2775-2785 Palladium Drive & 350 Culdaff Road

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Strategy Report

(Revision #1)

Prepared for:

Palladium Resort Development Limited Partnership
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October 2026

PN: 2024-167

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1 Screening

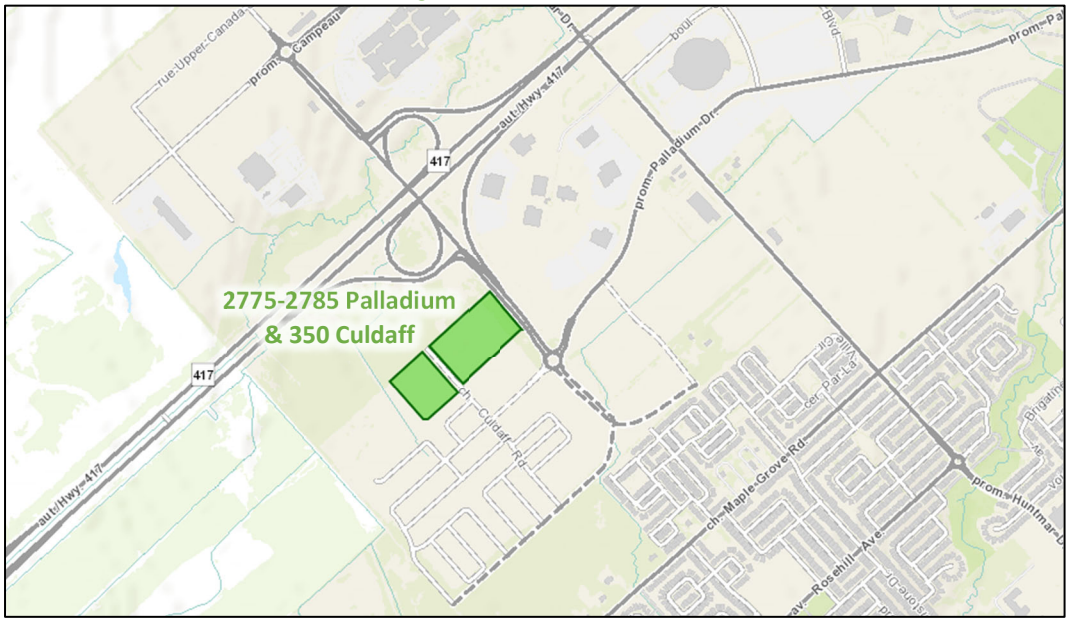
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, incorporating the 2023 Revision to Transportation Impact Assessment Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required. A terms of reference for the study supporting the MTO's Highway Corridor Management process, given the site is within its permit control area, has also been provided in Appendix A. This study has been prepared to support a Zoning By-Law amendment and Site Plan application.

2 Existing and Planned Conditions

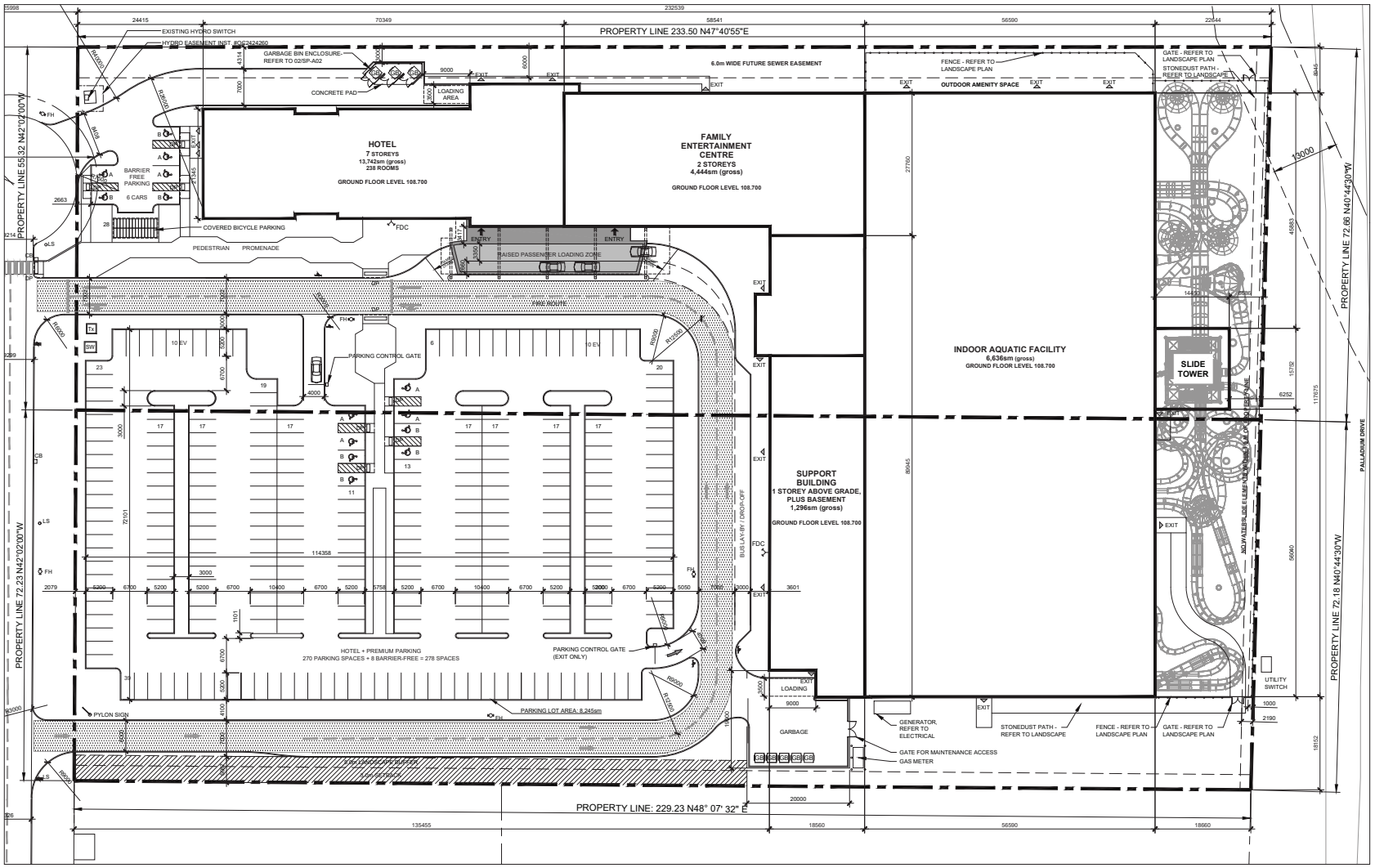
2.1 Proposed Development

The development site is located at 2775-2785 Palladium Drive and 350 Culdaff Road. The proposed development consists of a destination recreational and lodging complex including a 6,636 square metre indoor aquatic and recreational centre and 238-room hotel, and a 4,444 square metre family entertainment centre, and includes on-site dining within the building, all located on the parcel east of Culdaff Road. A surface parking lot is also located on this eastern parcel, and an additional surface parking lot is also provided on the parcel west of Culdaff Road, for a total of 704 vehicle parking spaces. Site access is via three access locations on Culdaff Road, two with one-way east and west legs creating a counterclockwise site circulation pattern, and one access on the turning basin for accessible parking. An unused area north of the western parcel's parking area is reserved to potentially be developed in the future, but at present there are no plans to develop this portion of the site. It is understood by the site owner that any future expansion, change in land use, change in access, or addition of event-related uses may require further review and a TIA update or addendum. The anticipated full build-out and occupancy horizon is 2029 with construction occurring in a single phase. The site is within the Kanata West Community Design Plan area. Figure 1 illustrates the study area context. Figure 2 and Figure 3 illustrate the proposed concept plans.

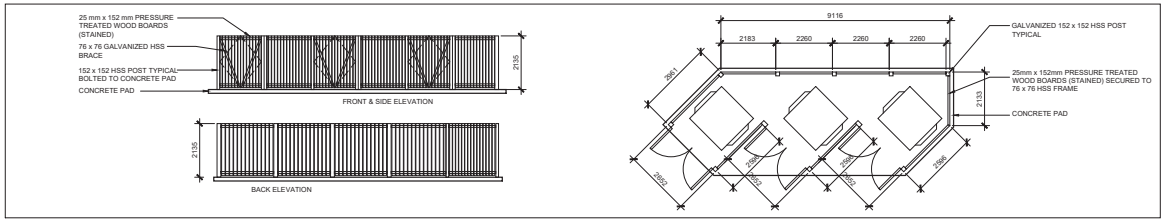
Figure 1: Area Context Plan



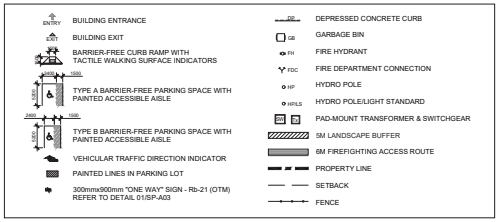
Source: http://maps.ottawa.ca/geoOttawa/ Accessed: August 6, 2025



01 SP-A02 SITE PLAN - EAST SECTOR
SCALE: 1:400



02 SP-A02 GARBAGE ENCLOSURE PLAN AND ELEVATION
SCALE: 1:100



03 SP-A02 LEGEND
SCALE: NTS

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WATERPARK BUILDING
OPENAIRE INC.

WATERPARK AQUATICS SYSTEMS
MARTIN AQUATICS

WATERPARK INTERIOR LANDSCAPING
EDSA

North

Revisions

No.	By	Description	Date
04	JT	REVISED FOR DISCUSSION	2026-08-31
03	JT	SITE PLAN APPLICATION	2026-07-15
02	JT	ISSUED FOR PRICING	2026-06-26
01	JT	ISSUED FOR DISCUSSION	2026-06-26

KEY PLAN - EAST SECTOR

Project

OTTAWA INDOOR AQUATIC & RECREATION FACILITY

2775 & 2785 PALLADIUM DRIVE, OTTAWA ON

Drawing

SITE PLAN EAST SECTOR

Scale: 1:400

Drawn: IEW

Checked: JT

Stamp: ONTARIO ASSOCIATION OF ARCHITECTS — IAN EDWARD WILLSON — LICENCE 7456

Project No.: 24-210

Date: JUN. 2026

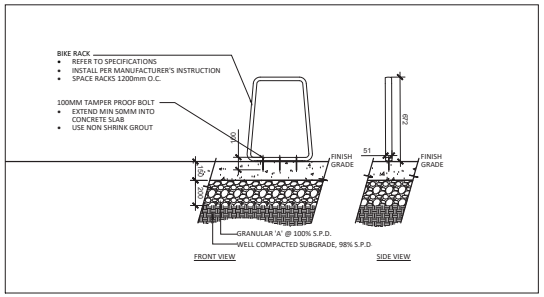
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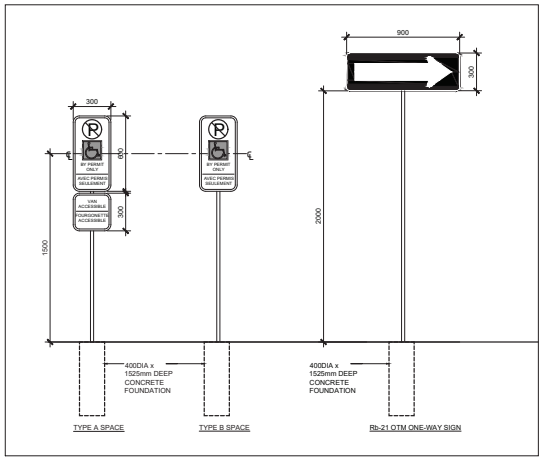
PLAN #19492

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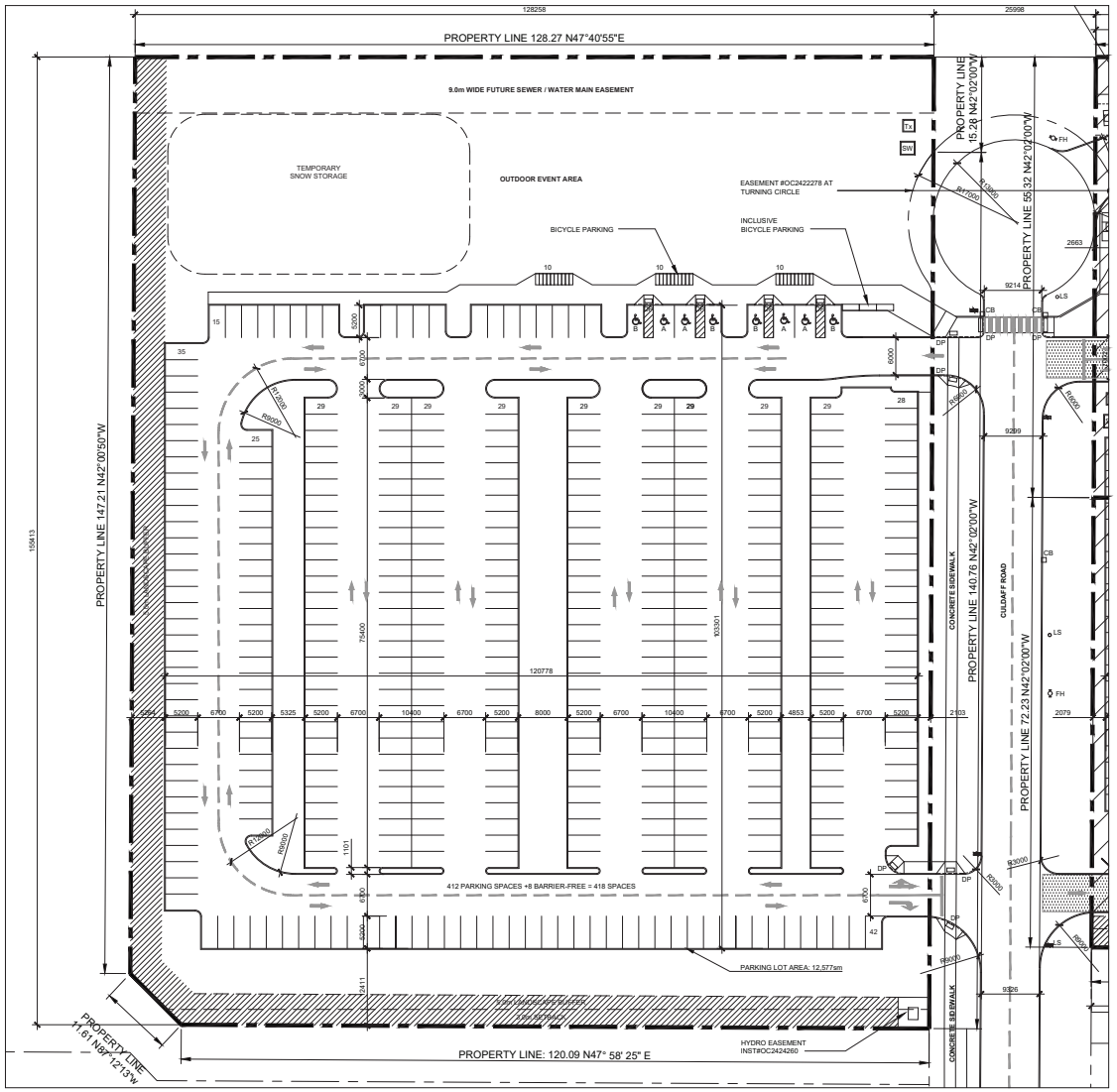
594 X 841 – PLOT A1



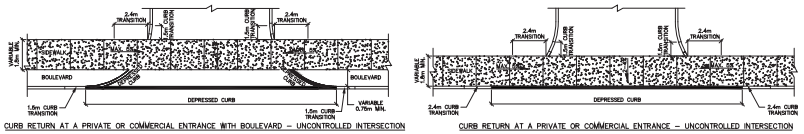
02 SP-A03 BICYCLE RACKS - REFER TO LANDSCAPE PLAN
SCALE: SP-A02



01 SP-A03 TYPICAL SIGN DETAILS
SCALE: 1:20



03 SP-A03 SITE PLAN - WEST SECTOR
SCALE: 1:400



04 SP-A03 CITY OF OTTAWA STANDARD DETAIL SC7.1 CURB RETURN ENTRANCES
SCALE: NTS

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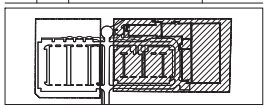
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KEY PLAN - WEST SECTOR

Project

OTTAWA INDOOR AQUATIC & RECREATION FACILITY

2775 & 2785 PALLADIUM DRIVE, OTTAWA ON

Drawing

SITE PLAN WEST SECTOR

Scale 1:400

Drawn IEW

Checked

Stamp

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IAN EDWARD WILLSON
LICENCE 7456

Project No. 24-210

Date JUN. 2026

Drawing No. SP-A03

D07-1226-0085

PLAN #19492

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594 X 841 – PLOT A1

2.2 Existing Conditions

2.2.1 Area Road Network

Highway 417: Highway 417 is a Ministry of Transportation of Ontario urban freeway with a seven-lane cross-section within the study area. The posted speed limit is 100 km/h, and the existing right-of-way is 60.0 metres.

Palladium Drive: Palladium Drive is a City of Ottawa arterial road south of Campeau Drive and a local road north of Campeau Drive. Palladium Drive north of Upper Canada Street has a two-lane urban cross-section. Between Upper Canada Street and Campeau Drive, it has a two-lane urban cross-section with sidewalks and cycletracks on both sides of the road. Between Campeau Drive and Westbound Highway 417 ramp terminal, it has a divided four-lane urban cross-section with sidewalks and cycletracks on both sides of the road. South of Westbound Highway 417 ramp terminal, it has a four-lane rural cross-section with gravel shoulders. East of Robert Grant Avenue, it has a four-lane rural cross-section with approximately 180 metres sidewalks and cycle tracks on both sides of the road. Palladium Drive also has sidewalks partially present between Huntmar Drive and Palladium Auto Park and on both sides east of Huntmar Drive. The posted speed limit is 60 km/h north of Westbound Highway 417 ramp terminal and 70 km/h south of the westbound Highway 417 ramp terminal and 60 km/h east of Robert Grant Avenue. The Official Plan reserves a right-of-way of 44.5 metres within the study area. Palladium Drive is a truck route.

Huntmar Drive: Huntmar Drive is a City of Ottawa arterial road with a two-lane cross-section north of Cyclone Taylor Boulevard, a divided four-lane urban cross-section between Cyclone Taylor Boulevard to Palladium Drive and transitioning to a rural two-lane cross-section south of Palladium Drive. Cycle tracks and sidewalks extend north of Campeau Drive on the east side of the roadway for 105 metres, to the south on both sides of the road for 115 metres and a sidewalk is provided on the east side of the roadway between Cyclone Taylor Boulevard and Palladium Drive. The posted speed limit is 70 km/h approximately north of Paine Avenue, 50 km/h to the south, and the City-protected right-of-way is 37.5 metres.

Robert Grant Avenue: Robert Grant Avenue is a City of Ottawa arterial road stub with a divided four-lane urban cross-section with a sidewalk and cycletrack on the west side and a MUP on the east side. The unposted speed limit is assumed to be 50km/h and the Official Plan reserves a right-of-way of 37.5 metres throughout the study area.

Derreen Avenue: Derreen Avenue is a City of Ottawa local road with a two-lane urban cross-section. Sidewalks and cycletracks are present on both sides of the road. The unposted speed limit is assumed to be 30km/h. The existing right-of-way is 26.0 metres.

Culdaff Road: Culdaff Road is a City of Ottawa local road with a two-lane cross-section. An approximately 110-metre sidewalk is present on the west side of the road north of Derreen Avenue, and sidewalks were planned along both sides of the road north of Derreen Avenue as part of the 195 Humar Road development. The unposted speed limit is assumed to be 30km/h. The existing right-of-way is 26.0 metres north of Derreen Avenue and is 18.0 metres to the south.

2.2.2 Existing Intersections

The existing key intersections within one kilometre of the site have been summarized below:

Palladium Drive at Westbound Highway 417 Ramp	The intersection of Palladium Drive at Westbound Highway 417 Ramp is a signalized T-intersection. The northbound approach consists of two through lanes and an auxiliary channelized right-turn lane, and the southbound approach consists of an auxiliary left-turn lane and

	two through lanes. The westbound approach consists of two left-turn lanes and an auxiliary right-turn lane. No turn restrictions were noted.
Palladium Drive at Eastbound Highway 417 Ramp	The intersection of Palladium Drive at Highway 417 eastbound ramp is a T-intersection with stop control on the minor approach of Highway 417 eastbound Ramp. The northbound and southbound approaches each consists of two through lanes. The eastbound approach consists of a left-turn land and an auxiliary channelized right-turn lane. Approximately 120 metres north and 90 metres south of the intersection are on-ramps to the Highway 417 eastbound. No turn restrictions were noted.
Palladium Drive/Robert Grant Avenue at Derreen Avenue	The intersection of Palladium Drive/Robert Grant Avenue at Derreen Avenue is a four-legged roundabout intersection with pedestrian crossovers on all approaches. The northbound, southbound, and eastbound approaches each consist of a shared left-turn/through lane and a shared through/right-turn lane. The westbound approach consists of a shared left-turn/through lane and a right-turn bypass lane. No turn restrictions were noted.
Derreen Avenue at Culdaff Road	The intersection of Derreen Avenue at Culdaff Road is an unsignalized intersection with all-way stop control. All approaches consist of a shared all-movements lane. No turn restrictions were noted.
Huntmar Drive at Palladium Drive	The intersection of Huntmar Drive at Palladium Drive is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane, a through lane, and an auxiliary right-turn lane, and the southbound approach consists of an auxiliary left-turn lane, a through lane, and a channelized right-turn lane. The eastbound and westbound approaches each consist of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. No turn restrictions were noted.

2.2.3 Existing Driveways

There are no existing driveways within 200 metres of the proposed site accesses along the boundary streets of Culdaff Road.

2.2.4 Cycling and Pedestrian Facilities

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

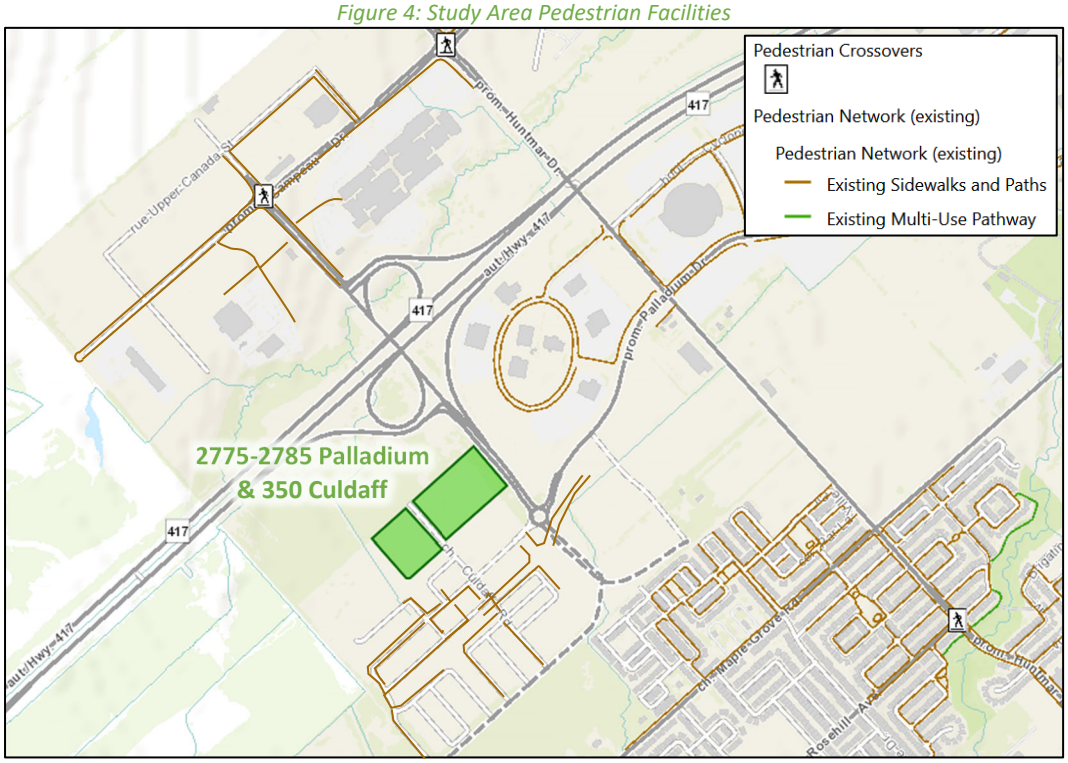
Within the study area, sidewalks are present on both sides of the road along Palladium Drive north of the westbound Highway 417 ramp terminal, east of Robert Grant Avenue for approximately 180 metres, and east of Palladium Auto Park. Additionally, sidewalks are present on both sides of Derreen Avenue and on the east side of the Culdaff Road north of Derreen Avenue for approximately 110 metres, and on Robert Grant Avenue south of the roundabout intersection.

Cycling facilities include cycletracks on both sides of Palladium Drive north of the westbound Highway 417 ramp terminal and east of Robert Grant Avenue for approximately 180 metres, and both sides of Derreen Avenue.

It is noted that the MTO and the City have agreed no pedestrian or cycling facilities are to be provided between the Highway terminals and the roundabout intersection at Palladium Drive/Robert Grant Avenue/Derreen

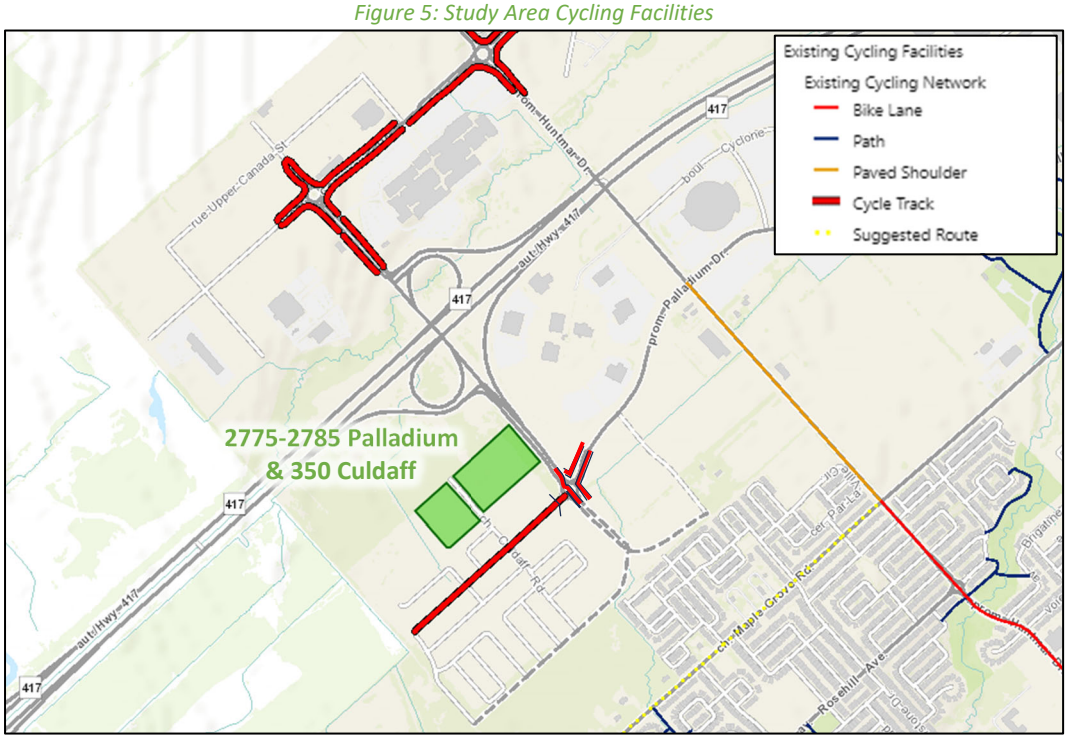
Avenue. This was discussed and finalized as part of the Palladium Drive re-alignment and roundabout construction for the adjacent subdivision.

Figure 4: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: August 6, 2025

Figure 5: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: August 6, 2025

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 5 and Figure 6, respectively.

Figure 6: Existing Pedestrian Volumes

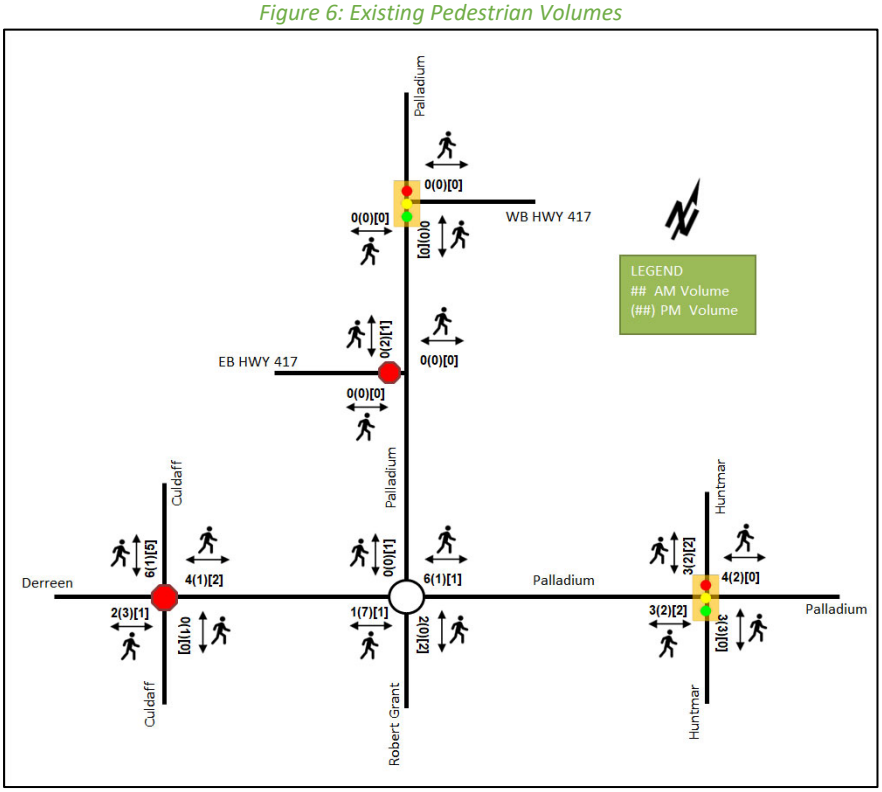
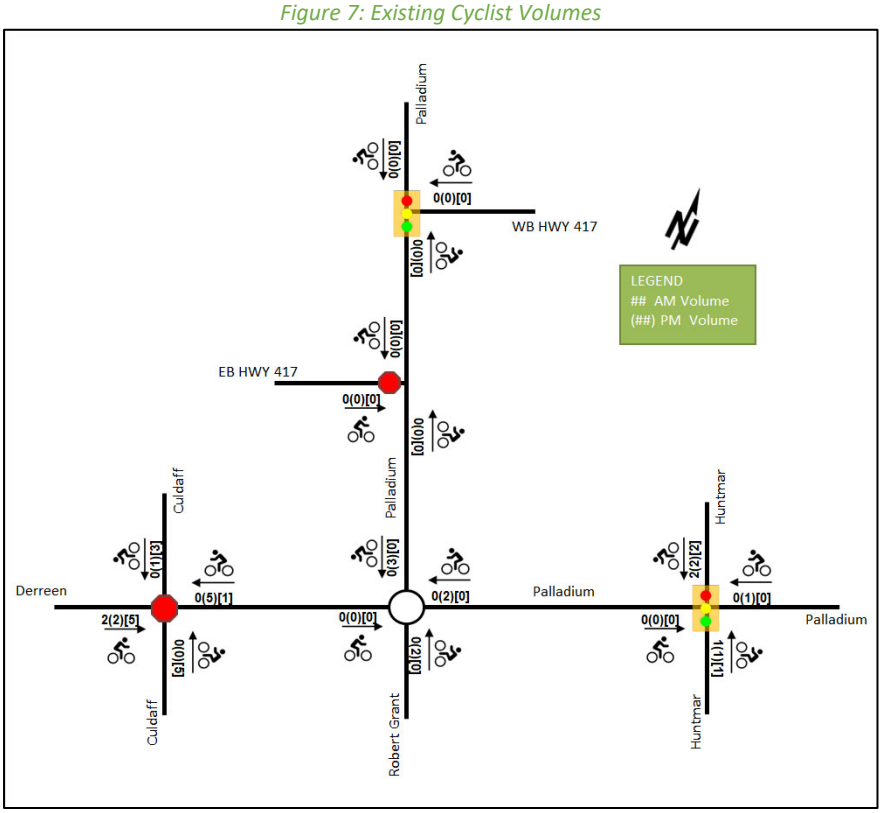


Figure 7: Existing Cyclist Volumes



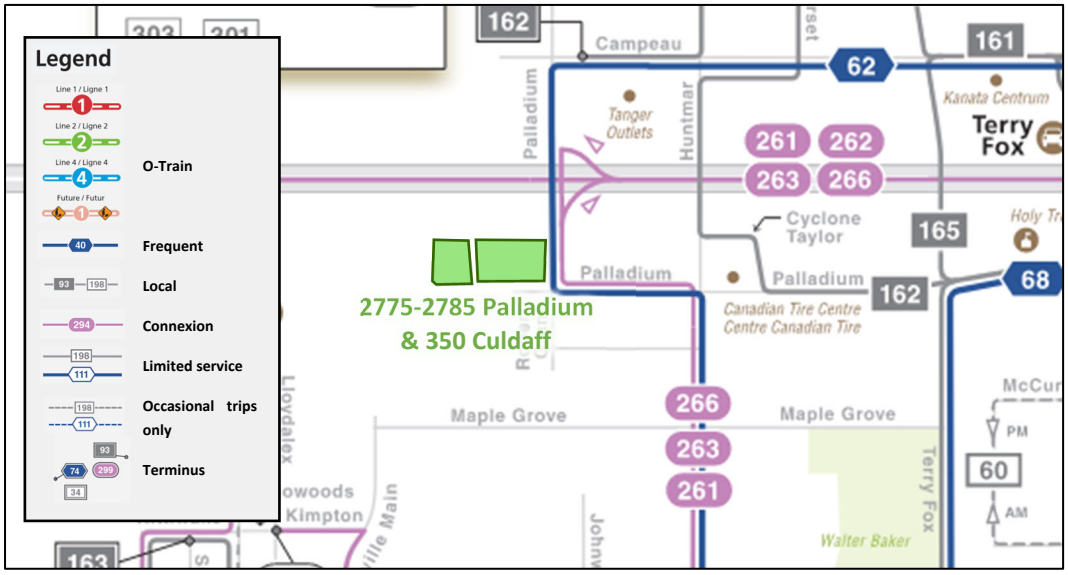
2.2.5 Existing Transit

Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates nearby transit stops. Two transit stops are proposed at the intersection of Derreen Avenue and Culdaff Road as part of the 195 Humar Road development. All transit information is from August 1, 2025, and is included for general information purposes and context to the surrounding area.

Within the study area, routes # 62 travels along Campeau Drive and Palladium Drive, and routes # 261, #263 and #266 travel along Highway 417 and Palladium Drive. The frequency of these routes within proximity of the proposed site based on August 1, 2025, service levels are:

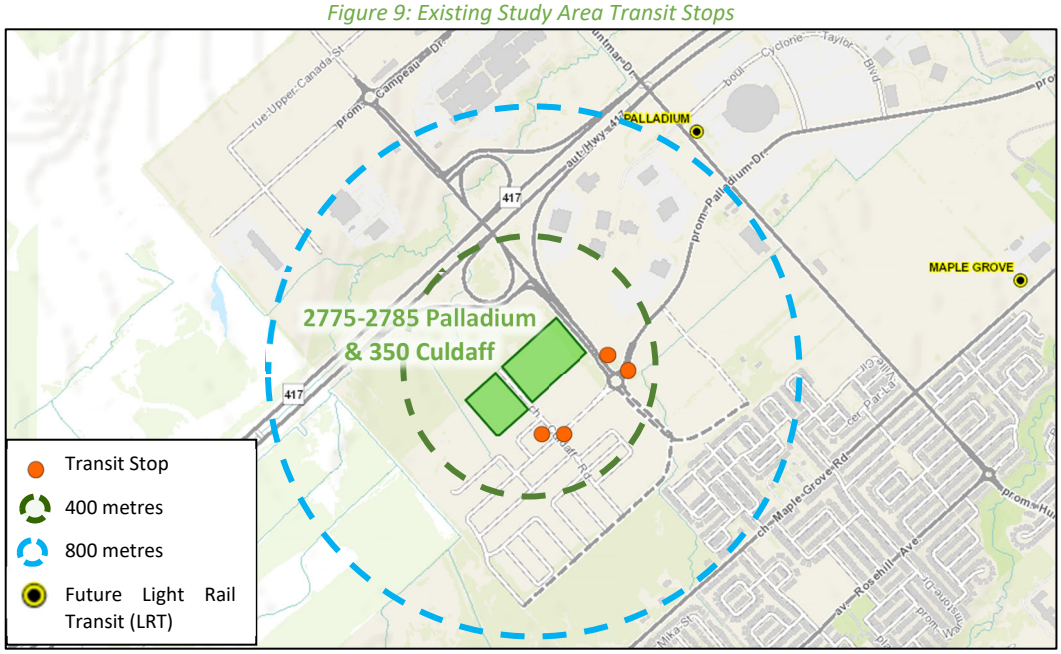
- Route # 62 – 30-minute service all-day
- Route # 261 – Four morning buses and four afternoon buses per day
- Route # 263 – Three morning buses and four afternoon buses per day
- Route # 266 – Four morning buses and four afternoon buses per day

Figure 8: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: August 1, 2025

Figure 9: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: August 11, 2025

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 acquired from Ministry of Transportation, The Traffic Specialist, and J & S Traffic Services for the existing study area intersections. Table 1 summarizes the intersection count dates and sources.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Palladium Drive at Westbound Highway 417 Ramp	Tuesday, September 26, 2023 Saturday, April 01, 2023	Ministry of Transportation The Traffic Specialist
Palladium Drive at Eastbound Highway 417 Ramp	Tuesday, September 26, 2023 Saturday, April 01, 2023	Ministry of Transportation The Traffic Specialist
Palladium Drive/Robert Grant Avenue at Derreen Avenue	Wednesday, June 25, 2025 Saturday, June 28, 2025	J & S Traffic Services
Derreen Avenue at Culdaff Road	Tuesday, June 24, 2025 Saturday, June 21, 2025	J & S Traffic Services
Huntmar Drive at Palladium Drive	Tuesday, June 24, 2025 Saturday, June 21, 2025	J & S Traffic Services

Figure 9 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The counts provided by the MTO did not include u-turn movements. As such, any u-turn volumes collected as part of the other area counts have been modelled as left-turns for the purposes of this study. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, and average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro and sidra worksheets are provided in Appendix C.

Figure 10: Existing Traffic Counts

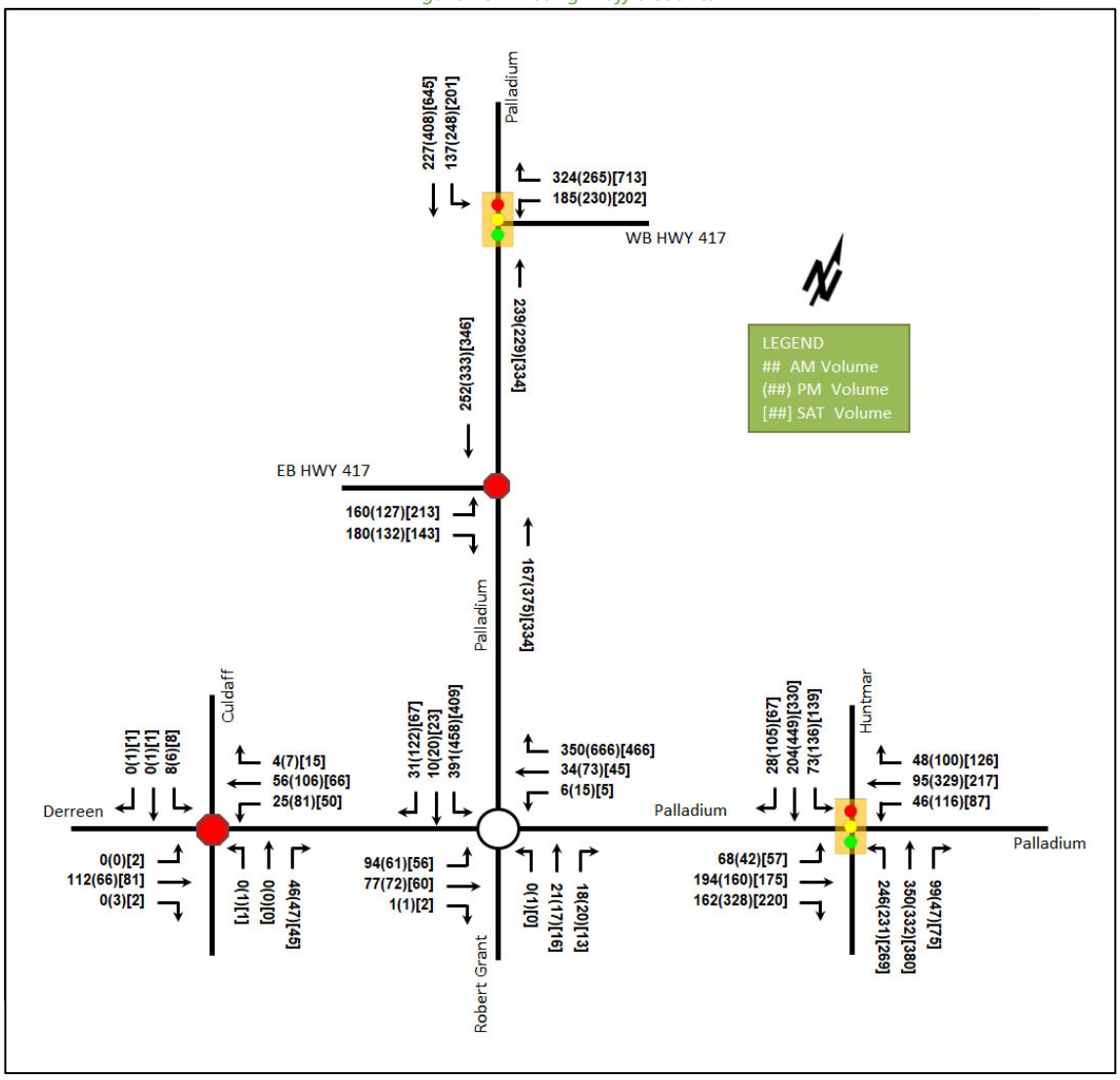


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive at Westbound Highway 417 Ramp *Signalized*	WBL	A	0.32	18.7	16.4	A	0.42	21.5	21.5	A	0.19	17.0	20.3
	WBR	B	0.62	7.8	17.1	A	0.57	7.9	16.5	D	0.90	23.6	**#129.0**
	NBT	A	0.34	18.3	21.7	A	0.38	20.8	22.4	B	0.61	33.2	41.0
	SBL	A	0.31	8.3	15.6	A	0.50	10.2	26.6	A	0.52	18.5	34.8
	SBT	A	0.16	6.6	11.4	A	0.25	6.8	19.1	A	0.49	16.5	52.2
	Overall	**A**	**0.46**	**11.7**	-	**A**	**0.49**	**12.4**	-	**C**	**0.76**	**21.8**	-
Palladium Drive at Eastbound Highway 417 Ramp *Unsignalized*	EBL	B	0.30	13.5	9.0	C	0.32	16.8	9.8	C	0.52	21.4	22.5
	EBR	B	0.23	10.3	6.8	B	0.18	10.3	4.5	B	0.19	10.5	5.3
	NB	-	-	-	-	-	-	-	-	-	-	-	-
	SB	-	-	-	-	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**5.3**	-	**A**	**-**	**3.6**	-	**A**	**-**	**5.8**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive/Robert Grant Avenue at Derreen Avenue *Roundabout*	EB	A	0.09	4.2	2.9	A	0.07	4.3	2.4	A	0.06	3.9	1.9
	WB	A	0.28	4.7	10.4	A	0.49	6.5	25.0	A	0.35	5.1	14.2
	NB	A	0.02	3.8	0.6	A	0.02	4.0	0.6	A	0.02	3.7	0.5
	SB	A	0.28	4.4	10.3	A	0.35	5.3	13.6	A	0.30	4.7	10.9
	Overall	**A**	-	**4.5**	-	**A**	-	**5.8**	-	**A**	-	**4.7**	-
Derreen Avenue at Culdaff Road *Unsignalized*	EB	A	0.05	7.0	1.5	A	0.06	7.3	1.5	A	0.06	7.1	1.5
	WB	A	0.14	7.8	3.8	A	0.09	7.7	2.3	A	0.11	7.7	3.0
	NB	A	0.11	7.7	3.0	A	0.25	8.6	7.5	A	0.17	8.0	4.5
	SB	A	0.01	7.7	0.0	A	0.01	7.8	0.0	A	0.01	7.7	0.0
	Overall	**A**	-	**7.6**	-	**A**	-	**8.2**	-	**A**	-	**7.7**	-
Huntmar Drive at Palladium Drive *Signalized*	EBL	A	0.32	31.6	24.6	A	0.36	47.3	21.5	A	0.38	40.3	23.3
	EBT/R	A	0.53	19.5	35.2	C	0.71	19.0	39.1	A	0.60	19.5	35.0
	WBL	A	0.17	17.7	13.2	A	0.51	32.5	38.2	A	0.33	22.8	24.4
	WBT/R	A	0.15	11.7	12.8	A	0.44	25.5	60.0	A	0.35	15.8	32.4
	NBL	A	0.56	19.6	56.8	C	0.78	33.0	**#72.2**	C	0.75	29.8	**#82.8**
	NBT	A	0.46	16.7	83.2	A	0.40	15.3	75.5	A	0.48	17.5	91.1
	NBR	A	0.14	3.9	9.4	A	0.06	1.3	2.9	A	0.11	3.8	8.0
	SBL	A	0.37	31.3	26.6	A	0.46	29.8	45.7	A	0.59	37.9	49.1
	SBT	A	0.55	31.4	61.3	D	0.83	41.5	144.6	C	0.73	37.1	101.7
	SBR	A	0.07	0.3	0.0	A	0.20	4.0	9.0	A	0.14	1.0	1.1
	Overall	**A**	**0.52**	**19.4**	-	**C**	**0.75**	**26.0**	-	**B**	**0.66**	**23.3**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90
Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

During all peak hours, the study area intersections operate well. No capacity issues are noted.

At the intersection of Huntmar Drive at Palladium Drive, the northbound left movement may exhibit extended queues during the PM and Saturday peak hours.

At the Palladium Drive at the Westbound Highway 417 ramp terminal intersection during the Saturday peak hour, the westbound right movement may exhibit extended queues and is forecast to be "critical," per MTO operations. No signal timing adjustments would permit this movement to reduce to out of the "critical" range.

The southbound approach at Palladium Drive at Westbound Highway 417 Ramp and the southbound and westbound approaches at Palladium Drive/Robert Grant Avenue at Derreen Avenue noted u-turn volumes during the data collection. The operational analysis assumed any u-turns as left-turning volumes and based on the LOS A and B for these movements; the possible u-turn movements are not expected to impact the movement or intersection operations. No further analysis or breakdown between the left-turn or u-turn volumes is required as part of this study.

2.2.8 Collision Analysis

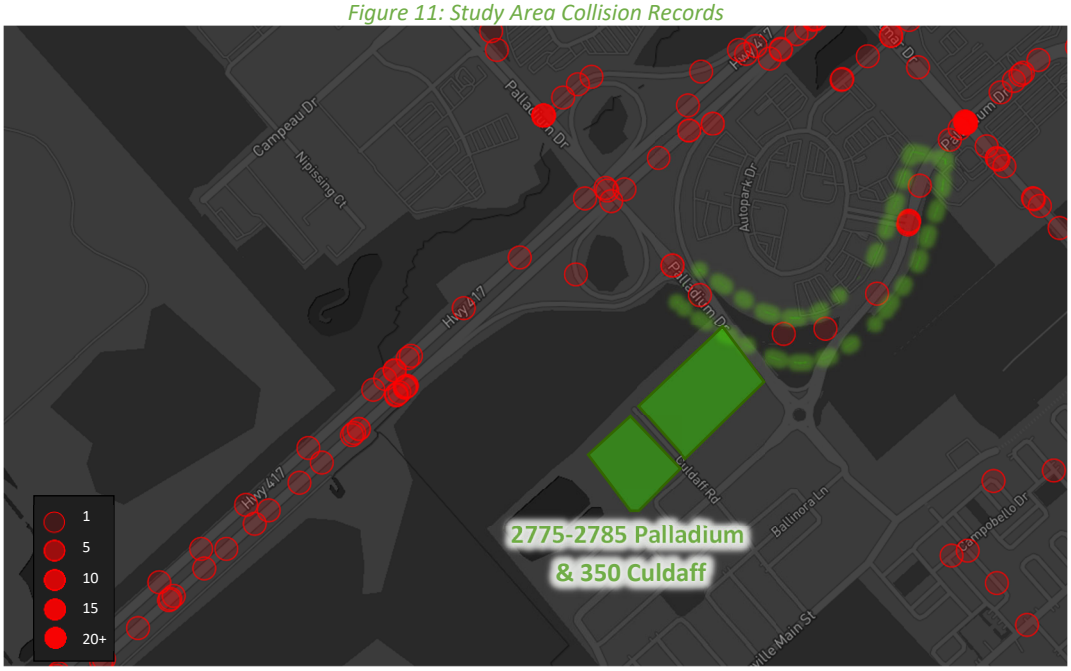
Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network (2018-2022). The study period does not include the constructed roundabout at Palladium Drive/Robert Grant Avenue and Derreen Avenue. Given that the new intersection is a roundabout, collision types are anticipated to be primarily sideswipe, and no safety issues are anticipated. Additionally, the segment of Palladium Drive between Eastbound Highway 417 Ramp and Huntmar Drive prior to the realignment and roundabout construction has been reviewed to highlight any possible

patterns for the area. Table 3 summarizes the collision types and conditions in the study area and Figure 10 illustrates the area collisions. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2018-2022

		Number	%
Total Collisions		**11**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	3	27%
	Property Damage Only	8	73%
Initial Impact Type	**Approaching**	1	9%
	Angle	4	36%
	Rear end	1	9%
	Sideswipe	3	27%
	Turning Movement	2	18%
	SMV Unattended	0	0%
	SMV Other	0	0%
	Other	0	0%
Road Surface Condition	**Dry**	8	73%
	Wet	3	27%
	Loose Snow	0	0%
	Slush	0	0%
	Packed Snow	0	0%
	Ice	0	0%
	Loose sand or gravel	0	0%
	Unknown	0	0%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

Figure 11: Study Area Collision Records



The segment of Palladium Drive between Eastbound Highway 417 Ramp and Huntmar Drive had a total of eleven collisions during the 2018-2022 time period, with eight involving property damage only and the remaining three

having non-fatal injuries. The collision types are most represented by angle with four collisions, sideswipe with three, turning movement with two, and approaching and rear end with one collision each. Weather conditions are not considered to affect collisions at this location. Angle collisions would be associated with the accesses to the Auto Park and the gas station along this segment. Two turning movement collisions did not include specific location data. No further collision review is required at this location as part of this study.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

2.3.1.1 Transportation Master Plan (2025)

The Transportation Master Plan (2025) includes a Capital Infrastructure Plan identifying transportation investment to support the forecasted growth and strategic connectivity and livability targets for the City. It also identifies committed projects, and a subset of priority projects that are expected to be implemented by 2046 based on current affordability assumptions. Area projects anticipated to impact travel in the study area that are included within the Capital Infrastructure Plan are:

- Active Transportation Network
    - Pedestrian Projects with Prioritization
        - (No projects within the study area)
    - Cycling Projects with Prioritization
        - (No projects within the study area)
- Transit Network
    - Priority Network
        - LRT Corridor
            - Moodie Station to Hazeldean Road
        - Transit Priority Corridors along:
            - Hazeldean Road
            - Terry Fox Drive
    - Needs-Based Network
        - BRT Corridor
            - Hazeldean Road to Abbott Street E
        - Conceptual Future Corridor
            - Abbott Street E to beyond Fernbank Road (beyond urban boundary)
- Road Network
    - Priority Network
        - Committed Projects
            - Carp Road widening between Highway 417 and Hazeldean Road
        - Roadway Projects
            - Robert Grant Avenue Extension from Palladium Drive at Derreen Avenue to Hazeldean Road (Phase 1)
            - Stittsville Main Street extension from current terminus to Derreen Avenue (Phase 1)
        - Road Widening
            - Huntmar Drive between Campeau Drive and Maple Grove Road (Phase 2)

- Needs-Based Network
  - Roadway Projects
    - Urbanization of Maple Grove east of future Robert Grant Avenue (Phase 1)
- Ultimate Network
  - New Roads
    - Major collector extension of Westbrook Road to intersection of Stittsville Main Street at Derreen Avenue

It is noted that while the Huntmar Drive widening is only depicted in the Needs Based Road Network, it is a Phase 2 capacity project of the Priority Road Network project list.

2.3.1.2 Robert Grant Avenue - Between Palladium Drive and Fernbank Road

Robert Grant Avenue is a 2-lane arterial roadway between Fernbank Road and Hazeldean Road. The ultimate configuration of Robert Grant Avenue will be a 4-lane roadway, supporting rapid transit, cycling facilities and pedestrian facilities between Palladium Drive and Fernbank Road. The nature of this corridor will evolve from the previously completed environmental assessment study, as City standards and guidelines have advanced during the intervening time. A transit station and park and ride facility are identified at the intersection of Robert Grant Avenue at Fernbank Road and Abbott Street at Hazeldean Road.

Based on information conveyed verbally by City staff, the preliminary design of Robert Grant Avenue extension is understood to currently be underway, considering an interim 2-lane condition, and funding of the design and construction of the corridor is understood to be planned for individual sections of the project beginning in 2028. It is therefore assumed that the entire corridor will not be completed by 2034 to connect to the south leg of the roundabout intersection of Palladium Drive/Robert Grant Avenue at Derreen Avenue/Palladium Drive.

2.3.1.3 Huntmar Drive Widening and Stittsville Main Street Extension

The Huntmar Drive Widening and Stittsville Main Street Extension EA includes widening of Huntmar Drive from two to four lanes between Campeau Drive and Cyclone Taylor Boulevard, as well as between Palladium Drive and Maple Grove Road. While no known implementation horizon is available for this aspect of the project, the preliminary design of the intersection of Huntmar Drive at Palladium Drive is provided in Appendix E.

The extension of Stittsville Main Street is planned as part of this EA from its current terminus connecting Maple Grove Road to the Robert Grant Avenue extension at a new roundabout intersection south of the intersection of Palladium Drive at Robert Grant Avenue/Derreen Avenue. The cross-section will include sidewalks and cycletracks on both sides of the road. It is anticipated that this portion of the work will be coordinated with the Robert Grant Avenue extension and is therefore assumed that it will occur beyond the study horizon years.

2.3.2 Other Study Area Developments

130 Huntmar Drive

The proposed development application includes a site plan for the construction of 90 single family homes, 226 Townhomes, 426 Stacked townhomes, 30,000 ft^2 of retail, and a 2.409 Ha school. The development was initially anticipated to be built out by 2024 and to generate 435 new AM two-way peak-hour auto trips and 507 new PM two-way peak-hour auto trips. The construction has not yet begun and it will be assumed to be built out by 2034. (Dillon Consulting, 2021)

195 Huntmar Drive

The proposed development application includes a plan of subdivision for the construction of a total of 155 single-detached, 418 townhouse units, 13,747 square metres of commercial spaces across three parcels, and two car

dealerships (4,000 square metres GFA each). The residential component was completed in 2024 and the subject site is part of the commercial spaces within this development. The remaining commercial components have been updated where changes are proposed, and will be assumed to be completed by 2034. The overall development was predicted to generate 991 new AM, 1372 new PM, and 1950 Saturday two-way peak-hour auto trips. (CGH Transportation, 2019)

319 Huntmar Drive

The proposed development application includes a site plan for the construction of six, six-storey mid-rise apartment buildings with 472 units and an amenity building for the use of the residents. The development is forecasted to be built by 2029 and to generate 78 AM new and 103 new PM two-way peak-hour auto trips. (Arcadis, 2026)

333 Huntmar Drive

The proposed development application includes a site plan for the construction of 134 hotel rooms and approximately 30,000 ft^2 of restaurant type land uses. The development was initially anticipated to be built out in 2022 but is yet to be constructed and will be assumed to be built out by 2034. The development is forecasted to generate 61 new AM two-way peak-hour auto trips and 309 new PM two-way peak-hour auto trips. (Parsons, 2014)

1485 Upper Canada Street

The proposed development application includes a site plan application for the construction of a single storey multi-tenant warehouse building. The construction has not yet begun and no TIA is available as part of this application.

8800 Campeau Drive

The proposed development application includes a site plan for the construction of 66,000 ft^2 of office/warehouse space by phase one and will expand to 77,800 ft^2 of office/warehouse space by phase two. The assumed phase one horizon year is 2021 with the facility operating at only 25% of the ultimate capacity but is yet to be constructed. The assumed phase two horizon year is 2026 but could take upwards of 20 years for this level of operation to materialize depending on market conditions. The development will be assumed to be completed by 2034 and is forecasted to generate 23 new AM and PM two-way peak-hour auto trips by phase one and 26 AM two-way peak-hour auto trips and 27 new PM two-way peak-hour auto trips by phase two. (Parsons, 2021)

8560 Campeau Drive

The proposed development application includes a site plan for the construction of a one-storey, 1,243 m^2 addition at the rear of the existing building. No TIA is available as part of this application.

8370 Campeau Drive (Arcadia community Stage 5)

The proposed development application includes 62 single detached and 160 townhome units. The development is expected to generate 86 AM and 103 PM peak hour two-way auto trips. The anticipated full build-out horizon was initially 2025, however construction has not yet begun, and it will be assumed to be built out by 2029. (CGH Transportation, 2023)

8415 Campeau Drive (Arcadia community Stage 6)

The proposed development application includes a site plan for the construction of 264 stacked towns and 104 townhomes. The anticipated build-out horizon was initially 2025, and the development is forecasted to generate 100 new AM two-way peak-hour auto trips and 123 new PM two-way peak-hour auto trips. The development is currently being constructed. (CGH Transportation, 2022)

8201 Campeau Drive

The proposed development application includes a site plan and zoning by-law amendment to construct two six-storey buildings with a total of 342 dwelling units and 2,930 sq ft of commercial space as part of Phase 1 of the development. The development is anticipated to be built out by 2029 and to generate 60 new AM and 83 new PM two-way peak-hour auto trips. (CGH, 2026)

3075 Palladium Drive

The proposed development application includes a site plan for approximately 85,153 sq. ft. of retail space including large and small multi-unit retail pads. The anticipated full build-out horizon is 2027 and it is expected to generate 190 PM two-way peak-hour auto trips and 273 Saturday two-way peak-hour auto trips. (WPE Engineering Ltd, 2024)

3095 Palladium Drive

The proposed development application includes a site plan for 3,461 sq. m of retail space including large and small multi-unit retail pads on the northern portion of the site and a 454 sq. m. of car wash on the southern portion of the site. The anticipated full build-out horizon is 2027 and it is expected to generate 90 PM two-way peak-hour auto trips and 117 Saturday two-way peak-hour auto trips. (CGH Transportation, 2024)

425 Culdaff Road

The proposed development application includes a site plan application to construct a six-storey apartment building comprising 177 residential dwelling units. The development is anticipated to be built out by 2027 and to generate 38 new AM and 38 new PM two-way peak-hour auto trips. (Novatech, 2024)

1981 Maple Grove Road

The proposed development application includes a plan of subdivision and zoning by-law amendment to construct 57 single detached dwellings, 101 townhomes, and 38 back-to-back townhomes. The development was initially anticipated to be built out in 2023, but is yet to be constructed and will be assumed to be built out by 2029. The development is forecasted to generate 126 new AM two-way peak-hour auto trips and 150 new PM two-way peak-hour auto trips. (IBI Group, 2021)

1919 Maple Grove Road

The proposed development application includes a plan of subdivision to construct 79 townhomes and 440 apartment units. The proposed development is assumed to be completed in two phases. The phase one was initially anticipated to be built out by 2021, and the initially assumed phase two horizon year was 2026. The development will be assumed to be completed by 2034 and is forecasted to generate 223 new AM two-way peak-hour auto trips and 284 new PM two-way peak-hour auto trips. (IBI Group, 2019)

1869 Maple Grove Road

The proposed development application includes a zoning by-law amendment to construct 16 townhouses and two semi-detached townhouses. The development was initially anticipated to be built out in 2022, but is yet to be constructed and will be assumed to be built out by 2029. The development is forecasted to generate five new AM two-way peak-hour auto trips and seven new PM two-way peak-hour auto trips. (exp, 2020)

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Palladium Drive at
  - Westbound Highway 417 Ramp
  - Eastbound Highway 417 Ramp
  - Derreen Avenue
  - Huntmar Drive
- Derreen Avenue at
  - Culdaff Road

The boundary roads are Culdaff Road and Palladium Drive, and screenlines 44 and 53 are beyond 1 km from the site and will not be analyzed as part of this study.

3.2 Time Periods

To ensure all of the impacts of the site are captured, the weekday AM and PM peak hours and Saturday peak hour will be examined.

3.3 Horizon Years

The anticipated build-out year is 2029. As a result, the full build-out plus five years horizon year is 2034.

4 Development-Generated Travel Demand

4.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Kanata/Stittsville have been summarized in Table 4. The PM peak hour mode shares were used for the Saturday peak hour.

Table 4: TRANS Trip Generation Manual Recommended Mode Shares – Kanata/Stittsville

Travel Mode	Commercial Generator		
	AM	PM	SAT
Auto Driver	81%	73%	73%
Auto Passenger	12%	22%	22%
Transit	5%	1%	1%
Cycling	0%	0%	0%
Walking	2%	4%	4%
Total	**100%**	**100%**	**100%**

To account for the proximity to a frequent transit route, and the utility of the site for the local Kanata community, adjusted mode shares accounting for higher transit are proposed and summarized in Table 5.

Table 5: Proposed Development Mode Shares

Travel Mode	Commercial Generator		
	AM	PM	SAT
Auto Driver	73%	66%	66%
Auto Passenger	10%	19%	19%
Transit	12%	8%	8%
Cycling	1%	2%	2%
Walking	4%	5%	5%
Total	**100%**	**100%**	**100%**

4.2 Trip Generation

This TIA has been prepared using the vehicle trip rates and derived person trip rates from the ITE Trip Generation Manual 12th Edition (2025) using the City-prescribed conversion factor of 1.28. As the ITE Trip Generation Manual does not include a land use category for an Indoor Aquatic and Recreational Facility, the Specialized Land Use Data in the land use description of the closest ITE land use—Indoor Water Slide Park—will be applied. The proposed land use includes an adjoining hotel use and supporting entertainment facilities, such as a restaurant, and the Indoor Water Slide Park has been selected to account for the synergies associated with the mix of land uses. Table 6 summarizes the person trip rates for the land use by peak hour.

Table 6: Trip Generation Person Trip Rates by Peak Hour

Land Use	Land Use Code	Peak Hour	Vehicle Trip Rate per Parking Space	Person Trip Rate per Parking Space
Water Slide Park	482 (ITE)	AM	0.10	0.13
		PM	0.23	0.29
		SAT	0.39	0.50

Using the above person trip rates, the total person trip generation has been estimated. Table 7 summarizes the total person trip generation for the non-residential land uses.

Table 7: Person Trip Generation by Peak Hour

Land Use	Parking Spaces	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Indoor Aquatic/ Rec. Facility	704 Spaces	39	53	92	118	86	204	204	148	352

Using the above mode share targets and the person trip rates, the person trips by mode have been projected. Table 8 summarizes the residential trip generation and the non-residential trip generation by mode and peak hour.

Table 8: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total	Mode Share	In	Out	Total
Indoor Aquatic/ Rec. Facility	Auto Driver	**73%**	28	39	67	**66%**	78	57	135	**66%**	135	98	232
	Auto Pass.	**10%**	4	5	9	**19%**	22	16	39	**19%**	39	28	67
	Transit	**12%**	5	6	11	**8%**	9	7	16	**8%**	16	12	28
	Cycling	**1%**	0	1	1	**2%**	2	2	4	**2%**	4	3	7
	Walking	**4%**	2	2	4	**5%**	6	4	10	**5%**	10	7	18
	Total	**100%**	**39**	**53**	**92**	**100%**	**117**	**86**	**204**	**100%**	**204**	**148**	**352**

As shown above, a total of 67 AM, 135 PM, and 232 Saturday peak hour two-way vehicle trips are projected as a result of the proposed development.

4.3 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to inform the travel for the aquatic and recreational centre. Given the hotel trips are anticipated to be associated substantially with regional travel, additional travel to and from the west have been applied beyond the typical distribution for developments within Kanata/Stittsville. Table 9 below summarizes the proposed distributions.

Table 9:Proposed Trip Distribution

To/From	% of Trips
North	5%
South	5%
East	65%
West	25%
Total	**100%**

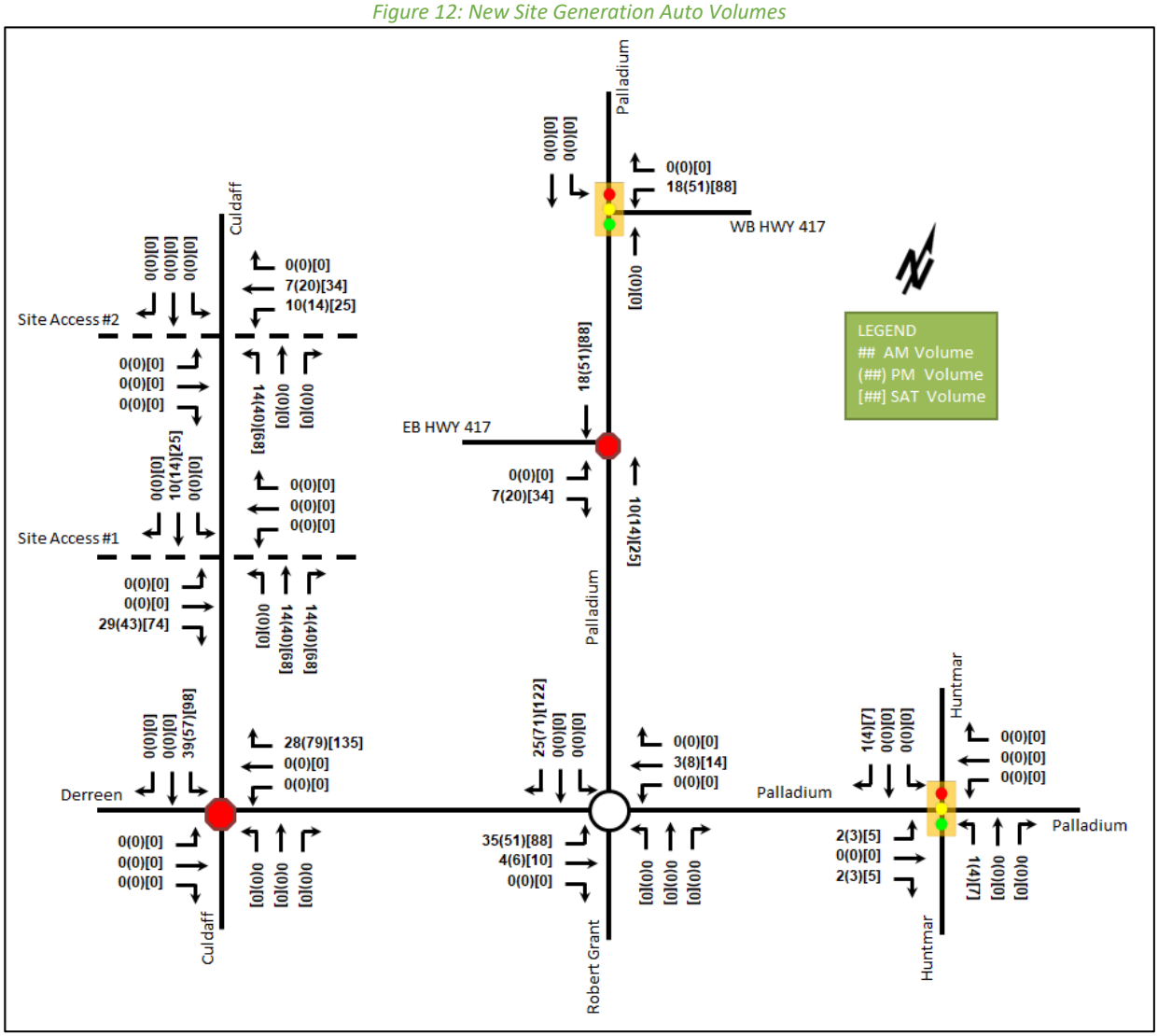
4.4 Trip Assignment

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. Table 10 summarizes the proportional assignment to the study area roadways, and Figure 11 illustrates the new site generated volumes.

Table 10: Trip Assignment

To/From	Via
North	5% Huntmar Dr (N)
South	5% Huntmar Dr (S)
East	65% Hwy 417 (E)
West	25% Hwy 417 (W)
Total	**100%**

Figure 12: New Site Generation Auto Volumes



5 Exemption Review

Table 11 summarizes the exemptions for this TIA.

Table 11: Exemption Review

Module	Element	Explanation	Exempt/Required
Site Design and TDM			
Development Design	4.1.2 Circulation and Access	Only required for site plan and zoning by-law applications	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
Parking	4.2.1 Parking Supply	Only required for site plan and zoning by-law applications	Required
Boundary Street Design		All applications	Required
Transportation Demand Management	All Elements	Only required when the development generates more than 60 person-trips	Required

Module	Element	Explanation	Exempt/Required
Network Impact			
Background Network Travel Demand	All Elements	Only required when one or more other Network Impact Modules are triggered when the development generates more than 75 auto or transit trips	Required
Demand Rationalization		Only required when one or more other Network Impact Modules when the development generates more than 75 auto trips	Required
Neighbourhood Traffic Calming	4.6.1 Adjacent Neighbourhoods	If the development meets all of the following criteria along the route(s) site generated traffic is expected to utilize between an arterial road and the site's access: 1. Access to Collector or Local; 2. "Significant sensitive land use presence" exists, where there is at least two of the following adjacent to the subject street segment: • School (within 250m walking distance); • Park; • Retirement / Older Adult Facility (i.e. long-term care and retirement homes); • Licenced Child Care Centre; • Community Centre; or • 50%, or greater, of adjacent property along the route(s) is occupied by residential lands and a minimum of 10 occupied residential units are present on the route. 3. Application is for Zoning By-Law Amendment or Draft Plan of Subdivision; 4. At least 75 site-generated auto trips; 5. Site Trip Infiltration is expected. Site traffic will increase peak hour vehicle volumes along the route by 50% or more.	Exempt
Transit	4.7.1 Transit Route Capacity	Only required when the development generates more than 75 transit trips	Exempt for all applications
	4.7.2 Transit Priority Requirements	Only required when the development generates more than 75 auto trips	Required
Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt
Intersection Design	4.4.1-2/4.9.1 Intersection Control	Only required when the development generates more than 75 auto trips	Required
	4.4.3/4.9.2 Intersection Design	Only required when the development generates more than 75 auto trips	Required

6 Development Design

6.1 Design for Sustainable Modes

The proposed development is a destination recreational facility with lodging, dining, and other supportive land uses. Pedestrian access is via the extension of an existing sidewalk along the west side of Culdaff Road connecting to a Type D pedestrian cross-over across the northern limits of Culdaff Road (south of the turning basin). This crossing connects two sides of the east-west "pedestrian promenade". Bicycle parking is located along the north side of the pedestrian promenade on the eastern property, and in open racks along the north side of the pedestrian promenade on the western property.

Auto parking is provided in open surface lots on both sides of Culdaff Road.

Bus stops for the existing frequent route #62 are located on the north and east legs of the roundabout intersection of Palladium Drive/Robert Grant Avenue at Derreen Avenue/Palladium Drive an approximately 800-metre walk to the facility entrance. Derreen Avenue is also planned and designed to accommodate transit in the fullness of time, and the future transit stops at the intersection of Derreen Avenue at Culdaff Road are an approximately 425-metre walk to the facility entrance.

The infrastructure TDM checklist is provided in Appendix F.

6.2 Circulation and Access

The site is to be served by three access locations. Access to vehicular parking for all but six parking spaces is provided via two four-legged accesses on Culdaff Road. The southern access includes an outbound access from the west parcel and an inbound access to the east parcel. The access includes an outbound access from the east parcel and an inbound access to the west parcel. On this basis, site circulation is counter-clockwise with parking lots internally accessible by this loop on each parcel.

Access to six of the accessible parking spaces is provided via a two-way full-movement access on the east side of the turning basin at the terminus of Culdaff Road.

Garbage collection and loading for the recreational portion of the site are located within an area on the southeast of the eastern parcel's drive aisle loop. Garbage collection and loading for the hotel portion of the site are located in an area accessed from the at the northernmost access on the turning basin at the terminus of Culdaff Avenue. A 6.0-metre fire lane circulates the east parcel's drive aisle loop site providing fire services access to all site buildings.

Turning templates for the site operations are provided in Appendix G.

7 Parking

7.1 Parking Supply

The site provides a total of 61 short-term bicycle spaces and 704 vehicle parking spaces.

Twenty-eight bicycle parking spaces are located in a covered parking area on the north side of the pedestrian promenade on the eastern parcel, and three sets of ten bicycle parking spaces are located in surface racks on the north side of the pedestrian promenade on the western parcel. Three inclusive bicycle parking spaces are also provided in an open area of the pedestrian promenade on the west parcel.

The west parcel provides 420 vehicle parking spaces for general site use, and 278 vehicle parking spaces are on the east parcel for hotel and priority guests. Six accessible parking spaces are located in a surface lot off of the turning basin access.

The new Zoning By-Law (2026-50) does not require a minimum parking provision. The site is proposed as including a parking target consistent with the needs identified by the owner through the operation of similar sites across North America. This target accounts for the synergies between co-located land uses of the aquatic recreational facility and the restaurant, and accounts for one vehicular parking space per room for the hotel. This parking provision, calculated as being 697 spaces, is considered to accommodate the peak simultaneous demand for the facility. As such, the proposed parking provision of 704 spaces is considered to be adequate and appropriate for the basis of the rezoning application.

With respect to bicycle parking, the new Zoning By-Law (2026-50) requires a minimum short-term bicycle parking provision of seven spaces for the hotel land use and 51 spaces for the indoor aquatic recreational facility (assumed as Indoor Entertainment Facility) for a total of 58 spaces. Therefore, the site is proposed as providing bicycle parking that meets this minimum.

A total of 20 accessible parking spaces is proposed, with eight in the western lot and eight in the eastern access-controlled lot, and six in the lot off of the turning basin access at the end of Culdaff Road. This accessible parking provision meets the required minimum accessible parking from the Ottawa Accessibility Design Standards of 17 spaces total for the site.

8 Boundary Street Design

Table 12 summarizes the MMLOS analysis for the boundary streets of Culdaff Road and Palladium Drive. The existing and future conditions for Palladium Drive will be the same and are considered in one row and only the future conditions of Culdaff Road will be scored. The boundary street analysis is based on the policy area of Mixed Industrial for Culdaff Road and Mainstreet Corridor (outside a Hub) for Palladium Drive. The MMLOS worksheets has been provided in Appendix H.

Table 12: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Pub. Realm LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	PRLOS	Target
Culdaff Road	A	D	B	D	-	-	B	-
Palladium Drive	**F**	B	**E**	C	B	D	E	-

Palladium Drive does not meet the pedestrian and cycling MMLOS targets. The cross-section of Palladium Drive is a divided urban arterial with no pedestrian connectivity between the lands north and south of the highway which are approximately one kilometre between the nearest accesses of the two sides. This condition was provided as part of the City's 2021-2022 reconstruction of the corridor, based on agreement between the MTO and the City. No change to this agreed upon condition is therefore required or recommended.

9 Transportation Demand Management

9.1 Context for TDM

The mode shares used within the TIA represent a slight shift from auto modes to transit modes given the adjacency of frequent transit. Overall, the modal shares are likely to be achieved and supporting TDM measures are of limited applicability given the majority of trips will be made by visitors to the site. No age restrictions are noted for the site.

9.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel with a slight increase in transit ridership with the proximity to the frequent route #62, and those assumptions have been carried through the analysis. The study area intersections are anticipated to have residual capacity, and thus potential impacts from the failure to meet target mode shares are negligible.

9.3 TDM Program

The "suite of post occupancy TDM measures" has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix F. The key TDM measures recommended include:

- Provide a multi-modal travel information package to new employees
- Post bus route maps and schedules, active transportation maps at employee entrances, provide online links to OC Transpo for employees

10 Background Network Travel Demands

10.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3.

None of the area projects are anticipated to be completed within the study horizons, and therefore no changes to the network intersections or traffic will be assumed as part of the future conditions at 2029 or 2034.

10.2 Background Growth

The 2022 and 2046 TRANS volume model plots have been reviewed to determine the City's forecasted growth along the individual study area roadways. The 2022 model plot is noted to exclude a 195 Huntmar Residential component and the realignment of Palladium Drive to intersect Derreen Avenue at the recently constructed roundabout. The 2046 model plot is noted to include the widening of Huntmar Drive and the extension of Robert Grant Avenue as assumed network conditions. Therefore, the interpolation between the 2022 and 2046 volumes are not anticipated to be linearly achieved, rather as a result of discrete increases resulting from area infrastructure projects, and similarly due to these terminal buildout states, no comparison with the existing volumes is appropriate to assess shorter-term growth. The resulting growth obtained by interpolating between these horizons is therefore considered the most appropriate method of forecasting growth, however is expected to be conservative absent the inclusion of these improvements in the traffic model. The growth rates for each study area arterial road for the AM peak hour derived from the two TRANS volume horizons are summarized in Table 13.

Table 13: TRANS Annual Growth Rates

Network Element	AM Peak Hour	
	SB/EB	NB/WB
Palladium Dr	2.96%	3.26%
Huntmar Dr	1.81%	1.53%
	On-Ramp	**Off-Ramp**
417 WB	2.14%	2.93%
417 EB	5.75%	1.89%

Based on the calculated rates, annual growth rates to be applied to the study area for the AM peak hour, rounded to the nearest 0.25% are proposed for the study area roadways, and will be reversed in the PM and Saturday peak hours. The applied growth rates are summarized in Table 14.

Table 14: Applied Annual Growth Rates

Network Element	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
	SB/EB	**NB/WB**	**SB/EB**	**NB/WB**	**SB/EB**	**NB/WB**
Palladium Dr	3.00%	3.25%	3.25%	3.00%	3.25%	3.00%
Huntmar Dr	1.75%	1.50%	1.50%	1.75%	1.50%	1.75%
	On-Ramp	**Off-Ramp**	**On-Ramp**	**Off-Ramp**	**On-Ramp**	**Off-Ramp**
417 WB	-	3.00%	-	5.75%	-	5.75%
417 EB	-	2.00 %	-	2.25%	-	2.25%

10.3 Other Developments

The background developments explicitly considered in the background conditions (Section 10.2) include:

- 130 Huntmar Drive
- 195 Huntmar Drive - Commercial Component
- 425 Culdaff Road

All other background developments, which are more remote from the subject development, are assumed to be captured by the high study area annual growth rates applied. The background development volumes within the study area have been provided in Appendix I.

11 Demand Rationalization

11.1 2029 Future Background Intersection Operations

Figure 12 illustrates the 2029 background volumes and Table 15 summarizes the 2029 background intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets for the 2029 future background horizon are provided in Appendix J.

Figure 13: 2029 Future Background Volumes

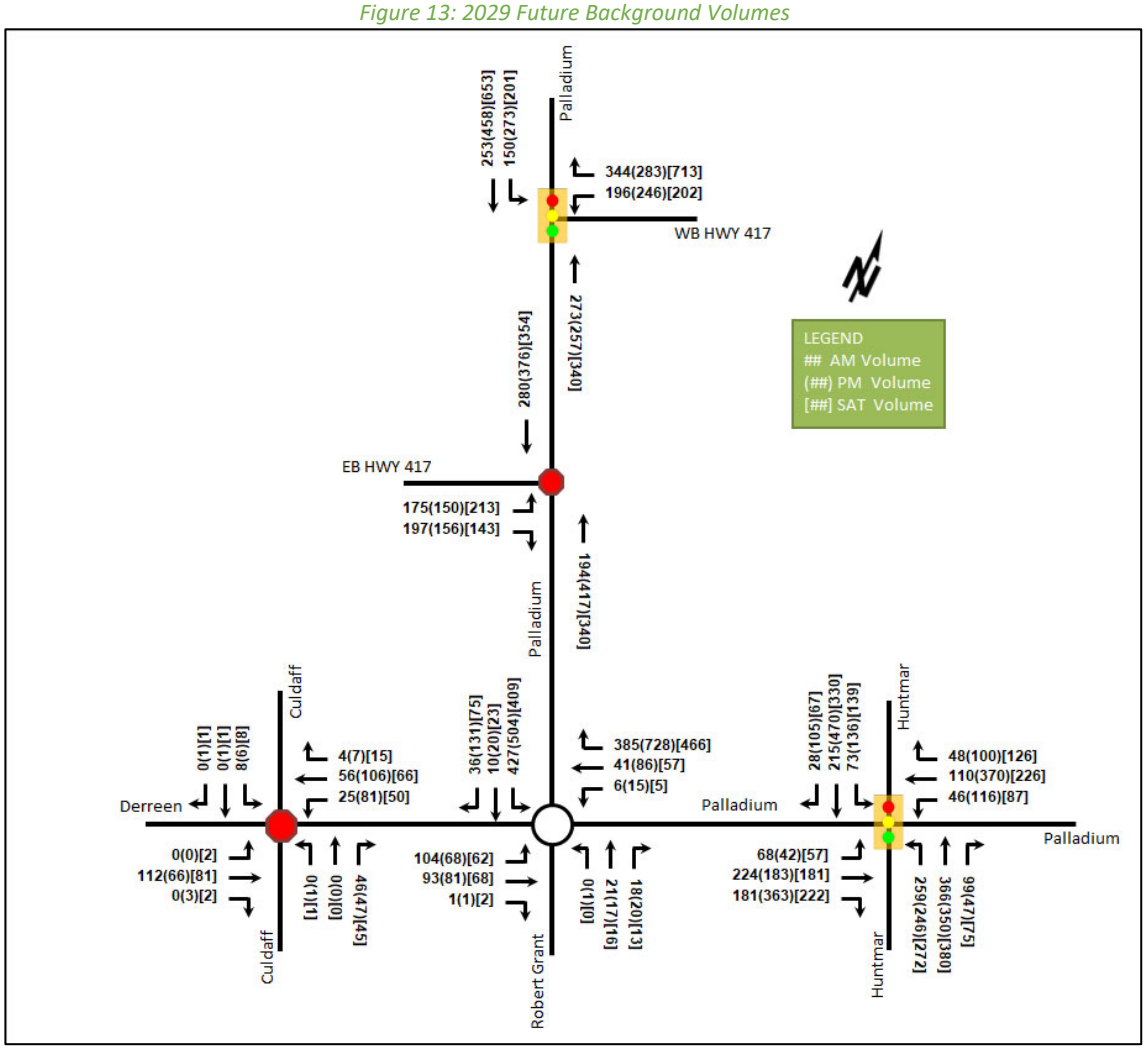


Table 15: 2029 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive at Westbound Highway 417 Ramp *Signalized*	WBL	A	0.31	18.7	15.6	A	0.41	21.4	20.6	A	0.22	17.4	18.1
	WBR	B	0.61	7.9	16.8	A	0.56	8.0	16.3	D	0.87	19.0	**#83.3**
	NBT	A	0.34	18.0	21.5	A	0.38	20.4	21.8	A	0.51	28.1	37.7
	SBL	A	0.31	8.1	14.7	A	0.49	9.9	25.0	A	0.42	14.7	31.6
	SBT	A	0.16	6.4	10.9	A	0.25	6.7	18.2	A	0.41	12.9	46.9
	Overall	**A**	**0.46**	**11.6**	-	**A**	**0.48**	**12.2**	-	**B**	**0.70**	**18.0**	-
Palladium Drive at Eastbound Highway 417 Ramp *Unsignalized*	EBL	B	0.29	13.5	9.0	C	0.34	17.3	11.3	C	0.44	18.2	16.5
	EBR	B	0.22	10.3	6.8	B	0.19	10.4	5.3	B	0.17	10.2	4.5
	NB	-	-	-	-	-	-	-	-	-	-	-	-
	SB	-	-	-	-	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**5.2**	**-**	**A**	**-**	**3.8**	**-**	**A**	**-**	**5.1**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive/Robert Grant Avenue at Derreen Avenue *Roundabout*	EB	A	0.11	4.4	3.4	A	0.09	4.5	2.9	A	0.07	4.0	2.1
	WB	A	0.31	5.0	12.0	A	0.54	7.1	29.8	A	0.35	5.1	14.4
	NB	A	0.02	4.0	0.6	A	0.02	4.1	0.7	A	0.02	3.7	0.4
	SB	A	0.31	4.7	11.8	A	0.39	5.8	16.0	A	0.30	4.8	11.2
	Overall	**A**	-	**4.7**	-	**A**	-	**6.3**	-	**A**	-	**4.8**	-
Derreen Avenue at Culdaff Road *Unsignalized*	EB	A	0.05	7.0	0.8	A	0.05	7.2	1.5	A	0.05	7.0	1.5
	WB	A	0.13	7.7	3.0	A	0.08	7.6	2.3	A	0.10	7.6	2.3
	NB	A	0.10	7.6	2.3	A	0.23	8.4	6.8	A	0.15	7.9	3.8
	SB	A	0.01	7.7	0.0	A	0.01	7.7	0.0	A	0.01	7.6	0.0
	Overall	**A**	-	**7.5**	-	**A**	-	**8.0**	-	**A**	-	**7.6**	-
Huntmar Drive at Palladium Drive *Signalized*	EBL	A	0.29	30.4	22.3	A	0.31	44.1	19.2	A	0.33	36.9	20.7
	EBT/R	A	0.54	19.6	36.2	B	0.70	18.2	37.9	A	0.56	17.6	30.1
	WBL	A	0.15	17.4	12.3	A	0.53	35.9	34.8	A	0.28	20.6	21.1
	WBT/R	A	0.15	12.0	13.1	A	0.45	26.6	59.3	A	0.32	14.6	28.4
	NBL	A	0.53	18.5	53.5	B	0.66	20.9	46.6	B	0.66	24.7	**#65.7**
	NBT	A	0.43	16.3	76.9	A	0.37	13.9	67.5	A	0.44	17.0	81.1
	NBR	A	0.13	4.0	8.9	A	0.06	0.9	1.7	A	0.10	3.9	7.3
	SBL	A	0.33	30.2	24.2	A	0.44	31.4	44.6	A	0.55	36.7	44.3
	SBT	A	0.53	30.8	57.8	D	0.83	44.1	145.8	C	0.71	36.6	90.5
	SBR	A	0.06	0.3	0.0	A	0.19	3.3	7.2	A	0.14	0.6	0.0
	Overall	**A**	**0.52**	**19.1**	-	**C**	**0.72**	**25.2**	-	**B**	**0.61**	**21.6**	-

Notes: Saturation flow rate of 1800 veh/h/lane; Queue is measured in metres; Peak Hour Factor = 1.00; Delay = average vehicle delay in seconds; m = metered queue; # = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2029 future background horizon operate well, and similarly to the existing conditions. Minor operational improvements are noted on various movements throughout the study area with the peak hour factor of 1.00 for forecasted conditions. At the intersection of Huntmar Drive at Palladium Drive, during the PM peak hour, queueing issues on the northbound left movement are forecast to resolve at this horizon. No impacts are noted to the westbound right-turn movement at the intersection of Palladium Drive at the westbound Highway 417 ramp terminal, and no mitigation is considered to be required or is recommended for this movement. No new capacity issues are noted.

11.2 2034 Future Background Intersection Operations

Figure 13 illustrates the 2034 background volumes and Table 16 summarizes the 2034 background intersection operations. Given the changes in volumes from background growth, signal timing adjustment to formalize a set cycle length at the intersection of Palladium at Huntmar were applied to balance the operations at this horizon. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets for the 2034 future background horizon are provided in Appendix K.

Figure 14: 2034 Future Background Volumes

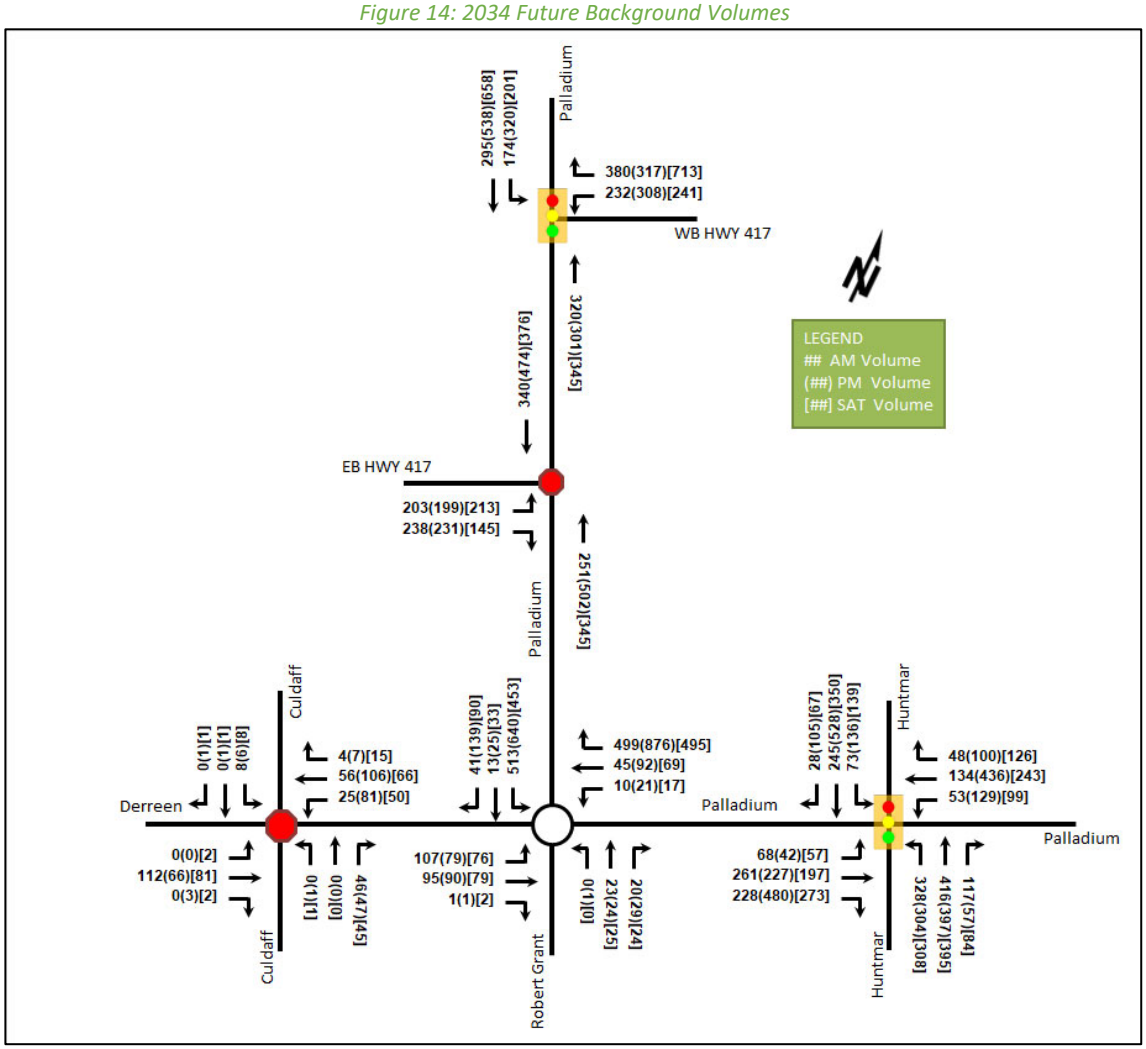


Table 16: 2034 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive at Westbound Highway 417 Ramp *Signalized*	WBL	A	0.38	20.0	19.1	A	0.48	22.7	26.2	A	0.25	17.8	21.2
	WBR	B	0.64	8.3	18.0	A	0.58	7.7	17.1	D	0.87	19.0	**#94.5**
	NBT	A	0.44	19.9	26.5	A	0.44	22.4	26.7	A	0.52	28.4	38.2
	SBL	A	0.35	8.7	18.1	A	0.57	11.8	33.1	A	0.43	14.8	31.6
	SBT	A	0.17	6.7	13.5	A	0.30	7.4	24.1	A	0.41	13.1	47.3
	Overall	**A**	**0.51**	**12.6**	-	**A**	**0.53**	**13.4**	-	**B**	**0.70**	**18.2**	-
Palladium Drive at Eastbound Highway 417 Ramp *Unsignalized*	EBL	C	0.39	16.1	13.5	D	0.55	26.7	24.0	C	0.46	19.1	18.0
	EBR	B	0.28	10.9	9.0	B	0.30	11.7	9.8	B	0.18	10.3	4.5
	NB	-	-	-	-	-	-	-	-	-	-	-	-
	SB	-	-	-	-	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**5.7**	-	**A**	**-**	**5.7**	-	**A**	**-**	**5.1**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive/Robert Grant Avenue at Derreen Avenue *Roundabout*	EB	A	0.12	4.8	3.9	A	0.11	5.2	3.7	A	0.90	4.4	2.8
	WB	A	0.40	5.9	17.4	A	0.66	9.1	44.5	A	0.38	5.4	16.3
	NB	A	0.03	4.2	0.8	A	0.03	4.8	1.2	A	0.03	4.0	0.8
	SB	A	0.37	5.3	15.4	A	0.50	7.0	23.5	A	0.34	5.3	13.5
	Overall	**A**	-	**5.4**	-	**A**	-	**7.9**	-	**A**	-	**5.2**	-
Derreen Avenue at Culdaff Road *Unsignalized*	EB	A	0.05	7.0	0.8	A	0.05	7.2	1.5	A	0.05	7.0	1.5
	WB	A	0.13	7.7	3.0	A	0.08	7.6	2.3	A	0.10	7.6	2.3
	NB	A	0.10	7.6	2.3	A	0.23	8.4	6.8	A	0.15	7.9	3.8
	SB	A	0.01	7.7	0.0	A	0.01	7.7	0.0	A	0.01	7.6	0.0
	Overall	**A**	-	**7.5**	-	**A**	-	**8.0**	-	**A**	-	**7.6**	-
Huntmar Drive at Palladium Drive *Signalized*	EBL	A	0.28	30.8	22.6	A	0.30	46.1	19.1	A	0.34	37.8	21.1
	EBT/R	B	0.62	22.4	46.3	D	0.83	28.0	60.3	B	0.63	19.2	36.2
	WBL	A	0.19	18.1	13.6	B	0.69	50.3	**#39.6**	A	0.34	22.3	24.2
	WBT/R	A	0.17	13.2	15.5	A	0.52	31.9	68.8	A	0.33	16.1	32.0
	NBL	B	0.69	25.8	**#84.5**	D	0.81	37.6	**#92.7**	C	0.77	31.2	**#87.6**
	NBT	A	0.49	17.9	90.4	A	0.40	15.4	79.9	A	0.46	17.4	84.5
	NBR	A	0.15	3.9	9.7	A	0.07	1.5	3.5	A	0.11	3.9	8.1
	SBL	A	0.34	31.2	24.4	A	0.43	34.1	45.7	A	0.54	36.2	44.2
	SBT	A	0.58	33.0	66.3	D	0.88	51.9	**#185.8**	C	0.72	37.3	96.6
	SBR	A	0.06	0.2	0.0	A	0.18	3.0	7.1	A	0.13	0.6	0.0
	Overall	**B**	**0.61**	**21.6**	-	**D**	**0.83**	**32.4**	-	**B**	**0.67**	**23.2**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2034 future background horizon operate well and similarly to the 2029 future background conditions. At the intersection of Huntmar Drive at Palladium Drive, the northbound left movement is forecast to exhibit extended queues during the AM peak hour as well as during the PM peak hour similarly to in the existing conditions. During the PM peak hour at this intersection the westbound left and southbound through movements are also forecast to exhibit extended queues at this horizon.

No impacts are noted to the westbound right-turn movement at the intersection of Palladium Drive at the westbound Highway 417 ramp terminal, and no mitigation is considered to be required or is recommended for this movement.

No new capacity issues are noted.

11.3 Modal Share Sensitivity

No capacity issues have been noted at all study area intersections. The subject development is a destination recreational facility drawing a higher regional traffic demand than most commercial land uses. Given each of these factors, rationalization for neither network nor site travel demands is required as part of this study.

12 Transit

12.1 Transit Priority

Site traffic is anticipated to have negligible impact on transit movements throughout the study area. No transit priority measures are present in the study area and none are required to address MMLOS.

13 Intersection Design

13.1 Intersection Control

No change to the existing signalized control is recommended for the network intersections based on the study area intersections operating well.

The site accesses are proposed as having minor stop control on their outbound approaches.

13.2 Intersection Design

The site is proposed as having three access locations on Culdaff Road. The northernmost site access being two-way and permitting full movements, and the remaining accesses being one-way resulting in a counterclockwise circulation across Culdaff Road. Relevant design criteria for the proposed accesses are detailed below and discussed in relation to relevant by-laws and design guidance.

13.2.1 Access By-Law Provisions

13.2.1.1 Number of Accesses

The site is divided into two property parcels with the 2775-2785 Palladium Road parcel on the east side of Culdaff Road and the 350 Culdaff Road parcel on the west side of Culdaff Road. The eastern parcel has a frontage of 143 metres and has two (2) one-way accesses and one (1) two-way access. Based on the Access By-Law, while the site would be permitted two (2) two-way accesses for this frontage, the proposed configuration is permitted for frontages of 150 metres or more. The site frontage nominally falls short of this value, however this shortfall is negligible and the site accesses are considered appropriate for the context.

The western parcel has a frontage of approximately 156 metres and has two (2) one-way accesses, which complies with the requirements for number of accesses from the Access By-Law.

These site accesses configurations are recommended to be approved as part of the site plan application.

13.2.1.2 Location and Spacing of Accesses

The one-way accesses along Culdaff Road are spaced approximately 79 metres apart, with the closest spacing of 5.7 metres from the nearest adjacent property line of any of these accesses. The access on the turning basin is offset approximately 18 metres from the northern set of one-way accesses and approximately 13.5 metres from the northern property line.

The accesses meet the minimum nine-metre spacing between the other accesses to the site, and the minimum three-metre spacing from the adjacent property line, each from the Access By-Law.

13.2.1.3 Width of Accesses

The Access By-Law states that two-way accesses are not to exceed nine metres in width at the property line or 19 metres at the curb line, and one-way accesses are not to exceed 7.5 metres in width at the property line or 17.5 metres at the curb line. The site access design values have been assessed against these targets and are summarized along with the targets in Table 17.

Table 17: Access Widths

Access	Design Values			Resulting Widths		Maximum Widths	
	Typical Width (m)	N Radius (m)	S Radius (m)	Property Line (m)	Curb Line (m)	Property Line (m)	Curb Line (m)
Southeast Inbound	6.0	3.0	9.0	6.0	**17.9**	7.5	17.5
Northeast Outbound	7.0	1.0	6.0	7.0	14.0		
Northwest Inbound	6.0	1.0	6.0	6.0	13.0		
Southwest Outbound	6.7	3.0	9.0	6.7	**18.6**		
Two-Way on Basin	8.4	3.5	7.5	**13.4**	15.0	9.0	19.0

It is noted that the southeast inbound and southwest outbound accesses exceed the maximum access widths for most conditions in the Access By-Law. However, per Section 17, provision (1)(c) of the Accesses By-Law, these accesses have been designed to permit turning movements between the site and Culdaff Road for an off-street bus loading areas, and are therefore recommended to be approved. Similarly, the two-way access exceeds the maximum value for most conditions at the property line, however as the access is oriented to the turning basis, it is skewed across the property line and exceeds this value. While this specific condition adjacent the roadway terminus is not considered to be properly assessed by the Access By-Law and is considered appropriate for the context. Therefore, all site accesses are recommended to be approved as proposed based on Access By-Law criteria.

13.2.2 TAC Suggested Design Criteria

13.2.2.1 Intersection Corner Clearance

Corner clearance for the intersection of Derreen Avenue at Culdaff Road is not impacted by the site accesses. The Geometric Design Guide for Canadian Roads (TAC 2017) provides a suggested minimum corner clearance of 15 metres along a local road, and 20 metres on the intersection departure and 25 metres on the intersection approach along a collector road. The site accesses are over 100 metres from the intersection and therefore these values are exceeded.

13.2.2.2 Access Throat Length

The TAC Geometric Design Guide provides suggested minimum clear throat lengths for a number of land uses along collector and arterial roads, however none of these land uses or road classifications are applicable to the subject site. On local roads eight metres of throat is the conventional minimum value for most land uses, and on collector roads, outside of very large office or retail developments, the normal range of values is eight to 25 metres. TAC also indicates that for complex sites, a trip analysis may be performed to arrive at a desirable throat length.

For the subject site, the proposed development inbound accesses to the general parking areas are approximately 125 metres on the southeast inbound access and 17 metres to the first accessible parking stall on the northwest inbound access. Given both inbound accesses are two-lane, the effective storage on the throat is double the given values above, resulting in 250 metres of storage on the southeast inbound access and 34 metres of storage on the northwest inbound access, exceeding the normal range of values for both local and collectors. Throat lengths on the outbound accesses are not critical for analysis given impacts are contained on-site for the one-way operation.

The inbound volumes during the Saturday peak hour are forecast to be 68 vehicles (averaging to 1.1 vehicles per minute) on the southeast access and 102 vehicles (averaging to 1.7 vehicles per minute) on the northwest access. While a higher proportion of bus traffic is forecast than for a typical traffic stream, the available storage of 250 metres on the southeast access is therefore considered adequate to negate impacts to the local road. The

proposed storage on the throat of 34 metres is considered adequate to accommodate forecasted traffic for the northwest access, and buses are anticipated only as through movements, where impacts from bus queueing may be contained on the eastern parcel. It is also noted that Culdaff road provides no access to any other parcels aside from the subject parcels beyond the southern site limit, and thus any impacts beyond those forecast from queuing on the northbound left movement at the northwest access are expected to be limited to the segment of Culdaff Road between site accesses and to not impact any other road users or landowners.

The throat length on the two-way access on the turning basin is approximately four metres from the end of the curb return given the larger radius required to support loading movements, however, approximately nine metres of space is available between the roadway edge and the first onsite conflict, and this design is considered adequate to address potential impacts onto the turning basin at the roadway terminus.

The site accesses are recommended to be approved as proposed based on the review of TAC criteria.

13.2.3 2029 Future Total Intersection Operations

The 2029 future total intersection volumes are illustrated in Figure 14 and the intersection operations are summarized below in Table 17. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix L.

Figure 15: 2029 Future Total Volumes

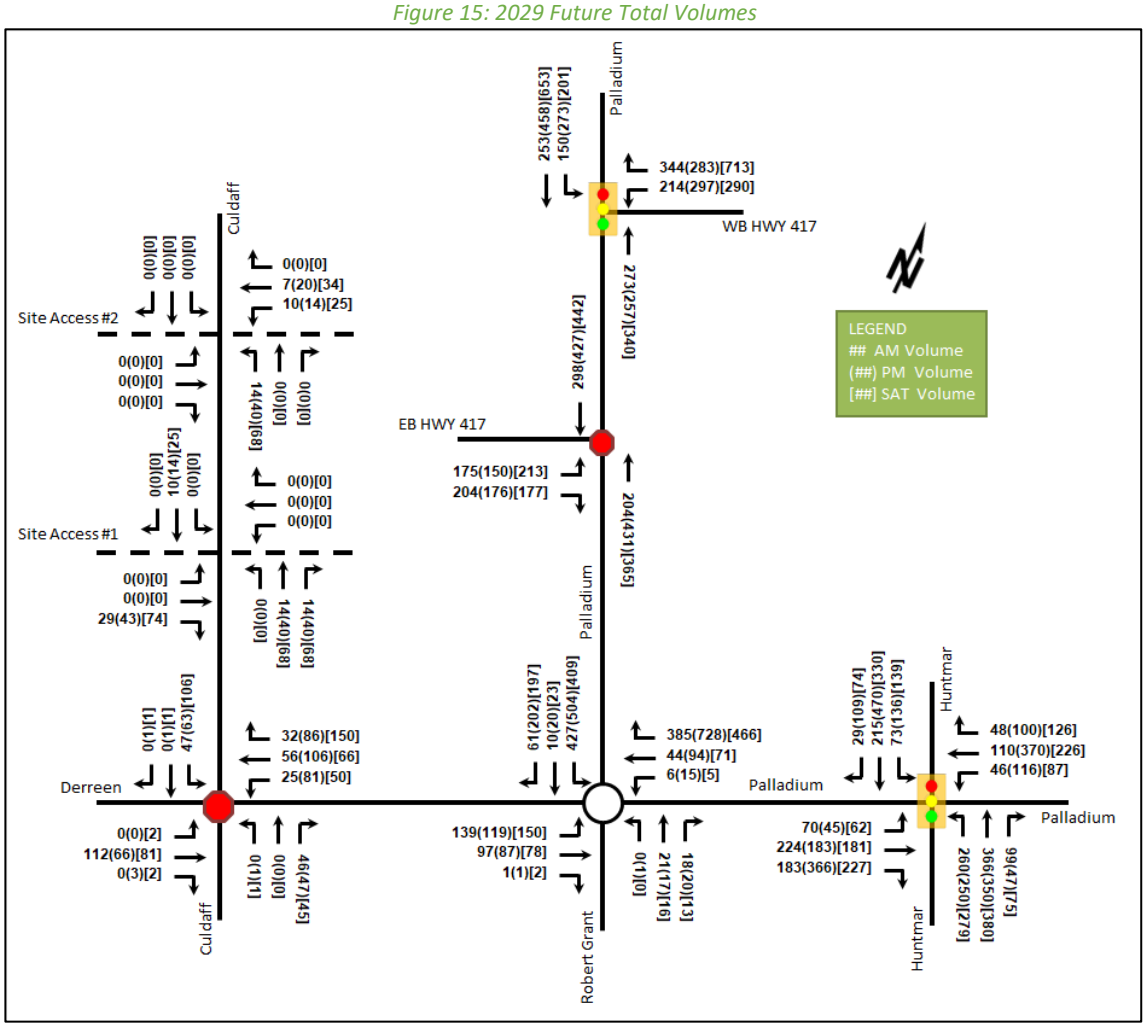


Table 18: 2029 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive at Westbound Highway 417 Ramp *Signalized*	WBL	A	0.33	18.8	17.0	A	0.46	21.8	24.7	A	0.30	18.1	25.1
	WBR	A	0.60	7.7	16.8	A	0.54	7.5	16.1	D	0.87	18.5	**#83.3**
	NBT	A	0.35	18.3	22.1	A	0.38	21.4	23.0	A	0.52	28.4	37.7
	SBL	A	0.31	8.3	15.2	A	0.50	10.5	27.4	A	0.43	14.9	31.6
	SBT	A	0.16	6.6	11.4	A	0.26	7.2	20.1	A	0.41	13.1	46.9
	Overall	**A**	**0.45**	**11.8**	-	**A**	**0.48**	**12.9**	-	**B**	**0.70**	**18.0**	-
Palladium Drive at Eastbound Highway 417 Ramp *Unsignalized*	EBL	B	0.30	13.9	9.8	C	0.37	19.0	12.8	C	0.51	22.3	21.0
	EBR	B	0.23	10.4	6.8	B	0.22	10.8	6.0	B	0.23	10.9	6.8
	NB	-	-	-	-	-	-	-	-	-	-	-	-
	SB	-	-	-	-	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**5.2**	**-**	**A**	**-**	**4.0**	**-**	**A**	**-**	**5.6**	**-**

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive/Robert Grant Avenue at Derreen Avenue *Roundabout*	EB	A	0.14	4.7	4.6	A	0.13	4.9	4.4	A	0.15	4.7	4.9
	WB	A	0.32	5.2	12.7	A	0.39	8.0	32.6	A	0.39	5.8	16.5
	NB	A	0.02	4.1	0.7	A	0.02	4.3	0.7	A	0.02	4.0	0.5
	SB	A	0.31	4.8	12.0	A	0.39	5.8	16.6	A	0.31	4.9	12.0
	Overall	**A**	-	**4.9**	-	**A**	-	**6.7**	-	**A**	-	**5.2**	-
Derreen Avenue at Culdaff Road *Unsignalized*	EB	A	0.05	7.1	1.5	A	0.06	7.5	1.5	A	0.06	7.5	1.5
	WB	A	0.13	7.9	3.0	A	0.09	7.9	2.3	A	0.11	8.2	3.0
	NB	A	0.13	7.7	3.0	A	0.32	9.1	10.5	A	0.30	8.9	9.8
	SB	A	0.06	8.0	1.5	A	0.09	8.4	2.3	A	0.15	8.8	3.8
	Overall	**A**	-	**7.7**	-	**A**	-	**8.6**	-	**A**	-	**8.6**	-
Huntmar Drive at Palladium Drive *Signalized*	EBL	A	0.30	30.6	22.9	A	0.33	45.1	20.4	A	0.36	37.8	22.1
	EBT/R	A	0.54	19.6	36.3	C	0.71	18.2	38.1	A	0.56	17.4	30.1
	WBL	A	0.15	17.4	12.3	A	0.53	36.2	34.8	A	0.28	20.7	21.1
	WBT/R	A	0.15	12.1	13.1	A	0.46	26.7	59.3	A	0.32	14.6	28.4
	NBL	A	0.53	18.6	53.7	B	0.66	21.2	47.7	B	0.68	25.5	**#69.5**
	NBT	A	0.43	16.3	76.9	A	0.37	13.8	67.5	A	0.44	17.0	81.1
	NBR	A	0.13	4.0	8.9	A	0.06	0.9	1.7	A	0.10	3.9	7.3
	SBL	A	0.33	30.2	24.2	A	0.44	31.5	44.6	A	0.55	36.8	44.3
	SBT	A	0.53	30.8	57.8	D	0.84	44.3	145.8	C	0.71	36.7	90.5
	SBR	A	0.07	0.3	0.0	A	0.19	3.6	7.9	A	0.15	1.1	1.4
	Overall	**A**	**0.52**	**19.1**	-	**C**	**0.73**	**25.4**	-	**B**	**0.61**	**21.7**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

The study intersections for the 2029 future total horizon operate similarly to the 2029 future background conditions. No site-generated impacts are noted to the westbound right-turn movement at the intersection of Palladium Drive at the westbound Highway 417 ramp terminal, and no mitigation is considered to be required or is recommended for this movement as part of this study. No new capacity issues are noted.

13.2.4 2034 Future Total Intersection Operations

The 2034 future total intersection volumes are illustrated in Figure 15 and the intersection operations are summarized below in Table 18. Signal timing is consistent with the 2034 future background horizon. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix M.

Figure 16: 2034 Future Total Volumes

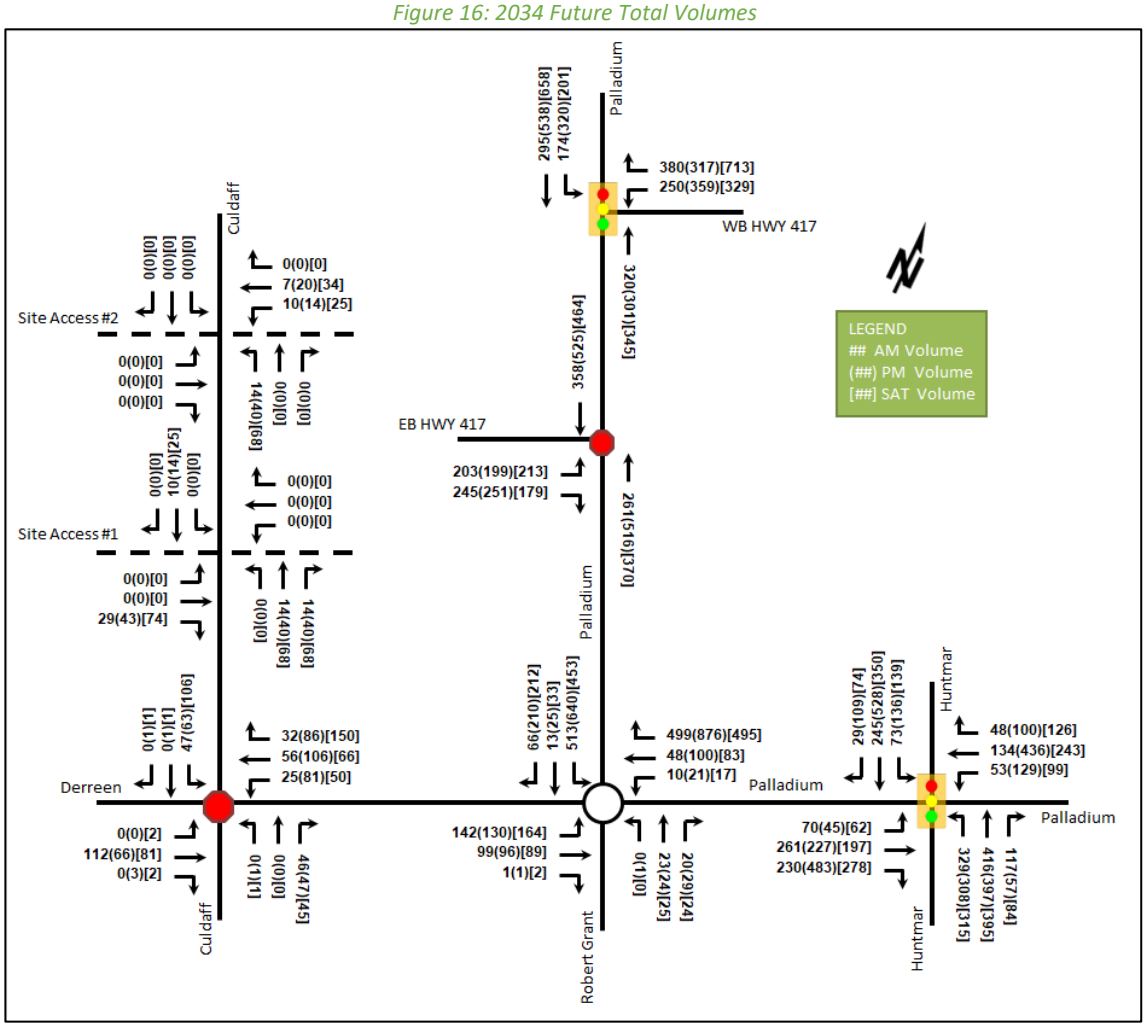


Table 19: 2034 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive at Westbound Highway 417 Ramp *Signalized*	WBL	A	0.40	20.2	20.4	A	0.53	23.2	30.2	A	0.34	18.6	28.4
	WBR	B	0.64	8.2	18.0	A	0.56	7.3	16.9	D	0.87	18.7	**#94.5**
	NBT	A	0.44	20.0	26.5	A	0.45	23.1	27.4	A	0.52	28.6	38.2
	SBL	A	0.35	8.8	18.1	A	0.58	12.4	35.0	A	0.43	14.9	31.6
	SBT	A	0.17	6.7	13.5	A	0.30	7.9	25.5	A	0.41	13.2	47.3
	Overall	**A**	**0.51**	**12.8**	-	**A**	**0.53**	**14.0**	-	**B**	**0.70**	**18.2**	-
Palladium Drive at Eastbound Highway 417 Ramp *Unsignalized*	EBL	C	0.40	16.7	14.3	D	0.60	31.0	27.8	C	0.53	23.6	22.5
	EBR	B	0.29	11.1	9.0	B	0.34	12.4	11.3	B	0.23	11.1	6.8
	NB	-	-	-	-	-	-	-	-	-	-	-	-
	SB	-	-	-	-	-	-	-	-	-	-	-	-
	Overall	**A**	-	**5.7**	-	**A**	-	**6.2**	-	**A**	-	**5.7**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour				SAT Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Palladium Drive/Robert Grant Avenue at Derreen Avenue *Roundabout*	EB	A	0.09	2.7	2.9	A	0.07	2.8	2.4	A	0.06	2.5	1.9
	WB	A	0.25	3.8	10.9	A	0.44	3.8	25.1	A	0.31	3.6	14.8
	NB	A	0.02	4.7	0.9	A	0.02	4.9	0.9	A	0.02	4.4	0.6
	SB	B	0.28	10.1	10.4	A	0.35	9.6	13.8	A	0.30	9.7	11.0
	Overall	**A**	**0.28**	**6.3**	**10.9**	**A**	**0.44**	**6.0**	**25.1**	**A**	**0.31**	**6.1**	**14.8**
Derreen Avenue at Culdaff Road *Unsignalized*	EB	A	0.13	7.9	3.0	A	0.09	7.9	2.3	A	0.06	7.5	1.5
	WB	A	0.13	7.7	3.0	A	0.32	9.1	10.5	A	0.11	8.2	3.0
	NB	A	0.05	7.1	1.5	A	0.06	7.5	1.5	A	0.30	8.9	9.8
	SB	A	0.06	8.0	1.5	A	0.09	8.4	2.3	A	0.15	8.8	3.8
	Overall	**A**	**-**	**7.7**	**-**	**A**	**-**	**8.6**	**-**	**A**	**-**	**8.6**	**-**
Huntmar Drive at Palladium Drive *Signalized*	EBL	A	0.29	30.9	23.2	A	0.32	46.8	20.3	A	0.36	38.7	22.8
	EBT/R	B	0.62	22.4	46.3	D	0.83	28.0	60.6	B	0.63	19.1	36.4
	WBL	A	0.19	18.2	13.6	B	0.69	50.6	**#39.7**	A	0.34	22.4	24.2
	WBT/R	A	0.17	13.2	15.5	A	0.52	32.0	68.8	A	0.33	16.1	32.0
	NBL	B	0.70	25.9	**#85.5**	D	0.82	38.5	**#95.9**	C	0.79	32.6	**#91.8**
	NBT	A	0.49	17.9	90.4	A	0.40	15.4	80.2	A	0.46	17.4	84.5
	NBR	A	0.15	3.9	9.7	A	0.07	1.5	3.5	A	0.11	3.9	8.1
	SBL	A	0.34	31.2	24.4	A	0.43	34.2	45.8	A	0.54	36.2	44.2
	SBT	A	0.58	33.0	66.3	D	0.88	52.2	**#186.3**	C	0.72	37.3	96.6
	SBR	A	0.06	0.3	0.0	A	0.19	3.5	8.0	A	0.15	1.0	1.2
	Overall	**B**	**0.61**	**21.6**	**-**	**D**	**0.83**	**32.6**	**-**	**B**	**0.67**	**23.4**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

The network intersection operations for the 2034 future total horizon operate similarly to the 2034 future background conditions. No site-generated impacts are noted to the westbound right-turn movement at the intersection of Palladium Drive at the westbound Highway 417 ramp terminal, and no mitigation is considered to be required or is recommended for this movement as part of this study. No new capacity issues are noted.

13.2.5 Intersection MMLOS

Table 19 summarizes the MMLOS analysis for the signalized intersections of Huntmar Drive at Palladium Drive and of Palladium Drive at Highway 417 westbound ramp terminal. The existing and future conditions for the intersection of Palladium Drive at the Highway 417 westbound ramp terminal will be the same and are considered in one row. For the intersection of Palladium Drive at Huntmar Drive, the preliminary design geometry will be used for the assessment of the future conditions. The intersection analysis is based on the policy area of Mainstreet Corridor for the intersection of Palladium Drive at Huntmar Drive and Outer Urban or Suburban for the intersection of Palladium Drive at the Highway 417 westbound ramp terminal. The MMLOS worksheets have been provided in Appendix H.

Table 20: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	ALOS	Target
Palladium Dr at Huntmar Dr (Ex)	**C**	B	**F**	B	C	D	C	E
Palladium Dr at Huntmar Dr (Fut)	**C**	B	B	B	C	D	C	E
Palladium Dr at WB Hwy 417 Ramp	C	C	C	C	B	D	A	E

The MMLOS targets will not be met for the pedestrian LOS at the intersection of Palladium Drive at Huntmar Drive in the existing and future conditions, and the bicycle LOS in the existing conditions. Meeting the pedestrian level of service targets would require the provision of pedestrian refuges on each crossing and a maximum of five lanes crossed on the north crossing. Ultimately, it will be incumbent on the City's design team to achieve its desired MMLOS target trade-offs at the intersection through the forthcoming functional and detailed design processes. No further MMLOS review is required as part of this study.

13.2.6 Recommended Design Elements

The site accesses are recommended to conform to City Standard SC7.1 with a continuous depressed curb through all accesses, including a continuous depressed sidewalk through the accesses on the west side of Culdaff Road.

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

14 Summary of Improvements Indicated and Modifications Options

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

Proposed Site and Screening

- The proposed development consists of a destination recreational and lodging complex including a 6,636 square metre indoor aquatic and recreational centre and 238-room hotel, and a 4,444 square metre family entertainment centre, and includes on-site dining within the building, all located on the parcel east of Culdaff Road, and surface parking lots on both parcels, east and west of Culdaff Road
- Three access locations are proposed: accesses to all vehicle parking save for six spaces is via two access locations on Culdaff Road, each with one-way east and west legs creating a counterclockwise site circulation pattern, and one two-way access on the turning basin of Culdaff Road for the remaining six spaces which are proposed as accessible spaces
- The development is proposed to be completed as a single phase by 2029

TIA Screening and Exemptions

- The TIA Screening form indicated a full TIA was required due to trip generation trigger
- A terms of reference for the study supporting the MTO Highway Corridor Management process was submitted and agreed to and this study has been prepared in accordance with this TOR
- This study is in support of a Zoning By-Law amendment and Site Plan application
- The exemption review for the TIA did not require the new street networks, neighbourhood traffic calming review, and network concept review components

Existing Conditions

- Palladium Drive, Huntmar Drive, and Robbert Grant Avenue are arterial roads in the study area
- Sidewalks/cycletracks/MUPs are generally provided in around and in immediate proximity to the roundabout intersection of Palladium Drive at Robert Grant Avenue on each leg, sidewalks and cycletracks are present on both sides of Derreen Avenue, and a sidewalk is present on the west side of Culdaff Road
- The MTO and the City have agreed no pedestrian or cycling facilities are to be provided between the Highway terminals and the roundabout intersection at Palladium Drive/Robert Grant Avenue/Derreen Avenue—this was discussed and finalized as part of the Palladium Drive re-alignment and roundabout construction for the adjacent subdivision

- The study area intersections generally operate well with the westbound right movement at the intersection of Palldium Drive at the westbound Highway 417 ramp terminal exhibiting extended queues and approaching theoretical capacity during the Saturday peak hour
- This movement is noted to be critical by MTO definitions, and cannot be mitigated through signal timing adjustments
- Negligible collision history was noted in proximity to the site in the five-year period reviewed, and no mitigations are required to address study area collisions

Planned Conditions

- Robert Grant Avenue is planned to be extended in segments, with funding beginning in 2028, but is not expected to be completed within the study horizons
- The widening of Huntmar Drive is noted within the TMP, however no timeline for this project is known and it is assumed it will not be completed within the study horizons.
- The Stittsville Main Street extension between Maple Grove Road and Derreen Avenue is expected to be coordinated with the Robert Grant Avenue extension and is not expected to be completed within the study horizons

Development Generated Travel Demand

- The proposed development is forecasted produce 92 two-way people trips during the AM peak hour, 204 two-way people trips during the PM peak hour, and 354 two-way people trips during the Saturday peak hour
- Of the forecasted people trips, 67 two-way trips will be vehicle trips during the AM peak hour, 135 two-way trips will be vehicle trips during the PM peak hour, and 234 two-way trips will be vehicle trips during the Saturday peak hour based on a 66-73% auto modal share target
- Of the forecasted trips, 5% are anticipated to travel each north and south, 65% to travel east, and 25% to travel west

Development Design

- Pedestrian connections will be made to an extension of the sidewalk on the west side of Culdaff Road, with a pedestrian walkway between the parking lots and main building entrance called the “pedestrian promenade” including a Type D pedestrian cross-over across Culdaff Road south of the turning basin
- Bicycle parking will be located on the north side of the pedestrian promenade, and a large surface parking lot is located on each side of Culdaff Road
- Bus stops for the frequent route #62 are located on the north and east legs of the roundabout intersection of Palladium Drive/Robert Grant Avenue at Derreen Avenue/Palladium Drive within an approximately 800-metre walk of the facility entrance, and future bus stops along Derreen Avenue are within an approximately 425 metre walk of the facility entrance
- Access to vehicular parking for all but six parking spaces is provided via two access locations on Culdaff Road, each with one-way east and west legs creating a counterclockwise site circulation pattern, and one access is provided on the turning basin of Culdaff Road for to six of the accessible parking spaces
- Garbage collection and loading for the recreational portion of the site are located within one area on the southeast of the eastern parcel’s drive aisle loop and garbage collection and loading for the hotel portion of the site are located in one area accessed from the at the northeast turning basin access at the terminus of Culdaff Avenue

- A 6.0 metre fire lane circulates the east parcel's drive aisle loop site providing fire services access to all site buildings

Parking

- The site is proposed to include 704 vehicle parking spaces
- The new Zoning By-Law (2026-50) does not require a minimum parking provision
- The site is proposed as including a parking target consistent with the needs identified by the owner through the operation of similar sites across North America which accounts for the synergies between co-located land uses of the aquatic recreational facility and the restaurant, and accounts for one vehicular parking space per room for the hotel and is considered to accommodate the peak simultaneous demand for the facility, without inducing spillover parking
- The site is proposed to include 58 bicycle parking spaces, and bicycle parking requirements for the site based on the new Zoning By-Law is 58 spaces
- The site is proposed to exceed the minimum accessible parking provision

Boundary Street Design

- Palladium Drive will not meet pedestrian and cycling MMLOS targets, due to no dedicated active transportation facilities being provided north of the intersection with Rober Grant Avenue, per the agreed upon conditions by the City as part of the 2021-2022 Palladium Drive reconstruction, and no changes to this condition are therefore required or recommended

TDM

- Supportive TDM measures to be included within the proposed development should include:
    - Provide a multi-modal travel information package to new employees
    - Post bus route maps and schedules, active transportation maps at employee entrances, provide online links to OC Transpo for employees

Background Conditions

- The nearby background developments were explicitly included in the background conditions, along with a total background annual growth derived from the City's TRANS volumes at the 2022 and 2046 horizons applied throughout the study area
- The study area intersections will operate similar to the existing conditions
- No impacts on the westbound right at the intersection of Palldium Drive at the westbound Highway 417 ramp terminal are noted in the future background conditions and no mitigation is recommended to address this condition

Transit

- Site traffic is anticipated to have negligible impact on transit movements throughout the study area
- No transit priority measures are present in the study area and none are required to address MMLOS

Intersection Design

- No change to the existing signalized control is recommended for the network intersections based on the study area intersections operating well
- The site accesses are proposed as having minor stop control on their outbound approaches

- The eastern parcel's frontage is nominally short of meeting the length that permits three accesses, but the shortfall is negligible and the site accesses are considered appropriate for the context
- The southeast and southwest one-way accesses are wider at the curb line than the maxima indicated in the Access By-Law, however these are designed to permit bus movements between the site and the road network and thus are considered appropriate
- The width of the access on the turning basin is wider at the curb line than the maxima indicated in the Access By-Law, however this condition results from the access being oriented to the basin, skewed from the property line and is considered appropriate
- The throat lengths and locations of the accesses are adequate
- No new capacity issues are resultant in the study area as a result of site traffic and no impacts to the critical movement intersection of Palladium Drive at the westbound Highway 417 ramp terminal are forecast as a result of site traffic
- The MMLOS targets will not be met for the pedestrian LOS at the intersection of Palladium Drive at Huntmar Drive in the existing and future conditions, and the bicycle LOS in the existing conditions
- Meeting the pedestrian level of service targets would require the provision of pedestrian refuges on each crossing and a maximum of five lanes crossed on the north crossing and ultimately, it will be incumbent on the City's design team to achieve its desired MMLOS target trade-offs at the intersection through the forthcoming functional and detailed design processes
- The site accesses are recommended to conform to City Standard SC7.1 with a continuous depressed curb through all accesses, including a continuous depressed sidewalk through the accesses on the west side of Culdaff Road
- No specific recommendations or design elements are required outside of typical site design

15 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:

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Transportation Engineering-Intern

Reviewed By:

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A. J. HARTE
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Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form and MTO TOR

6 Plaza Court
Ottawa, ON K2H 7W1

City of Ottawa 2023 Revisions to 2017 TIA Guidelines
Step 1 - Screening Form

Date: 2026-07-09
Project Number: 2024-167
Project Reference: 2785 Palladium

1.1 Description of Proposed Development	
Municipal Address	2775-2785 Palladium Drive
Description of Location	5.31 ha rectangular parcel west of Palladium Dr bistected by Culdaff Rd, with development located on portion east of Culdaff Rd
Land Use Classification	Business Park Industrial Zone (IP)
Development Size	A 26,425 sq. m complex including a 6,643 sq. m indoor aquatic and recreational centre and 236-room hotel, and a 3,267 sq. m family entertainment centre, and includes on-site dining within the building
Accesses	Two (2) three-legged full moves access intersections on Culdaff Rd
Phase of Development	One
Buildout Year	2029
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Indoor Aquatic/Rec.Facility	
Development Size	704	Spaces
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 Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	No
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?	No
Location Trigger	No

1.4. Safety Triggers		
Are posted speed limits on a boundary street 80 km/hr or greater?	No	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No	Two accesses on Culdaff Rd with negligible horizontal/vertical curvature
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	Two accesses on Culdaff Rd, first of which is 320 m+ from Derreen Ave at Palladium Dr roundabout
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	

Certification Form for TIA Study PM

TIA Plan Reports

On April 14, 2022, the Province's Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

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 they meet the four criteria listed below.

CERTIFICATION

- ☑ 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; (Update effective July 2023)
- ☑ 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;
- ☑ 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
- ☑ I am either a licensed or registered[1] professional in good standing, whose field of expertise
  - ☑ is either transportation engineering
  - ☐ or transportation planning.

[1] 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.

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Revision Date: June 2023

Dated at Ottawa (City) this 17 day of August , 20 23 .

Name : Andrew Harte

Professional title: Senior Transportation Engineer / Vice-President Ottawa

Signature of individual certifier that s/he/they meet the above criteria

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Revision Date: June 2023

Technical Memorandum

To:	Brian Hickey - MTO	Date:	2026-06-02
Cc:	Tim Eisner – JFSA		
From:	Andrew Harte – CGH Transportation	Project Number:	2024-167

Re: 2775 & 2785 Palladium Drive, Ottawa – Transportation Impact Assessment Terms of Reference

CGH has been retained to undertake transportation consulting services to support the Zoning Bylaw Amendment and Site Plan Control submission to the City of Ottawa for a proposed site located at 2775 & 2785 Palladium Drive plus the unaddressed parcel on the West side of Culdaff Road in Ottawa. The proposed development includes an indoor water, a 7-storey hotel with 236 rooms and supporting facilities for the indoor water park including with a restaurant and entertainment area. A total of 694 parking spaces are provided, 270 regular and 8 accessible spaces for the hotel use, and 404 regular and 12 accessible spaces on the west side of Culdaff Road. The build-out year is anticipated to be 2029. Primary access is provided on Culdaff Road, via Derreen Avenue with two one-way accesses on the east side of Culdaff Road, and an one-way inbound and two-way access on the west side. Attachment 1 includes the proposed site plan. Attachment 2 includes the City of Ottawa Pre-Consultant Feedback Form (PC2025-0008).

Using the ITE Trip Generation Manual (12th Edition) rates for Hotel (LUC 310) and the Specialized Land Use Data from Water Slide Park (LUC 482), it was determined that the proposed development may generate up to 162 bi-directional vehicle trips during the AM peak hour, 228 bi-directional vehicle trips during the PM peak hour and 330 bi-directional vehicle trips during the SAT peak hour. These volumes do not include any synergistic use or adjustments for mode shares, such as higher auto passengers. We have prepared the following Terms of Reference for the scope of work for review. Please let us know if you have any comments.

Traffic Impact Study Requirements:

The study will be completed in accordance with the City of Ottawa's 2017 Transportation Impact Assessment Guidelines, incorporating the *2023 Revision to Transportation Impact Assessment Guidelines*.

Proposed Development Overview:

- A description of the proposed development
- Outline of land use as it relates to the development and site statistics
- Identification of proposed site access locations and parking

Study Area:

- An overview of the transportation network existing conditions will be documents (including transit, cycling, pedestrian, and automobile modes)

- A summary of existing transportation planning policies within the Study Area will be identified.
- An overview of the Study Area road network will be provided including the road classification and descriptions of:
    - Palladium Drive
    - Huntmar Drive
    - Robert Grant Avenue
    - Highway 417
    - Derreen Avenue
    - Culdaff Road
- The following intersection will be included in the Transportation Impact Assessment and the existing turning movement counts collected to date:
    - Palladium Drive at Westbound Highway 417 Ramp
        - Tuesday, September 26, 2023
        - Saturday, April 01, 2023
    - Palladium Drive at Eastbound Highway 417 Ramp
        - Tuesday, September 26, 2023
        - Saturday, April 01, 2023
    - Palladium Drive/Robert Grant Avenue at Derreen Avenue
        - Wednesday, June 25, 2025
        - Saturday, June 28, 2025
    - Derreen Avenue at Culdaff Road
        - Tuesday, June 24, 2025
        - Saturday, June 21, 2025
    - Huntmar Drive at Palladium Drive
        - Tuesday, June 24, 2025
        - Saturday, June 21, 2025

<u>Study Horizon & Peak Periods:</u>

- Background and future total horizons include 2029 and 2034
- AM, PM and SAT peak hour periods

<u>Study Area Improvements:</u>

- Huntmar Drive Widening from two to four lanes, Maple Grove Road to Campeau Road
- Robert Grant Extension, EA currently underway
- Stittsville Main Street Extension from Maple Grove Road to Derreen Avenue.

<u>Background Growth:</u>

- The TRANS forecasting model for 2022 and 2046 will be used to developed the area background growth rates, adjusted for explicit background development considered within the forecasting.

<u>Background Developments:</u>

- 130 Huntmar Drive
- 195 Huntmar Drive
- 319 Huntmar Drive

- 333 Huntmar Drive
- 1485 Upper Canada Street
- 8800 Campeau Drive
- 8560 Campeau Drive
- 8370 Campeau Drive (Arcadia community Stage 5)
- 8415 Campeau Drive (Arcadia community Stage 6)
- 8201 Campeau Drive
- 3075 Palladium Drive
- 3095 Palladium Drive
- 425 Culdaff Road
- 1981 Maple Grove Road
- 1919 Maple Grove Road
- 1869 Maple Grove Road

Development Site Traffic:

- Trip generation: ITE Trip Generation Manual 12th Edition
- ITE Land Use code 310 "Hotel" and the Specialized Land Use Data from ITE Land Use code 482 "Water Slide Park" will be used to determine the trip generation of the proposed development
- Trip distribution and assignment of auto trips will be based on the 2011 TRANS Trip OD Survey data, existing turning movement counts, surrounding area transportation network characteristics.

Analysis:

- Traffic analysis to be performed using Synchro 11 or Sidra 9 at the study area intersections, as per the City's Guideline, to determine the LOS, delay, V / C ratio and the 95th percentile queues for the signalized, unsignalized and roundabout intersections
- Heavy Vehicle %, pedestrian volumes, and cyclist volumes will be taken from the collected TMC data
- Synchro inputs will be based on the City's Guidelines, as well as Synchro and Sidra default parameters
- Multi-Modal Level of Service analysis will be completed for the boundary conditions to the site following the City of Ottawa's *Multimodal Level of Service Guidelines Update (2025)*
- Entrance analysis including conceptual access design review, access geometry, spacing, and turn-lane requirements
- Site parking, loading and circulation to be considered where necessary.

Recommendations:

- Any recommended offsite and onsite improvements or mitigation measures, which may include turn lane requirements, pedestrian / cycling amenities, construction impacts, safety measures etc.

List of Attachments:

Attachment 1 – Site Plan 2026-06-01

Attachment 2 – Feedback Form - Phase 1 - PC2025-0008 - 2775 Palladium

Appendix B

Turning Movement Counts

CGH TRANSPORTATION

Turning Movement Count
Summary Report
Including OFF Peak, PM Peak and PHF
All Vehicles Except Bicycles and Personal E-Transportation

Culdaff Road & Derreen Avenue — Stittsville, ON

Survey Date: Saturday, June 21, 2025 | **Start Time:** 1100 | **AADT Factor:** 1.1
Weather: AM: Cloudy 23° C | **Survey Duration:** 5 Hrs. | **Survey Hours:** 1100 - 1600
Weather PM: Cloudy 27° C | **Surveyor(s):** J. Mousseau

	Derreen Ave. Eastbound					Derreen Ave. Westbound						Culdaff Rd. Northbound						Culdaff Rd. Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
1100-1200	0	59	1	0	60	35	53	4	0	92	152	0	0	51	0	51	3	0	1	0	4	55	207
1200-1300	1	84	2	0	87	45	71	8	0	124	211	0	1	47	0	48	10	0	0	0	10	58	269
1300-1400	1	69	1	0	71	43	68	9	1	121	192	3	0	39	0	42	5	1	1	0	7	49	241
1400-1500	0	61	0	0	61	57	61	8	0	126	187	0	2	42	0	44	8	0	1	0	9	53	240
1500-1600	1	72	0	0	73	36	72	10	1	119	192	1	1	51	0	53	3	0	3	0	6	59	251
Totals	3	345	4	0	352	216	325	39	2	582	934	4	4	230	0	238	29	1	6	0	36	274	1208

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

OFF Peak Hour Factor ➡ 0.84											Highest Hourly Vehicle Volume Between 1100h & 1500h										
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1245-1345	2	81	2	0	85	49	66	15	1	131	216	1	0	45	0	46	8	1	1	0	10	56	272

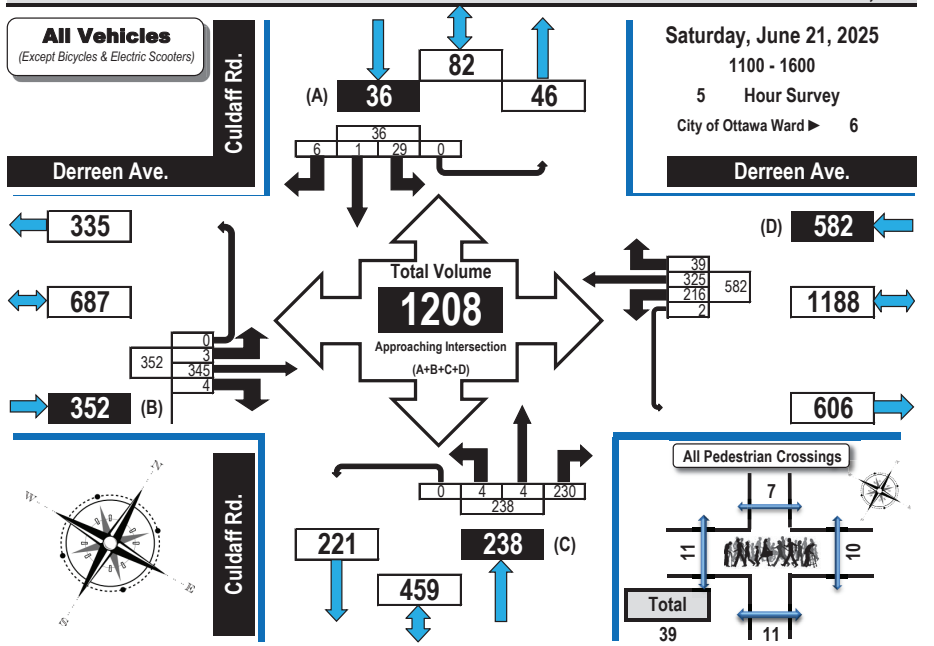
PM Peak Hour Factor ➡ 0.85											Highest Hourly Vehicle Volume Between 1500h & 1900h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1500-1600	1	72	0	0	73	36	72	10	1	119	192	1	1	51	0	53	3	0	3	0	6	59	251

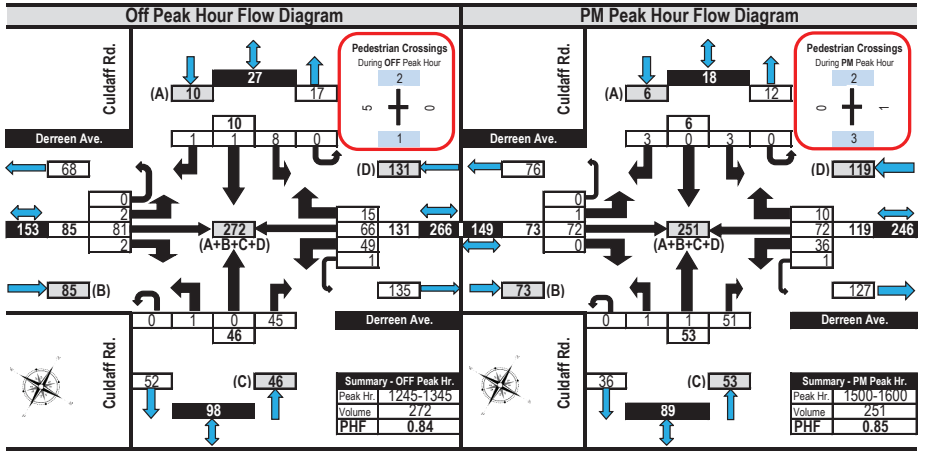
Comments:
School buses comprise 25.00% of the heavy vehicle traffic.

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

Turning Movement Count
Summary, OFF and PM Peak Hour
Flow Diagrams
All Vehicles Except Bicycles and Personal E-Transportation

Culdaff Road & Derreen Avenue — Stittsville, ON





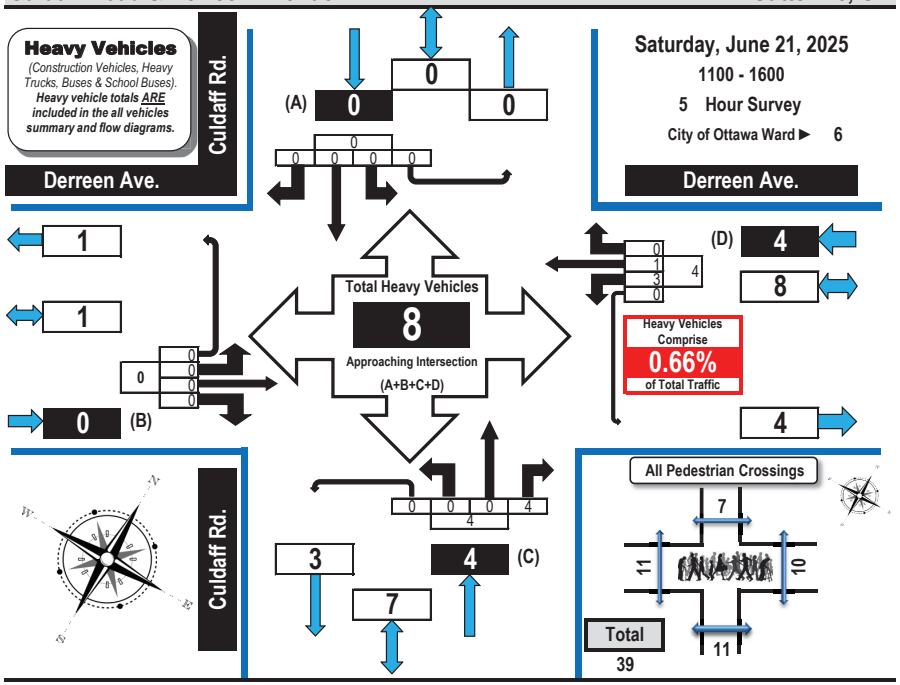
Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



Culdaff Road & Derreen Avenue — **Stittsville, ON**

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

Saturday, June 21, 2025
1100 - 1600
5 Hour Survey
City of Ottawa Ward ► 6



	Derreen Ave. Eastbound					Derreen Ave. Westbound					Culdaff Rd. Northbound					Culdaff Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200-1300	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
1300-1400	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
1400-1500	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
Totals	0	0	0	0	0	3	1	0	0	4	0	0	4	0	4	0	0	0	0	0	8

Comments:

School buses comprise 25.00% of the heavy vehicle traffic.

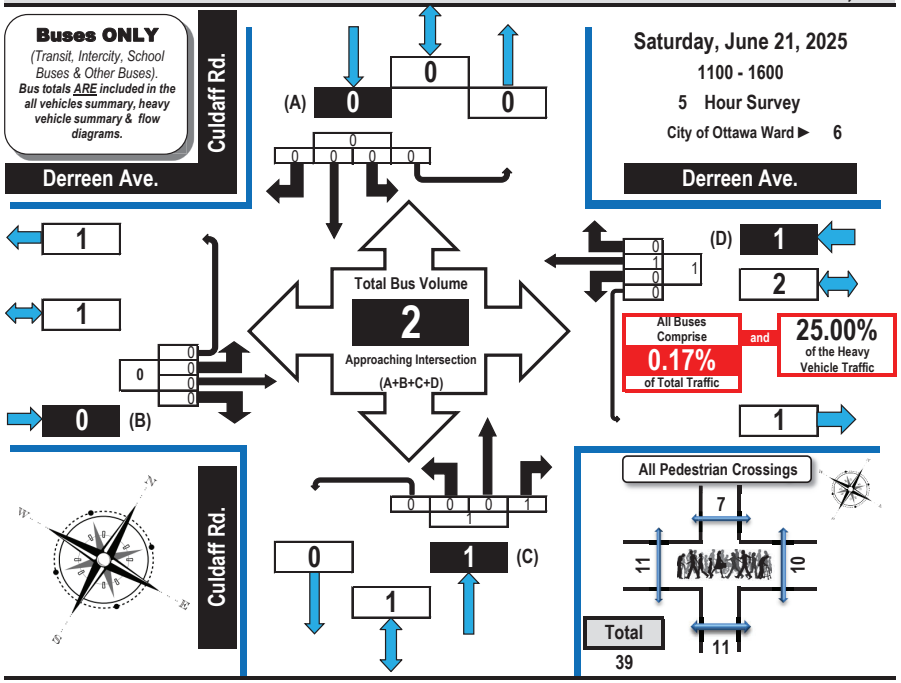
Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram



Culdaff Road & Derreen Avenue — **Stittsville, ON**

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Saturday, June 21, 2025
1100 - 1600
5 Hour Survey
City of Ottawa Ward ► 6

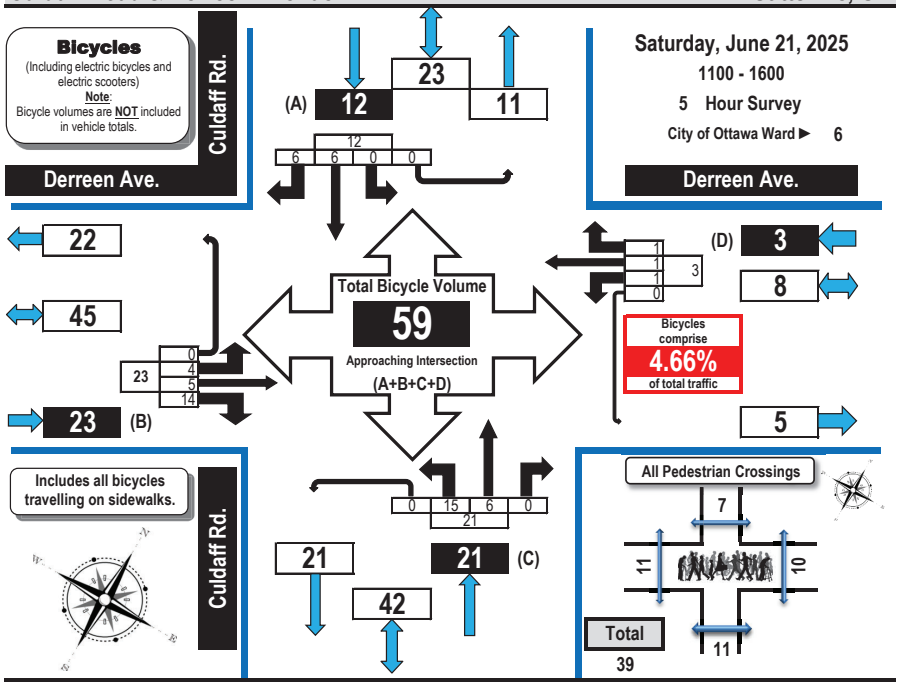


	Derreen Ave. Eastbound					Derreen Ave. Westbound					Culdaff Rd. Northbound					Culdaff Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200-1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300-1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400-1500	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Totals	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	2

Comments:
School buses comprise 25.00% of the heavy vehicle traffic.

Turning Movement Count
Bicycles and Personal E-Transportation Summary
Flow Diagram

Culdaff Road & Derreen Avenue — **Stittsville, ON**



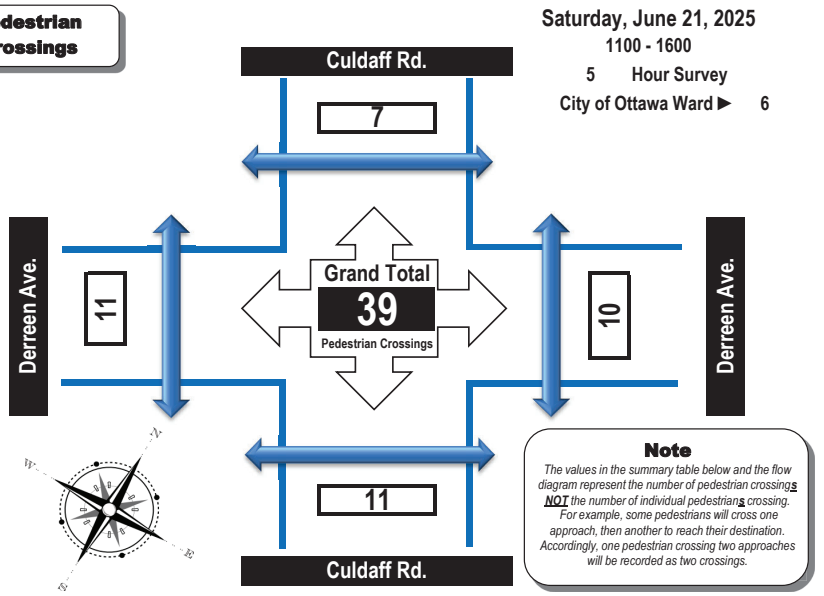
	Derreen Ave. Eastbound					Derreen Ave. Westbound					Culdaff Rd. Northbound					Culdaff Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	1	0	2	0	3	1	0	0	0	1	0	0	0	0	0	0	2	2	0	4	8
1200-1300	0	0	1	0	1	0	0	0	0	0	5	4	0	0	9	0	4	0	0	4	14
1300-1400	0	0	5	0	5	0	0	1	0	1	4	1	0	0	5	0	0	3	0	3	14
1400-1500	1	3	6	0	10	0	1	0	0	1	6	0	0	0	6	0	0	1	0	1	18
1500-1600	2	2	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
Totals	4	5	14	0	23	1	1	1	0	3	15	6	0	0	21	0	6	6	0	12	59

Comments:

School buses comprise 25.00% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

Culdaff Road & Derreen Avenue — **Stittsville, ON**



Time Period	West Side Crossing Derreen Ave.	East Side Crossing Derreen Ave.	Street Total	South Side Crossing Culdaff Rd.	North Side Crossing Culdaff Rd.	Street Total	Grand Total
1100-1200	2	4	6	3	0	3	9
1200-1300	5	2	7	2	2	4	11
1300-1400	3	0	3	1	2	3	6
1400-1500	1	3	4	2	1	3	7
1500-1600	0	1	1	3	2	5	6
Totals	11	10	21	11	7	18	39

Comments:

School buses comprise 25.00% of the heavy vehicle traffic.

Turning Movement Count
Summary Report
Including AM and PM Peak Hours
All Vehicles Except Bicycles and Personal E-Transportation

Culdaff Road & Derreen Avenue — Stittsville, ON

Survey Date: Tuesday, June 24, 2025 **Start Time:** 0700 **AADT Factor:** 0.9
Weather AM: Sunny 25°C **Survey Duration:** 6 Hrs. **Survey Hours:** 0700-1000 & 1500-1800
Weather PM: Mostly Sunny 34° C **Surveyor(s):** J. Mousseau

	Derreen Ave. Eastbound					Derreen Ave. Westbound						Culdaff Rd. Northbound						Culdaff Rd. Southbound					
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	Street Total	LT	ST	RT	UT	S/B Tot	Grand Total
0700-0800	1	79	1	0	81	16	22	1	0	39	120	2	0	51	0	53	173	4	0	0	0	4	177
0800-0900	0	112	0	0	112	25	56	4	0	85	197	0	0	46	0	46	243	8	0	0	0	8	251
0900-1000	0	71	1	0	72	29	36	2	0	67	139	0	1	46	0	47	186	2	2	0	0	4	190
1500-1600	0	47	1	0	48	50	68	8	0	126	174	0	0	35	0	35	209	5	0	1	0	6	215
1600-1700	0	66	2	0	68	62	98	8	1	169	237	0	1	50	0	51	288	8	1	1	0	10	298
1700-1800	0	66	2	0	68	78	104	7	0	189	257	1	0	38	0	39	296	6	0	2	0	8	304
Totals	1	441	7	0	449	260	384	30	1	675	1124	3	2	266	0	271	1395	33	3	4	0	40	1435

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

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

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

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

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

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

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

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

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.92												Highest Hourly Vehicle Volume Between 0700h & 1000h										
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot	Gr. Total
0800-0900	0	112	0	0	112	25	56	4	0	85	197	0	0	46	0	46	8	0	0	0	8	54	251

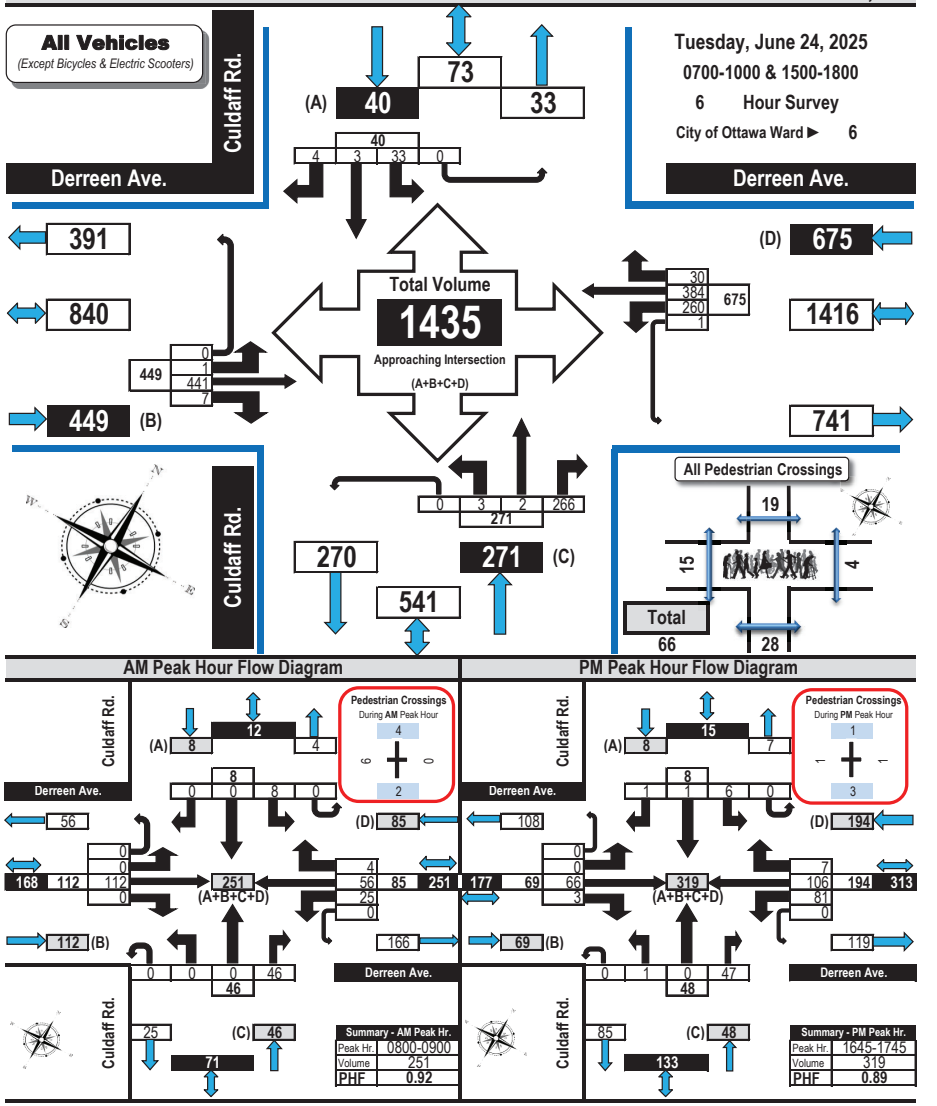
PM Peak Hour Factor ➡ 0.89												Highest Hourly Vehicle Volume Between 1500h & 1800h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot	Gr. Tot.
1645-1745	0	66	3	0	69	81	106	7	0	194	263	1	0	47	0	48	6	1	1	0	8	56	319

Comments:
School buses comprise 75.86% of the heavy vehicle traffic.

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

Turning Movement Count
Summary, AM and PM Peak Hour
Flow Diagrams
All Vehicles Except Bicycles and Personal E-Transportation

Culdaff Road & Derreen Avenue — Stittsville, ON



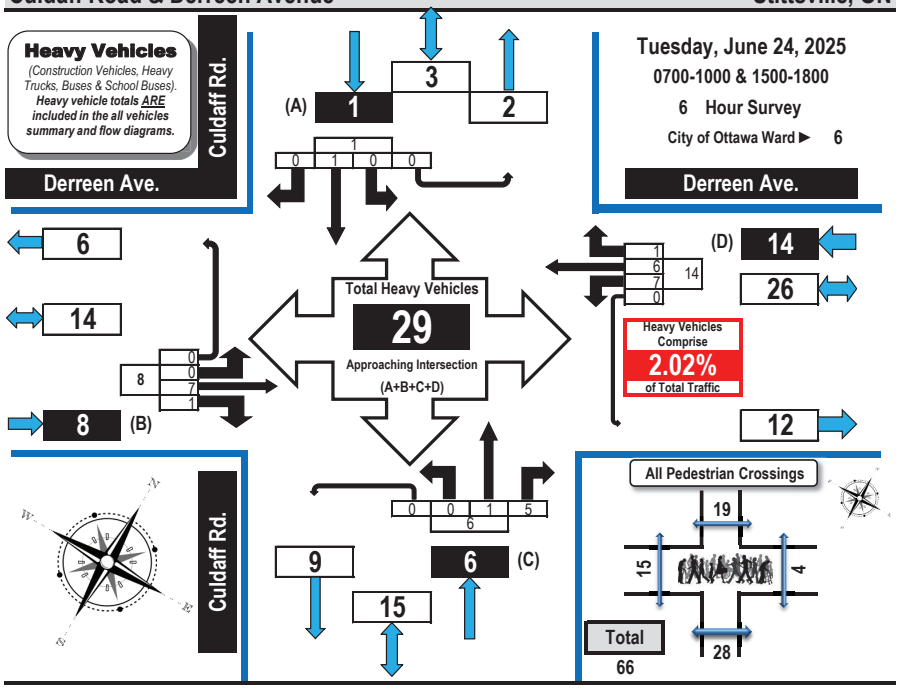
Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



Culdaff Road & Derreen Avenue — **Stittsville, ON**

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

Tuesday, June 24, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6



	Derreen Ave. Eastbound					Derreen Ave. Westbound					Culdaff Rd. Northbound					Culdaff Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	2	0	0	2	1	1	0	0	2	0	0	1	0	1	0	0	0	0	0	5
0800-0900	0	2	0	0	2	3	2	0	0	5	0	0	2	0	2	0	0	0	0	0	9
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
1500-1600	0	3	0	0	3	3	3	0	0	6	0	0	2	0	2	0	0	0	0	0	11
1600-1700	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
1700-1800	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
Totals	0	7	1	0	8	7	6	1	0	14	0	1	5	0	6	0	1	0	0	1	29

Comments:
School buses comprise 75.86% of the heavy vehicle traffic.

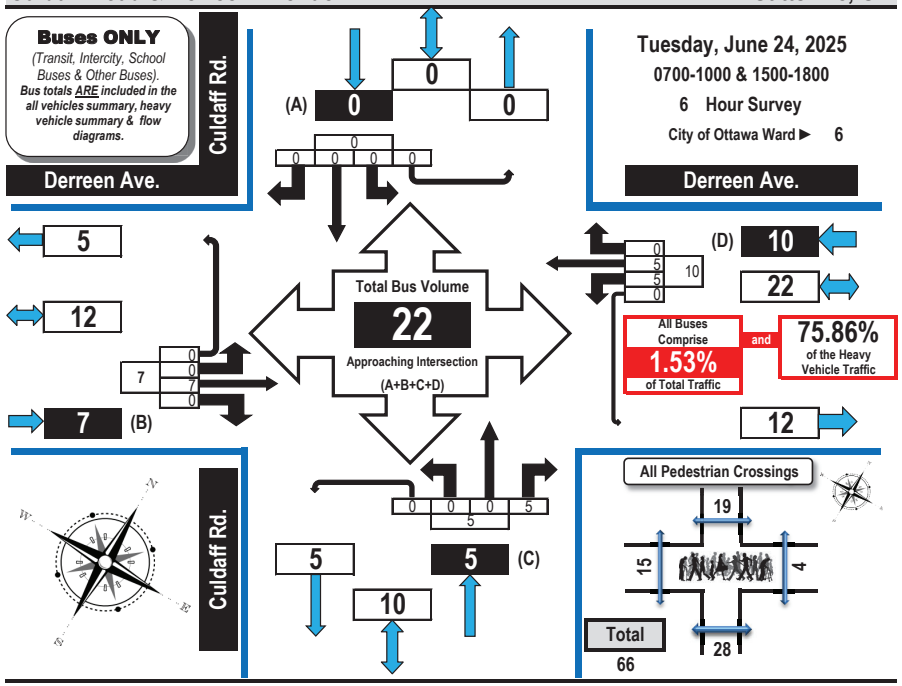
Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram



Culdaff Road & Derreen Avenue — **Stittsville, ON**

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Tuesday, June 24, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6



	Derreen Ave. Eastbound					Derreen Ave. Westbound					Culdaff Rd. Northbound					Culdaff Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	2	0	0	2	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	4
0800-0900	0	2	0	0	2	2	2	0	0	4	0	0	2	0	2	0	0	0	0	0	8
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500-1600	0	3	0	0	3	2	3	0	0	5	0	0	2	0	2	0	0	0	0	0	10
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	7	0	0	7	5	5	0	0	10	0	0	5	0	5	0	0	0	0	0	22

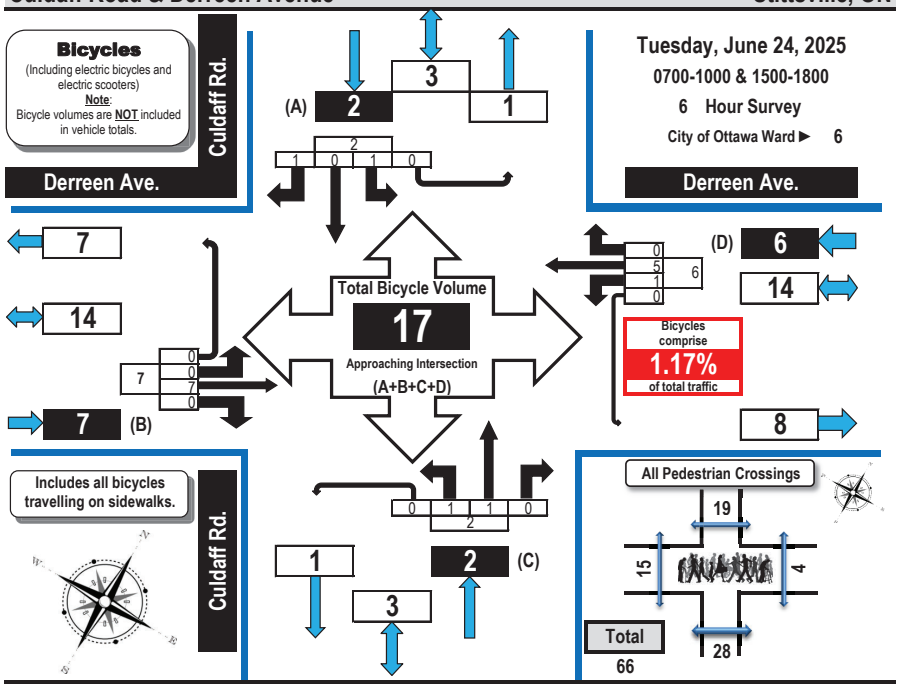
Comments:
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Turning Movement Count
Bicycles and Personal E-Transportation Summary
Flow Diagram

Culdaff Road & Derreen Avenue — **Stittsville, ON**

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are NOT included in vehicle totals.

Tuesday, June 24, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6



	Derreen Ave. Eastbound					Derreen Ave. Westbound					Culdaff Rd. Northbound					Culdaff Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
0800-0900	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0900-1000	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1500-1600	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1600-1700	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	1	0	1	3
1700-1800	0	2	0	0	2	0	5	0	0	5	0	0	0	0	0	1	0	0	0	1	8
Totals	0	7	0	0	7	1	5	0	0	6	1	1	0	0	2	1	0	1	0	2	17

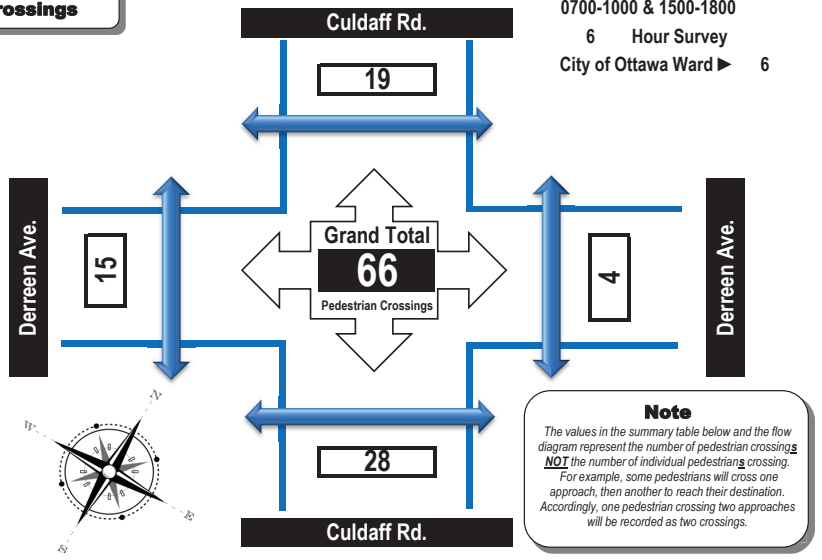
Comments:
School buses comprise 75.86% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

Culdaff Road & Derreen Avenue — **Stittsville, ON**

Pedestrian Crossings

Tuesday, June 24, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6



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

Time Period	West Side Crossing Derreen Ave.	East Side Crossing Derreen Ave.	Street Total	South Side Crossing Culdaff Rd.	North Side Crossing Culdaff Rd.	Street Total	Grand Total
0700-0800	5	3	8	10	5	15	23
0800-0900	6	0	6	2	4	6	12
0900-1000	0	0	0	2	0	2	2
1500-1600	2	0	2	3	8	11	13
1600-1700	2	0	2	6	1	7	9
1700-1800	0	1	1	5	1	6	7
Totals	15	4	19	28	19	47	66

Comments:
School buses comprise 75.86% of the heavy vehicle traffic.

Turning Movement Count
Summary Report
Including OFF Peak, PM Peak and PHF
All Vehicles Except Bicycles and Personal E-Transportation



Derreen Avenue/Palladium Drive & Robert Grant Avenue — Stittsville, ON

Survey Date: Saturday, June 28, 2025 | **Start Time:** 1100 | **AADT Factor:** 1.1
Weather: AM: Overcast 20° C | **Survey Duration:** 5 Hrs. | **Survey Hours:** 1100 - 1600
Weather PM: Mostly Cloudy 27° C | **Surveyor(s):** J. Mousseau

	Derreen Ave. (Eastbound)					Palladium Dr. (Westbound)						Robert Grant Ave. (Northbound)					Palladium Dr. (Southbound)						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
1100-1200	63	42	0	2	107	3	46	426	3	478	585	1	9	9	0	19	325	9	32	15	381	400	985
1200-1300	51	60	1	0	112	4	53	459	0	516	628	0	15	11	0	26	379	17	63	27	486	512	1140
1300-1400	64	49	4	0	117	4	51	435	0	490	607	0	17	17	0	34	334	23	59	34	450	484	1091
1400-1500	53	56	3	0	112	9	54	444	4	511	623	0	6	18	0	24	330	19	67	15	431	455	1078
1500-1600	60	47	3	0	110	2	66	419	3	490	600	0	13	10	0	23	328	10	55	25	418	441	1041
Totals	291	254	11	2	558	22	270	2183	10	2485	3043	1	60	65	0	126	1696	78	276	116	2166	2292	5335

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

OFF Peak Hour Factor ➡ 0.88

OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
	Derreen Ave. (Eastbound)					Palladium Dr. (Westbound)						Highest Hourly Vehicle Volume Between 1100h & 1500h: Robert Grant Ave. (Northbound)					Palladium Dr. (Southbound)						
1215-1315	56	60	2	0	118	5	45	466	0	516	634	0	16	13	0	29	377	23	67	32	499	528	1162

PM Peak Hour Factor ➡ 0.93

PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
	Derreen Ave. (Eastbound)					Palladium Dr. (Westbound)						Highest Hourly Vehicle Volume Between 1500h & 1900h: Robert Grant Ave. (Northbound)					Palladium Dr. (Southbound)						
1500-1600	60	47	3	0	110	2	66	419	3	490	600	0	13	10	0	23	328	10	55	25	418	441	1041

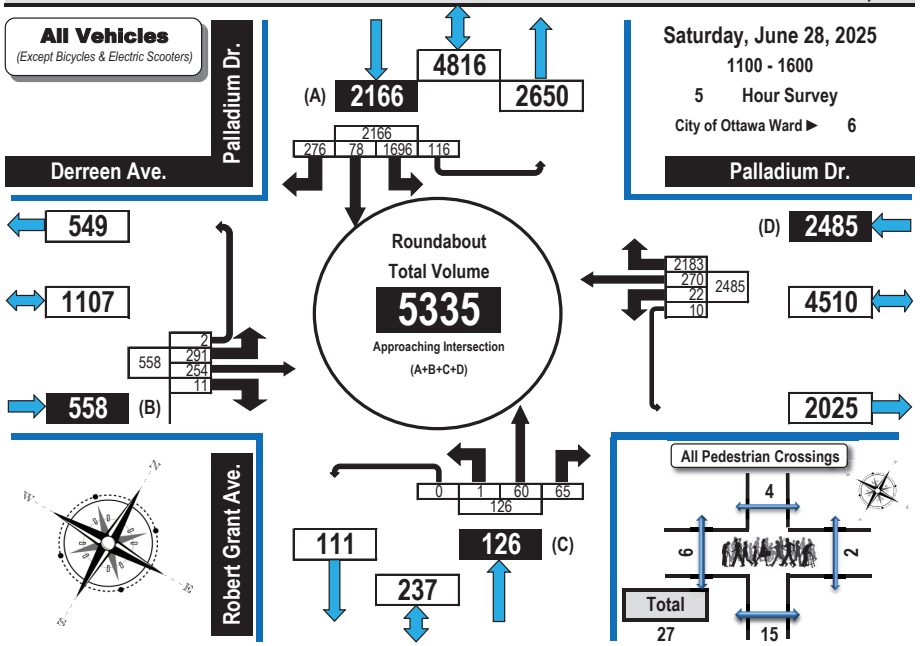
Comments:
OC Transpo buses and school buses comprise 51.28% of the heavy vehicle traffic.

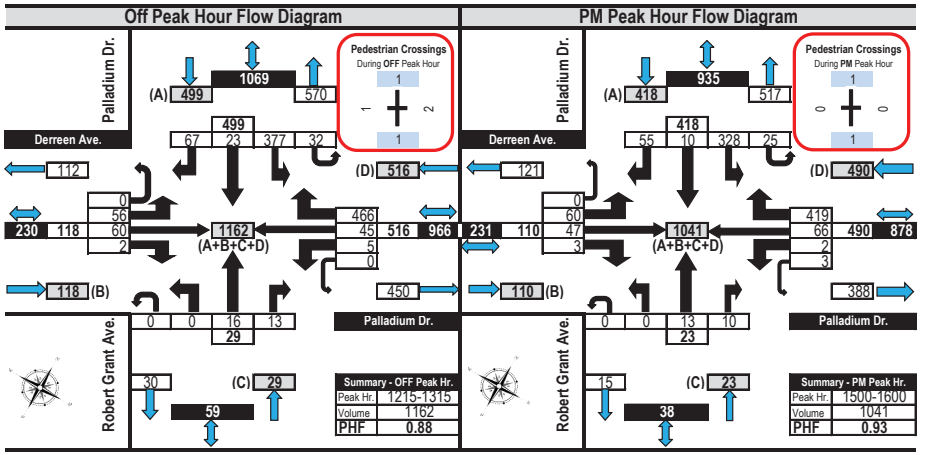
Notes:
1. Includes all vehicle types except bicycles and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Turning Movement Count
Summary, OFF and PM Peak Hour
Flow Diagrams
All Vehicles Except Bicycles and Personal E-Transportation



Derreen Avenue/Palladium Drive & Robert Grant Avenue — Stittsville, ON





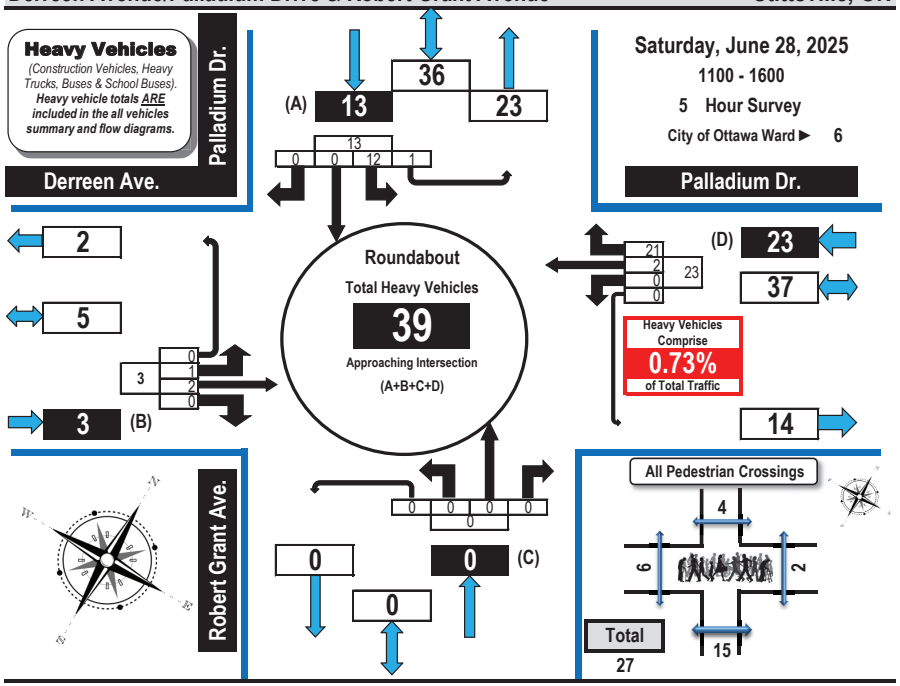
Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**

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

Saturday, June 28, 2025
1100 - 1600
5 Hour Survey
City of Ottawa Ward ► 6



	Derreen Ave.					Palladium Dr.					Robert Grant Ave.					Palladium Dr.				
	Eastbound					Westbound					Northbound					Southbound				
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	4	0	0	0	4	8
1200-1300	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	3	0	0	0	3	7
1300-1400	1	0	0	0	1	0	0	5	0	5	0	0	0	0	0	1	0	0	1	2	8
1400-1500	0	1	0	0	1	0	1	5	0	6	0	0	0	0	0	2	0	0	0	2	9
1500-1600	0	1	0	0	1	0	1	3	0	4	0	0	0	0	0	2	0	0	0	2	7
Totals	1	2	0	0	3	0	2	21	0	23	0	0	0	0	0	12	0	0	1	13	39

Comments:

OC Transpo buses and school buses comprise 51.28% of the heavy vehicle traffic.

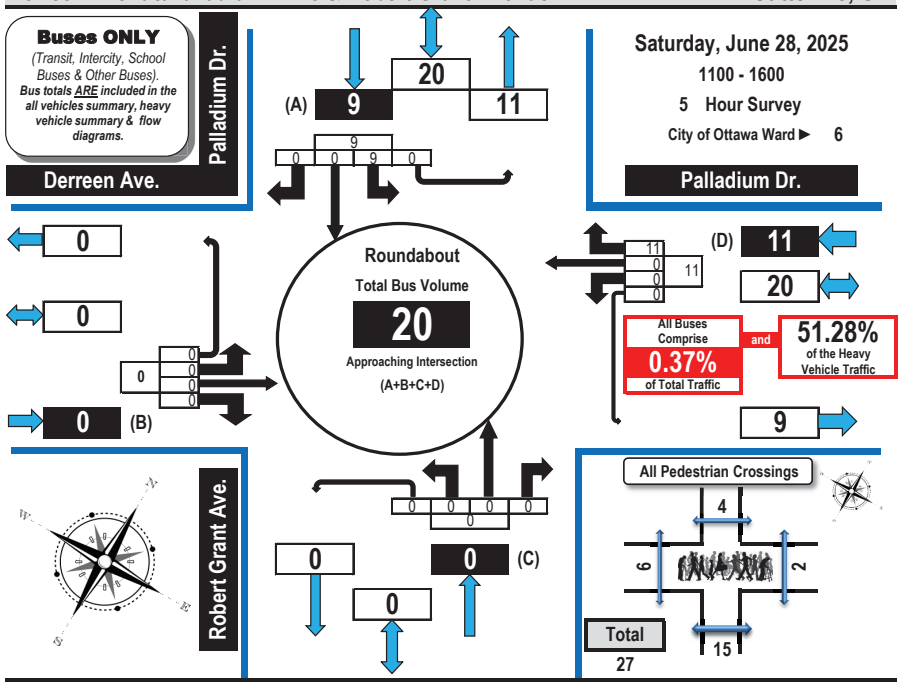
Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram



Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Saturday, June 28, 2025
1100 - 1600
5 Hour Survey
City of Ottawa Ward ► 6

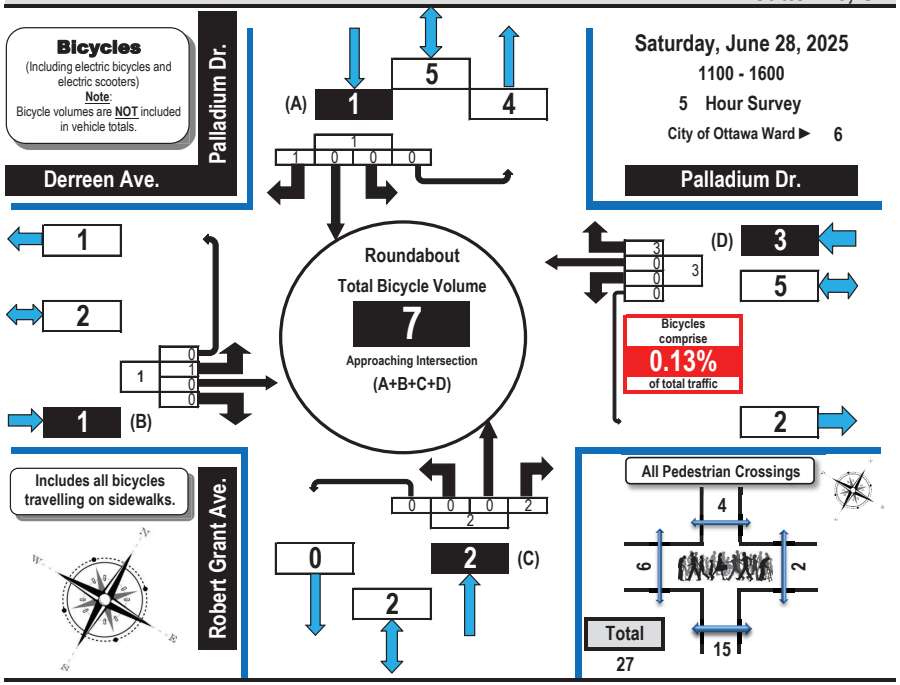


	Derreen Ave.					Palladium Dr.					Robert Grant Ave.					Palladium Dr.				
	Eastbound					Westbound					Northbound					Southbound				
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	3
1200-1300	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	0	0	2	4
1300-1400	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	0	0	1	4
1400-1500	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	0	0	2	4
1500-1600	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	0	0	2	5
Totals	0	0	0	0	0	0	0	11	0	11	0	0	0	0	0	9	0	0	0	9	20

Comments:
OC Transpo buses and school buses comprise 51.28% of the heavy vehicle traffic.

Turning Movement Count
Bicycles and Personal E-Transportation Summary Flow Diagram

Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**



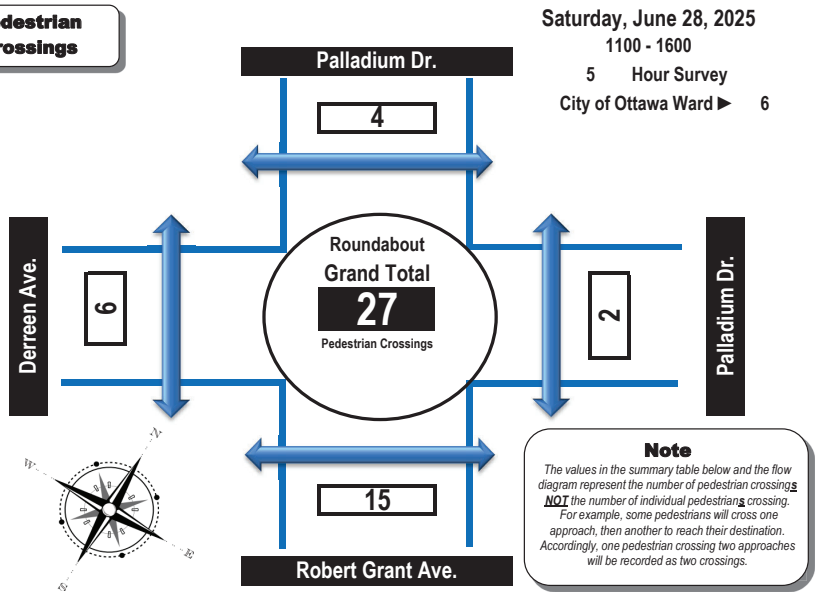
	Derreen Ave.					Palladium Dr.					Robert Grant Ave.					Palladium Dr.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
1200-1300	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1300-1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400-1500	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	1	0	1	4
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Totals	1	0	0	0	1	0	0	3	0	3	0	0	2	0	2	0	0	1	0	1	7

Comments:

OC Transpo buses and school buses comprise 51.28% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**



Time Period	West Side Crossing Derreen Ave.	East Side Crossing Palladium Dr.	Street Total	South Side Crossing Robert Grant Ave.	North Side Crossing Palladium Dr.	Street Total	Grand Total
1100-1200	5	0	5	1	1	2	7
1200-1300	1	2	3	1	1	2	5
1300-1400	0	0	0	0	1	1	1
1400-1500	0	0	0	12	0	12	12
1500-1600	0	0	0	1	1	2	2
Totals	6	2	8	15	4	19	27

Comments:

OC Transpo buses and school buses comprise 51.28% of the heavy vehicle traffic.

Turning Movement Count
Summary Report
Including AM and PM Peak Hours
All Vehicles Except Bicycles and Personal E-Transportation

Derreen Avenue/Palladium Drive & Robert Grant Avenue — Stittsville, ON

Survey Date: Wednesday, June 25, 2025 **Start Time:** 0700 **AADT Factor:** 0.9
Weather AM: Sunny 22° C **Survey Duration:** 6 Hrs. **Survey Hours:** 0700-1000 & 1500-1800
Weather PM: Mostly Sunny 28° C **Surveyor(s):** J. Mousseau

	Derreen Ave. (Eastbound)					Palladium Dr. (Westbound)						Robert Grant Ave. (Northbound)					Palladium Dr. (Southbound)						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	79	51	2	0	132	5	9	311	2	327	459	0	24	13	0	37	316	16	15	4	351	388	847
0800-0900	94	77	1	0	172	2	34	350	4	390	562	0	21	18	0	39	385	10	31	6	432	471	1033
0900-1000	59	53	1	0	113	5	33	316	2	356	469	0	6	13	0	19	378	4	40	4	426	445	914
1500-1600	40	33	0	0	73	7	53	524	8	592	665	0	10	22	0	32	406	16	65	4	491	523	1188
1600-1700	55	45	0	0	100	11	61	653	4	729	829	0	20	19	0	39	456	21	94	8	579	618	1447
1700-1800	57	64	4	0	125	7	80	569	11	667	792	1	13	21	0	35	406	29	119	8	562	597	1389
Totals	384	323	8	0	715	37	270	2723	31	3061	3776	1	94	106	0	201	2347	96	364	34	2841	3042	6818

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

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

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

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

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

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

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

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

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.91

AM Peak Hr	Derreen Ave. (Eastbound) LT	ST	RT	UT	Total	Palladium Dr. (Westbound) LT	ST	RT	UT	Total	Str. Tot.	Robert Grant Ave. (Northbound) LT	ST	RT	UT	Total	Palladium Dr. (Southbound) LT	ST	RT	UT	Total	Str. Tot.	Gr. Total
0800-0900	94	77	1	0	172	2	34	350	4	390	562	0	21	18	0	39	385	10	31	6	432	471	1033

PM Peak Hour Factor ➡ 0.96

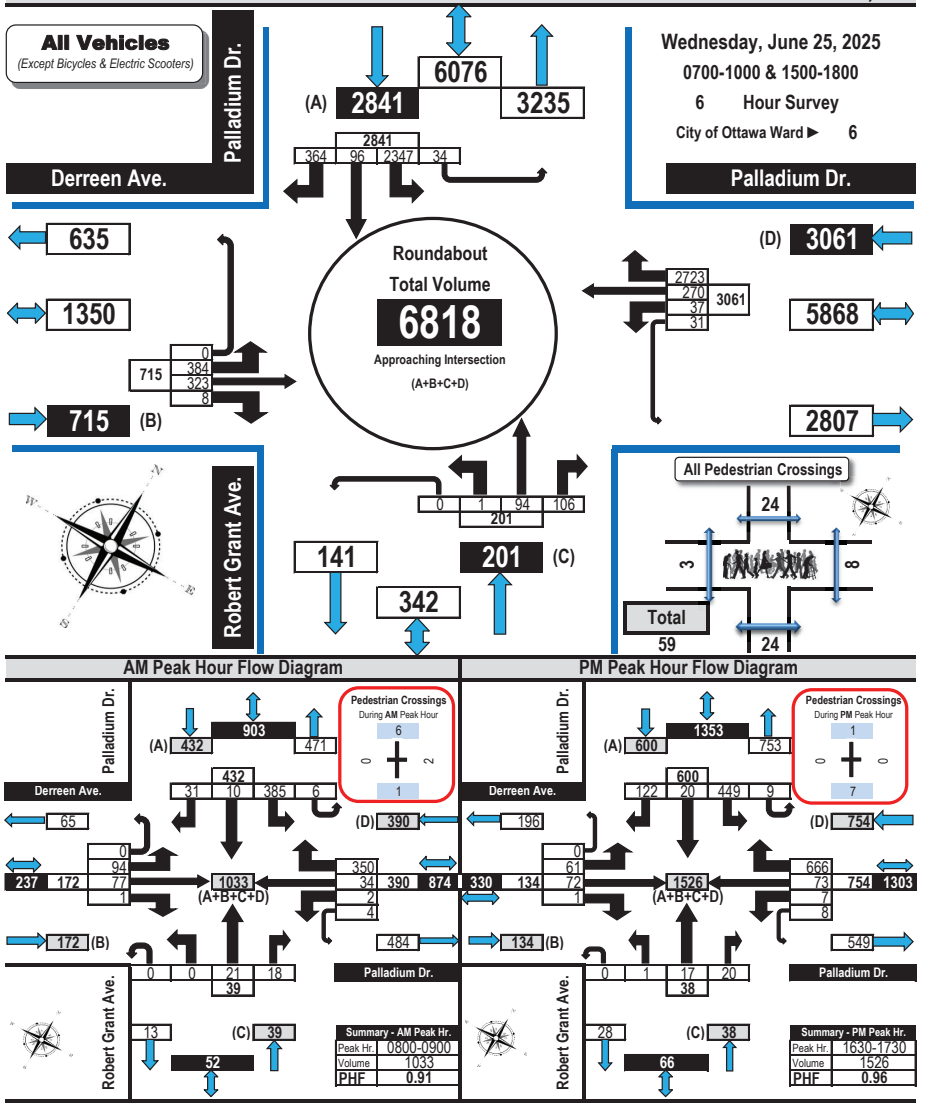
PM Peak Hr	Derreen Ave. (Eastbound) LT	ST	RT	UT	Total	Palladium Dr. (Westbound) LT	ST	RT	UT	Total	Str. Tot.	Robert Grant Ave. (Northbound) LT	ST	RT	UT	Total	Palladium Dr. (Southbound) LT	ST	RT	UT	Total	Str. Tot.	Gr. Total
1630-1730	61	72	1	0	134	7	73	666	8	754	888	1	17	20	0	38	449	20	122	9	600	638	1526

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 42.76% of the heavy vehicle traffic.

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

Turning Movement Count
Summary, AM and PM Peak Hour
Flow Diagrams
All Vehicles Except Bicycles and Personal E-Transportation

Derreen Avenue/Palladium Drive & Robert Grant Avenue — Stittsville, ON



Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**

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

Wednesday, June 25, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6

Palladium Dr. | Derreen Ave. | Robert Grant Ave. | Palladium Dr.

(A) 56 | 129 | 73 | 56 | 2 | 3 | 48 | 3
13 | 28 | 15 | (B) | 0 | 3 | 11 | 1
Roundabout
Total Heavy Vehicles
152
Approaching Intersection
(A+B+C+D)
(D) 75 | 136 | 61 | 63 | 11 | 1 | 0 | 75
Heavy Vehicles Comprise **2.23%** of Total Traffic
0 | 0 | 4 | 2 | 6 | 5 | 11 | 6 (C)
All Pedestrian Crossings: 24 | 3 | 8 | 24 | Total 59

Derreen Ave. Eastbound					Palladium Dr. Westbound					Robert Grant Ave. Northbound					Palladium Dr. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	3	1	0	4	0	2	13	0	15	0	2	0	0	2	4	3	2	1	10	31
0800-0900	1	5	0	0	6	0	3	15	0	18	0	0	0	0	0	11	0	0	1	12	36
0900-1000	0	0	0	0	0	0	0	10	0	10	0	0	0	0	0	11	0	0	1	12	22
1500-1600	2	2	0	0	4	1	5	7	0	13	0	1	1	0	2	9	0	0	0	9	28
1600-1700	0	1	0	0	1	0	1	9	0	10	0	0	1	0	1	8	0	0	0	8	20
1700-1800	0	0	0	0	0	0	0	9	0	9	0	1	0	0	1	5	0	0	0	5	15
Totals	3	11	1	0	15	1	11	63	0	75	0	4	2	0	6	48	3	2	3	56	152

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 42.76% of the heavy vehicle traffic.

Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram



Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Wednesday, June 25, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6

Palladium Dr. | Derreen Ave. | Robert Grant Ave. | Palladium Dr.

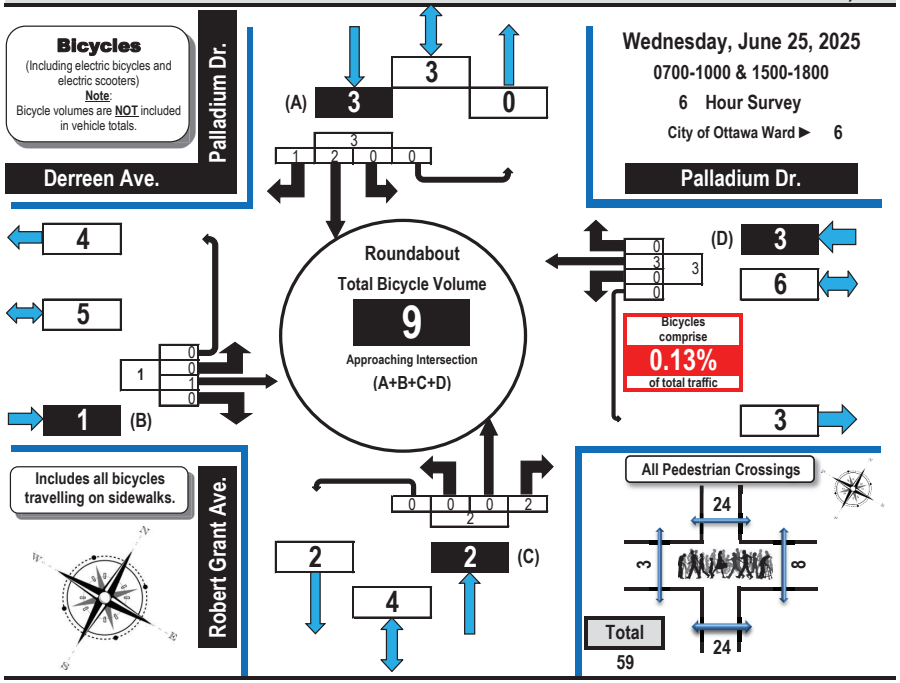
(A) 21 | 45 | 24 | 21 | 0 | 1 | 20 | 0
10 | 23 | 13 | (B) | 0 | 3 | 9 | 1
Roundabout
Total Bus Volume
65
Approaching Intersection
(A+B+C+D)
(D) 30 | 59 | 29 | 20 | 10 | 0 | 0 | 30
All Buses Comprise **0.95%** of Total Traffic and **42.76%** of the Heavy Vehicle Traffic
0 | 0 | 1 | 0 | 1 | 2 | 3 | 1 (C)
All Pedestrian Crossings: 24 | 3 | 8 | 24 | Total 59

Derreen Ave. Eastbound					Palladium Dr. Westbound					Robert Grant Ave. Northbound					Palladium Dr. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	3	1	0	4	0	2	7	0	9	0	0	0	0	0	2	1	0	0	3	16
0800-0900	1	4	0	0	5	0	3	5	0	8	0	0	0	0	0	1	0	0	0	1	14
0900-1000	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	0	0	3	5
1500-1600	2	2	0	0	4	0	5	2	0	7	0	1	0	0	1	4	0	0	0	4	16
1600-1700	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	5	0	0	0	5	6
1700-1800	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	5	0	0	0	5	8
Totals	3	9	1	0	13	0	10	20	0	30	0	1	0	0	1	20	1	0	0	21	65

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 42.76% of the heavy vehicle traffic.

Turning Movement Count
Bicycles and Personal E-Transportation Summary
Flow Diagram

Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**

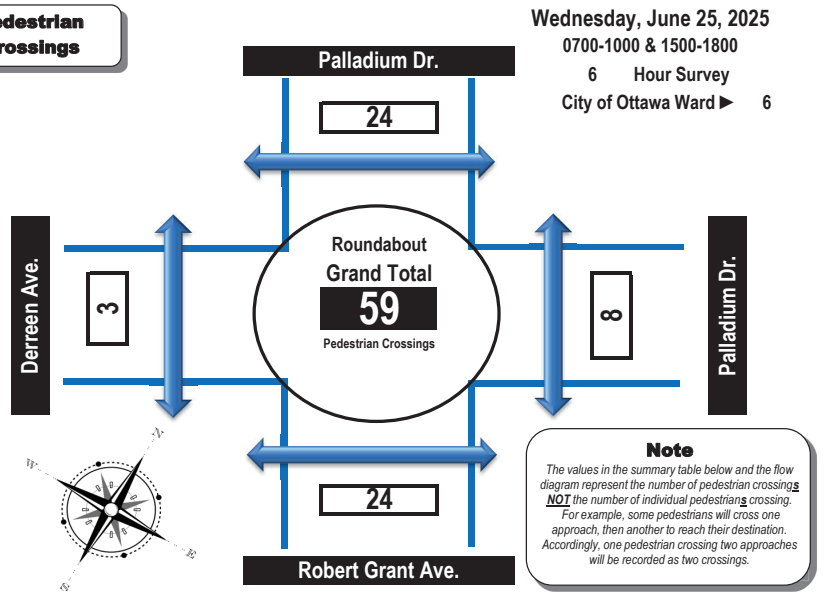


	Derreen Ave. Eastbound					Palladium Dr. Westbound					Robert Grant Ave. Northbound					Palladium Dr. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500-1600	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	2	0	0	2	0	0	2	0	2	0	2	1	0	3	7
Totals	0	1	0	0	1	0	3	0	0	3	0	0	2	0	2	0	2	1	0	3	9

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 42.76% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

Derreen Avenue/Palladium Drive & Robert Grant Avenue — **Stittsville, ON**



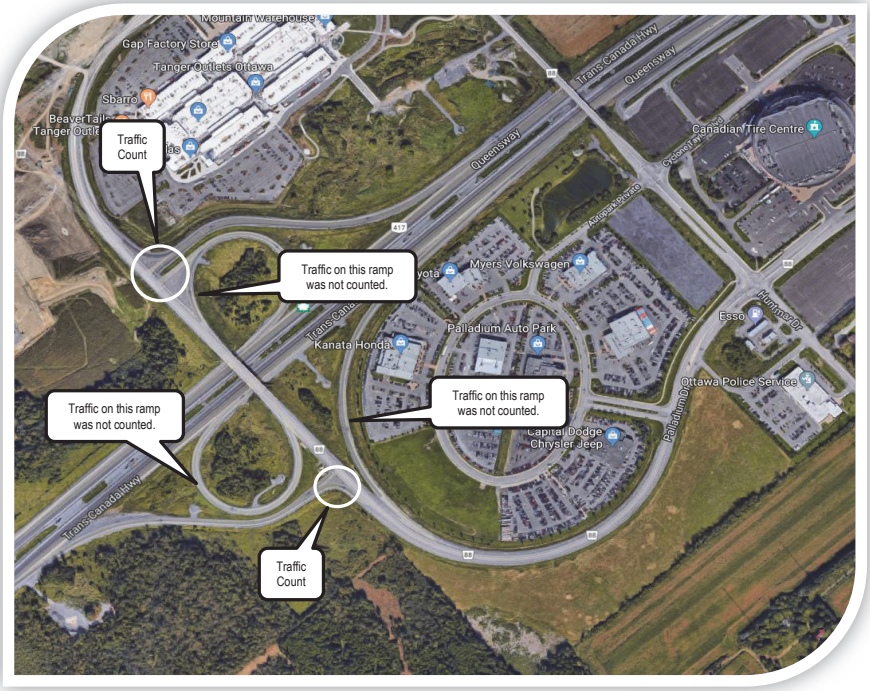
Time Period	West Side Crossing Derreen Ave.	East Side Crossing Palladium Dr.	Street Total	South Side Crossing Robert Grant Ave.	North Side Crossing Palladium Dr.	Street Total	Grand Total
0700-0800	3	2	5	3	11	14	19
0800-0900	0	2	2	1	6	7	9
0900-1000	0	4	4	2	3	5	9
1500-1600	0	0	0	0	1	1	1
1600-1700	0	0	0	2	2	4	4
1700-1800	0	0	0	16	1	17	17
Totals	3	8	11	24	24	48	59

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 42.76% of the heavy vehicle traffic.

Diagrams, Maps and Photographs

Highway 417 Eastbound Off Ramp & Palladium Drive

Saturday, April 01, 2023

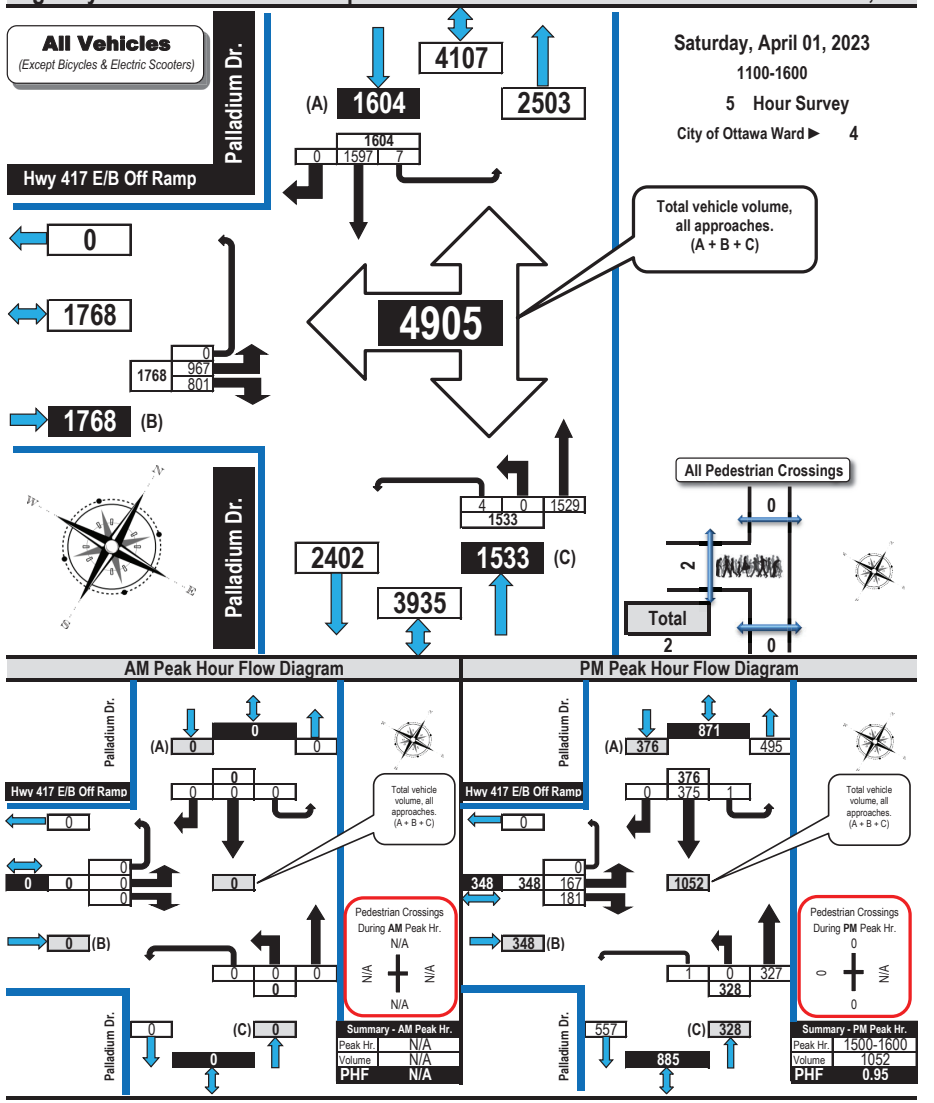


Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

Highway 417 Eastbound Off Ramp & Palladium Drive — Kanata, ON

All Vehicles (Except Bicycles & Electric Scooters)

Saturday, April 01, 2023
1100-1600
5 Hour Survey
City of Ottawa Ward ► 4

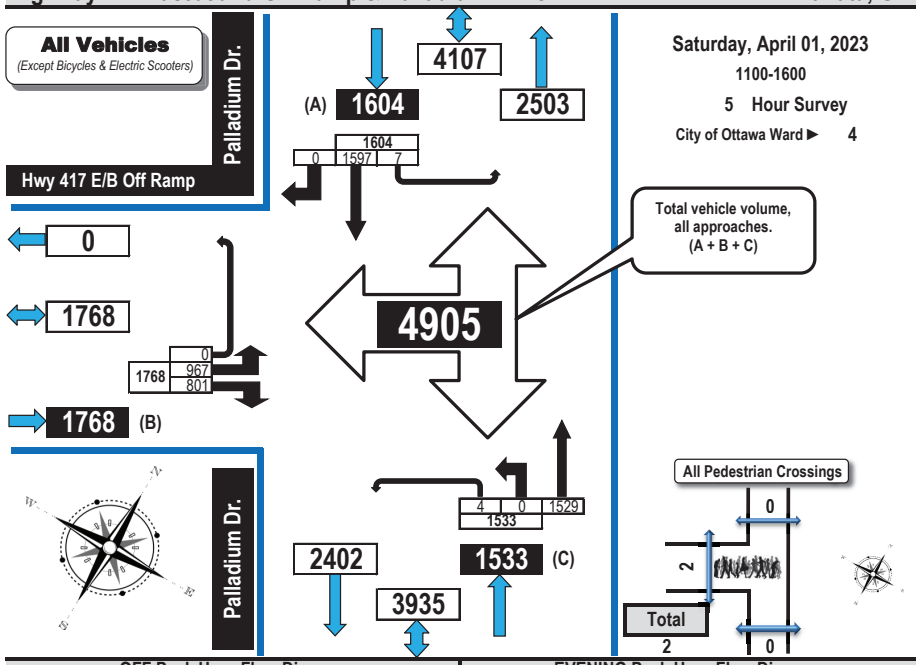


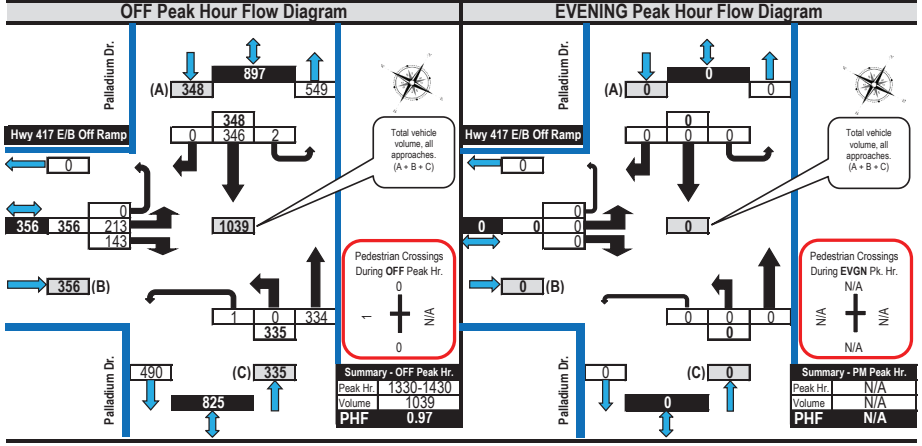
ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Summary, OFF and EVGN Peak Hour Flow Diagrams
All Vehicles Except Bicycles



Highway 417 Eastbound Off Ramp & Palladium Drive — Kanata, ON



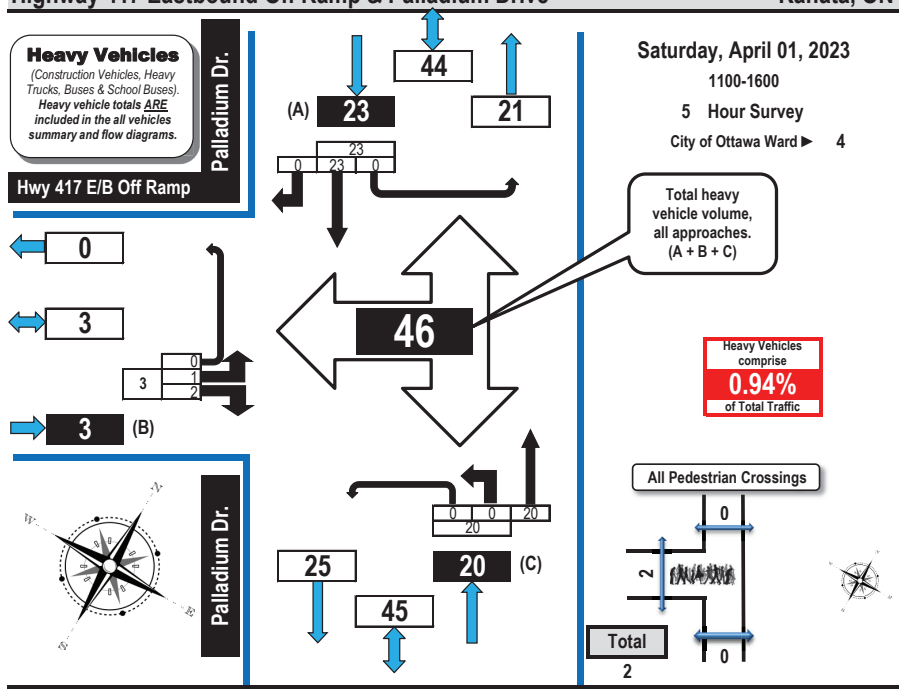


ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4 to 13)
Flow Diagram



Highway 417 Eastbound Off Ramp & Palladium Drive — Kanata, ON

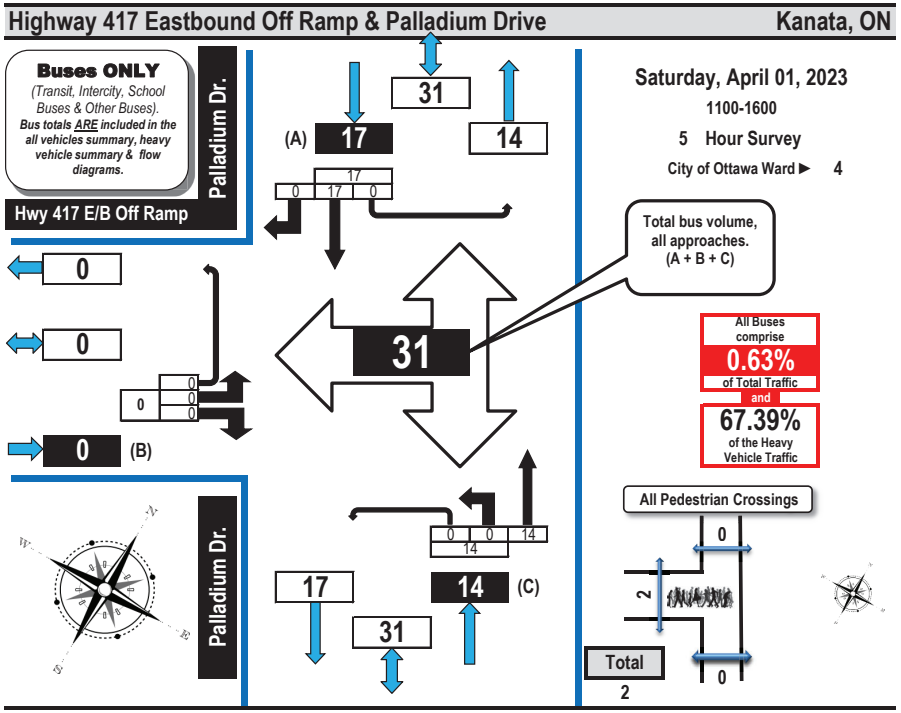


	Hwy 417 E/B Off Ramp					N/A					Palladium Dr.					Palladium Dr.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0		1	0	1						0	3		0	3		3	0	0	3	7
1200-1300	0		1	0	1						0	5		0	5		6	0	0	6	12
1300-1400	1		0	0	1						0	4		0	4		5	0	0	5	10
1400-1500	0		0	0	0						0	4		0	4		4	0	0	4	8
1500-1600	0		0	0	0						0	4		0	4		5	0	0	5	9
Totals	1		2	0	3						0	20		0	20		23	0	0	23	46

Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram



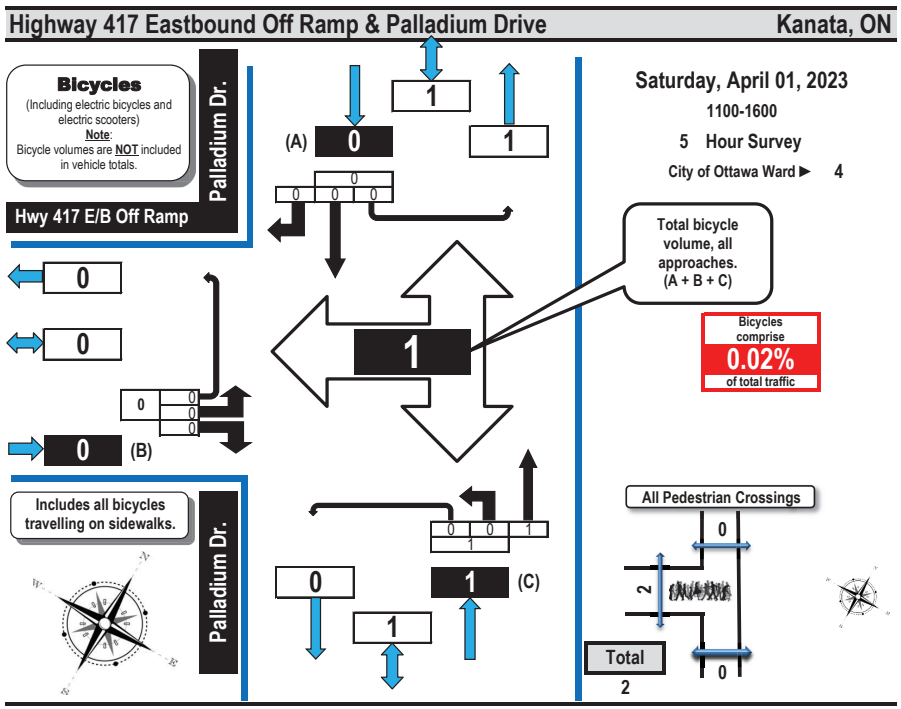
Highway 417 Eastbound Off Ramp & Palladium Drive — Kanata, ON



	Hwy 417 E/B Off Ramp					N/A					Palladium Dr.					Palladium Dr.				
	Eastbound					Westbound					Northbound					Southbound				
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0		0	0	0						0	3		0	3		2	0	0	2	5
1200-1300	0		0	0	0						0	3		0	3		5	0	0	5	8
1300-1400	0		0	0	0						0	3		0	3		3	0	0	3	6
1400-1500	0		0	0	0						0	3		0	3		3	0	0	3	6
1500-1600	0		0	0	0						0	2		0	2		4	0	0	4	6
Totals	0		0	0	0						0	14		0	14		17	0	0	17	31

Turning Movement Count
Bicycle Summary
Flow Diagram

Highway 417 Eastbound Off Ramp & Palladium Drive — Kanata, ON



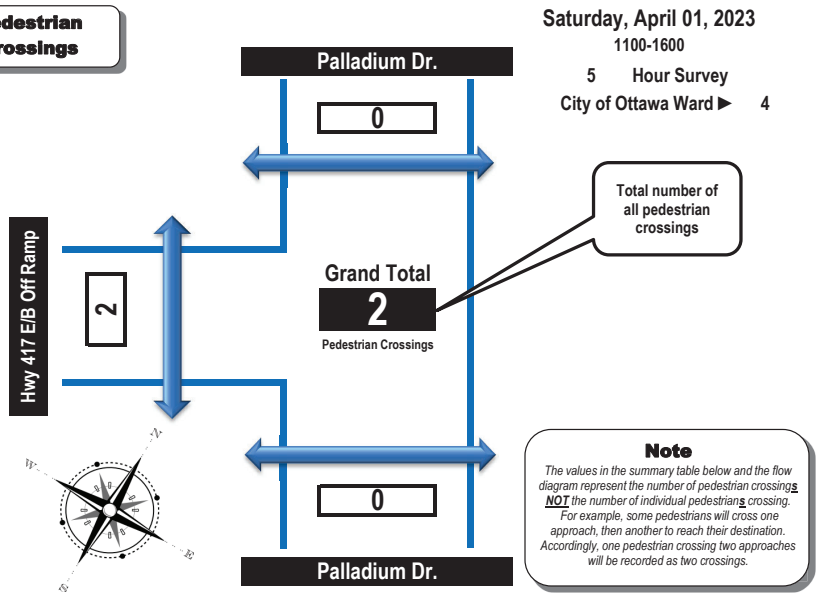
	Hwy 417 E/B Off Ramp					N/A					Palladium Dr.					Palladium Dr.				
	Eastbound					Westbound					Northbound					Southbound				
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0		0	0	0						0	0		0	0		0	0	0	0	0
1200-1300	0		0	0	0						0	0		0	0		0	0	0	0	0
1300-1400	0		0	0	0						0	0		0	0		0	0	0	0	0
1400-1500	0		0	0	0						0	0		0	0		0	0	0	0	0
1500-1600	0		0	0	0						0	1		0	1		0	0	0	0	1
Totals	0		0	0	0						0	1		0	1		0	0	0	0	1

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Highway 417 Eastbound Off Ramp & Palladium Drive — Kanata, ON

Pedestrian Crossings

Saturday, April 01, 2023
1100-1600
5 Hour Survey
City of Ottawa Ward ▶ 4



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

Time Period	West Side Crossing Hwy 417 E/B Off Ramp	East Side Crossing N/A	Street Total	South Side Crossing Palladium Dr.	North Side Crossing Palladium Dr.	Street Total	Grand Total
1100-1200	0		0	0	0	0	0
1200-1300	1		1	0	0	0	1
1300-1400	1		1	0	0	0	1
1400-1500	0		0	0	0	0	0
1500-1600	0		0	0	0	0	0
Totals	2		2	0	0	0	2

Comments:
OC Transpo and Para Transpo buses comprise 67.39% of the heavy vehicle traffic. The bicycle total includes 1 E-scooter (stand-up type). 6 pedestrians walked along the east shoulder, 5 southbound and 1 northbound but are not included in the pedestrian crossings totals as they did not cross the off ramp. Traffic was not counted on the southbound and northbound on ramps to Hwy 417 eastbound.

Turning Movement Count
Summary Report
Including OFF Peak, PM Peak and PHF
All Vehicles Except Bicycles

Highway 417 Eastbound Off Ramp & Palladium Drive — Kanata, ON

Survey Date: Saturday, April 01, 2023 **Start Time:** 1100 **AADT Factor:** 1.0
Weather: AM: Drizzle +1° C **Survey Duration:** 5 Hrs. **Survey Hours:** 1100 - 1600
Weather PM: Mostly Sunny +8° C **Surveyor(s):** T. Carmody

	Hwy 417 E/B Off Ramp					N/A						Palladium Dr.					Palladium Dr.					
	Eastbound					Westbound						Northbound					Southbound					
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
1100-1200	203	0	178	0	381	0	0	0	0	0	381	0	273	0	0	273	0	263	0	2	265	538	919
1200-1300	199	0	168	0	367	0	0	0	0	0	367	0	290	0	2	292	0	318	0	0	318	610	977
1300-1400	218	0	137	0	355	0	0	0	0	0	355	0	326	0	1	327	0	291	0	2	293	620	975
1400-1500	180	0	137	0	317	0	0	0	0	0	317	0	313	0	0	313	0	350	0	2	352	665	982
1500-1600	167	0	181	0	348	0	0	0	0	0	348	0	327	0	1	328	0	375	0	1	376	704	1052
Totals	967	0	801	0	1768	0	0	0	0	0	1768	0	1529	0	4	1533	0	1597	0	7	1604	3137	4905

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

OFF Peak Hour Factor ➡ 0.97

												Highest Hourly Vehicle Volume Between 1100h & 1500h										
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1330-1430	213	0	143	0	356	0	0	0	0	0	356	0	334	0	1	335	0	346	0	2	348	683	1039

PM Peak Hour Factor ➡ 0.95

												Highest Hourly Vehicle Volume Between 1500h & 1900h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1500-1600	167	0	181	0	348	0	0	0	0	0	348	0	327	0	1	328	0	375	0	1	376	704	1052

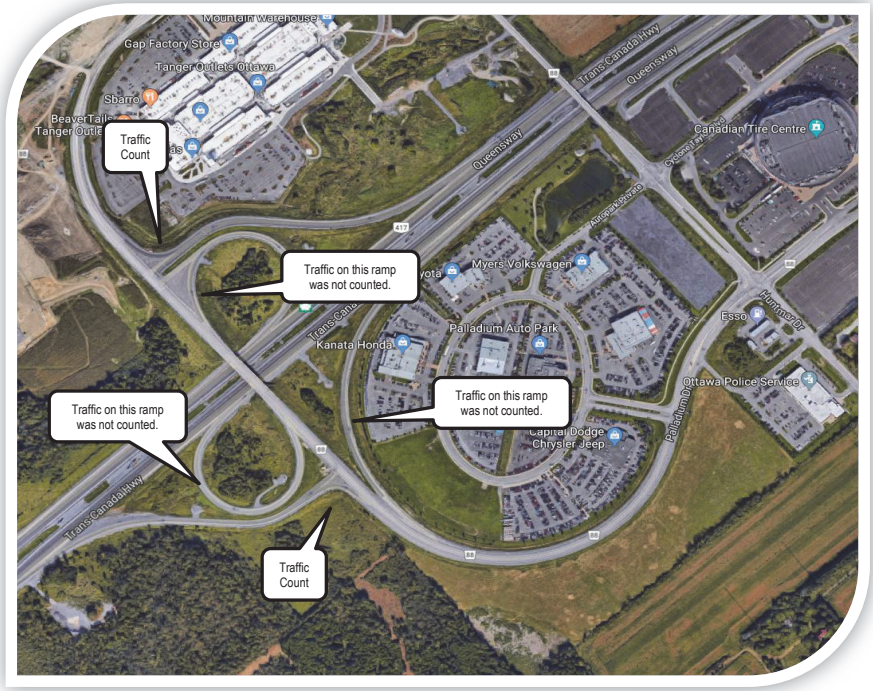
Comments:
OC Transpo and Para Transpo buses comprise 67.39% of the heavy vehicle traffic. The bicycle total includes 1 E-scooter (stand-up type). 6 pedestrians walked along the east shoulder, 5 southbound and 1 northbound but are not included in the pedestrian crossings totals as they did not cross the off ramp. Traffic was not counted on the southbound and northbound on ramps to Hwy 417 eastbound.

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

Diagrams, Maps and Photographs

Highway 417 & Palladium Drive Westbound ON/OFF Ramp

Saturday, April 01, 2023



Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

Highway 417 & Palladium Drive Westbound ON/OFF Ramp — **Kanata, ON**

All Vehicles (Except Bicycles & Electric Scooters)

Saturday, April 01, 2023
1100-1600
5 Hour Survey
City of Ottawa Ward ► 4

Total vehicle volume, all approaches. (A + C + D)

Palladium Dr.

(A) 3686 — 8544 — 4858
3686
2720 856 110

9316

Hwy 417 E/B ON/OFF Ramp
3093 869 5 — 3967 (D) 3967
4829
862

Palladium Dr.

7 1655 1 — 1663
3596 — 1663 (C) — 5259

All Pedestrian Crossings
1 — 7 — 0
Total 8

AM Peak Hour Flow Diagram

Palladium Dr.

(A) 0 — 0 — 0
0
0 0 0
Pedestrian Crossings During AM Peak Hr. N/A (N/A, N/A, N/A)
(D) 0
Total vehicle volume, all approaches. (A + C + D)
0 (A+C+D)
0 0 0 — 0 0 0 0 — 0
0 0 0
0
(C) 0 — 0

Hwy 417 E/B ON/OFF Ramp

Summary - AM Peak Hr.

Peak Hr.	N/A
Volume	N/A
PHF	N/A

Palladium Dr.

PM Peak Hour Flow Diagram

Palladium Dr.

(A) 915 — 1927 — 1012
915
680 218 17
Pedestrian Crossings During PM Peak Hr. 1 (N/A, 2) 0
(D) 907
Total vehicle volume, all approaches. (A + C + D)
2132 (A+C+D)
687 218 907 1127 2 — 220
2 308 0 — 310
900 — (C) 310 — 1210

Hwy 417 E/B ON/OFF Ramp

Summary - PM Peak Hr.

Peak Hr.	1500-1600
Volume	2132
PHF	0.95

Palladium Dr.

Turning Movement Count
Summary, OFF and EVENING Peak Hour Flow Diagrams
All Vehicles Except Bicycles

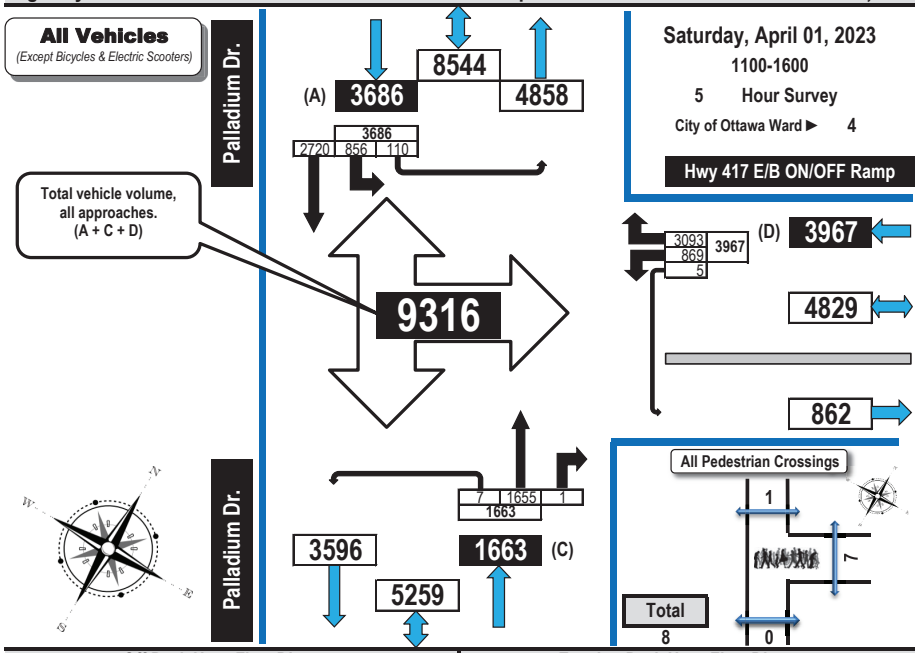


Highway 417 & Palladium Drive Westbound ON/OFF Ramp — Kanata, ON

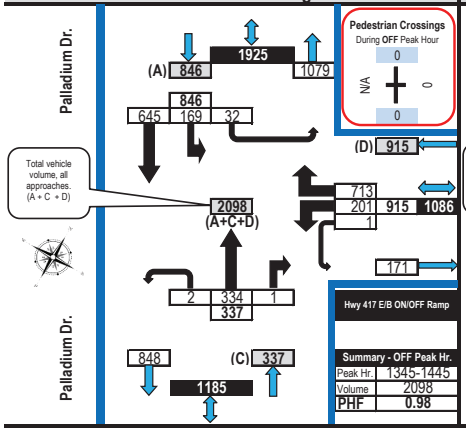
All Vehicles
(Except Bicycles & Electric Scooters)

Saturday, April 01, 2023
1100-1600
5 Hour Survey
City of Ottawa Ward ► 4

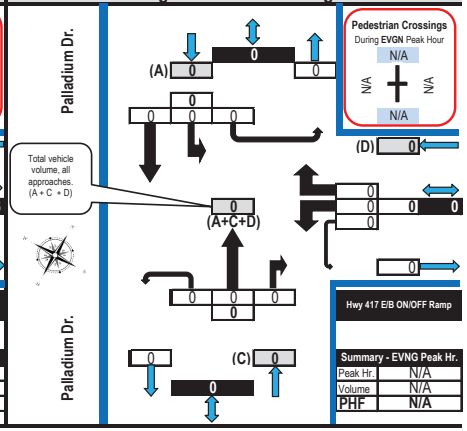
Total vehicle volume, all approaches. (A + C + D)



Off Peak Hour Flow Diagram



Evening Peak Hour Flow Diagram



Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4 to 13)
Flow Diagram



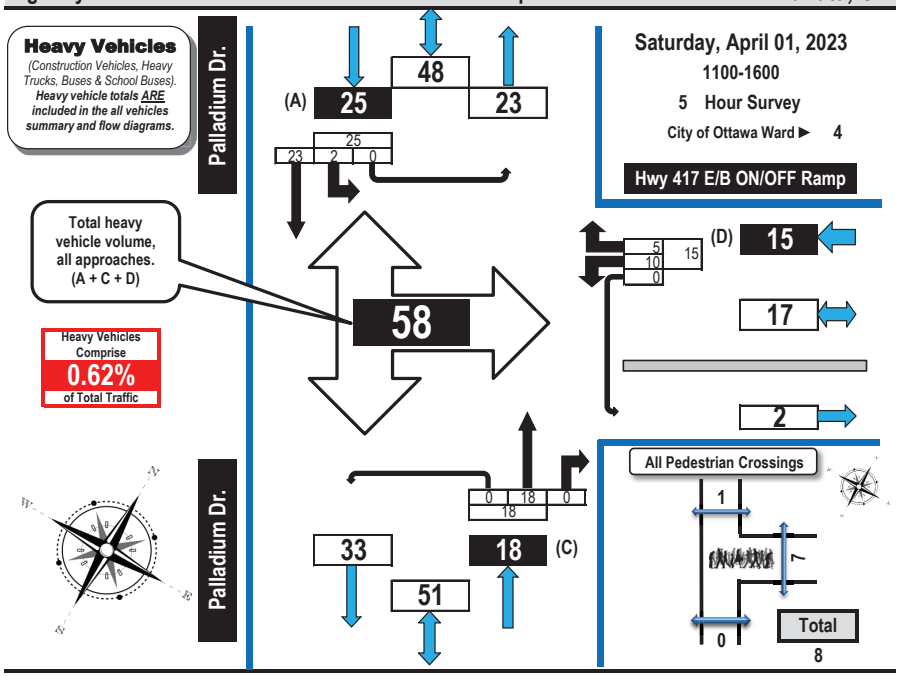
Highway 417 & Palladium Drive Westbound ON/OFF Ramp — Kanata, ON

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

Saturday, April 01, 2023
1100-1600
5 Hour Survey
City of Ottawa Ward ► 4

Total heavy vehicle volume, all approaches. (A + C + D)

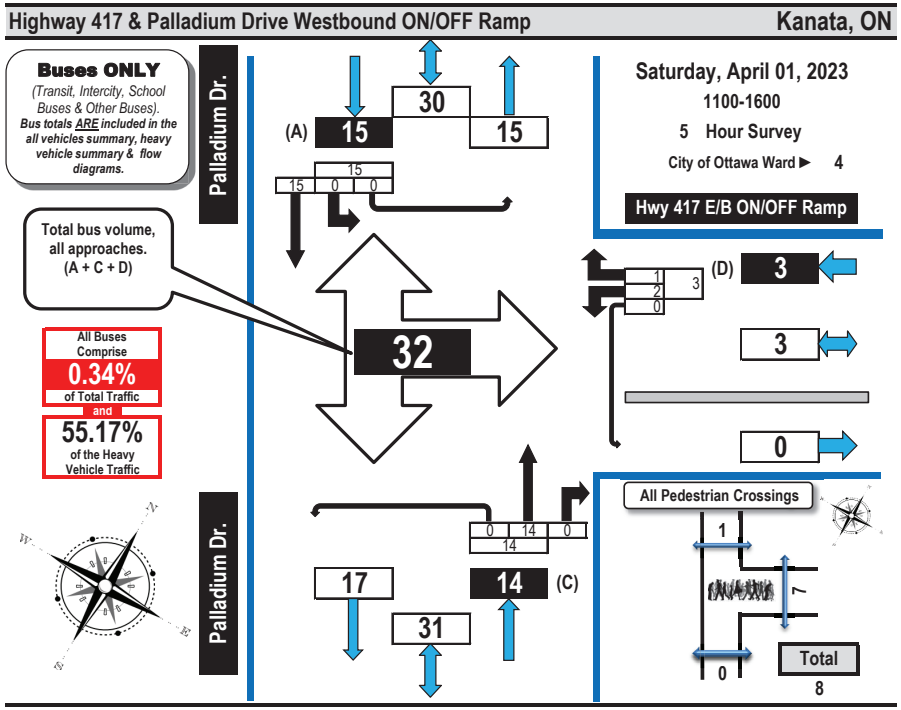
Heavy Vehicles Comprise **0.62%** of Total Traffic



	N/A					Hwy 417 E/B ON/OFF Ramp					Palladium Dr.					Palladium Dr.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200						1		1	0	2		3	0	0	3	0	3		0	3	8
1200-1300						2		0	0	2		4	0	0	4	0	6		0	6	12
1300-1400						3		2	0	5		4	0	0	4	0	3		0	3	12
1400-1500						3		1	0	4		4	0	0	4	1	6		0	7	15
1500-1600						1		1	0	2		3	0	0	3	1	5		0	6	11
Totals						10		5	0	15		18	0	0	18	2	23		0	25	58

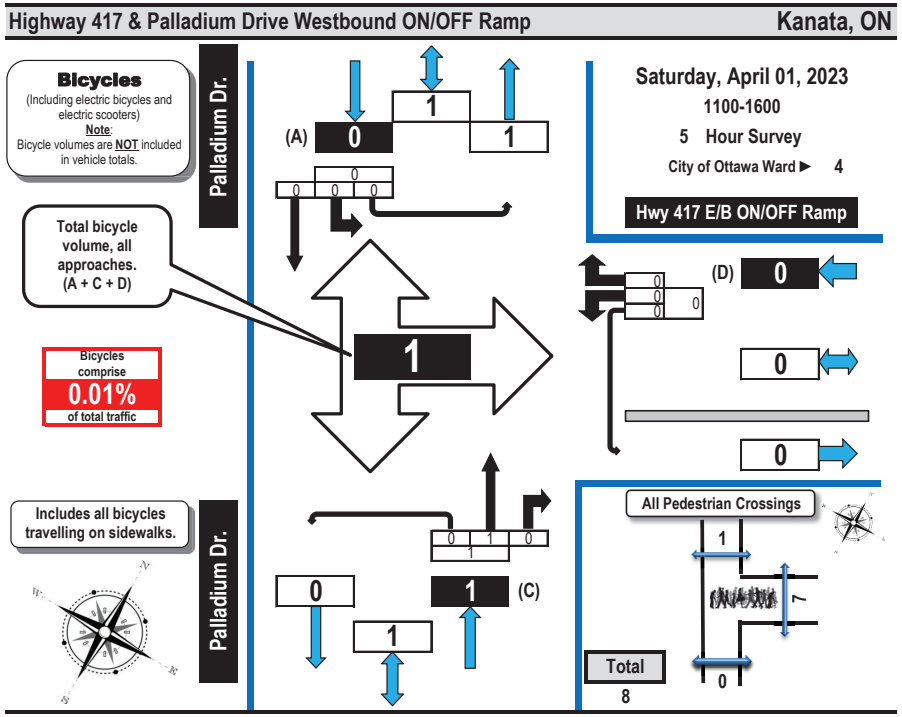
Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram





	N/A					Hwy 417 E/B ON/OFF Ramp					Palladium Dr.					Palladium Dr.				
	Eastbound					Westbound					Northbound					Southbound				
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200						0		1	0	1		3	0	0	3	0	2		0	2	6
1200-1300						1		0	0	1		3	0	0	3	0	4		0	4	8
1300-1400						0		0	0	0		3	0	0	3	0	3		0	3	6
1400-1500						0		0	0	0		3	0	0	3	0	3		0	3	6
1500-1600						1		0	0	1		2	0	0	2	0	3		0	3	6
Totals						2		1	0	3		14	0	0	14	0	15		0	15	32

Turning Movement Count
Bicycle Summary
Flow Diagram



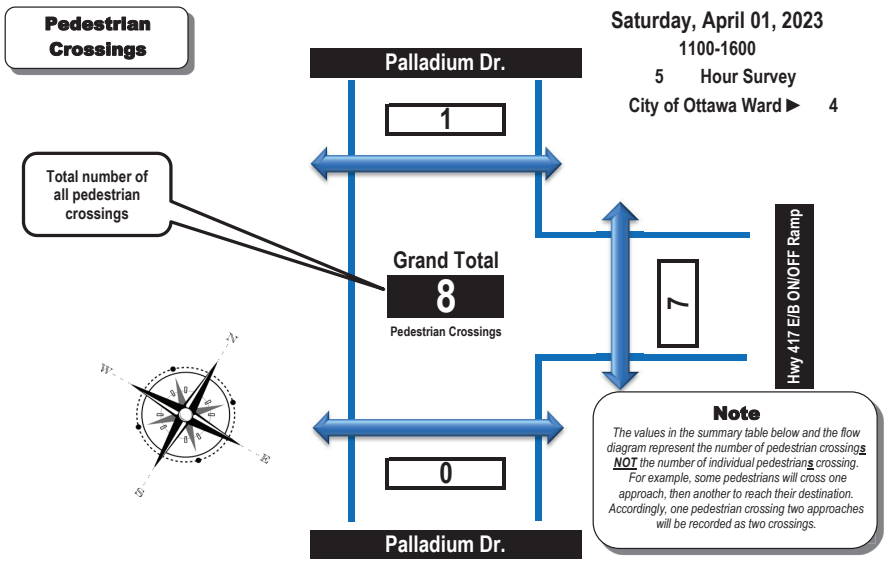
	N/A					Hwy 417 E/B ON/OFF Ramp					Palladium Dr.					Palladium Dr.				
	Eastbound					Westbound					Northbound					Southbound				
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200						0		0	0	0		0	0	0	0	0	0		0	0	0
1200-1300						0		0	0	0		0	0	0	0	0	0		0	0	0
1300-1400						0		0	0	0		0	0	0	0	0	0		0	0	0
1400-1500						0		0	0	0		0	0	0	0	0	0		0	0	0
1500-1600						0		0	0	0		1	0	0	1	0	0		0	0	1
Totals						0		0	0	0		1	0	0	1	0	0		0	0	1

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Highway 417 & Palladium Drive Westbound ON/OFF Ramp — Kanata, ON

Pedestrian Crossings

Saturday, April 01, 2023
1100-1600
5 Hour Survey
City of Ottawa Ward ▶ 4



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

Time Period	West Side Crossing N/A	East Side Crossing Hwy 417 E/B ON/OFF Ramp	Street Total	South Side Crossing Palladium Dr.	North Side Crossing Palladium Dr.	Street Total	Grand Total
1100-1200		0	0	0	0	0	0
1200-1300		3	3	0	0	0	3
1300-1400		2	2	0	0	0	2
1400-1500		0	0	0	0	0	0
1500-1600		2	2	0	1	1	3
Totals	0	7	7	0	1	1	8

Comments:
OC Transpo and Para Transpo buses comprise 55.17% of the heavy vehicle traffic. Traffic on the northbound to westbound ramp was not counted. 2 pedestrians walked along the west shoulder and are not included in the pedestrian crossings totals. Conflicts occurred throughout the count between S/B U-turns and W/B right turns.

Turning Movement Count
Summary Report
Including OFF Peak, PM Peak and PHF
All Vehicles Except Bicycles

Highway 417 & Palladium Drive Westbound ON/OFF Ramp — Kanata, ON

Survey Date: Saturday, April 01, 2023 **Start Time:** 1100 **AADT Factor:** 1.0
Weather: AM: Drizzle +1° C **Survey Duration:** 5 Hrs. **Survey Hours:** 1100 - 1600
Weather PM: Mostly Sunny +8° C **Surveyor(s):** T. Carmody

	N/A					Hwy 417 E/B ON/OFF Ramp						Palladium Dr.					Palladium Dr.						
	Eastbound					Westbound						Northbound					Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
1100-1200	0	0	0	0	0	134	0	450	1	585	585	0	337	0	0	337	143	421	0	18	582	919	1504
1200-1300	0	0	0	0	0	167	0	548	1	716	716	0	322	0	3	325	132	457	0	28	617	942	1658
1300-1400	0	0	0	0	0	155	0	683	0	838	838	0	379	0	2	381	185	516	0	24	725	1106	1944
1400-1500	0	0	0	0	0	195	0	725	1	921	921	0	309	1	0	310	178	646	0	23	847	1157	2078
1500-1600	0	0	0	0	0	218	0	687	2	907	907	0	308	0	2	310	218	680	0	17	915	1225	2132
Totals	0	0	0	0	0	869	0	3093	5	3967	3967	0	1655	1	7	1663	856	2720	0	110	3686	5349	9316

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

OFF Peak Hour Factor ➡ 0.98												Highest Hourly Vehicle Volume Between 1100h & 1500h										
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1345-1445	0	0	0	0	0	201	0	713	1	915	915	0	334	1	2	337	169	645	0	32	846	1183	2098

PM Peak Hour Factor ➡ 0.95												Highest Hourly Vehicle Volume Between 1500h & 1900h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1500-1600	0	0	0	0	0	218	0	687	2	907	907	0	308	0	2	310	218	680	0	17	915	1225	2132

Comments:
OC Transpo and Para Transpo buses comprise 55.17% of the heavy vehicle traffic. Traffic on the northbound to westbound ramp was not counted. 2 pedestrians walked along the west shoulder and are not included in the pedestrian crossings totals. Conflicts occurred throughout the count between S/B U-turns and W/B right turns.

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

Turning Movement Count
Summary Report
Including OFF Peak, PM Peak and PHF
All Vehicles Except Bicycles and Personal E-Transportation

Huntmar Drive & Palladium Drive — Stittsville, ON

Survey Date: Saturday, June 21, 2025 | **Start Time:** 1100 | **AADT Factor:** 1.1
Weather: AM: Cloudy 23° C | **Survey Duration:** 5 Hrs. | **Survey Hours:** 1100 - 1600
Weather PM: Cloudy 27° C | **Surveyor(s):** J. Mousseau

	Palladium Dr. Eastbound					Palladium Dr. Westbound						Huntmar Dr. Northbound						Huntmar Dr. Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
1100-1200	37	178	202	10	**427**	75	179	118	0	**372**	**799**	258	404	83	0	**745**	116	288	54	0	**458**	**1203**	**2002**
1200-1300	44	175	198	13	**430**	93	196	132	0	**421**	**851**	257	396	59	0	**712**	145	362	70	1	**578**	**1290**	**2141**
1300-1400	30	122	215	3	**370**	82	176	124	0	**382**	**752**	235	373	64	0	**672**	127	303	78	0	**508**	**1180**	**1932**
1400-1500	35	104	206	7	**352**	61	181	117	0	**359**	**711**	238	306	52	0	**596**	148	328	92	0	**568**	**1164**	**1875**
1500-1600	19	134	226	7	**386**	58	158	90	0	**306**	**692**	199	352	57	0	**608**	160	385	111	0	**656**	**1264**	**1956**
Totals	**165**	**713**	**1047**	**40**	**1965**	**369**	**890**	**581**	**0**	**1840**	**3805**	**1187**	**1831**	**315**	**0**	**3333**	**696**	**1666**	**405**	**1**	**2768**	**6101**	**9906**

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

OFF Peak Hour Factor ➡ 0.90												Highest Hourly Vehicle Volume Between 1100h & 1500h										
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1130-1230	47	175	220	10	**452**	87	217	126	0	**430**	**882**	269	380	75	0	**724**	139	330	67	0	**536**	**1260**	**2142**

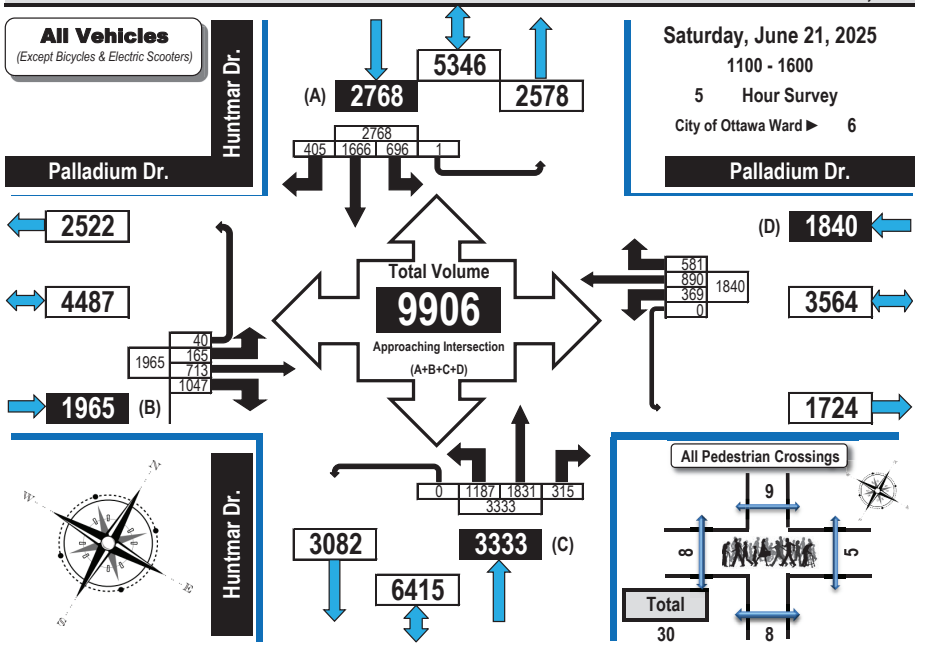
PM Peak Hour Factor ➡ 0.94												Highest Hourly Vehicle Volume Between 1500h & 1900h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1500-1600	19	134	226	7	**386**	58	158	90	0	**306**	**692**	199	352	57	0	**608**	160	385	111	0	**656**	**1264**	**1956**

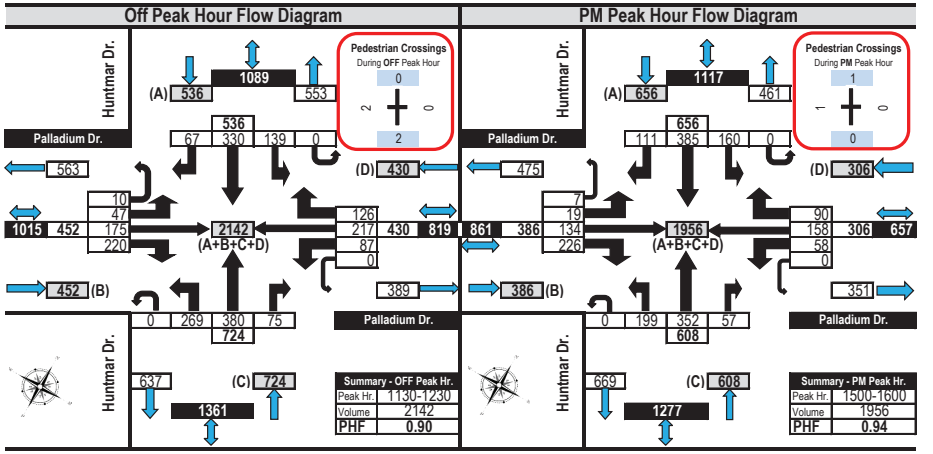
Comments:
OC Transpo and Para Transpo buses, 1 school bus and 1 tour bus comprised 33.33% of the heavy vehicle traffic.

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

Turning Movement Count
Summary, OFF and PM Peak Hour
Flow Diagrams
All Vehicles Except Bicycles and Personal E-Transportation

Huntmar Drive & Palladium Drive — Stittsville, ON





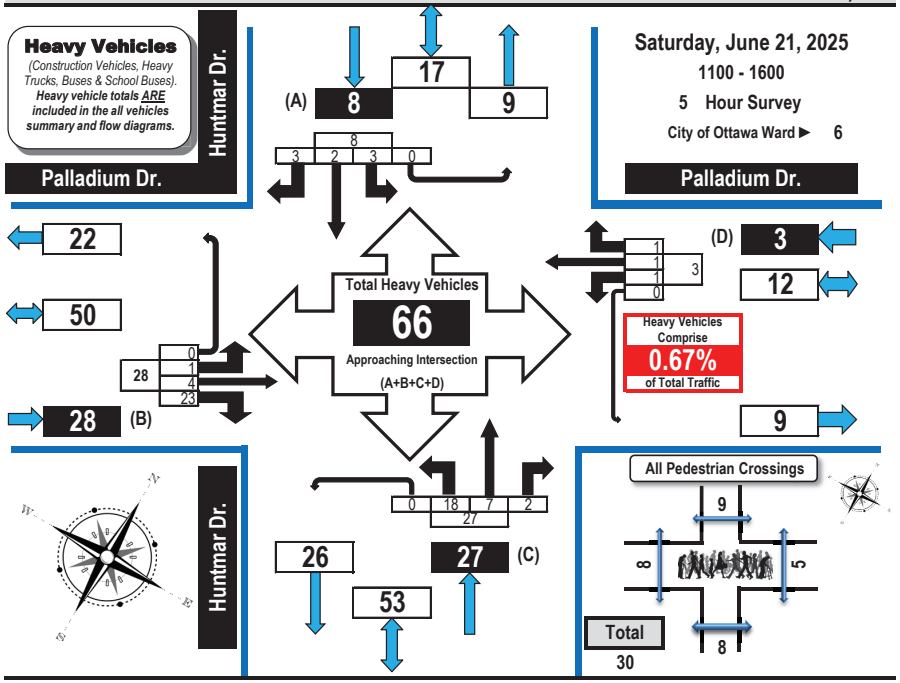
Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



Huntmar Drive & Palladium Drive — **Stittsville, ON**

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

Saturday, June 21, 2025
1100 - 1600
5 Hour Survey
City of Ottawa Ward ► 6



	Palladium Dr.					Palladium Dr.					Huntmar Dr.					Huntmar Dr.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	1	0	5	0	6	0	1	0	0	1	2	2	0	0	4	0	0	1	0	1	12
1200-1300	0	0	4	0	4	1	0	1	0	2	6	4	0	0	10	0	1	1	0	2	18
1300-1400	0	1	6	0	7	0	0	0	0	0	2	1	1	0	4	0	0	0	0	0	11
1400-1500	0	2	2	0	4	0	0	0	0	0	5	0	0	0	5	3	0	1	0	4	13
1500-1600	0	1	6	0	7	0	0	0	0	0	3	0	1	0	4	0	1	0	0	1	12
Totals	1	4	23	0	28	1	1	1	0	3	18	7	2	0	27	3	2	3	0	8	66

Comments:

OC Transpo and Para Transpo buses, 1 school bus and 1 tour bus comprised 33.33% of the heavy vehicle traffic.

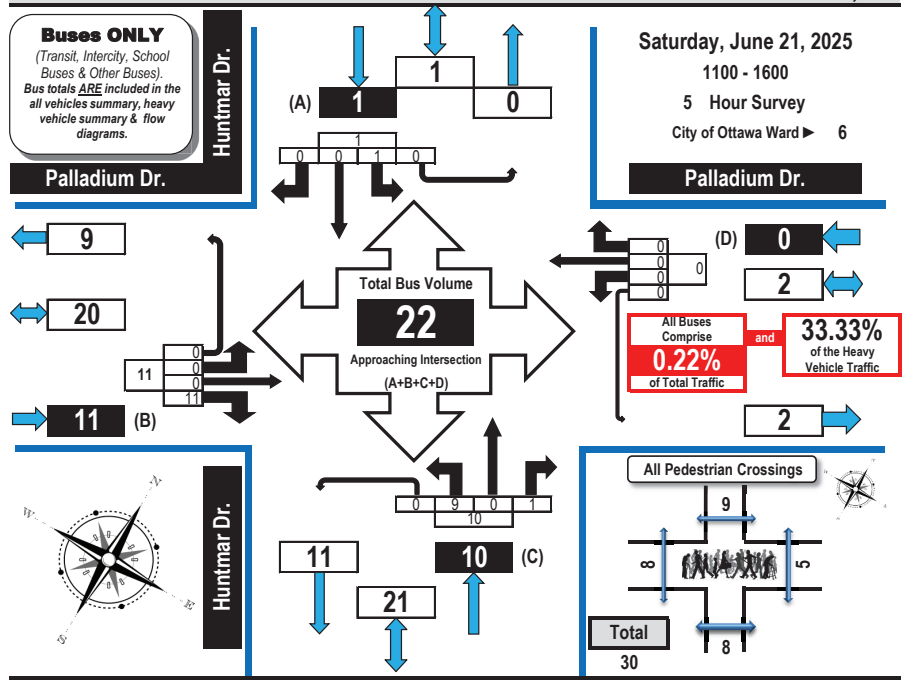
Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram



Huntmar Drive & Palladium Drive — **Stittsville, ON**

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Saturday, June 21, 2025
1100 - 1600
5 Hour Survey
City of Ottawa Ward ► 6

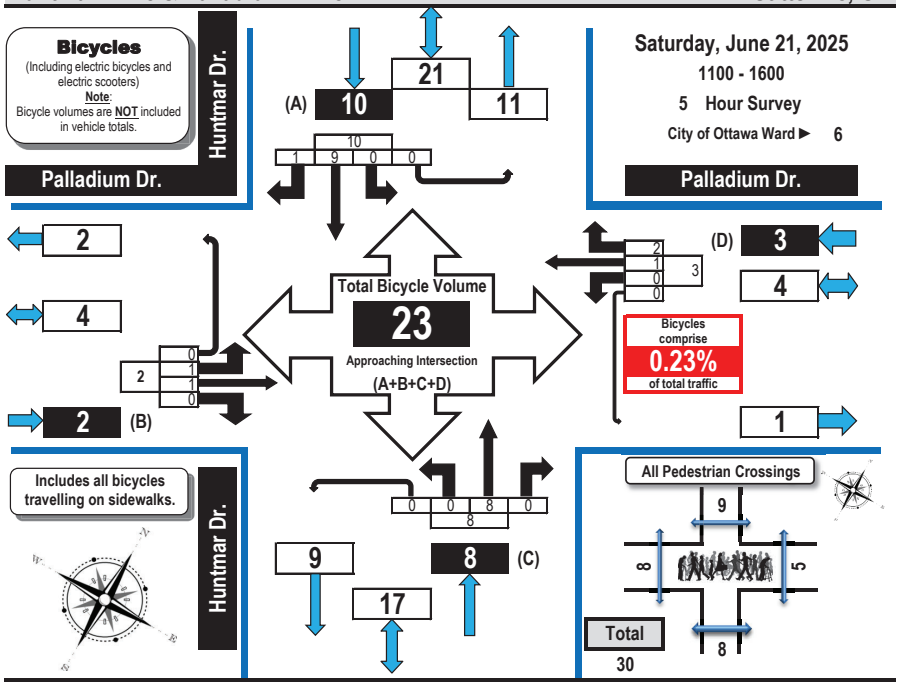


	Palladium Dr.					Palladium Dr.					Huntmar Dr.					Huntmar Dr.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	3
1200-1300	0	0	3	0	3	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	6
1300-1400	0	0	2	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3
1400-1500	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	4
1500-1600	0	0	4	0	4	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	6
Totals	0	0	11	0	11	0	0	0	0	0	9	0	1	0	10	1	0	0	0	1	22

Comments:
OC Transpo and Para Transpo buses, 1 school bus and 1 tour bus comprised 33.33% of the heavy vehicle traffic.

Turning Movement Count
Bicycles and Personal E-Transportation Summary
Flow Diagram

Huntmar Drive & Palladium Drive — **Stittsville, ON**



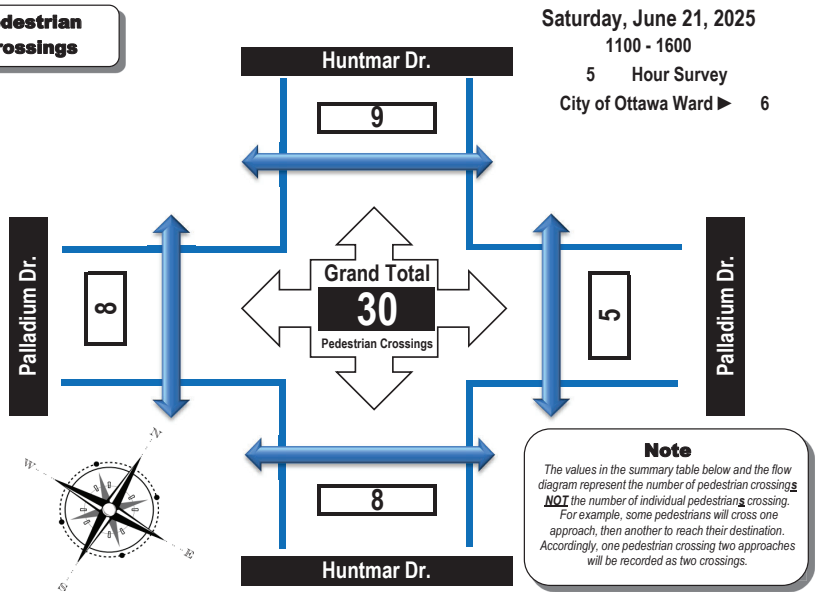
	Palladium Dr. Eastbound					Palladium Dr. Westbound					Huntmar Dr. Northbound					Huntmar Dr. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
1100-1200	1	0	0	0	1	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	4
1200-1300	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	4	0	0	4	5
1300-1400	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	2	3
1400-1500	0	0	0	0	0	0	1	1	0	2	0	1	0	0	1	0	3	0	0	3	6
1500-1600	0	1	0	0	1	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	5
Totals	1	1	0	0	2	0	1	2	0	3	0	8	0	0	8	0	9	1	0	10	23

Comments:

OC Transpo and Para Transpo buses, 1 school bus and 1 tour bus comprised 33.33% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

Huntmar Drive & Palladium Drive — **Stittsville, ON**



Time Period	West Side Crossing Palladium Dr.	East Side Crossing Palladium Dr.	Street Total	South Side Crossing Huntmar Dr.	North Side Crossing Huntmar Dr.	Street Total	Grand Total
1100-1200	1	2	3	6	2	8	11
1200-1300	4	0	4	0	2	2	6
1300-1400	2	1	3	1	2	3	6
1400-1500	0	2	2	1	2	3	5
1500-1600	1	0	1	0	1	1	2
Totals	8	5	13	8	9	17	30

Comments:

OC Transpo and Para Transpo buses, 1 school bus and 1 tour bus comprised 33.33% of the heavy vehicle traffic.

Turning Movement Count
Summary Report
Including AM and PM Peak Hours
All Vehicles Except Bicycles and Personal E-Transportation

Huntmar Drive & Palladium Drive — Stittsville, ON

Survey Date: Tuesday, June 24, 2025 **Start Time:** 0700 **AADT Factor:** 0.9
Weather AM: Sunny 25° C **Survey Duration:** 6 Hrs. **Survey Hours:** 0700-1000 & 1500-1800
Weather PM: Mostly Sunny 34° C **Surveyor(s):** J. Mousseau

	Palladium Dr. Eastbound					Palladium Dr. Westbound						Huntmar Dr. Northbound					Huntmar Dr. Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	17	123	132	11	**283**	31	51	27	0	**109**	**392**	287	195	40	0	**522**	31	149	20	0	**200**	**722**	**1114**
0800-0900	56	181	162	11	**410**	40	85	46	0	**171**	**581**	275	333	99	0	**707**	70	208	27	0	**305**	**1012**	**1593**
0900-1000	38	167	148	13	**366**	53	98	58	0	**209**	**575**	189	284	83	0	**556**	73	187	36	0	**296**	**852**	**1427**
1500-1600	35	116	256	4	**411**	80	255	102	0	**437**	**848**	249	307	37	0	**593**	97	302	55	0	**454**	**1047**	**1895**
1600-1700	41	160	320	3	**524**	108	321	110	0	**539**	**1063**	238	326	44	0	**608**	136	423	103	0	**662**	**1270**	**2333**
1700-1800	31	140	304	6	**481**	95	284	103	0	**482**	**963**	223	305	61	0	**589**	125	424	93	0	**642**	**1231**	**2194**
Totals	218	887	1322	48	**2475**	407	1094	446	0	**1947**	**4422**	1461	1750	364	0	**3575**	532	1693	334	0	**2559**	**6134**	**10556**

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

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

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

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

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

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

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

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

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.88												Highest Hourly Vehicle Volume Between 0700h & 1000h										
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot	Gr. Total
0815-0915	60	194	162	8	**424**	46	95	48	0	**189**	**613**	246	350	99	0	**695**	73	204	28	0	**305**	**1000**	**1613**

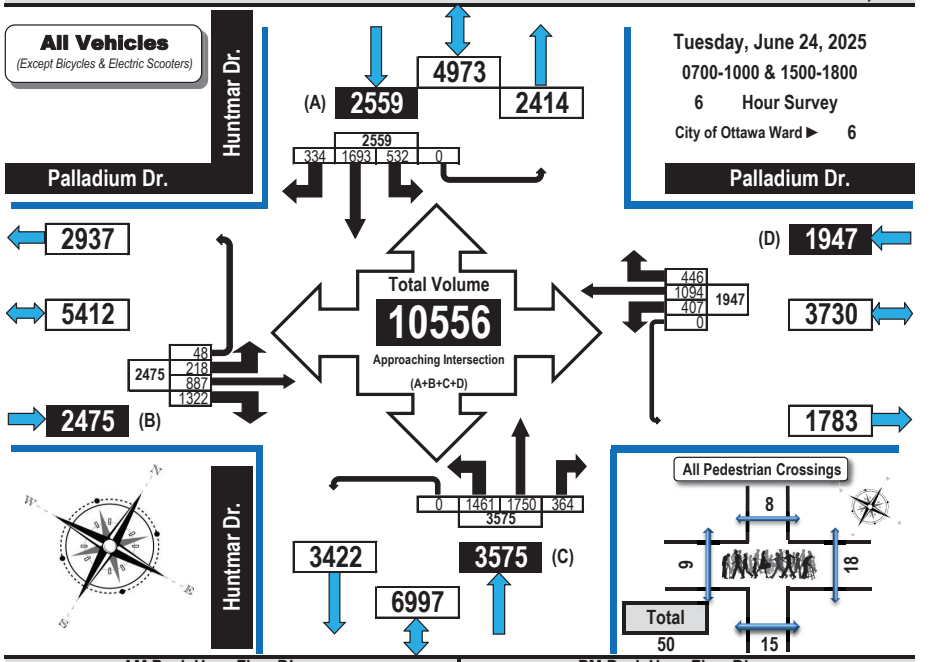
PM Peak Hour Factor ➡ 0.97												Highest Hourly Vehicle Volume Between 1500h & 1800h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot	Gr. Total
1615-1715	38	160	328	4	**530**	116	329	100	0	**545**	**1075**	231	332	47	0	**610**	136	449	105	0	**690**	**1300**	**2375**

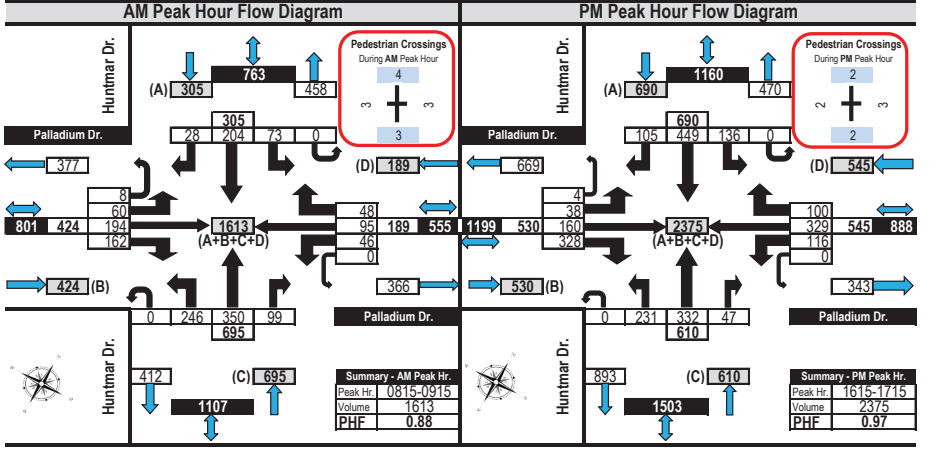
Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 41.67% of the heavy vehicle traffic.

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

Turning Movement Count
Summary, AM and PM Peak Hour
Flow Diagrams
All Vehicles Except Bicycles and Personal E-Transportation

Huntmar Drive & Palladium Drive — Stittsville, ON





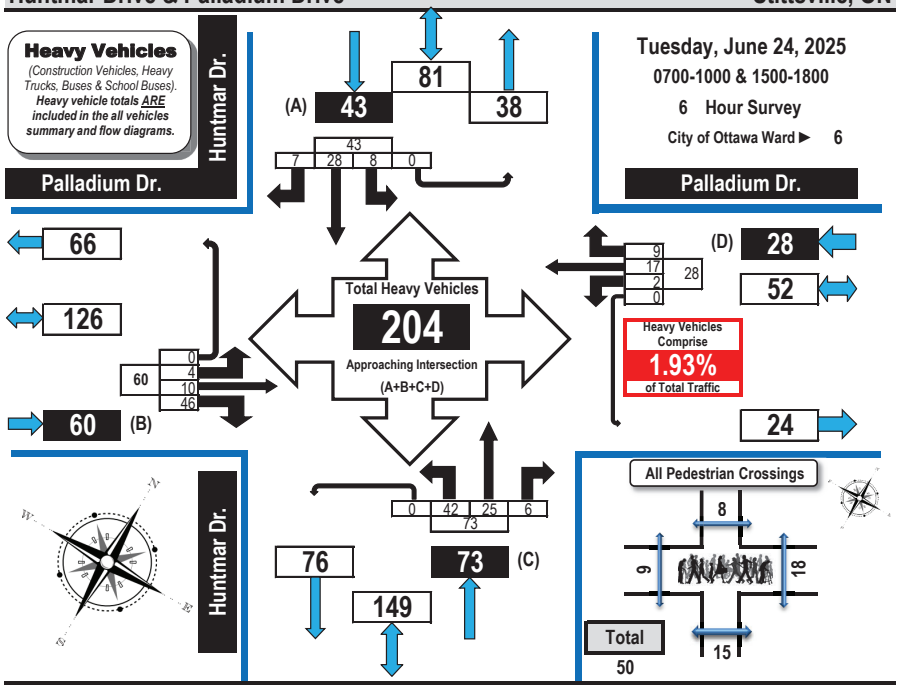
Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



Huntmar Drive & Palladium Drive — **Stittsville, ON**

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

Tuesday, June 24, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6



	Palladium Dr. Eastbound					Palladium Dr. Westbound					Huntmar Dr. Northbound					Huntmar Dr. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	1	7	0	8	0	4	1	0	5	7	6	2	0	15	2	10	2	0	14	42
0800-0900	1	3	8	0	12	0	6	0	0	6	8	4	2	0	14	1	6	2	0	9	41
0900-1000	1	3	6	0	10	0	2	2	0	4	4	4	2	0	10	2	6	1	0	9	33
1500-1600	1	2	9	0	12	1	3	4	0	8	12	4	0	0	16	1	1	1	0	3	39
1600-1700	1	0	11	0	12	1	1	2	0	4	7	5	0	0	12	1	5	1	0	7	35
1700-1800	0	1	5	0	6	0	1	0	0	1	4	2	0	0	6	1	0	0	0	1	14
Totals	4	10	46	0	60	2	17	9	0	28	42	25	6	0	73	8	28	7	0	43	204

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 41.67% of the heavy vehicle traffic.

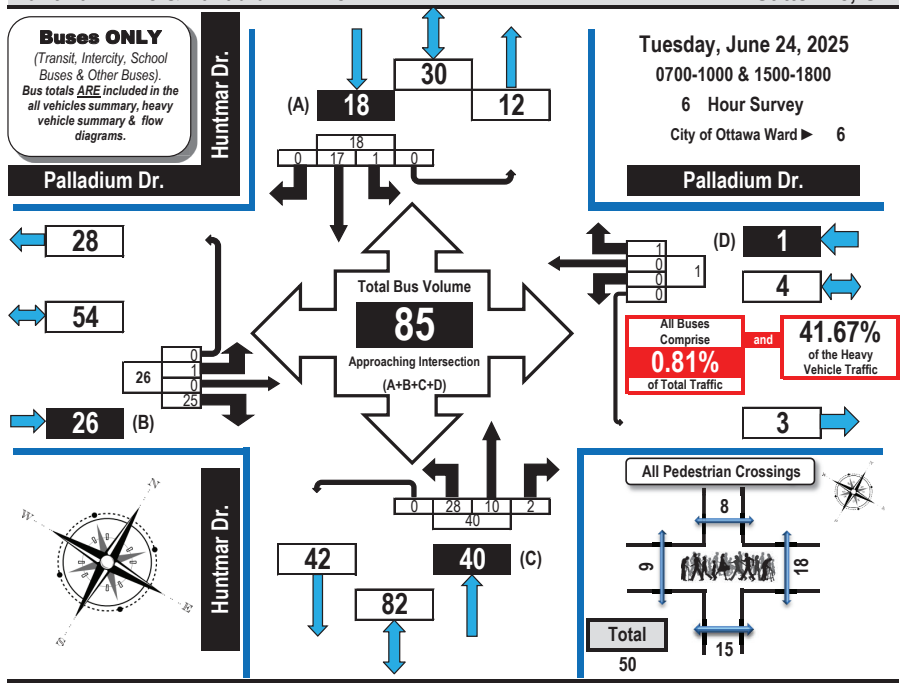
Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram



Huntmar Drive & Palladium Drive — **Stittsville, ON**

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Tuesday, June 24, 2025
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 6

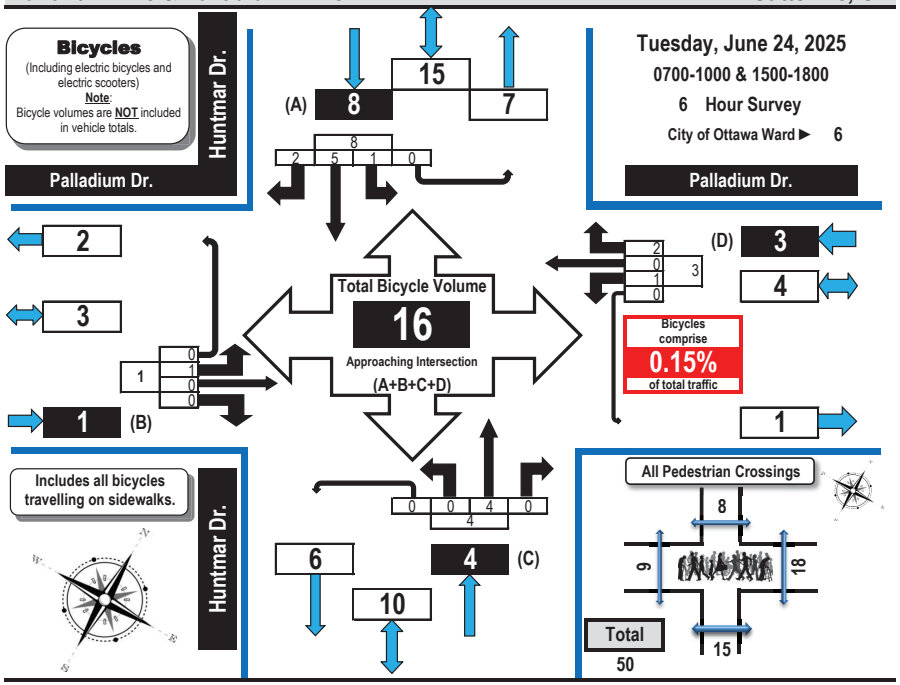


	Palladium Dr. Eastbound					Palladium Dr. Westbound					Huntmar Dr. Northbound					Huntmar Dr. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0	5	0	5	0	0	0	0	0	7	2	1	0	10	0	8	0	0	8	23
0800-0900	1	0	6	0	7	0	0	0	0	0	8	1	0	0	9	0	5	0	0	5	21
0900-1000	0	0	1	0	1	0	0	0	0	0	2	2	1	0	5	0	3	0	0	3	9
1500-1600	0	0	5	0	5	0	0	1	0	1	7	2	0	0	9	1	0	0	0	1	16
1600-1700	0	0	5	0	5	0	0	0	0	0	3	3	0	0	6	0	1	0	0	1	12
1700-1800	0	0	3	0	3	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	4
Totals	1	0	25	0	26	0	0	1	0	1	28	10	2	0	40	1	17	0	0	18	85

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 41.67% of the heavy vehicle traffic.

Turning Movement Count
Bicycles and Personal E-Transportation Summary
Flow Diagram

Huntmar Drive & Palladium Drive — **Stittsville, ON**

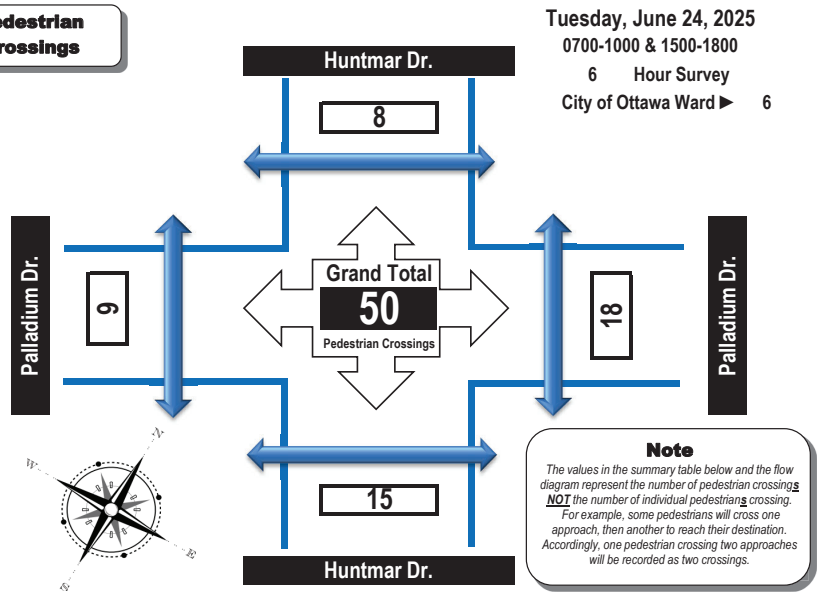


	Palladium Dr. Eastbound					Palladium Dr. Westbound					Huntmar Dr. Northbound					Huntmar Dr. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
0900-1000	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	3
1500-1600	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	3
1600-1700	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	2	4
1700-1800	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
Totals	1	0	0	0	1	1	0	2	0	3	0	4	0	0	4	1	5	2	0	8	16

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 41.67% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

Huntmar Drive & Palladium Drive — **Stittsville, ON**



Time Period	West Side Crossing Palladium Dr.	East Side Crossing Palladium Dr.	Street Total	South Side Crossing Huntmar Dr.	North Side Crossing Huntmar Dr.	Street Total	Grand Total
0700-0800	3	2	5	5	0	5	10
0800-0900	3	3	6	3	4	7	13
0900-1000	0	0	0	2	0	2	2
1500-1600	1	4	5	1	2	3	8
1600-1700	0	4	4	3	1	4	8
1700-1800	2	5	7	1	1	2	9
Totals	9	18	27	15	8	23	50

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 41.67% of the heavy vehicle traffic.

Ontario
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TES - Traffic Engineering System

Turning Movement 15 Minute Report

Description: HWY 417 @ PALLADIUM DR - RAMP 61
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_61T
Count Period. 6/20/2023 7:00:00 AM
Count Start Date: 6/20/2023 12:00:00 AM
6/20/2023 6:00:00 PM
Int. Type: T-Intersection

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		
07:00	10	38	0	3	2	0	2	0	0	0	0	38	17	0	3	1	0	0	0	0	26	0	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	182
07:15	12	41	0	0	2	0	0	1	0	0	0	39	9	0	6	1	0	1	1	0	34	0	40	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	190
07:30	16	38	0	3	3	0	0	0	0	0	0	42	21	0	3	0	0	3	1	0	40	0	49	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	221
07:45	36	35	0	1	4	0	2	0	0	0	0	56	13	0	0	1	0	1	1	0	58	0	63	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	275
08:00	19	48	0	2	2	0	0	2	0	0	0	61	18	0	4	0	0	0	0	0	49	0	65	2	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	278
08:15	29	51	0	0	3	0	0	1	0	0	0	56	27	0	0	2	0	0	0	0	67	0	77	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	317
08:30	26	56	0	0	4	0	2	0	0	0	0	64	16	0	1	1	0	2	0	0	53	0	89	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	315
08:45	17	62	0	0	3	0	0	1	0	0	0	47	16	0	0	1	0	1	0	0	65	0	109	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	326
11:00	24	75	0	1	3	0	1	0	0	1	0	42	31	0	1	3	0	1	1	0	38	0	57	1	0	2	1	0	2	1	0	0	0	0	0	0	0	0	0	0	284
11:15	38	66	0	1	1	0	0	1	0	0	0	54	37	0	1	0	0	2	1	0	32	0	60	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	297
11:30	44	67	0	0	1	0	0	0	0	0	0	72	29	0	0	2	0	4	3	0	32	0	69	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	325
11:45	34	85	0	0	0	0	2	2	0	0	0	63	33	0	0	2	0	1	2	0	43	0	69	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	339
12:00	40	102	0	0	0	0	0	1	0	0	0	74	36	0	0	0	0	0	0	0	44	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	372
12:15	42	92	0	0	0	0	2	1	0	0	0	50	46	0	5	1	0	1	6	0	36	0	91	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	377
12:30	42	81	0	0	2	0	0	1	0	0	0	62	37	0	0	1	0	1	1	0	44	0	85	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	359
12:45	35	95	0	1	1	0	3	1	0	0	0	54	42	0	0	0	0	2	1	0	51	0	99	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	387
13:00	32	98	0	2	0	0	3	1	0	0	0	45	54	0	1	1	0	3	2	0	44	0	97	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	386
13:15	39	92	0	1	3	0	0	0	0	0	0	46	40	0	0	1	0	4	0	0	63	0	89	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	379
13:30	41	78	0	0	0	0	1	1	0	0	0	63	45	0	0	1	0	1	1	0	61	0	85	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	381
13:45	47	95	0	2	3	0	1	1	0	0	0	56	38	0	3	0	0	1	0	0	59	0	90	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	399
15:00	53	104	0	2	1	0	0	3	0	0	0	46	61	0	2	1	0	1	0	0	52	0	63	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	390

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		
15:15	47	75	0	0	0	0	0	0	0	0	0	41	70	0	0	3	0	2	1	0	55	0	60	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	357
15:30	46	84	0	0	1	0	1	1	0	0	0	47	74	0	0	2	0	1	2	0	46	0	82	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	391
15:45	50	76	0	0	0	0	0	1	0	0	0	45	73	0	0	5	0	3	4	0	65	0	73	1	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	400
16:00	50	103	0	1	3	0	1	2	0	0	0	46	84	0	0	3	0	2	0	0	65	0	77	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	438
16:15	59	99	0	0	0	0	0	1	0	0	0	55	93	0	2	1	0	0	0	0	64	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	437
16:30	50	113	0	0	3	0	1	1	0	0	0	57	84	0	3	0	0	1	0	0	57	0	92	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	464
16:45	59	110	0	0	2	0	0	1	0	0	0	50	75	0	1	1	0	1	1	0	80	0	81	0	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	467
17:00	41	113	0	0	3	0	1	1	0	0	0	53	78	0	2	0	0	2	0	0	72	0	58	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	429
17:15	41	81	0	0	1	0	0	0	0	0	0	59	69	0	2	1	0	3	0	0	58	0	75	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	394
17:30	40	91	0	0	0	0	1	1	0	0	0	37	61	0	2	0	0	0	0	0	77	0	71	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	389
17:45	29	76	0	0	0	0	0	3	0	0	0	27	58	0	3	0	0	1	0	0	68	0	87	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	354

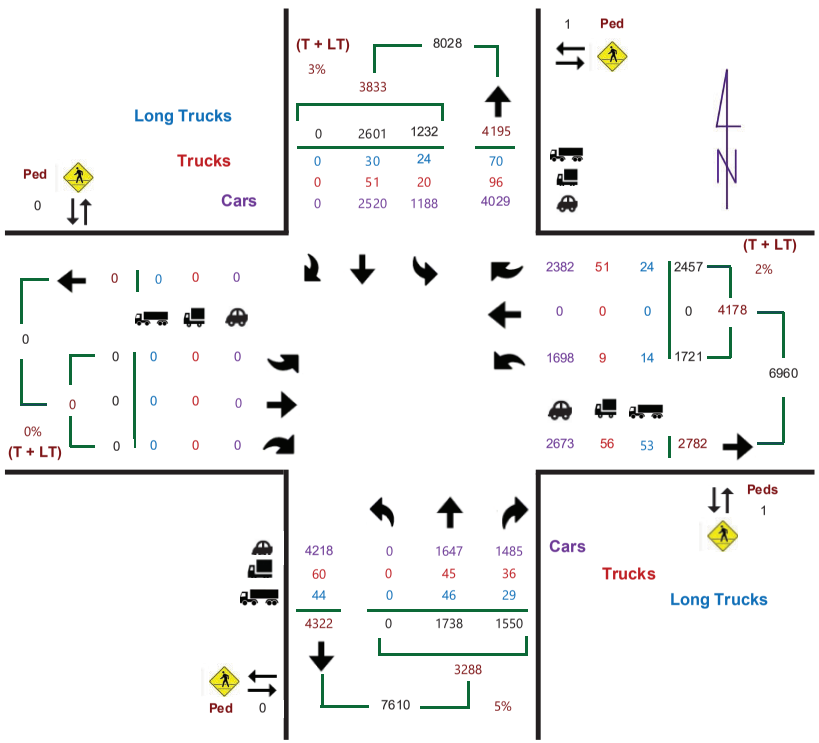
Ontario

TES - Traffic Engineering System
Turning Movement Count Period Report - Full Study

Description: HWY 417 @ PALLADIUM DR - RAMP 61
Region EAST
LHRS_Offset: 49562_0000_61T
Count Start Date: Tuesday, 20 June, 2023
Int. Type: T-Intersection

Hwy #: HWY 417
Count Period: 6/20/2023 07:00 AM to 6/20/2023 06:00 PM

Full Study



Ontario

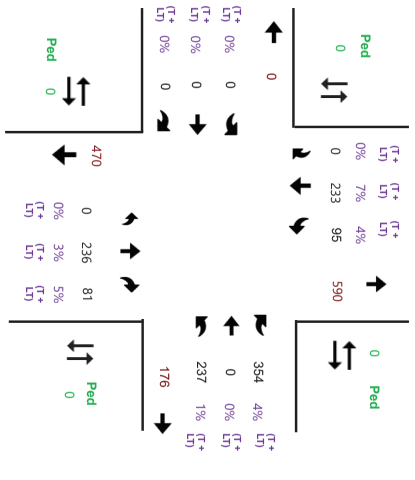
TES - Traffic Engineering System
Turning Movement Total Count and Peak Summary Report

Description: HWY 417 @ PALLADIUM DR - RAMP 61
Region EAST
LHRS_Offset: 49562_0000_61T
Count Date: Tuesday, 20 June, 2023

Hwy #: HWY 417
Int. Type: T-Intersection

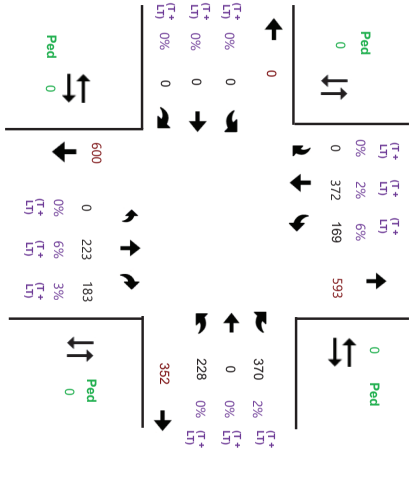
AM Period

Tue, 20 Jun, 2023 08:00 AM - 09:00 AM



MD Period

Tue, 20 Jun, 2023 01:00 PM - 02:00 PM



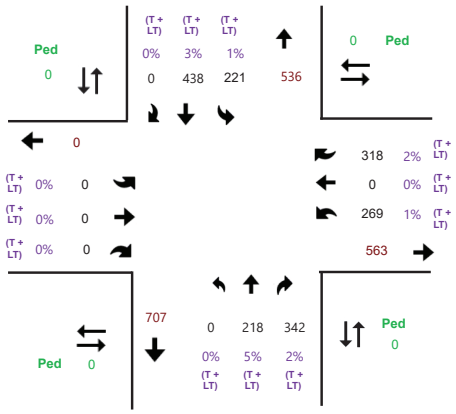
Ontario

TES - Traffic Engineering System

Turning Movement Total Count and Peak Summary Report

Description: HWY 417 @ PALLADIUM DR - RAMP 61
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_61T
Int. Type: T-Intersection
Count Date: Tuesday, 20 June, 2023

PM Period Tue, 20 Jun, 2023 04:00 PM - 05:00 PM



Ontario
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TES - Traffic Engineering System

Turning Movement 15 Minute Report

Description: HWY 417 @ PALLADIUM DR - RAMP 61
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_61T
Count Period. 9/26/2023 7:00:00 AM
Count Start Date: 9/26/2023 12:00:00 AM
9/26/2023 6:00:00 PM
Int. Type: T-Intersection

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT	
07:00	14	50	0	1	3	0	6	5	0	0	0	47	15	0	2	0	0	7	0	0	27	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	215
07:15	18	31	0	1	1	0	11	4	0	0	0	25	18	0	4	0	0	7	0	0	34	0	48	1	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	207
07:30	13	32	0	0	6	0	6	1	0	0	0	41	21	0	0	0	0	11	0	0	35	0	41	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208
07:45	29	52	0	0	0	0	8	1	0	0	0	59	22	0	2	0	0	6	0	0	27	0	81	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	292
08:00	23	63	0	1	2	0	6	1	0	0	0	37	18	0	3	0	0	11	0	0	51	0	68	1	0	4	2	0	1	0	0	0	0	0	0	0	0	0	0	0	292
08:15	25	56	0	1	3	0	10	2	0	0	0	56	29	0	0	1	0	9	1	0	32	0	67	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	296
08:30	22	48	0	1	0	0	8	1	0	0	0	45	21	0	4	0	0	10	0	0	39	0	83	2	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	288
08:45	26	49	0	5	1	0	9	1	0	0	0	55	22	0	1	1	0	8	1	0	55	0	95	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330
11:00	27	67	0	0	3	0	7	1	0	0	0	40	22	0	1	2	0	9	1	0	36	0	68	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	287
11:15	31	66	0	0	0	0	8	2	0	0	0	44	32	0	1	2	0	8	1	0	23	0	67	1	0	2	1	0	4	0	0	0	0	0	0	0	0	0	0	0	293
11:30	28	74	0	1	4	0	6	3	0	1	0	44	35	0	1	0	0	7	2	0	22	0	76	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	306
11:45	26	68	0	0	0	0	10	4	0	0	0	61	39	0	1	0	0	7	0	0	35	0	76	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	329
12:00	36	89	0	0	4	0	4	0	0	0	0	54	44	0	1	0	0	7	0	0	32	0	85	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	361
12:15	39	71	0	2	3	0	6	3	0	0	0	50	33	0	0	1	0	10	2	0	41	0	64	3	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	332
12:30	29	85	0	0	4	0	10	0	0	0	0	49	35	0	2	1	0	5	4	0	37	0	61	1	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	327
12:45	31	97	0	0	0	0	5	1	0	0	0	48	37	0	0	0	0	10	0	0	44	0	78	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	354
13:00	31	71	0	1	0	0	10	2	0	0	0	47	40	0	3	0	0	10	0	0	56	0	54	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	329
13:15	31	86	0	1	2	0	8	5	0	0	0	57	40	0	0	1	0	3	2	0	37	0	61	0	0	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	339
13:30	39	62	0	3	2	0	8	1	0	0	0	43	38	0	3	0	0	11	1	0	35	0	61	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	309
13:45	42	74	0	0	3	0	7	2	0	0	0	47	30	0	0	0	0	10	1	0	28	0	70	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	318
15:00	55	88	0	4	0	0	4	4	0	0	0	32	64	0	0	0	0	13	0	0	45	0	65	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	378

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		
15:15	55	59	0	0	1	0	9	1	0	0	0	39	76	0	0	1	0	4	1	0	61	0	54	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	364
15:30	53	67	0	0	0	0	8	3	0	0	0	37	73	0	0	2	0	5	2	0	60	0	63	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	376
15:45	49	72	0	2	2	0	4	2	0	0	0	43	68	0	1	1	0	16	2	0	58	0	60	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	383
16:00	52	98	0	0	1	0	9	5	0	0	0	45	102	0	1	2	0	5	3	0	65	0	62	1	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	455
16:15	53	90	0	0	0	0	5	2	0	0	0	51	75	0	2	0	0	5	1	0	49	0	54	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	390
16:30	61	96	0	0	1	0	5	1	0	0	0	55	66	0	1	2	0	3	1	0	60	0	80	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	436
16:45	62	111	0	0	3	0	1	0	0	0	0	56	68	0	2	1	0	3	1	0	53	0	58	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	421
17:00	57	100	0	0	2	0	2	1	0	0	0	41	83	0	2	0	0	1	0	0	63	0	77	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	433
17:15	37	109	0	1	1	0	0	0	0	0	0	46	69	0	0	0	0	0	0	0	63	0	79	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	410
17:30	41	90	0	0	2	0	1	1	0	0	0	44	56	0	1	0	0	1	1	0	47	0	50	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	340
17:45	31	95	0	0	0	0	0	0	0	0	0	36	66	0	3	0	0	0	1	0	61	0	70	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	368

Ontario

TES - Traffic Engineering System

Turning Movement Count Period Report - Full Study

Description: HWY 417 @ PALLADIUM DR - RAMP 61

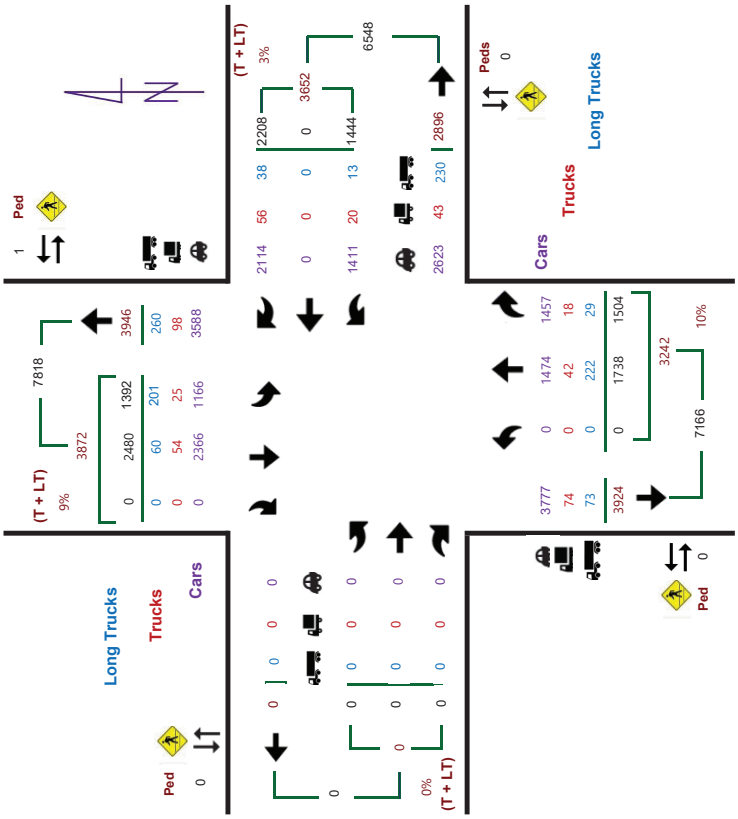
Region EAST **Hwy #:** HWY 417

LHRS_Offset: 49562_0000_61T **Count Period:** 9/26/2023 07:00 AM to 9/26/2023 06:00 PM

Count Start Date: Tuesday, 26 September, 2023

Int. Type: T-Intersection

Full Study

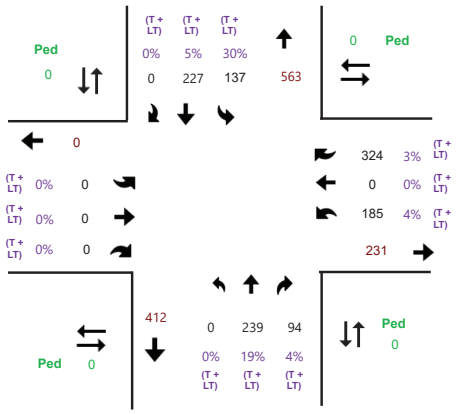


Ontario

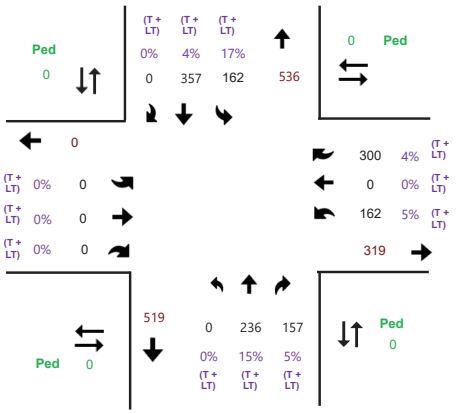
TES - Traffic Engineering System
Turning Movement Total Count and Peak Summary Report

Description: HWY 417 @ PALLADIUM DR - RAMP 61
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_61T
Int. Type: T-Intersection
Count Date: Tuesday, 26 September, 2023

AM Period Tue, 26 Sep, 2023 08:00 AM - 09:00 AM



MD Period Tue, 26 Sep, 2023 12:00 PM - 01:00 PM

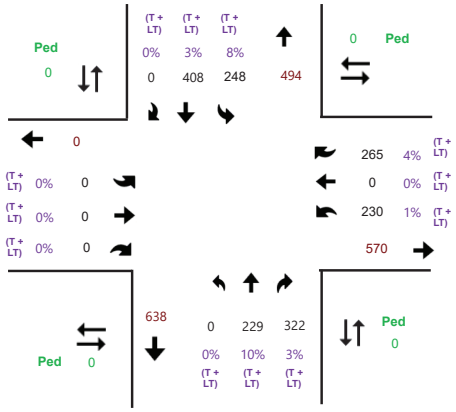


Ontario

TES - Traffic Engineering System
Turning Movement Total Count and Peak Summary Report

Description: HWY 417 @ PALLADIUM DR - RAMP 61
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_61T
Int. Type: T-Intersection
Count Date: Tuesday, 26 September, 2023

PM Period Tue, 26 Sep, 2023 04:00 PM - 05:00 PM



Ontario
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TES - Traffic Engineering System

Turning Movement 15 Minute Report

Description: HWY 417 @ PALLADIUM DR - RAMP 51
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_51T
Count Period. 6/20/2023 7:00:00 AM
Count Start Date: 6/20/2023 12:00:00 AM
6/20/2023 6:00:00 PM
Int. Type: T-Intersection

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT	
07:00	0	37	34	0	0	2	0	0	0	0	0	31	76	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	27	3	0	1	1	0	1	0	235
07:15	0	41	30	0	0	2	0	1	0	0	0	14	62	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	36	0	35	6	0	4	1	0	0	0	234
07:30	0	45	32	0	0	3	0	1	0	0	0	33	75	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	29	0	46	2	0	0	2	0	1	0	274
07:45	0	60	24	0	0	3	0	0	0	0	0	25	65	0	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	47	0	59	0	0	0	0	0	0	0	287
08:00	0	66	33	0	1	1	0	2	0	0	0	34	60	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	54	3	0	1	0	0	2	0	303
08:15	0	88	30	0	1	3	0	2	1	0	0	43	60	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	43	0	0	0	0	0	3	0	309
08:30	0	81	27	0	0	3	0	0	0	0	0	42	59	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	39	0	53	1	0	1	0	0	0	0	309
08:45	0	87	42	0	0	4	0	0	0	0	0	42	68	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	29	0	50	0	0	1	0	0	2	0	328
11:00	0	52	49	0	1	3	0	1	0	0	0	53	43	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	24	0	32	0	0	0	1	0	0	0	264
11:15	0	55	43	0	1	0	0	1	2	0	0	60	41	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	25	0	43	1	0	0	1	0	0	0	276
11:30	0	48	55	0	2	1	0	2	0	0	0	71	57	0	2	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	42	0	25	0	0	0	3	0	2	0	315
11:45	0	65	56	0	0	0	0	1	1	0	0	59	76	0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	40	0	26	0	0	0	0	0	0	0	329
12:00	0	77	71	0	0	1	0	1	0	1	0	71	144	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	30	0	30	0	0	0	0	0	2	0	432
12:15	0	68	70	0	1	0	0	1	0	0	0	70	119	0	3	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	34	0	16	3	0	1	0	0	0	0	393
12:30	0	65	58	0	1	1	0	0	1	0	0	61	53	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	35	0	24	1	0	0	1	0	2	0	308
12:45	0	74	62	0	1	0	0	1	0	0	0	76	52	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	25	0	36	1	0	1	1	0	2	0	334
13:00	0	80	71	0	0	0	0	1	0	0	0	67	37	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	31	0	31	0	0	1	1	0	0	0	325
13:15	0	84	62	0	1	3	0	0	0	0	0	63	41	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	23	0	36	0	0	0	3	0	1	0	319
13:30	0	86	59	0	0	0	0	1	0	0	0	70	31	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	29	0	0	0	1	0	1	0	313
13:45	0	87	58	0	0	1	0	0	0	0	0	68	46	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	35	0	32	1	0	3	0	0	1	0	335
15:00	0	84	62	0	1	3	0	3	1	0	0	83	57	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	27	0	33	2	0	2	0	0	1	0	362

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT	
15:15	0	77	54	0	0	0	0	0	0	0	0	79	42	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	22	0	22	2	0	1	1	0	1	0	305
15:30	0	67	57	0	0	0	0	2	0	0	0	88	50	0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	28	0	24	0	0	1	0	0	1	0	323
15:45	0	88	50	0	2	1	0	1	0	1	0	98	45	0	2	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	30	0	24	0	0	0	1	0	0	0	348
16:00	0	88	77	0	1	3	0	2	2	0	0	107	49	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	21	0	33	0	0	1	0	0	0	0	388
16:15	0	92	70	0	0	0	0	1	0	0	0	106	83	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	40	0	28	1	0	0	0	0	0	0	424
16:30	0	78	99	0	2	0	0	1	0	0	0	119	144	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	33	0	0	0	1	0	0	0	497
16:45	0	111	77	0	0	3	0	1	0	0	0	97	109	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	39	0	41	0	0	1	0	0	1	0	484
17:00	0	109	80	0	0	2	0	2	1	0	0	107	84	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	32	0	47	1	0	0	1	0	0	0	468
17:15	0	80	71	0	0	2	0	0	0	0	0	90	81	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	33	0	27	2	0	0	1	0	0	0	390
17:30	0	102	75	0	0	0	0	2	0	0	0	89	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	40	1	0	0	0	0	0	0	399
17:45	0	99	49	0	0	1	0	2	1	0	0	70	43	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	11	0	59	4	0	0	0	0	0	0	340

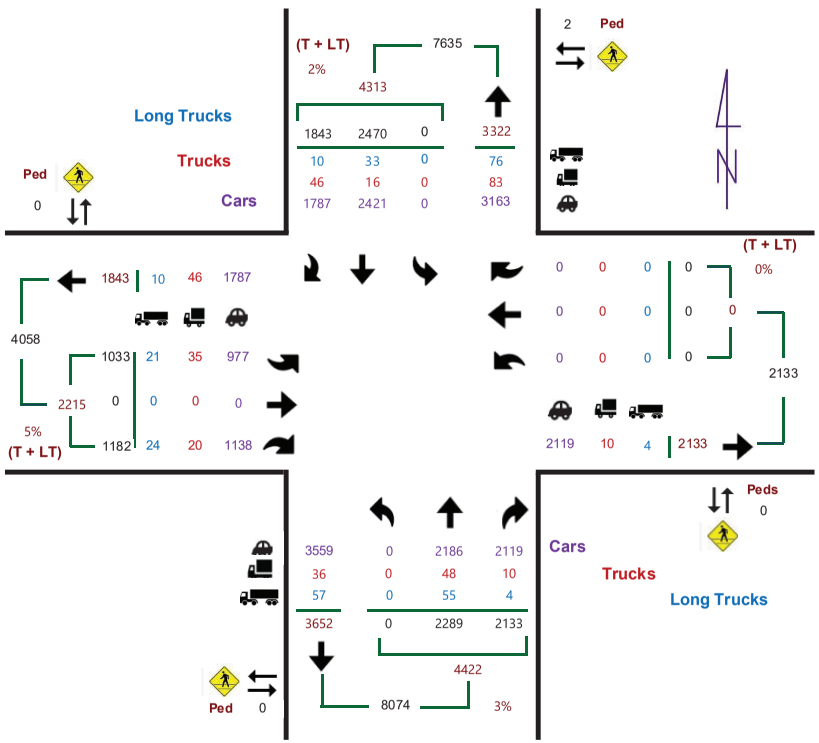
Ontario

TES - Traffic Engineering System
Turning Movement Count Period Report - Full Study

Description: HWY 417 @ PALLADIUM DR - RAMP 51
Region EAST
LHRS_Offset: 49562_0000_51T
Count Start Date: Tuesday, 20 June, 2023
Int. Type: T-Intersection

Hwy #: HWY 417
Count Period: 6/20/2023 07:00 AM to 6/20/2023 06:00 PM

Full Study



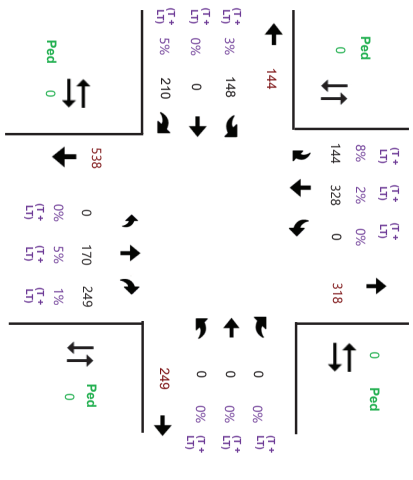
Ontario

TES - Traffic Engineering System
Turning Movement Total Count and Peak Summary Report

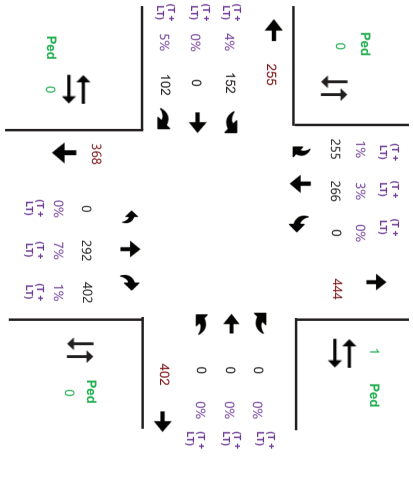
Description: HWY 417 @ PALLADIUM DR - RAMP 51
Region EAST
LHRS_Offset: 49562_0000_51T
Count Date: Tuesday, 20 June, 2023

Hwy #: HWY 417
Int. Type: T-Intersection

AM Period Tue, 20 Jun, 2023 08:00 AM - 09:00 AM



MD Period Tue, 20 Jun, 2023 11:30 AM - 12:30 PM



Ontario

TES - Traffic Engineering System

Turning Movement Total Count and Peak Summary Report

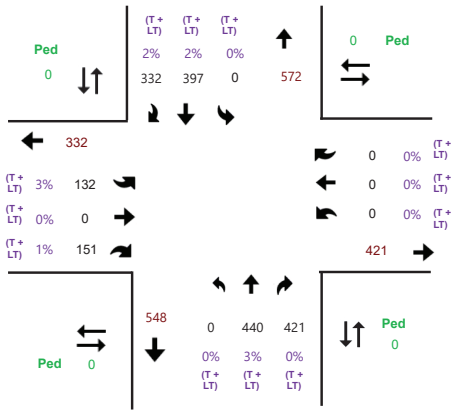
Description: HWY 417 @ PALLADIUM DR - RAMP 51

Region EAST **Hwy #:** HWY 417

LHRS_Offset: 49562_0000_51T **Int. Type:** T-Intersection

Count Date: Tuesday, 20 June, 2023

PM Period Tue, 20 Jun, 2023 04:15 PM - 05:15 PM



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Ministry of Transportation

TES - Traffic Engineering System

Turning Movement 15 Minute Report

Description: HWY 417 @ PALLADIUM DR - RAMP 51

Region EAST **Hwy #:** HWY 417

LHRS_Offset: 49562_0000_51T **Count Period.** 9/26/2023 7:00:00 AM

Count Start Date: 9/26/2023 12:00:00 AM 9/26/2023 6:00:00 PM

Int. Type: T-Intersection

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT	
07:00	0	37	40	0	0	4	0	1	4	0	0	24	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	34	2	0	1	7	0	1	0	256
07:15	0	41	21	0	1	2	0	2	3	0	0	23	66	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	19	0	44	4	0	1	6	0	2	0	237
07:30	0	38	30	0	1	4	0	0	1	0	0	30	69	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	29	0	49	1	0	1	9	0	0	0	264
07:45	0	43	38	0	0	1	0	1	0	0	0	40	49	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	43	0	56	2	0	0	6	0	0	0	280
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08:15	0	49	40	0	3	1	0	2	0	0	0	46	56	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	39	0	36	0	0	0	9	0	4	0	287
08:30	0	56	36	0	2	0	0	0	1	0	0	42	57	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	29	0	50	2	0	0	9	0	1	0	288
08:45	0	63	36	0	2	1	0	0	1	0	0	37	56	0	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	32	0	51	0	0	0	7	0	2	0	292
11:00	0	49	53	0	2	2	0	0	1	0	0	35	40	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	28	1	0	1	9	0	0	0	251
11:15	0	40	48	0	1	1	0	2	1	0	0	53	39	0	3	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	24	0	24	0	0	0	8	0	1	1	247
11:30	0	51	45	0	1	2	0	0	3	0	0	55	34	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	27	0	25	0	0	0	7	0	1	1	256
11:45	0	56	42	0	1	0	0	1	3	0	0	63	41	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	36	0	35	1	0	1	6	0	0	0	288
12:00	0	65	63	0	2	2	0	0	1	0	0	73	39	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	19	0	0	0	7	0	1	0	296
12:15	0	70	41	0	3	4	0	2	1	0	0	53	49	0	1	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	34	0	23	0	0	1	9	0	0	0	297
12:30	0	62	54	0	1	3	0	0	0	0	0	54	30	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	33	0	30	1	0	0	5	0	0	0	279
12:45	0	79	62	0	2	0	0	0	1	0	0	64	27	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	21	0	29	0	0	0	9	0	0	0	297
13:00	0	79	52	0	1	0	0	2	0	0	0	64	32	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	24	2	0	0	10	0	0	0	293
13:15	0	67	51	0	1	0	0	3	4	0	0	65	34	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	30	0	23	0	0	1	3	0	2	0	288
13:30	0	54	35	0	0	2	0	0	1	0	0	52	37	0	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	29	0	33	1	0	1	10	0	0	0	260
13:45	0	58	53	0	2	2	0	1	2	0	0	52	37	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	25	0	25	0	0	0	8	0	0	0	268
15:00	0	67	73	0	0	0	0	2	2	0	0	86	42	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	12	0	19	0	0	1	11	0	3	1	319

Start Time	North										South										East										West										Total
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	
	LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT	LT	TH	RT	
15:15	0	75	37	0	0	0	0	0	2	0	0	93	47	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	19	0	33	0	0	0	4	0	0	0	314
15:30	0	70	58	0	1	0	0	0	3	0	0	85	41	0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	23	0	23	0	0	1	5	0	0	1	315
15:45	0	80	51	0	0	2	0	3	0	0	0	83	48	0	1	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	28	0	32	0	0	0	14	0	0	0	347
16:00	0	85	75	0	2	1	0	2	4	0	0	125	69	0	3	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	22	0	33	0	0	1	6	0	0	0	432
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16:30	0	79	84	0	0	1	0	1	0	0	0	85	63	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	35	0	37	1	0	0	2	0	0	0	392
16:45	0	80	71	0	0	2	0	2	0	0	0	96	57	0	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	29	0	39	2	0	0	1	0	0	0	384
17:00	0	82	90	0	0	2	0	1	0	0	0	100	79	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	25	0	27	2	0	0	0	0	2	0	411
17:15	0	88	77	0	0	1	0	0	0	0	0	85	67	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	30	0	27	0	0	0	0	0	0	0	376
17:30	0	72	76	0	1	1	0	2	0	0	0	79	49	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	22	0	28	0	0	0	0	0	0	0	333
17:45	0	80	55	0	0	0	0	1	0	0	0	82	38	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	18	0	29	3	0	0	0	0	0	0	307

Ontario

TES - Traffic Engineering System

Turning Movement Count Period Report - Full Study

Description: HWY 417 @ PALLADIUM DR - RAMP 51

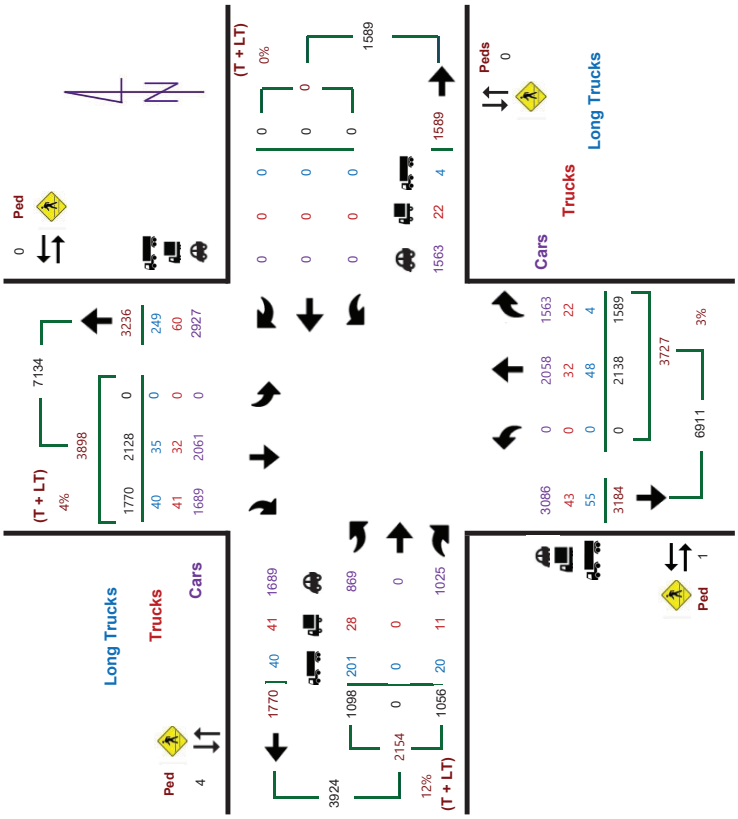
Region EAST **Hwy #:** HWY 417

LHRS_Offset: 49562_0000_51T **Count Period:** 9/26/2023 07:00 AM to 9/26/2023 06:00 PM

Count Start Date: Tuesday, 26 September, 2023

Int. Type: T-Intersection

Full Study

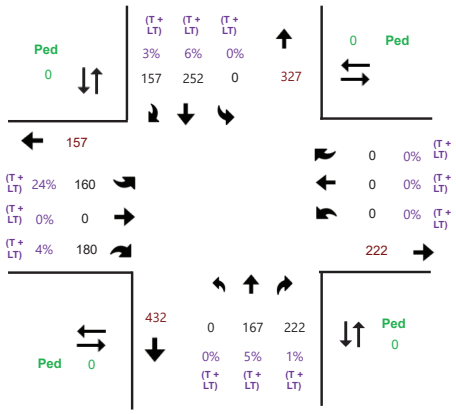


Ontario

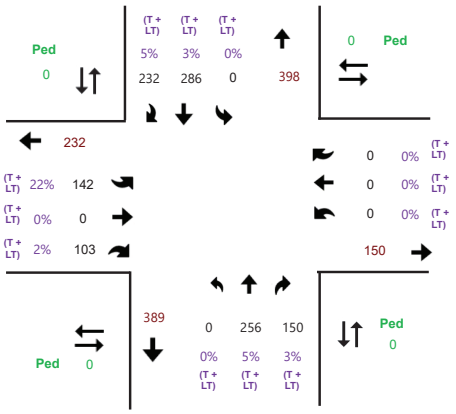
TES - Traffic Engineering System
Turning Movement Total Count and Peak Summary Report

Description: HWY 417 @ PALLADIUM DR - RAMP 51
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_51T
Int. Type: T-Intersection
Count Date: Tuesday, 26 September, 2023

AM Period Tue, 26 Sep, 2023 08:00 AM - 09:00 AM



MD Period Tue, 26 Sep, 2023 12:00 PM - 01:00 PM

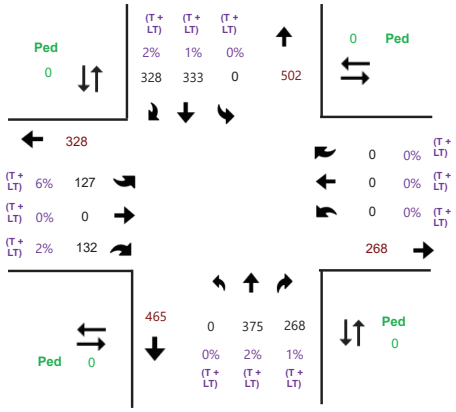


Ontario

TES - Traffic Engineering System
Turning Movement Total Count and Peak Summary Report

Description: HWY 417 @ PALLADIUM DR - RAMP 51
Region EAST
Hwy #: HWY 417
LHRS_Offset: 49562_0000_51T
Int. Type: T-Intersection
Count Date: Tuesday, 26 September, 2023

PM Period Tue, 26 Sep, 2023 04:30 PM - 05:30 PM



Appendix C

Synchro Intersection Worksheets – Existing Conditions

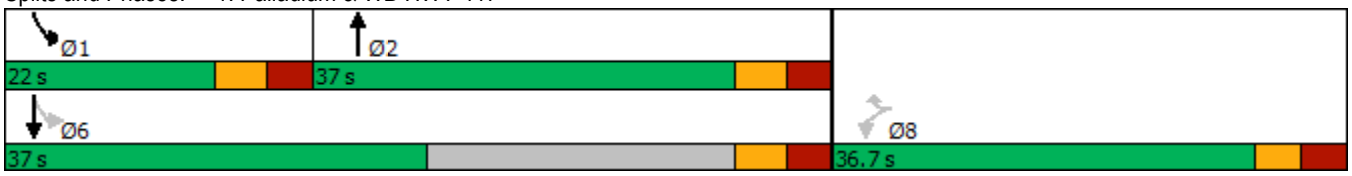


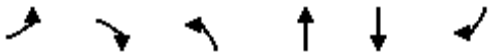
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	185	324	239	0	137	227
Future Volume (vph)	185	324	239	0	137	227
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.358	
Satd. Flow (perm)	3216	1483	3316	0	625	3316
Satd. Flow (RTOR)		360				
Lane Group Flow (vph)	206	360	266	0	152	252
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	9.2	9.2	10.9		22.5	22.5
Actuated g/C Ratio	0.20	0.20	0.24		0.49	0.49
v/c Ratio	0.32	0.62	0.34		0.31	0.16
Control Delay	18.7	7.8	18.3		8.3	6.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.7	7.8	18.3		8.3	6.6
LOS	B	A	B		A	A
Approach Delay	11.8		18.3			7.3
Approach LOS	B		B			A
Queue Length 50th (m)	7.8	0.0	10.0		5.7	4.8
Queue Length 95th (m)	16.4	17.1	21.7		15.6	11.4
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	2193	1125	2261		677	3242
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.09	0.32	0.12		0.22	0.08

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 46.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.7 Intersection LOS: B
Intersection Capacity Utilization 40.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	160	180	0	167	252	0
Future Volume (vph)	160	180	0	167	252	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	178	200	0	186	280	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 25.8%		ICU Level of Service A	
Analysis Period (min) 15			

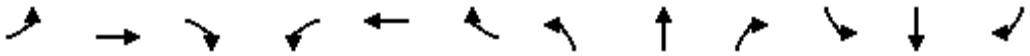
Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	160	180	0	167	252	0
Future Vol, veh/h	160	180	0	167	252	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	178	200	0	186	280	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	373	140	-	0	-	0
Stage 1	280	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	601	882	0	-	-	0
Stage 1	742	-	0	-	-	0
Stage 2	920	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	601	882	-	-	-	-
Mov Cap-2 Maneuver	601	-	-	-	-	-
Stage 1	742	-	-	-	-	-
Stage 2	920	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	601	882	-
HCM Lane V/C Ratio	-	0.296	0.227	-
HCM Control Delay (s)	-	13.5	10.3	-
HCM Lane LOS	-	B	B	-
HCM 95th %tile Q(veh)	-	1.2	0.9	-



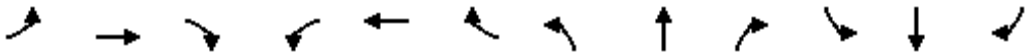
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	77	1	6	34	350	0	21	18	391	10	31
Future Volume (vph)	94	77	1	6	34	350	0	21	18	391	10	31
Satd. Flow (prot)	0	3223	0	0	1731	1483	0	3084	0	0	3138	0
Flt Permitted		0.973			0.992						0.957	
Satd. Flow (perm)	0	3223	0	0	1731	1483	0	3084	0	0	3138	0
Lane Group Flow (vph)	0	191	0	0	45	389	0	43	0	0	479	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 48.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	5.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	1	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	191	434	43	479
Demand Flow Rate, veh/h	195	443	43	489
Vehicles Circulating, veh/h	461	129	637	46
Vehicles Exiting, veh/h	74	551	19	129
Ped Vol Crossing Leg, #/h	0	2	1	6
Ped Cap Adj	1.000	1.000	1.000	0.993
Approach Delay, s/veh	6.0	5.9	4.8	5.6
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Bypass	Left	Right	Left	Right
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized				Yield				
Lane Util	0.995	0.005	1.000		0.535	0.465	0.928	0.072
Follow-Up Headway, s	2.535	2.535	2.609		2.535	2.535	2.535	2.535
Critical Headway, s	4.544	4.544	4.976	397	4.544	4.544	4.544	4.544
Entry Flow, veh/h	194	1	46	1210	23	20	454	35
Cap Entry Lane, veh/h	933	933	1210	0.980	795	795	1362	1362
Entry HV Adj Factor	0.981	1.000	0.983	389	0.980	1.000	0.980	0.971
Flow Entry, veh/h	190	1	45	1186	23	20	445	34
Cap Entry, veh/h	916	933	1189	0.328	779	795	1325	1314
V/C Ratio	0.208	0.001	0.038	6.2	0.029	0.025	0.336	0.026
Control Delay, s/veh	6.0	3.9	3.3	A	4.9	4.8	5.8	2.9
LOS	A	A	A	1	A	A	A	A
95th %tile Queue, veh	1	0	0		0	0	1	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	112	0	25	56	4	0	0	46	8	0	0
Future Volume (vph)	0	112	0	25	56	4	0	0	46	8	0	0
Satd. Flow (prot)	0	1745	0	0	1709	0	0	1510	0	0	1658	0
Flt Permitted					0.985						0.950	
Satd. Flow (perm)	0	1745	0	0	1709	0	0	1510	0	0	1658	0
Lane Group Flow (vph)	0	124	0	0	94	0	0	51	0	0	9	0
Sign Control		Stop			Stop			Stop			Stop	

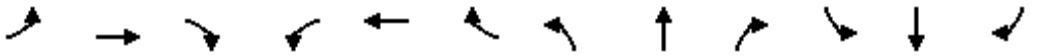
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 26.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	112	0	25	56	4	0	0	46	8	0	0
Future Vol, veh/h	0	112	0	25	56	4	0	0	46	8	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	124	0	28	62	4	0	0	51	9	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.7	7	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	29%	100%
Vol Thru, %	0%	100%	66%	0%
Vol Right, %	100%	0%	5%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	112	85	8
LT Vol	0	0	25	8
Through Vol	0	112	56	0
RT Vol	46	0	4	0
Lane Flow Rate	51	124	94	9
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.142	0.109	0.012
Departure Headway (Hd)	3.823	4.11	4.163	4.667
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	942	867	856	771
Service Time	1.824	2.157	2.216	2.668
HCM Lane V/C Ratio	0.054	0.143	0.11	0.012
HCM Control Delay	7	7.8	7.7	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.5	0.4	0

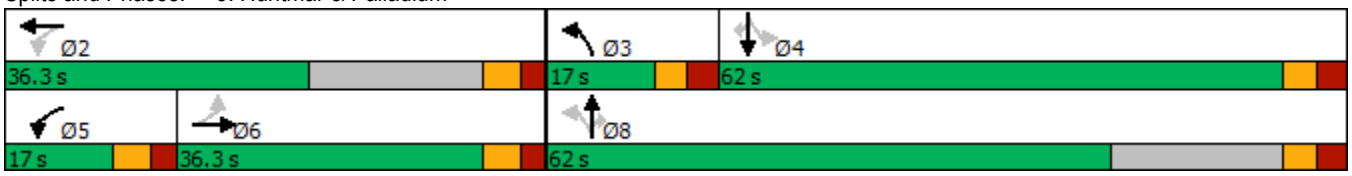


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	194	162	46	95	48	246	350	99	73	204	28
Future Volume (vph)	68	194	162	46	95	48	246	350	99	73	204	28
Satd. Flow (prot)	1658	3053	0	1658	3132	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.651			0.328			0.411			0.532		
Satd. Flow (perm)	1131	3053	0	571	3132	0	716	1745	1459	926	1745	1458
Satd. Flow (RTOR)		147			53				110			132
Lane Group Flow (vph)	76	396	0	51	159	0	273	389	110	81	227	31
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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)	2.5	2.5		2.6	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)	6.2	6.2		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.5	14.5		22.1	22.1		33.9	33.9	33.9	16.6	16.6	16.6
Actuated g/C Ratio	0.21	0.21		0.32	0.32		0.48	0.48	0.48	0.24	0.24	0.24
v/c Ratio	0.32	0.53		0.17	0.15		0.56	0.46	0.14	0.37	0.55	0.07
Control Delay	31.6	19.5		17.7	11.7		19.6	16.7	3.9	31.3	31.4	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	19.5		17.7	11.7		19.6	16.7	3.9	31.3	31.4	0.3
LOS	C	B		B	B		B	B	A	C	C	A
Approach Delay		21.4			13.2			15.9			28.5	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	9.0	15.7		4.3	4.6		22.0	33.7	0.0	9.2	27.0	0.0
Queue Length 95th (m)	24.6	35.2		13.2	12.8		56.8	83.2	9.4	26.6	61.3	0.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	531	1512		365	2311		503	1620	1362	751	1415	1208
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	0.26		0.14	0.07		0.54	0.24	0.08	0.11	0.16	0.03

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 69.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56

Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Huntmar & Palladium



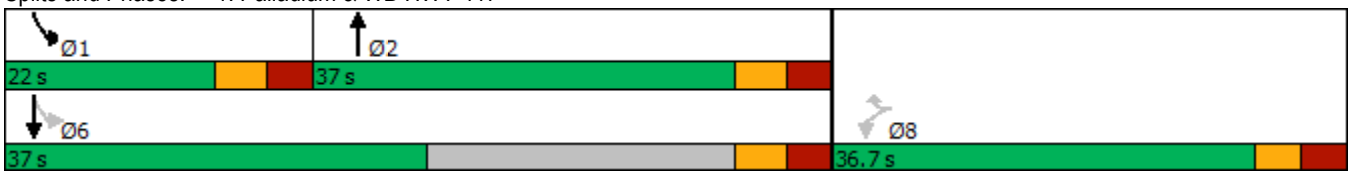


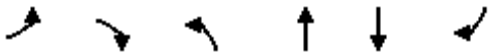
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	230	265	229	0	248	408
Future Volume (vph)	230	265	229	0	248	408
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.359	
Satd. Flow (perm)	3216	1483	3316	0	626	3316
Satd. Flow (RTOR)		294				
Lane Group Flow (vph)	256	294	254	0	276	453
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	9.8	9.8	10.6		28.4	28.4
Actuated g/C Ratio	0.19	0.19	0.20		0.55	0.55
v/c Ratio	0.42	0.57	0.38		0.50	0.25
Control Delay	21.5	7.9	20.8		10.2	6.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	21.5	7.9	20.8		10.2	6.8
LOS	C	A	C		B	A
Approach Delay	14.2		20.8			8.1
Approach LOS	B		C			A
Queue Length 50th (m)	10.6	0.0	10.6		12.1	10.1
Queue Length 95th (m)	21.5	16.5	22.4		26.6	19.1
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1873	986	1931		641	3187
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.14	0.30	0.13		0.43	0.14

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 52.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.57

Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 47.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	127	132	0	375	333	0
Future Volume (vph)	127	132	0	375	333	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	141	147	0	417	370	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 25.2%		ICU Level of Service A	
Analysis Period (min) 15			

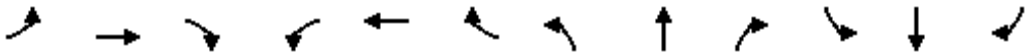
Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	127	132	0	375	333	0
Future Vol, veh/h	127	132	0	375	333	0
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	141	147	0	417	370	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	579	185	-	0	-	0
Stage 1	370	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	446	826	0	-	-	0
Stage 1	669	-	0	-	-	0
Stage 2	806	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	446	826	-	-	-	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	806	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	446	826	-
HCM Lane V/C Ratio	-	0.316	0.178	-
HCM Control Delay (s)	-	16.8	10.3	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	1.3	0.6	-



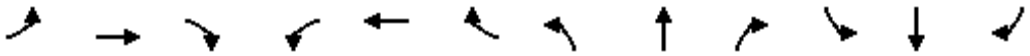
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	72	1	15	73	666	1	17	20	458	20	122
Future Volume (vph)	61	72	1	15	73	666	1	17	20	458	20	122
Satd. Flow (prot)	0	3239	0	0	1729	1483	0	3051	0	0	3094	0
Flt Permitted		0.978			0.991			0.999			0.963	
Satd. Flow (perm)	0	3239	0	0	1729	1483	0	3051	0	0	3094	0
Lane Group Flow (vph)	0	149	0	0	98	740	0	42	0	0	667	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 62.9%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	149	838	42	667
Demand Flow Rate, veh/h	152	855	42	680
Vehicles Circulating, veh/h	558	89	670	101
Vehicles Exiting, veh/h	223	623	40	843
Ped Vol Crossing Leg, #/h	0	0	7	1
Ped Cap Adj	1.000	1.000	0.997	0.999
Approach Delay, s/veh	6.1	8.7	5.0	6.3
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized								
Lane Util	0.993	0.007	0.117	0.883	0.476	0.524	0.796	0.204
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.535	2.535	2.535
Critical Headway, s	4.544	4.544	4.544	4.544	4.544	4.544	4.544	4.544
Entry Flow, veh/h	151	1	100	755	20	22	541	139
Cap Entry Lane, veh/h	855	855	1310	1310	772	772	1295	1295
Entry HV Adj Factor	0.983	1.000	0.984	0.980	0.981	1.000	0.981	0.978
Flow Entry, veh/h	148	1	98	740	20	22	531	136
Cap Entry, veh/h	840	855	1288	1284	755	770	1269	1266
V/C Ratio	0.177	0.001	0.076	0.577	0.026	0.029	0.418	0.107
Control Delay, s/veh	6.1	4.2	3.4	9.4	5.0	5.0	6.9	3.7
LOS	A	A	A	A	A	A	A	A
95th %tile Queue, veh	1	0	0	4	0	0	2	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	66	3	81	106	7	1	0	47	6	1	1
Future Volume (vph)	0	66	3	81	106	7	1	0	47	6	1	1
Satd. Flow (prot)	0	1736	0	0	1702	0	0	1513	0	0	1655	0
Flt Permitted					0.980			0.999			0.963	
Satd. Flow (perm)	0	1736	0	0	1702	0	0	1513	0	0	1655	0
Lane Group Flow (vph)	0	76	0	0	216	0	0	53	0	0	9	0
Sign Control		Stop			Stop			Stop			Stop	

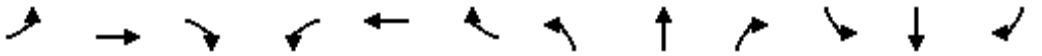
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 29.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	66	3	81	106	7	1	0	47	6	1	1
Future Vol, veh/h	0	66	3	81	106	7	1	0	47	6	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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	73	3	90	118	8	1	0	52	7	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	8.6	7.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	42%	75%
Vol Thru, %	0%	96%	55%	12%
Vol Right, %	98%	4%	4%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	48	69	194	8
LT Vol	1	0	81	6
Through Vol	0	66	106	1
RT Vol	47	3	7	1
Lane Flow Rate	53	77	216	9
Geometry Grp	1	1	1	1
Degree of Util (X)	0.059	0.089	0.249	0.012
Departure Headway (Hd)	4.006	4.18	4.162	4.714
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	899	846	858	763
Service Time	2.007	2.262	2.212	2.716
HCM Lane V/C Ratio	0.059	0.091	0.252	0.012
HCM Control Delay	7.3	7.7	8.6	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1	0



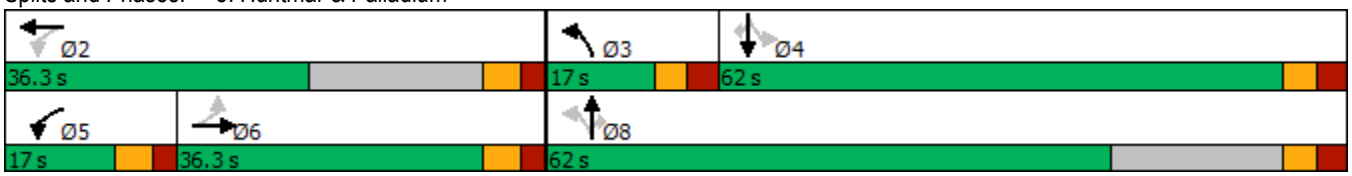
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	160	328	116	329	100	231	332	47	136	449	105
Future Volume (vph)	42	160	328	116	329	100	231	332	47	136	449	105
Satd. Flow (prot)	1658	2932	0	1658	3188	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.479			0.189			0.193			0.542		
Satd. Flow (perm)	835	2932	0	329	3188	0	337	1745	1459	944	1745	1460
Satd. Flow (RTOR)		360			33				78			131
Lane Group Flow (vph)	47	542	0	129	477	0	257	369	52	151	499	117
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.7	14.7		31.6	31.5		50.1	50.1	50.1	32.7	32.7	32.7
Actuated g/C Ratio	0.16	0.16		0.33	0.33		0.53	0.53	0.53	0.34	0.34	0.34
v/c Ratio	0.36	0.71		0.51	0.44		0.78	0.40	0.06	0.46	0.83	0.20
Control Delay	47.3	19.0		32.5	25.5		33.0	15.3	1.3	29.8	41.5	4.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	19.0		32.5	25.5		33.0	15.3	1.3	29.8	41.5	4.0
LOS	D	B		C	C		C	B	A	C	D	A
Approach Delay		21.2			27.0			21.0			33.5	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	7.6	15.5		16.3	31.7		22.9	35.3	0.0	20.0	77.8	0.0
Queue Length 95th (m)	21.5	39.1		38.2	60.0		#72.2	75.5	2.9	45.7	144.6	9.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	275	1207		267	1662		332	1389	1177	576	1066	942
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	0.45		0.48	0.29		0.77	0.27	0.04	0.26	0.47	0.12

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 94.8
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 26.0	Intersection LOS: C
Intersection Capacity Utilization 82.9%	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: 5: Huntmar & Palladium





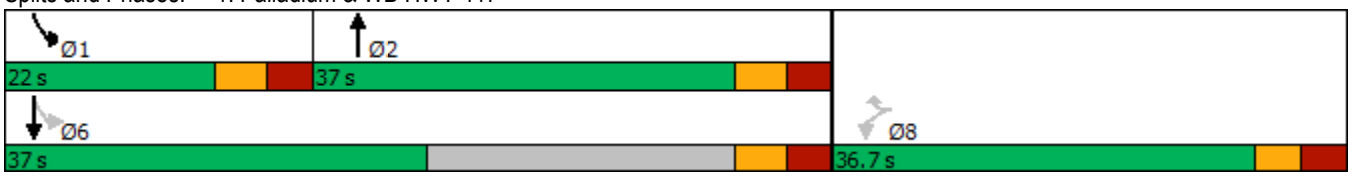
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	202	713	334	0	201	645
Future Volume (vph)	202	713	334	0	201	645
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.345	
Satd. Flow (perm)	3216	1483	3316	0	602	3316
Satd. Flow (RTOR)		519				
Lane Group Flow (vph)	224	792	371	0	223	717
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	27.8	27.8	13.8		32.7	32.7
Actuated g/C Ratio	0.37	0.37	0.19		0.44	0.44
v/c Ratio	0.19	0.90	0.61		0.52	0.49
Control Delay	17.0	23.6	33.2		18.5	16.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	17.0	23.6	33.2		18.5	16.5
LOS	B	C	C		B	B
Approach Delay	22.1		33.2			16.9
Approach LOS	C		C			B
Queue Length 50th (m)	10.6	36.3	26.4		20.5	38.3
Queue Length 95th (m)	20.3	#129.0	41.0		34.8	52.2
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1317	913	1358		480	2355
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.17	0.87	0.27		0.46	0.30

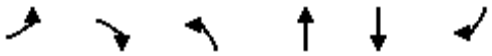
Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 74.4
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 67.8%	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: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	213	143	0	334	346	0
Future Volume (vph)	213	143	0	334	346	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	237	159	0	371	384	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 29.3%		ICU Level of Service A	
Analysis Period (min) 15			

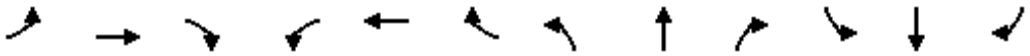
Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	213	143	0	334	346	0
Future Vol, veh/h	213	143	0	334	346	0
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	35	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	237	159	0	371	384	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	570	192	-	0	-	0
Stage 1	384	-	-	-	-	-
Stage 2	186	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	452	817	0	-	-	0
Stage 1	658	-	0	-	-	0
Stage 2	827	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	452	817	-	-	-	-
Mov Cap-2 Maneuver	452	-	-	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	827	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	452	817	-
HCM Lane V/C Ratio	-	0.524	0.194	-
HCM Control Delay (s)	-	21.4	10.5	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	3	0.7	-



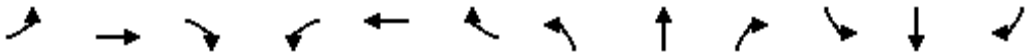
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	60	2	5	45	466	0	16	13	409	23	67
Future Volume (vph)	56	60	2	5	45	466	0	16	13	409	23	67
Satd. Flow (prot)	0	3233	0	0	1736	1483	0	3097	0	0	3123	0
Flt Permitted		0.977			0.995						0.961	
Satd. Flow (perm)	0	3233	0	0	1736	1483	0	3097	0	0	3123	0
Lane Group Flow (vph)	0	131	0	0	56	518	0	32	0	0	554	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 48.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	6.1
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	1	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	131	574	32	554
Demand Flow Rate, veh/h	133	585	32	565
Vehicles Circulating, veh/h	496	81	594	57
Vehicles Exiting, veh/h	126	545	35	81
Ped Vol Crossing Leg, #/h	1	2	1	1
Ped Cap Adj	0.999	1.000	0.999	0.999
Approach Delay, s/veh	5.4	6.6	4.6	5.7
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Bypass	Left	Right	Left	Right
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized				Yield				
Lane Util	0.985	0.015	1.000		0.562	0.438	0.867	0.133
Follow-Up Headway, s	2.535	2.535	2.609		2.535	2.535	2.535	2.535
Critical Headway, s	4.544	4.544	4.976	528	4.544	4.544	4.544	4.544
Entry Flow, veh/h	131	2	57	1270	18	14	490	75
Cap Entry Lane, veh/h	904	904	1270	0.980	827	827	1348	1348
Entry HV Adj Factor	0.982	1.000	0.982	518	0.980	1.000	0.981	0.987
Flow Entry, veh/h	129	2	56	1245	18	14	480	74
Cap Entry, veh/h	888	904	1248	0.416	810	827	1321	1329
V/C Ratio	0.145	0.002	0.045	7.0	0.022	0.017	0.364	0.056
Control Delay, s/veh	5.5	4.0	3.2	A	4.6	4.5	6.1	3.1
LOS	A	A	A	2	A	A	A	A
95th %tile Queue, veh	1	0	0		0	0	2	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	81	2	50	66	15	1	0	45	8	1	1
Future Volume (vph)	2	81	2	50	66	15	1	0	45	8	1	1
Satd. Flow (prot)	0	1738	0	0	1685	0	0	1513	0	0	1657	0
Flt Permitted		0.999			0.981			0.999			0.961	
Satd. Flow (perm)	0	1738	0	0	1685	0	0	1513	0	0	1657	0
Lane Group Flow (vph)	0	94	0	0	146	0	0	51	0	0	11	0
Sign Control		Stop			Stop			Stop			Stop	

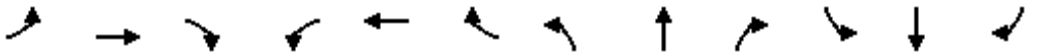
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 27.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	81	2	50	66	15	1	0	45	8	1	1
Future Vol, veh/h	2	81	2	50	66	15	1	0	45	8	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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	90	2	56	73	17	1	0	50	9	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	8	7.1	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	2%	38%	80%
Vol Thru, %	0%	95%	50%	10%
Vol Right, %	98%	2%	11%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	85	131	10
LT Vol	1	2	50	8
Through Vol	0	81	66	1
RT Vol	45	2	15	1
Lane Flow Rate	51	94	146	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.109	0.167	0.014
Departure Headway (Hd)	3.891	4.143	4.121	4.615
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	926	858	865	780
Service Time	1.891	2.204	2.171	2.616
HCM Lane V/C Ratio	0.055	0.11	0.169	0.014
HCM Control Delay	7.1	7.7	8	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.4	0.6	0



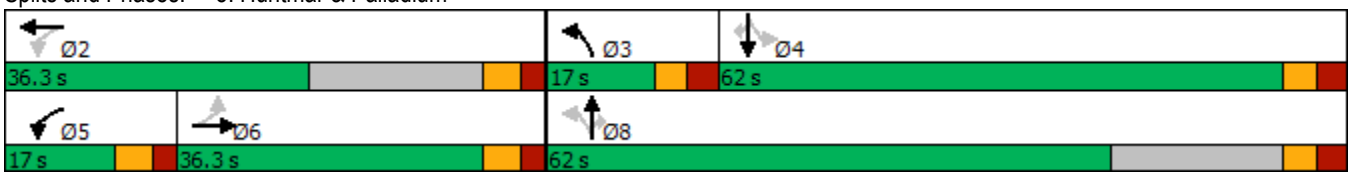
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	175	220	87	217	126	269	380	75	139	330	67
Future Volume (vph)	57	175	220	87	217	126	269	380	75	139	330	67
Satd. Flow (prot)	1658	2996	0	1658	3133	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.526			0.263			0.278			0.516		
Satd. Flow (perm)	918	2996	0	458	3133	0	485	1745	1465	900	1745	1460
Satd. Flow (RTOR)		226			97				83			131
Lane Group Flow (vph)	63	438	0	97	381	0	299	422	83	154	367	74
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.6	14.6		26.9	26.8		41.0	41.0	41.0	23.5	23.5	23.5
Actuated g/C Ratio	0.18	0.18		0.33	0.33		0.50	0.50	0.50	0.29	0.29	0.29
v/c Ratio	0.38	0.60		0.33	0.35		0.75	0.48	0.11	0.59	0.73	0.14
Control Delay	40.3	19.5		22.8	15.8		29.8	17.5	3.8	37.9	37.1	1.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	19.5		22.8	15.8		29.8	17.5	3.8	37.9	37.1	1.0
LOS	D	B		C	B		C	B	A	D	D	A
Approach Delay		22.1			17.2			20.7			32.8	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	8.9	15.7		10.0	15.9		26.7	40.8	0.0	20.3	50.7	0.0
Queue Length 95th (m)	23.3	35.0		24.4	32.4		#82.8	91.1	8.0	49.1	101.7	1.1
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	361	1318		322	1972		407	1522	1288	643	1247	1081
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	0.33		0.30	0.19		0.73	0.28	0.06	0.24	0.29	0.07

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 81.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75

Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 74.6%	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: 5: Huntmar & Palladium



MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen AM Existing (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.021	4.1	LOS A	0.1	0.6	0.49	0.34	0.49	45.6
2	T1	All MCs	22	2.0	22	2.0	0.021	4.0	LOS A	0.1	0.6	0.49	0.34	0.49	46.2
3	R2	All MCs	19	2.0	19	2.0	0.021	3.6	LOS A	0.1	0.6	0.48	0.32	0.48	46.0
Approach			42	2.0	42	2.0	0.021	3.8	LOS A	0.1	0.6	0.48	0.33	0.48	46.1
East: Palladium															
4	L2	All MCs	7	2.0	7	2.0	0.033	2.9	LOS A	0.1	1.0	0.23	0.10	0.23	52.2
5	T1	All MCs	38	2.0	38	2.0	0.033	2.9	LOS A	0.1	1.0	0.23	0.10	0.23	53.2
6	R2	All MCs	389	2.0	389	2.0	0.278	4.9	LOS A	1.5	10.4	0.29	0.14	0.29	52.0
Approach			433	2.0	433	2.0	0.278	4.7	LOS A	1.5	10.4	0.28	0.13	0.28	52.1
North: Palladium															
7	L2	All MCs	434	2.0	434	2.0	0.279	4.4	LOS A	1.4	10.3	0.15	0.05	0.15	52.5
8	T1	All MCs	11	2.0	11	2.0	0.049	4.2	LOS A	0.2	1.4	0.16	0.06	0.16	58.1
9	R2	All MCs	34	2.0	34	2.0	0.049	4.2	LOS A	0.2	1.4	0.16	0.06	0.16	57.1
Approach			480	2.0	480	2.0	0.279	4.4	LOS A	1.4	10.3	0.15	0.05	0.15	52.9
West: Derreen															
10	L2	All MCs	104	2.0	104	2.0	0.092	4.0	LOS A	0.4	2.9	0.44	0.30	0.44	28.6
11	T1	All MCs	86	2.0	86	2.0	0.087	4.4	LOS A	0.4	2.6	0.45	0.32	0.45	29.0
12	R2	All MCs	1	2.0	1	2.0	0.087	4.4	LOS A	0.4	2.6	0.45	0.32	0.45	29.0
Approach			191	2.0	191	2.0	0.092	4.2	LOS A	0.4	2.9	0.45	0.31	0.45	28.8
All Vehicles			1147	2.0	1147	2.0	0.279	4.5	LOS A	1.5	10.4	0.26	0.14	0.26	45.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen PM Existing (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.021	4.3	LOS A	0.1	0.6	0.51	0.36	0.51	45.5
2	T1	All MCs	18	2.0	18	2.0	0.021	4.3	LOS A	0.1	0.6	0.51	0.36	0.51	46.1
3	R2	All MCs	21	2.0	21	2.0	0.021	3.7	LOS A	0.1	0.6	0.50	0.34	0.50	45.8
Approach			40	2.0	40	2.0	0.021	4.0	LOS A	0.1	0.6	0.51	0.35	0.51	46.0
East: Palladium															
4	L2	All MCs	17	2.0	17	2.0	0.071	3.2	LOS A	0.3	2.2	0.20	0.08	0.20	52.0
5	T1	All MCs	81	2.0	81	2.0	0.071	3.2	LOS A	0.3	2.2	0.20	0.08	0.20	52.9
6	R2	All MCs	740	2.0	740	2.0	0.493	6.9	LOS A	3.5	25.0	0.30	0.13	0.30	50.6
Approach			838	2.0	838	2.0	0.493	6.5	LOS A	3.5	25.0	0.29	0.12	0.29	50.8
North: Palladium															
7	L2	All MCs	509	2.0	509	2.0	0.349	5.4	LOS A	1.9	13.6	0.26	0.11	0.26	51.8
8	T1	All MCs	22	2.0	22	2.0	0.160	5.1	LOS A	0.7	4.9	0.25	0.12	0.25	57.3
9	R2	All MCs	136	2.0	136	2.0	0.160	5.1	LOS A	0.7	4.9	0.25	0.12	0.25	56.4
Approach			667	2.0	667	2.0	0.349	5.3	LOS A	1.9	13.6	0.26	0.11	0.26	52.8
West: Derreen															
10	L2	All MCs	68	2.0	68	2.0	0.074	4.5	LOS A	0.3	2.3	0.50	0.37	0.50	28.5
11	T1	All MCs	80	2.0	80	2.0	0.074	4.0	LOS A	0.3	2.4	0.49	0.35	0.49	29.1
12	R2	All MCs	1	2.0	1	2.0	0.074	4.0	LOS A	0.3	2.4	0.49	0.35	0.49	29.1
Approach			149	2.0	149	2.0	0.074	4.3	LOS A	0.3	2.4	0.50	0.36	0.50	28.8
All Vehicles			1693	2.0	1693	2.0	0.493	5.8	LOS A	3.5	25.0	0.30	0.15	0.30	48.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen SAT Existing (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.016	4.0	LOS A	0.1	0.4	0.47	0.32	0.47	45.6
2	T1	All MCs	17	2.0	17	2.0	0.016	3.9	LOS A	0.1	0.5	0.47	0.31	0.47	46.3
3	R2	All MCs	14	2.0	14	2.0	0.016	3.5	LOS A	0.1	0.5	0.46	0.30	0.46	46.0
Approach			32	2.0	32	2.0	0.016	3.7	LOS A	0.1	0.5	0.47	0.31	0.47	46.1
East: Palladium															
4	L2	All MCs	6	2.0	6	2.0	0.040	2.9	LOS A	0.2	1.2	0.18	0.07	0.18	52.4
5	T1	All MCs	50	2.0	50	2.0	0.040	2.9	LOS A	0.2	1.2	0.18	0.07	0.18	53.4
6	R2	All MCs	518	2.0	518	2.0	0.347	5.3	LOS A	2.0	14.2	0.24	0.10	0.24	51.8
Approach			573	2.0	573	2.0	0.347	5.1	LOS A	2.0	14.2	0.23	0.09	0.23	51.9
North: Palladium															
7	L2	All MCs	454	2.0	454	2.0	0.297	4.7	LOS A	1.5	10.9	0.18	0.06	0.18	52.3
8	T1	All MCs	26	2.0	26	2.0	0.106	4.7	LOS A	0.4	3.1	0.18	0.07	0.18	57.7
9	R2	All MCs	74	2.0	74	2.0	0.106	4.7	LOS A	0.4	3.1	0.18	0.07	0.18	56.7
Approach			554	2.0	554	2.0	0.297	4.7	LOS A	1.5	10.9	0.18	0.06	0.18	53.1
West: Derreen															
10	L2	All MCs	62	2.0	62	2.0	0.063	4.2	LOS A	0.3	1.9	0.46	0.33	0.46	28.6
11	T1	All MCs	67	2.0	67	2.0	0.062	3.7	LOS A	0.3	1.9	0.44	0.31	0.44	29.1
12	R2	All MCs	2	2.0	2	2.0	0.062	3.7	LOS A	0.3	1.9	0.44	0.31	0.44	29.1
Approach			131	2.0	131	2.0	0.063	3.9	LOS A	0.3	1.9	0.45	0.32	0.45	28.9
All Vehicles			1290	2.0	1290	2.0	0.347	4.7	LOS A	2.0	14.2	0.24	0.11	0.24	48.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Appendix D

Collision Data

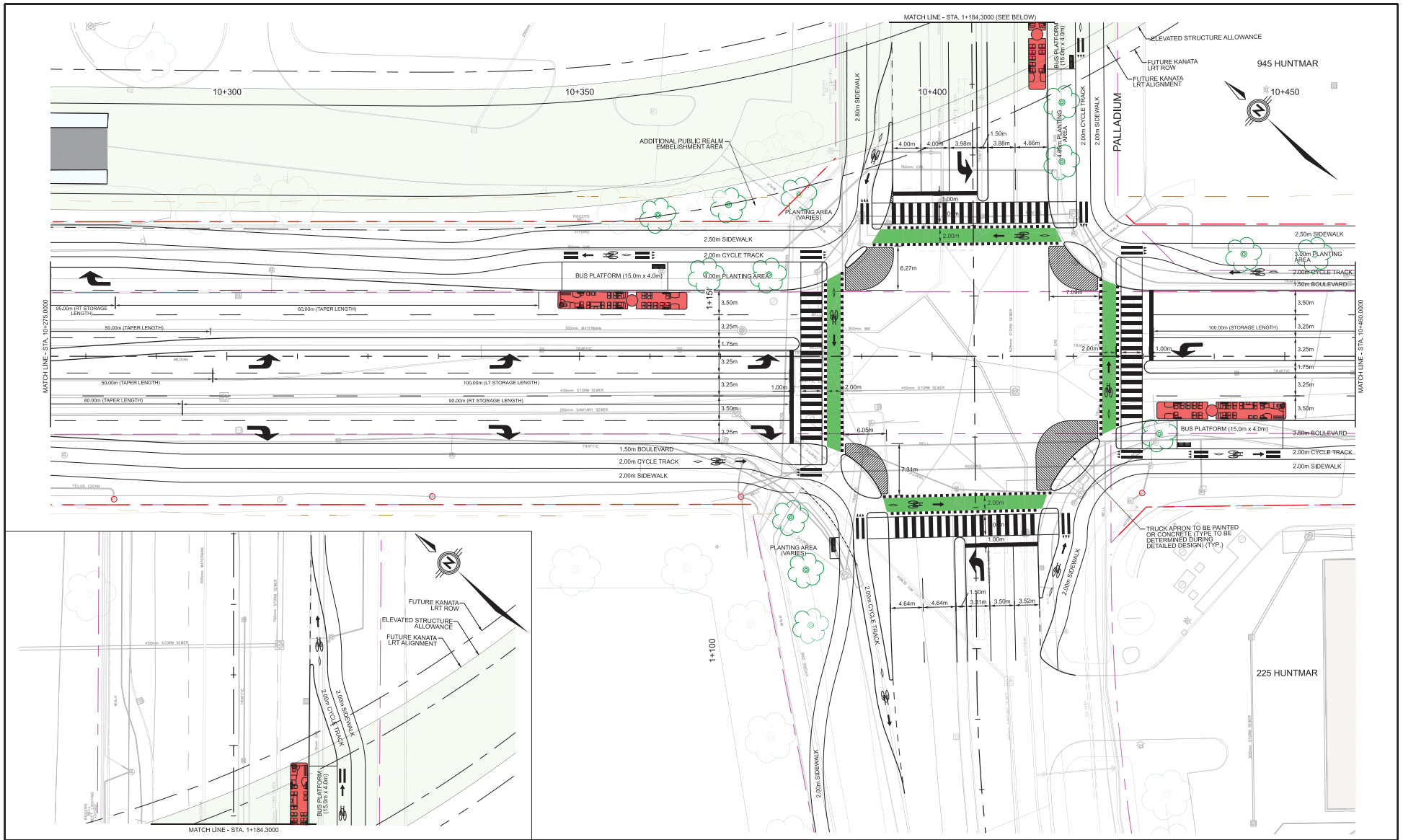
CGH TRANSPORTATION

Anom_ID	Accident_Date	Accident_Time	Location	Geo_ID	Accident	Classification_of	Initial_Impact_Typ	Environment_Cond	Light	Road_Surface	Traffic_Control	Traffic_Control_Condition	No__of_Vehicles	No__of_Bicycles	No__of_Motorcycles	No__of_Pedestrians
2018--20382	2018-06-27	4:15 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	02 - Angle	02 - Rain	01 - Daylight	02 - Wet	10 - No control		2			0
2019--33124	2019-04-06	10:00 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	01 - Dry	10 - No control		2			0
2019--34328	2019-05-14	1:50 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	04 - Sideswipe	02 - Rain	01 - Daylight	02 - Wet	10 - No control		2			0
2019--34461	2019-05-17	4:10 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2			0
2019--35146	2019-06-06	8:28 AM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	02 - Non-fatal inj	01 - Approaching	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2			0
2019--37415	2019-08-09	4:30 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	02 - Non-fatal inj	05 - Turning mover	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2			0
2020--47686	2020-02-20	10:36 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	02 - Non-fatal inj	02 - Angle	01 - Clear	07 - Dark	01 - Dry	10 - No control		2			0
2020--52012	2020-10-07	8:32 AM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	02 - Angle	02 - Rain	01 - Daylight	02 - Wet	10 - No control		2			0
2021--57926	2021-05-07	11:00 AM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2			0
2021--58839	2021-06-25	1:45 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	05 - Turning mover	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2			0
2021--61541	2021-10-14	5:38 PM	PALLADIUM DR btwn HUNTMAR DR & HWY417 IC142 RAMP25 (__32050A)	__32050A	Midbloc	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2			0

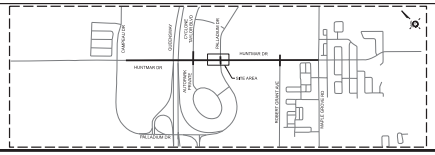
Appendix E

Huntmar Drive at Palladium Drive Preliminary Design

CGH TRANSPORTATION



KEY PLAN



LEGEND

- EXISTING PROPERTY LINE
- PROPOSED ROW
- GRADING LIMITS
- PROPOSED GUIDE RAIL
- EXISTING HYDRO POLE
- PROPOSED BENCH
- EXISTING TREE
- PROPOSED TREE

PARSONS

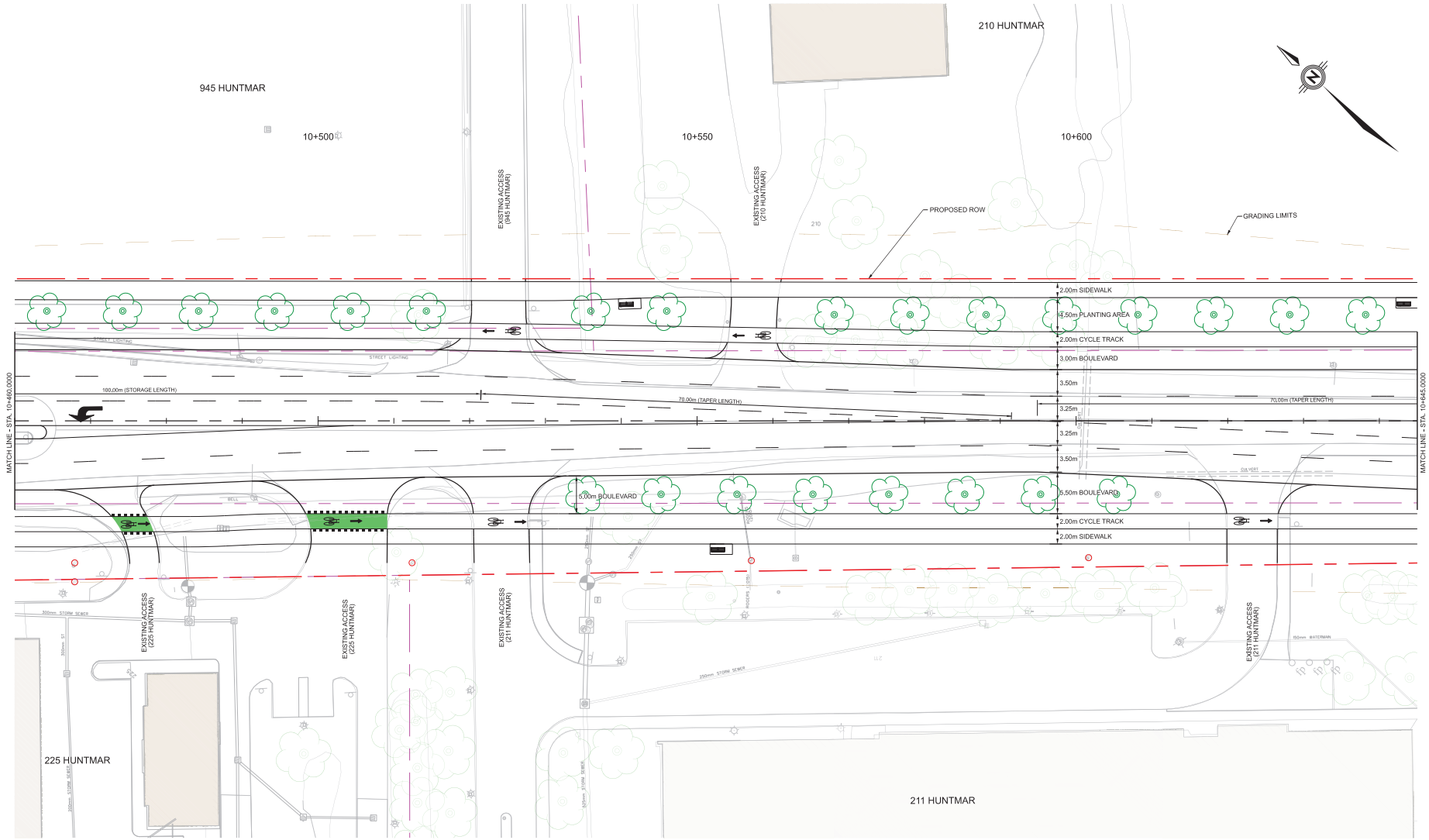
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Project Manager:	Discipline Engineer:	Checked By:
Scale: HORIZONTAL 0m 2.5 5 10 20		
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Ottawa

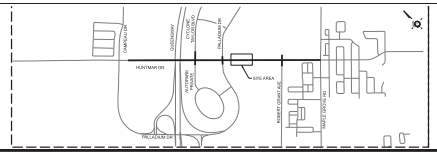
HUNTMAR DRIVE WIDENING AND STITTSVILLE MAIN STREET EXTENSION ENVIRONMENTAL ASSESSMENT (EA) STUDY

HUNTMAR DRIVE
STA. 10+275 to STA 10+460

Revision: 00 | Sheet No.: 05



KEY PLAN



LEGEND

- EXISTING PROPERTY LINE
- PROPOSED ROW
- GRADING LIMITS
- PROPOSED GUIDE RAIL
- EXISTING HYDRO POLE
- PROPOSED BENCH
- EXISTING TREE
- PROPOSED TREE

PARSONS

Date: 14 March 2023	Designed By:	Drawn By:
Project Manager:	Discipline Engineer:	Checked By:
Scale: HORIZONTAL 0m 2.5 5 10 20		
CAD File Name: 477917-HUNTMAR SHEETS.DGN	Plot Date:	Drawings No.:

Revision: 00 | Sheet No.: 06

Ottawa

HUNTMAR DRIVE WIDENING AND STITTSVILLE MAIN STREET EXTENSION ENVIRONMENTAL ASSESSMENT (EA) STUDY

HUNTMAR DRIVE
STA. 10+460 to STA 10+645

Appendix F

TDM Checklist

CGH TRANSPORTATION

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

Legend

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

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

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

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

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

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

TDM 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)	☐

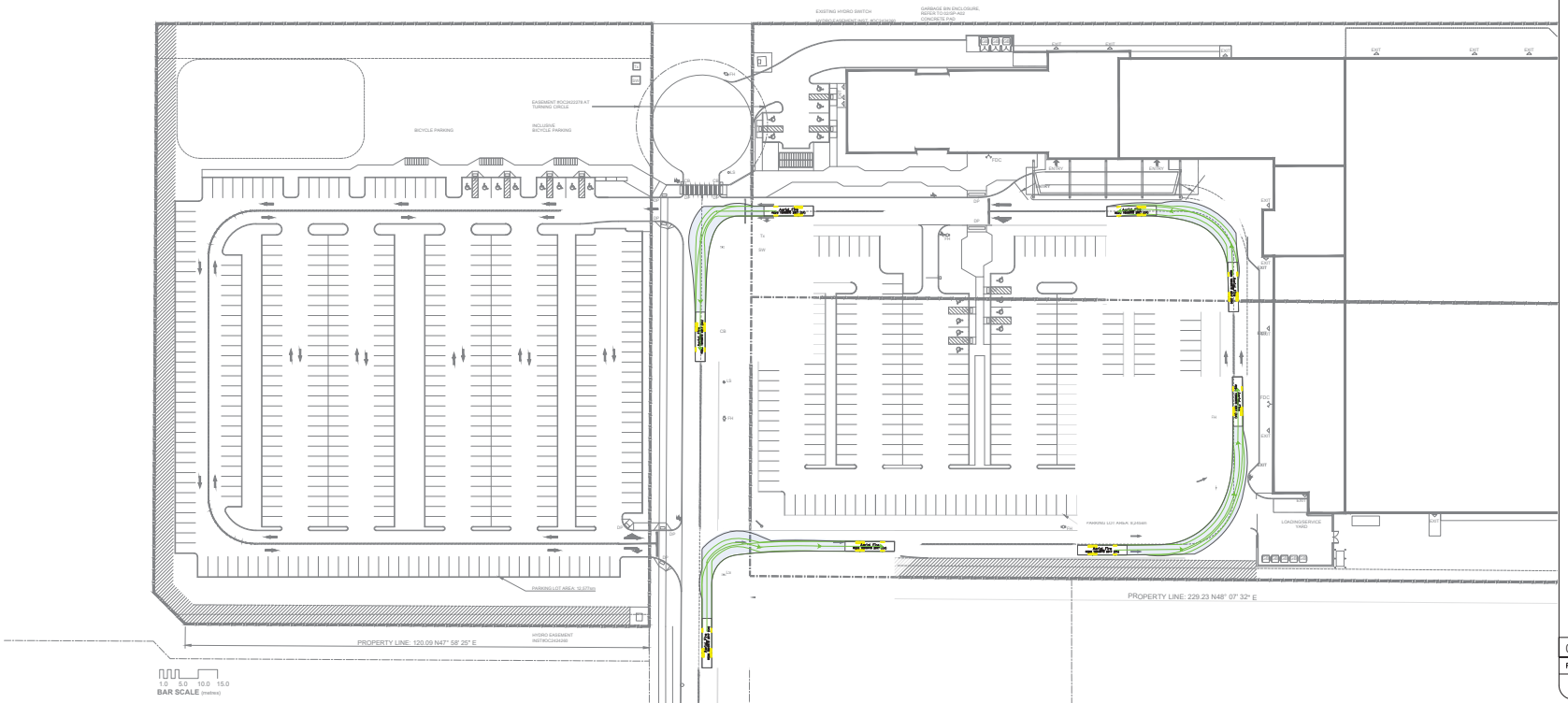
		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	7.	**TDM MARKETING & COMMUNICATIONS**	
	7.1	**Multimodal travel information**	
		Commuter travel	
BASIC ★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑
		Visitor 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	☐

Appendix G

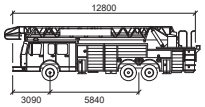
Turning Templates

CGH TRANSPORTATION

FIRE TRUCK MOVEMENTS



Notes:



Aerial Fire

	mm
Width	: 2540
Track	: 2540
Lock to Lock Time	: 6.0
Steering Angle	: 37.0

REV:	DESCRIPTION:	BY:	DATE:
05	Issued for Review	EA	2026-10-02

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:
Palladium Resort Development Limited Partnership

FILE NUMBER: D07-12-26-0085

PLAN NUMBER: 19492

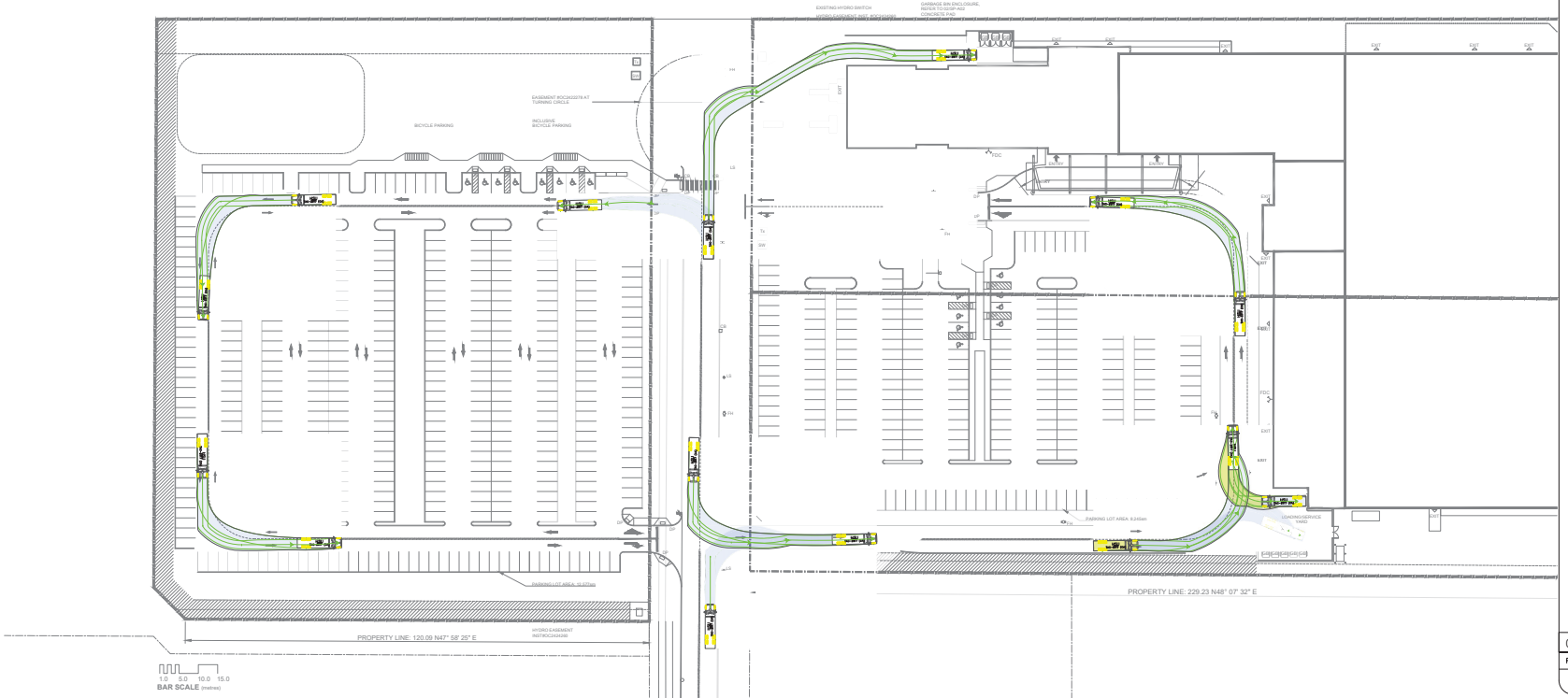
SITE:
2785 Palladium Drive
350 Culdaff Road

TITLE:
Turning Template Analysis

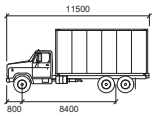
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-10-02	EA	AH

PROJECT NO:	DRAWING NO:	REVISION:
2024-167	001	05

HSU INBOUND MOVEMENTS



Notes:



HSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

REV:	DESCRIPTION:	BY:	DATE:
05	Issued for Review	EA	2026-10-02

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:
Palladium Resort Development Limited Partnership

FILE NUMBER:
D07-12-26-0085

PLAN NUMBER:
19492

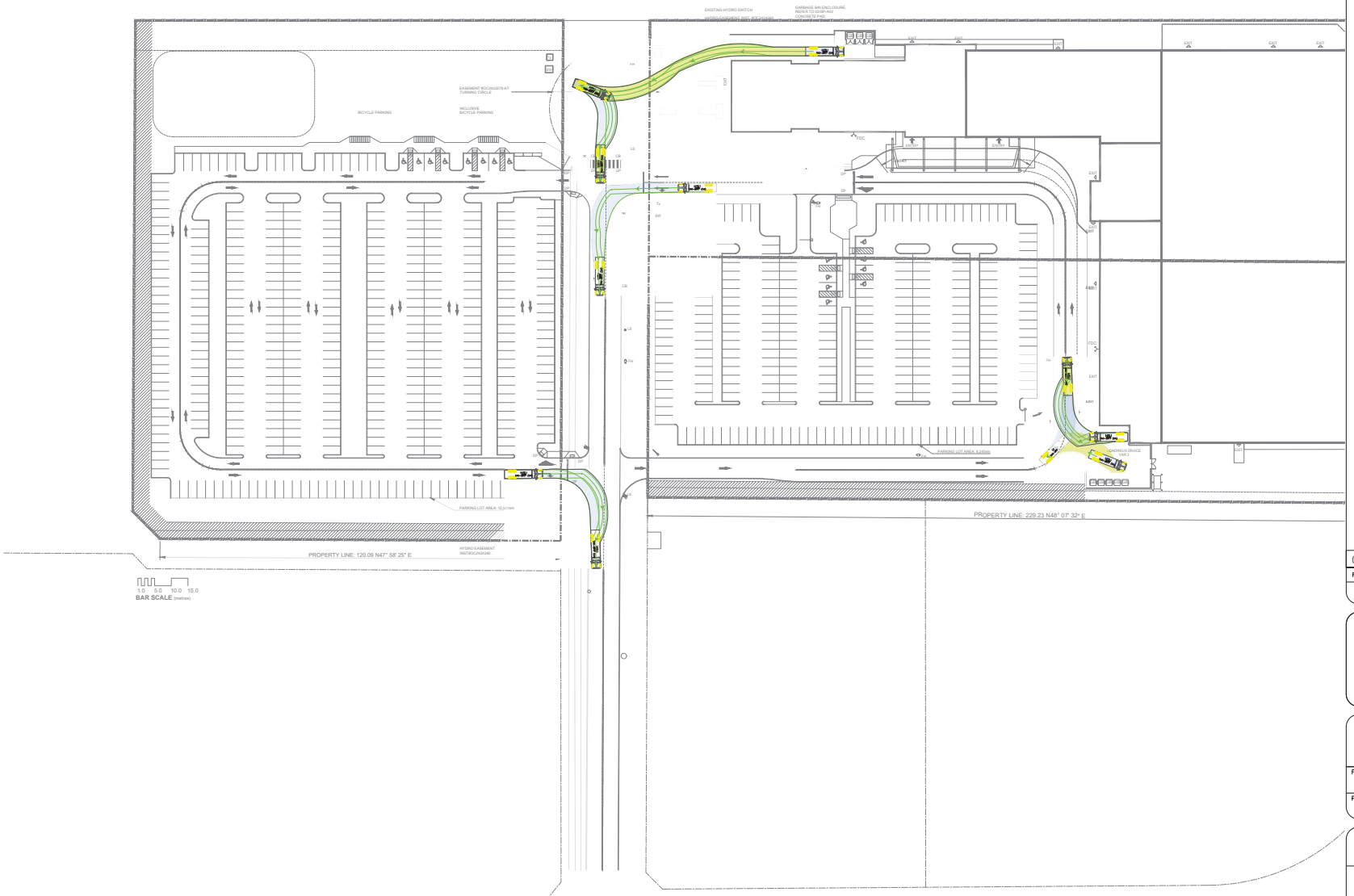
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2785 Palladium Drive
350 Culdaff Road

TITLE:
Turning Template Analysis

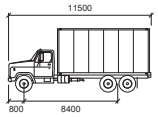
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-10-02	EA	AH

PROJECT NO:	DRAWING NO:	REVISION:
2024-167	002	05

HSU OUTBOUND MOVEMENTS



Notes:



HSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

REV:	DESCRIPTION:	BY:	DATE:
05	Issued for Review	EA	2026-10-02

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:
Palladium Resort Development Limited Partnership

FILE NUMBER: D07-12-26-0085

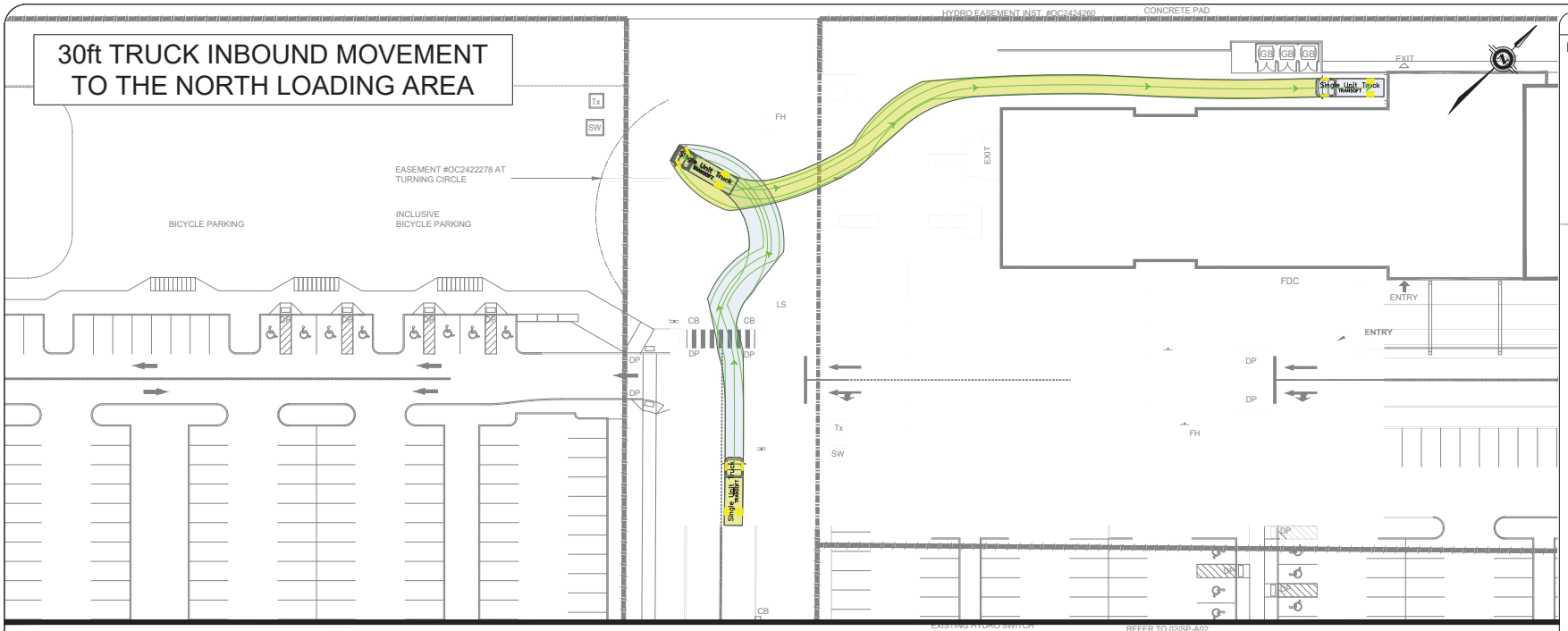
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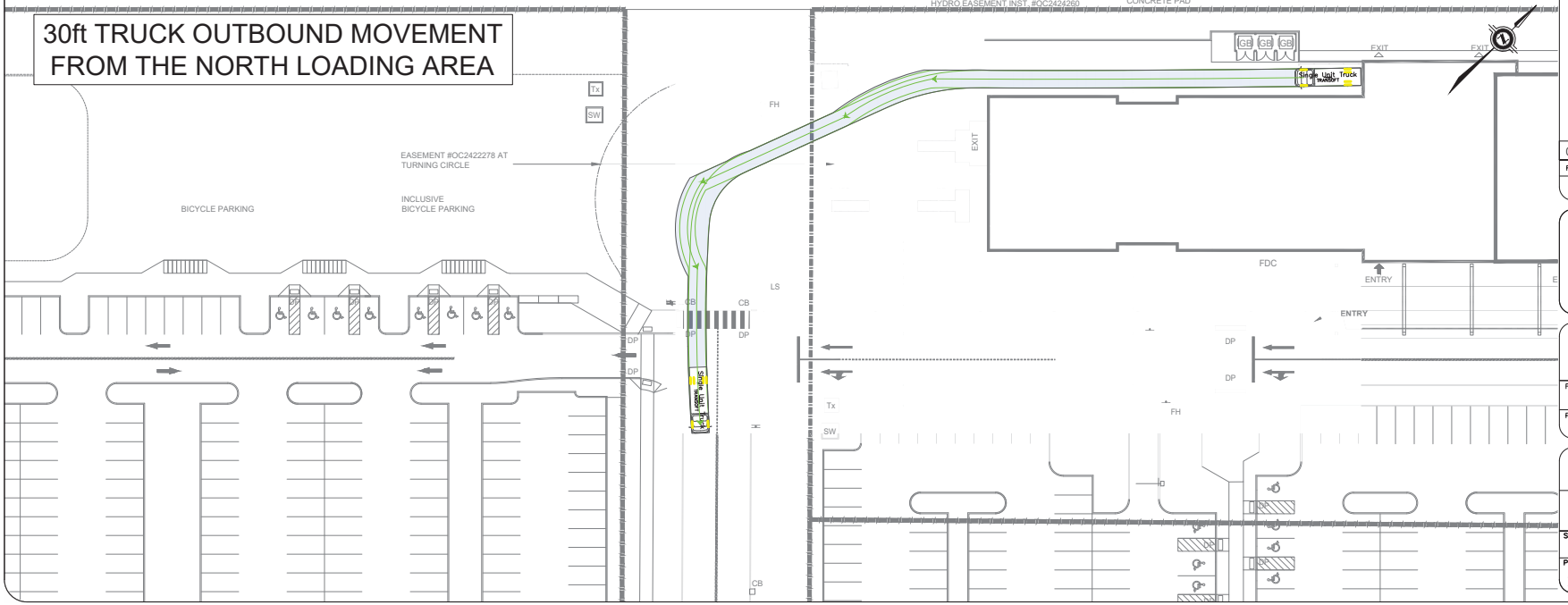
SITE:
2785 Palladium Drive
350 Culdaff Road

TITLE:
Turning Template Analysis

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-10-02	EA	AH

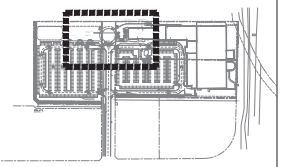
PROJECT NO:	DRAWING NO:	REVISION:
2024-167	003	05

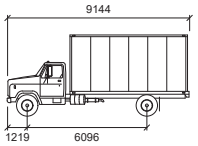




Notes:

Key Map:





Single Unit Truck

	mm
Width	: 2438
Track	: 2438
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

REV:	DESCRIPTION:	BY:	DATE:
05	Issued for Review	EA	2026-10-02

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:
Palladium Resort Development
Limited Partnership

FILE NUMBER:
D07-12-26-0085

PLAN NUMBER:
19492

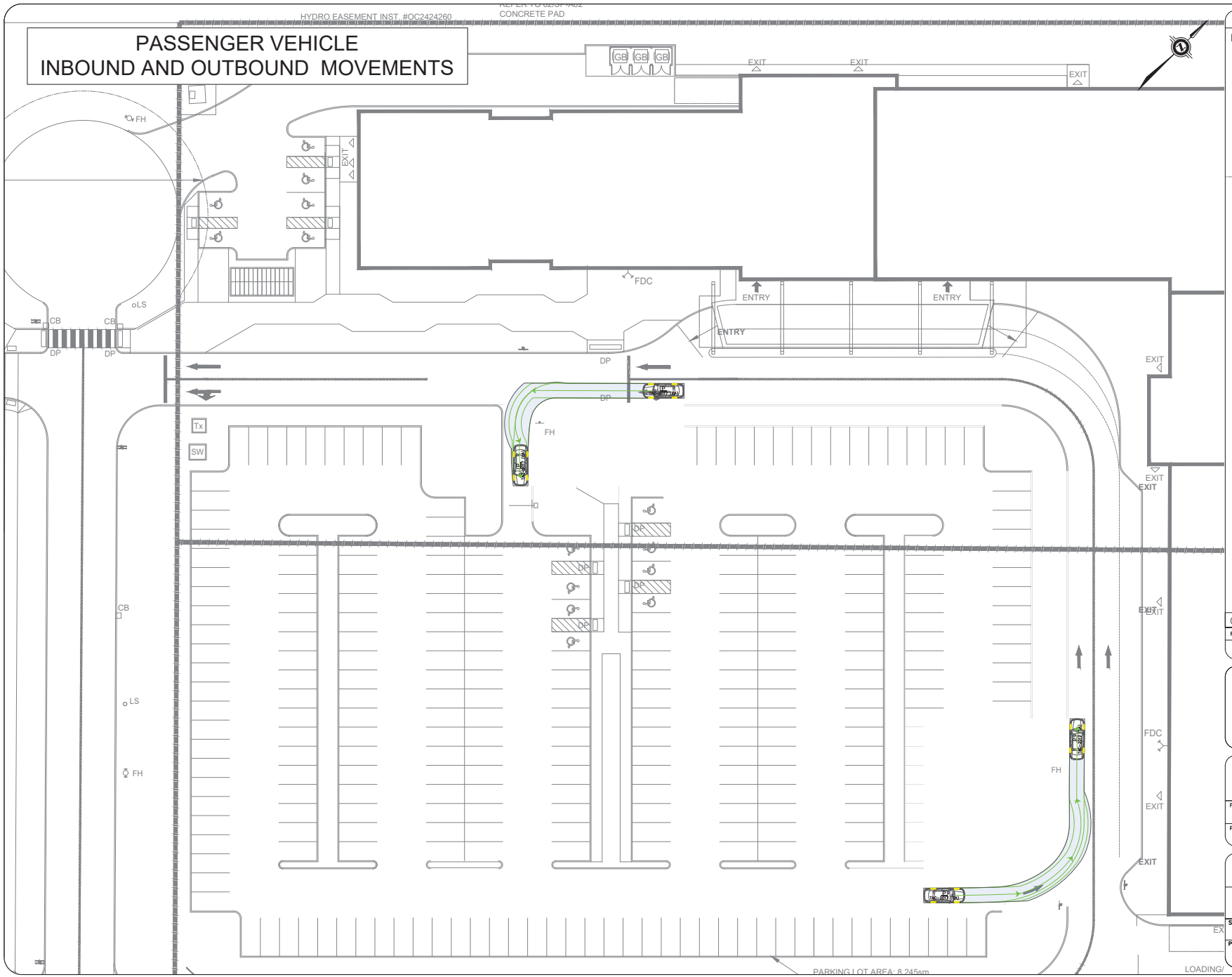
SITE:
2785 Palladium Drive
350 Culdaff Road

TITLE:
Turning Template Analysis

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-10-02	EA	AH

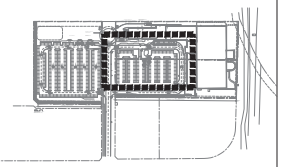
PROJECT NO:	DRAWING NO:	REVISION:
2024-167	004	05

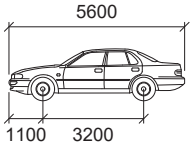
PASSENGER VEHICLE
INBOUND AND OUTBOUND MOVEMENTS



Notes:

Key Map:





P

	mm
Width	: 2000
Track	: 2000
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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05	Issued for Review	EA	2026-10-02

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:
Palladium Resort Development Limited Partnership

FILE NUMBER: D07-12-26-0085

PLAN NUMBER: 19492

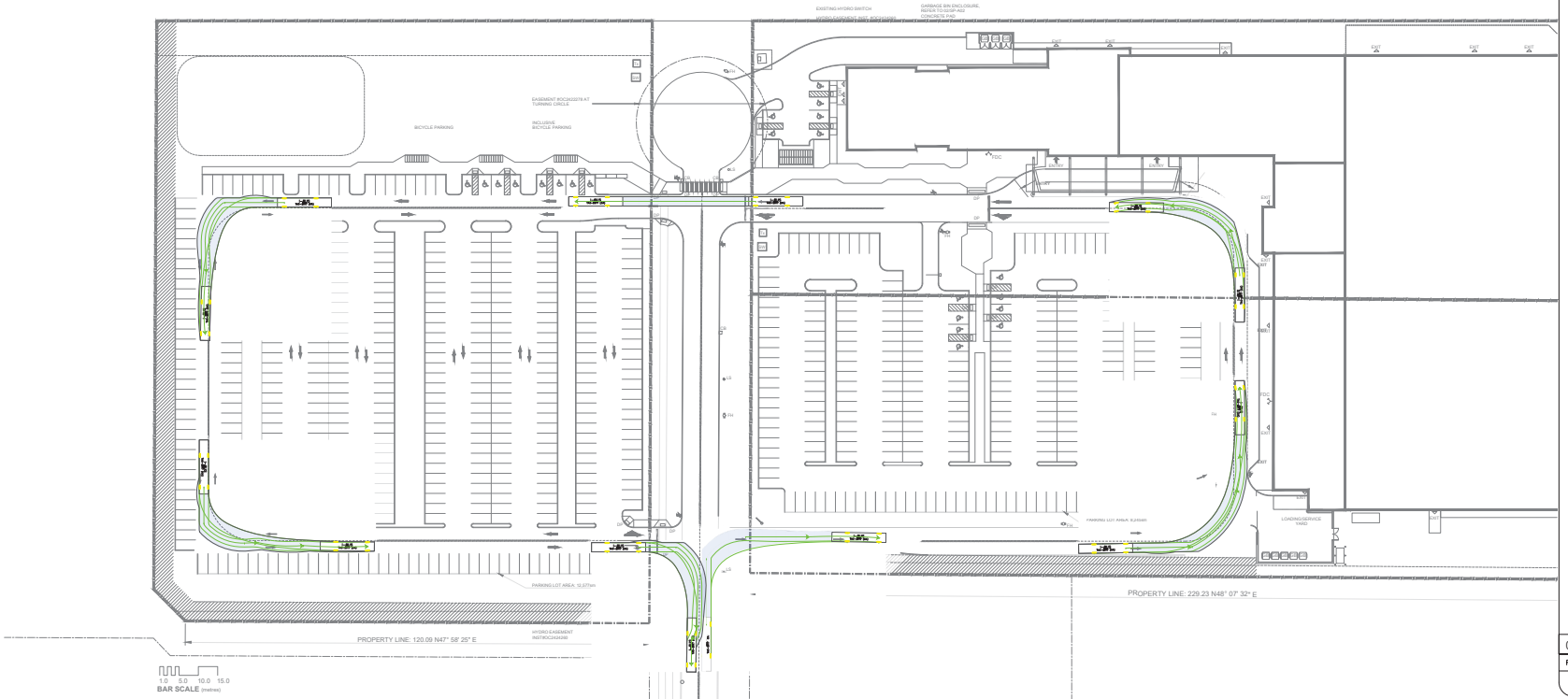
SITE:
2785 Palladium Drive
350 Culdaff Road

TITLE:
Turning Template Analysis

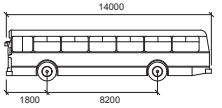
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-10-02	EA	AH

PROJECT NO:	DRAWING NO:	REVISION:
2024-167	005	05

14m I-Bus Movements
Site Circulation



Notes:



I-BUS
mm

Width	: 2400
Track	: 2400
Lock to Lock Time	: 6.0
Steering Angle	: 39.3

REV:	DESCRIPTION:	BY:	DATE:
05	Issued for Review	EA	2026-10-02

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:
Palladium Resort Development Limited Partnership

FILE NUMBER: D07-12-26-0085

PLAN NUMBER: 19492

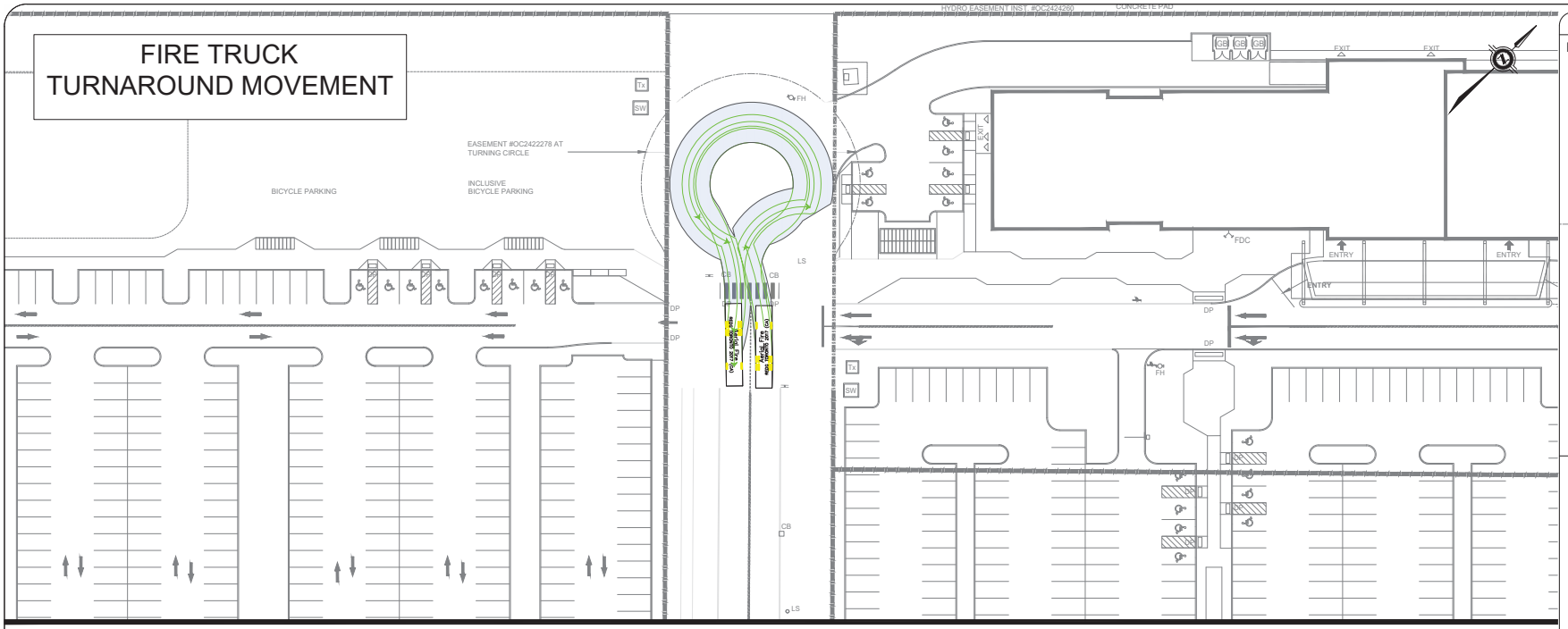
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2785 Palladium Drive
350 Culdaff Road

TITLE:
Turning Template Analysis

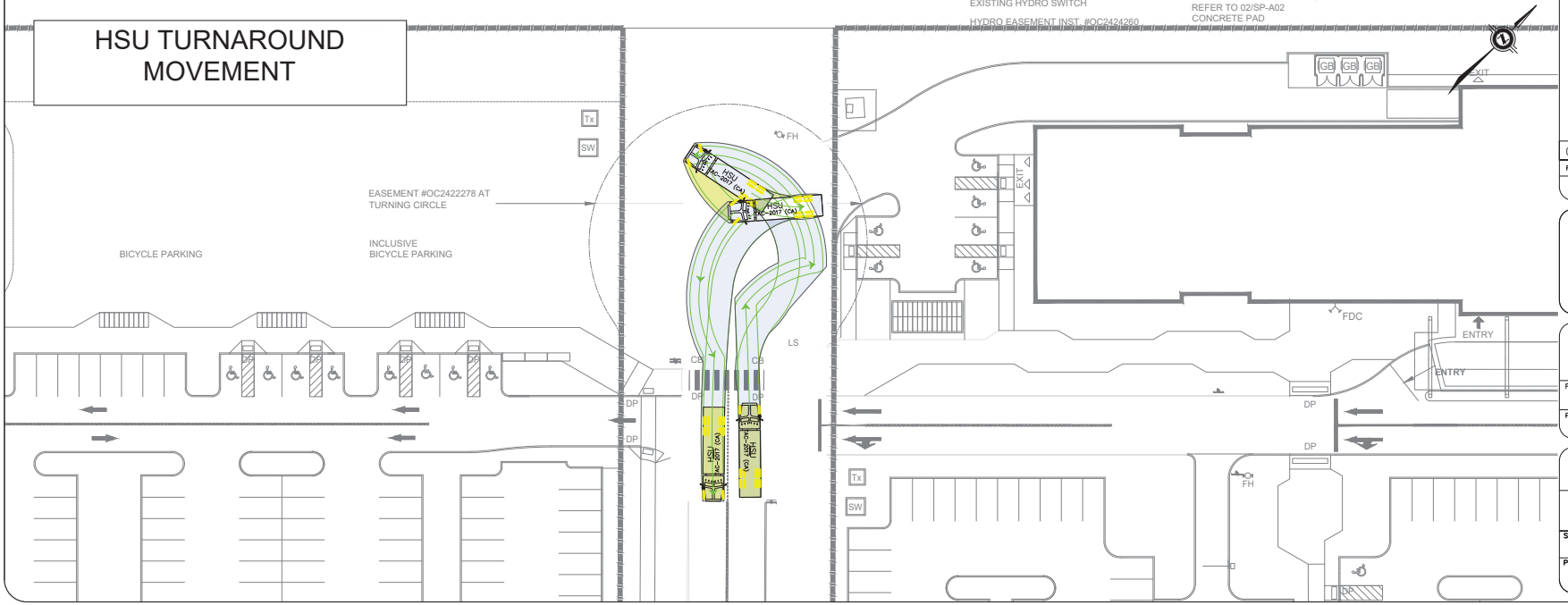
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-10-02	EA	AH

PROJECT NO:	DRAWING NO:	REVISION:
2024-167	006	05

FIRE TRUCK TURNAROUND MOVEMENT

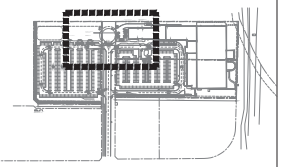


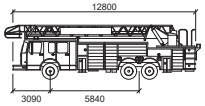
HSU TURNAROUND MOVEMENT



Notes:

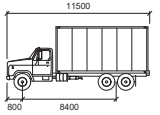
Key Map:





Aerial Fire

	mm
Width	: 2540
Track	: 2540
Lock to Lock Time	: 6.0
Steering Angle	: 37.0



HSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

REV:	DESCRIPTION:	BY:	DATE:
05	Issued for Review	EA	2026-10-02

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:
Palladium Resort Development Limited Partnership

FILE NUMBER: D07-12-26-0085

PLAN NUMBER: 19492

SITE:
2785 Palladium Drive
350 Culdaff Road

TITLE:
Turning Template Analysis

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2026-10-02	EA	AH

PROJECT NO:	DRAWING NO:	REVISION:
2024-167	007	05

Appendix H

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Segments Form

Project: 2775-2785 Palladium Drive
Consultant: CGH Transportation
Date: 2026-07-09
Scenario: Existing/Future

		Segment Name	Culdaff Rd				Palladium Dr			
		OP Transect / Policy Area	Industrial and Logistics or Mixed Industrial				Mainstreet Corridor (outside a Hub)			
		Segment Component	Majority (>50%)		Critical		Majority (>50%)		Critical	
		Side of Street	W or N	E or S	W or N	E or S	W or N	E or S	W or N	E or S
Pedestrian		PLOS Inputs								
	Posted Speed (km/h)		40 km/h		40 km/h		70 km/h		70 km/h	
	Two-Way ADT		550		550		7,080		7,080	
	Pedestrian Facility		Sidewalk	None	Sidewalk	None	None	None	None	None
	Does the facility meet the TMP Sidewalk or MUP Policy? If not, for MUPs, does the location have a low volume of peak daily users AND are pedestrian volumes likely less than 20% of total users?		Yes	Yes	Yes	Yes	No	No	No	No
	Facility Width (m)		1.80m	-	1.80m	-	-	-	-	-
	Offset from Motor Vehicle Travel Lanes (m)		≥ 3.0m	-	≥ 3.0m	-	-	-	-	-
	Presence of Adjacent Parking?		No	-	No	-	-	-	-	-
	General Purpose Curb Lane ADT		-	-	-	-	-	-	-	-
	Max. Distance between Controlled Crossings (m)		-	-	-	-	-	-	-	-
	Score		5.00	-	5.00	-	0.00	0.00	0.00	0.00
	PLOS		A	-	A	-	F	F	F	F
	Target PLOS		D				B			
Bicycle	BLOS Inputs									
	Cycling Route Classification		Elsewhere				Elsewhere			
	Cycling Facility		Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space
	Is the minimum level of separation provided according to OTM Book 18 Pre-Selection Nomograph - Rural Context (Figure 5.6)? (for paved shoulders)		-	-	-	-	-	-	-	-
	Facility Operation		-	-	-	-	-	-	-	-
	Pedestrian/Cyclist Volume		-	-	-	-	-	-	-	-
	Facility Width		-	-	-	-	-	-	-	-
	Boulevard/Buffer Width (excluding curb)		-	-	-	-	-	-	-	-
	Unsignalized Roadway Crossing Type (where cyclists are required to yield)		None	None	None	None	None	None	None	None
	Number of Travel Lanes at Crossing		-	-	-	-	-	-	-	-
	Crossing includes Median Refuge (≥ 2.7m)		-	-	-	-	-	-	-	-
	Cross-street Posted Speed (km/h)		-	-	-	-	-	-	-	-
	Cycling Path Blockages (e.g. bus stops and/or loading zones)		Rare	Rare	Rare	Rare	Rare	Rare	Rare	Rare
	Score		4.15	4.15	4.15	4.15	0.75	0.75	0.75	0.75
	BLOS		B	B	B	B	E	E	E	E
	Target BLOS		D				C			
Transit	TLOS Inputs									
	Transit Facility						Mixed Traffic			
	Facility Type						Mixed Traffic	Mixed Traffic		
	Expected Transit Running Time						Unimpeded	Unimpeded		
	Transit Travel Speed (if available)						Enter Speed (if available)	Enter Speed (if available)		
	TLOS		-	-			B	B		
	Target TLOS		-				E (D for frequent transit routes)			
Public Realm	PRLOS Inputs									
	Context		Other Streets	Other Streets			Other Streets	Other Streets		
	Inner Boulevard Width		≥ 4.0m	≥ 4.0m			≥ 4.0m	≥ 4.0m		
	Middle Boulevard Width		≤ 0.5m	≤ 0.5m			≥ 3.0m	≥ 3.0m		
	Outer Boulevard (Frontage) Width		2.0-2.99m	2.0-2.99m			≥ 3.0m	≥ 3.0m		
	Transit Route on Segment?		No	No			No	Yes		
	Bus Stop Elements		-	-			-	Curbside landing zone with shelter behind sidewalk		
	Number of Midblock Traffic Lanes (both travel directions)		≤ 2				5			
	Score		24.00	19.50			8.10	7.50		
	PRLOS		B	C			E	E		
			B				E			

Multi-Modal Level of Service - Intersections Form

Project: 2775-2785 Palladium Drive
Consultant: CGH Transportation
Date: 2026-07-09
Scenario: Existing/Future

	Intersection Name	Palladium Dr at Huntmar Dr (EX)				Palladium Dr at Huntmar Dr (FUT)				Palladium Dr at Hwy 417 WB			
	OP Transect / Policy Area	**Mainstreet Corridor (outside a Hub)**				**Mainstreet Corridor (outside a Hub)**				**Outer Urban or Suburban**			
Pedestrian	**PLOS Inputs**												
	Pedestrians Crossing the	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**
	Number of Travel Lanes Crossed	4	4	5	5	6	5	5	5	5	No Crosswalk	4	No Crosswalk
	Median Refuge (≥2.7m)	No	No	No	No	No	No	No	No	No	-	No	-
	Crosswalk Treatment	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Std Transverse Markings	-	Std Transverse Markings	-
	Signal Cycle Length (sec)	132.0				130.0				95.7			
	Effective Walk Time (sec)	6.7	6.7	31.6	31.6	11.7	11.7	24.6	24.6	11.0	-	5.0	-
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	**WBR**	**EBR**	**NBR**	**SBR**	**WBR**	**EBR**	**NBR**	**SBR**	**WBR**	**EBR**	**NBR**	**SBR**
	Right-Turn Geometry	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Conventional Right-Turn Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	No Right-Turn / Prohib.	No Right-Turn / Prohib.	No Right-Turn / Prohib.
	Right-Turn Signal Phasing	Permissive	Permissive	Permissive	-	Protected-Permissive	Protected-Permissive	Protected-Permissive	Protected-Permissive	Permissive	-	-	-
	Right-Turn Volume	≤ 150 veh/h	> 300 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	> 300 veh/h	≤ 150 veh/h	≤ 150 veh/h	> 300 veh/h	-	-	-
	Right-Turn Effective Corner Radius	> 8m	> 8m	> 8m	-	≤ 8m	≤ 8m	≤ 8m	≤ 8m	> 8m	-	-	-
	Cross-street Posted Speed (km/h)	50 km/h		60 km/h		50 km/h		60 km/h		60 km/h		50 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	**EBL**	**WBL**	**SBL**	**NBL**	**EBL**	**WBL**	**SBL**	**NBL**	**EBL**	**WBL**	**SBL**	**NBL**
	Left-Turn Signal Phasing	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	No Left-Turn / Prohib.	Fully Protected	Perm or Prot+Perm	No Left-Turn / Prohib.
	Left-Turn Volume	≤ 50 veh/h	> 100 veh/h	> 100 veh/h	> 100 veh/h	≤ 50 veh/h	> 100 veh/h	> 100 veh/h	> 100 veh/h	-	-	> 100 veh/h	-
	Left-Turn Opposing Lanes	-	-	-	-	-	-	-	-	-	-	-	-
	Score	**3.55**	**2.75**	**2.75**	**2.45**	**2.55**	**2.35**	**2.95**	**2.95**	**2.50**	**-**	**3.50**	**-**
	PLOS	**B**	**C**	**C**	**D**	**C**	**D**	**C**	**C**	**C**	**-**	**B**	**-**
		C				**C**				**C**			
	Target PLOS	**B**				**B**				**C**			
Bicycle	**BLOS Inputs**												
	Cycling Route Classification	**Cross-Town Bikeway**				**Cross-Town Bikeway**				**Elsewhere**			
	Cyclists Crossing the	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**
	Type of Cycling Facility Across Leg	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Crossride	Crossride	Crossride	Crossride			Mixed Traffic	Mixed Traffic
	Two-Way ADT (in Cyclist Travel Direction)	11,640		11,950		11,640		11,950				7,240	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	No	No	No	No	No	No	No			No	No
	Crossride Operation	-	-	-	-	Unidirectional	Unidirectional	Unidirectional	Unidirectional			-	-
	Target Crossride Setback Met?	-	-	-	-	Yes	Yes	Yes	Yes		-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-			-	-
	Cyclist Left-Turn Operation	**WBL**	**EBL**	**NBL**	**SBL**	**WBL**	**EBL**	**NBL**	**SBL**	**WBL**	**EBL**	**NBL**	**SBL**
	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	Protected Corner	Protected Corner	Protected Corner	Protected Corner			No Left-Turn	No Left-Turn
	Vehicle Lanes Crossed by Cyclists	Two or More Lanes Crossed	Two or More Lanes Crossed	Two or More Lanes Crossed	Two or More Lanes Crossed	-	-	-	-			-	-
	Score	**40**	**-40**	**-10**	**-30**	**150**	**70**	**110**	**110**	**-**	**-**	**60**	**100**
	BLOS	**D**	**F**	**F**	**F**	**A**	**C**	**B**	**B**	**-**	**-**	**D**	**B**
		-				**B**				**C**			
	Target BLOS	**B**				**B**				**C**			
Transit	**TLOS Inputs**												
	Transit Facility	**Mixed Traffic**				**Mixed Traffic**				**Mixed Traffic**			
	Vehicles Travelling	**Southbound**	**Northbound**	**Westbound**	**Eastbound**	**Southbound**	**Northbound**	**Westbound**	**Eastbound**	**Southbound**	**Northbound**	**Westbound**	**Eastbound**
	Average Transit Delay (if available)		21-35 sec		21-35 sec		21-35 sec		21-35 sec	≤ 10 sec	21-35 sec		
	Example Transit Priority Treatment		-		-		-		-	-	-		
	TLOS	**-**	**C**	**-**	**C**	**-**	**C**	**-**	**C**	**A**	**C**	**-**	**-**
		C				**C**				**B**			
	Target TLOS	**E (D for frequent transit routes)**				**E (D for frequent transit routes)**				**E (D for frequent transit routes)**			
Auto	**AutoLOS Inputs**												
	Overall Intersection Volume to Capacity Ratio	0.71 to 0.80				0.71 to 0.80				0 to 0.60			
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table				See Separate Traffic Operations Table				See Separate Traffic Operations Table			
	AutoLOS	**C**				**C**				**A**			
	Target AutoLOS	**E**				**E**				**E**			

Appendix I

Background Development Volumes

Figure 20: Trip Assignment

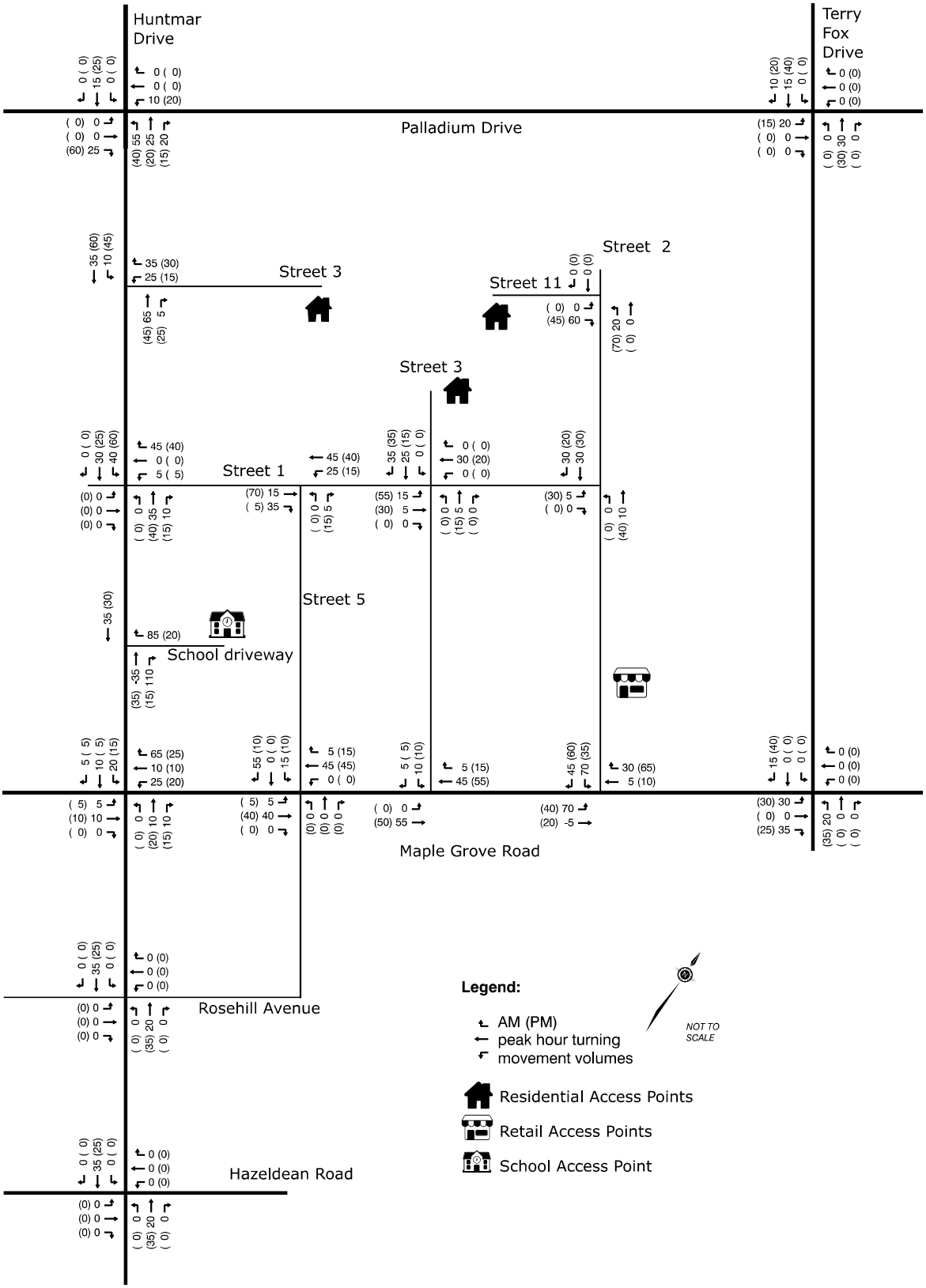


Figure 13: Site Generated Traffic

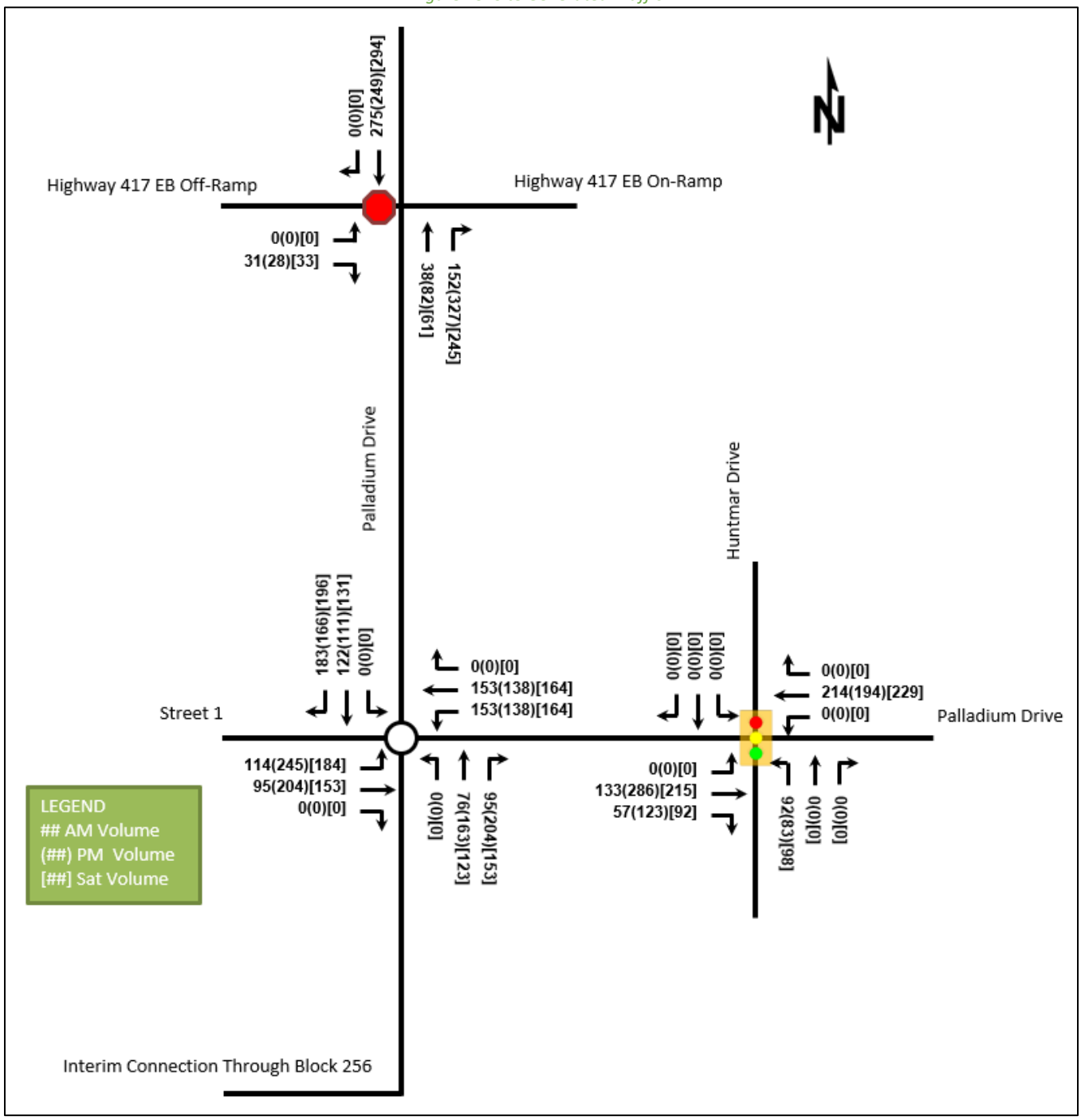
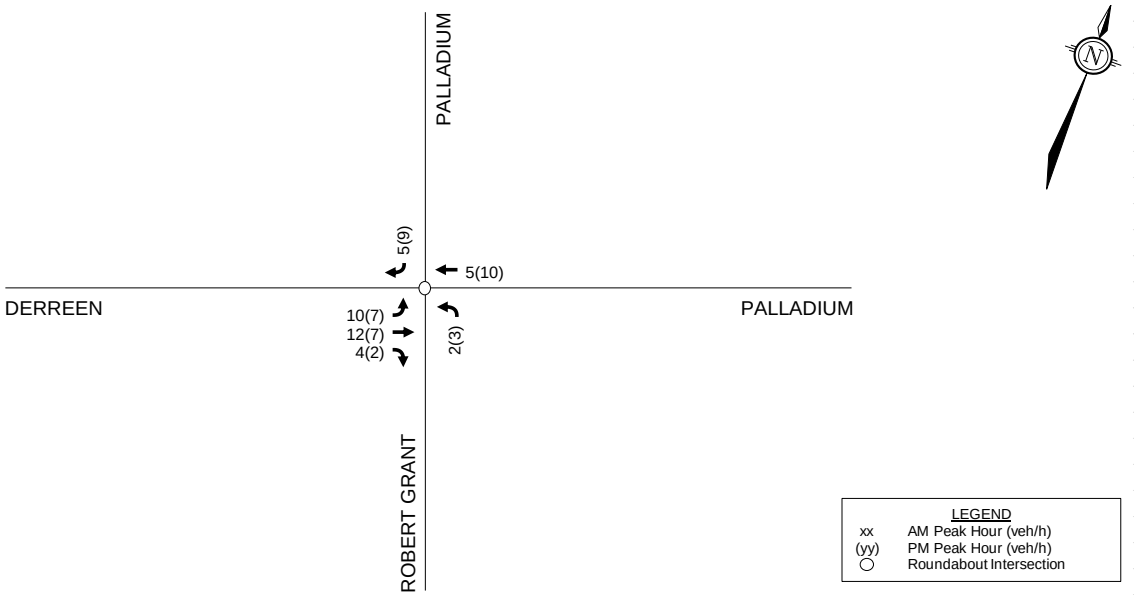


Figure 6: Site-Generated Traffic Volumes



Appendix J

Synchro Intersection Worksheets – 2029 Future Background Conditions



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	344	273	0	150	253
Future Volume (vph)	196	344	273	0	150	253
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.355	
Satd. Flow (perm)	3216	1483	3316	0	620	3316
Satd. Flow (RTOR)		344				
Lane Group Flow (vph)	196	344	273	0	150	253
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	8.9	8.9	10.9		22.4	22.4
Actuated g/C Ratio	0.20	0.20	0.24		0.49	0.49
v/c Ratio	0.31	0.61	0.34		0.31	0.16
Control Delay	18.7	7.9	18.0		8.1	6.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.7	7.9	18.0		8.1	6.4
LOS	B	A	B		A	A
Approach Delay	11.8		18.0			7.0
Approach LOS	B		B			A
Queue Length 50th (m)	7.3	0.0	10.2		5.6	4.8
Queue Length 95th (m)	15.6	16.8	21.5		14.7	10.9
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	2208	1126	2277		680	3260
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.09	0.31	0.12		0.22	0.08

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 45.6
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61

Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	175	197	0	194	280	0
Future Volume (vph)	175	197	0	194	280	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	175	197	0	194	280	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 27.7%		ICU Level of Service A	
Analysis Period (min) 15			

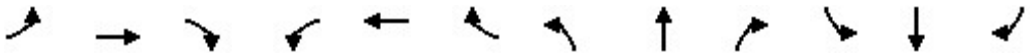
Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	175	197	0	194	280	0
Future Vol, veh/h	175	197	0	194	280	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	197	0	194	280	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	377	140	-	0	-	0
Stage 1	280	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	597	882	0	-	-	0
Stage 1	742	-	0	-	-	0
Stage 2	916	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	597	882	-	-	-	-
Mov Cap-2 Maneuver	597	-	-	-	-	-
Stage 1	742	-	-	-	-	-
Stage 2	916	-	-	-	-	-

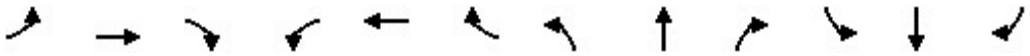
Approach	EB	NB	SB
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	597	882	-
HCM Lane V/C Ratio	-	0.293	0.223	-
HCM Control Delay (s)	-	13.5	10.3	-
HCM Lane LOS	-	B	B	-
HCM 95th %tile Q(veh)	-	1.2	0.9	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	93	1	6	41	385	0	21	18	427	10	36
Future Volume (vph)	104	93	1	6	41	385	0	21	18	427	10	36
Satd. Flow (prot)	0	3226	0	0	1735	1483	0	3087	0	0	3138	0
Flt Permitted		0.974			0.994						0.957	
Satd. Flow (perm)	0	3226	0	0	1735	1483	0	3087	0	0	3138	0
Lane Group Flow (vph)	0	198	0	0	47	385	0	39	0	0	473	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	112	0	25	56	4	0	0	46	8	0	0
Future Volume (vph)	0	112	0	25	56	4	0	0	46	8	0	0
Satd. Flow (prot)	0	1745	0	0	1710	0	0	1510	0	0	1658	0
Flt Permitted					0.986						0.950	
Satd. Flow (perm)	0	1745	0	0	1710	0	0	1510	0	0	1658	0
Lane Group Flow (vph)	0	112	0	0	85	0	0	46	0	0	8	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 26.6%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	112	0	25	56	4	0	0	46	8	0	0
Future Vol, veh/h	0	112	0	25	56	4	0	0	46	8	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	112	0	25	56	4	0	0	46	8	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.6	7	7.7
HCM LOS	A	A	A	A

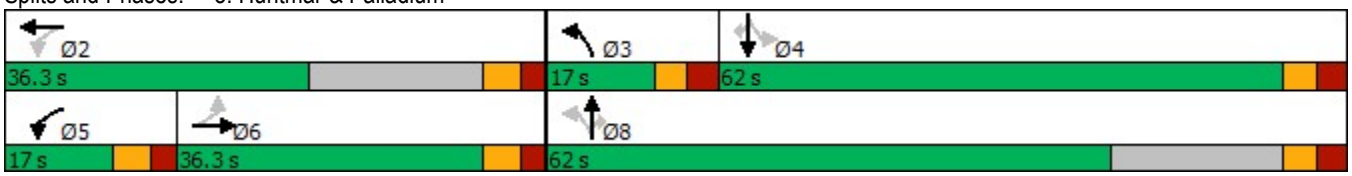
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	29%	100%
Vol Thru, %	0%	100%	66%	0%
Vol Right, %	100%	0%	5%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	112	85	8
LT Vol	0	0	25	8
Through Vol	0	112	56	0
RT Vol	46	0	4	0
Lane Flow Rate	46	112	85	8
Geometry Grp	1	1	1	1
Degree of Util (X)	0.047	0.127	0.098	0.01
Departure Headway (Hd)	3.678	4.093	4.144	4.612
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	955	874	862	781
Service Time	1.774	2.13	2.185	2.612
HCM Lane V/C Ratio	0.048	0.128	0.099	0.01
HCM Control Delay	7	7.7	7.6	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.3	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	224	181	46	110	48	259	366	99	73	215	28
Future Volume (vph)	68	224	181	46	110	48	259	366	99	73	215	28
Satd. Flow (prot)	1658	3057	0	1658	3147	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.652			0.323			0.426			0.543		
Satd. Flow (perm)	1133	3057	0	562	3147	0	742	1745	1459	945	1745	1458
Satd. Flow (RTOR)		145			48				99			132
Lane Group Flow (vph)	68	405	0	46	158	0	259	366	99	73	215	28
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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)	2.5	2.5		2.6	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)	6.2	6.2		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.6	14.6		22.0	22.0		33.5	33.5	33.5	16.3	16.3	16.3
Actuated g/C Ratio	0.21	0.21		0.32	0.32		0.48	0.48	0.48	0.23	0.23	0.23
v/c Ratio	0.29	0.54		0.15	0.15		0.53	0.43	0.13	0.33	0.53	0.06
Control Delay	30.4	19.6		17.4	12.0		18.5	16.3	4.0	30.2	30.8	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	19.6		17.4	12.0		18.5	16.3	4.0	30.2	30.8	0.3
LOS	C	B		B	B		B	B	A	C	C	A
Approach Delay		21.2			13.3			15.4			28.0	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	7.8	16.2		3.8	4.7		20.6	31.1	0.0	8.1	25.3	0.0
Queue Length 95th (m)	22.3	36.2		12.3	13.1		53.5	76.9	8.9	24.2	57.8	0.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	536	1524		366	2337		511	1625	1365	770	1422	1212
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	0.27		0.13	0.07		0.51	0.23	0.07	0.09	0.15	0.02

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 69.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54

Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Huntmar & Palladium





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	246	283	257	0	273	458
Future Volume (vph)	246	283	257	0	273	458
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.358	
Satd. Flow (perm)	3216	1483	3316	0	625	3316
Satd. Flow (RTOR)		283				
Lane Group Flow (vph)	246	283	257	0	273	458
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	9.5	9.5	10.6		28.2	28.2
Actuated g/C Ratio	0.18	0.18	0.21		0.55	0.55
v/c Ratio	0.41	0.56	0.38		0.49	0.25
Control Delay	21.4	8.0	20.4		9.9	6.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	21.4	8.0	20.4		9.9	6.7
LOS	C	A	C		A	A
Approach Delay	14.3		20.4			7.9
Approach LOS	B		C			A
Queue Length 50th (m)	10.1	0.0	10.6		11.8	10.2
Queue Length 95th (m)	20.6	16.3	21.8		25.0	18.2
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1890	988	1948		645	3209
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.13	0.29	0.13		0.42	0.14

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 51.5
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56

Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 49.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	150	156	0	417	376	0
Future Volume (vph)	150	156	0	417	376	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	150	156	0	417	376	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 28.0%		ICU Level of Service A	
Analysis Period (min) 15			

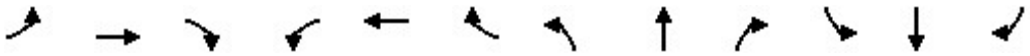
Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	150	156	0	417	376	0
Future Vol, veh/h	150	156	0	417	376	0
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	150	156	0	417	376	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	585	188	-	0	-	0
Stage 1	376	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	442	822	0	-	-	0
Stage 1	664	-	0	-	-	0
Stage 2	806	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	442	822	-	-	-	-
Mov Cap-2 Maneuver	442	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	806	-	-	-	-	-

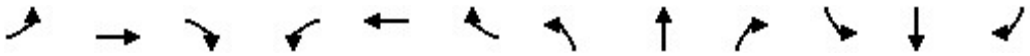
Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	442	822	-
HCM Lane V/C Ratio	-	0.339	0.19	-
HCM Control Delay (s)	-	17.3	10.4	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	1.5	0.7	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	81	1	15	86	728	1	17	20	504	20	131
Future Volume (vph)	68	81	1	15	86	728	1	17	20	504	20	131
Satd. Flow (prot)	0	3239	0	0	1733	1483	0	3051	0	0	3097	0
Flt Permitted		0.978			0.993			0.999			0.963	
Satd. Flow (perm)	0	3239	0	0	1733	1483	0	3051	0	0	3097	0
Lane Group Flow (vph)	0	150	0	0	101	728	0	38	0	0	655	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 67.4%		ICU Level of Service C	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	66	3	81	106	7	1	0	47	6	1	1
Future Volume (vph)	0	66	3	81	106	7	1	0	47	6	1	1
Satd. Flow (prot)	0	1735	0	0	1702	0	0	1513	0	0	1654	0
Flt Permitted					0.980			0.999			0.964	
Satd. Flow (perm)	0	1735	0	0	1702	0	0	1513	0	0	1654	0
Lane Group Flow (vph)	0	69	0	0	194	0	0	48	0	0	8	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 29.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	66	3	81	106	7	1	0	47	6	1	1
Future Vol, veh/h	0	66	3	81	106	7	1	0	47	6	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	66	3	81	106	7	1	0	47	6	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	8.4	7.2	7.7
HCM LOS	A	A	A	A

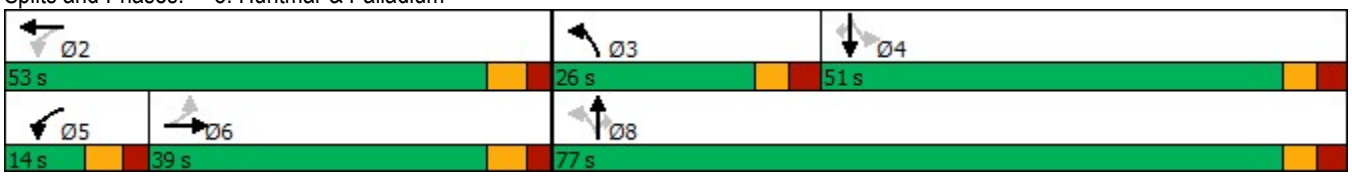
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	42%	75%
Vol Thru, %	0%	96%	55%	12%
Vol Right, %	98%	4%	4%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	48	69	194	8
LT Vol	1	0	81	6
Through Vol	0	66	106	1
RT Vol	47	3	7	1
Lane Flow Rate	48	69	194	8
Geometry Grp	1	1	1	1
Degree of Util (X)	0.053	0.08	0.223	0.01
Departure Headway (Hd)	3.939	4.153	4.146	4.641
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	915	854	863	776
Service Time	1.939	2.223	2.188	2.643
HCM Lane V/C Ratio	0.052	0.081	0.225	0.01
HCM Control Delay	7.2	7.6	8.4	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.9	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	183	363	116	370	100	246	350	47	136	470	105
Future Volume (vph)	42	183	363	116	370	100	246	350	47	136	470	105
Satd. Flow (prot)	1658	2936	0	1658	3199	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.483			0.188			0.200			0.551		
Satd. Flow (perm)	842	2936	0	328	3199	0	349	1745	1459	959	1745	1460
Satd. Flow (RTOR)		363			29				80			133
Lane Group Flow (vph)	42	546	0	116	470	0	246	350	47	136	470	105
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	39.0	39.0		14.0	53.0		26.0	77.0	77.0	51.0	51.0	51.0
Total Split (%)	30.0%	30.0%		10.8%	40.8%		20.0%	59.2%	59.2%	39.2%	39.2%	39.2%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.8	14.8		29.4	29.3		49.3	49.3	49.3	29.7	29.7	29.7
Actuated g/C Ratio	0.16	0.16		0.32	0.32		0.54	0.54	0.54	0.32	0.32	0.32
v/c Ratio	0.31	0.70		0.53	0.45		0.66	0.37	0.06	0.44	0.83	0.19
Control Delay	43.6	18.0		35.4	26.2		21.2	13.9	0.9	31.1	43.8	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	43.6	18.0		35.4	26.2		21.2	13.9	0.9	31.1	43.8	3.3
LOS	D	B		D	C		C	B	A	C	D	A
Approach Delay		19.8			28.0			15.8			35.4	
Approach LOS		B			C			B			D	
Queue Length 50th (m)	6.4	14.9		14.4	31.2		20.0	30.3	0.0	17.2	69.8	0.0
Queue Length 95th (m)	19.2	37.9		34.8	59.3		46.6	67.5	1.7	44.6	145.8	7.2
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	313	1320		223	1713		479	1396	1183	486	885	806
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	0.41		0.52	0.27		0.51	0.25	0.04	0.28	0.53	0.13

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 91.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Huntmar & Palladium





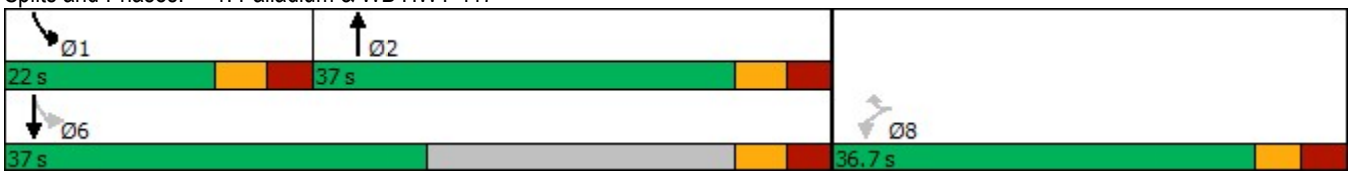
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	202	713	340	0	201	653
Future Volume (vph)	202	713	340	0	201	653
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.359	
Satd. Flow (perm)	3216	1483	3316	0	626	3316
Satd. Flow (RTOR)		541				
Lane Group Flow (vph)	202	713	340	0	201	653
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	18.7	18.7	12.8		30.9	30.9
Actuated g/C Ratio	0.29	0.29	0.20		0.48	0.48
v/c Ratio	0.22	0.87	0.51		0.42	0.41
Control Delay	17.4	19.0	28.1		14.7	12.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	17.4	19.0	28.1		14.7	12.9
LOS	B	B	C		B	B
Approach Delay	18.6		28.1			13.3
Approach LOS	B		C			B
Queue Length 50th (m)	8.8	15.5	19.0		13.4	25.0
Queue Length 95th (m)	18.1	#83.3	37.7		31.6	46.9
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1590	1007	1640		557	2733
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.13	0.71	0.21		0.36	0.24

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 64
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87

Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	213	143	0	340	354	0
Future Volume (vph)	213	143	0	340	354	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	213	143	0	340	354	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 29.6%		ICU Level of Service A	
Analysis Period (min) 15			

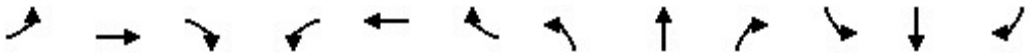
Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	213	143	0	340	354	0
Future Vol, veh/h	213	143	0	340	354	0
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	35	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	143	0	340	354	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	524	177	-	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	170	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	483	835	0	-	-	0
Stage 1	681	-	0	-	-	0
Stage 2	843	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	483	835	-	-	-	-
Mov Cap-2 Maneuver	483	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	843	-	-	-	-	-

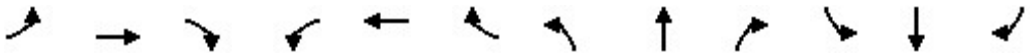
Approach	EB	NB	SB
HCM Control Delay, s	15	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	483	835	-
HCM Lane V/C Ratio	-	0.441	0.171	-
HCM Control Delay (s)	-	18.2	10.2	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	2.2	0.6	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	68	2	5	57	466	0	16	13	409	23	75
Future Volume (vph)	62	68	2	5	57	466	0	16	13	409	23	75
Satd. Flow (prot)	0	3233	0	0	1738	1483	0	3094	0	0	3116	0
Flt Permitted		0.977			0.996						0.961	
Satd. Flow (perm)	0	3233	0	0	1738	1483	0	3094	0	0	3116	0
Lane Group Flow (vph)	0	132	0	0	62	466	0	29	0	0	507	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	81	2	50	66	15	1	0	45	8	1	1
Future Volume (vph)	2	81	2	50	66	15	1	0	45	8	1	1
Satd. Flow (prot)	0	1738	0	0	1686	0	0	1513	0	0	1655	0
Flt Permitted		0.999			0.981			0.999			0.962	
Satd. Flow (perm)	0	1738	0	0	1686	0	0	1513	0	0	1655	0
Lane Group Flow (vph)	0	85	0	0	131	0	0	46	0	0	10	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 27.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	81	2	50	66	15	1	0	45	8	1	1
Future Vol, veh/h	2	81	2	50	66	15	1	0	45	8	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	81	2	50	66	15	1	0	45	8	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7.9	7	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	2%	38%	80%
Vol Thru, %	0%	95%	50%	10%
Vol Right, %	98%	2%	11%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	85	131	10
LT Vol	1	2	50	8
Through Vol	0	81	66	1
RT Vol	45	2	15	1
Lane Flow Rate	46	85	131	10
Geometry Grp	1	1	1	1
Degree of Util (X)	0.049	0.097	0.149	0.013
Departure Headway (Hd)	3.833	4.121	4.104	4.553
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	940	864	870	791
Service Time	1.834	2.174	2.146	2.554
HCM Lane V/C Ratio	0.049	0.098	0.151	0.013
HCM Control Delay	7	7.6	7.9	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.5	0

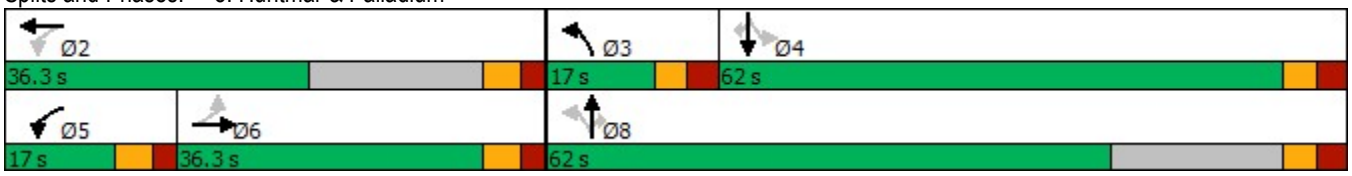
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	181	222	87	226	126	272	380	75	139	330	67
Future Volume (vph)	57	181	222	87	226	126	272	380	75	139	330	67
Satd. Flow (prot)	1658	3000	0	1658	3137	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.541			0.299			0.302			0.536		
Satd. Flow (perm)	944	3000	0	521	3137	0	526	1745	1465	935	1745	1460
Satd. Flow (RTOR)		217			90				78			131
Lane Group Flow (vph)	57	403	0	87	352	0	272	380	75	139	330	67
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.1	14.1		26.2	26.1		38.3	38.3	38.3	20.9	20.9	20.9
Actuated g/C Ratio	0.18	0.18		0.34	0.34		0.49	0.49	0.49	0.27	0.27	0.27
v/c Ratio	0.33	0.56		0.28	0.32		0.66	0.44	0.10	0.55	0.71	0.14
Control Delay	36.9	17.6		20.6	14.6		24.7	17.0	3.9	36.7	36.6	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	17.6		20.6	14.6		24.7	17.0	3.9	36.7	36.6	0.6
LOS	D	B		C	B		C	B	A	D	D	A
Approach Delay		20.0			15.8			18.5			32.1	
Approach LOS		B			B			B			C	
Queue Length 50th (m)	7.6	13.0		8.4	13.8		22.6	33.7	0.0	17.2	42.9	0.0
Queue Length 95th (m)	20.7	30.1		21.1	28.4		#65.7	81.1	7.3	44.3	90.5	0.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	388	1362		345	2054		422	1567	1324	691	1290	1113
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	0.15	0.30		0.25	0.17		0.64	0.24	0.06	0.20	0.26	0.06

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 77.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71

Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 75.1%	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: 5: Huntmar & Palladium



MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen AM FB2029 (Site Folder: FB2029)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.021	4.3	LOS A	0.1	0.6	0.51	0.37	0.51	45.5
2	T1	All MCs	21	2.0	21	2.0	0.021	4.2	LOS A	0.1	0.6	0.51	0.37	0.51	46.1
3	R2	All MCs	18	2.0	18	2.0	0.021	3.7	LOS A	0.1	0.6	0.50	0.35	0.50	45.9
Approach			40	2.0	40	2.0	0.021	4.0	LOS A	0.1	0.6	0.51	0.36	0.51	46.0
East: Palladium															
4	L2	All MCs	7	2.0	7	2.0	0.039	3.0	LOS A	0.2	1.2	0.25	0.11	0.25	52.2
5	T1	All MCs	46	2.0	46	2.0	0.039	3.0	LOS A	0.2	1.2	0.25	0.11	0.25	53.2
6	R2	All MCs	428	2.0	428	2.0	0.308	5.2	LOS A	1.7	12.0	0.31	0.15	0.31	51.8
Approach			480	2.0	480	2.0	0.308	5.0	LOS A	1.7	12.0	0.30	0.15	0.30	52.0
North: Palladium															
7	L2	All MCs	474	2.0	474	2.0	0.308	4.7	LOS A	1.7	11.8	0.18	0.06	0.18	52.3
8	T1	All MCs	11	2.0	11	2.0	0.055	4.3	LOS A	0.2	1.6	0.17	0.07	0.17	58.0
9	R2	All MCs	40	2.0	40	2.0	0.055	4.3	LOS A	0.2	1.6	0.17	0.07	0.17	57.1
Approach			526	2.0	526	2.0	0.308	4.7	LOS A	1.7	11.8	0.18	0.06	0.18	52.7
West: Derreen															
10	L2	All MCs	116	2.0	116	2.0	0.105	4.2	LOS A	0.5	3.4	0.47	0.33	0.47	28.6
11	T1	All MCs	103	2.0	103	2.0	0.105	4.6	LOS A	0.5	3.4	0.48	0.35	0.48	28.9
12	R2	All MCs	1	2.0	1	2.0	0.105	4.6	LOS A	0.5	3.3	0.48	0.35	0.48	28.9
Approach			220	2.0	220	2.0	0.105	4.4	LOS A	0.5	3.4	0.48	0.34	0.48	28.8
All Vehicles			1266	2.0	1266	2.0	0.308	4.7	LOS A	1.7	12.0	0.29	0.15	0.29	45.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen PM FB2029 (Site Folder: FB2029)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.021	4.5	LOS A	0.1	0.6	0.54	0.40	0.54	45.4
2	T1	All MCs	17	2.0	17	2.0	0.021	4.5	LOS A	0.1	0.7	0.54	0.39	0.54	46.0
3	R2	All MCs	20	2.0	20	2.0	0.021	3.8	LOS A	0.1	0.7	0.53	0.37	0.53	45.7
Approach			38	2.0	38	2.0	0.021	4.1	LOS A	0.1	0.7	0.54	0.38	0.54	45.9
East: Palladium															
4	L2	All MCs	17	2.0	17	2.0	0.082	3.3	LOS A	0.4	2.6	0.21	0.09	0.21	52.0
5	T1	All MCs	96	2.0	96	2.0	0.082	3.3	LOS A	0.4	2.6	0.21	0.09	0.21	53.0
6	R2	All MCs	809	2.0	809	2.0	0.542	7.7	LOS A	4.2	29.8	0.34	0.15	0.34	50.1
Approach			921	2.0	921	2.0	0.542	7.1	LOS A	4.2	29.8	0.32	0.14	0.32	50.4
North: Palladium															
7	L2	All MCs	560	2.0	560	2.0	0.388	5.9	LOS A	2.2	16.0	0.29	0.13	0.29	51.5
8	T1	All MCs	22	2.0	22	2.0	0.176	5.4	LOS A	0.8	5.5	0.28	0.14	0.28	57.1
9	R2	All MCs	146	2.0	146	2.0	0.176	5.4	LOS A	0.8	5.5	0.28	0.14	0.28	56.1
Approach			728	2.0	728	2.0	0.388	5.8	LOS A	2.2	16.0	0.29	0.14	0.29	52.5
West: Derreen															
10	L2	All MCs	76	2.0	76	2.0	0.086	4.8	LOS A	0.4	2.8	0.53	0.41	0.53	28.5
11	T1	All MCs	90	2.0	90	2.0	0.086	4.3	LOS A	0.4	2.9	0.52	0.39	0.52	29.0
12	R2	All MCs	1	2.0	1	2.0	0.086	4.3	LOS A	0.4	2.9	0.52	0.39	0.52	29.0
Approach			167	2.0	167	2.0	0.086	4.5	LOS A	0.4	2.9	0.53	0.39	0.53	28.8
All Vehicles			1854	2.0	1854	2.0	0.542	6.3	LOS A	4.2	29.8	0.33	0.17	0.33	47.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen SAT FB2029 (Site Folder: FB2029)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.015	4.0	LOS A	0.1	0.4	0.48	0.32	0.48	45.6
2	T1	All MCs	16	2.0	16	2.0	0.015	3.9	LOS A	0.1	0.4	0.48	0.32	0.48	46.2
3	R2	All MCs	13	2.0	13	2.0	0.015	3.5	LOS A	0.1	0.4	0.47	0.30	0.47	46.0
Approach			30	2.0	30	2.0	0.015	3.7	LOS A	0.1	0.4	0.47	0.31	0.47	46.1
East: Palladium															
4	L2	All MCs	6	2.0	6	2.0	0.050	3.0	LOS A	0.2	1.5	0.19	0.08	0.19	52.4
5	T1	All MCs	63	2.0	63	2.0	0.050	3.0	LOS A	0.2	1.5	0.19	0.08	0.19	53.4
6	R2	All MCs	518	2.0	518	2.0	0.350	5.4	LOS A	2.0	14.4	0.25	0.10	0.25	51.7
Approach			587	2.0	587	2.0	0.350	5.1	LOS A	2.0	14.4	0.24	0.10	0.24	51.9
North: Palladium															
7	L2	All MCs	454	2.0	454	2.0	0.302	4.8	LOS A	1.6	11.2	0.20	0.08	0.20	52.2
8	T1	All MCs	26	2.0	26	2.0	0.117	4.9	LOS A	0.5	3.5	0.21	0.09	0.21	57.5
9	R2	All MCs	83	2.0	83	2.0	0.117	4.9	LOS A	0.5	3.5	0.21	0.09	0.21	56.6
Approach			563	2.0	563	2.0	0.302	4.8	LOS A	1.6	11.2	0.20	0.08	0.20	53.0
West: Derreen															
10	L2	All MCs	69	2.0	69	2.0	0.070	4.3	LOS A	0.3	2.1	0.46	0.33	0.46	28.6
11	T1	All MCs	76	2.0	76	2.0	0.070	3.8	LOS A	0.3	2.1	0.45	0.31	0.45	29.1
12	R2	All MCs	2	2.0	2	2.0	0.070	3.8	LOS A	0.3	2.1	0.45	0.31	0.45	29.1
Approach			147	2.0	147	2.0	0.070	4.0	LOS A	0.3	2.1	0.45	0.32	0.45	28.9
All Vehicles			1327	2.0	1327	2.0	0.350	4.8	LOS A	2.0	14.4	0.25	0.12	0.25	47.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Appendix K

Synchro Intersection Worksheets – 2034 Future Background Conditions



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	232	380	320	0	174	295
Future Volume (vph)	232	380	320	0	174	295
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.343	
Satd. Flow (perm)	3216	1483	3316	0	599	3316
Satd. Flow (RTOR)		380				
Lane Group Flow (vph)	232	380	320	0	174	295
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	9.7	9.7	11.2		26.8	26.8
Actuated g/C Ratio	0.19	0.19	0.22		0.53	0.53
v/c Ratio	0.38	0.64	0.44		0.35	0.17
Control Delay	20.0	8.3	19.9		8.7	6.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	20.0	8.3	19.9		8.7	6.7
LOS	C	A	B		A	A
Approach Delay	12.7		19.9			7.4
Approach LOS	B		B			A
Queue Length 50th (m)	9.0	0.0	12.6		6.9	6.0
Queue Length 95th (m)	19.1	18.0	26.5		18.1	13.5
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1940	1045	2000		638	3211
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.12	0.36	0.16		0.27	0.09

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 50.4
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	203	238	0	251	340	0
Future Volume (vph)	203	238	0	251	340	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	203	238	0	251	340	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 32.1%		ICU Level of Service A	
Analysis Period (min) 15			

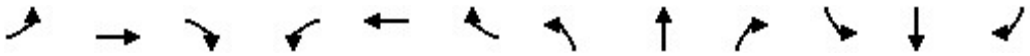
Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	203	238	0	251	340	0
Future Vol, veh/h	203	238	0	251	340	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	203	238	0	251	340	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	466	170	-	0	-	0
Stage 1	340	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	525	844	0	-	-	0
Stage 1	692	-	0	-	-	0
Stage 2	886	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	525	844	-	-	-	-
Mov Cap-2 Maneuver	525	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	886	-	-	-	-	-

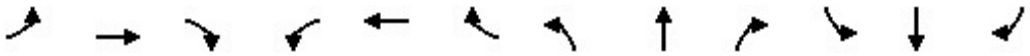
Approach	EB	NB	SB
HCM Control Delay, s	13.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	525	844	-
HCM Lane V/C Ratio	-	0.387	0.282	-
HCM Control Delay (s)	-	16.1	10.9	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	1.8	1.2	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	95	1	10	45	499	0	23	20	513	13	41
Future Volume (vph)	107	95	1	10	45	499	0	23	20	513	13	41
Satd. Flow (prot)	0	3226	0	0	1729	1483	0	3084	0	0	3138	0
Flt Permitted		0.974			0.991						0.957	
Satd. Flow (perm)	0	3226	0	0	1729	1483	0	3084	0	0	3138	0
Lane Group Flow (vph)	0	203	0	0	55	499	0	43	0	0	567	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary	
Control Type: Roundabout	
Intersection Capacity Utilization 56.3%	ICU Level of Service B
Analysis Period (min) 15	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	112	0	25	56	4	0	0	46	8	0	0
Future Volume (vph)	0	112	0	25	56	4	0	0	46	8	0	0
Satd. Flow (prot)	0	1745	0	0	1710	0	0	1510	0	0	1658	0
Flt Permitted					0.986						0.950	
Satd. Flow (perm)	0	1745	0	0	1710	0	0	1510	0	0	1658	0
Lane Group Flow (vph)	0	112	0	0	85	0	0	46	0	0	8	0
Sign Control		Stop			Stop			Stop			Stop	

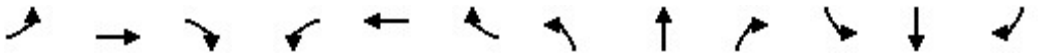
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 26.6%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	112	0	25	56	4	0	0	46	8	0	0
Future Vol, veh/h	0	112	0	25	56	4	0	0	46	8	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	112	0	25	56	4	0	0	46	8	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.6	7	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	29%	100%
Vol Thru, %	0%	100%	66%	0%
Vol Right, %	100%	0%	5%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	112	85	8
LT Vol	0	0	25	8
Through Vol	0	112	56	0
RT Vol	46	0	4	0
Lane Flow Rate	46	112	85	8
Geometry Grp	1	1	1	1
Degree of Util (X)	0.047	0.127	0.098	0.01
Departure Headway (Hd)	3.678	4.093	4.144	4.612
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	955	874	862	781
Service Time	1.774	2.13	2.185	2.612
HCM Lane V/C Ratio	0.048	0.128	0.099	0.01
HCM Control Delay	7	7.7	7.6	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.3	0



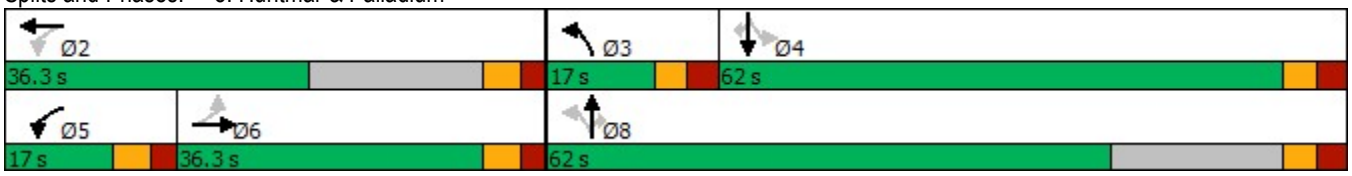
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	261	228	53	134	48	328	416	117	73	245	28
Future Volume (vph)	68	261	228	53	134	48	328	416	117	73	245	28
Satd. Flow (prot)	1658	3046	0	1658	3169	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.637			0.262			0.385			0.519		
Satd. Flow (perm)	1107	3046	0	456	3169	0	670	1745	1459	904	1745	1458
Satd. Flow (RTOR)		154			42				117			132
Lane Group Flow (vph)	68	489	0	53	182	0	328	416	117	73	245	28
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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)	2.5	2.5		2.6	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)	6.2	6.2		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	16.0	16.0		23.8	23.8		35.4	35.4	35.4	17.6	17.6	17.6
Actuated g/C Ratio	0.22	0.22		0.33	0.33		0.49	0.49	0.49	0.24	0.24	0.24
v/c Ratio	0.28	0.62		0.19	0.17		0.69	0.49	0.15	0.34	0.58	0.06
Control Delay	30.8	22.4		18.1	13.2		25.8	17.9	3.9	31.2	33.0	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	22.4		18.1	13.2		25.8	17.9	3.9	31.2	33.0	0.2
LOS	C	C		B	B		C	B	A	C	C	A
Approach Delay		23.5			14.3			19.0			30.0	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	8.3	22.7		4.6	6.4		30.0	40.0	0.0	8.7	31.1	0.0
Queue Length 95th (m)	22.6	46.3		13.6	15.5		#84.5	90.4	9.7	24.4	66.3	0.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	495	1448		341	2228		480	1590	1340	715	1381	1182
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	0.34		0.16	0.08		0.68	0.26	0.09	0.10	0.18	0.02

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 72.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69

Intersection Signal Delay: 21.6	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: 5: Huntmar & Palladium





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	308	317	301	0	320	538
Future Volume (vph)	308	317	301	0	320	538
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.352	
Satd. Flow (perm)	3216	1483	3316	0	614	3316
Satd. Flow (RTOR)		317				
Lane Group Flow (vph)	308	317	301	0	320	538
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	11.0	11.0	11.2		30.0	30.0
Actuated g/C Ratio	0.20	0.20	0.20		0.55	0.55
v/c Ratio	0.48	0.58	0.44		0.57	0.30
Control Delay	22.7	7.7	22.4		11.8	7.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	22.7	7.7	22.4		11.8	7.4
LOS	C	A	C		B	A
Approach Delay	15.1		22.4			9.1
Approach LOS	B		C			A
Queue Length 50th (m)	13.7	0.0	13.7		15.5	13.2
Queue Length 95th (m)	26.2	17.1	26.7		33.1	24.1
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1783	963	1839		625	3092
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.17	0.33	0.16		0.51	0.17

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 54.8
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.58

Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	199	231	0	502	474	0
Future Volume (vph)	199	231	0	502	474	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	199	231	0	502	474	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 35.6%		ICU Level of Service A	
Analysis Period (min) 15			

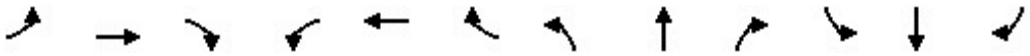
Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	199	231	0	502	474	0
Future Vol, veh/h	199	231	0	502	474	0
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	199	231	0	502	474	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	725	237	-	0	-	0
Stage 1	474	-	-	-	-	-
Stage 2	251	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	360	764	0	-	-	0
Stage 1	592	-	0	-	-	0
Stage 2	768	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	360	764	-	-	-	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	768	-	-	-	-	-

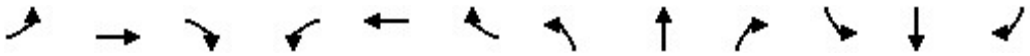
Approach	EB	NB	SB
HCM Control Delay, s	18.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	360	764	-
HCM Lane V/C Ratio	-	0.553	0.302	-
HCM Control Delay (s)	-	26.7	11.7	-
HCM Lane LOS	-	D	B	-
HCM 95th %tile Q(veh)	-	3.2	1.3	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	90	1	21	92	876	1	24	29	640	25	139
Future Volume (vph)	79	90	1	21	92	876	1	24	29	640	25	139
Satd. Flow (prot)	0	3236	0	0	1729	1483	0	3044	0	0	3107	0
Flt Permitted		0.977			0.991			0.999			0.962	
Satd. Flow (perm)	0	3236	0	0	1729	1483	0	3044	0	0	3107	0
Lane Group Flow (vph)	0	170	0	0	113	876	0	54	0	0	804	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 77.5%		ICU Level of Service D	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	66	3	81	106	7	1	0	47	6	1	1
Future Volume (vph)	0	66	3	81	106	7	1	0	47	6	1	1
Satd. Flow (prot)	0	1735	0	0	1702	0	0	1513	0	0	1654	0
Flt Permitted					0.980			0.999			0.964	
Satd. Flow (perm)	0	1735	0	0	1702	0	0	1513	0	0	1654	0
Lane Group Flow (vph)	0	69	0	0	194	0	0	48	0	0	8	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 29.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	66	3	81	106	7	1	0	47	6	1	1
Future Vol, veh/h	0	66	3	81	106	7	1	0	47	6	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	66	3	81	106	7	1	0	47	6	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	8.4	7.2	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	42%	75%
Vol Thru, %	0%	96%	55%	12%
Vol Right, %	98%	4%	4%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	48	69	194	8
LT Vol	1	0	81	6
Through Vol	0	66	106	1
RT Vol	47	3	7	1
Lane Flow Rate	48	69	194	8
Geometry Grp	1	1	1	1
Degree of Util (X)	0.053	0.08	0.223	0.01
Departure Headway (Hd)	3.939	4.153	4.146	4.641
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	915	854	863	776
Service Time	1.939	2.223	2.188	2.643
HCM Lane V/C Ratio	0.052	0.081	0.225	0.01
HCM Control Delay	7.2	7.6	8.4	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.9	0

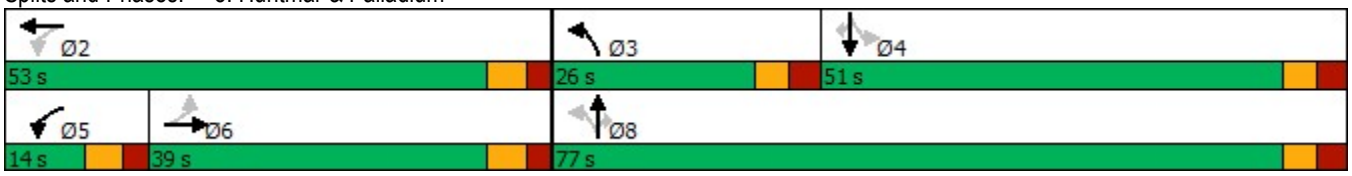
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	227	480	129	436	100	304	397	57	136	528	105
Future Volume (vph)	42	227	480	129	436	100	304	397	57	136	528	105
Satd. Flow (prot)	1658	2928	0	1658	3214	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.453			0.154			0.155			0.528		
Satd. Flow (perm)	790	2928	0	268	3214	0	270	1745	1459	919	1745	1460
Satd. Flow (RTOR)		395			24				80			133
Lane Group Flow (vph)	42	707	0	129	536	0	304	397	57	136	528	105
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	39.0	39.0		14.0	53.0		26.0	77.0	77.0	51.0	51.0	51.0
Total Split (%)	30.0%	30.0%		10.8%	40.8%		20.0%	59.2%	59.2%	39.2%	39.2%	39.2%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	19.6	19.6		34.1	34.0		61.2	61.2	61.2	37.2	37.2	37.2
Actuated g/C Ratio	0.18	0.18		0.31	0.31		0.57	0.57	0.57	0.34	0.34	0.34
v/c Ratio	0.30	0.83		0.69	0.52		0.81	0.40	0.07	0.43	0.88	0.18
Control Delay	46.1	28.0		50.3	31.9		37.6	15.4	1.5	34.1	51.9	3.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	28.0		50.3	31.9		37.6	15.4	1.5	34.1	51.9	3.0
LOS	D	C		D	C		D	B	A	C	D	A
Approach Delay		29.0			35.5			23.2			42.1	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	8.3	37.1		22.1	50.8		36.7	44.8	0.0	22.7	107.4	0.0
Queue Length 95th (m)	19.1	60.3		#39.6	68.8		#92.7	79.9	3.5	45.7	#185.8	7.1
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	246	1184		187	1443		411	1173	1007	390	741	696
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	0.60		0.69	0.37		0.74	0.34	0.06	0.35	0.71	0.15

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 108.3
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 32.4	Intersection LOS: C
Intersection Capacity Utilization 99.0%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 5: Huntmar & Palladium





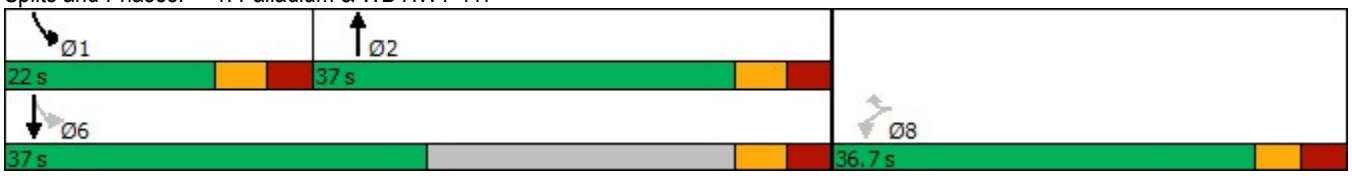
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	241	713	345	0	201	658
Future Volume (vph)	241	713	345	0	201	658
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.357	
Satd. Flow (perm)	3216	1483	3316	0	623	3316
Satd. Flow (RTOR)		537				
Lane Group Flow (vph)	241	713	345	0	201	658
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	19.1	19.1	13.0		31.0	31.0
Actuated g/C Ratio	0.30	0.30	0.20		0.48	0.48
v/c Ratio	0.25	0.87	0.52		0.43	0.41
Control Delay	17.8	19.0	28.4		14.8	13.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	17.8	19.0	28.4		14.8	13.1
LOS	B	B	C		B	B
Approach Delay	18.7		28.4			13.5
Approach LOS	B		C			B
Queue Length 50th (m)	10.7	16.0	19.5		13.5	25.4
Queue Length 95th (m)	21.2	#94.5	38.2		31.6	47.3
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1574	1000	1623		552	2711
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.15	0.71	0.21		0.36	0.24

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 64.6
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87

Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 68.1%	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: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	213	145	0	345	376	0
Future Volume (vph)	213	145	0	345	376	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	213	145	0	345	376	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 30.2%		ICU Level of Service A	
Analysis Period (min) 15			

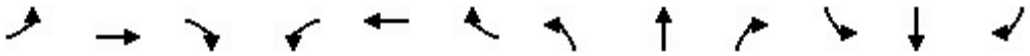
Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	213	145	0	345	376	0
Future Vol, veh/h	213	145	0	345	376	0
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	35	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	145	0	345	376	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	549	188	-	0	-	0
Stage 1	376	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	466	822	0	-	-	0
Stage 1	664	-	0	-	-	0
Stage 2	840	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	466	822	-	-	-	-
Mov Cap-2 Maneuver	466	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	840	-	-	-	-	-

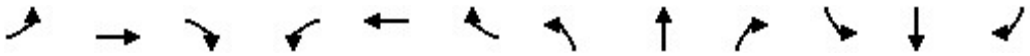
Approach	EB	NB	SB
HCM Control Delay, s	15.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	466	822	-
HCM Lane V/C Ratio	-	0.457	0.176	-
HCM Control Delay (s)	-	19.1	10.3	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	2.4	0.6	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	79	2	17	69	495	0	25	24	453	33	90
Future Volume (vph)	76	79	2	17	69	495	0	25	24	453	33	90
Satd. Flow (prot)	0	3230	0	0	1728	1483	0	3074	0	0	3116	0
Flt Permitted		0.976			0.990						0.962	
Satd. Flow (perm)	0	3230	0	0	1728	1483	0	3074	0	0	3116	0
Lane Group Flow (vph)	0	157	0	0	86	495	0	49	0	0	576	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 51.4%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	81	2	50	66	15	1	0	45	8	1	1
Future Volume (vph)	2	81	2	50	66	15	1	0	45	8	1	1
Satd. Flow (prot)	0	1738	0	0	1686	0	0	1513	0	0	1655	0
Flt Permitted		0.999			0.981			0.999			0.962	
Satd. Flow (perm)	0	1738	0	0	1686	0	0	1513	0	0	1655	0
Lane Group Flow (vph)	0	85	0	0	131	0	0	46	0	0	10	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 27.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	81	2	50	66	15	1	0	45	8	1	1
Future Vol, veh/h	2	81	2	50	66	15	1	0	45	8	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	81	2	50	66	15	1	0	45	8	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7.9	7	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	2%	38%	80%
Vol Thru, %	0%	95%	50%	10%
Vol Right, %	98%	2%	11%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	85	131	10
LT Vol	1	2	50	8
Through Vol	0	81	66	1
RT Vol	45	2	15	1
Lane Flow Rate	46	85	131	10
Geometry Grp	1	1	1	1
Degree of Util (X)	0.049	0.097	0.149	0.013
Departure Headway (Hd)	3.833	4.121	4.104	4.553
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	940	864	870	791
Service Time	1.834	2.174	2.146	2.554
HCM Lane V/C Ratio	0.049	0.098	0.151	0.013
HCM Control Delay	7	7.6	7.9	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.5	0

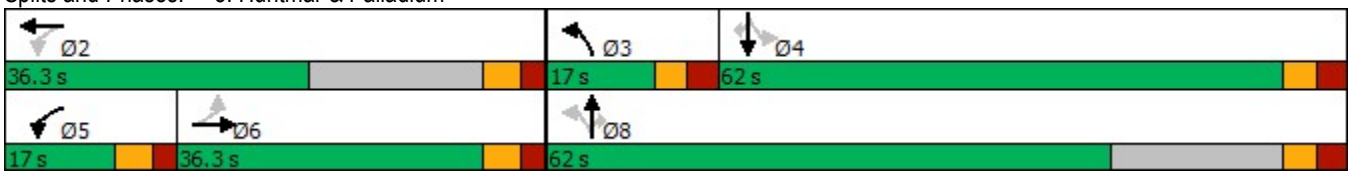
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	197	273	99	243	126	308	395	84	139	350	67
Future Volume (vph)	57	197	273	99	243	126	308	395	84	139	350	67
Satd. Flow (prot)	1658	2984	0	1658	3147	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.532			0.242			0.287			0.529		
Satd. Flow (perm)	928	2984	0	422	3147	0	500	1745	1465	923	1745	1460
Satd. Flow (RTOR)		246			78				84			131
Lane Group Flow (vph)	57	470	0	99	369	0	308	395	84	139	350	67
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.8	14.8		27.1	27.0		39.9	39.9	39.9	22.5	22.5	22.5
Actuated g/C Ratio	0.18	0.18		0.34	0.34		0.50	0.50	0.50	0.28	0.28	0.28
v/c Ratio	0.34	0.63		0.34	0.33		0.77	0.46	0.11	0.54	0.72	0.13
Control Delay	37.8	19.2		22.3	16.1		31.2	17.4	3.9	36.2	37.3	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	19.2		22.3	16.1		31.2	17.4	3.9	36.2	37.3	0.6
LOS	D	B		C	B		C	B	A	D	D	A
Approach Delay		21.2			17.4			21.3			32.6	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	7.9	16.5		10.0	16.1		28.1	38.0	0.0	18.1	48.3	0.0
Queue Length 95th (m)	21.1	36.2		24.2	32.0		#87.6	84.5	8.1	44.2	96.6	0.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	369	1336		320	1992		411	1533	1297	664	1257	1088
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	0.15	0.35		0.31	0.19		0.75	0.26	0.06	0.21	0.28	0.06

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 80.5
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77

Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 80.5%	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: 5: Huntmar & Palladium



MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen AM FB2034 (Site Folder: FB2034)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.025	4.6	LOS A	0.1	0.7	0.55	0.42	0.55	45.3
2	T1	All MCs	23	2.0	23	2.0	0.025	4.5	LOS A	0.1	0.8	0.55	0.41	0.55	46.0
3	R2	All MCs	20	2.0	20	2.0	0.025	3.9	LOS A	0.1	0.8	0.54	0.39	0.54	45.8
Approach			44	2.0	44	2.0	0.025	4.2	LOS A	0.1	0.8	0.55	0.41	0.55	45.9
East: Palladium															
4	L2	All MCs	11	2.0	11	2.0	0.046	3.1	LOS A	0.2	1.4	0.26	0.12	0.26	52.0
5	T1	All MCs	50	2.0	50	2.0	0.046	3.1	LOS A	0.2	1.4	0.26	0.12	0.26	52.9
6	R2	All MCs	554	2.0	554	2.0	0.398	6.2	LOS A	2.4	17.4	0.35	0.18	0.35	51.1
Approach			616	2.0	616	2.0	0.398	5.9	LOS A	2.4	17.4	0.34	0.17	0.34	51.3
North: Palladium															
7	L2	All MCs	570	2.0	570	2.0	0.372	5.4	LOS A	2.2	15.4	0.21	0.08	0.21	51.8
8	T1	All MCs	14	2.0	14	2.0	0.065	4.5	LOS A	0.3	1.9	0.19	0.08	0.19	57.9
9	R2	All MCs	46	2.0	46	2.0	0.065	4.5	LOS A	0.3	1.9	0.19	0.08	0.19	56.9
Approach			630	2.0	630	2.0	0.372	5.3	LOS A	2.2	15.4	0.20	0.08	0.20	52.3
West: Derreen															
10	L2	All MCs	119	2.0	119	2.0	0.116	4.5	LOS A	0.6	3.9	0.53	0.39	0.53	28.5
11	T1	All MCs	106	2.0	106	2.0	0.116	5.1	LOS A	0.6	3.9	0.54	0.41	0.54	28.8
12	R2	All MCs	1	2.0	1	2.0	0.116	5.1	LOS A	0.5	3.8	0.54	0.41	0.54	28.8
Approach			226	2.0	226	2.0	0.116	4.8	LOS A	0.6	3.9	0.53	0.40	0.53	28.7
All Vehicles			1515	2.0	1515	2.0	0.398	5.4	LOS A	2.4	17.4	0.32	0.17	0.32	46.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen PM FB2034 (Site Folder: FB2034)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.033	5.3	LOS A	0.2	1.1	0.62	0.50	0.62	45.0
2	T1	All MCs	24	2.0	24	2.0	0.033	5.3	LOS A	0.2	1.2	0.62	0.49	0.62	45.6
3	R2	All MCs	29	2.0	29	2.0	0.033	4.4	LOS A	0.2	1.2	0.62	0.47	0.62	45.4
Approach			54	2.0	54	2.0	0.033	4.8	LOS A	0.2	1.2	0.62	0.48	0.62	45.5
East: Palladium															
4	L2	All MCs	23	2.0	23	2.0	0.093	3.4	LOS A	0.4	3.0	0.24	0.10	0.24	51.7
5	T1	All MCs	102	2.0	102	2.0	0.093	3.4	LOS A	0.4	3.0	0.24	0.10	0.24	52.7
6	R2	All MCs	973	2.0	973	2.0	0.661	9.9	LOS A	6.3	44.5	0.45	0.22	0.45	48.6
Approach			1099	2.0	1099	2.0	0.661	9.1	LOS A	6.3	44.5	0.42	0.21	0.42	49.0
North: Palladium															
7	L2	All MCs	711	2.0	711	2.0	0.495	7.2	LOS A	3.3	23.5	0.35	0.17	0.35	50.6
8	T1	All MCs	28	2.0	28	2.0	0.206	6.1	LOS A	0.9	6.6	0.31	0.17	0.31	56.5
9	R2	All MCs	154	2.0	154	2.0	0.206	6.1	LOS A	0.9	6.6	0.31	0.17	0.31	55.5
Approach			893	2.0	893	2.0	0.495	7.0	LOS A	3.3	23.5	0.34	0.17	0.34	51.5
West: Derreen															
10	L2	All MCs	84	2.0	84	2.0	0.106	5.6	LOS A	0.5	3.7	0.62	0.50	0.62	28.3
11	T1	All MCs	88	2.0	88	2.0	0.096	4.8	LOS A	0.5	3.5	0.61	0.47	0.61	28.9
12	R2	All MCs	1	2.0	1	2.0	0.096	4.8	LOS A	0.5	3.5	0.61	0.47	0.61	28.9
Approach			173	2.0	173	2.0	0.106	5.2	LOS A	0.5	3.7	0.62	0.48	0.62	28.6
All Vehicles			2220	2.0	2220	2.0	0.661	7.9	LOS A	6.3	44.5	0.41	0.22	0.41	47.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen SAT FB2034 (Site Folder: FB2034)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.026	4.4	LOS A	0.1	0.8	0.52	0.38	0.52	45.5
2	T1	All MCs	25	2.0	25	2.0	0.026	4.3	LOS A	0.1	0.8	0.52	0.38	0.52	46.1
3	R2	All MCs	24	2.0	24	2.0	0.026	3.8	LOS A	0.1	0.8	0.51	0.36	0.51	45.8
Approach			50	2.0	50	2.0	0.026	4.0	LOS A	0.1	0.8	0.51	0.37	0.51	46.0
East: Palladium															
4	L2	All MCs	19	2.0	19	2.0	0.071	3.2	LOS A	0.3	2.2	0.23	0.10	0.23	51.8
5	T1	All MCs	77	2.0	77	2.0	0.071	3.2	LOS A	0.3	2.2	0.23	0.10	0.23	52.8
6	R2	All MCs	550	2.0	550	2.0	0.382	5.8	LOS A	2.3	16.3	0.30	0.14	0.30	51.4
Approach			646	2.0	646	2.0	0.382	5.4	LOS A	2.3	16.3	0.29	0.13	0.29	51.6
North: Palladium															
7	L2	All MCs	503	2.0	503	2.0	0.344	5.4	LOS A	1.9	13.5	0.25	0.11	0.25	51.8
8	T1	All MCs	37	2.0	37	2.0	0.147	5.2	LOS A	0.6	4.5	0.25	0.12	0.25	57.2
9	R2	All MCs	100	2.0	100	2.0	0.147	5.2	LOS A	0.6	4.5	0.25	0.12	0.25	56.3
Approach			640	2.0	640	2.0	0.344	5.3	LOS A	1.9	13.5	0.25	0.11	0.25	52.7
West: Derreen															
10	L2	All MCs	84	2.0	84	2.0	0.089	4.6	LOS A	0.4	2.8	0.50	0.38	0.50	28.5
11	T1	All MCs	88	2.0	88	2.0	0.084	4.1	LOS A	0.4	2.7	0.49	0.36	0.49	29.0
12	R2	All MCs	2	2.0	2	2.0	0.084	4.1	LOS A	0.4	2.7	0.49	0.36	0.49	29.0
Approach			174	2.0	174	2.0	0.089	4.4	LOS A	0.4	2.8	0.50	0.37	0.50	28.8
All Vehicles			1510	2.0	1510	2.0	0.382	5.2	LOS A	2.3	16.3	0.30	0.16	0.30	47.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Appendix L

Synchro Intersection Worksheets – 2029 Future Total Conditions



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	214	344	273	0	150	253
Future Volume (vph)	214	344	273	0	150	253
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.357	
Satd. Flow (perm)	3216	1483	3316	0	623	3316
Satd. Flow (RTOR)		344				
Lane Group Flow (vph)	214	344	273	0	150	253
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	9.3	9.3	11.0		22.5	22.5
Actuated g/C Ratio	0.20	0.20	0.24		0.49	0.49
v/c Ratio	0.33	0.60	0.35		0.31	0.16
Control Delay	18.8	7.7	18.3		8.3	6.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.8	7.7	18.3		8.3	6.6
LOS	B	A	B		A	A
Approach Delay	11.9		18.3			7.3
Approach LOS	B		B			A
Queue Length 50th (m)	8.1	0.0	10.3		5.7	4.9
Queue Length 95th (m)	17.0	16.8	22.1		15.2	11.4
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	2189	1119	2257		676	3245
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.10	0.31	0.12		0.22	0.08

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 46.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	175	204	0	204	298	0
Future Volume (vph)	175	204	0	204	298	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	175	204	0	204	298	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 28.7%		ICU Level of Service A	
Analysis Period (min) 15			

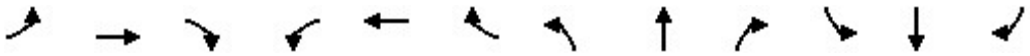
Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	175	204	0	204	298	0
Future Vol, veh/h	175	204	0	204	298	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	204	0	204	298	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	400	149	-	0	-	0
Stage 1	298	-	-	-	-	-
Stage 2	102	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	578	871	0	-	-	0
Stage 1	727	-	0	-	-	0
Stage 2	911	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	578	871	-	-	-	-
Mov Cap-2 Maneuver	578	-	-	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	911	-	-	-	-	-

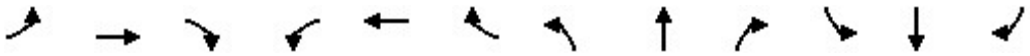
Approach	EB	NB	SB
HCM Control Delay, s	12	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	578	871	-
HCM Lane V/C Ratio	-	0.303	0.234	-
HCM Control Delay (s)	-	13.9	10.4	-
HCM Lane LOS	-	B	B	-
HCM 95th %tile Q(veh)	-	1.3	0.9	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	97	1	6	44	385	0	21	18	427	10	61
Future Volume (vph)	139	97	1	6	44	385	0	21	18	427	10	61
Satd. Flow (prot)	0	3220	0	0	1735	1483	0	3087	0	0	3123	0
Flt Permitted		0.972			0.994						0.959	
Satd. Flow (perm)	0	3220	0	0	1735	1483	0	3087	0	0	3123	0
Lane Group Flow (vph)	0	237	0	0	50	385	0	39	0	0	498	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	112	0	25	56	32	0	0	46	47	0	0
Future Volume (vph)	0	112	0	25	56	32	0	0	46	47	0	0
Satd. Flow (prot)	0	1745	0	0	1660	0	0	1510	0	0	1658	0
Flt Permitted					0.989						0.950	
Satd. Flow (perm)	0	1745	0	0	1660	0	0	1510	0	0	1658	0
Lane Group Flow (vph)	0	112	0	0	113	0	0	46	0	0	47	0
Sign Control		Stop			Stop			Stop			Stop	

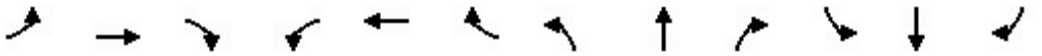
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 30.2%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	112	0	25	56	32	0	0	46	47	0	0
Future Vol, veh/h	0	112	0	25	56	32	0	0	46	47	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	112	0	25	56	32	0	0	46	47	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	7.7	7.1	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	22%	100%
Vol Thru, %	0%	100%	50%	0%
Vol Right, %	100%	0%	28%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	112	113	47
LT Vol	0	0	25	47
Through Vol	0	112	56	0
RT Vol	46	0	32	0
Lane Flow Rate	46	112	113	47
Geometry Grp	1	1	1	1
Degree of Util (X)	0.05	0.13	0.127	0.061
Departure Headway (Hd)	3.881	4.183	4.057	4.674
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	928	847	871	771
Service Time	1.882	2.262	2.138	2.675
HCM Lane V/C Ratio	0.05	0.132	0.13	0.061
HCM Control Delay	7.1	7.9	7.7	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.4	0.4	0.2

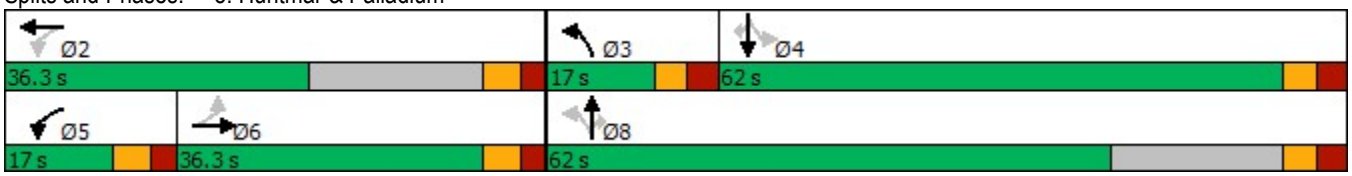


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	224	183	46	110	48	260	366	99	73	215	29
Future Volume (vph)	70	224	183	46	110	48	260	366	99	73	215	29
Satd. Flow (prot)	1658	3057	0	1658	3147	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.652			0.322			0.426			0.543		
Satd. Flow (perm)	1133	3057	0	560	3147	0	742	1745	1459	945	1745	1458
Satd. Flow (RTOR)		147			48				99			132
Lane Group Flow (vph)	70	407	0	46	158	0	260	366	99	73	215	29
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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)	2.5	2.5		2.6	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)	6.2	6.2		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.5	14.5		22.0	22.0		33.5	33.5	33.5	16.3	16.3	16.3
Actuated g/C Ratio	0.21	0.21		0.32	0.32		0.48	0.48	0.48	0.23	0.23	0.23
v/c Ratio	0.30	0.54		0.15	0.15		0.53	0.43	0.13	0.33	0.53	0.07
Control Delay	30.6	19.6		17.4	12.1		18.6	16.3	4.0	30.2	30.8	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	19.6		17.4	12.1		18.6	16.3	4.0	30.2	30.8	0.3
LOS	C	B		B	B		B	B	A	C	C	A
Approach Delay		21.2			13.3			15.4			27.9	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	8.1	16.2		3.8	4.7		20.7	31.1	0.0	8.1	25.3	0.0
Queue Length 95th (m)	22.9	36.3		12.3	13.1		53.7	76.9	8.9	24.2	57.8	0.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	536	1524		365	2336		511	1624	1365	769	1421	1212
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	0.27		0.13	0.07		0.51	0.23	0.07	0.09	0.15	0.02

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 69.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54

Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Huntmar & Palladium





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	297	283	257	0	273	458
Future Volume (vph)	297	283	257	0	273	458
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.360	
Satd. Flow (perm)	3216	1483	3316	0	628	3316
Satd. Flow (RTOR)		283				
Lane Group Flow (vph)	297	283	257	0	273	458
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	10.6	10.6	10.7		28.6	28.6
Actuated g/C Ratio	0.20	0.20	0.20		0.54	0.54
v/c Ratio	0.46	0.54	0.38		0.50	0.26
Control Delay	21.8	7.5	21.4		10.5	7.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	21.8	7.5	21.4		10.5	7.2
LOS	C	A	C		B	A
Approach Delay	14.8		21.4			8.4
Approach LOS	B		C			A
Queue Length 50th (m)	12.5	0.0	11.0		12.5	10.7
Queue Length 95th (m)	24.7	16.1	23.0		27.4	20.1
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1841	969	1898		633	3159
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.16	0.29	0.14		0.43	0.14

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 53
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54

Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	150	176	0	431	427	0
Future Volume (vph)	150	176	0	431	427	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	150	176	0	431	427	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 30.7%		ICU Level of Service A	
Analysis Period (min) 15			

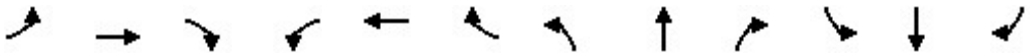
Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	150	176	0	431	427	0
Future Vol, veh/h	150	176	0	431	427	0
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	150	176	0	431	427	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	643	214	-	0	-	0
Stage 1	427	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	406	791	0	-	-	0
Stage 1	626	-	0	-	-	0
Stage 2	799	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	406	791	-	-	-	-
Mov Cap-2 Maneuver	406	-	-	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	799	-	-	-	-	-

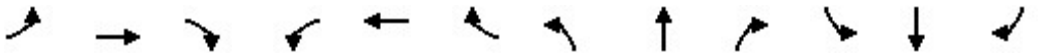
Approach	EB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	406	791	-
HCM Lane V/C Ratio	-	0.369	0.223	-
HCM Control Delay (s)	-	19	10.8	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	1.7	0.8	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	87	1	15	94	728	1	17	20	504	20	202
Future Volume (vph)	119	87	1	15	94	728	1	17	20	504	20	202
Satd. Flow (prot)	0	3220	0	0	1733	1483	0	3051	0	0	3068	0
Flt Permitted		0.972			0.993			0.999			0.966	
Satd. Flow (perm)	0	3220	0	0	1733	1483	0	3051	0	0	3068	0
Lane Group Flow (vph)	0	207	0	0	109	728	0	38	0	0	726	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 69.3%		ICU Level of Service C	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	66	3	81	106	86	1	0	47	63	1	1
Future Volume (vph)	0	66	3	81	106	86	1	0	47	63	1	1
Satd. Flow (prot)	0	1735	0	0	1645	0	0	1513	0	0	1661	0
Flt Permitted					0.985			0.999			0.954	
Satd. Flow (perm)	0	1735	0	0	1645	0	0	1513	0	0	1661	0
Lane Group Flow (vph)	0	69	0	0	273	0	0	48	0	0	65	0
Sign Control		Stop			Stop			Stop			Stop	

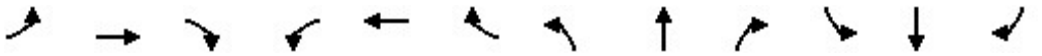
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 40.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	66	3	81	106	86	1	0	47	63	1	1
Future Vol, veh/h	0	66	3	81	106	86	1	0	47	63	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	66	3	81	106	86	1	0	47	63	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	9.1	7.5	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	30%	97%
Vol Thru, %	0%	96%	39%	2%
Vol Right, %	98%	4%	32%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	48	69	273	65
LT Vol	1	0	81	63
Through Vol	0	66	106	1
RT Vol	47	3	86	1
Lane Flow Rate	48	69	273	65
Geometry Grp	1	1	1	1
Degree of Util (X)	0.056	0.085	0.316	0.089
Departure Headway (Hd)	4.182	4.453	4.161	4.921
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	857	806	868	729
Service Time	2.206	2.473	2.161	2.946
HCM Lane V/C Ratio	0.056	0.086	0.315	0.089
HCM Control Delay	7.5	7.9	9.1	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.4	0.3

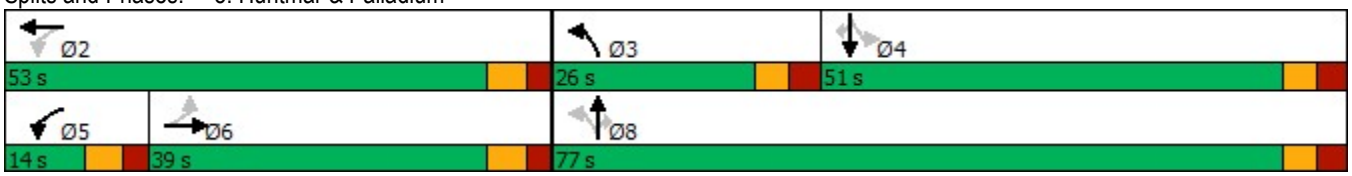


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	183	366	116	370	100	250	350	47	136	470	109
Future Volume (vph)	45	183	366	116	370	100	250	350	47	136	470	109
Satd. Flow (prot)	1658	2936	0	1658	3199	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.483			0.188			0.199			0.551		
Satd. Flow (perm)	842	2936	0	328	3199	0	347	1745	1459	959	1745	1460
Satd. Flow (RTOR)		366			29				80			133
Lane Group Flow (vph)	45	549	0	116	470	0	250	350	47	136	470	109
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	39.0	39.0		14.0	53.0		26.0	77.0	77.0	51.0	51.0	51.0
Total Split (%)	30.0%	30.0%		10.8%	40.8%		20.0%	59.2%	59.2%	39.2%	39.2%	39.2%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.8	14.8		29.4	29.3		49.5	49.5	49.5	29.8	29.8	29.8
Actuated g/C Ratio	0.16	0.16		0.32	0.32		0.54	0.54	0.54	0.32	0.32	0.32
v/c Ratio	0.33	0.70		0.53	0.45		0.67	0.37	0.06	0.44	0.83	0.19
Control Delay	44.5	18.0		35.5	26.3		21.8	13.9	0.9	31.2	43.8	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	44.5	18.0		35.5	26.3		21.8	13.9	0.9	31.2	43.8	3.7
LOS	D	B		D	C		C	B	A	C	D	A
Approach Delay		20.0			28.1			16.0			35.3	
Approach LOS		C			C			B			D	
Queue Length 50th (m)	6.9	15.0		14.5	31.3		20.5	30.4	0.0	17.3	70.2	0.0
Queue Length 95th (m)	20.4	38.1		34.8	59.3		47.6	67.5	1.7	44.6	145.8	7.9
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	312	1319		222	1708		478	1392	1180	485	882	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	0.14	0.42		0.52	0.28		0.52	0.25	0.04	0.28	0.53	0.14

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 92.1
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 87.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Huntmar & Palladium





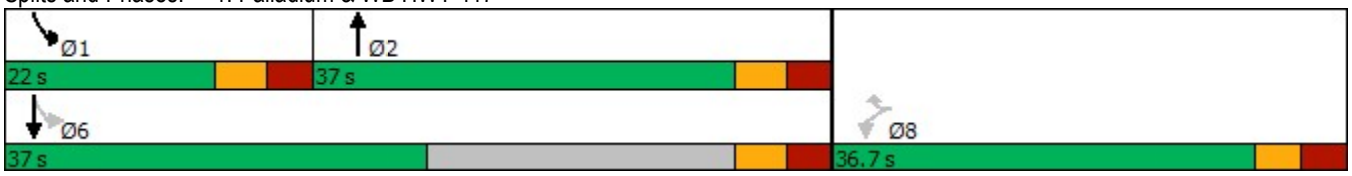
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	290	713	340	0	201	653
Future Volume (vph)	290	713	340	0	201	653
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.358	
Satd. Flow (perm)	3216	1483	3316	0	625	3316
Satd. Flow (RTOR)		541				
Lane Group Flow (vph)	290	713	340	0	201	653
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	19.1	19.1	12.8		30.9	30.9
Actuated g/C Ratio	0.30	0.30	0.20		0.48	0.48
v/c Ratio	0.30	0.87	0.52		0.43	0.41
Control Delay	18.1	18.5	28.4		14.9	13.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.1	18.5	28.4		14.9	13.1
LOS	B	B	C		B	B
Approach Delay	18.4		28.4			13.5
Approach LOS	B		C			B
Queue Length 50th (m)	13.0	15.5	19.0		13.4	25.0
Queue Length 95th (m)	25.1	#83.3	37.7		31.6	46.9
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1579	1003	1628		553	2720
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.18	0.71	0.21		0.36	0.24

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 64.4
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87

Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	213	177	0	365	442	0
Future Volume (vph)	213	177	0	365	442	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	213	177	0	365	442	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 32.0%		ICU Level of Service A	
Analysis Period (min) 15			

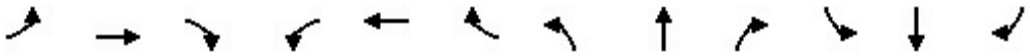
Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	213	177	0	365	442	0
Future Vol, veh/h	213	177	0	365	442	0
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	35	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	177	0	365	442	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	625	221	-	0	-	0
Stage 1	442	-	-	-	-	-
Stage 2	183	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	417	783	0	-	-	0
Stage 1	615	-	0	-	-	0
Stage 2	830	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	417	783	-	-	-	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	830	-	-	-	-	-

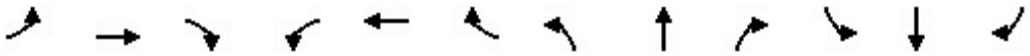
Approach	EB	NB	SB
HCM Control Delay, s	17.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	417	783	-
HCM Lane V/C Ratio	-	0.511	0.226	-
HCM Control Delay (s)	-	22.3	10.9	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	2.8	0.9	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	78	2	5	71	466	0	16	13	409	23	197
Future Volume (vph)	150	78	2	5	71	466	0	16	13	409	23	197
Satd. Flow (prot)	0	3206	0	0	1740	1483	0	3094	0	0	3062	0
Flt Permitted		0.968			0.997						0.969	
Satd. Flow (perm)	0	3206	0	0	1740	1483	0	3094	0	0	3062	0
Lane Group Flow (vph)	0	230	0	0	76	466	0	29	0	0	629	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	81	2	50	66	150	1	0	45	106	1	1
Future Volume (vph)	2	81	2	50	66	150	1	0	45	106	1	1
Satd. Flow (prot)	0	1738	0	0	1598	0	0	1513	0	0	1661	0
Flt Permitted		0.999			0.991			0.999			0.953	
Satd. Flow (perm)	0	1738	0	0	1598	0	0	1513	0	0	1661	0
Lane Group Flow (vph)	0	85	0	0	266	0	0	46	0	0	108	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 42.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	81	2	50	66	150	1	0	45	106	1	1
Future Vol, veh/h	2	81	2	50	66	150	1	0	45	106	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	81	2	50	66	150	1	0	45	106	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	8.9	7.5	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	2%	19%	98%
Vol Thru, %	0%	95%	25%	1%
Vol Right, %	98%	2%	56%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	85	266	108
LT Vol	1	2	50	106
Through Vol	0	81	66	1
RT Vol	45	2	150	1
Lane Flow Rate	46	85	266	108
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.108	0.303	0.148
Departure Headway (Hd)	4.252	4.573	4.105	4.937
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	841	785	878	727
Service Time	2.284	2.596	2.123	2.966
HCM Lane V/C Ratio	0.055	0.108	0.303	0.149
HCM Control Delay	7.5	8.2	8.9	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.4	1.3	0.5

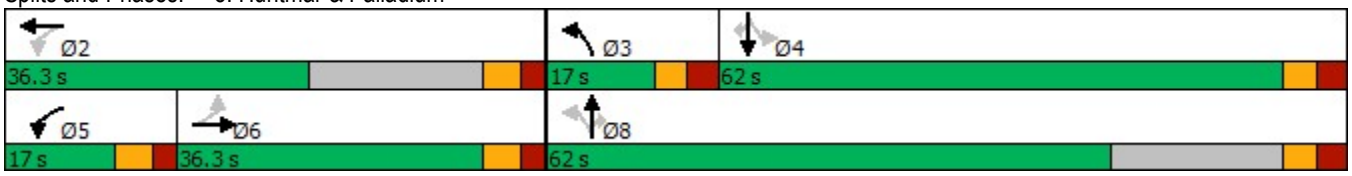
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	181	227	87	226	126	279	380	75	139	330	74
Future Volume (vph)	62	181	227	87	226	126	279	380	75	139	330	74
Satd. Flow (prot)	1658	2999	0	1658	3137	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.541			0.295			0.302			0.536		
Satd. Flow (perm)	944	2999	0	514	3137	0	526	1745	1465	935	1745	1460
Satd. Flow (RTOR)		222			90				78			131
Lane Group Flow (vph)	62	408	0	87	352	0	279	380	75	139	330	74
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.2	14.2		26.2	26.1		38.3	38.3	38.3	20.9	20.9	20.9
Actuated g/C Ratio	0.18	0.18		0.34	0.33		0.49	0.49	0.49	0.27	0.27	0.27
v/c Ratio	0.36	0.56		0.28	0.32		0.68	0.44	0.10	0.55	0.71	0.15
Control Delay	37.8	17.4		20.7	14.6		25.5	17.0	3.9	36.8	36.7	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	17.4		20.7	14.6		25.5	17.0	3.9	36.8	36.7	1.1
LOS	D	B		C	B		C	B	A	D	D	A
Approach Delay		20.1			15.8			18.9			31.9	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	8.3	13.0		8.4	13.8		23.4	33.8	0.0	17.3	43.0	0.0
Queue Length 95th (m)	22.1	30.1		21.1	28.4		#69.5	81.1	7.3	44.3	90.5	1.4
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	387	1363		343	2051		422	1566	1322	690	1289	1112
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	0.16	0.30		0.25	0.17		0.66	0.24	0.06	0.20	0.26	0.07

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 78
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71

Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 75.5%	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: 5: Huntmar & Palladium



MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen AM FT2029 (Site Folder: FT2029)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.022	4.4	LOS A	0.1	0.6	0.53	0.39	0.53	45.4
2	T1	All MCs	21	2.0	21	2.0	0.022	4.3	LOS A	0.1	0.7	0.53	0.39	0.53	46.1
3	R2	All MCs	18	2.0	18	2.0	0.022	3.8	LOS A	0.1	0.7	0.52	0.37	0.52	45.8
Approach			40	2.0	40	2.0	0.022	4.1	LOS A	0.1	0.7	0.53	0.38	0.53	45.9
East: Palladium															
4	L2	All MCs	7	2.0	7	2.0	0.043	3.1	LOS A	0.2	1.3	0.29	0.14	0.29	52.2
5	T1	All MCs	49	2.0	49	2.0	0.043	3.1	LOS A	0.2	1.3	0.29	0.14	0.29	53.2
6	R2	All MCs	428	2.0	428	2.0	0.320	5.5	LOS A	1.8	12.7	0.36	0.19	0.36	51.6
Approach			483	2.0	483	2.0	0.320	5.2	LOS A	1.8	12.7	0.35	0.19	0.35	51.8
North: Palladium															
7	L2	All MCs	474	2.0	474	2.0	0.310	4.8	LOS A	1.7	12.0	0.18	0.06	0.18	52.2
8	T1	All MCs	11	2.0	11	2.0	0.085	4.6	LOS A	0.3	2.5	0.19	0.07	0.19	57.8
9	R2	All MCs	68	2.0	68	2.0	0.085	4.6	LOS A	0.3	2.5	0.19	0.07	0.19	56.8
Approach			553	2.0	553	2.0	0.310	4.8	LOS A	1.7	12.0	0.18	0.07	0.18	52.8
West: Derreen															
10	L2	All MCs	154	2.0	154	2.0	0.140	4.5	LOS A	0.7	4.6	0.48	0.34	0.48	28.5
11	T1	All MCs	108	2.0	108	2.0	0.116	4.9	LOS A	0.5	3.6	0.49	0.36	0.49	28.9
12	R2	All MCs	1	2.0	1	2.0	0.116	4.9	LOS A	0.5	3.6	0.49	0.36	0.49	28.9
Approach			263	2.0	263	2.0	0.140	4.7	LOS A	0.7	4.6	0.49	0.35	0.49	28.7
All Vehicles			1340	2.0	1340	2.0	0.320	4.9	LOS A	1.8	12.7	0.31	0.17	0.31	44.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen PM FT2029 (Site Folder: FT2029)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.021	4.7	LOS A	0.1	0.7	0.57	0.42	0.57	45.3
2	T1	All MCs	17	2.0	17	2.0	0.021	4.7	LOS A	0.1	0.7	0.57	0.42	0.57	45.9
3	R2	All MCs	20	2.0	20	2.0	0.021	4.0	LOS A	0.1	0.7	0.56	0.40	0.56	45.7
Approach			38	2.0	38	2.0	0.021	4.3	LOS A	0.1	0.7	0.56	0.41	0.56	45.8
East: Palladium															
4	L2	All MCs	17	2.0	17	2.0	0.092	3.5	LOS A	0.4	3.0	0.28	0.14	0.28	51.9
5	T1	All MCs	104	2.0	104	2.0	0.092	3.5	LOS A	0.4	3.0	0.28	0.14	0.28	52.8
6	R2	All MCs	809	2.0	809	2.0	0.577	8.7	LOS A	4.6	32.6	0.45	0.24	0.45	49.4
Approach			930	2.0	930	2.0	0.577	8.0	LOS A	4.6	32.6	0.43	0.23	0.43	49.8
North: Palladium															
7	L2	All MCs	560	2.0	560	2.0	0.392	6.0	LOS A	2.3	16.6	0.31	0.15	0.31	51.4
8	T1	All MCs	22	2.0	22	2.0	0.226	5.3	LOS A	1.1	7.7	0.29	0.14	0.29	57.1
9	R2	All MCs	224	2.0	224	2.0	0.226	5.3	LOS A	1.1	7.7	0.29	0.14	0.29	56.2
Approach			807	2.0	807	2.0	0.392	5.8	LOS A	2.3	16.6	0.30	0.15	0.30	52.8
West: Derreen															
10	L2	All MCs	132	2.0	132	2.0	0.128	4.7	LOS A	0.6	4.4	0.54	0.40	0.54	28.5
11	T1	All MCs	97	2.0	97	2.0	0.112	5.2	LOS A	0.5	3.7	0.55	0.42	0.55	28.8
12	R2	All MCs	1	2.0	1	2.0	0.112	5.2	LOS A	0.5	3.7	0.55	0.42	0.55	28.8
Approach			230	2.0	230	2.0	0.128	4.9	LOS A	0.6	4.4	0.54	0.41	0.54	28.6
All Vehicles			2005	2.0	2005	2.0	0.577	6.7	LOS A	4.6	32.6	0.40	0.22	0.40	46.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen SAT FT2029 (Site Folder: FT2029)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.016	4.3	LOS A	0.1	0.5	0.53	0.37	0.53	45.4
2	T1	All MCs	16	2.0	16	2.0	0.016	4.2	LOS A	0.1	0.5	0.52	0.37	0.52	46.1
3	R2	All MCs	13	2.0	13	2.0	0.016	3.7	LOS A	0.1	0.5	0.51	0.35	0.51	45.9
Approach			30	2.0	30	2.0	0.016	4.0	LOS A	0.1	0.5	0.52	0.36	0.52	46.0
East: Palladium															
4	L2	All MCs	6	2.0	6	2.0	0.065	3.3	LOS A	0.3	2.1	0.30	0.16	0.30	52.3
5	T1	All MCs	79	2.0	79	2.0	0.065	3.3	LOS A	0.3	2.1	0.30	0.16	0.30	53.2
6	R2	All MCs	518	2.0	518	2.0	0.386	6.2	LOS A	2.3	16.5	0.39	0.21	0.39	51.1
Approach			602	2.0	602	2.0	0.386	5.8	LOS A	2.3	16.5	0.38	0.21	0.38	51.4
North: Palladium															
7	L2	All MCs	454	2.0	454	2.0	0.309	5.0	LOS A	1.7	12.0	0.23	0.10	0.23	52.1
8	T1	All MCs	26	2.0	26	2.0	0.204	4.7	LOS A	1.0	6.9	0.23	0.10	0.23	57.7
9	R2	All MCs	219	2.0	219	2.0	0.204	4.7	LOS A	1.0	6.9	0.23	0.10	0.23	56.7
Approach			699	2.0	699	2.0	0.309	4.9	LOS A	1.7	12.0	0.23	0.10	0.23	53.6
West: Derreen															
10	L2	All MCs	167	2.0	167	2.0	0.150	4.5	LOS A	0.7	4.9	0.48	0.34	0.48	28.5
11	T1	All MCs	87	2.0	87	2.0	0.100	5.0	LOS A	0.4	3.0	0.48	0.36	0.48	28.8
12	R2	All MCs	2	2.0	2	2.0	0.100	5.0	LOS A	0.4	3.0	0.48	0.36	0.48	28.8
Approach			256	2.0	256	2.0	0.150	4.7	LOS A	0.7	4.9	0.48	0.34	0.48	28.6
All Vehicles			1587	2.0	1587	2.0	0.386	5.2	LOS A	2.3	16.5	0.33	0.18	0.33	46.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Appendix M

Synchro Intersection Worksheets – 2034 Future Total Conditions

CGH TRANSPORTATION



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	250	380	320	0	174	295
Future Volume (vph)	250	380	320	0	174	295
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.344	
Satd. Flow (perm)	3216	1483	3316	0	600	3316
Satd. Flow (RTOR)		380				
Lane Group Flow (vph)	250	380	320	0	174	295
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	9.9	9.9	11.2		26.9	26.9
Actuated g/C Ratio	0.20	0.20	0.22		0.53	0.53
v/c Ratio	0.40	0.64	0.44		0.35	0.17
Control Delay	20.2	8.2	20.0		8.8	6.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	20.2	8.2	20.0		8.8	6.7
LOS	C	A	C		A	A
Approach Delay	13.0		20.0			7.5
Approach LOS	B		C			A
Queue Length 50th (m)	9.8	0.0	12.8		7.0	6.1
Queue Length 95th (m)	20.4	18.0	26.5		18.1	13.5
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1928	1041	1988		635	3207
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.13	0.37	0.16		0.27	0.09

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 50.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64

Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	203	245	0	261	358	0
Future Volume (vph)	203	245	0	261	358	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	203	245	0	261	358	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 33.1%		ICU Level of Service A	
Analysis Period (min) 15			

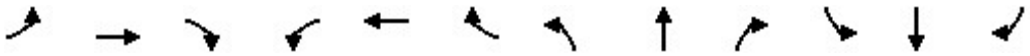
Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	203	245	0	261	358	0
Future Vol, veh/h	203	245	0	261	358	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	203	245	0	261	358	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	489	179	-	0	-	0
Stage 1	358	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	508	833	0	-	-	0
Stage 1	678	-	0	-	-	0
Stage 2	881	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	508	833	-	-	-	-
Mov Cap-2 Maneuver	508	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	881	-	-	-	-	-

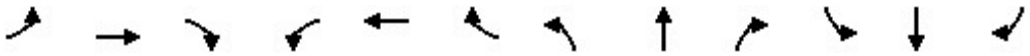
Approach	EB	NB	SB
HCM Control Delay, s	13.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	508	833	-
HCM Lane V/C Ratio	-	0.4	0.294	-
HCM Control Delay (s)	-	16.7	11.1	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	1.9	1.2	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	99	1	10	48	499	0	23	20	513	13	66
Future Volume (vph)	142	99	1	10	48	499	0	23	20	513	13	66
Satd. Flow (prot)	0	3216	0	0	1729	1483	0	3084	0	0	3122	0
Flt Permitted		0.971			0.991						0.958	
Satd. Flow (perm)	0	3216	0	0	1729	1483	0	3084	0	0	3122	0
Lane Group Flow (vph)	0	242	0	0	58	499	0	43	0	0	592	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary	
Control Type: Roundabout	
Intersection Capacity Utilization 58.3%	ICU Level of Service B
Analysis Period (min) 15	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	112	0	25	56	32	0	0	46	47	0	0
Future Volume (vph)	0	112	0	25	56	32	0	0	46	47	0	0
Satd. Flow (prot)	0	1745	0	0	1660	0	0	1510	0	0	1658	0
Flt Permitted					0.989						0.950	
Satd. Flow (perm)	0	1745	0	0	1660	0	0	1510	0	0	1658	0
Lane Group Flow (vph)	0	112	0	0	113	0	0	46	0	0	47	0
Sign Control		Stop			Stop			Stop			Stop	

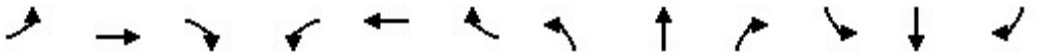
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 30.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	112	0	25	56	32	0	0	46	47	0	0
Future Vol, veh/h	0	112	0	25	56	32	0	0	46	47	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	112	0	25	56	32	0	0	46	47	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	7.7	7.1	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	22%	100%
Vol Thru, %	0%	100%	50%	0%
Vol Right, %	100%	0%	28%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	112	113	47
LT Vol	0	0	25	47
Through Vol	0	112	56	0
RT Vol	46	0	32	0
Lane Flow Rate	46	112	113	47
Geometry Grp	1	1	1	1
Degree of Util (X)	0.05	0.13	0.127	0.061
Departure Headway (Hd)	3.881	4.183	4.057	4.674
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	928	847	871	771
Service Time	1.882	2.262	2.138	2.675
HCM Lane V/C Ratio	0.05	0.132	0.13	0.061
HCM Control Delay	7.1	7.9	7.7	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.4	0.4	0.2



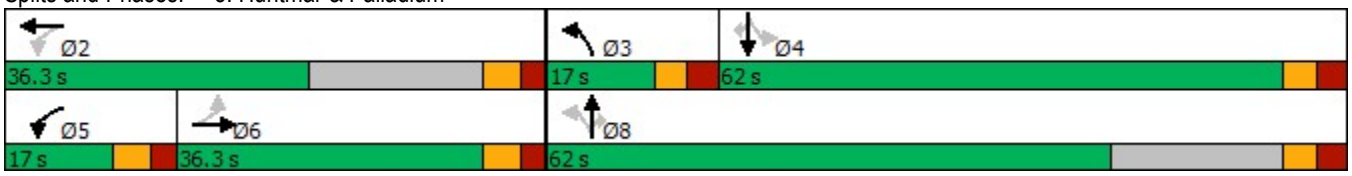
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	261	230	53	134	48	329	416	117	73	245	29
Future Volume (vph)	70	261	230	53	134	48	329	416	117	73	245	29
Satd. Flow (prot)	1658	3045	0	1658	3169	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.637			0.260			0.385			0.519		
Satd. Flow (perm)	1107	3045	0	453	3169	0	670	1745	1459	904	1745	1458
Satd. Flow (RTOR)		156			42				117			132
Lane Group Flow (vph)	70	491	0	53	182	0	329	416	117	73	245	29
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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)	2.5	2.5		2.6	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)	6.2	6.2		6.3	6.3		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	16.0	16.0		23.8	23.8		35.4	35.4	35.4	17.6	17.6	17.6
Actuated g/C Ratio	0.22	0.22		0.33	0.33		0.49	0.49	0.49	0.24	0.24	0.24
v/c Ratio	0.29	0.62		0.19	0.17		0.70	0.49	0.15	0.34	0.58	0.06
Control Delay	30.9	22.4		18.2	13.2		25.9	17.9	3.9	31.2	33.0	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	22.4		18.2	13.2		25.9	17.9	3.9	31.2	33.0	0.3
LOS	C	C		B	B		C	B	A	C	C	A
Approach Delay		23.4			14.3			19.0			29.9	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	8.5	22.6		4.6	6.4		30.0	40.0	0.0	8.7	31.1	0.0
Queue Length 95th (m)	23.2	46.3		13.6	15.5		#85.5	90.4	9.7	24.4	66.3	0.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	495	1449		341	2228		480	1590	1340	715	1381	1182
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	0.34		0.16	0.08		0.69	0.26	0.09	0.10	0.18	0.02

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 72.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70

Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 75.7%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 5: Huntmar & Palladium





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	359	317	301	0	320	538
Future Volume (vph)	359	317	301	0	320	538
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.353	
Satd. Flow (perm)	3216	1483	3316	0	616	3316
Satd. Flow (RTOR)		317				
Lane Group Flow (vph)	359	317	301	0	320	538
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	11.9	11.9	11.4		30.3	30.3
Actuated g/C Ratio	0.21	0.21	0.20		0.54	0.54
v/c Ratio	0.53	0.56	0.45		0.58	0.30
Control Delay	23.2	7.3	23.1		12.4	7.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	23.2	7.3	23.1		12.4	7.9
LOS	C	A	C		B	A
Approach Delay	15.7		23.1			9.5
Approach LOS	B		C			A
Queue Length 50th (m)	16.4	0.0	14.2		16.3	13.9
Queue Length 95th (m)	30.2	16.9	27.4		35.0	25.5
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1743	949	1797		615	3043
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.21	0.33	0.17		0.52	0.18

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 56.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.58

Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 55.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	199	251	0	516	525	0
Future Volume (vph)	199	251	0	516	525	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	199	251	0	516	525	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 38.4%		ICU Level of Service A	
Analysis Period (min) 15			

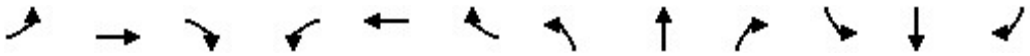
Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	199	251	0	516	525	0
Future Vol, veh/h	199	251	0	516	525	0
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	38	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	199	251	0	516	525	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	783	263	-	0	-	0
Stage 1	525	-	-	-	-	-
Stage 2	258	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	331	735	0	-	-	0
Stage 1	558	-	0	-	-	0
Stage 2	761	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	331	735	-	-	-	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	558	-	-	-	-	-
Stage 2	761	-	-	-	-	-

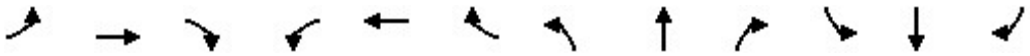
Approach	EB	NB	SB
HCM Control Delay, s	20.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	331	735	-
HCM Lane V/C Ratio	-	0.601	0.341	-
HCM Control Delay (s)	-	31	12.4	-
HCM Lane LOS	-	D	B	-
HCM 95th %tile Q(veh)	-	3.7	1.5	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	96	1	21	100	876	1	24	29	640	25	210
Future Volume (vph)	130	96	1	21	100	876	1	24	29	640	25	210
Satd. Flow (prot)	0	3220	0	0	1729	1483	0	3044	0	0	3084	0
Flt Permitted		0.972			0.991			0.999			0.965	
Satd. Flow (perm)	0	3220	0	0	1729	1483	0	3044	0	0	3084	0
Lane Group Flow (vph)	0	227	0	0	121	876	0	54	0	0	875	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Control Type: Roundabout			
Intersection Capacity Utilization 79.5%		ICU Level of Service D	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	66	3	81	106	86	1	0	47	63	1	1
Future Volume (vph)	0	66	3	81	106	86	1	0	47	63	1	1
Satd. Flow (prot)	0	1735	0	0	1645	0	0	1513	0	0	1661	0
Flt Permitted					0.985			0.999			0.954	
Satd. Flow (perm)	0	1735	0	0	1645	0	0	1513	0	0	1661	0
Lane Group Flow (vph)	0	69	0	0	273	0	0	48	0	0	65	0
Sign Control		Stop			Stop			Stop			Stop	

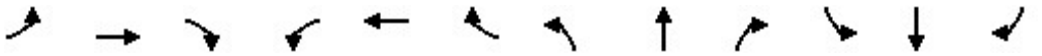
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 40.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	66	3	81	106	86	1	0	47	63	1	1
Future Vol, veh/h	0	66	3	81	106	86	1	0	47	63	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	66	3	81	106	86	1	0	47	63	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	9.1	7.5	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	30%	97%
Vol Thru, %	0%	96%	39%	2%
Vol Right, %	98%	4%	32%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	48	69	273	65
LT Vol	1	0	81	63
Through Vol	0	66	106	1
RT Vol	47	3	86	1
Lane Flow Rate	48	69	273	65
Geometry Grp	1	1	1	1
Degree of Util (X)	0.056	0.085	0.316	0.089
Departure Headway (Hd)	4.182	4.453	4.161	4.921
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	857	806	868	729
Service Time	2.206	2.473	2.161	2.946
HCM Lane V/C Ratio	0.056	0.086	0.315	0.089
HCM Control Delay	7.5	7.9	9.1	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.4	0.3



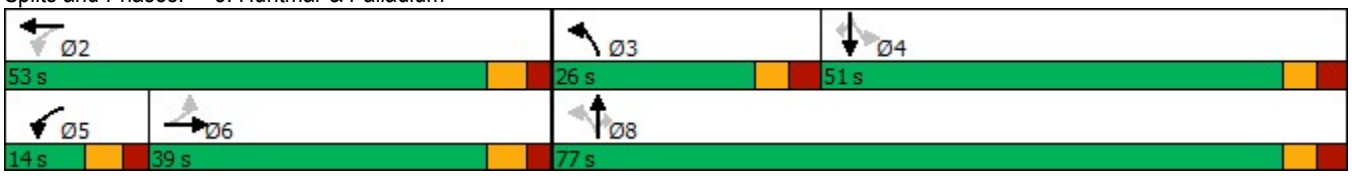
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	227	483	129	436	100	308	397	57	136	528	109
Future Volume (vph)	45	227	483	129	436	100	308	397	57	136	528	109
Satd. Flow (prot)	1658	2928	0	1658	3214	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.453			0.153			0.154			0.528		
Satd. Flow (perm)	790	2928	0	267	3214	0	269	1745	1459	919	1745	1460
Satd. Flow (RTOR)		397			24				80			133
Lane Group Flow (vph)	45	710	0	129	536	0	308	397	57	136	528	109
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	39.0	39.0		14.0	53.0		26.0	77.0	77.0	51.0	51.0	51.0
Total Split (%)	30.0%	30.0%		10.8%	40.8%		20.0%	59.2%	59.2%	39.2%	39.2%	39.2%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	19.6	19.6		34.2	34.1		61.4	61.4	61.4	37.3	37.3	37.3
Actuated g/C Ratio	0.18	0.18		0.31	0.31		0.57	0.57	0.57	0.34	0.34	0.34
v/c Ratio	0.32	0.83		0.69	0.52		0.82	0.40	0.07	0.43	0.88	0.19
Control Delay	46.8	28.0		50.6	32.0		38.5	15.4	1.5	34.2	52.2	3.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.0		50.6	32.0		38.5	15.4	1.5	34.2	52.2	3.5
LOS	D	C		D	C		D	B	A	C	D	A
Approach Delay		29.1			35.6			23.7			42.1	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	9.0	37.2		22.1	50.8		37.8	44.8	0.0	22.7	107.4	0.0
Queue Length 95th (m)	20.3	60.6		#39.7	68.8		#95.9	80.2	3.5	45.8	#186.3	8.0
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	245	1182		186	1437		410	1168	1003	388	738	694
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	0.18	0.60		0.69	0.37		0.75	0.34	0.06	0.35	0.72	0.16

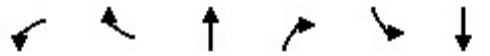
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 108.6
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 32.6	Intersection LOS: C
Intersection Capacity Utilization 99.3%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 5: Huntmar & Palladium





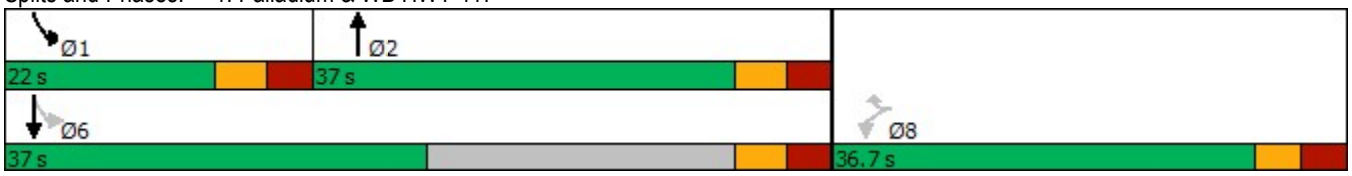
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	329	713	345	0	201	658
Future Volume (vph)	329	713	345	0	201	658
Satd. Flow (prot)	3216	1483	3316	0	1658	3316
Flt Permitted	0.950				0.357	
Satd. Flow (perm)	3216	1483	3316	0	623	3316
Satd. Flow (RTOR)		537				
Lane Group Flow (vph)	329	713	345	0	201	658
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		5.0	10.0
Minimum Split (s)	32.7	32.7	39.0		12.0	17.0
Total Split (s)	36.7	36.7	37.0		22.0	37.0
Total Split (%)	38.3%	38.3%	38.7%		23.0%	38.7%
Yellow Time (s)	3.3	3.3	3.7		3.7	3.7
All-Red Time (s)	3.4	3.4	3.3		3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.7	6.7	7.0		7.0	7.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None		None	None
Act Effct Green (s)	19.4	19.4	13.0		31.0	31.0
Actuated g/C Ratio	0.30	0.30	0.20		0.48	0.48
v/c Ratio	0.34	0.87	0.52		0.43	0.41
Control Delay	18.6	18.7	28.6		14.9	13.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.6	18.7	28.6		14.9	13.2
LOS	B	B	C		B	B
Approach Delay	18.7		28.6			13.6
Approach LOS	B		C			B
Queue Length 50th (m)	15.1	16.0	19.5		13.5	25.4
Queue Length 95th (m)	28.4	#94.5	38.2		31.6	47.3
Internal Link Dist (m)	501.1		407.9			281.6
Turn Bay Length (m)		125.0			115.0	
Base Capacity (vph)	1567	997	1616		550	2706
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.21	0.72	0.21		0.37	0.24

Intersection Summary
Cycle Length: 95.7
Actuated Cycle Length: 64.8
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87

Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 68.1%	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: 1: Palladium & WB HWY 417





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	213	179	0	370	464	0
Future Volume (vph)	213	179	0	370	464	0
Satd. Flow (prot)	1658	1483	0	3316	3316	0
Flt Permitted	0.950					
Satd. Flow (perm)	1658	1483	0	3316	3316	0
Lane Group Flow (vph)	213	179	0	370	464	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 32.7%		ICU Level of Service A	
Analysis Period (min) 15			

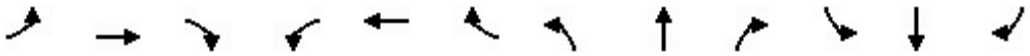
Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	213	179	0	370	464	0
Future Vol, veh/h	213	179	0	370	464	0
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	35	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	179	0	370	464	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	649	232	-	0	-	0
Stage 1	464	-	-	-	-	-
Stage 2	185	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	402	770	0	-	-	0
Stage 1	599	-	0	-	-	0
Stage 2	828	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	402	770	-	-	-	-
Mov Cap-2 Maneuver	402	-	-	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	828	-	-	-	-	-

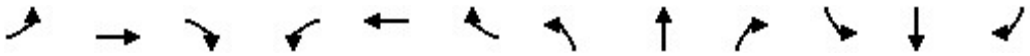
Approach	EB	NB	SB
HCM Control Delay, s	17.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	402	770	-
HCM Lane V/C Ratio	-	0.53	0.232	-
HCM Control Delay (s)	-	23.6	11.1	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	3	0.9	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	89	2	17	83	495	0	25	24	453	33	212
Future Volume (vph)	164	89	2	17	83	495	0	25	24	453	33	212
Satd. Flow (prot)	0	3210	0	0	1731	1483	0	3074	0	0	3065	0
Flt Permitted		0.969			0.992						0.969	
Satd. Flow (perm)	0	3210	0	0	1731	1483	0	3074	0	0	3065	0
Lane Group Flow (vph)	0	255	0	0	100	495	0	49	0	0	698	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary	
Control Type: Roundabout	
Intersection Capacity Utilization 56.2%	ICU Level of Service B
Analysis Period (min) 15	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	81	2	50	66	150	1	0	45	106	1	1
Future Volume (vph)	2	81	2	50	66	150	1	0	45	106	1	1
Satd. Flow (prot)	0	1738	0	0	1598	0	0	1513	0	0	1661	0
Flt Permitted		0.999			0.991			0.999			0.953	
Satd. Flow (perm)	0	1738	0	0	1598	0	0	1513	0	0	1661	0
Lane Group Flow (vph)	0	85	0	0	266	0	0	46	0	0	108	0
Sign Control		Stop			Stop			Stop			Stop	

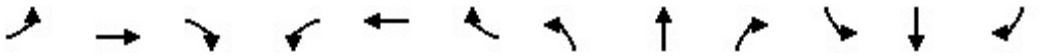
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 42.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	81	2	50	66	150	1	0	45	106	1	1
Future Vol, veh/h	2	81	2	50	66	150	1	0	45	106	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	81	2	50	66	150	1	0	45	106	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	8.9	7.5	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	2%	19%	98%
Vol Thru, %	0%	95%	25%	1%
Vol Right, %	98%	2%	56%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	85	266	108
LT Vol	1	2	50	106
Through Vol	0	81	66	1
RT Vol	45	2	150	1
Lane Flow Rate	46	85	266	108
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.108	0.303	0.148
Departure Headway (Hd)	4.252	4.573	4.105	4.937
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	841	785	878	727
Service Time	2.284	2.596	2.123	2.966
HCM Lane V/C Ratio	0.055	0.108	0.303	0.149
HCM Control Delay	7.5	8.2	8.9	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.4	1.3	0.5



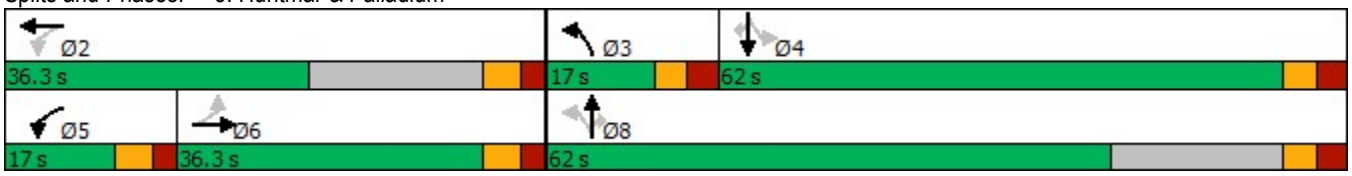
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	197	278	99	243	126	315	395	84	139	350	74
Future Volume (vph)	62	197	278	99	243	126	315	395	84	139	350	74
Satd. Flow (prot)	1658	2981	0	1658	3147	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.532			0.238			0.286			0.529		
Satd. Flow (perm)	928	2981	0	415	3147	0	499	1745	1465	923	1745	1460
Satd. Flow (RTOR)		251			78				84			131
Lane Group Flow (vph)	62	475	0	99	369	0	315	395	84	139	350	74
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		3	8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.3	36.3		11.3	36.3		11.4	37.4	37.4	37.4	37.4	37.4
Total Split (s)	36.3	36.3		17.0	36.3		17.0	62.0	62.0	62.0	62.0	62.0
Total Split (%)	27.4%	27.4%		12.8%	27.4%		12.8%	46.9%	46.9%	46.9%	46.9%	46.9%
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	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min		None	Min		None	None	None	None	None	None
Act Effct Green (s)	14.8	14.8		27.1	27.0		40.0	40.0	40.0	22.5	22.5	22.5
Actuated g/C Ratio	0.18	0.18		0.34	0.34		0.50	0.50	0.50	0.28	0.28	0.28
v/c Ratio	0.36	0.63		0.34	0.33		0.79	0.46	0.11	0.54	0.72	0.15
Control Delay	38.7	19.1		22.4	16.1		32.6	17.4	3.9	36.2	37.3	1.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	19.1		22.4	16.1		32.6	17.4	3.9	36.2	37.3	1.0
LOS	D	B		C	B		C	B	A	D	D	A
Approach Delay		21.3			17.4			22.0			32.2	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	8.7	16.5		10.0	16.1		28.9	38.0	0.0	18.1	48.3	0.0
Queue Length 95th (m)	22.8	36.4		24.2	32.0		#91.8	84.5	8.1	44.2	96.6	1.2
Internal Link Dist (m)		711.9			262.0			296.6			219.1	
Turn Bay Length (m)	100.0			70.0			105.0		50.0	50.0		
Base Capacity (vph)	369	1337		318	1991		410	1533	1297	664	1257	1088
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	0.36		0.31	0.19		0.77	0.26	0.06	0.21	0.28	0.07

Intersection Summary
Cycle Length: 132.3
Actuated Cycle Length: 80.5
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79

Intersection Signal Delay: 23.4	Intersection LOS: C
Intersection Capacity Utilization 81.1%	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: 5: Huntmar & Palladium



MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen AM FT2034 (Site Folder: FT2034)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.025	4.8	LOS A	0.1	0.8	0.57	0.44	0.57	45.2
2	T1	All MCs	23	2.0	23	2.0	0.025	4.7	LOS A	0.1	0.8	0.57	0.43	0.57	45.9
3	R2	All MCs	20	2.0	20	2.0	0.025	4.0	LOS A	0.1	0.8	0.56	0.41	0.56	45.7
Approach			44	2.0	44	2.0	0.025	4.4	LOS A	0.1	0.8	0.57	0.43	0.57	45.8
East: Palladium															
4	L2	All MCs	1	2.0	1	2.0	0.042	3.1	LOS A	0.2	1.3	0.29	0.15	0.29	52.6
5	T1	All MCs	53	2.0	53	2.0	0.042	3.1	LOS A	0.2	1.3	0.29	0.15	0.29	53.6
6	R2	All MCs	554	2.0	554	2.0	0.413	6.5	LOS A	2.6	18.3	0.40	0.22	0.40	50.9
Approach			609	2.0	609	2.0	0.413	6.2	LOS A	2.6	18.3	0.39	0.21	0.39	51.1
North: Palladium															
7	L2	All MCs	570	2.0	570	2.0	0.368	5.3	LOS A	2.2	15.4	0.20	0.07	0.20	51.9
8	T1	All MCs	14	2.0	14	2.0	0.093	4.6	LOS A	0.4	2.8	0.18	0.07	0.18	57.8
9	R2	All MCs	73	2.0	73	2.0	0.093	4.6	LOS A	0.4	2.8	0.18	0.07	0.18	56.8
Approach			658	2.0	658	2.0	0.368	5.2	LOS A	2.2	15.4	0.19	0.07	0.19	52.5
West: Derreen															
10	L2	All MCs	158	2.0	158	2.0	0.151	4.8	LOS A	0.7	5.2	0.53	0.39	0.53	28.5
11	T1	All MCs	110	2.0	110	2.0	0.126	5.3	LOS A	0.6	4.1	0.54	0.41	0.54	28.8
12	R2	All MCs	1	2.0	1	2.0	0.126	5.3	LOS A	0.6	4.1	0.54	0.41	0.54	28.8
Approach			269	2.0	269	2.0	0.151	5.0	LOS A	0.7	5.2	0.53	0.40	0.53	28.6
All Vehicles			1580	2.0	1580	2.0	0.413	5.5	LOS A	2.6	18.3	0.34	0.19	0.34	45.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen PM FT2034 (Site Folder: FT2034)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.035	5.6	LOS A	0.2	1.2	0.65	0.53	0.65	44.8
2	T1	All MCs	24	2.0	24	2.0	0.035	5.5	LOS A	0.2	1.2	0.65	0.52	0.65	45.5
3	R2	All MCs	29	2.0	29	2.0	0.035	4.6	LOS A	0.2	1.2	0.64	0.50	0.64	45.3
Approach			54	2.0	54	2.0	0.035	5.0	LOS A	0.2	1.2	0.65	0.51	0.65	45.4
East: Palladium															
4	L2	All MCs	23	2.0	23	2.0	0.104	3.6	LOS A	0.5	3.5	0.31	0.16	0.31	51.6
5	T1	All MCs	111	2.0	111	2.0	0.104	3.6	LOS A	0.5	3.5	0.31	0.16	0.31	52.6
6	R2	All MCs	973	2.0	973	2.0	0.704	11.6	LOS B	6.9	49.4	0.59	0.35	0.59	47.5
Approach			1108	2.0	1108	2.0	0.704	10.7	LOS B	6.9	49.4	0.56	0.32	0.56	48.1
North: Palladium															
7	L2	All MCs	711	2.0	711	2.0	0.501	7.4	LOS A	3.4	24.4	0.37	0.19	0.37	50.5
8	T1	All MCs	28	2.0	28	2.0	0.257	6.0	LOS A	1.3	9.0	0.32	0.17	0.32	56.6
9	R2	All MCs	233	2.0	233	2.0	0.257	6.0	LOS A	1.3	9.0	0.32	0.17	0.32	55.6
Approach			972	2.0	972	2.0	0.501	7.0	LOS A	3.4	24.4	0.36	0.18	0.36	51.7
West: Derreen															
10	L2	All MCs	144	2.0	144	2.0	0.157	5.4	LOS A	0.8	5.9	0.63	0.49	0.63	28.3
11	T1	All MCs	107	2.0	107	2.0	0.141	6.2	LOS A	0.7	4.9	0.63	0.51	0.63	28.6
12	R2	All MCs	1	2.0	1	2.0	0.141	6.2	LOS A	0.7	4.9	0.63	0.51	0.63	28.6
Approach			252	2.0	252	2.0	0.157	5.8	LOS A	0.8	5.9	0.63	0.50	0.63	28.4
All Vehicles			2386	2.0	2386	2.0	0.704	8.5	LOS A	6.9	49.4	0.49	0.29	0.49	45.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Palladium/Robert Grant at Derreen SAT FT2034 (Site Folder: FT2034)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Robert Grant															
1	L2	All MCs	1	2.0	1	2.0	0.028	4.7	LOS A	0.1	0.8	0.56	0.43	0.56	45.3
2	T1	All MCs	25	2.0	25	2.0	0.028	4.6	LOS A	0.1	0.9	0.56	0.42	0.56	46.0
3	R2	All MCs	24	2.0	24	2.0	0.028	4.0	LOS A	0.1	0.9	0.55	0.40	0.55	45.7
Approach			50	2.0	50	2.0	0.028	4.3	LOS A	0.1	0.9	0.55	0.41	0.55	45.8
East: Palladium															
4	L2	All MCs	19	2.0	19	2.0	0.088	3.5	LOS A	0.4	2.8	0.33	0.18	0.33	51.7
5	T1	All MCs	92	2.0	92	2.0	0.088	3.5	LOS A	0.4	2.8	0.33	0.18	0.33	52.6
6	R2	All MCs	550	2.0	550	2.0	0.419	6.7	LOS A	2.6	18.6	0.43	0.25	0.43	50.7
Approach			661	2.0	661	2.0	0.419	6.2	LOS A	2.6	18.6	0.41	0.24	0.41	51.0
North: Palladium															
7	L2	All MCs	503	2.0	503	2.0	0.351	5.5	LOS A	2.0	14.4	0.29	0.13	0.29	51.7
8	T1	All MCs	37	2.0	37	2.0	0.233	5.1	LOS A	1.1	8.2	0.28	0.13	0.28	57.3
9	R2	All MCs	236	2.0	236	2.0	0.233	5.1	LOS A	1.1	8.2	0.28	0.13	0.28	56.4
Approach			776	2.0	776	2.0	0.351	5.4	LOS A	2.0	14.4	0.28	0.13	0.28	53.3
West: Derreen															
10	L2	All MCs	182	2.0	182	2.0	0.171	4.9	LOS A	0.8	5.8	0.52	0.38	0.52	28.4
11	T1	All MCs	99	2.0	99	2.0	0.119	5.4	LOS A	0.5	3.7	0.52	0.40	0.52	28.8
12	R2	All MCs	2	2.0	2	2.0	0.119	5.4	LOS A	0.5	3.7	0.52	0.40	0.52	28.8
Approach			283	2.0	283	2.0	0.171	5.1	LOS A	0.8	5.8	0.52	0.39	0.52	28.6
All Vehicles			1770	2.0	1770	2.0	0.419	5.6	LOS A	2.6	18.6	0.38	0.22	0.38	45.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
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