.51		0.35	0.35	0.35	0.35	0.35	0.35
v/c Ratio	0.12	0.50		0.48	0.29		0.93	0.39	0.13	0.27	0.50	0.14
Control Delay	28.7	10.1		20.5	14.8		67.6	23.4	3.5	22.1	25.6	3.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	10.1		20.5	14.8		67.6	23.4	3.5	22.1	25.6	3.7
LOS	C	B		C	B		E	C	A	C	C	A
Approach Delay		11.0			16.2			41.0			21.2	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	4.4	13.9		16.1	23.5		48.3	33.2	0.0	12.1	44.8	0.0
Queue Length 95th (m)	15.0	38.5		41.2	50.4		85.2	51.4	6.8	23.3	66.8	7.2
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	286	1312		371	1669		492	1057	934	587	1057	934
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.50		0.45	0.29		0.55	0.23	0.08	0.16	0.29	0.09

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 93.8			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 21.8		Intersection LOS: C	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Huntmar Drive & Palladium Drive



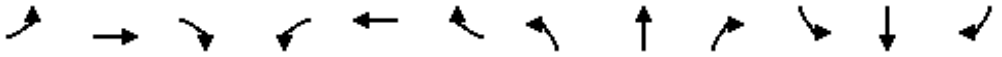
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	153	433	151	338	98	244	216	71	83	278	73
Future Volume (veh/h)	31	153	433	151	338	98	244	216	71	83	278	73
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	34	170	481	168	376	109	271	240	79	92	309	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	526	470	213	1181	338	383	736	626	414	736	626
Arrive On Green	0.31	0.31	0.31	0.08	0.46	0.46	0.42	0.42	0.42	0.42	0.42	0.00
Sat Flow, veh/h	907	1676	1500	1681	2574	737	1066	1765	1500	1056	1765	1500
Grp Volume(v), veh/h	34	170	481	168	243	242	271	240	79	92	309	0
Grp Sat Flow(s),veh/h/ln	907	1676	1500	1681	1676	1635	1066	1765	1500	1056	1765	1500
Q Serve(g_s), s	2.7	7.9	32.1	6.6	9.4	9.6	24.7	9.4	3.3	6.6	12.7	0.0
Cycle Q Clear(g_c), s	2.7	7.9	32.1	6.6	9.4	9.6	37.3	9.4	3.3	16.0	12.7	0.0
Prop In Lane	1.00		1.00	1.00		0.45	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	355	526	470	213	769	750	383	736	626	414	736	626
V/C Ratio(X)	0.10	0.32	1.02	0.79	0.32	0.32	0.71	0.33	0.13	0.22	0.42	0.00
Avail Cap(c_a), veh/h	355	526	470	247	769	750	514	952	810	544	952	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.1	26.9	35.2	25.0	17.6	17.6	34.3	20.1	18.4	25.5	21.1	0.0
Incr Delay (d2), s/veh	0.5	1.6	47.4	13.8	1.1	1.1	2.9	0.3	0.1	0.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.9	19.4	3.8	4.6	4.5	7.5	4.7	1.4	1.9	6.3	0.0
LnGrp Delay(d),s/veh	25.6	28.5	82.6	38.8	18.6	18.8	37.1	20.4	18.4	25.8	21.5	0.0
LnGrp LOS	C	C	F	D	B	B	D	C	B	C	C	
Approach Vol, veh/h		685			653			590			401	
Approach Delay, s/veh		66.3			23.9			27.8			22.5	
Approach LOS		E			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	14.9	38.4		49.2		53.3		49.2
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	8.6	34.1		18.0		11.6		39.3
Green Ext Time (p_c), s	0.1	0.0		3.1		3.8		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	37.1
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	0	156	0	0	0	0	322	260	0	429	489
Future Volume (vph)	137	0	156	0	0	0	0	322	260	0	429	489
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	152	0	173	0	0	0	0	358	289	0	477	543
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	0	173	0	0	0	0	358	289	0	477	543
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.3%		ICU Level of Service A	
Analysis Period (min) 15			

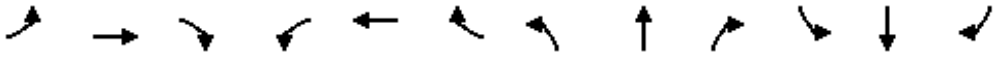
Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	0	156	0	0	0	0	322	260	0	429	489
Future Vol, veh/h	137	0	156	0	0	0	0	322	260	0	429	489
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	0	173	0	0	0	0	358	289	0	477	543

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	656	-	-				-	0	-	-	-	0
Stage 1	477	-	-				-	-	-	-	-	-
Stage 2	179	-	-				-	-	-	-	-	-
Critical Hdwy	6.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	398	0	0				0	-	0	0	-	0
Stage 1	590	0	0				0	-	0	0	-	0
Stage 2	834	0	0				0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	398	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	398	0	-				-	-	-	-	-	-
Stage 1	590	0	-				-	-	-	-	-	-
Stage 2	834	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	398	-	-
HCM Lane V/C Ratio	-	0.382	-	-
HCM Control Delay (s)	-	19.5	0	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	1.8	-	-



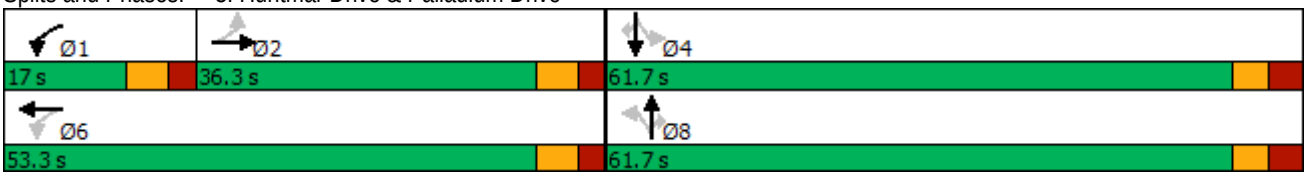
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	227	309	115	217	112	227	195	80	184	268	85
Future Volume (vph)	44	227	309	115	217	112	227	195	80	184	268	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.914			0.949				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3065	0	1676	3182	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.534			0.296			0.469			0.583		
Satd. Flow (perm)	942	3065	0	522	3182	0	828	1765	1500	1029	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		291			97				90			94
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	49	252	343	128	241	124	252	217	89	204	298	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	595	0	128	365	0	252	217	89	204	298	94
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	32.6	32.6		47.8	47.7		29.7	29.7	29.7	29.7	29.7	29.7
Actuated g/C Ratio	0.36	0.36		0.53	0.53		0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.14	0.46		0.33	0.21		0.93	0.37	0.16	0.60	0.51	0.17
Control Delay	26.1	13.9		16.1	10.2		67.6	24.0	4.7	32.3	26.7	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	13.9		16.1	10.2		67.6	24.0	4.7	32.3	26.7	4.7
LOS	C	B		B	B		E	C	A	C	C	A
Approach Delay		14.8			11.7			40.6			25.2	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	5.8	20.0		10.9	12.2		43.3	29.5	0.0	30.4	42.8	0.0
Queue Length 95th (m)	18.5	47.1		29.2	28.8		77.3	46.8	8.9	52.0	65.0	9.2
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	340	1292		416	1726		514	1096	966	639	1096	967
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.46		0.31	0.21		0.49	0.20	0.09	0.32	0.27	0.10

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 90.2
Natural Cycle: 85
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 23.1 Intersection LOS: C
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Huntmar Drive & Palladium Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	227	309	115	217	112	227	195	80	184	268	85
Future Volume (veh/h)	44	227	309	115	217	112	227	195	80	184	268	85
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	49	252	343	128	241	124	252	217	89	204	298	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	422	578	517	308	1029	512	369	702	597	408	702	597
Arrive On Green	0.34	0.34	0.34	0.07	0.47	0.47	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	1013	1676	1500	1681	2170	1080	1077	1765	1500	1069	1765	1500
Grp Volume(v), veh/h	49	252	343	128	184	181	252	217	89	204	298	0
Grp Sat Flow(s),veh/h/ln	1013	1676	1500	1681	1676	1574	1077	1765	1500	1069	1765	1500
Q Serve(g_s), s	3.3	11.5	19.3	4.6	6.4	6.8	21.9	8.4	3.8	16.1	12.1	0.0
Cycle Q Clear(g_c), s	3.3	11.5	19.3	4.6	6.4	6.8	34.1	8.4	3.8	24.4	12.1	0.0
Prop In Lane	1.00		1.00	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	422	578	517	308	795	746	369	702	597	408	702	597
V/C Ratio(X)	0.12	0.44	0.66	0.42	0.23	0.24	0.68	0.31	0.15	0.50	0.42	0.00
Avail Cap(c_a), veh/h	422	578	517	379	795	746	541	984	836	578	984	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	25.0	27.6	20.0	15.4	15.5	34.0	20.5	19.1	28.9	21.6	0.0
Incr Delay (d2), s/veh	0.6	2.4	6.6	0.9	0.7	0.8	2.2	0.2	0.1	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.7	8.9	2.2	3.1	3.1	6.7	4.1	1.6	4.8	6.0	0.0
LnGrp Delay(d),s/veh	22.9	27.4	34.1	20.9	16.1	16.3	36.2	20.7	19.2	29.8	22.0	0.0
LnGrp LOS	C	C	C	C	B	B	D	C	B	C	C	
Approach Vol, veh/h		644			493			558			502	
Approach Delay, s/veh		30.7			17.4			27.5			25.2	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	12.8	40.5		45.9		53.3		45.9
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	6.6	21.3		26.4		8.8		36.1
Green Ext Time (p_c), s	0.1	3.0		3.7		2.8		3.4

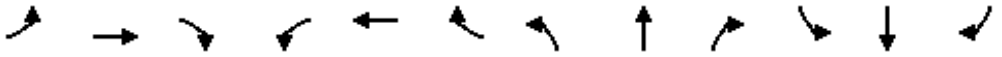
Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Appendix I

2024 Future Background Synchro



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	0	276	0	0	0	0	125	382	0	355	118
Future Volume (vph)	89	0	276	0	0	0	0	125	382	0	355	118
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	99	0	307	0	0	0	0	139	424	0	394	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	0	307	0	0	0	0	139	424	0	394	131
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	0	276	0	0	0	0	125	382	0	355	118
Future Vol, veh/h	89	0	276	0	0	0	0	125	382	0	355	118
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	99	0	307	0	0	0	0	139	424	0	394	131

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	464	-	-			-	0	-	-	-	0
Stage 1	394	-	-			-	-	-	-	-	-
Stage 2	70	-	-			-	-	-	-	-	-
Critical Hdwy	6.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-			-	-	-	-	-	-
Pot Cap-1 Maneuver	527	0	0			0	-	0	0	-	0
Stage 1	650	0	0			0	-	0	0	-	0
Stage 2	945	0	0			0	-	0	0	-	0
Platoon blocked, %							-			-	
Mov Cap-1 Maneuver	527	0	-			-	-	-	-	-	-
Mov Cap-2 Maneuver	527	0	-			-	-	-	-	-	-
Stage 1	650	0	-			-	-	-	-	-	-
Stage 2	945	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	527	-	-
HCM Lane V/C Ratio	-	0.188	-	-
HCM Control Delay (s)	-	13.4	0	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.7	-	-

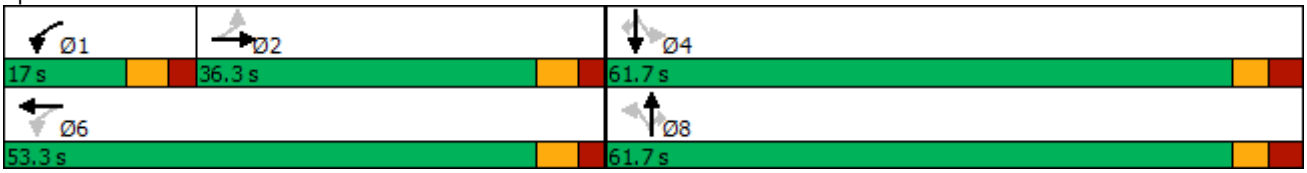
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	239	260	56	96	39	424	256	139	73	176	55
Future Volume (vph)	26	239	260	56	96	39	424	256	139	73	176	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.922			0.957				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3091	0	1676	3209	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.657			0.291			0.620			0.525		
Satd. Flow (perm)	1159	3091	0	514	3209	0	1094	1765	1500	926	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		231			43				154			90
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	29	266	289	62	107	43	471	284	154	81	196	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	555	0	62	150	0	471	284	154	81	196	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	35.8	35.8		47.4	47.3		49.7	49.7	49.7	49.7	49.7	49.7
Actuated g/C Ratio	0.33	0.33		0.43	0.43		0.45	0.45	0.45	0.45	0.45	0.45
v/c Ratio	0.08	0.48		0.20	0.11		0.95	0.36	0.20	0.19	0.25	0.08
Control Delay	31.9	20.3		22.3	14.7		59.5	20.6	3.3	18.8	18.9	1.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	20.3		22.3	14.7		59.5	20.6	3.3	18.8	18.9	1.7
LOS	C	C		C	B		E	C	A	B	B	A
Approach Delay		20.8			16.9			37.8			15.8	
Approach LOS		C			B			D			B	
Queue Length 50th (m)	5.1	33.3		8.9	8.0		98.8	40.4	0.0	10.6	26.3	0.0
Queue Length 95th (m)	13.2	53.1		17.9	15.0		#168.3	60.8	11.0	21.0	41.9	3.7
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	377	1163		336	1406		554	894	836	469	894	804
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.48		0.18	0.11		0.85	0.32	0.18	0.17	0.22	0.08

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 109.7
Natural Cycle: 95
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 27.2 Intersection LOS: C
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



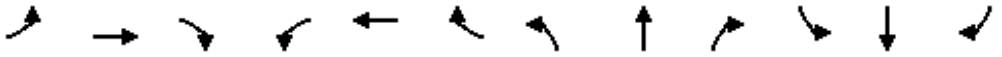
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	239	260	56	96	39	424	256	139	73	176	55
Future Volume (veh/h)	26	239	260	56	96	39	424	256	139	73	176	55
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	29	266	289	62	107	43	471	284	154	81	196	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	456	535	478	259	974	374	551	844	717	421	844	717
Arrive On Green	0.32	0.32	0.32	0.04	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.00
Sat Flow, veh/h	1232	1676	1500	1681	2372	909	1182	1765	1500	947	1765	1500
Grp Volume(v), veh/h	29	266	289	62	74	76	471	284	154	81	196	0
Grp Sat Flow(s),veh/h/ln	1232	1676	1500	1681	1676	1604	1182	1765	1500	947	1765	1500
Q Serve(g_s), s	1.9	14.7	18.6	2.7	3.1	3.3	44.5	11.5	6.8	6.7	7.5	0.0
Cycle Q Clear(g_c), s	1.9	14.7	18.6	2.7	3.1	3.3	52.0	11.5	6.8	18.1	7.5	0.0
Prop In Lane	1.00		1.00	1.00		0.57	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	456	535	478	259	689	659	551	844	717	421	844	717
V/C Ratio(X)	0.06	0.50	0.60	0.24	0.11	0.12	0.85	0.34	0.21	0.19	0.23	0.00
Avail Cap(c_a), veh/h	456	535	478	355	689	659	557	853	725	426	853	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.2	31.5	32.9	25.3	20.8	20.8	32.8	18.6	17.4	24.2	17.5	0.0
Incr Delay (d2), s/veh	0.3	3.3	5.6	0.5	0.3	0.4	12.3	0.2	0.1	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.3	8.4	1.3	1.5	1.5	16.4	5.6	2.9	1.8	3.7	0.0
LnGrp Delay(d),s/veh	27.4	34.8	38.4	25.7	21.1	21.2	45.0	18.8	17.5	24.4	17.7	0.0
LnGrp LOS	C	C	D	C	C	C	D	B	B	C	B	
Approach Vol, veh/h		584			212			909			277	
Approach Delay, s/veh		36.2			22.5			32.2			19.6	
Approach LOS		D			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.5	42.8		61.1		53.3		61.1
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	4.7	20.6		20.1		5.3		54.0
Green Ext Time (p_c), s	0.1	2.8		2.1		1.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



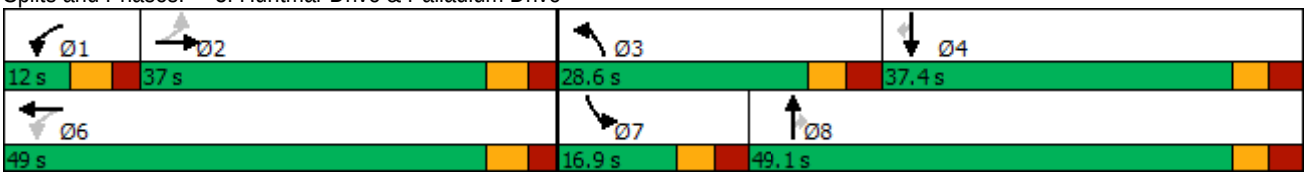
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	239	260	56	96	39	424	256	139	73	176	55
Future Volume (vph)	26	239	260	56	96	39	424	256	139	73	176	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.922			0.957				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3091	0	1676	3209	0	3252	1765	1500	1676	1765	1500
Flt Permitted	0.657			0.303			0.950			0.950		
Satd. Flow (perm)	1159	3091	0	535	3209	0	3252	1765	1500	1676	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		233			43				151			212
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	29	266	289	62	107	43	471	284	154	81	196	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	555	0	62	150	0	471	284	154	81	196	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6					8			4
Detector Phase	2	2		1	6		3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		11.4	37.4	37.4	11.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	37.0	37.0		12.0	49.0		28.6	49.1	49.1	16.9	37.4	37.4
Total Split (%)	32.2%	32.2%		10.4%	42.6%		24.9%	42.7%	42.7%	14.7%	32.5%	32.5%
Maximum Green (s)	30.7	30.7		5.8	42.7		22.2	42.7	42.7	10.5	31.0	31.0
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0			24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)	0	0			0			0	0		0	0
Act Effct Green (s)	33.6	33.6		43.1	43.0		18.5	28.4	28.4	9.1	16.1	16.1
Actuated g/C Ratio	0.35	0.35		0.45	0.44		0.19	0.29	0.29	0.09	0.17	0.17
v/c Ratio	0.07	0.45		0.20	0.10		0.76	0.55	0.28	0.52	0.67	0.14
Control Delay	26.8	16.8		19.6	12.8		46.1	34.4	6.2	55.6	49.9	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	16.8		19.6	12.8		46.1	34.4	6.2	55.6	49.9	0.7
LOS	C	B		B	B		D	C	A	E	D	A
Approach Delay		17.3			14.8			35.7			42.4	
Approach LOS		B			B			D			D	
Queue Length 50th (m)	4.0	25.7		6.9	6.2		45.4	49.6	0.4	15.3	36.7	0.0
Queue Length 95th (m)	12.0	47.7		17.1	14.3		67.6	76.4	14.8	33.1	61.9	0.0
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	402	1225		306	1449		750	784	749	183	568	627
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.45		0.20	0.10		0.63	0.36	0.21	0.44	0.35	0.10

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 96.8
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 29.4 — Intersection LOS: C
Intersection Capacity Utilization 63.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Huntmar Drive & Palladium Drive



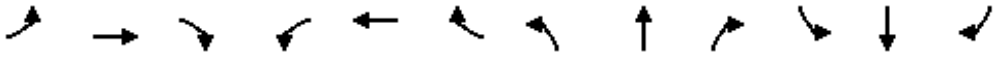
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	239	260	56	96	39	424	256	139	73	176	55
Future Volume (veh/h)	26	239	260	56	96	39	424	256	139	73	176	55
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	29	266	289	62	107	43	471	284	154	81	196	0
Adj No. of Lanes	1	2	0	1	2	0	2	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	521	601	538	327	1115	427	579	456	387	103	251	213
Arrive On Green	0.36	0.36	0.36	0.04	0.47	0.47	0.18	0.26	0.26	0.06	0.14	0.00
Sat Flow, veh/h	1232	1676	1500	1681	2372	909	3261	1765	1500	1681	1765	1500
Grp Volume(v), veh/h	29	266	289	62	74	76	471	284	154	81	196	0
Grp Sat Flow(s),veh/h/ln	1232	1676	1500	1681	1676	1604	1630	1765	1500	1681	1765	1500
Q Serve(g_s), s	1.4	11.0	13.9	2.0	2.2	2.4	12.6	12.9	7.7	4.3	9.7	0.0
Cycle Q Clear(g_c), s	1.4	11.0	13.9	2.0	2.2	2.4	12.6	12.9	7.7	4.3	9.7	0.0
Prop In Lane	1.00		1.00	1.00		0.57	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	521	601	538	327	788	754	579	456	387	103	251	213
V/C Ratio(X)	0.06	0.44	0.54	0.19	0.09	0.10	0.81	0.62	0.40	0.79	0.78	0.00
Avail Cap(c_a), veh/h	521	601	538	361	788	754	797	830	705	194	602	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.1	22.2	23.2	17.2	13.3	13.4	35.9	29.8	27.8	42.0	37.6	0.0
Incr Delay (d2), s/veh	0.2	2.4	3.8	0.3	0.2	0.3	4.6	1.4	0.7	12.3	5.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.5	6.3	0.9	1.1	1.1	6.1	6.5	3.2	2.4	5.1	0.0
LnGrp Delay(d),s/veh	19.4	24.6	27.0	17.4	13.6	13.6	40.5	31.2	28.5	54.4	42.9	0.0
LnGrp LOS	B	C	C	B	B	B	D	C	C	D	D	
Approach Vol, veh/h		584			212			909			277	
Approach Delay, s/veh		25.5			14.7			35.6			46.2	
Approach LOS		C			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	10.2	38.8	22.5	19.3		49.0	12.0	29.9
Change Period (Y+Rc), s	* 6.2	* 6.3	* 6.4	* 6.4		* 6.3	* 6.4	* 6.4
Max Green Setting (Gmax), s	* 5.8	* 31	* 22	* 31		* 43	* 11	* 43
Max Q Clear Time (g_c+I1), s	4.0	15.9	14.6	11.7		4.4	6.3	14.9
Green Ext Time (p_c), s	0.0	3.6	1.5	1.2		1.0	0.1	2.9

Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	0	224	0	0	0	0	445	428	0	730	192
Future Volume (vph)	68	0	224	0	0	0	0	445	428	0	730	192
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	76	0	249	0	0	0	0	494	476	0	811	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	0	249	0	0	0	0	494	476	0	811	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.6%		ICU Level of Service A	
Analysis Period (min) 15			

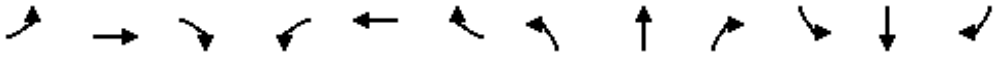
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	0	224	0	0	0	0	445	428	0	730	192
Future Vol, veh/h	68	0	224	0	0	0	0	445	428	0	730	192
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	0	249	0	0	0	0	494	476	0	811	213

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	1058	-	-			-	0	-	-	-	0
Stage 1	811	-	-			-	-	-	-	-	-
Stage 2	247	-	-			-	-	-	-	-	-
Critical Hdwy	6.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-			-	-	-	-	-	-
Pot Cap-1 Maneuver	220	0	0			0	-	0	0	-	0
Stage 1	397	0	0			0	-	0	0	-	0
Stage 2	771	0	0			0	-	0	0	-	0
Platoon blocked, %							-			-	
Mov Cap-1 Maneuver	220	0	-			-	-	-	-	-	-
Mov Cap-2 Maneuver	220	0	-			-	-	-	-	-	-
Stage 1	397	0	-			-	-	-	-	-	-
Stage 2	771	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.7	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	220	-	-
HCM Lane V/C Ratio	-	0.343	-	-
HCM Control Delay (s)	-	29.7	0	-
HCM Lane LOS	-	D	A	-
HCM 95th %tile Q(veh)	-	1.5	-	-



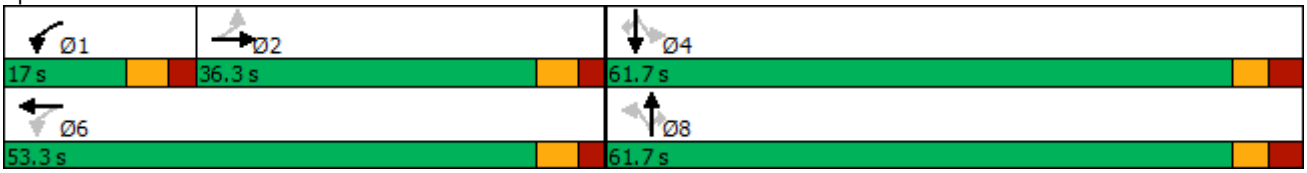
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	161	522	173	360	98	307	231	94	83	290	73
Future Volume (vph)	31	161	522	173	360	98	307	231	94	83	290	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.885			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	2967	0	1676	3246	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.465			0.158			0.479			0.551		
Satd. Flow (perm)	821	2967	0	279	3246	0	845	1765	1500	972	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		417			36				104			90
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	34	179	580	192	400	109	341	257	104	92	322	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	759	0	192	509	0	341	257	104	92	322	81
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	30.7	30.7		47.7	47.6		44.2	44.2	44.2	44.2	44.2	44.2
Actuated g/C Ratio	0.29	0.29		0.46	0.46		0.42	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.14	0.65		0.71	0.34		0.96	0.34	0.15	0.22	0.43	0.12
Control Delay	33.6	18.1		37.0	19.5		67.4	21.0	3.7	19.7	22.5	3.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	18.1		37.0	19.5		67.4	21.0	3.7	19.7	22.5	3.3
LOS	C	B		D	B		E	C	A	B	C	A
Approach Delay		18.8			24.3			41.0			18.9	
Approach LOS		B			C			D			B	
Queue Length 50th (m)	5.7	35.0		26.6	36.0		68.2	35.9	0.0	12.1	47.1	0.0
Queue Length 95th (m)	15.4	61.8		#59.5	54.7		#126.8	54.9	9.3	23.2	69.5	7.2
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	240	1164		273	1495		452	944	851	520	944	844
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.65		0.70	0.34		0.75	0.27	0.12	0.18	0.34	0.10

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 104.6
Natural Cycle: 85
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 26.0 Intersection LOS: C
Intersection Capacity Utilization 87.8% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



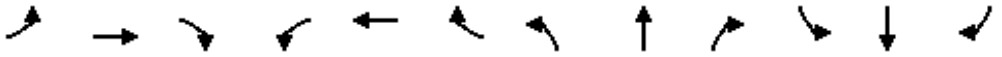
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	161	522	173	360	98	307	231	94	83	290	73
Future Volume (veh/h)	31	161	522	173	360	98	307	231	94	83	290	73
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	34	179	580	192	400	109	341	257	104	92	322	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	302	449	402	226	1097	296	431	824	700	446	824	700
Arrive On Green	0.27	0.27	0.27	0.10	0.42	0.42	0.47	0.47	0.47	0.47	0.47	0.00
Sat Flow, veh/h	887	1676	1500	1681	2612	705	1053	1765	1500	1016	1765	1500
Grp Volume(v), veh/h	34	179	580	192	255	254	341	257	104	92	322	0
Grp Sat Flow(s),veh/h/ln	887	1676	1500	1681	1676	1640	1053	1765	1500	1016	1765	1500
Q Serve(g_s), s	3.3	9.8	30.0	8.9	11.7	11.9	35.0	10.2	4.4	7.0	13.3	0.0
Cycle Q Clear(g_c), s	3.3	9.8	30.0	8.9	11.7	11.9	48.3	10.2	4.4	17.1	13.3	0.0
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	302	449	402	226	704	689	431	824	700	446	824	700
V/C Ratio(X)	0.11	0.40	1.44	0.85	0.36	0.37	0.79	0.31	0.15	0.21	0.39	0.00
Avail Cap(c_a), veh/h	302	449	402	226	704	689	459	872	741	474	872	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.2	33.6	41.0	28.7	22.2	22.3	35.2	18.6	17.1	24.0	19.5	0.0
Incr Delay (d2), s/veh	0.8	2.6	213.0	24.8	1.4	1.5	8.7	0.2	0.1	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	4.9	36.1	5.6	5.7	5.6	11.2	5.0	1.9	2.0	6.5	0.0
LnGrp Delay(d),s/veh	32.0	36.2	254.0	53.5	23.7	23.8	43.9	18.8	17.2	24.2	19.8	0.0
LnGrp LOS	C	D	F	D	C	C	D	B	B	C	B	
Approach Vol, veh/h		793			701			702			414	
Approach Delay, s/veh		195.3			31.9			30.8			20.8	
Approach LOS		F			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	17.0	36.3		58.7		53.3		58.7
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	10.9	32.0		19.1		13.9		50.3
Green Ext Time (p_c), s	0.0	0.0		3.2		3.9		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	79.5
HCM 2010 LOS	E

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



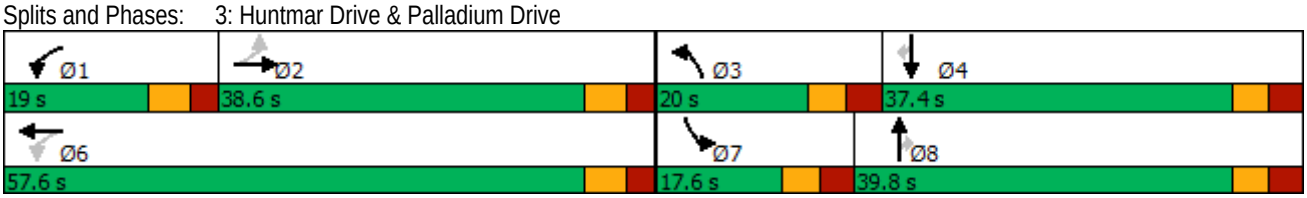
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	161	522	173	360	98	307	231	94	83	290	73
Future Volume (vph)	31	161	522	173	360	98	307	231	94	83	290	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.885			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	2967	0	1676	3246	0	3252	1765	1500	1676	1765	1500
Flt Permitted	0.465			0.167			0.950			0.950		
Satd. Flow (perm)	821	2967	0	295	3246	0	3252	1765	1500	1676	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		410			39				151			151
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	34	179	580	192	400	109	341	257	104	92	322	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	759	0	192	509	0	341	257	104	92	322	81
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6					8			4
Detector Phase	2	2		1	6		3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		11.4	37.4	37.4	11.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	38.6	38.6		19.0	57.6		20.0	39.8	39.8	17.6	37.4	37.4
Total Split (%)	33.6%	33.6%		16.5%	50.1%		17.4%	34.6%	34.6%	15.3%	32.5%	32.5%
Maximum Green (s)	32.3	32.3		12.8	51.3		13.6	33.4	33.4	11.2	31.0	31.0
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0			24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)	0	0			0			0	0		0	0
Act Effct Green (s)	33.6	33.6		51.6	51.5		13.5	30.6	30.6	9.9	24.1	24.1
Actuated g/C Ratio	0.31	0.31		0.48	0.48		0.12	0.28	0.28	0.09	0.22	0.22
v/c Ratio	0.13	0.63		0.67	0.33		0.84	0.52	0.20	0.60	0.82	0.18
Control Delay	31.6	17.4		30.0	17.6		66.5	38.1	2.3	65.2	57.1	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	17.4		30.0	17.6		66.5	38.1	2.3	65.2	57.1	0.9
LOS	C	B		C	B		E	D	A	E	E	A
Approach Delay		18.0			21.0			46.6			49.4	
Approach LOS		B			C			D			D	
Queue Length 50th (m)	5.6	34.8		24.8	33.2		38.9	50.6	0.0	19.8	68.3	0.0
Queue Length 95th (m)	14.9	61.0		#44.6	50.6		#68.0	77.3	4.6	39.0	101.0	0.0
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	255	1204		304	1563		410	553	573	174	507	538
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.63		0.63	0.33		0.83	0.46	0.18	0.53	0.64	0.15

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 108.2
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 32.0 Intersection LOS: C
Intersection Capacity Utilization 79.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



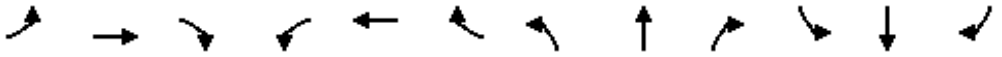
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	161	522	173	360	98	307	231	94	83	290	73
Future Volume (veh/h)	31	161	522	173	360	98	307	231	94	83	290	73
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	34	179	580	192	400	109	341	257	104	92	322	0
Adj No. of Lanes	1	2	0	1	2	0	2	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	562	503	223	1270	342	400	466	396	115	371	315
Arrive On Green	0.34	0.34	0.34	0.09	0.49	0.49	0.12	0.26	0.26	0.07	0.21	0.00
Sat Flow, veh/h	887	1676	1500	1681	2612	705	3261	1765	1500	1681	1765	1500
Grp Volume(v), veh/h	34	179	580	192	255	254	341	257	104	92	322	0
Grp Sat Flow(s),veh/h/ln	887	1676	1500	1681	1676	1640	1630	1765	1500	1681	1765	1500
Q Serve(g_s), s	2.8	8.4	35.4	7.5	9.7	9.9	10.8	13.2	5.8	5.7	18.6	0.0
Cycle Q Clear(g_c), s	2.8	8.4	35.4	7.5	9.7	9.9	10.8	13.2	5.8	5.7	18.6	0.0
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	562	503	223	815	797	400	466	396	115	371	315
V/C Ratio(X)	0.09	0.32	1.15	0.86	0.31	0.32	0.85	0.55	0.26	0.80	0.87	0.00
Avail Cap(c_a), veh/h	366	562	503	272	815	797	420	558	475	178	518	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.2	26.1	35.1	24.9	16.4	16.5	45.3	33.4	30.7	48.4	40.3	0.0
Incr Delay (d2), s/veh	0.5	1.5	89.7	20.3	1.0	1.1	14.9	1.0	0.3	12.9	11.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.1	27.1	4.7	4.7	4.7	5.7	6.6	2.4	3.0	10.2	0.0
LnGrp Delay(d),s/veh	24.8	27.6	124.8	45.2	17.4	17.5	60.2	34.5	31.0	61.4	51.2	0.0
LnGrp LOS	C	C	F	D	B	B	E	C	C	E	D	
Approach Vol, veh/h		793			701			702			414	
Approach Delay, s/veh		98.6			25.1			46.5			53.5	
Approach LOS		F			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	15.9	41.7	19.4	28.6		57.6	13.6	34.3
Change Period (Y+Rc), s	* 6.2	* 6.3	* 6.4	* 6.4		* 6.3	* 6.4	* 6.4
Max Green Setting (Gmax), s	* 13	* 32	* 14	* 31		* 51	* 11	* 33
Max Q Clear Time (g_c+I1), s	9.5	37.4	12.8	20.6		11.9	7.7	15.2
Green Ext Time (p_c), s	0.2	0.0	0.1	1.6		4.0	0.1	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	57.7
HCM 2010 LOS	E

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	0	156	0	0	0	0	322	260	0	429	489
Future Volume (vph)	137	0	156	0	0	0	0	322	260	0	429	489
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	152	0	173	0	0	0	0	358	289	0	477	543
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	0	173	0	0	0	0	358	289	0	477	543
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	0	156	0	0	0	0	322	260	0	429	489
Future Vol, veh/h	137	0	156	0	0	0	0	322	260	0	429	489
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	0	173	0	0	0	0	358	289	0	477	543

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	656	-	-				-	0	-	-	-	0
Stage 1	477	-	-				-	-	-	-	-	-
Stage 2	179	-	-				-	-	-	-	-	-
Critical Hdwy	6.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	398	0	0				0	-	0	0	-	0
Stage 1	590	0	0				0	-	0	0	-	0
Stage 2	834	0	0				0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	398	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	398	0	-				-	-	-	-	-	-
Stage 1	590	0	-				-	-	-	-	-	-
Stage 2	834	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	398	-	-
HCM Lane V/C Ratio	-	0.382	-	-
HCM Control Delay (s)	-	19.5	0	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	1.8	-	-

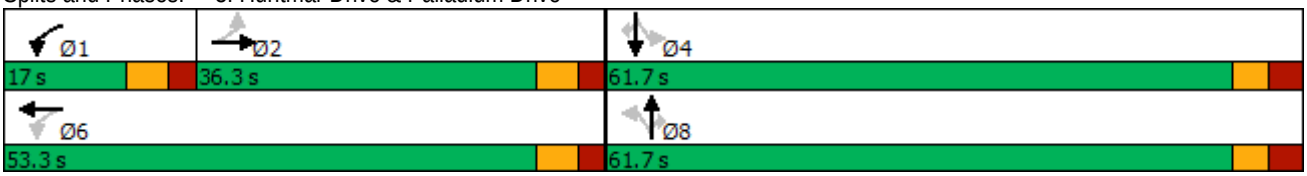
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	227	309	115	217	112	227	195	80	184	268	85
Future Volume (vph)	44	227	309	115	217	112	227	195	80	184	268	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.914			0.949				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3065	0	1676	3182	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.534			0.296			0.469			0.583		
Satd. Flow (perm)	942	3065	0	522	3182	0	828	1765	1500	1029	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		291			97				90			94
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	49	252	343	128	241	124	252	217	89	204	298	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	595	0	128	365	0	252	217	89	204	298	94
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	32.6	32.6		47.8	47.7		29.7	29.7	29.7	29.7	29.7	29.7
Actuated g/C Ratio	0.36	0.36		0.53	0.53		0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.14	0.46		0.33	0.21		0.93	0.37	0.16	0.60	0.51	0.17
Control Delay	26.1	13.9		16.1	10.2		67.6	24.0	4.7	32.3	26.7	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	13.9		16.1	10.2		67.6	24.0	4.7	32.3	26.7	4.7
LOS	C	B		B	B		E	C	A	C	C	A
Approach Delay		14.8			11.7			40.6			25.2	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	5.8	20.0		10.9	12.2		43.3	29.5	0.0	30.4	42.8	0.0
Queue Length 95th (m)	18.5	47.1		29.2	28.8		77.3	46.8	8.9	52.0	65.0	9.2
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	340	1292		416	1726		514	1096	966	639	1096	967
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.46		0.31	0.21		0.49	0.20	0.09	0.32	0.27	0.10

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 90.2
Natural Cycle: 85
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 23.1 Intersection LOS: C
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Huntmar Drive & Palladium Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	227	309	115	217	112	227	195	80	184	268	85
Future Volume (veh/h)	44	227	309	115	217	112	227	195	80	184	268	85
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	49	252	343	128	241	124	252	217	89	204	298	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	422	578	517	308	1029	512	369	702	597	408	702	597
Arrive On Green	0.34	0.34	0.34	0.07	0.47	0.47	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	1013	1676	1500	1681	2170	1080	1077	1765	1500	1069	1765	1500
Grp Volume(v), veh/h	49	252	343	128	184	181	252	217	89	204	298	0
Grp Sat Flow(s),veh/h/ln	1013	1676	1500	1681	1676	1574	1077	1765	1500	1069	1765	1500
Q Serve(g_s), s	3.3	11.5	19.3	4.6	6.4	6.8	21.9	8.4	3.8	16.1	12.1	0.0
Cycle Q Clear(g_c), s	3.3	11.5	19.3	4.6	6.4	6.8	34.1	8.4	3.8	24.4	12.1	0.0
Prop In Lane	1.00		1.00	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	422	578	517	308	795	746	369	702	597	408	702	597
V/C Ratio(X)	0.12	0.44	0.66	0.42	0.23	0.24	0.68	0.31	0.15	0.50	0.42	0.00
Avail Cap(c_a), veh/h	422	578	517	379	795	746	541	984	836	578	984	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	25.0	27.6	20.0	15.4	15.5	34.0	20.5	19.1	28.9	21.6	0.0
Incr Delay (d2), s/veh	0.6	2.4	6.6	0.9	0.7	0.8	2.2	0.2	0.1	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.7	8.9	2.2	3.1	3.1	6.7	4.1	1.6	4.8	6.0	0.0
LnGrp Delay(d),s/veh	22.9	27.4	34.1	20.9	16.1	16.3	36.2	20.7	19.2	29.8	22.0	0.0
LnGrp LOS	C	C	C	C	B	B	D	C	B	C	C	
Approach Vol, veh/h		644			493			558			502	
Approach Delay, s/veh		30.7			17.4			27.5			25.2	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	12.8	40.5		45.9		53.3		45.9
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	6.6	21.3		26.4		8.8		36.1
Green Ext Time (p_c), s	0.1	3.0		3.7		2.8		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

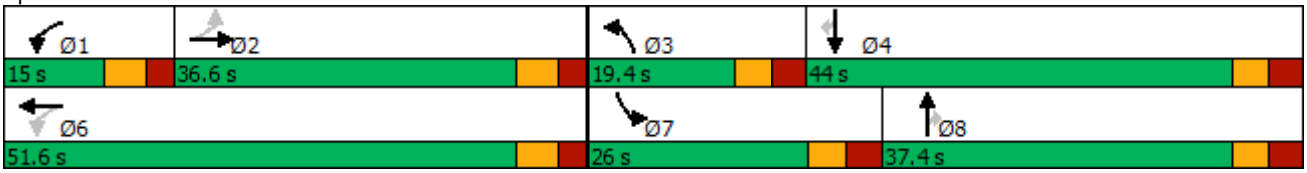
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	227	309	115	217	112	227	195	80	184	268	85
Future Volume (vph)	44	227	309	115	217	112	227	195	80	184	268	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt		0.914			0.949				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3065	0	1676	3182	0	3252	1765	1500	1676	1765	1500
Flt Permitted	0.534			0.265			0.950			0.950		
Satd. Flow (perm)	942	3065	0	468	3182	0	3252	1765	1500	1676	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		292			94				212			151
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	49	252	343	128	241	124	252	217	89	204	298	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	595	0	128	365	0	252	217	89	204	298	94
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6					8			4
Detector Phase	2	2		1	6		3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		11.4	37.4	37.4	11.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.6	36.6		15.0	51.6		19.4	37.4	37.4	26.0	44.0	44.0
Total Split (%)	31.8%	31.8%		13.0%	44.9%		16.9%	32.5%	32.5%	22.6%	38.3%	38.3%
Maximum Green (s)	30.3	30.3		8.8	45.3		13.0	31.0	31.0	19.6	37.6	37.6
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0			24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)	0	0			0			0	0		0	0
Act Effct Green (s)	31.0	31.0		45.7	45.6		11.8	17.7	17.7	16.3	22.2	22.2
Actuated g/C Ratio	0.31	0.31		0.46	0.46		0.12	0.18	0.18	0.16	0.22	0.22
v/c Ratio	0.17	0.51		0.40	0.24		0.65	0.69	0.20	0.74	0.75	0.21
Control Delay	29.7	16.3		21.4	13.3		51.0	50.1	1.0	56.5	48.1	1.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	16.3		21.4	13.3		51.0	50.1	1.0	56.5	48.1	1.9
LOS	C	B		C	B		D	D	A	E	D	A
Approach Delay		17.3			15.4			42.7			43.7	
Approach LOS		B			B			D			D	
Queue Length 50th (m)	7.3	25.2		14.8	16.7		25.2	41.8	0.0	39.2	56.9	0.0
Queue Length 95th (m)	18.8	47.7		31.0	30.7		41.9	67.8	0.0	#69.8	86.1	2.6
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	295	1162		324	1518		430	557	618	334	675	667
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.51		0.40	0.24		0.59	0.39	0.14	0.61	0.44	0.14

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 98.8			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 29.9		Intersection LOS: C	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			

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

Splits and Phases: 3: Huntmar Drive & Palladium Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	227	309	115	217	112	227	195	80	184	268	85
Future Volume (veh/h)	44	227	309	115	217	112	227	195	80	184	268	85
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	49	252	343	128	241	124	252	217	89	204	298	0
Adj No. of Lanes	1	2	0	1	2	0	2	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	437	596	533	323	1059	527	330	287	244	242	361	307
Arrive On Green	0.36	0.36	0.36	0.07	0.49	0.49	0.10	0.16	0.16	0.14	0.20	0.00
Sat Flow, veh/h	1013	1676	1500	1681	2170	1080	3261	1765	1500	1681	1765	1500
Grp Volume(v), veh/h	49	252	343	128	184	181	252	217	89	204	298	0
Grp Sat Flow(s),veh/h/ln	1013	1676	1500	1681	1676	1574	1630	1765	1500	1681	1765	1500
Q Serve(g_s), s	3.0	10.6	17.7	4.3	5.9	6.2	7.0	10.9	4.9	11.0	15.0	0.0
Cycle Q Clear(g_c), s	3.0	10.6	17.7	4.3	5.9	6.2	7.0	10.9	4.9	11.0	15.0	0.0
Prop In Lane	1.00		1.00	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	437	596	533	323	818	768	330	287	244	242	361	307
V/C Ratio(X)	0.11	0.42	0.64	0.40	0.23	0.24	0.76	0.76	0.37	0.84	0.82	0.00
Avail Cap(c_a), veh/h	437	596	533	371	818	768	457	589	501	355	715	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.3	22.7	25.0	18.1	13.7	13.7	40.6	37.1	34.6	38.7	35.3	0.0
Incr Delay (d2), s/veh	0.5	2.2	5.9	0.8	0.6	0.7	5.0	4.1	0.9	11.6	4.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.3	8.2	2.0	2.9	2.8	3.4	5.6	2.1	5.9	7.8	0.0
LnGrp Delay(d),s/veh	20.8	24.9	30.9	18.9	14.3	14.5	45.6	41.2	35.5	50.3	40.1	0.0
LnGrp LOS	C	C	C	B	B	B	D	D	D	D	D	
Approach Vol, veh/h		644			493			558			502	
Approach Delay, s/veh		27.8			15.5			42.3			44.2	
Approach LOS		C			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	12.3	39.3	15.8	25.4		51.6	19.7	21.5
Change Period (Y+Rc), s	* 6.2	* 6.3	* 6.4	* 6.4		* 6.3	* 6.4	* 6.4
Max Green Setting (Gmax), s	* 8.8	* 30	* 13	* 38		* 45	* 20	* 31
Max Q Clear Time (g_c+I1), s	6.3	19.7	9.0	17.0		8.2	13.0	12.9
Green Ext Time (p_c), s	0.1	3.4	0.4	2.0		2.8	0.4	1.7

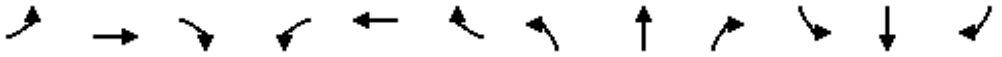
Intersection Summary		
HCM 2010 Ctrl Delay		32.5
HCM 2010 LOS		C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Appendix J

2024 Future Total Synchro and Sidra



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	0	307	0	0	0	0	163	534	0	630	118
Future Volume (vph)	89	0	307	0	0	0	0	163	534	0	630	118
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	99	0	341	0	0	0	0	181	593	0	700	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	0	341	0	0	0	0	181	593	0	700	131
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

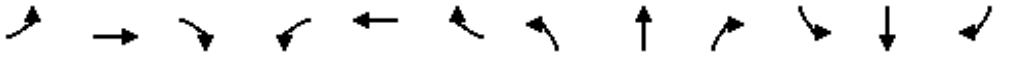
Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	0	307	0	0	0	0	163	534	0	630	118
Future Vol, veh/h	89	0	307	0	0	0	0	163	534	0	630	118
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	99	0	341	0	0	0	0	181	593	0	700	131

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	791	-	-			-	0	-	-	-	0
Stage 1	700	-	-			-	-	-	-	-	-
Stage 2	91	-	-			-	-	-	-	-	-
Critical Hdwy	6.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-			-	-	-	-	-	-
Pot Cap-1 Maneuver	327	0	0			0	-	0	0	-	0
Stage 1	454	0	0			0	-	0	0	-	0
Stage 2	922	0	0			0	-	0	0	-	0
Platoon blocked, %							-			-	
Mov Cap-1 Maneuver	327	0	-			-	-	-	-	-	-
Mov Cap-2 Maneuver	327	0	-			-	-	-	-	-	-
Stage 1	454	0	-			-	-	-	-	-	-
Stage 2	922	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	327	-	-
HCM Lane V/C Ratio	-	0.302	-	-
HCM Control Delay (s)	-	20.7	0	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	1.2	-	-



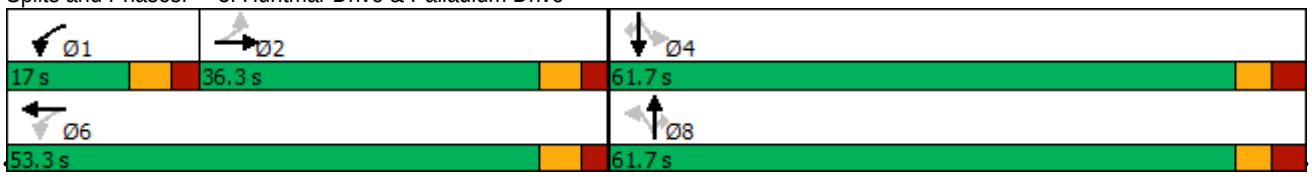
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	372	317	56	310	39	516	256	139	73	176	55
Future Volume (vph)	26	372	317	56	310	39	516	256	139	73	176	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.931			0.983				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3122	0	1676	3296	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.523			0.158			0.622			0.532		
Satd. Flow (perm)	923	3122	0	279	3296	0	1098	1765	1500	939	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		182			14				154			90
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	29	413	352	62	344	43	573	284	154	81	196	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	765	0	62	387	0	573	284	154	81	196	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	35.1	35.1		47.1	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Actuated g/C Ratio	0.31	0.31		0.41	0.41		0.48	0.48	0.48	0.48	0.48	0.48
v/c Ratio	0.10	0.71		0.29	0.29		1.09	0.33	0.19	0.18	0.23	0.08
Control Delay	32.8	31.9		24.6	22.6		95.2	19.9	3.2	18.3	18.4	1.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	31.9		24.6	22.6		95.2	19.9	3.2	18.3	18.4	1.6
LOS	C	C		C	C		F	B	A	B	B	A
Approach Delay		31.9			22.9			60.0			15.3	
Approach LOS		C			C			E			B	
Queue Length 50th (m)	5.1	67.2		8.9	30.5		~152.5	40.4	0.0	10.6	26.3	0.0
Queue Length 95th (m)	13.5	94.3		17.9	42.5		#222.1	60.8	11.0	21.0	41.9	3.7
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	281	1078		245	1355		527	848	801	451	848	768
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.71		0.25	0.29		1.09	0.33	0.19	0.18	0.23	0.08

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 39.1 Intersection LOS: D
Intersection Capacity Utilization 86.8% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



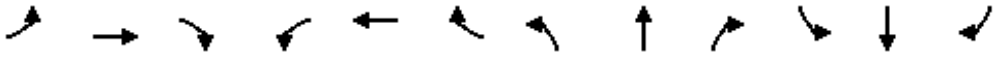
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	372	317	56	310	39	516	256	139	73	176	55
Future Volume (veh/h)	26	372	317	56	310	39	516	256	139	73	176	55
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	29	413	352	62	344	43	573	284	154	81	196	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	378	547	463	196	1227	152	554	849	721	424	849	721
Arrive On Green	0.32	0.32	0.32	0.04	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.00
Sat Flow, veh/h	992	1724	1460	1681	3003	373	1182	1765	1500	947	1765	1500
Grp Volume(v), veh/h	29	402	363	62	191	196	573	284	154	81	196	0
Grp Sat Flow(s),veh/h/ln	992	1676	1507	1681	1676	1699	1182	1765	1500	947	1765	1500
Q Serve(g_s), s	2.4	24.7	24.9	2.8	8.7	8.9	47.8	11.5	6.8	6.7	7.5	0.0
Cycle Q Clear(g_c), s	2.4	24.7	24.9	2.8	8.7	8.9	55.3	11.5	6.8	18.1	7.5	0.0
Prop In Lane	1.00		0.97	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	378	532	478	196	685	694	554	849	721	424	849	721
V/C Ratio(X)	0.08	0.75	0.76	0.32	0.28	0.28	1.03	0.33	0.21	0.19	0.23	0.00
Avail Cap(c_a), veh/h	378	532	478	291	685	694	554	849	721	424	849	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.6	35.2	35.3	27.0	22.7	22.7	36.3	18.5	17.3	24.1	17.4	0.0
Incr Delay (d2), s/veh	0.4	9.6	10.8	0.9	1.0	1.0	47.2	0.2	0.1	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	12.9	11.8	1.3	4.2	4.3	24.8	5.7	2.9	1.8	3.7	0.0
LnGrp Delay(d),s/veh	28.0	44.8	46.1	27.9	23.7	23.7	83.5	18.7	17.4	24.3	17.6	0.0
LnGrp LOS	C	D	D	C	C	C	F	B	B	C	B	
Approach Vol, veh/h		794			449			1011			277	
Approach Delay, s/veh		44.8			24.3			55.2			19.5	
Approach LOS		D			C			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.5	42.8		61.7		53.3		61.7
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	4.8	26.9		20.1		10.9		57.3
Green Ext Time (p_c), s	0.1	1.6		2.1		2.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.6
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



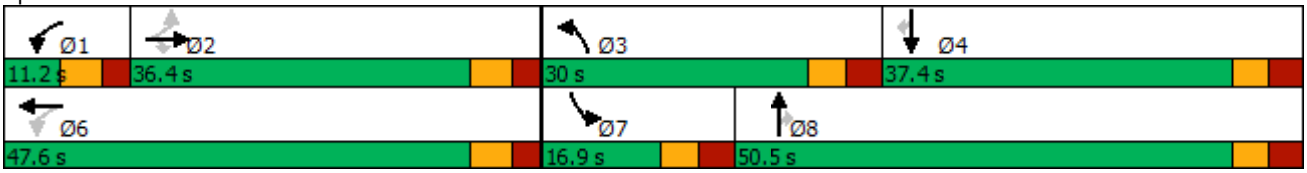
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	372	317	56	310	39	516	256	139	73	176	55
Future Volume (vph)	26	372	317	56	310	39	516	256	139	73	176	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		1	1		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.983				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3353	1500	1676	3296	0	3252	1765	1500	1676	1765	1500
Flt Permitted	0.523			0.389			0.950			0.950		
Satd. Flow (perm)	923	3353	1500	686	3296	0	3252	1765	1500	1676	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			352		13				151			212
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	29	413	352	62	344	43	573	284	154	81	196	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	413	352	62	387	0	573	284	154	81	196	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8			4
Detector Phase	2	2	2	1	6		3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	36.3	36.3	36.3	11.2	36.3		11.4	37.4	37.4	11.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.4	36.4	36.4	11.2	47.6		30.0	50.5	50.5	16.9	37.4	37.4
Total Split (%)	31.7%	31.7%	31.7%	9.7%	41.4%		26.1%	43.9%	43.9%	14.7%	32.5%	32.5%
Maximum Green (s)	30.1	30.1	30.1	5.0	41.3		23.6	44.1	44.1	10.5	31.0	31.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0	23.0		23.0			24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effct Green (s)	32.8	32.8	32.8	41.6	41.5		21.4	31.3	31.3	9.1	16.2	16.2
Actuated g/C Ratio	0.33	0.33	0.33	0.42	0.42		0.22	0.32	0.32	0.09	0.16	0.16
v/c Ratio	0.09	0.37	0.48	0.18	0.28		0.81	0.51	0.27	0.52	0.68	0.14
Control Delay	28.2	28.4	5.7	20.6	19.7		47.2	32.0	5.8	56.6	50.9	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	28.4	5.7	20.6	19.7		47.2	32.0	5.8	56.6	50.9	0.7
LOS	C	C	A	C	B		D	C	A	E	D	A
Approach Delay		18.3			19.8			36.6			43.2	
Approach LOS		B			B			D			D	
Queue Length 50th (m)	4.3	35.2	0.0	7.5	26.0		56.3	48.6	0.4	15.9	38.1	0.0
Queue Length 95th (m)	12.3	54.0	22.2	17.6	41.6		#82.7	74.8	14.5	33.1	61.9	0.0
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	307	1118	734	340	1399		785	796	759	180	559	620
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.37	0.48	0.18	0.28		0.73	0.36	0.20	0.45	0.35	0.10

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 98.3
Natural Cycle: 110
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 28.9 Intersection LOS: C
Intersection Capacity Utilization 61.4% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



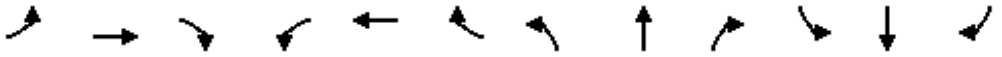
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	372	317	56	310	39	516	256	139	73	176	55
Future Volume (veh/h)	26	372	317	56	310	39	516	256	139	73	176	55
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1765	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	29	413	352	62	344	43	573	284	154	81	196	0
Adj No. of Lanes	1	2	1	1	2	0	2	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	410	1124	503	319	1337	166	677	508	432	103	250	212
Arrive On Green	0.34	0.34	0.34	0.04	0.45	0.45	0.21	0.29	0.29	0.06	0.14	0.00
Sat Flow, veh/h	992	3353	1500	1681	3003	373	3261	1765	1500	1681	1765	1500
Grp Volume(v), veh/h	29	413	352	62	191	196	573	284	154	81	196	0
Grp Sat Flow(s),veh/h/ln	992	1676	1500	1681	1676	1699	1630	1765	1500	1681	1765	1500
Q Serve(g_s), s	1.9	8.7	18.9	2.1	6.6	6.7	15.7	12.7	7.6	4.4	10.0	0.0
Cycle Q Clear(g_c), s	1.9	8.7	18.9	2.1	6.6	6.7	15.7	12.7	7.6	4.4	10.0	0.0
Prop In Lane	1.00		1.00	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	410	1124	503	319	746	756	677	508	432	103	250	212
V/C Ratio(X)	0.07	0.37	0.70	0.19	0.26	0.26	0.85	0.56	0.36	0.79	0.79	0.00
Avail Cap(c_a), veh/h	410	1124	503	337	746	756	829	839	713	190	590	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.1	23.4	26.8	18.0	16.1	16.1	35.3	28.0	26.2	43.0	38.5	0.0
Incr Delay (d2), s/veh	0.3	0.9	7.9	0.3	0.8	0.8	6.9	1.0	0.5	12.4	5.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.2	8.9	1.0	3.2	3.3	7.7	6.3	3.2	2.4	5.2	0.0
LnGrp Delay(d),s/veh	21.4	24.3	34.7	18.3	16.9	17.0	42.2	29.0	26.7	55.3	43.9	0.0
LnGrp LOS	C	C	C	B	B	B	D	C	C	E	D	
Approach Vol, veh/h		794			449			1011			277	
Approach Delay, s/veh		28.8			17.1			36.1			47.2	
Approach LOS		C			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	10.2	37.4	25.7	19.5		47.6	12.1	33.1
Change Period (Y+Rc), s	* 6.2	* 6.3	* 6.4	* 6.4		* 6.3	* 6.4	* 6.4
Max Green Setting (Gmax), s	* 5	* 30	* 24	* 31		* 41	* 11	* 44
Max Q Clear Time (g_c+I1), s	4.1	20.9	17.7	12.0		8.7	6.4	14.7
Green Ext Time (p_c), s	0.0	3.4	1.6	1.2		2.8	0.1	3.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	0	252	0	0	0	0	527	755	0	979	192
Future Volume (vph)	68	0	252	0	0	0	0	527	755	0	979	192
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	76	0	280	0	0	0	0	586	839	0	1088	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	0	280	0	0	0	0	586	839	0	1088	213
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.7%		ICU Level of Service A	
Analysis Period (min) 15			

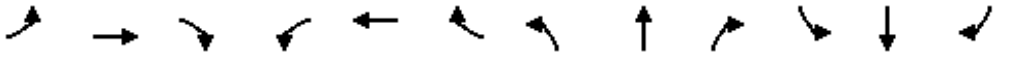
Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	0	252	0	0	0	0	527	755	0	979	192
Future Vol, veh/h	68	0	252	0	0	0	0	527	755	0	979	192
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	0	280	0	0	0	0	586	839	0	1088	213

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	1381	-	-			-	0	-	-	-	0
Stage 1	1088	-	-			-	-	-	-	-	-
Stage 2	293	-	-			-	-	-	-	-	-
Critical Hdwy	6.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-			-	-	-	-	-	-
Pot Cap-1 Maneuver	135	0	0			0	-	0	0	-	0
Stage 1	284	0	0			0	-	0	0	-	0
Stage 2	731	0	0			0	-	0	0	-	0
Platoon blocked, %							-			-	
Mov Cap-1 Maneuver	135	0	-			-	-	-	-	-	-
Mov Cap-2 Maneuver	135	0	-			-	-	-	-	-	-
Stage 1	284	0	-			-	-	-	-	-	-
Stage 2	731	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	61.2	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	135	-	-
HCM Lane V/C Ratio	-	0.56	-	-
HCM Control Delay (s)	-	61.2	0	-
HCM Lane LOS	-	F	A	-
HCM 95th %tile Q(veh)	-	2.8	-	-



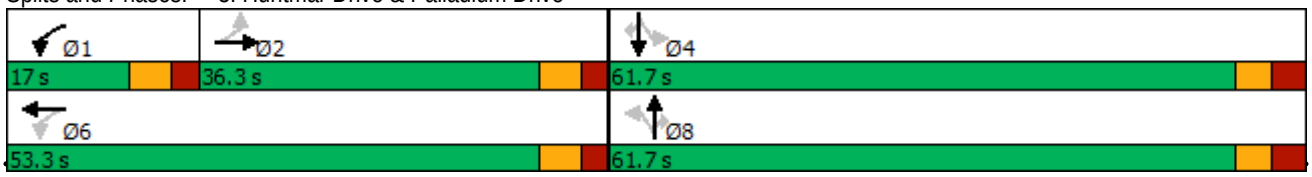
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	447	645	173	554	98	390	231	94	83	290	73
Future Volume (vph)	31	447	645	173	554	98	390	231	94	83	290	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.911			0.977				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3055	0	1676	3276	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.376			0.110			0.498			0.562		
Satd. Flow (perm)	664	3055	0	194	3276	0	879	1765	1500	992	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		307			21				104			90
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	34	497	717	192	616	109	433	257	104	92	322	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	1214	0	192	725	0	433	257	104	92	322	81
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	30.0	30.0		47.1	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Actuated g/C Ratio	0.26	0.26		0.41	0.41		0.48	0.48	0.48	0.48	0.48	0.48
v/c Ratio	0.20	1.19		0.88	0.54		1.03	0.30	0.13	0.19	0.38	0.11
Control Delay	36.8	123.1		63.9	26.7		81.6	19.4	3.6	18.5	20.6	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.8	123.1		63.9	26.7		81.6	19.4	3.6	18.5	20.6	3.2
LOS	D	F		E	C		F	B	A	B	C	A
Approach Delay		120.8			34.5			51.2			17.4	
Approach LOS		F			C			D			B	
Queue Length 50th (m)	6.3	~152.7		29.8	65.3		~109.4	35.9	0.0	12.1	47.1	0.0
Queue Length 95th (m)	15.7	#197.1		#73.2	84.4		#173.6	54.9	9.3	23.1	69.5	7.2
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	173	1023		218	1351		422	848	775	477	848	768
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.20	1.19		0.88	0.54		1.03	0.30	0.13	0.19	0.38	0.11

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Natural Cycle: 95
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 67.1 Intersection LOS: E
Intersection Capacity Utilization 105.1% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



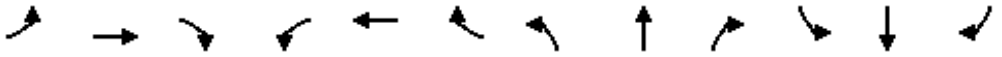
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	447	645	173	554	98	390	231	94	83	290	73
Future Volume (veh/h)	31	447	645	173	554	98	390	231	94	83	290	73
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	34	497	717	192	616	109	433	257	104	92	322	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	437	391	220	1164	206	447	849	721	461	849	721
Arrive On Green	0.26	0.26	0.26	0.09	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.00
Sat Flow, veh/h	726	1676	1500	1681	2849	503	1053	1765	1500	1016	1765	1500
Grp Volume(v), veh/h	34	497	717	192	362	363	433	257	104	92	322	0
Grp Sat Flow(s),veh/h/ln	726	1676	1500	1681	1676	1676	1053	1765	1500	1016	1765	1500
Q Serve(g_s), s	4.3	30.0	30.0	9.3	18.7	18.8	42.0	10.2	4.4	7.0	13.3	0.0
Cycle Q Clear(g_c), s	6.1	30.0	30.0	9.3	18.7	18.8	55.3	10.2	4.4	17.1	13.3	0.0
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	437	391	220	685	685	447	849	721	461	849	721
V/C Ratio(X)	0.14	1.14	1.83	0.87	0.53	0.53	0.97	0.30	0.14	0.20	0.38	0.00
Avail Cap(c_a), veh/h	241	437	391	220	685	685	447	849	721	461	849	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.4	42.5	42.5	30.0	25.6	25.7	38.9	18.1	16.7	23.3	19.0	0.0
Incr Delay (d2), s/veh	1.2	85.9	384.4	29.2	2.9	2.9	34.3	0.2	0.1	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	24.3	54.2	6.1	9.2	9.2	18.0	5.0	1.9	2.0	6.5	0.0
LnGrp Delay(d),s/veh	35.6	128.4	426.9	59.3	28.5	28.6	73.2	18.3	16.7	23.6	19.2	0.0
LnGrp LOS	D	F	F	E	C	C	E	B	B	C	B	
Approach Vol, veh/h		1248			917			794			414	
Approach Delay, s/veh		297.4			35.0			48.1			20.2	
Approach LOS		F			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	17.0	36.3		61.7		53.3		61.7
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	11.3	32.0		19.1		20.8		57.3
Green Ext Time (p_c), s	0.0	0.0		3.2		5.7		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		133.3
HCM 2010 LOS		F

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



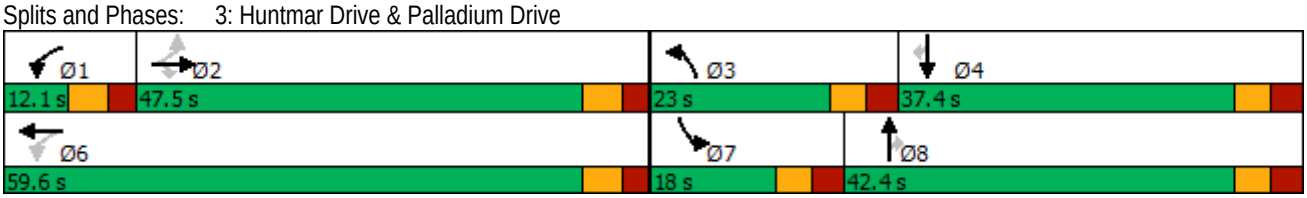
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	447	645	173	554	98	390	231	94	83	290	73
Future Volume (vph)	31	447	645	173	554	98	390	231	94	83	290	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		1	1		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.977				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3353	1500	1676	3276	0	3252	1765	1500	1676	1765	1500
Flt Permitted	0.376			0.346			0.950			0.950		
Satd. Flow (perm)	664	3353	1500	611	3276	0	3252	1765	1500	1676	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			434		22				145			145
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	34	497	717	192	616	109	433	257	104	92	322	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	497	717	192	725	0	433	257	104	92	322	81
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8			4
Detector Phase	2	2	2	1	6		3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	36.3	36.3	36.3	11.2	36.3		11.4	37.4	37.4	11.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	47.5	47.5	47.5	12.1	59.6		23.0	42.4	42.4	18.0	37.4	37.4
Total Split (%)	39.6%	39.6%	39.6%	10.1%	49.7%		19.2%	35.3%	35.3%	15.0%	31.2%	31.2%
Maximum Green (s)	41.2	41.2	41.2	5.9	53.3		16.6	36.0	36.0	11.6	31.0	31.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0	23.0		23.0			24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effct Green (s)	41.3	41.3	41.3	53.5	53.4		16.6	34.3	34.3	10.2	25.0	25.0
Actuated g/C Ratio	0.36	0.36	0.36	0.47	0.47		0.15	0.30	0.30	0.09	0.22	0.22
v/c Ratio	0.14	0.41	0.88	0.56	0.47		0.92	0.48	0.19	0.61	0.83	0.18
Control Delay	28.5	29.3	26.9	27.8	21.9		74.0	37.7	2.6	68.9	61.5	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	29.3	26.9	27.8	21.9		74.0	37.7	2.6	68.9	61.5	0.9
LOS	C	C	C	C	C		E	D	A	E	E	A
Approach Delay		27.9			23.2			52.9			53.0	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	5.4	46.2	70.5	26.8	58.4		52.7	52.2	0.0	21.1	72.7	0.0
Queue Length 95th (m)	14.3	65.7	#162.8	46.3	81.9		#88.5	78.7	5.5	40.3	106.8	0.2
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	240	1212	819	341	1544		473	570	583	170	480	513
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.41	0.88	0.56	0.47		0.92	0.45	0.18	0.54	0.67	0.16

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 114.2
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.0 Intersection LOS: D
Intersection Capacity Utilization 84.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



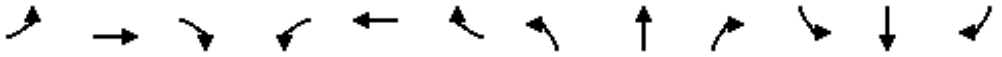
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	447	645	173	554	98	390	231	94	83	290	73
Future Volume (veh/h)	31	447	645	173	554	98	390	231	94	83	290	73
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1765	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	34	497	717	192	616	109	433	257	104	92	322	0
Adj No. of Lanes	1	2	1	1	2	0	2	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	1230	550	270	1352	239	482	506	431	115	366	311
Arrive On Green	0.37	0.37	0.37	0.05	0.47	0.47	0.15	0.29	0.29	0.07	0.21	0.00
Sat Flow, veh/h	726	3353	1500	1681	2849	503	3261	1765	1500	1681	1765	1500
Grp Volume(v), veh/h	34	497	717	192	362	363	433	257	104	92	322	0
Grp Sat Flow(s),veh/h/ln	726	1676	1500	1681	1676	1676	1630	1765	1500	1681	1765	1500
Q Serve(g_s), s	3.7	12.4	41.2	5.9	16.2	16.3	14.7	13.6	6.0	6.1	19.9	0.0
Cycle Q Clear(g_c), s	7.9	12.4	41.2	5.9	16.2	16.3	14.7	13.6	6.0	6.1	19.9	0.0
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	303	1230	550	270	796	795	482	506	431	115	366	311
V/C Ratio(X)	0.11	0.40	1.30	0.71	0.45	0.46	0.90	0.51	0.24	0.80	0.88	0.00
Avail Cap(c_a), veh/h	303	1230	550	270	796	795	482	566	481	174	487	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.5	26.4	35.6	26.3	19.8	19.8	47.0	33.4	30.7	51.6	43.1	0.0
Incr Delay (d2), s/veh	0.7	1.0	149.2	8.4	1.9	1.9	19.5	0.8	0.3	14.3	13.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	5.9	39.8	3.5	8.0	8.0	7.9	6.8	2.5	3.3	11.0	0.0
LnGrp Delay(d),s/veh	27.3	27.4	184.8	34.8	21.6	21.7	66.5	34.2	31.0	65.9	56.6	0.0
LnGrp LOS	C	C	F	C	C	C	E	C	C	E	E	
Approach Vol, veh/h		1248			917			794			414	
Approach Delay, s/veh		117.8			24.4			51.4			58.6	
Approach LOS		F			C			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	12.1	47.5	23.0	29.7		59.6	14.1	38.6
Change Period (Y+Rc), s	* 6.2	* 6.3	* 6.4	* 6.4		* 6.3	* 6.4	* 6.4
Max Green Setting (Gmax), s	* 5.9	* 41	* 17	* 31		* 53	* 12	* 36
Max Q Clear Time (g_c+I1), s	7.9	43.2	16.7	21.9		18.3	8.1	15.6
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4		6.1	0.1	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	69.5
HCM 2010 LOS	E

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	0	189	0	0	0	0	383	505	0	723	489
Future Volume (vph)	137	0	189	0	0	0	0	383	505	0	723	489
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		75.0	0.0		0.0	0.0		75.0	0.0		75.0
Storage Lanes	1		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950											
Satd. Flow (prot)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Flt Permitted	0.950											
Satd. Flow (perm)	1676	0	1500	0	0	0	0	3353	1500	0	3353	1500
Link Speed (k/h)		70			70			70			70	
Link Distance (m)		200.0			200.0			422.0			200.0	
Travel Time (s)		10.3			10.3			21.7			10.3	
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
Adj. Flow (vph)	152	0	210	0	0	0	0	426	561	0	803	543
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	0	210	0	0	0	0	426	561	0	803	543
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Free			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.1%		ICU Level of Service A	
Analysis Period (min) 15			

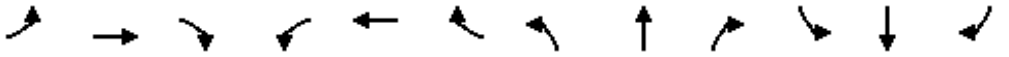
Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	0	189	0	0	0	0	383	505	0	723	489
Future Vol, veh/h	137	0	189	0	0	0	0	383	505	0	723	489
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	0	-	750	-	-	-	-	-	750	-	-	750
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	0	210	0	0	0	0	426	561	0	803	543

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1016	-	-				-	0	-	-	-	0
Stage 1	803	-	-				-	-	-	-	-	-
Stage 2	213	-	-				-	-	-	-	-	-
Critical Hdwy	6.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	234	0	0				0	-	0	0	-	0
Stage 1	401	0	0				0	-	0	0	-	0
Stage 2	802	0	0				0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	234	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	234	0	-				-	-	-	-	-	-
Stage 1	401	0	-				-	-	-	-	-	-
Stage 2	802	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45.1	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	234	-	-
HCM Lane V/C Ratio	-	0.651	-	-
HCM Control Delay (s)	-	45.1	0	-
HCM Lane LOS	-	E	A	-
HCM 95th %tile Q(veh)	-	4	-	-



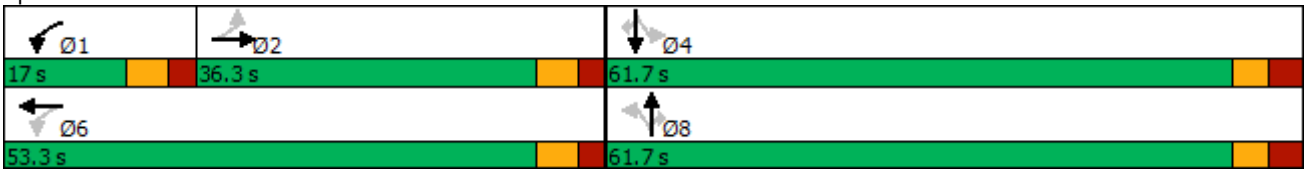
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	442	401	115	446	112	325	195	80	184	268	85
Future Volume (vph)	44	442	401	115	446	112	325	195	80	184	268	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.929			0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3115	0	1676	3252	0	1676	1765	1500	1676	1765	1500
Flt Permitted	0.417			0.105			0.506			0.597		
Satd. Flow (perm)	736	3115	0	185	3252	0	893	1765	1500	1054	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		193			32				90			94
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	49	491	446	128	496	124	361	217	89	204	298	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	937	0	128	620	0	361	217	89	204	298	94
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.2	36.3		37.4	37.4	37.4	37.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.3	36.3		17.0	53.3		61.7	61.7	61.7	61.7	61.7	61.7
Total Split (%)	31.6%	31.6%		14.8%	46.3%		53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
Maximum Green (s)	30.0	30.0		10.8	47.0		55.3	55.3	55.3	55.3	55.3	55.3
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6		2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0			23.0		24.0	24.0	24.0	24.0	24.0	24.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	31.9	31.9		47.6	47.5		44.6	44.6	44.6	44.6	44.6	44.6
Actuated g/C Ratio	0.30	0.30		0.45	0.45		0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.22	0.87		0.59	0.42		0.95	0.29	0.13	0.46	0.40	0.14
Control Delay	35.4	39.0		32.3	21.0		65.3	20.1	3.9	24.4	21.9	3.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	39.0		32.3	21.0		65.3	20.1	3.9	24.4	21.9	3.9
LOS	D	D		C	C		E	C	A	C	C	A
Approach Delay		38.8			22.9			42.4			19.9	
Approach LOS		D			C			D			B	
Queue Length 50th (m)	8.4	87.6		17.0	46.6		72.4	29.5	0.0	30.2	42.8	0.0
Queue Length 95th (m)	20.8	#142.3		35.1	69.1		#131.9	46.3	8.5	50.5	64.0	8.9
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	223	1080		239	1490		475	940	841	561	940	843
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.87		0.54	0.42		0.76	0.23	0.11	0.36	0.32	0.11

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 104.9
Natural Cycle: 85
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 31.9 Intersection LOS: C
Intersection Capacity Utilization 88.2% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Huntmar Drive & Palladium Drive



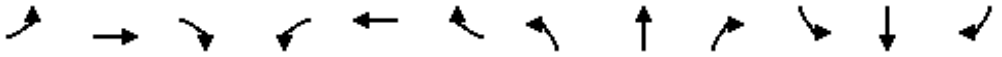
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	442	401	115	446	112	325	195	80	184	268	85
Future Volume (veh/h)	44	442	401	115	446	112	325	195	80	184	268	85
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	49	491	446	128	496	124	361	217	89	204	298	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	496	444	179	1118	278	450	823	700	483	823	700
Arrive On Green	0.30	0.30	0.30	0.07	0.42	0.42	0.47	0.47	0.47	0.47	0.47	0.00
Sat Flow, veh/h	800	1676	1500	1681	2662	662	1077	1765	1500	1069	1765	1500
Grp Volume(v), veh/h	49	491	446	128	311	309	361	217	89	204	298	0
Grp Sat Flow(s),veh/h/ln	800	1676	1500	1681	1676	1648	1077	1765	1500	1069	1765	1500
Q Serve(g_s), s	5.2	32.6	33.1	5.7	14.8	15.0	36.2	8.4	3.8	16.1	12.1	0.0
Cycle Q Clear(g_c), s	6.3	32.6	33.1	5.7	14.8	15.0	48.4	8.4	3.8	24.4	12.1	0.0
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	496	444	179	704	692	450	823	700	483	823	700
V/C Ratio(X)	0.17	0.99	1.00	0.71	0.44	0.45	0.80	0.26	0.13	0.42	0.36	0.00
Avail Cap(c_a), veh/h	294	496	444	227	704	692	480	872	741	513	872	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.4	39.2	39.4	28.6	23.1	23.2	34.7	18.2	16.9	25.6	19.2	0.0
Incr Delay (d2), s/veh	1.2	37.8	43.7	7.5	2.0	2.1	9.0	0.2	0.1	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	20.2	19.0	3.0	7.2	7.2	11.9	4.1	1.6	4.8	5.9	0.0
LnGrp Delay(d),s/veh	31.6	77.0	83.1	36.1	25.1	25.2	43.7	18.3	17.0	26.2	19.4	0.0
LnGrp LOS	C	E	F	D	C	C	D	B	B	C	B	
Approach Vol, veh/h		986			748			667			502	
Approach Delay, s/veh		77.5			27.0			31.9			22.2	
Approach LOS		E			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	13.9	39.4		58.6		53.3		58.6
Change Period (Y+Rc), s	* 6.2	* 6.3		* 6.4		* 6.3		* 6.4
Max Green Setting (Gmax), s	* 11	* 30		* 55		* 47		* 55
Max Q Clear Time (g_c+I1), s	7.7	35.1		26.4		17.0		50.4
Green Ext Time (p_c), s	0.1	0.0		3.7		4.9		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	44.5
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

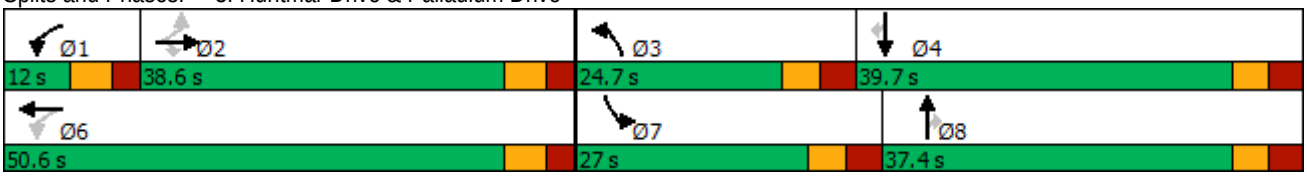


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	442	401	115	446	112	325	195	80	184	268	85
Future Volume (vph)	44	442	401	115	446	112	325	195	80	184	268	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		0.0	70.0		0.0	110.0		30.0	50.0		0.0
Storage Lanes	1		1	1		0	2		1	1		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3353	1500	1676	3252	0	3252	1765	1500	1676	1765	1500
Flt Permitted	0.417			0.333			0.950			0.950		
Satd. Flow (perm)	736	3353	1500	588	3252	0	3252	1765	1500	1676	1765	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			446		31				151			151
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		675.0			200.0			200.0			200.0	
Travel Time (s)		40.5			12.0			14.4			14.4	
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
Adj. Flow (vph)	49	491	446	128	496	124	361	217	89	204	298	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	491	446	128	620	0	361	217	89	204	298	94
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2		2	6					8			4
Detector Phase	2	2	2	1	6		3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	36.3	36.3	36.3	11.2	36.3		11.4	37.4	37.4	11.4	37.4	37.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	38.6	38.6	38.6	12.0	50.6		24.7	37.4	37.4	27.0	39.7	39.7
Total Split (%)	33.6%	33.6%	33.6%	10.4%	44.0%		21.5%	32.5%	32.5%	23.5%	34.5%	34.5%
Maximum Green (s)	32.3	32.3	32.3	5.8	44.3		18.3	31.0	31.0	20.6	33.3	33.3
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.5	2.6		3.1	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	6.2	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	None	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	23.0	23.0	23.0		23.0			24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effct Green (s)	32.5	32.5	32.5	44.7	44.6		15.6	21.3	21.3	16.7	22.3	22.3
Actuated g/C Ratio	0.32	0.32	0.32	0.44	0.44		0.15	0.21	0.21	0.16	0.22	0.22
v/c Ratio	0.21	0.46	0.57	0.40	0.43		0.72	0.59	0.21	0.75	0.77	0.21
Control Delay	31.5	30.8	6.2	24.1	21.2		50.8	43.6	1.5	58.6	51.4	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	30.8	6.2	24.1	21.2		50.8	43.6	1.5	58.6	51.4	1.9
LOS	C	C	A	C	C		D	D	A	E	D	A
Approach Delay		19.7			21.7			41.9			46.1	
Approach LOS		B			C			D			D	
Queue Length 50th (m)	7.5	43.1	0.0	16.0	44.1		37.2	41.3	0.0	40.7	58.9	0.0
Queue Length 95th (m)	20.0	67.7	26.4	33.8	70.8		58.0	67.3	1.2	71.3	90.4	2.6
Internal Link Dist (m)		651.0			176.0			176.0			176.0	
Turn Bay Length (m)	90.0			70.0			110.0		30.0	50.0		
Base Capacity (vph)	235	1071	782	320	1442		588	541	564	341	581	595
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.46	0.57	0.40	0.43		0.61	0.40	0.16	0.60	0.51	0.16

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 101.8			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 30.4		Intersection LOS: C	
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Huntmar Drive & Palladium Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	442	401	115	446	112	325	195	80	184	268	85
Future Volume (veh/h)	44	442	401	115	446	112	325	195	80	184	268	85
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1765	1765	1765	1765	1765	1800	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	49	491	446	128	496	124	361	217	89	204	298	0
Adj No. of Lanes	1	2	1	1	2	0	2	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	344	1128	505	309	1229	305	449	346	294	241	356	303
Arrive On Green	0.34	0.34	0.34	0.06	0.46	0.46	0.14	0.20	0.20	0.14	0.20	0.00
Sat Flow, veh/h	800	3353	1500	1681	2662	662	3261	1765	1500	1681	1765	1500
Grp Volume(v), veh/h	49	491	446	128	311	309	361	217	89	204	298	0
Grp Sat Flow(s),veh/h/ln	800	1676	1500	1681	1676	1648	1630	1765	1500	1681	1765	1500
Q Serve(g_s), s	4.2	10.9	27.0	4.6	11.8	11.9	10.3	10.8	4.9	11.4	15.6	0.0
Cycle Q Clear(g_c), s	4.2	10.9	27.0	4.6	11.8	11.9	10.3	10.8	4.9	11.4	15.6	0.0
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	344	1128	505	309	774	760	449	346	294	241	356	303
V/C Ratio(X)	0.14	0.44	0.88	0.41	0.40	0.41	0.80	0.63	0.30	0.85	0.84	0.00
Avail Cap(c_a), veh/h	344	1128	505	309	774	760	622	570	484	361	612	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.5	24.8	30.1	18.7	17.1	17.1	40.1	35.4	33.0	40.1	36.8	0.0
Incr Delay (d2), s/veh	0.9	1.2	19.7	0.9	1.6	1.6	5.3	1.9	0.6	11.3	5.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.2	13.9	2.2	5.8	5.7	4.9	5.4	2.1	6.0	8.1	0.0
LnGrp Delay(d),s/veh	23.4	26.0	49.8	19.6	18.7	18.7	45.4	37.2	33.5	51.4	42.0	0.0
LnGrp LOS	C	C	D	B	B	B	D	D	C	D	D	
Approach Vol, veh/h		986			748			667			502	
Approach Delay, s/veh		36.6			18.9			41.2			45.9	
Approach LOS		D			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	12.0	38.6	19.6	25.8		50.6	20.2	25.2
Change Period (Y+Rc), s	* 6.2	* 6.3	* 6.4	* 6.4		* 6.3	* 6.4	* 6.4
Max Green Setting (Gmax), s	* 5.8	* 32	* 18	* 33		* 44	* 21	* 31
Max Q Clear Time (g_c+I1), s	6.6	29.0	12.3	17.6		13.9	13.4	12.8
Green Ext Time (p_c), s	0.0	1.9	0.9	1.8		4.9	0.5	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.