

2025 Mer Bleue Road

Community Transportation Study

Ottawa, Ontario

Prepared for: SmartREIT

Prepared by: Stantec Consulting Ltd.

January 2017

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

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1.0 INTRODUCTION

1.1 STUDY PURPOSE

SmartREIT is submitting a rezoning application for 2025 Mer Bleue Road in the Orleans community of Ottawa, Ontario. As part of the approvals process a Community Transportation Study (CTS) is required to support the application.

This CTS has been prepared to assess the potential transportation implications of the proposed development and to determine whether transportation improvements are required to support it.

1.2 PROPOSED DEVELOPMENT

The subject development is located in the Orleans community of Ottawa. The site is bound by Innes Road and existing commercial to the north, Mer Bleue Road and existing commercial to the west, existing commercial and vacant commercial / industrial lands to the east, and vacant commercial / industrial lands to the south.

Figure 1 illustrates the location of the subject development.

Despite being part of the current development application, a portion of the subject lands fronting onto Innes Road - which included roughly 220,000 ft² of retail - were recently assessed as part of a site plan application and the transportation implications were detailed within *SmartREIT Orleans Commercial Development Transportation Impact Study* (Stantec, 2016). As part of the subject CTS, the trips generated by site plan application lands were included as background traffic and not as site traffic.

Figure 2 depicts the site plan and proposed accesses for the proposed development including which portion of the development is considered site traffic and which portion is considered to be part of the background traffic.

The proposed development (i.e. the lands considered as site traffic) includes approximately 42,000 ft² gross floor area (GFA) of retail space, 14,000 ft² GFA of restaurant space, 118,000 ft² GFA of industrial space, 1200 apartment units, 350 units for senior housing, and an assisted living building containing 256 beds.



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Figure 1 Site Location



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1.3 SCOPE OF THE ASSESSMENT

This CTS has been carried out in accordance with the City of Ottawa's *2006 Transportation Impact Assessment (TIA) Guidelines*. The scope of the transportation assessment was approved by City of Ottawa approvals staff during a pre-consultation email on November 14th, 2016.

The scope of the transportation assessment includes the following:

- Study area intersections include:
 - Innes Road at Mer Bleue Road
 - Mer Bleue Road at Commercial Access / Site Access 1
 - Mer Bleue Road at Site Access 2
 - Innes Road at Site Access 3
 - Innes Road at Wildflower Drive / Site Access 4
 - Vanguard Drive extension at Mer Bleue Road
 - Vanguard Drive at Site Access 5
- Study horizons include:
 - 2016 existing conditions;
 - 2026 future background conditions;
 - 2026 total future conditions (site build-out); and
 - 2031 ultimate conditions (5 years beyond build-out).
- Study scenarios include:
 - with the Vanguard Drive extension to Mer Bleue Road; and
 - without the Vanguard Drive extension to Mer Bleue Road.
- Analysis time periods include the weekday AM and PM peak hours.

The methodology used in the CTS includes:

- The net increase in site traffic from the proposed development will be estimated;
- Background traffic growth will be explicitly accounted for based on known developments in the study area as well as a nominal 1% annual growth rate;
- Future background traffic volumes will be combined with the net increase in site traffic volumes to determine total future traffic volumes;



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- Screenline analyses will be undertaken for the Mer Bleue Road and Innes Road screenlines to determine the system capacity in the study area;
- Intersection analyses will be performed to determine the operating characteristics of the study area intersections under each study horizon; and
- Where operational deficiencies are identified mitigation measures will be examined.

2.0 EXISTING TRANSPORTATION ENVIRONMENT

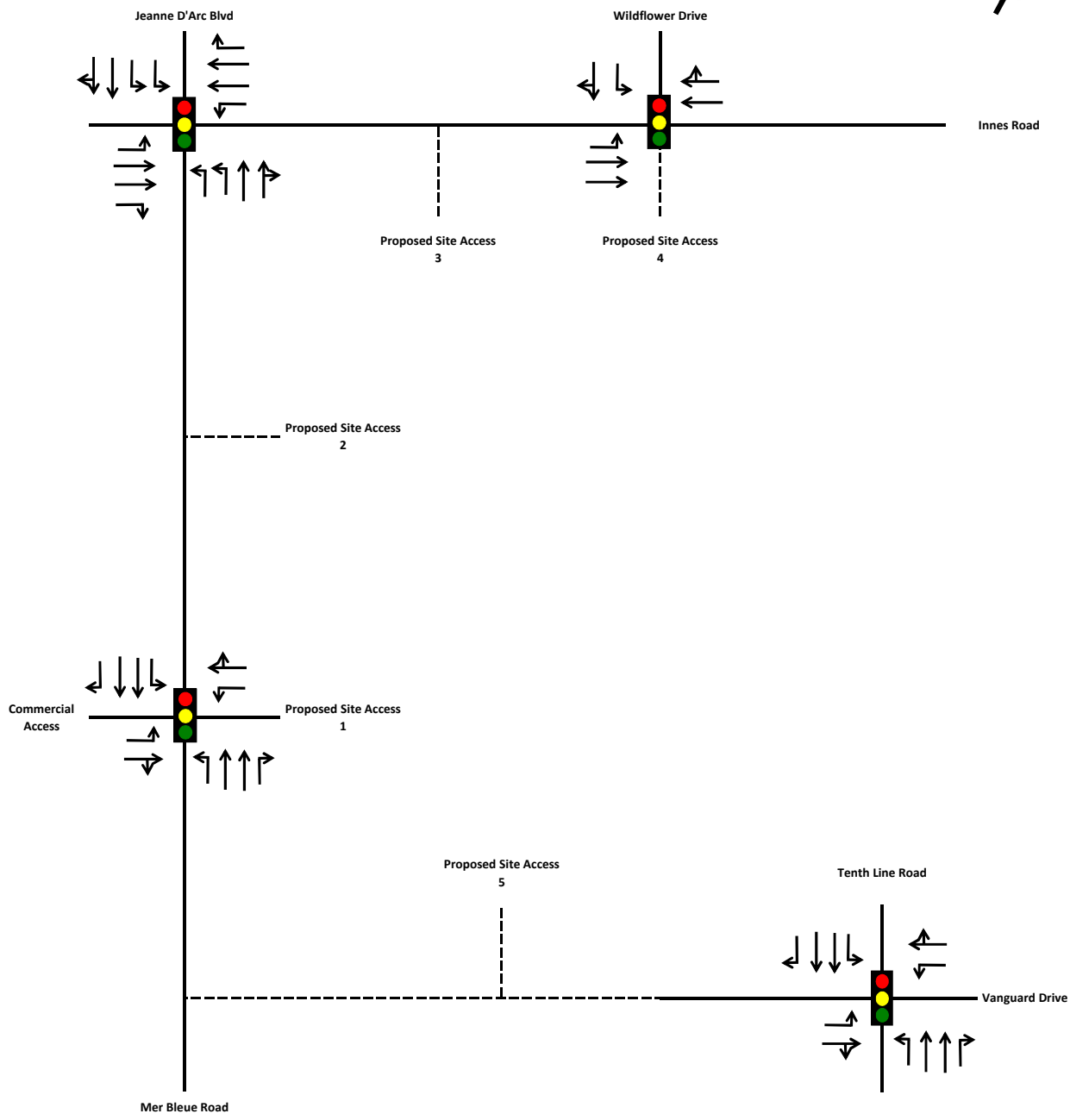
2.1 ROADS AND TRAFFIC CONTROL

The roadways under consideration in the study area are described below:

Innes Road	Innes Road is a four lane divided urban arterial road with a posted speed limit of 60 km/hr. Sidewalks and bicycle lanes are provided along both sides of the road. Within the vicinity of the subject site, there are multiple commercial developments with numerous site accesses along Innes Road.
Mer Bleue Road	Within the vicinity of the subject site, Mer Bleue Road is a four lane divided urban arterial road with a posted speed limit of 60 km/hr. Sidewalks and bicycle lanes are provided along both side of the road. The intersection with Innes Road is signalized and includes exclusive turning lanes in all directions with dual left turning lanes in the northbound and southbound directions. There exists a commercial access approximately 200m south of Innes Road along Mer Bleue Road. The intersection of Mer Bleue Road with this Commercial Access is signalized and provides exclusive turning lanes in all directions.
Wildflower Drive	Wildflower Drive is a two lane urban local road with a posted speed limit of 40 km/hr. A sidewalk is provided along the west side of the road. The intersection with Innes Road is signalized and exclusive eastbound and southbound left turning lanes are provided. There currently exists a westbound left turning lane to accommodate future growth on the south side of Innes Road (i.e. the subject development).
Vanguard Drive	Vanguard Drive is a two lane urban collector road with an assumed speed limit of 50 km/hr. It currently extends from Tenth Line Road to Lanthier Drive. Sidewalks are provided along both sides of the road and the intersection with Tenth Line Road is signalized.

The road classifications noted above are referenced from Map 6 of the City of Ottawa's *Transportation Master Plan, 2013*.

Figure 3 illustrates the existing intersection control and lane configuration for the study area intersections.



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Figure 3: Existing Intersection Control and Lane Configuration

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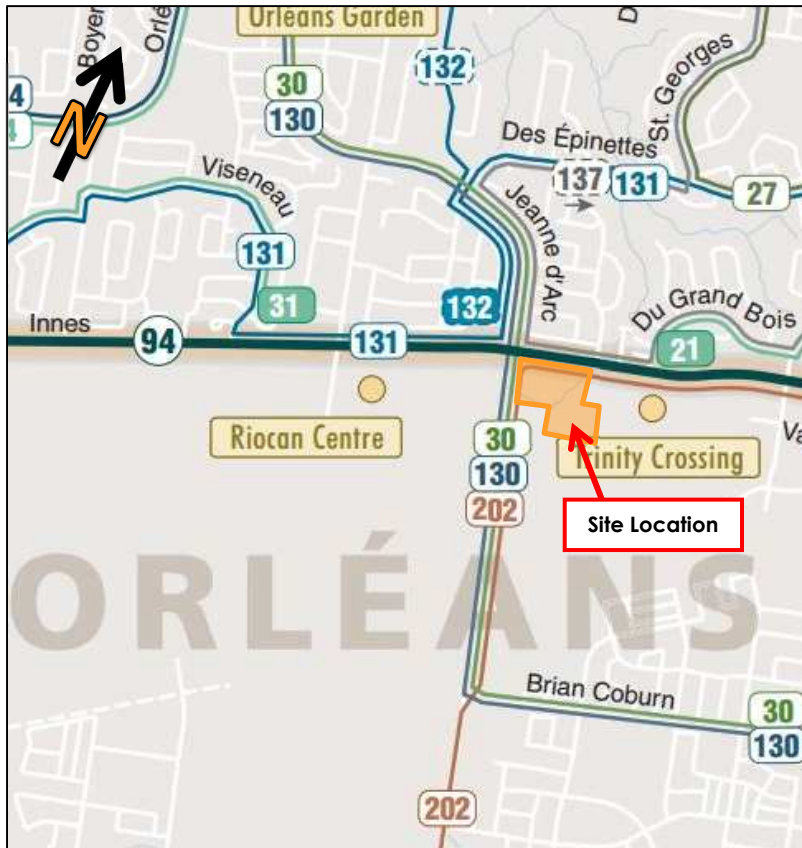
Existing Transportation Environment
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2.2 TRANSIT

Transit service provided in the vicinity of the proposed development includes routes 21, 30, 130, 131, 132, and 202. Routes 21 and 30 are peak hour bus routes that run from Lebreton to Orleans. Route 130 is a regular bus route that runs between Blair Station and Millennium Station. Route 131 is a regular bus route that runs within the Orleans community. Route 132 is a regular bus route that runs from Place d'Orléans to Innes Road. Route 202 is a Tuesday only free bus route that runs from Sarsfield to St. Laurent Station. There are currently two transit stops on Innes Road along the frontage of the subject site (i.e. one on either side of Innes Road).

Figure 4 illustrates the local transit route.

Figure 4 Study Area Transit



(Source: OC Transpo System Map, Accessed November 22nd, 2016)

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2.3 WALKING AND CYCLING

Within the vicinity of the subject site sidewalks are provided along the majority of the roads and cycling lanes are provided along Innes Road and Mer Bleue Road.

2.4 TRAFFIC VOLUMES

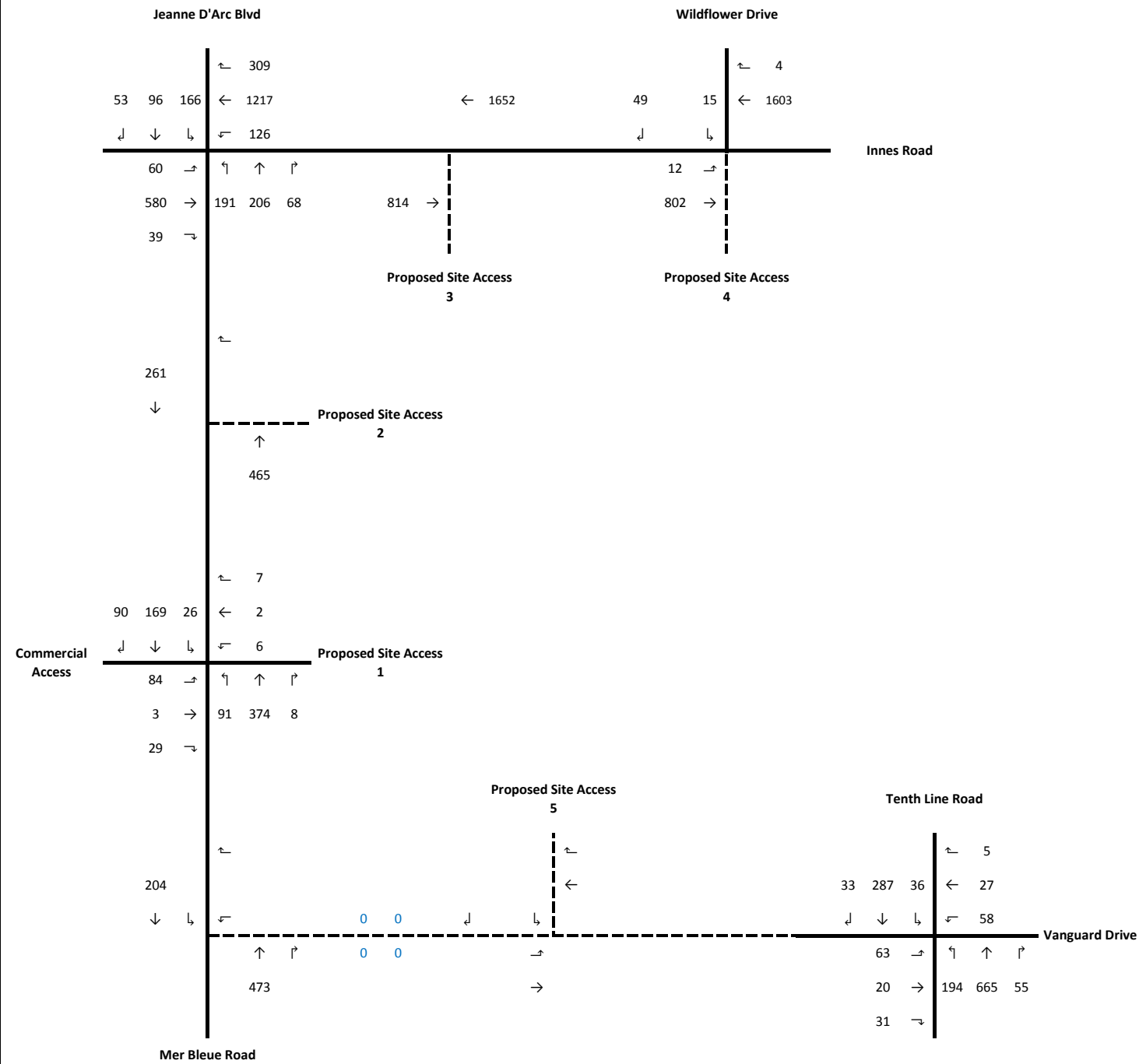
Traffic counts were obtained from the City of Ottawa at all study area intersections. The counts were adjusted to the current base year (2016) using a 1% per annum growth rate. This growth rate is consistent with previous transportation studies in the area (i.e. *Orleans Commercial Development Transportation Impact Study (Stantec 2016)*).

Figure 5 illustrates 2016 existing AM and PM peak hour traffic volumes at the study area intersections.

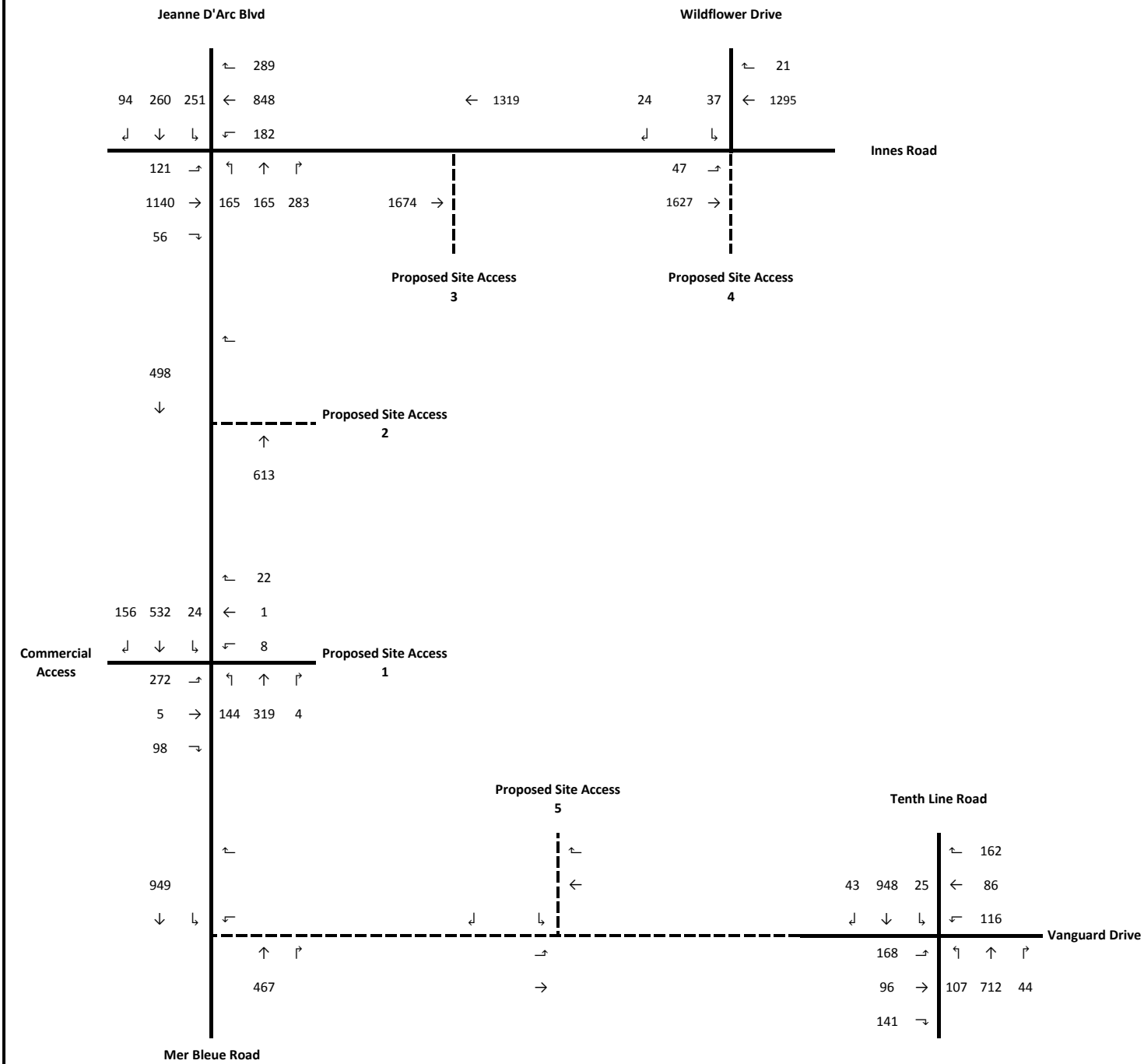
An assessment of 2016 existing traffic conditions is outlined in **Section 4.1**.

Appendix A contains the traffic data and is provided for reference.

AM Peak Hour



PM Peak Hour



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Figure 5: 2016 Existing Traffic Volumes

3.0 FUTURE TRANSPORTATION ENVIRONMENT

3.1 TRANSPORTATION NETWORK

3.1.1 Road Network Improvements

Several significant transportation improvements have been noted in the City of Ottawa's 2013 *Transportation Master Plan* (TMP) in the vicinity of the proposed site and are outlined in **Table 1** below.

Table 1 2013 Transportation Master Plan Scheduled Upgrades

Project	Description	TMP Phase
Brian Coburn Boulevard Extension	New two-lane road (ultimately four-lane) between Navan Road and Mer Bleue Road	Phase 1 (2014 – 2019)
Blackburn Hamlet Bypass Extension	New four lane road between Innes Road and Navan Road	Phase 2 (2020 – 2025)
	Widen from four to six lanes between Innes Road (west entrance to Blackburn Hamlet) and Navan Road	Network Concept (i.e. beyond 2031)
Mer Bleue Road Widening	New four-lane realignment, west of existing Mer Bleue Road, between Renaud Road and Navan Road	Network Concept (i.e. beyond 2031)
Eastern Light Rail Transit	Eastern extension of LRT service following Ottawa Road 174 between Blair Station and Place d'Orléans Station	Affordable Network (i.e. before 2031)
	Eastern extension of LRT service following Ottawa Road 174 between Place d'Orléans Station and Trim Station	Network Concept (i.e. beyond 2031)

It should be noted that despite the timelines outlined in the TMP, it is our understanding that the Eastern Light Rail Transit (LRT) will be extended between Blair Station and Trim Road by 2023 as part of the City of Ottawa's Stage 2 Light Rail Transit project.

3.1.2 Traffic Diversion from Innes Road to Brian Coburn Boulevard

As indicated in **Table 1**, Brian Coburn Boulevard is scheduled to be extended west from Mer Bleue Road to Navan Road during Phase 1 of the TMP. This new facility will not only accommodate growth from new developments but it will also alleviate traffic congestion along Innes Road as some traffic diverts to Brian Coburn Boulevard.

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Consistent with the previously approved *Proposed Avalon West Community Development Traffic Impact Brief* (CastleGlenn Consultants Inc., 2013) and the *Summerside West Phase 1 Transportation Impact Study* (Stantec, 2015), and the recently submitted *Orleans Commercial Development Transportation Impact Study* (Stantec 2016), it was assumed that approximately 18% of the existing traffic volumes along Innes Road will divert onto Brian Coburn Boulevard. These reports identified that the traffic diversion would amount to 267 vehicles per hour (vph) westbound and 93 vph eastbound during the AM peak hour and 172 vph westbound and 334 vph eastbound during the PM peak hour. Consistent with the above diversion assumptions, traffic volumes along Innes Road were reduced to reflect the expected traffic diversion to Brian Coburn Boulevard.

3.1.3 Traffic Diversion from Innes Road to Vanguard Drive

While the Vanguard Drive Extension project is not identified within the City's TMP, our understanding is that this project has been a recent topic for discussion between City staff and local stakeholders. Once constructed to Mer Bleue Road, the Vanguard Drive Extension will provide an alternate means of accessing existing and future retail/commercial and industrial lands south of Innes Road and north of the Hydro corridor. Consequently, with the extension in place, the subject SmartREIT development will have the ability to include a site access to Vanguard Drive.

To predict the potential volume of traffic that might divert from Innes Road onto Vanguard Drive, the nature of the facility must first be examined. Vanguard Drive will function as a collector road and will run from Mer Bleue Road to Tenth Line Road. The relatively short length of Vanguard Drive (approximately 1.5km) will limit the amount of traffic it will divert from Innes Road. As a comparison, Brian Coburn Boulevard will function as an arterial road and will be a much longer facility (approximately 4.5km) that currently extends from Mer Bleue Road to Trim Road, with the ultimate configuration extending all the way to Navan Road. With this in mind, it is clear that Vanguard Drive will not divert nearly as much traffic off of Innes Road as Brian Coburn Boulevard will. It was assumed that the Vanguard Drive Extension will divert approximately 50% of the amount of traffic that Brian Coburn Boulevard is anticipated to divert from Innes Road. As such, it was assumed that the Vanguard Drive Extension will divert 134 vehicles per hour (vph) westbound and 47 vph eastbound during the AM peak hour and 86 vph westbound and 167 vph eastbound during the PM peak hour.

This CTS will examine the transportation implications of the proposed SmartREIT development both with and without the Vanguard Drive Extension in place.

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3.2 FUTURE BACKGROUND DEVELOPMENTS

The Orleans community has experienced substantial growth over the past number of years and this growth is anticipated to continue well into the future. There are numerous developments scheduled to occur in the vicinity of the subject site, as outlined in **Table 2** below.

Consistent with the *2405 Mer Bleue Transportation Impact Study* (Stantec, 2014), *Summerside West Phase 1 TIS* (Stantec, 2015), and *Summerside West Phase 2 TIS* (Stantec 2016), each background development was specifically accounted for and assigned to the roadway network as part of this traffic study.

Table 2 Background Developments

Development	Location	Anticipated Units (Commercial GFA)	Assumed Start of Closings	Assumed Build-Out
Minto's 2605 Tenth Line Road	East of Tenth Line Road, south of Harvest Valley Avenue	612	2015	2019
Minto's Avalon West	Between Mer Bleue Road and Tenth Line Road, north of Mattamy's Summerside West	2,220 (330,000)	2015	2021
East Urban Community	West of Mer Bleue Road, south of Innes Road	8,670	2016	2044
West 10 Lands	East of Mer Bleue Road, south of Mattamy's Summerside West	119	2019	2022
Mattamy's Summerside West Phase 1	West of Tenth Line Road, east of Summerside West Phase 2	249	2016	2018
Area 10 Lands	Between Mer Bleue Road and Tenth Line Road, south of Mattamy's Summerside West	4,150	2019	2032

3.3 2026 FUTURE BACKGROUND CONDITIONS

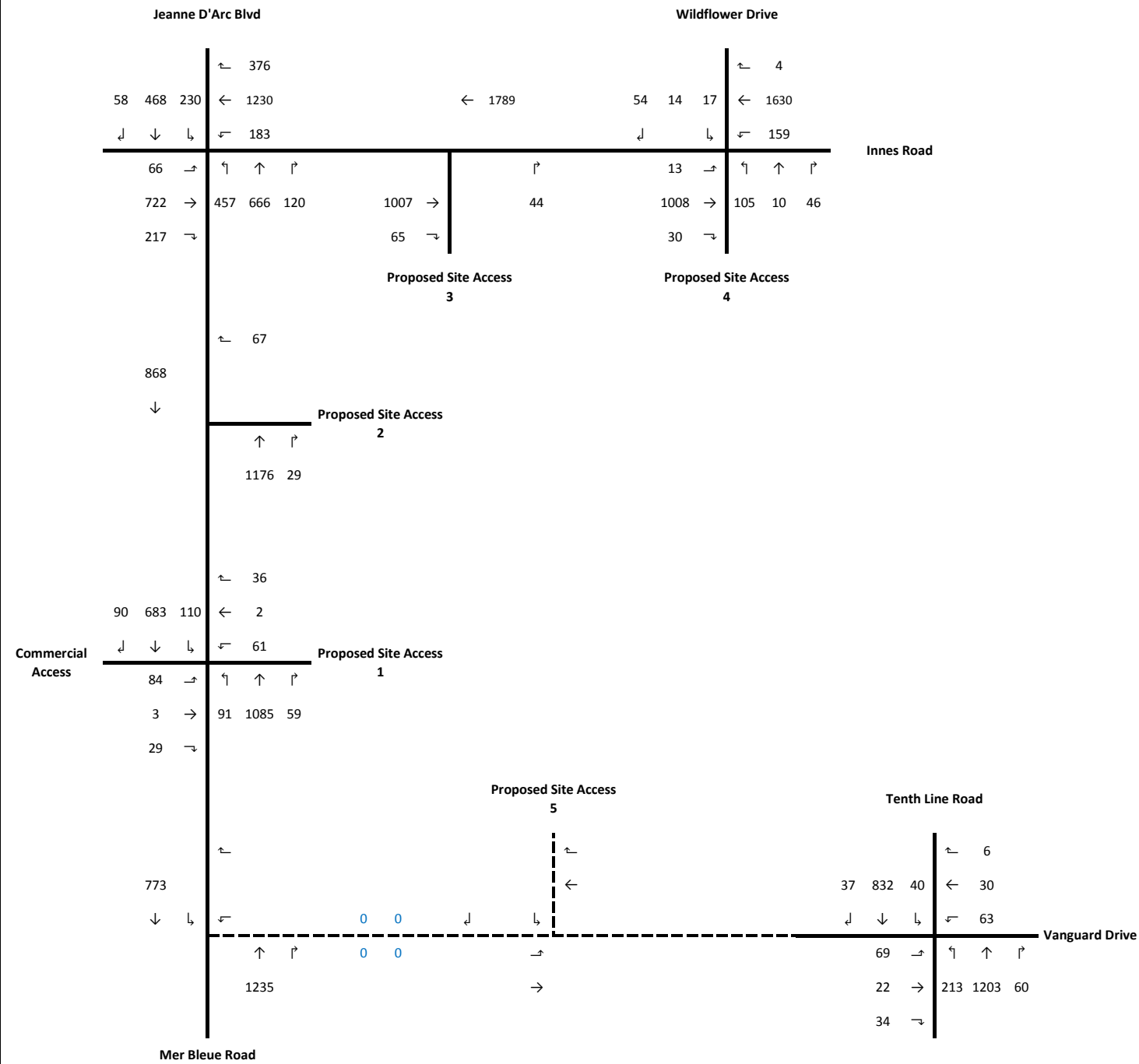
Future background conditions are assessed to determine transportation improvements that may be required to address traffic growth exclusive from improvements that may be required to accommodate traffic generated by the subject development. Any improvements identified to address future background conditions are not the responsibility of the developer.

Figure 6 illustrates 2026 future background traffic volumes at the study area intersections.

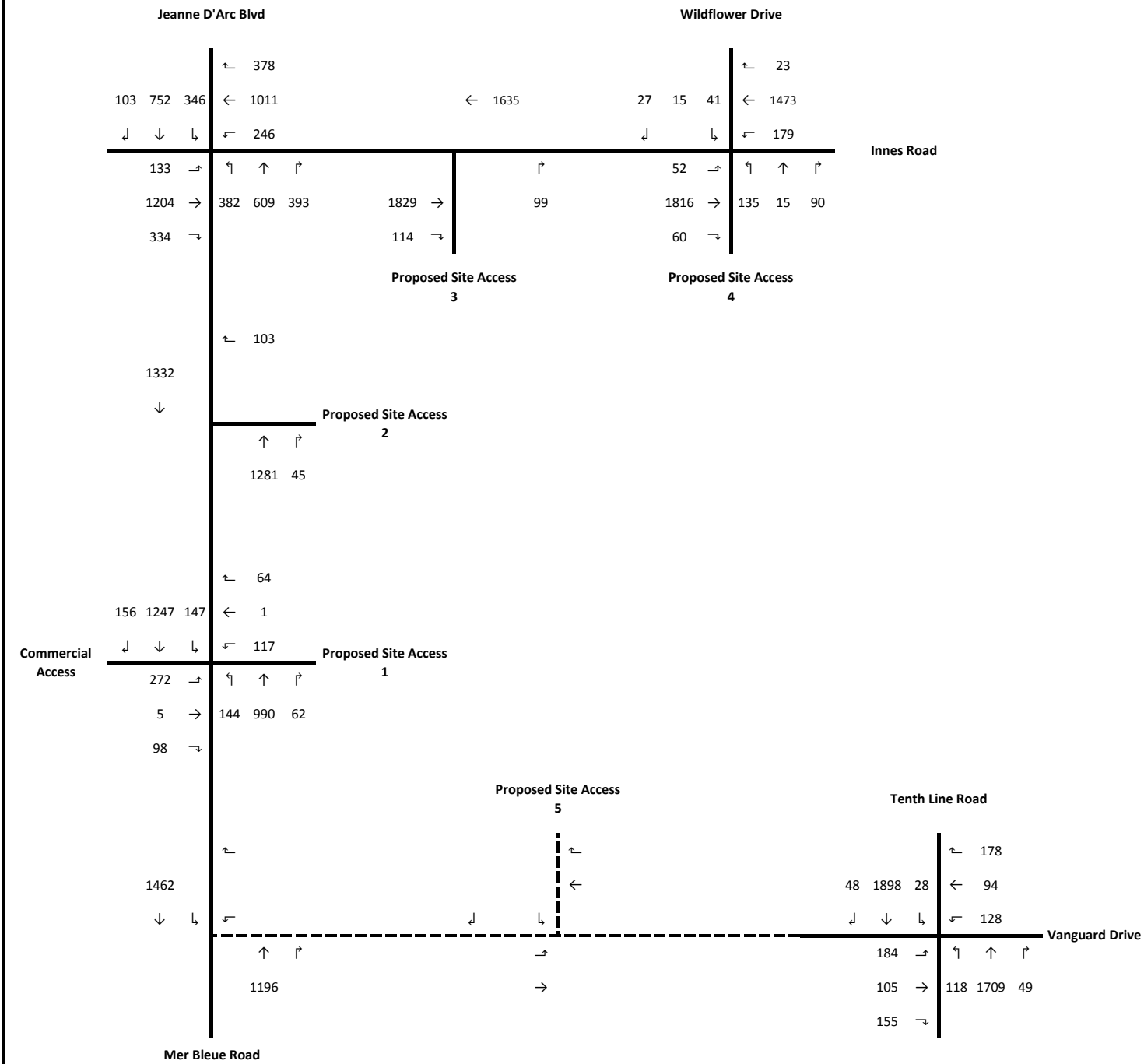
An assessment of 2026 future background traffic conditions is outlined in **Section 4.2**.



AM Peak Hour



PM Peak Hour



3.4 SITE TRAFFIC GENERATION

3.4.1 Land Use and Trip Generation Rates

The *Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition)* was used to estimate traffic generated by the subject site. The ITE land use codes 820 – Shopping Centre, 931 – Quality Restaurant, 222 – High-Rise Apartments, 252 – Senior Housing, 254 – Assisted Living, and 110 – General Light Industrial were thought to be most representative of the proposed land uses.

Table 3 summarizes the trip rates obtained from the *ITE Trip Generation Manual* and the ensuing sections describe the methodology used to convert these trips to person trips across all modes.

Table 3 ITE Trip Generation Rates

ITE Land Use	Independent Variable		Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
820 – Shopping Centre	Gross Floor Area (1000 ft ²)	42	1.36	0.79	2.19	3.83	4.15	7.98
931 – Quality Restaurant	Gross Floor Area (1000 ft ²)	14	0.66	0.15	0.81	5.02	2.47	7.49
222 – High-Rise Apartments	Units	1200	0.07	0.22	0.30	0.20	0.13	0.33
252 – Senior Housing	Units	350	0.07	0.13	0.20	0.13	0.11	0.24
254 – Assisted Living	Beds	256	0.09	0.05	0.14	0.10	0.12	0.22
110 – General Light Industrial	Gross Floor Area (1000 ft ²)	118	0.35	0.08	0.42	0.02	0.07	0.09

3.4.2 Conversion of ITE Rates to Person Trips

The notion of quantifying the volume of “person” trips expected to be generated by a given development is becoming a commonly accepted practice. It is aimed at quantifying the expected demands across the primary modes of transportation.

In order to convert ITE rates to person trips, the rates obtained from the *ITE Trip Generation Manual* were adjusted to account for an inherent transit modal share and auto occupancy. An assumed transit share of 10% was thought to be inherent within the ITE rates and an auto occupancy rate of 1.1 persons per vehicle was also assumed to be inherent within the ITE rates.

The proposed commercial development is anticipated to generate 734 and 1186 person trips during the AM and PM peak hours, respectively.

Table 4 outlines the conversion from auto trips to person trips.

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Table 4 Conversion to Person Trips

ITE Land Use	Conversion		Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
820 – Shopping Centre	Trip Gen		57	33	90	161	174	335
	Transit Share	10%	6	3	9	16	17	33
	Auto Occupancy	1.1	6	3	9	16	17	33
	Total Person Trips		69	39	108	193	208	401
931 – Quality Restaurant	Trip Gen		9	2	11	70	35	105
	Transit Share	10%	1	0	1	7	4	11
	Auto Occupancy	1.1	1	0	1	7	4	11
	Total Person Trips		11	2	13	84	43	127
222 – High-Rise Apartments	Trip Gen		89	268	357	242	155	397
	Transit Share	10%	9	26	35	24	15	39
	Auto Occupancy	1.1	9	26	35	24	15	39
	Total Person Trips		107	320	427	290	185	475
252 – Senior Housing	Trip Gen		24	46	70	46	39	85
	Transit Share	10%	2	5	7	5	4	9
	Auto Occupancy	1.1	2	5	7	5	4	9
	Total Person Trips		28	56	84	56	47	103
254 – Assisted Living	Trip Gen		23	13	36	25	32	57
	Transit Share	10%	2	1	3	2	3	5
	Auto Occupancy	1.1	2	1	3	2	3	5
	Total Person Trips		27	15	42	29	38	67
110 – General Light Industrial	Trip Gen		41	9	50	2	9	11
	Transit Share	10%	4	1	5	0	1	1
	Auto Occupancy	1.1	4	1	5	0	1	1
	Total Person Trips		49	11	60	2	11	13
Total Development	Trip Generation		243	371	614	546	444	990
	Transit Share	10%	24	36	60	54	44	98
	Auto Occupancy	1.1	24	36	60	54	44	98
	Total Person Trips		291	443	734	654	532	1186

3.4.3 Modal Share Adjustments

In order to convert the person trips to auto trips, the person trips were assigned to the four primary modal shares (i.e. auto, passenger, transit, and active moves) for each specific land use. The modal split for the apartment land use was determined according to the TRANS Committee's 2011 *Origin-Destination (O-D)* Survey for the Orleans District. The modal splits for the remaining land uses were adjusted to include a higher auto modal share to reflect the nature of the land uses.



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In terms of vehicle trips, the proposed commercial development is anticipated to generate 449 and 761 auto trips (two-way) during the AM and PM peak hours, respectively.

Table 5 summarizes the expected person trips by modal share.

Table 5 Person Trips by Modal Share

ITE Land Use	Modal Share		Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
820 – Shopping Centre	Auto	70%	49	27	76	135	146	281
	Passenger	20%	7	4	11	19	21	40
	Transit	18%	12	7	19	35	37	72
	Walk / Bike	2%	1	1	2	4	4	8
931 – Quality Restaurant	Auto	70%	8	2	10	59	30	89
	Passenger	20%	1	0	1	8	4	12
	Transit	18%	2	0	2	15	8	23
	Walk / Bike	2%	0	0	0	2	1	3
222 – High-Rise Apartments	Auto	55%	59	176	235	160	102	262
	Passenger	10%	11	32	43	28	18	46
	Transit	34%	36	109	145	99	63	162
	Walk / Bike	1%	1	3	4	3	2	5
252 – Senior Housing	Auto	70%	19	39	58	39	33	72
	Passenger	20%	3	6	9	6	5	11
	Transit	18%	5	10	15	10	9	19
	Walk / Bike	2%	1	1	2	1	1	2
254 – Assisted Living	Auto	70%	19	10	29	21	27	48
	Passenger	20%	3	2	5	2	4	6
	Transit	18%	5	3	8	5	6	11
	Walk / Bike	2%	0	0	0	1	1	2
110 – General Light Industrial	Auto	70%	34	7	41	2	7	9
	Passenger	20%	5	1	6	0	1	1
	Transit	18%	9	2	11	0	2	2
	Walk / Bike	2%	1	0	1	0	0	0
Total Development	Auto		188	261	449	416	345	761
	Passenger		30	45	75	63	53	116
	Transit		69	131	200	164	125	289
	Walk / Bike		4	5	9	11	9	20

3.4.4 Pass-By and Internal Capture Trips

Pass-by trips are considered intermediate stops between an origin and a destination. They are site trips that are drawn from existing traffic volumes on the road network that are “passing-by”



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the site. While the total number of trips generated by a given development remains the same, the turning movements at study area intersections and site access require adjustments to reflect pass-by traffic. The rate of pass-by traffic is based on the specific land use and the various pass-by rates were obtained from the *ITE Trip Generation Manual*.

Appendix B contains the pass-by traffic volumes and is provided for reference.

When predicting trips that are associated with different land use types the interaction between those land use types must be accounted for by applying the principals of internal capture adjustments. Internal capture trips are trips which are shared between two or more uses on the same site. A portion of the generated trips for each individual land use is therefore drawn from the adjacent land uses. Internal capture adjustments were made to account for vehicles that visit more than one land use within the subject commercial development. Since these trips are contained within the subject site, accounting for each trip separately on the roadway network would result in “double-counting”. For this reason, land uses that may have associated internal capture trips between one another ultimately had their net new trips adjusted consistent with typical industry standards.

Table 6 below outlines the pass-by and internal capture percentages that were used for each land use in the subject development.

Table 6 Pass-By and Internal Capture Rates

Land Use	Pass-By		Internal Capture	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
820 – Shopping Centre	5%	34%	50%	50%
931 – Quality Restaurant	0%	44%	0%	25%
222 – High-Rise Apartments	0%	0%	0%	0%
252 – Senior Housing	0%	0%	0%	0%
110 – General Light Industrial	0%	0%	0%	0%

Table 7 summarizes the expected pass-by and internal capture trips by modal share.

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Table 7 Pass-By and Internal Capture

ITE Land Use	Pass-By / Internal Capture	Morning Peak Hour			Afternoon Peak Hour		
		In	Out	Total	In	Out	Total
820 – Shopping Centre	Auto Trips	49	27	76	135	146	281
	Pass-By	2	2	4	48	48	96
	Internal Capture	25	14	39	68	73	141
	Net New Auto Trips	22	11	33	19	25	44
931 – Quality Restaurant	Auto Trips	2	0	2	15	8	23
	Pass-By	0	0	0	5	5	10
	Internal Capture	0	0	0	4	2	6
	Net New Auto Trips	2	0	2	6	1	7
222 – High-Rise Apartments	Auto Trips	59	176	235	160	102	262
	Pass-By	0	0	0	0	0	0
	Internal Capture	0	0	0	0	0	0
	Net New Auto Trips	59	176	235	160	102	262
252 – Senior Housing	Auto Trips	19	39	58	39	33	72
	Pass-By	0	0	0	0	0	0
	Internal Capture	0	0	0	0	0	0
	Net New Auto Trips	19	39	58	39	33	72
254 – Assisted Living	Auto Trips	19	10	29	21	27	48
	Pass-By	0	0	0	0	0	0
	Internal Capture	0	0	0	0	0	0
	Net New Auto Trips	19	10	29	21	27	48
110 – General Light Industrial	Auto Trips	34	7	41	2	7	9
	Pass-By	0	0	0	0	0	0
	Internal Capture	0	0	0	0	0	0
	Net New Auto Trips	34	7	41	2	7	9
Total Development	Auto Trips	182	259	441	372	323	695
	Pass-By	2	2	4	53	53	106
	Internal Capture	25	14	39	72	75	147
	Net New Auto Trips	155	243	398	247	195	442

Following the application of the pass-by and internal capture rates, the commercial development is expected to generate approximately 398 and 442 net new auto trips (two-way) during the AM and PM peak hours, respectively.

3.4.5 Traffic Distribution and Assignment

The distribution of traffic to / from the study area was determined through examination of the TRANS Committee's 2011 *Origin-Destination (O-D) Survey* for the Orleans District. The anticipated traffic generated by the proposed development was assigned to the boundary road network using a logical pattern of primary roads (i.e. along arterials and collectors).



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Table 8 provides a summary of the estimated distribution for the traffic generated by the proposed development.

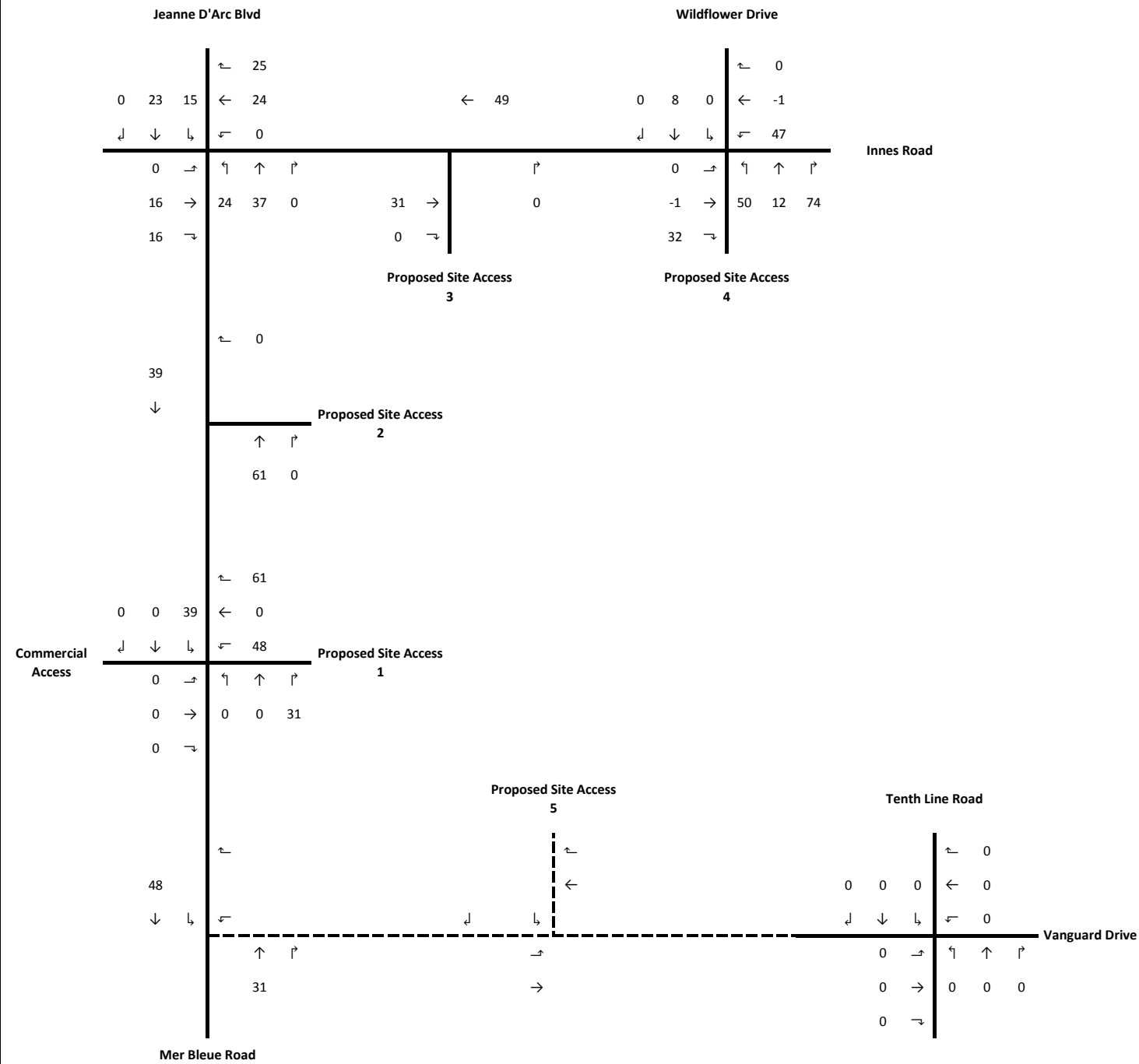
Table 8 Site Traffic Distribution

Via (to / from)				
Innes Road East	Innes Road West	Mer Bleue Road South	Mer Bleue Road North	Wildflower North
30%	20%	20%	25%	5%

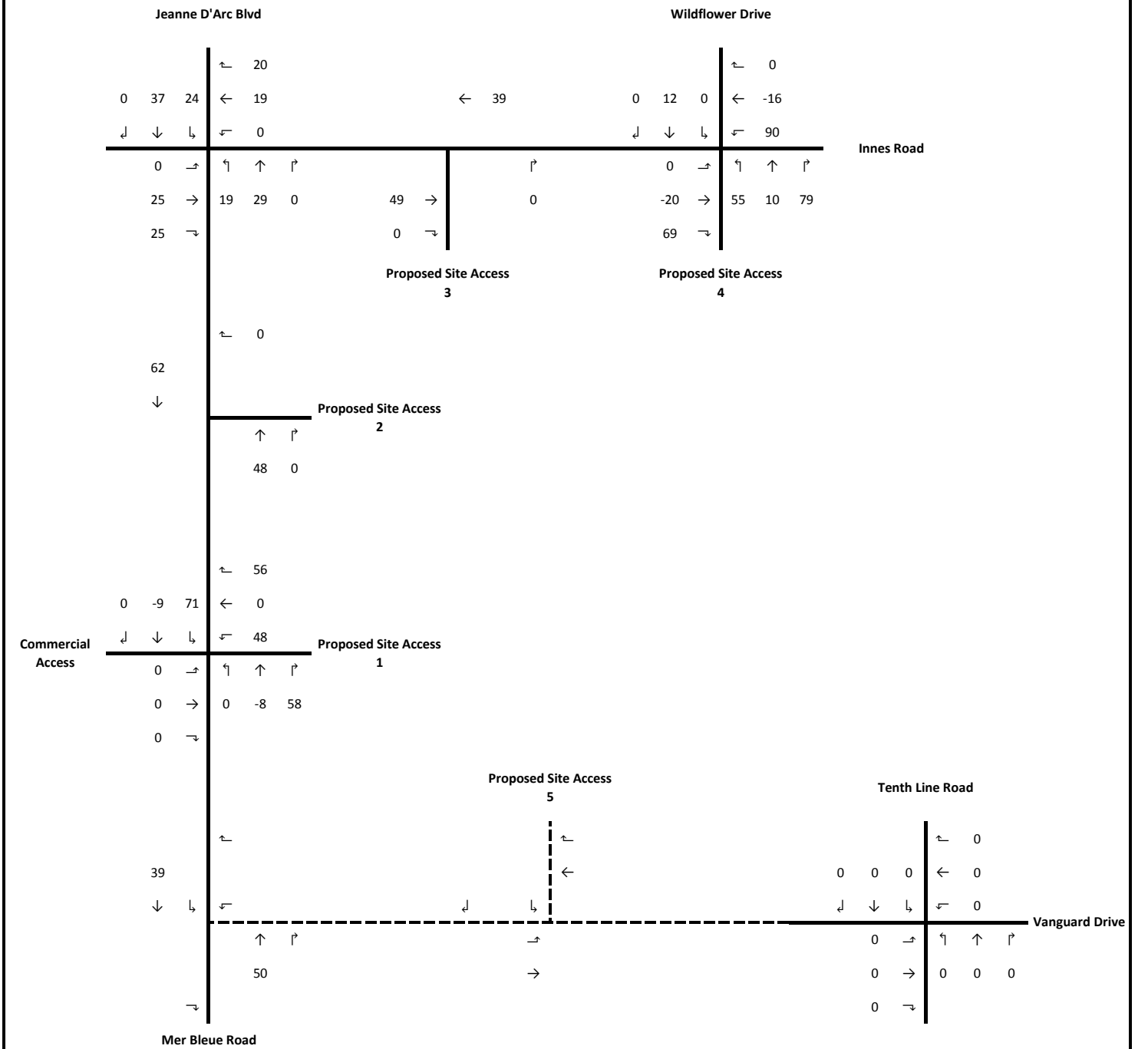
Figure 7 illustrates the assignment of total site traffic volumes to the boundary road network without the Vanguard Drive Extension.

Figure 8 illustrates the assignment of total site traffic volumes to the boundary road network with the Vanguard Drive Extension.

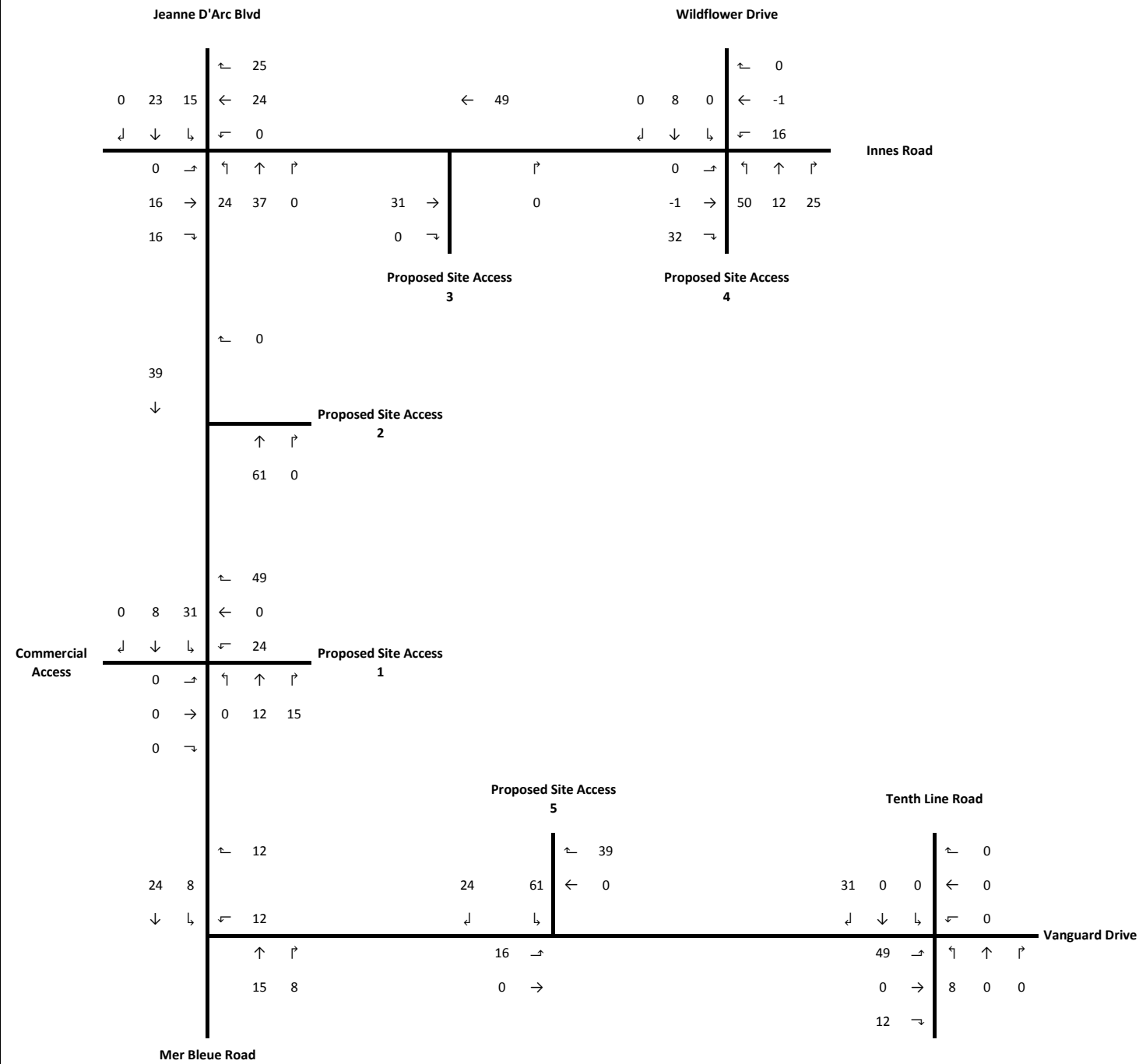
AM Peak Hour



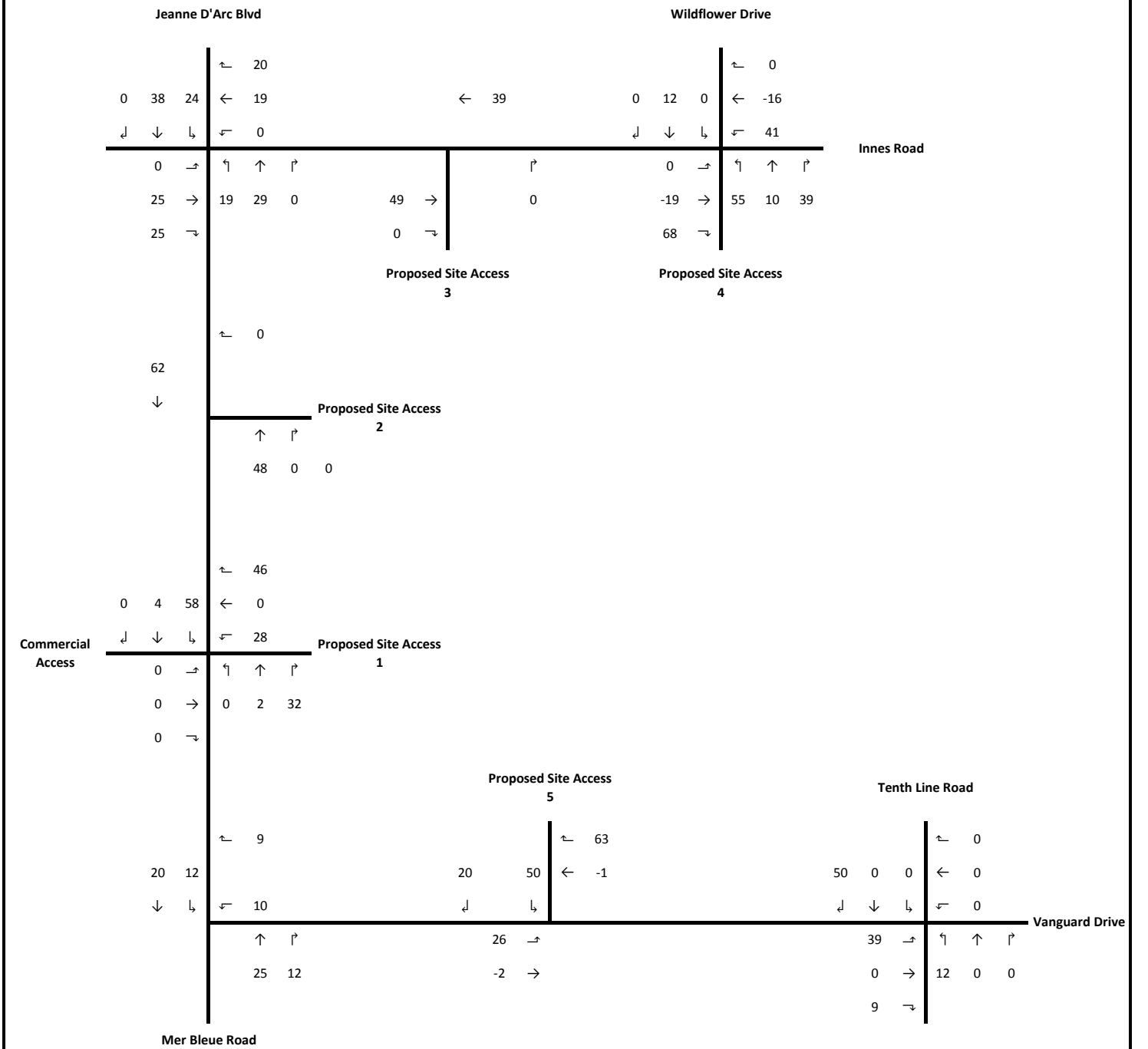
PM Peak Hour



AM Peak Hour



PM Peak Hour



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 Figure 8: Net New Site Trips
 with the Vanguard Drive Extension

3.5 2026 TOTAL FUTURE CONDITIONS

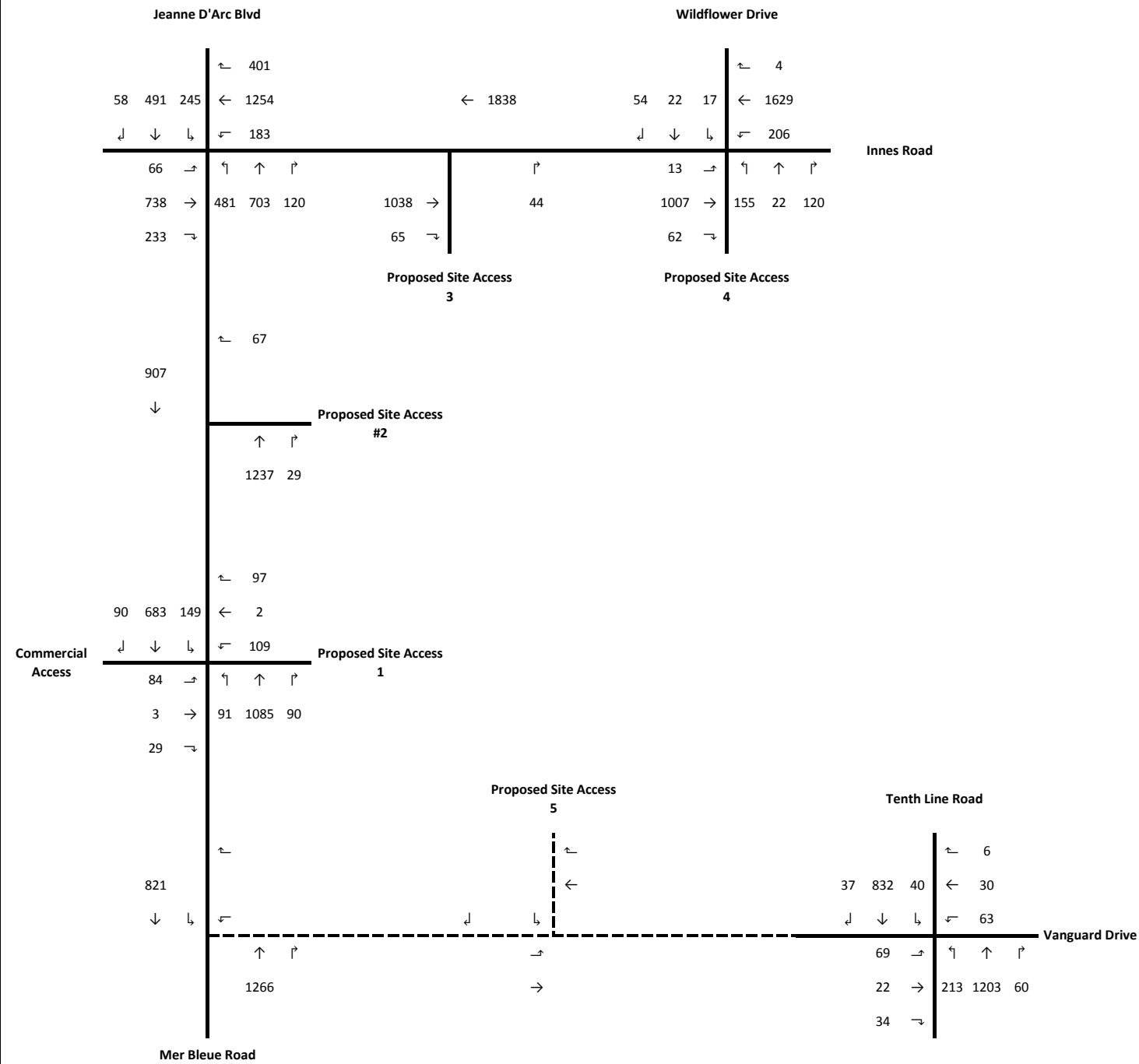
Total future conditions are examined to determine improvements that may be required as a direct result of the development of the site. It is anticipated that by 2026 the proposed development will be fully built and occupied.

The 2026 total future traffic volumes were derived by adding the projected site generated trips to future background volumes anticipated for 2026. The assignment of the site trips for the 2026 horizon follows the distribution outlined in **Table 8**.

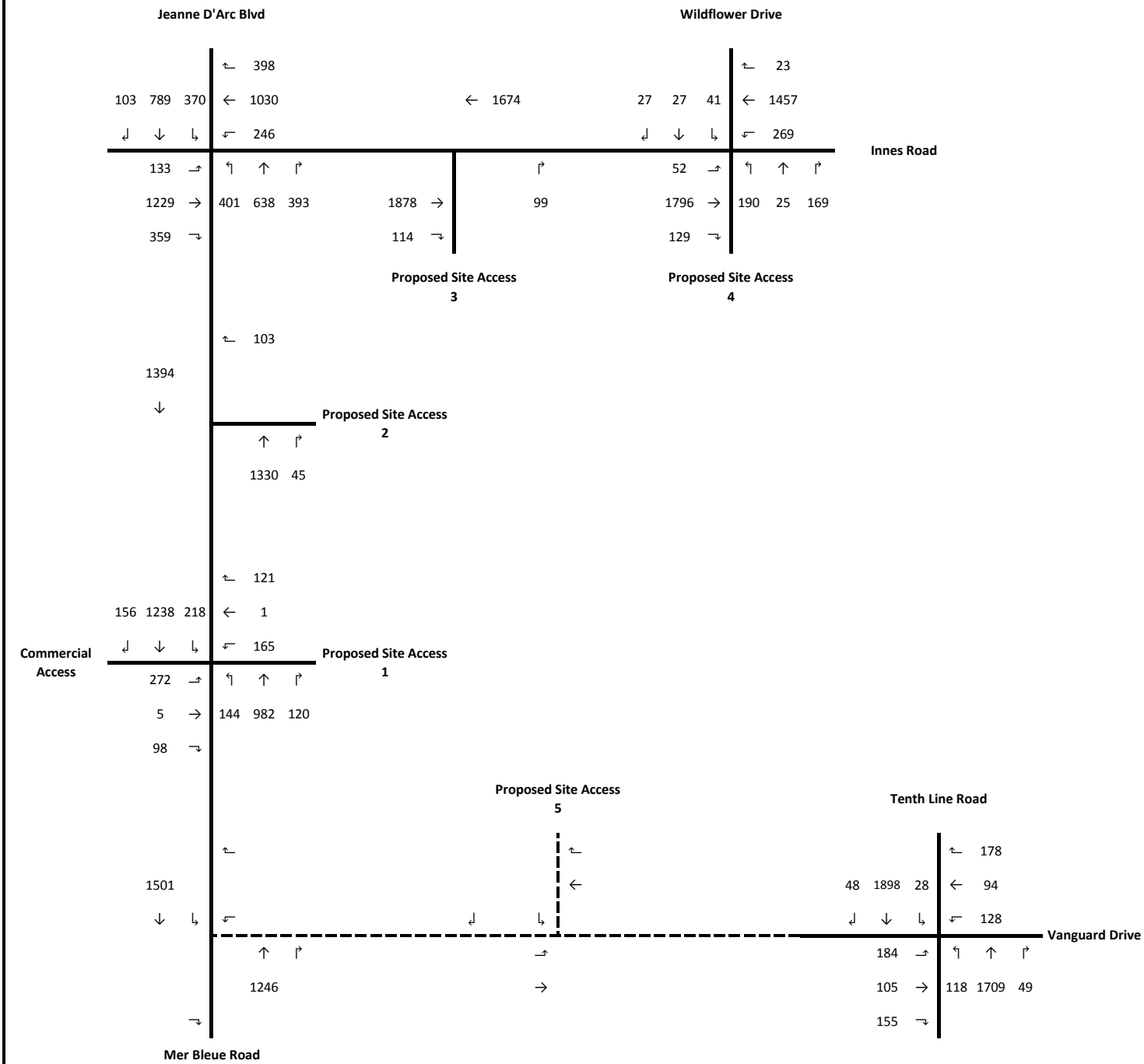
Figure 9 and **Figure 10** illustrate 2026 total future traffic volumes at the study area intersections during the AM and PM peak hours both with and without the Vanguard Drive Extension.

An assessment of 2026 total future traffic conditions is outlined in **Section 4.3**.

AM Peak Hour

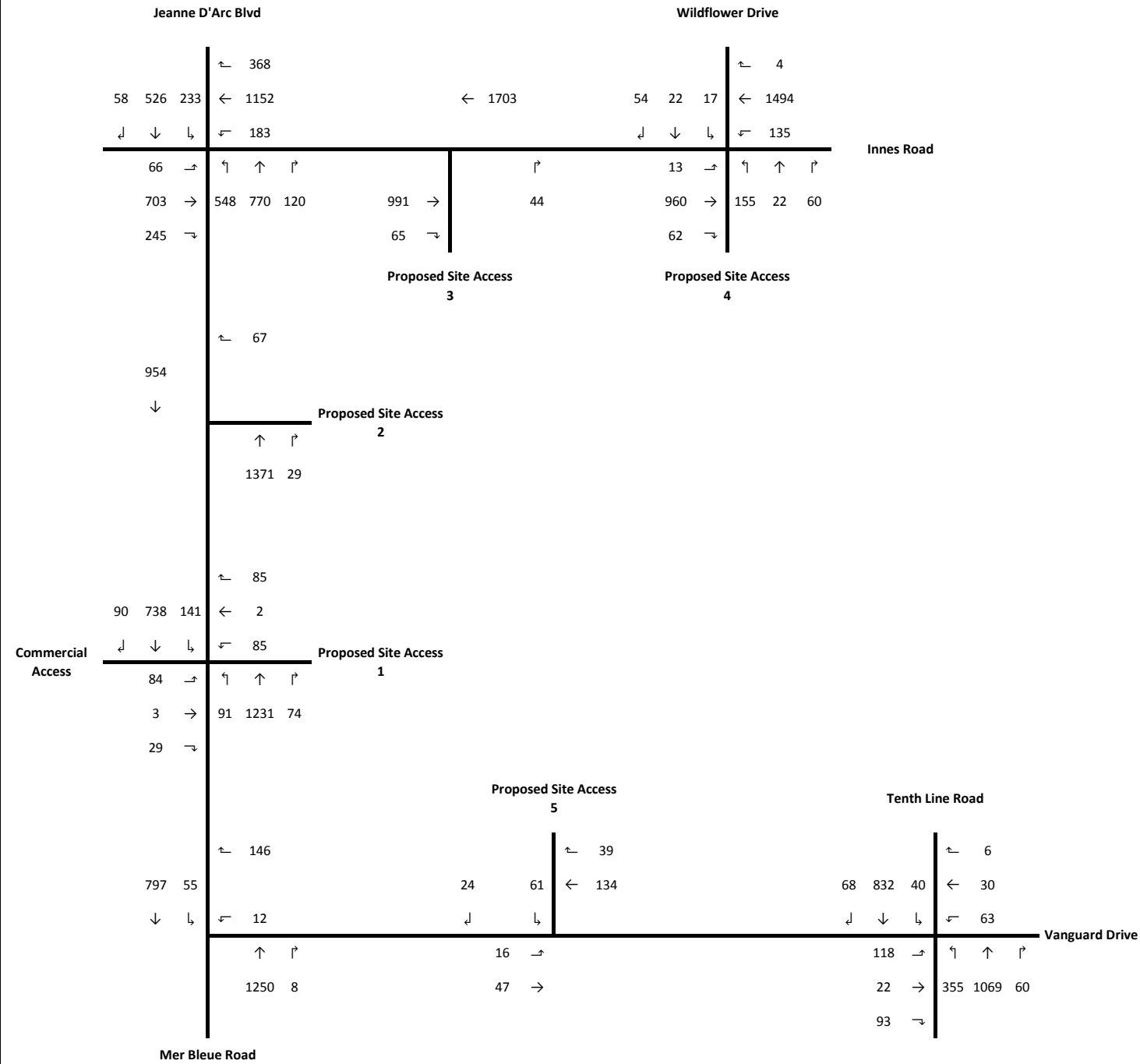


PM Peak Hour

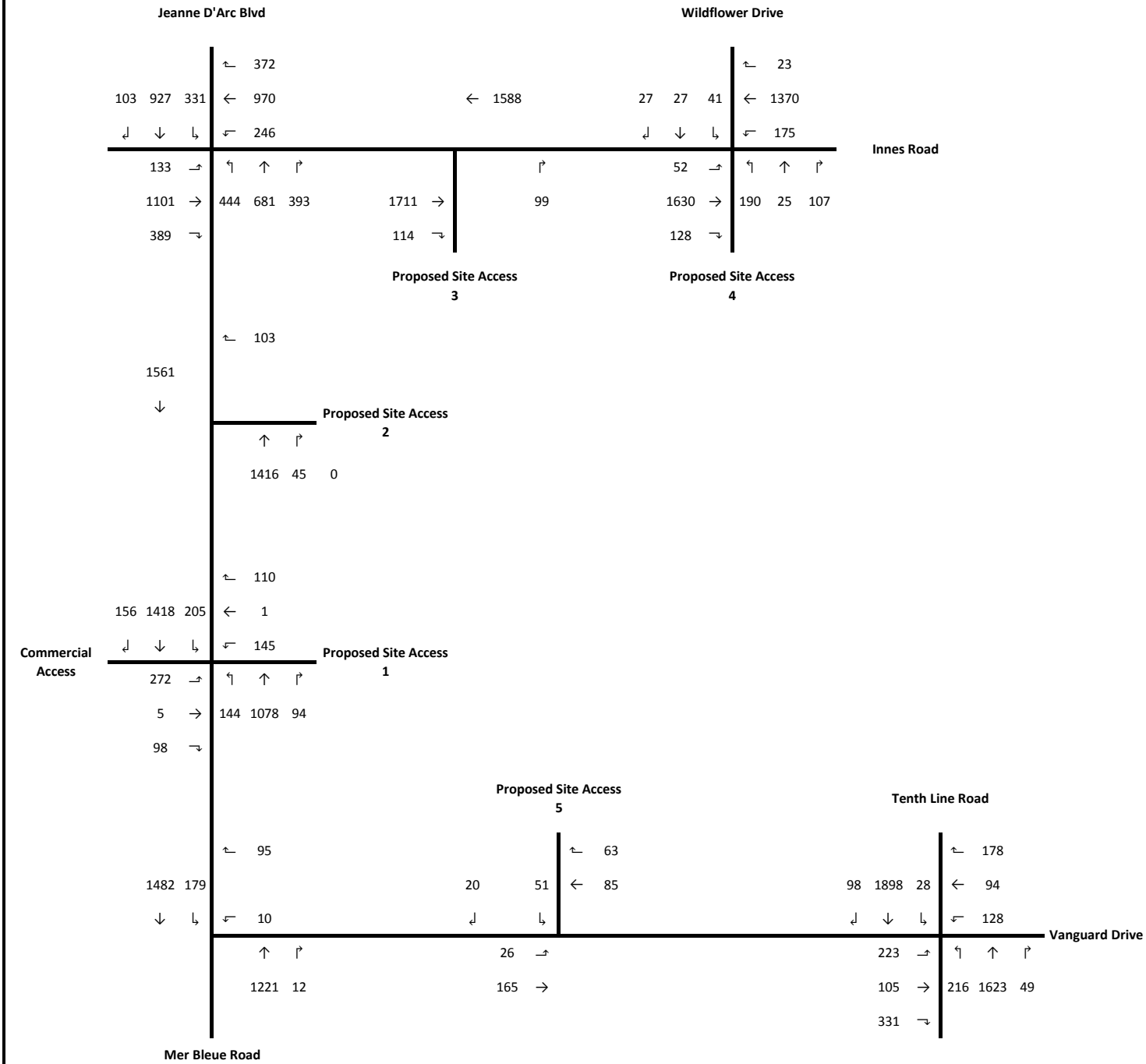


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 Figure 9: 2026 Total Future Traffic Volumes
 without the Vanguard Drive Extension

AM Peak Hour



PM Peak Hour



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Figure 10: 2026 Total Future Traffic Volumes
with the Vanguard Drive Extension

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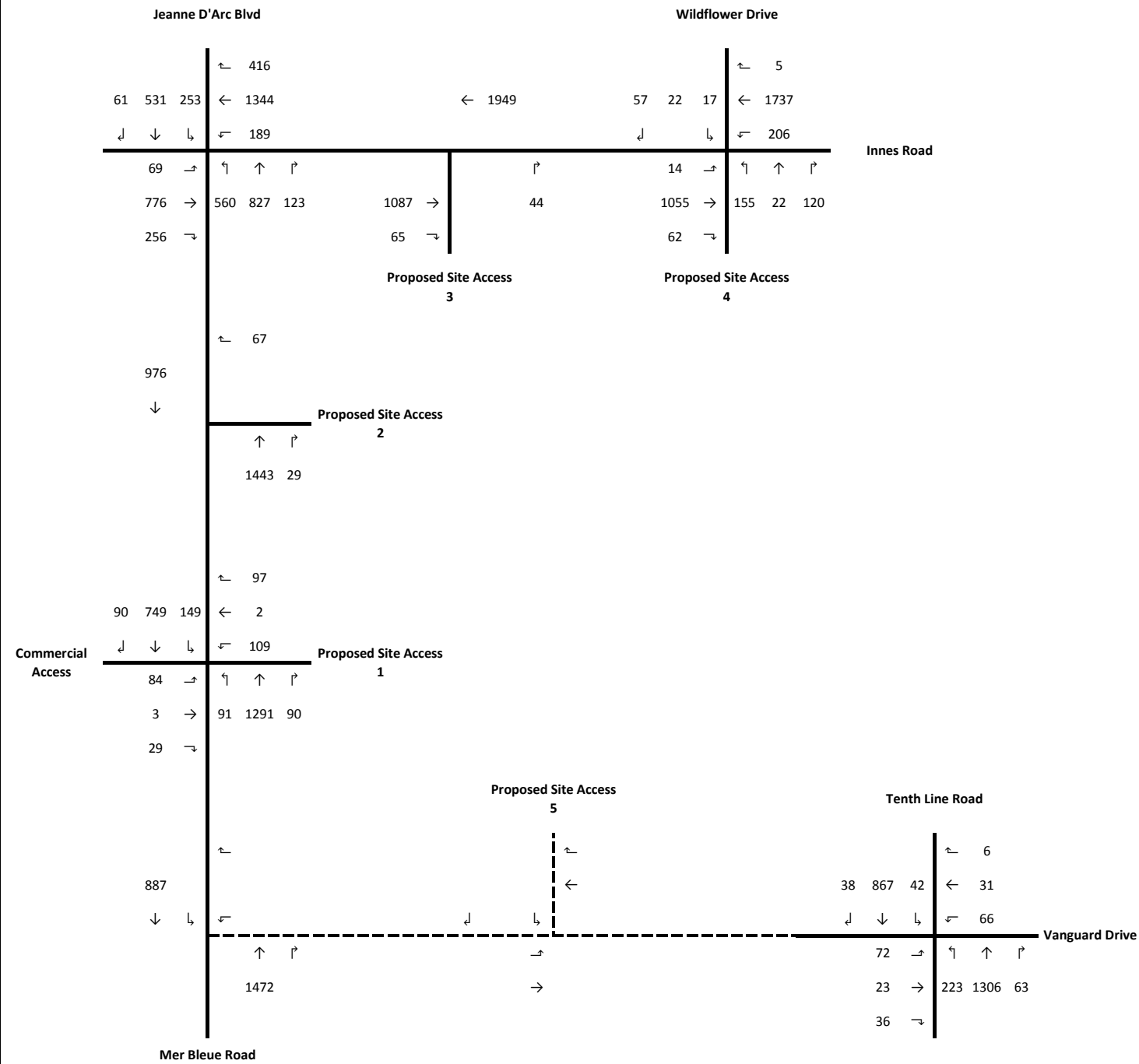
3.6 2031 ULTIMATE CONDITIONS

Ultimate conditions for the 2031 horizon were examined to determine if other improvements may be required due to further growth in background traffic volumes 5 years beyond the development of the subject site.

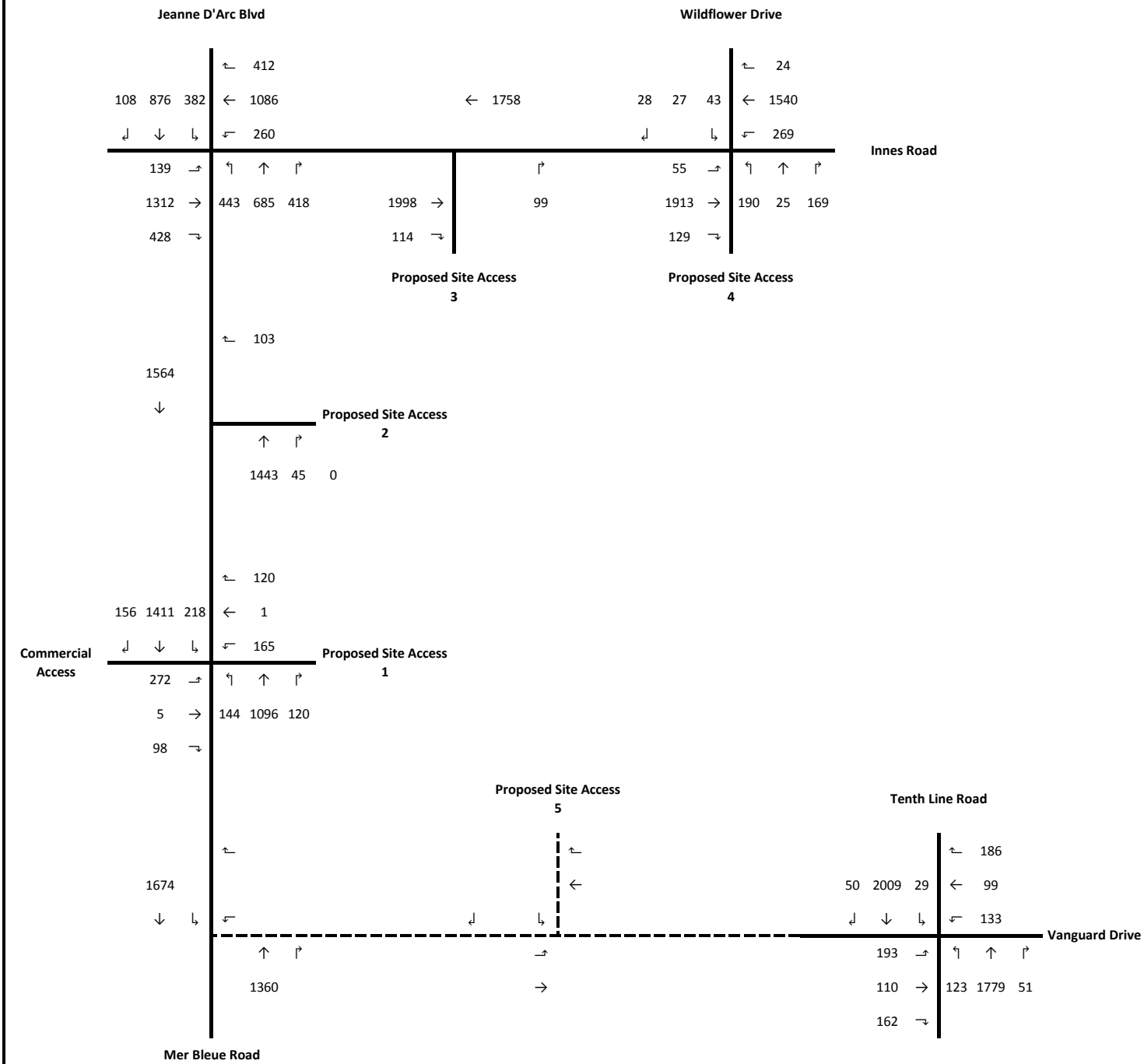
Figure 11 and **Figure 12** illustrate 2031 ultimate traffic volume at the study area intersections during the AM and PM peak hours.

An assessment of 2031 ultimate traffic conditions is outlined in **Section 4.4**.

AM Peak Hour

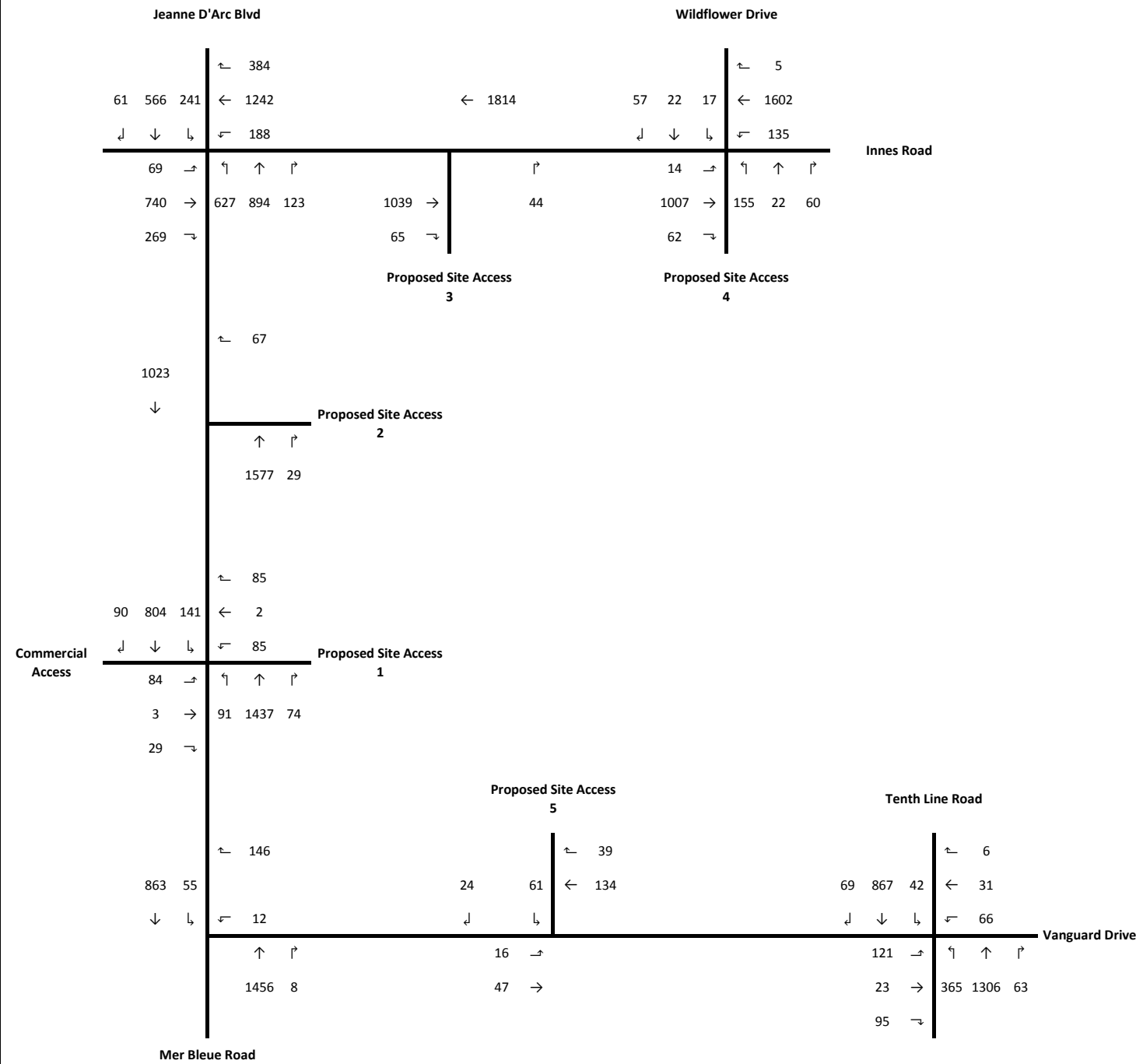


PM Peak Hour

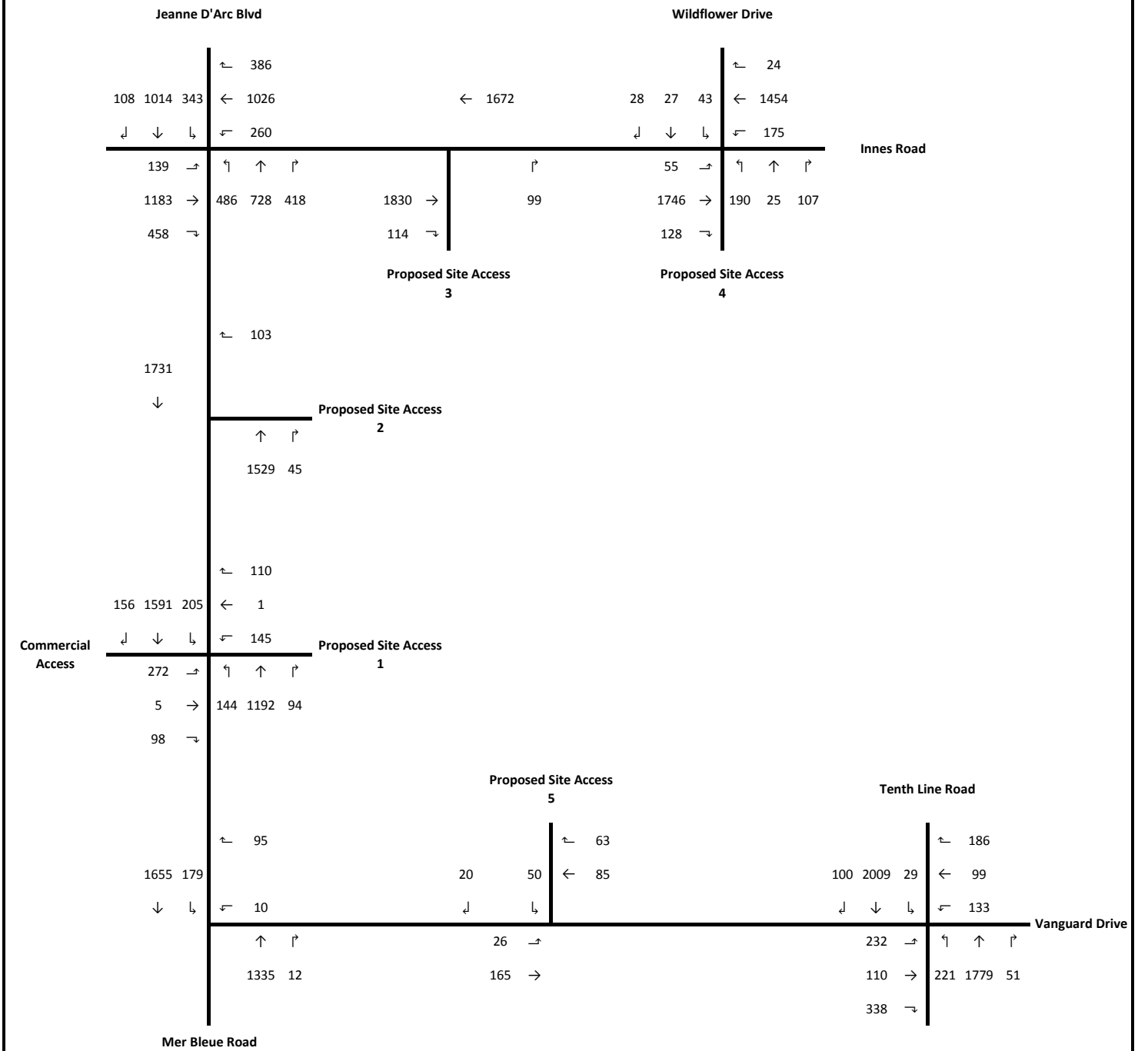


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Figure 11: 2031 Ultimate Traffic Volumes
without the Vanguard Drive Extension

AM Peak Hour



PM Peak Hour



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 Figure 12: 2031 Ultimate Traffic Volumes
 with the Vanguard Drive Extension

4.0 TRANSPORTATION ASSESSMENT

4.1 2016 EXISTING CONDITIONS

Figure 3 (Section 2.1) illustrates the 2016 existing intersection controls and lane configuration at the study area intersections.

4.1.1 Screenline Analysis

A screenline is an imaginary line that is drawn along the boundary of an area of interest, in this case, Mer Bleue Road and Innes Road. System capacity across a screenline is determined by the number of roads and travel lanes which cross the screenline. Traffic demands are then compared to the available capacity to determine if there is a surplus or shortfall in system capacity.

Screenline data from the TRANS regional transportation model for the Mer Bleue Road (screenline 45) and Innes Road (screenline 47) screenlines were obtained from the City of Ottawa's Transportation Modeling department for the years 2011 and 2031. The Mer Bleue Road screenline was selected to assess east / west screenline demand vs. capacity and the Innes Road screenline was selected to assess north / south screenline demand vs. capacity.

Annual growth rates were calculated for the both screenlines and at each station between 2011 and 2031 (assuming a straight line growth assumption), which is outlined in **Table 9** below. The inbound movements represent vehicles traveling towards the urban core and outbound movements represent vehicles traveling away from the urban core.

For the Mer Bleue Road screenline, total annual growth across the entire screenline is forecasted to be 1% during both the AM and PM peak hours. The growth appears to be relatively consistent at all stations across the Mer Bleue Road screenline.

For the Innes Road screenline, total annual growth across the entire screenline is forecasted to be 8% during the AM peak hour (predominant direction being 'inbound') and 5% during the PM peak hour (predominant direction being 'outbound')). The majority of the growth will occur at the Pagé Road and Mer Bleue Road stations across the Innes Road screenline.

Using the annual growth rates from **Table 9**, the screenline data was interpolated to the existing 2016 horizon and can be seen in **Table 10** below.

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Table 9 Screenline Growth from 2011 to 2031

Screenline	Station	Direction	2011		2031		Annual Growth 2011 to 2031	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Mer Bleue Road	Jeanne D'Arc	Inbound	444	111	528	221	1%	5%
	Jeanne D'Arc	Outbound	105	462	152	591	2%	1%
	Hwy 174	Inbound	3199	2032	3750	2505	1%	1%
	Hwy 174	Outbound	1436	3300	1538	3865	0%	1%
	St. Joseph	Inbound	896	325	1086	457	1%	2%
	St. Joseph	Outbound	314	651	426	1107	2%	4%
	Des Epinettes	Inbound	407	104	357	104	-1%	0%
	Des Epinettes	Outbound	35	388	38	370	0%	0%
	Innes	Inbound	1868	1090	1720	1266	0%	1%
	Innes	Outbound	616	1849	794	1793	1%	0%
		Total	Inbound	4946	2572	5721	3287	1%
	Total	Outbound	2471	6262	2910	7356	1%	1%
Innes Road	Navan	Inbound	776	155	1743	719	6%	18%
	Navan	Outbound	82	735	237	1272	9%	4%
	Orleans	Inbound	225	519	582	522	8%	0%
	Orleans	Outbound	353	346	451	734	1%	6%
	Pagé	Inbound	11	36	44	251	15%	30%
	Pagé	Outbound	55	18	46	294	-1%	77%
	Mer Bleue	Inbound	22	99	257	29	53%	-4%
	Mer Bleue	Outbound	99	22	14	334	-4%	71%
	Tenth Line	Inbound	579	394	1073	716	4%	4%
	Tenth Line	Outbound	157	641	432	1043	9%	3%
	Esprit	Inbound	469	413	432	403	0%	0%
	Esprit	Outbound	317	572	308	510	0%	-1%
	Portobello	Inbound	232	177	176	128	-1%	-1%
	Portobello	Outbound	111	245	89	184	-1%	-1%
	Provence	Inbound	129	100	122	136	0%	2%
	Provence	Outbound	120	117	131	183	0%	3%
	Trim	Inbound	0	59	0	78	0%	2%
	Trim	Outbound	8	0	35	0	17%	0%
		Total	Inbound	1034	809	2626	1521	8%
	Total	Outbound	647	1740	1166	3343	4%	5%



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Table 10 2016 Existing Jock River Screenline Analysis

Screenline	Station	Direction	2016					
			AM Peak Hour	PM Peak Hour	Capacity (veh/hr)	AM Peak v/c	PM Peak v/c	
Screenline 45 - Mer Bleue Road	Jeanne D'Arc	Inbound	465	139	1200	0.39	0.12	
	Jeanne D'Arc	Outbound	117	494	1200	0.10	0.41	
	Hwy 174	Inbound	3337	2150	3200	1.04	0.67	
	Hwy 174	Outbound	1462	3441	3200	0.46	1.08	
	St. Joseph	Inbound	944	358	1600	0.59	0.22	
	St. Joseph	Outbound	342	765	1600	0.21	0.48	
	Des Epinettes	Inbound	395	104	400	0.99	0.26	
	Des Epinettes	Outbound	342	384	400	0.86	0.96	
	Innes	Inbound	395	1134	1600	0.25	0.71	
	Innes	Outbound	661	1835	1600	0.41	1.15	
	Total	Inbound	5536	3885	8000	0.69	0.49	
	Total	Outbound	2924	6919	8000	0.37	0.86	
	Screenline 47 - Innes Road	Navan	Inbound	1018	296	800	1.27	0.37
		Navan	Outbound	121	869	800	0.15	1.09
Orleans		Inbound	314	520	800	0.39	0.65	
Orleans		Outbound	378	443	800	0.47	0.55	
Page		Inbound	19	90	400	0.05	0.23	
Page		Outbound	53	87	400	0.13	0.22	
Mer Bleue		Inbound	81	82	1600	0.05	0.05	
Mer Bleue		Outbound	78	100	1600	0.05	0.06	
Tenth Line		Inbound	703	475	1600	0.44	0.30	
Tenth Line		Outbound	226	742	1600	0.14	0.46	
Esprit		Inbound	460	411	600	0.77	0.69	
Esprit		Outbound	315	557	600	0.53	0.93	
Portobello		Inbound	218	165	1200	0.18	0.14	
Portobello		Outbound	106	230	1200	0.09	0.19	
Provence		Inbound	127	109	400	0.32	0.27	
Provence		Outbound	123	134	400	0.31	0.34	
Trim		Inbound	0	64	1600	0.00	0.04	
Trim		Outbound	15	0	1600	0.01	0.00	
Total	Inbound	2940	2212	9000	0.33	0.25		
Total	Outbound	1415	3162	9000	0.16	0.35		



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Screenline 45 – Mer Bleue Road

As shown in **Table 10**, the Highway 174 station along the Mer Bleue Road screenline is projected to operate at or above capacity during the AM peak hour in the inbound direction (i.e. vehicles traveling towards the urban core) and during the PM peak hour in the outbound direction (i.e. vehicles traveling away from the urban core). Despite this, there is residual capacity at the remaining stations along the Mer Bleue Road screenline. This allows the Mer Bleue Road screenline as a whole to operate below the available capacity. During the AM peak, where predominant direction is inbound, the screenline currently operates at a volume to capacity (v/c) ratio of 0.69. During the PM peak, where the predominant direction is outbound, the screenline currently operates at v/c 0.86.

Screenline 47 – Innes Road

As shown in **Table 10**, the Navan Road station along the Innes Road screenline is projected to operate at or above capacity during the AM peak hour in the inbound direction (i.e. vehicles traveling towards the urban core) and during the PM peak hour in the outbound direction (i.e. vehicles traveling away from the urban core). Despite this, there is residual capacity at the remaining stations along the Innes Road screenline. This allows the Innes Road screenline as a whole to operate well below the available capacity. During the AM peak, where predominant direction is inbound, the screenline currently operates at v/c 0.33. During the PM peak, where the predominant direction is outbound, the screenline currently operates at v/c 0.35.

4.1.2 Intersection Operational Analysis

An assessment of the study area intersections was undertaken to determine the operational characteristics of these intersections. Intersection operations were facilitated by Synchro 9.1™ software package for all study area intersections.

Table 11 provides a summary of 2016 existing intersection operations.

The eastbound left turning movement at the intersection of Tenth Line Road at Vanguard Drive currently operates at or above capacity using the existing signal timing plan obtained from the City of Ottawa. Optimizing the signal timing will allow this intersection to operate acceptably.

Operationally, all remaining study area intersections operate satisfactorily, and as such, no improvements are required to supplement existing conditions.

Appendix B contains detailed intersection performance worksheets.

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Table 11 2016 Existing Intersection Operations

Intersection	Traffic Control	Approach/Movement	LOS ¹	v/c	Delay (s)	Q ² (m)	
Mer Bleue Road at Innes Road	Traffic Signals	EB	Left	A (A)	0.38 (0.43)	18.3 (18.4)	12.5 (25.6)
			Through	A (D)	0.39 (0.82)	19.3 (36.7)	62.2 (179.2)
			Right	A (A)	0.03 (0.04)	15.4 (20.5)	0.0 (0.0)
		WB	Left	A (C)	0.33 (0.80)	8.4 (53.7)	17.7 (#78.5)
			Through	C (A)	0.79 (0.57)	23.4 (23.3)	#166.5 (119.1)
			Right	A (A)	0.22 (0.21)	29.1 (14.9)	31.0 (10.7)
		NB	Left	A (A)	0.43 (0.48)	43.3 (55.0)	31.9 (33.8)
			Through / Right	B (C)	0.63 (0.78)	48.5 (62.7)	40.8 (60.9)
		SB	Left	A (C)	0.55 (0.72)	49.0 (62.1)	30.0 (49.2)
			Through / Right	A (C)	0.42 (0.76)	49.1 (60.3)	21.3 (62.2)
Overall Intersection			C (D)	0.71 (0.81)	28.4 (39.7)	-	
Innes Road at Wildflower Drive	Traffic Signals	EB	Left	A (A)	0.08 (0.20)	1.9 (1.8)	m0.9 (m1.7)
			Through	A (B)	0.31 (0.61)	1.6 (1.8)	17.6 (36.8)
		WB	Through / Right	B (A)	0.62 (0.50)	3.5 (2.7)	82.2 (58.7)
		SB	Left	A (A)	0.17 (0.42)	50.3 (62.1)	10.0 (21.5)
			Right	A (A)	0.22 (0.02)	50.9 (57.9)	15.4 (9.0)
		Overall Intersection			A (A)	0.59 (0.60)	4.1 (3.4)
Mer Bleue Road at Commercial Access	Traffic Signals	EB	Left	A (C)	0.53 (0.73)	29.6 (25.1)	20.6 (50.0)
			Through / Right	A (A)	0.04 (0.07)	25.0 (14.6)	6.4 (8.1)
		WB	Left	A (A)	0.04 (0.02)	25.1 (14.4)	3.5 (3.1)
			Through / Right	A (A)	0.02 (0.02)	24.9 (14.3)	3.5 (4.0)
		NB	Left	A (A)	0.13 (0.43)	4.2 (13.9)	10.4 (31.6)
			Through	A (A)	0.18 (0.22)	4.2 (9.4)	16.1 (23.4)
			Right	A (A)	0.01 (0.00)	3.5 (8.2)	0.0 (0.0)
		SB	Left	A (A)	0.05 (0.06)	3.8 (8.6)	4.0 (6.3)
			Through	A (A)	0.08 (0.36)	3.8 (10.5)	7.8 (39.3)
			Right	A (A)	0.06 (0.11)	3.8 (9.0)	4.6 (9.9)
Overall Intersection			A (A)	0.23 (0.55)	7.5 (13.2)	-	
Tenth Line Road at Vanguard Drive	Traffic Signals	EB	Left	A (F)	0.59 (1.03)	55.5 (121.9)	27.0 (#91.2)
			Through / Right	A (A)	0.17 (0.53)	46.9 (40.2)	15.5 (68.0)
		WB	Left	A (B)	0.55 (0.67)	53.7 (49.9)	25.5 (#54.1)
			Through / Right	A (A)	0.19 (0.53)	47.0 (40.2)	14.6 (68.0)
		NB	Left	A (A)	0.26 (0.42)	3.5 (14.9)	21.1 (26.8)
			Through	A (A)	0.27 (0.35)	3.0 (9.9)	28.8 (50.5)
			Right	A (A)	0.04 (0.03)	2.3 (7.5)	2.9 (4.0)
		SB	Left	A (A)	0.07 (0.07)	2.5 (8.0)	4.7 (5.7)
			Through	A (A)	0.11 (0.47)	2.4 (11.2)	12.0 (72.7)
			Right	A (A)	0.02 (0.03)	2.2 (7.5)	2.2 (4.0)
Overall Intersection			A (B)	0.30 (0.62)	9.6 (24.9)	-	

1. Table Format: AM (PM)
2. 95th Percentile Queue (m)
3. # - 95th percentile volume exceeds capacity, queue may be longer
4. m - volume for 95th percentile queue is metered by upstream signal

4.2 2026 FUTURE BACKGROUND CONDITIONS

Future background conditions for the 2026 horizon were assessed to determine transportation improvements that may be required to address growth in traffic exclusive from improvements that may be required to accommodate traffic generated by the proposed development.

The background development assumptions outlined in **Section 3.0** were applied to existing traffic volumes to predict 2026 future background traffic volumes.

4.2.1 Intersection Operational Analysis

Table 12 summarizes the operational characteristics of the study area intersections under 2026 future background conditions. The signal timing plans for the study area intersections were optimized for the 2026 future background horizon.

Given the expected growth from the surrounding background developments, the intersections of Mer Bleue Road at Innes Road and Tenth Line Road at Vanguard Drive are expected to operate with several individual movements operating at or above capacity during the PM peak hour. Due to property constraints, both at the two intersections as well as upstream and downstream from them, adding geometric improvements such as additional lanes is not feasible.

Operationally, all remaining study area intersections operate satisfactorily, and as such, no improvements are required to supplement existing conditions.

Figure 13 illustrates the 2026 future background intersection control and lane configuration for the study area intersections.

Appendix B contains detailed intersection performance worksheets.

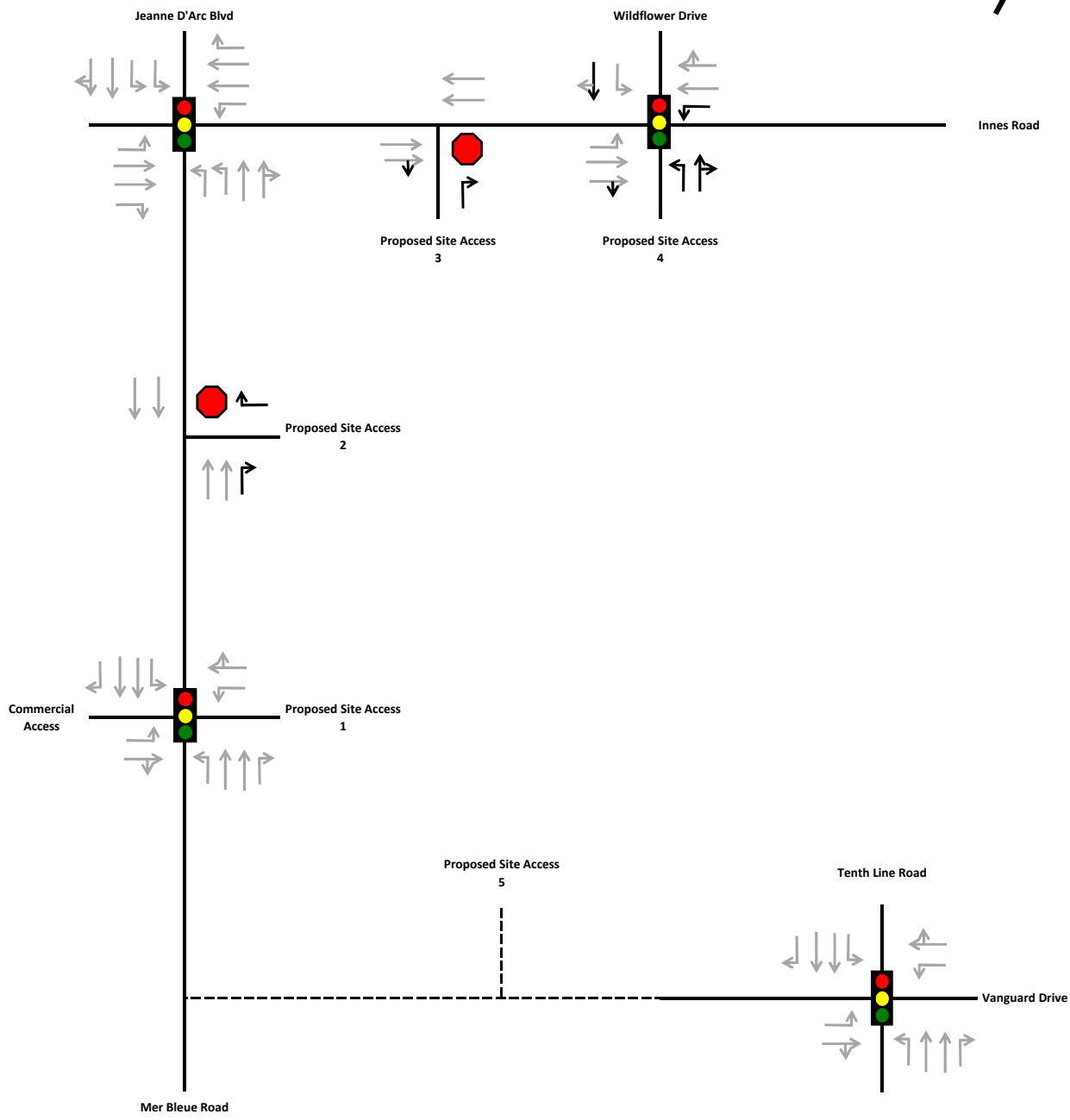
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Table 12 2026 Future Background Intersection Operations

Intersection	Traffic Control	Approach/Movement	LOS ¹	v/c	Delay (s)	Q ² (m)		
Mer Bleue Road at Innes Road	Traffic Signals	EB	Left	C (D)	0.75 (0.85)	89.1 (71.5)	#46.9 (#59.6)	
			Through	B (F)	0.61 (1.15)	34.6 (318.2)	109.2 (#255.7)	
			Right	A (A)	0.14 (0.28)	27.3 (32.8)	23.1 (44.0)	
		WB	Left	B (F)	0.70 (1.08)	29.9 (263.3)	#62.5 (m#118.4)	
			Through	C (D)	0.78 (0.83)	31.0 (39.3)	#194.3 (#173.7)	
			Right	A (A)	0.25 (0.25)	20.3 (63.2)	27.4 (39.3)	
		NB	Left	C (D)	0.78 (0.81)	54.3 (60.9)	78.6 (#78.2)	
			Through / Right	D (F)	0.89 (1.17)	54.9 (374.6)	#160.0 (#215.4)	
		SB	Left	B (C)	0.61 (0.76)	53.6 (57.6)	43.4 (#67.2)	
			Through / Right	C (F)	0.78 (1.06)	51.4 (178.5)	#107.4 (#187.2)	
Overall Intersection			D (F)	0.90 (1.10)	40.8 (187.3)	-		
Innes Road at Wildflower Drive / Site Access #4	Traffic Signals	EB	Left	A (A)	0.08 (0.24)	4.3 (5.7)	3.5 (m2.4)	
			Through / Right	A (D)	0.42 (0.89)	4.9 (10.8)	62.7 (m71.1)	
		WB	Left	A (C)	0.46 (0.80)	5.6 (56.8)	40.3 (#81.1)	
			Through / Right	B (A)	0.65 (0.65)	6.5 (11.9)	142.3 (176.4)	
		NB	Left	B (C)	0.66 (0.73)	47.8 (63.7)	35.3 (57.0)	
			Through / Right	A (A)	0.08 (0.13)	34.9 (45.2)	12.9 (22.4)	
		SB	Left	A (A)	0.11 (0.24)	35.2 (46.4)	8.7 (20.9)	
			Through / Right	A (A)	0.21 (0.08)	35.9 (44.8)	18.5 (14.8)	
		Overall Intersection			B (D)	0.65 (0.86)	8.6 (16.7)	-
		Mer Bleue Road at Commercial Access / Site Access #1	Traffic Signals	EB	Left	A (D)	0.51 (0.85)	28.3 (55.3)
Through / Right	A (A)				0.03 (0.15)	24.3 (27.8)	7.3 (21.4)	
WB	Left			A (A)	0.37 (0.38)	26.7 (30.2)	17.0 (37.6)	
	Through / Right			A (A)	0.03 (0.04)	24.3 (27.0)	7.8 (11.7)	
NB	Left			A (C)	0.20 (0.79)	5.0 (48.3)	12.7 (#71.2)	
	Through			A (A)	0.48 (0.48)	5.9 (11.0)	59.5 (84.4)	
	Right			A (A)	0.04 (0.04)	3.7 (7.5)	4.3 (6.3)	
SB	Left			A (A)	0.38 (0.55)	8.6 (18.9)	22.8 (#56.7)	
	Through			A (A)	0.30 (0.60)	4.7 (12.7)	31.8 (120.8)	
				Right	A (A)	0.06 (0.10)	3.8 (7.9)	5.4 (10.2)
Overall Intersection			A (D)	0.48 (0.81)	7.4 (18.6)	-		
Tenth Line Road at Vanguard Drive	Traffic Signals	EB	Left	A (F)	0.53 (1.02)	42.7 (201.9)	25.8 (#105.6)	
			Through / Right	A (A)	0.16 (0.53)	37.5 (39.8)	15.6 (80.3)	
		WB	Left	A (B)	0.49 (0.67)	41.3 (49.8)	24.1 (#66.1)	
			Through / Right	A (A)	0.18 (0.53)	37.6 (39.9)	14.3 (81.2)	
		NB	Left	A (D)	0.47 (0.87)	7.2 (89.5)	40.8 (#59.0)	
			Through	A (D)	0.46 (0.88)	4.4 (28.1)	66.1 (#292.2)	
			Right	A (A)	0.04 (0.03)	2.6 (11.1)	3.7 (3.4)	
		SB	Left	A (A)	0.14 (0.28)	3.7 (20.6)	6.4 (6.1)	
			Through	A (F)	0.32 (1.01)	3.5 (75.5)	38.6 (#347.8)	
				Right	A (A)	0.02 (0.03)	2.5 (12.1)	2.8 (3.2)
Overall Intersection			A (E)	0.47 (1.00)	7.3 (57.1)	-		
Mer Bleue Road at Site Access #2	Minor Stop Control (Right-in / Right-out)	WB	Right	B (C)	0.15 (0.25)	14.3 (16.5)	3.0 (6.0)	
		NB	Through	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
			Right	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
		Overall Intersection			A (A)	-	0.4 (0.6)	-
Innes Road at Site Access #3	Minor Stop Control (Right-in / Right-out)	EB	Through / Right	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
		NB	Right	B (D)	0.09 (0.39)	13.1 (28.5)	3.0 (12.0)	
		Overall Intersection			A (A)	-	0.2 (0.8)	-

1. Table Format: AM (PM)
2. 95th Percentile Queue (m)
3. # - 95th percentile volume exceeds capacity, queue may be longer
4. m - volume for 95th percentile queue is metered by upstream signal



— Existing Geometry
— Upgraded Geometry



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Figure 13: 2026 Future Background Intersection Control
and Lane Configuration

4.3 2026 TOTAL FUTURE CONDITIONS

Total future conditions are assessed to determine transportation improvements that may be required to accommodate traffic generated by the proposed development. The site trip generation, distribution, and assignment assumptions outlined in **Section 3.4** were applied to 2026 future background traffic volumes to predict 2026 total future traffic volumes.

4.3.1 Screenline Analysis

The Mer Bleue Road and Innes Road screenlines were assessed under 2026 total future conditions using the growth rate assumptions outlined in **Section 4.1.1** and can be seen in **Table 13** below.

Screenline 45 – Mer Bleue Road

As shown in **Table 13**, consistent with the 2016 screenline analysis, the Highway 174 and Innes Road stations along the Mer Bleue Road screenline are projected to operate at or above capacity during the AM peak hour in the inbound direction (i.e. vehicles traveling towards the urban core) and during the PM peak hour in the outbound direction (i.e. vehicles traveling away from the urban core). Despite this, there is residual capacity at the remaining stations along the Mer Bleue Road screenline. This allows the Mer Bleue Road screenline as a whole to operate below the available capacity. During the AM peak, where predominant direction is inbound, the screenline is projected to operate at a volume to capacity (v/c) ratio of 0.91. During the PM peak, where the predominant direction is outbound, the screenline is projected to operate at v/c 0.93.

Screenline 47 – Innes Road

As outlined in **Section 3.1.1**, the Blackburn Hamlet Bypass Extension is scheduled to occur as part of Phase 2 (2020 – 2025) of the City's TMP. With this new infrastructure in place, the Navan Road station along the Innes Road Screenline will shift to the new Blackburn Hamlet Bypass, thus increasing the capacity from 800 vehicles per hour per direction (existing conditions on Navan Road) to 2000 vehicles per hour per direction (future Blackburn Hamlet Bypass). This increase in capacity allows the Navan Road / Blackburn Hamlet Bypass station to operate well below capacity under 2026 total future conditions.

As shown in **Table 13**, during the AM peak, where predominant direction is inbound, the overall screenline is projected to operate at v/c 0.39. During the PM peak, where the predominant direction is outbound, the overall screenline is projected to operate at v/c 0.41.

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Table 13 2026 Total Future Screenline Analysis

Screenline	Station	Direction	2026				
			AM Peak Hour	PM Peak Hour	Capacity (veh/hr)	AM Peak v/c	PM Peak v/c
Screenline 45 - Mer Bleue Road	Jeanne D'Arc	Inbound	507	194	1200	0.42	0.16
	Jeanne D'Arc	Outbound	140	559	1200	0.12	0.47
	Hwy 174	Inbound	3612	2387	3200	1.13	0.75
	Hwy 174	Outbound	1513	3724	3200	0.47	1.16
	St. Joseph	Inbound	1039	424	1600	0.65	0.27
	St. Joseph	Outbound	398	993	1600	0.25	0.62
	Des Epinettes	Inbound	370	104	400	0.93	0.26
	Des Epinettes	Outbound	37	375	400	0.09	0.94
	Innes	Inbound	1757	1222	1600	1.10	0.76
	Innes	Outbound	750	1807	1600	0.47	1.13
	Total	Inbound	7285	4331	8000	0.91	0.54
	Total	Outbound	2838	7458	8000	0.35	0.93
	Screenline 47 - Innes Road	Navan / BHBP	Inbound	1501	578	2000	0.75
Navan / BHBP		Outbound	198	1138	2000	0.10	0.57
Orleans		Inbound	493	521	800	0.62	0.65
Orleans		Outbound	427	637	800	0.53	0.80
Page		Inbound	36	197	400	0.09	0.49
Page		Outbound	48	225	400	0.12	0.56
Mer Bleue		Inbound	198	47	1600	0.12	0.03
Mer Bleue		Outbound	35	256	1600	0.02	0.16
Tenth Line		Inbound	950	636	1600	0.59	0.40
Tenth Line		Outbound	363	943	1600	0.23	0.59
Esprit		Inbound	441	406	600	0.74	0.68
Esprit		Outbound	310	526	600	0.52	0.88
Portobello		Inbound	234	140	1200	0.20	0.12
Portobello		Outbound	95	250	1200	0.08	0.21
Provence		Inbound	124	127	400	0.31	0.32
Provence		Outbound	128	167	400	0.32	0.42
Trim		Inbound	0	73	1600	0.00	0.05
Trim		Outbound	28	0	1600	0.02	0.00
Total		Inbound	3977	2725	10200	0.39	0.27
Total	Outbound	1632	4142	10200	0.16	0.41	



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4.3.2 Intersection Operational Analysis

The 2026 total future horizon was assessed both with and without the Vanguard Drive Extension to Mer Bleue Road. **Table 14** summarizes the operational characteristics of the study area intersections under 2026 total future conditions.

Consistent with the findings from the 2026 future background horizon, the Mer Bleue Road at Innes Road and Tenth Line Road at Vanguard Drive intersections are projected to operate with several individual turning movements operating at or above capacity during the PM peak hour. However, as previously stated, adding geometric improvements to these intersections is not feasible due to spatial constraints.

It is our understanding that the City of Ottawa will be moving forward with the Environmental Assessment of the Vanguard Drive Extension in 2017, and therefore, the focus of the 2026 total future horizon is assessing the implications of implementing the Vanguard Drive Extension.

Without the Vanguard Drive Extension, the Innes Road at Wildflower Drive / Site Access 4 is projected to operate at or above capacity during the PM peak hour. Of particular note is the westbound left turn movement into the development. The westbound left turn queue is projected to reach approximately 130m, however the available storage for this lane is approximately 75m which will result in 55m of spillover into the westbound through lane.

With the Vanguard Drive Extension in place, not only will traffic volumes be lower on Innes Road but site traffic will also have the opportunity to access the site via Vanguard Drive. As a result, traffic demands at the westbound left turn movement at Wildflower Drive / Site Access 4 will be lower. With the Vanguard Drive Extension in place, the westbound left turn queue is anticipated to reach approximately 73m which will be able to be contained within the existing storage lane.

Appendix B contains detailed intersection performance worksheets.

Figure 14 illustrates the 2026 total future intersection control and lane configuration for the study area intersections without the Vanguard Drive Extension.

Figure 15 illustrates the 2026 total future intersection control and lane configuration for the study area intersections with the Vanguard Drive Extension.

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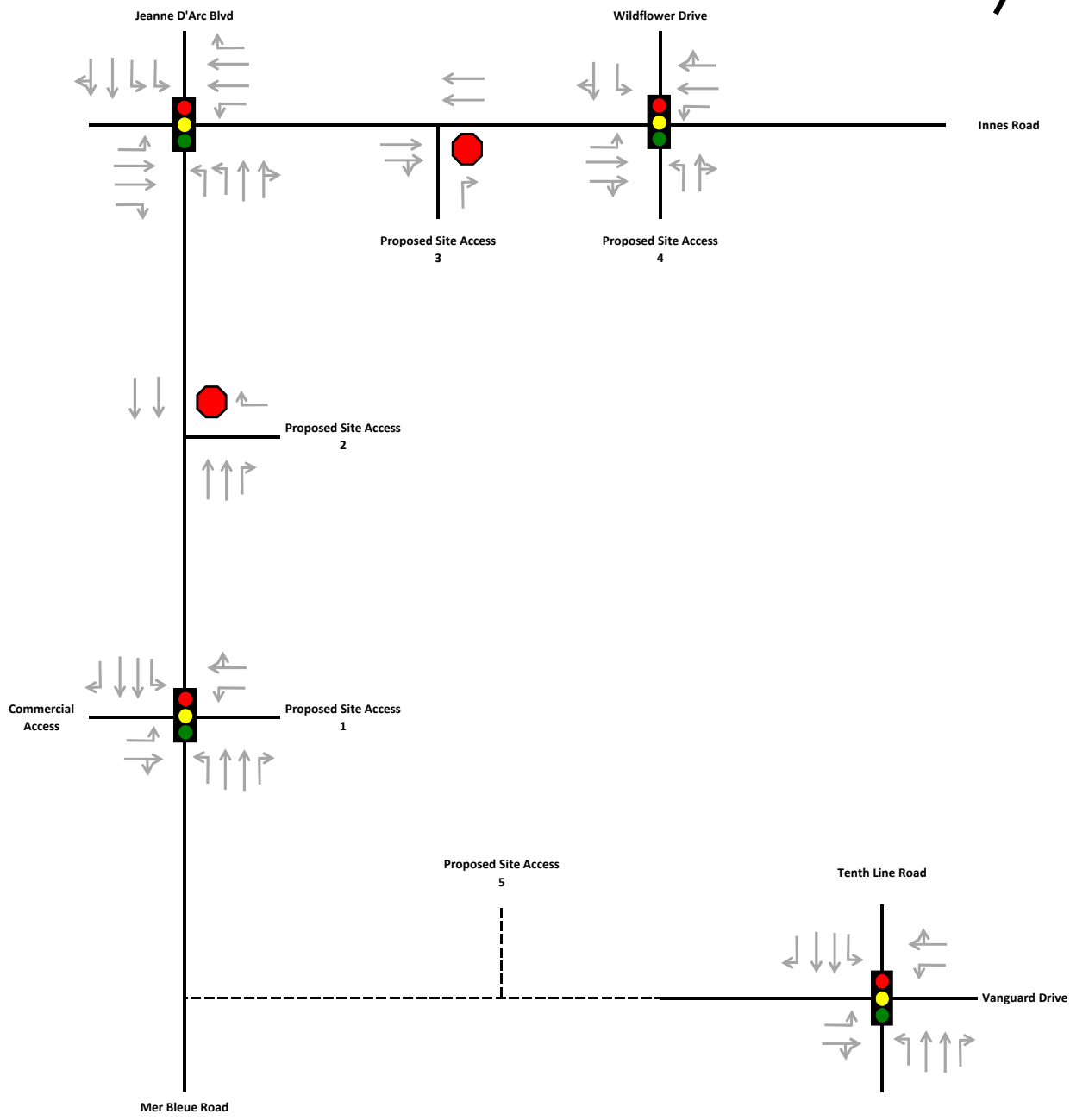
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Table 14 2026 Total Future Intersection Operations

Intersection	Traffic Control	Approach/Movement	Without the Vanguard Drive Extension				With the Vanguard Drive Extension					
			LOS ¹	v/c	Delay (s)	Q ² (m)	LOS ¹	v/c	Delay (s)	Q ² (m)		
Mer Bleue Road at Innes Road	Traffic Signals	EB	Left	A (D)	0.57 (0.86)	36.4 (73.9)	#21.0 (#64.9)	C (D)	0.76 (0.85)	94.4 (71.3)	#47.2 (#63.2)	
			Through	B (F)	0.66 (1.14)	37.3 (304.1)	114.6 (#259.3)	B (F)	0.66 (1.11)	38.6 (253.3)	111.7 (#232.8)	
			Right	A (A)	0.15 (0.30)	28.9 (32.4)	24.8 (47.1)	A (A)	0.16 (0.29)	30.3 (34.5)	26.7 (46.0)	
		WB	Left	B (F)	0.67 (1.19)	28.2 (427.8)	#48.3 (m#124.4)	C (F)	0.74 (1.12)	36.6 (315.1)	#71.2 (m#120.4)	
			Through	E (D)	0.97 (0.87)	65.6 (36.8)	#242.4(m#186.0)	D (D)	0.78 (0.86)	33.5 (42.8)	#193.5 (m#173.1)	
			Right	A (A)	0.26 (0.26)	26.6 (5.9)	34.4 (m9.1)	A (A)	0.24 (0.25)	22.4 (59.1)	29.0 (m31.4)	
		NB	Left	D (D)	0.81 (0.84)	56.3 (63.3)	#89.1 (#84.1)	D (D)	0.83 (0.87)	55.8 (67.3)	#99.6 (#94.0)	
			Through / Right	E (F)	0.95 (1.24)	70.8 (493.2)	#180.5 (#223.0)	D (F)	0.90 (1.22)	54.3 (458.3)	#178.0 (#231.1)	
		SB	Left	B (C)	0.63 (0.77)	53.6 (57.3)	45.6 (#74.5)	B (B)	0.62 (0.69)	53.6 (52.7)	43.8 (60.8)	
			Through / Right	C (F)	0.83 (1.10)	55.2 (245.9)	#118.0 (#194.8)	D (F)	0.83 (1.23)	54.4 (464.8)	#117.8 (#232.8)	
Overall Intersection			E (F)	0.98 (1.18)	53.0 (216.0)	-	E (F)	0.92 (1.15)	43.7 (239.9)	-		
Innes Road at Wildflower Drive / Site Access 4	Traffic Signals	EB	Left	A (A)	0.10 (0.30)	6.3 (10.9)	4.2 (m4.9)	A (A)	0.08 (0.23)	5.7 (6.9)	3.9 (m2.0)	
			Through	A (F)	0.46 (1.04)	7.1 (98.7)	74.8 (m237.0)	A (D)	0.44 (0.88)	6.9 (15.2)	70.3 (m78.0)	
		WB	Left	B (E)	0.70 (0.96)	16.2 (115.1)	#80.9 (#127.3)	A (D)	0.43 (0.81)	7.2 (58.0)	35.1 (#72.5)	
			Through / Right	B (A)	0.70 (0.60)	9.4 (8.2)	162.7 (124.2)	B (B)	0.64 (0.63)	8.5 (13.0)	135.8 (153.4)	
		NB	Left	B (D)	0.69 (0.87)	44.0 (86.6)	48.2 (#95.7)	B (D)	0.69 (0.86)	44.0 (83.6)	48.1 (#94.7)	
			Through / Right	A (A)	0.16 (0.20)	31.6 (43.2)	21.2 (34.0)	A (A)	0.12 (0.16)	31.2 (42.7)	16.3 (27.8)	
		SB	Left	A (A)	0.08 (0.31)	31.1 (44.9)	8.3 (22.0)	A (A)	0.08 (0.22)	31.0 (43.5)	8.3 (21.1)	
			Through / Right	A (A)	0.18 (0.11)	31.7 (42.3)	19.5 (19.1)	A (A)	0.14 (0.11)	31.5 (42.2)	17.6 (19.1)	
		Overall Intersection			B (E)	0.70 (1.00)	12.3 (62.5)	-	B (D)	0.65 (0.87)	11.0 (21.3)	-
		Mer Bleue Road at Commercial Access / Site Access 1	Traffic Signals	EB	Left	A (D)	0.47 (0.82)	26.9 (46.0)	22.0 (#90.4)	A (E)	0.51 (0.94)	27.9 (104.8)
Through / Right	A (A)				0.03 (0.16)	23.4 (23.5)	7.2 (21.0)	A (A)	0.03 (0.16)	23.7 (36.3)	7.3 (26.9)	
WB	Left			A (A)	0.58 (0.49)	29.7 (26.9)	27.3 (45.9)	A (A)	0.49 (0.50)	27.4 (40.8)	22.2 (57.2)	
	Through / Right			A (A)	0.25 (0.13)	24.7 (23.2)	18.1 (17.9)	A (A)	0.29 (0.08)	25.2 (35.5)	18.1 (18.4)	
NB	Left			A (D)	0.20 (0.88)	5.4 (79.6)	13.7 (#70.1)	A (E)	0.21 (0.93)	5.3 (107.5)	13.2 (#48.9)	
	Through			A (A)	0.49 (0.51)	6.5 (11.7)	64.5 (85.2)	A (A)	0.55 (0.49)	6.6 (11.2)	74.3 (92.4)	
	Right			A (A)	0.06 (0.08)	4.1 (8.2)	5.8 (9.4)	A (A)	0.05 (0.06)	3.8 (7.5)	5.0 (7.0)	
SB	Left			A (D)	0.54 (0.88)	13.4 (59.3)	#45.7 (#93.1)	B (C)	0.61 (0.79)	18.0 (38.9)	#46.9 (#100.3)	
	Through			A (B)	0.31 (0.64)	5.2 (13.7)	34.7 (121.8)	A (B)	0.33 (0.64)	5.0 (13.6)	35.7 (145.9)	
	Right			A (A)	0.06 (0.10)	4.1 (8.4)	5.8 (10.8)	A (A)	0.06 (0.10)	3.9 (7.8)	5.5 (9.3)	
Overall Intersection			A (D)	0.54 (0.86)	9.0 (22.0)	-	A (E)	0.59 (0.93)	8.7 (26.5)	-		
Tenth Line Road at Vanguard Drive	Traffic Signals	EB	Left	A (F)	0.53 (1.02)	42.7 (201.9)	25.8 (#105.6)	B (E)	0.69 (0.94)	61.8 (108.1)	50.8 (#117.1)	
			Through / Right	A (A)	0.16 (0.53)	37.5 (39.8)	15.6 (80.3)	A (C)	0.17 (0.73)	46.7 (43.3)	25.7 (#143.7)	
		WB	Left	A (B)	0.49 (0.67)	41.3 (49.8)	24.1 (#66.1)	A (F)	0.42 (1.13)	49.9 (377.7)	30.1 (#84.9)	
			Through / Right	A (A)	0.18 (0.53)	37.6 (39.9)	14.3 (81.2)	A (A)	0.14 (0.52)	46.4 (36.0)	17.3 (87.3)	
		NB	Left	A (D)	0.47 (0.87)	7.2 (89.5)	40.8 (#59.0)	C (F)	0.79 (1.21)	22.7 (472.8)	#153.6 (#113.1)	
			Through	A (D)	0.46 (0.88)	4.4 (28.1)	66.1 (#292.2)	A (C)	0.41 (0.80)	5.1 (21.7)	68.2 (223.0)	
			Right	A (A)	0.04 (0.03)	2.6 (11.1)	3.7 (3.4)	A (A)	0.04 (0.04)	3.3 (9.8)	4.2 (7.6)	
		SB	Left	A (A)	0.14 (0.28)	3.7 (20.6)	6.4 (6.1)	A (A)	0.12 (0.35)	4.2 (31.6)	7.1 (16.7)	
			Through	A (F)	0.32 (1.01)	3.5 (75.5)	38.6 (#347.8)	A (F)	0.32 (1.15)	4.5 (317.0)	48.2 (#378.8)	
			Right	A (A)	0.02 (0.03)	2.5 (12.1)	2.8 (3.2)	A (A)	0.04 (0.08)	3.4 (16.7)	4.4 (13.6)	
Overall Intersection			A (E)	0.47 (1.00)	7.3 (57.1)	-	C (F)	0.77 (1.21)	12.8 (169.6)	-		
Mer Bleue Road at Vanguard Drive	Traffic Signals	WB	Left					A (A)	0.06 (0.09)	32.8 (38.4)	6.8 (6.4)	
			Right					A (A)	0.45 (0.06)	36.1 (38.2)	31.2 (15.9)	
		NB	Through / Right					A (A)	0.50 (0.46)	5.2 (3.4)	73.8 (54.2)	
			Left					A (A)	0.21 (0.59)	5.2 (11.9)	9.6 (#60.8)	
		SB	Through					A (A)	0.32 (0.55)	4.0 (4.0)	37.7 (76.4)	
			Overall Intersection			A (A)	0.50 (0.53)	6.9 (5.4)	-	A (A)	0.50 (0.53)	6.9 (5.4)
Mer Bleue Road at Site Access 2	Minor Stop Control (Right-in / Right-out)	WB	Right	B (C)	0.16 (0.26)	14.9 (17.0)	3.0 (6.0)	C (C)	0.17 (0.27)	16.1 (18.1)	3.0 (7.0)	
			Through	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
		NB	Right	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
			Overall Intersection			A (A)	-	0.4 (0.6)	-	A (A)	-	0.4 (0.6)
Innes Road at Site Access 3	Minor Stop Control (Right-in / Right-out)	EB	Through	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
			NB	Right	B (D)	0.09 (0.41)	13.3 (29.9)	3.0 (12.0)	B (D)	0.09 (0.36)	13.0 (25.3)	3.0 (10.0)
		Overall Intersection			A (A)	-	0.2 (0.8)	-	A (A)	-	0.2 (0.7)	-
Vanguard Drive at Site Access 5	Minor Stop Control	EB	Left / Through					A (A)	0.01 (0.02)	7.5 (7.4)	0.0 (1.0)	
			WB	Through / Right					A (A)	0.0 (0.00)	0.0 (0.0)	0.0 (0.0)
		SB		Left / Right					A (B)	0.11 (0.09)	10.0 (10.4)	3.0 (2.0)
			Overall Intersection			A (A)	-	3.0 (2.2)	-	A (A)	-	3.0 (2.2)

1. Table Format: AM (PM)
2. 95th Percentile Queue (m)
3. # - 95th percentile volume exceeds capacity, queue may be longer
4. m - volume for 95th percentile queue is metered by upstream signal

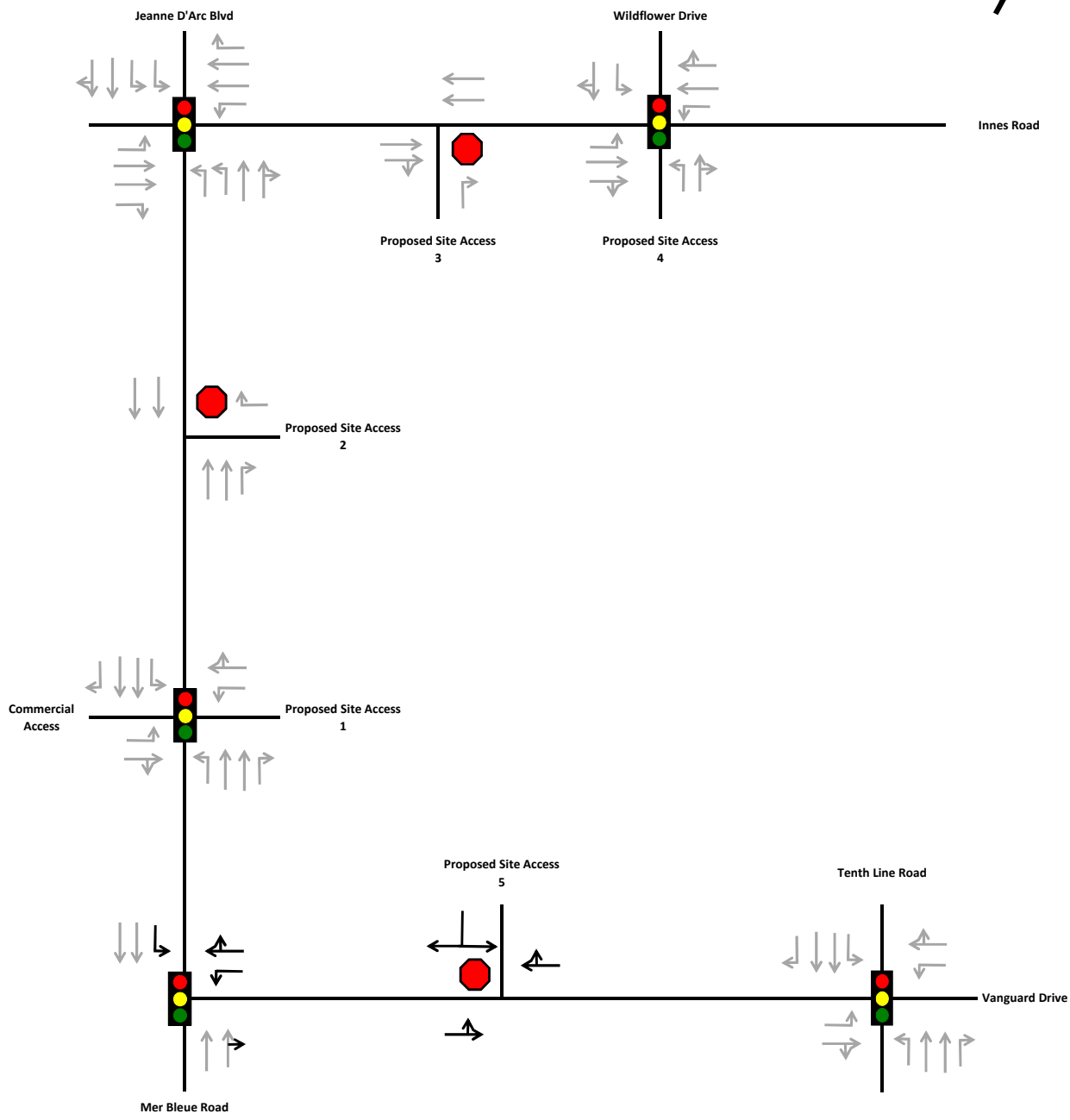




— Existing Geometry
— Upgraded Geometry



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Figure 14: 2026 Total Future Intersection Control
and Lane Configuration - without the Vanguard Drive Extension



— Existing / Planned Geometry
— Upgraded Geometry



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Figure 15: 2026 Total Future Intersection Control
and Lane Configuration - with the Vanguard Drive Extension

4.4 2031 ULTIMATE CONDITIONS

Ultimate future conditions for the 2031 horizon were examined to determine if other improvements may be required due to additional growth in background traffic volumes 5 years beyond the anticipated build-out of the site. Any improvements required to accommodate 2031 ultimate conditions are not attributed to the subject development.

4.4.1 Screenline Analysis

The Mer Bleue Road and Innes Road screenlines were assessed under 2031 ultimate conditions using the growth rate assumptions outlined in Section 4.1.1 and can be seen in **Table 15** below.

Screenline 45 – Mer Bleue Road

As shown in **Table 15**, the Highway 174 and Innes Road stations along the Mer Bleue Road screenline are projected to operate at or above capacity during the AM peak hour in the inbound direction (i.e. vehicles traveling towards the urban core) and during the PM peak hour in the outbound direction (i.e. vehicles traveling away from the urban core). Despite this, there is residual capacity at the remaining stations along the Mer Bleue Road screenline. This allows the Mer Bleue Road screenline as a whole to operate below the available capacity. During the AM peak, where predominant direction is inbound, the screenline is projected to operate at a v/c ratio of 0.93. During the PM peak, where the predominant direction is outbound, the screenline is projected to operate at v/c 0.97.

Screenline 47 – Innes Road

As shown in **Table 15**, the Innes Road screenline is projected to operate well below the available capacity during the 2031 ultimate horizon. During the AM peak, where predominant direction is inbound, the screenline is projected to operate at v/c 0.44. During the PM peak, where the predominant direction is outbound, the screenline is projected to operate at v/c 0.45.

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Table 15 2031 Screenline Analysis

Screenline	Station	Direction	2026				
			AM Peak Hour	PM Peak Hour	Capacity (veh/hr)	AM Peak v/c	PM Peak v/c
Screenline 45 - Mer Bleue Road	Jeanne D'Arc	Inbound	528	221	1200	0.44	0.18
	Jeanne D'Arc	Outbound	152	591	1200	0.13	0.49
	Hwy 174	Inbound	3750	2505	3200	1.17	0.78
	Hwy 174	Outbound	1538	3865	3200	0.48	1.21
	St. Joseph	Inbound	1086	457	1600	0.68	0.29
	St. Joseph	Outbound	426	1107	1600	0.27	0.69
	Des Epinettes	Inbound	357	104	400	0.89	0.26
	Des Epinettes	Outbound	38	370	400	0.10	0.93
	Innes	Inbound	1720	1266	1600	1.08	0.79
	Innes	Outbound	794	1793	1600	0.50	1.12
	Total	Inbound	7441	4553	8000	0.93	0.57
	Total	Outbound	2948	7726	8000	0.37	0.97
	Screenline 47 - Innes Road	Navan / BHBP	Inbound	1743	719	2000	0.87
Navan / BHBP		Outbound	237	1272	2000	0.12	0.64
Orleans		Inbound	582	522	800	0.73	0.65
Orleans		Outbound	451	734	800	0.56	0.92
Page		Inbound	44	251	400	0.11	0.63
Page		Outbound	46	294	400	0.12	0.74
Mer Bleue		Inbound	257	29	1600	0.16	0.02
Mer Bleue		Outbound	14	334	1600	0.01	0.21
Tenth Line		Inbound	1073	716	1600	0.67	0.45
Tenth Line		Outbound	432	1043	1600	0.27	0.65
Esprit		Inbound	432	403	600	0.72	0.67
Esprit		Outbound	308	510	600	0.51	0.85
Portobello		Inbound	235	128	1200	0.20	0.11
Portobello		Outbound	89	252	1200	0.07	0.21
Provence		Inbound	122	136	400	0.31	0.34
Provence		Outbound	131	183	400	0.33	0.46
Trim		Inbound	0	78	1600	0.00	0.05
Trim		Outbound	35	0	1600	0.02	0.00
Total	Inbound	4488	2982	10200	0.44	0.29	
Total	Outbound	1743	4622	10200	0.17	0.45	



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4.4.2 Intersection Operational Analysis

The 2031 ultimate horizon was assessed both with and without the Vanguard Drive Extension to Mer Bleue Road. **Table 16** summarizes the operational characteristics of the study area intersections under 2031 ultimate conditions.

Consistent with the findings from the 2026 future background and total future horizons, the Mer Bleue Road at Innes Road and Tenth Line Road at Vanguard Drive intersections are projected to operate with several individual turning movements operating at or above capacity during the PM peak hour. However, as previously stated, adding geometric improvements to these intersections is not feasible due to spatial constraints.

In addition, without the Vanguard Drive Extension, the Innes Road at Wildflower Drive / Site Access 4 intersection is projected to continue to deteriorate as more background growth is added to the roadway network. The implementation of the Vanguard Drive Extension will alleviate the congestion at this intersection allowing it to operate acceptably.

Appendix B contains detailed intersection performance worksheets.

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Table 16 2031 Ultimate Intersection Operations

Intersection	Traffic Control	Approach/Movement	Without the Vanguard Drive Extension				With the Vanguard Drive Extension					
			LOS ¹	v/c	Delay (s)	Q ² (m)	LOS ¹	v/c	Delay (s)	Q ² (m)		
Mer Bleue Road at Innes Road	Traffic Signals	EB	Left	A (E)	0.60 (0.96)	40.4 (140.1)	#23.8 (#70.7)	A (E)	0.60 (0.93)	41.4 (118.8)	#23.6 (#67.2)	
			Through	C (F)	0.75 (1.24)	42.8 (473.6)	#128.8 (#285.4)	C (F)	0.76 (1.11)	45.1 (261.7)	#130.8 (#248.0)	
			Right	A (A)	0.17 (0.40)	31.3 (34.8)	27.8 (64.8)	A (A)	0.18 (0.41)	33.1 (35.0)	29.9 (66.4)	
		WB	Left	C (F)	0.72 (1.20)	33.8 (452.7)	#63.3 (m#129.5)	C (F)	0.72 (1.22)	34.8 (482.6)	#64.3 (m#119.8)	
			Through	F (D)	1.08 (0.90)	198.6 (39.4)	#274.7 (m#198.1)	F (D)	1.04 (0.85)	145.8 (42.4)	#252.5 (m180.4)	
			Right	A (A)	0.30 (0.28)	28.4 (10.5)	43.9 (m14.0)	A (A)	0.26 (0.25)	29.0 (72.1)	36.9 (m36.9)	
		NB	Left	D (D)	0.85 (0.90)	57.8 (75.6)	#106.3 (#97.2)	E (E)	0.91 (0.98)	67.1 (115.0)	#126.5 (#110.3)	
			Through / Right	F (F)	1.05 (1.36)	157.8 (697.4)	#213.0 (#246.2)	F (F)	1.05 (1.42)	154.9 (813.8)	#224.9 (#261.3)	
		SB	Left	B (C)	0.64 (0.78)	54.0 (57.3)	47.0 (#78.2)	B (B)	0.62 (0.69)	53.6 (52.6)	45.0 (#66.1)	
			Through / Right	E (F)	0.92 (1.23)	71.0 (471.0)	#132.1 (#224.2)	E (F)	0.94 (1.40)	76.2 (775.2)	#135.9 (#265.4)	
Overall Intersection			F (F)	1.08 (1.23)	104.9 (322.0)	-	F (F)	1.07 (1.27)	93.3 (368.8)	-		
Innes Road at Wildflower Drive / Site Access 4	Traffic Signals	EB	Left	A (A)	0.13 (0.34)	7.5 (10.5)	4.8 (m4.6)	A (A)	0.11 (0.28)	6.3 (8.2)	4.3 (m2.3)	
			Through	A (F)	0.48 (1.09)	7.3 (178.0)	80.3 (m234.2)	A (E)	0.46 (0.95)	7.1 (17.3)	74.8 (m82.2)	
		WB	Left	C (E)	0.75 (0.94)	20.4 (100.3)	#83.9 (#124.5)	A (D)	0.46 (0.84)	7.6 (67.3)	38.1 (#78.7)	
			Through / Right	C (B)	0.75 (0.63)	10.4 (8.7)	#215.0 (139.1)	B (B)	0.69 (0.69)	9.2 (15.3)	157.0 (181.3)	
		NB	Left	B (D)	0.70 (0.87)	44.2 (86.6)	48.2 (#95.8)	B (D)	0.70 (0.86)	44.2 (83.5)	48.2 (#94.8)	
			Through / Right	A (A)	0.17 (0.20)	31.7 (43.2)	22.1 (34.0)	A (A)	0.12 (0.16)	31.2 (42.6)	16.4 (27.8)	
		SB	Left	A (A)	0.08 (0.32)	31.1 (45.1)	8.3 (22.7)	A (A)	0.08 (0.23)	31.0 (43.5)	8.3 (21.8)	
			Through / Right	A (A)	0.21 (0.11)	32.0 (42.3)	21.1 (19.3)	A (A)	0.18 (0.11)	31.8 (42.2)	19.8 (19.3)	
		Overall Intersection			C (F)	0.74 (1.02)	12.9 (98.3)	-	B (E)	0.69 (0.92)	11.4 (23.2)	-
		Mer Bleue Road at Commercial Access / Site Access 1	Traffic Signals	EB	Left	A (E)	0.47 (0.94)	26.9 (102.6)	22.0 (#133.5)	A (E)	0.51 (0.94)	27.9 (104.8)
Through / Right	A (A)				0.03 (0.16)	23.4 (36.1)	7.2 (26.8)	A (A)	0.03 (0.08)	23.7 (35.5)	7.3 (18.4)	
WB	Left			A (A)	0.58 (0.56)	29.7 (42.3)	27.3 (65.1)	A (A)	0.49 (0.50)	27.4 (40.8)	22.2 (57.2)	
	Through / Right			A (A)	0.35 (0.09)	25.4 (35.4)	21.1 (20.0)	A (A)	0.36 (0.11)	25.7 (35.8)	19.9 (21.5)	
NB	Left			A (E)	0.21 (0.92)	5.6 (103.7)	14.1 (#49.3)	A (E)	0.22 (0.91)	5.5 (98.1)	13.6 (#70.6)	
	Through			A (A)	0.59 (0.50)	7.4 (11.4)	86.4 (95.9)	B (A)	0.64 (0.54)	7.7 (11.9)	99.0 (108.1)	
	Right			A (A)	0.06 (0.08)	4.1 (7.7)	5.8 (8.1)	A (A)	0.05 (0.06)	3.8 (7.5)	5.0 (7.0)	
SB	Left			C (D)	0.72 (0.87)	29.2 (57.1)	#53.8 (#111.0)	D (E)	0.83 (0.93)	52.9 (93.5)	#36.4 (#109.7)	
	Through			A (B)	0.34 (0.64)	5.4 (13.8)	38.8 (146.2)	A (D)	0.36 (0.87)	5.2 (29.7)	39.7 (#267.5)	
	Right			A (A)	0.06 (0.10)	4.1 (7.9)	5.8 (9.4)	A (A)	0.06 (0.13)	3.9 (13.7)	5.5 (18.8)	
Overall Intersection			B (E)	0.70 (0.93)	10.0 (27.4)	-	C (E)	0.78 (0.94)	10.8 (34.8)	-		
Tenth Line Road at Vanguard Drive	Traffic Signals	EB	Left	A (F)	0.54 (1.07)	42.9 (262.7)	26.6 (#111.7)	B (F)	0.70 (1.02)	62.2 (184.3)	52.0 (#125.0)	
			Through / Right	A (A)	0.16 (0.54)	37.3 (39.5)	16.1 (84.0)	A (D)	0.17 (0.82)	46.6 (50.3)	26.1 (#166.9)	
		WB	Left	A (B)	0.50 (0.70)	41.3 (51.4)	25.0 (#69.5)	A (F)	0.45 (1.27)	50.1 (593.0)	31.2 (#90.3)	
			Through / Right	A (A)	0.18 (0.55)	37.4 (39.7)	14.5 (85.3)	A (A)	0.14 (0.48)	46.3 (35.1)	17.8 (79.5)	
		NB	Left	A (E)	0.51 (0.92)	8.3 (120.4)	49.0 (#63.1)	D (F)	0.85 (1.24)	31.0 (519.4)	#163.6 (#117.6)	
			Through	A (E)	0.50 (0.92)	4.7 (34.0)	77.2 (#315.6)	A (E)	0.50 (0.99)	5.9 (62.5)	94.2 (#332.3)	
			Right	A (A)	0.04 (0.03)	2.6 (11.5)	3.9 (3.7)	A (A)	0.04 (0.03)	3.4 (13.6)	4.3 (4.1)	
		SB	Left	A (A)	0.16 (0.29)	4.2 (23.0)	7.1 (6.4)	A (A)	0.17 (0.28)	5.1 (27.0)	8.2 (7.2)	
			Through	A (F)	0.33 (1.08)	3.7 (179.3)	41.5 (#381.8)	A (F)	0.33 (1.22)	4.7 (436.5)	50.7 (#410.3)	
			Right	A (A)	0.03 (0.03)	2.6 (12.4)	2.9 (3.6)	A (A)	0.05 (0.08)	3.4 (16.8)	4.5 (14.1)	
Overall Intersection			A (F)	0.51 (1.07)	7.6 (105.0)	-	D (F)	0.83 (1.28)	13.7 (238.4)	-		
Mer Bleue Road at Vanguard Drive	Traffic Signals	WB	Left					A (A)	0.06 (0.08)	33.4 (38.0)	6.8 (6.3)	
			Right					A (A)	0.53 (0.22)	38.0 (39.2)	35.7 (19.0)	
		NB	Through / Right					A (A)	0.59 (0.50)	6.3 (3.9)	103.7 (67.7)	
		SB	Left					A (B)	0.28 (0.69)	7.5 (19.1)	12.8 (#68.2)	
			Through					A (A)	0.35 (0.62)	4.4 (4.8)	44.7 (103.5)	
Overall Intersection							A (B)	0.58 (0.65)	7.7 (6.3)	-		
Mer Bleue Road at Site Access 2	Minor Stop Control (Right-in / Right-out)	WB	Right	B (C)	0.18 (0.28)	16.9 (18.5)	4.0 (7.0)	C (C)	0.20 (0.30)	18.5 (19.8)	5.0 (8.0)	
			Through	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
		NB	Right	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
			Overall Intersection			A (A)	-	0.5 (0.6)	-	A (A)	-	0.5 (0.6)
Innes Road at Site Access 3	Minor Stop Control (Right-in / Right-out)	EB	Through	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	A (A)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	
		NB	Right	B (D)	0.10 (0.45)	13.7 (34.1)	3.0 (14.0)	B (D)	0.09 (0.39)	13.3 (28.5)	3.0 (12.0)	
		Overall Intersection			A (A)	-	0.2 (0.9)	-	A (A)	-	0.2 (0.8)	-
Vanguard Drive at Site Access 5	Minor Stop Control	EB	Left / Through					A (A)	0.01 (0.02)	7.5 (7.4)	0.0 (1.0)	
			Through / Right					A (A)	0.0 (0.00)	0.0 (0.0)	0.0 (0.0)	
		WB	Left / Right					A (B)	0.11 (0.09)	10.0 (10.4)	3.0 (2.0)	
			Overall Intersection							A (A)	-	3.0 (2.2)

1. Table Format: AM (PM)
2. 95th Percentile Queue (m)
3. # - 95th percentile volume exceeds capacity, queue may be longer
4. m - volume for 95th percentile queue is metered by upstream signal



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5.0 SUMMARY AND CONCLUSIONS

5.1 SUMMARY

Proposed Development

SmartREIT is submitting a rezoning application for 2025 Mer Bleue Road in the Orleans Community of Ottawa, Ontario. The site is bound by Innes Road and existing commercial to the north, Mer Bleue Road and existing commercial to the west, existing commercial and vacant commercial / industrial lands to the east, and vacant commercial / industrial lands to the south.

The proposed development includes approximately 42,000 ft² gross floor area (GFA) of retail space, 14,000 ft² GFA of restaurant space, 118,000 ft² GFA of industrial space, 1200 apartment units, 350 units for senior housing, and an assisted living building containing 256 beds.

The proposed commercial development is anticipated to generate 734 and 1186 person trips during the AM and PM peak hours, respectively. In terms of vehicle trips, the proposed it is anticipated to generate 398 and 442 net new auto trips (two-way) during the AM and PM peak hours, respectively.

2016 Existing Conditions

An assessment of transportation system capacity was undertaken by looking at two screenlines in the vicinity of the subject site; the Mer Bleue Road and Innes Road screenlines. The Mer Bleue Road screenline was selected to assess east / west screenline demand vs. capacity and the Innes Road screenline was selected to assess north / south screenline demand vs. capacity. Capacity across the screenline is determined by the number of roads and travel lanes which cross the screenline. Traffic demands are then compared to the available capacity to determine if there is a surplus or shortfall in system capacity.

The Highway 174 station along the Mer Bleue Road screenline is projected to operate at or above capacity during the AM peak hour in the inbound direction and during the PM peak hour in the outbound direction. Despite this, there is residual capacity at the remaining stations and therefore the overall Mer Bleue Road screenline as a whole operates below the available capacity. During the AM peak, where predominant direction is inbound (i.e. towards the urban core), the screenline currently operates at a volume to capacity (v/c) ratio of 0.69. During the PM peak, where the predominant direction is outbound, the screenline currently operates at v/c 0.86.

The Navan Road station along the Innes Road screenline is projected to operate at or above capacity during the AM peak hour in the inbound direction and during the PM peak hour in the

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outbound direction. Despite this, there is residual capacity at the remaining stations and therefore the overall Innes Road screenline as a whole operates below the available capacity. During the AM peak, where predominant direction is inbound, the screenline currently operates at v/c 0.33. During the PM peak, where the predominant direction is outbound, the screenline currently operates at v/c 0.35.

The eastbound left turning movement at the intersection of Tenth Line Road at Vanguard Drive currently operates at or above capacity using the current signal timing plan obtained from the City of Ottawa. Optimizing the signal timing will allow this intersection to operate acceptably.

2026 Future Background Conditions

Given the expected growth from the surrounding background developments, the intersections of Mer Bleue Road at Innes Road and Tenth Line Road at Vanguard Drive are expected to operate with several individual movements operating at or above capacity during the PM peak hour. Due to property and geometric constraints - both at the two intersections as well as upstream and downstream from them - adding geometric improvements in the form of additional travel lanes is not feasible.

2026 Total Future Conditions

The Highway 174 and Innes Road stations along the Mer Bleue Road screenline are projected to operate at or above capacity during the AM peak hour in the inbound direction and during the PM peak hour in the outbound direction. Despite this, there is residual capacity at the remaining stations along the Mer Bleue Road screenline. This permits the Mer Bleue Road screenline as a whole to operate below the projected available capacity. During the AM peak, where predominant direction is inbound, the screenline is projected to operate at a v/c ratio of 0.91. During the PM peak, where the predominant direction is outbound, the screenline is projected to operate at v/c 0.93.

The Blackburn Hamlet Bypass Extension is scheduled to occur as part of Phase 2 (2020 – 2025) of the City's TMP. With this new infrastructure in place, the Navan Road station on the Innes Road Screenline will shift to the new Blackburn Hamlet Bypass, thus increasing the capacity from 800 vehicles per hour per direction (existing conditions on Navan Road) to 2000 vehicles per hour per direction (future Blackburn Hamlet Bypass). This increase in capacity allows the Navan Road / Blackburn Hamlet Bypass station to operate well below capacity under 2026 total future conditions. During the AM peak, where predominant direction is inbound, the screenline currently operates at v/c 0.39. During the PM peak, where the predominant direction is outbound, the screenline currently operates at v/c 0.41.

Consistent with the findings from the 2026 future background horizon, the Mer Bleue Road at Innes Road and Tenth Line Road at Vanguard Drive intersections are projected to operate with several individual turning movements operating at or above capacity during the PM peak hour.

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However, as previously stated, adding geometric improvements to these intersections is not feasible due to property and geometric constraints.

Without the Vanguard Drive Extension in place, the Innes Road at Wildflower Drive / Site Access 4 is projected to operate at or above capacity during the PM peak hour. Of particular note is the westbound left turn movement into the development. The westbound left turn queue is projected to reach approximately 130m, however the available storage for this lane is approximately 75m which, on occasion, might result in spillover into the westbound through lane.

With the Vanguard Drive Extension in place, some traffic will divert off of Innes Road and onto Vanguard Drive, thus alleviating some of the congestion at the Wildflower Drive intersection. The Vanguard Drive Extension is expected to divert enough traffic away from Innes Road such that the Innes Road at Wildflower Drive / Site Access 4 intersection is projected to operate acceptably. With the Vanguard Drive Extension in place, the westbound left turn queue is anticipated to reach approximately 73m which will be able to be contained within the existing storage lane.

2031 Ultimate Conditions

The Highway 174 and Innes Road stations along the Mer Bleue Road screenline are projected to operate at or above capacity during the AM peak hour in the inbound direction and during the PM peak hour in the outbound direction. Despite this, there is residual capacity at the remaining stations along the Mer Bleue Road screenline. This allows the Mer Bleue Road screenline as a whole to operate below the available capacity. During the AM peak, where predominant direction is inbound, the screenline is projected to operate at a volume to capacity (v/c) ratio of 0.93. During the PM peak, where the predominant direction is outbound, the screenline is projected to operate at v/c 0.97.

The Innes Road screenline is projected to operate well below the available capacity during the 2031 ultimate horizon. During the AM peak, where predominant direction is inbound, the screenline is projected to operate at v/c 0.44. During the PM peak, where the predominant direction is outbound, the screenline is projected to operate at v/c 0.45.

Consistent with the findings from the 2026 future background and total future horizons, the Mer Bleue Road at Innes Road and Tenth Line Road at Vanguard Drive intersections are projected to operate with several individual turning movements operating at or above capacity during the PM peak hour. However, as previously stated, adding geometric improvements to these intersections is not feasible due to property and geometric constraints.

In addition, without the Vanguard Drive Extension, the Innes Road at Wildflower Drive / Site Access 4 intersection is projected to continue to deteriorate as more background growth is

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added to the roadway network. The implementation of the Vanguard Drive Extension will alleviate the congestion at this intersection allowing it to operate acceptably.

5.2 CONCLUSIONS

The City of Ottawa's 2013 *Transportation Master Plan (TMP)* sets the groundwork for transportation policy and infrastructure improvements across the City. Inherent within the TMP is a very large gap between what the City needs in terms of transportation infrastructure and what the City can afford. Transportation infrastructure projects that are deemed affordable are scheduled to occur prior to 2031 and those that are not are slated to occur sometime in the future beyond 2031.

The affordability gap in transportation needs is a clear acknowledgement that deficiencies will exist in the transportation system. It is also a clear acknowledgement that traffic congestion will occur as a result. As the City focuses the majority of its capital investment on transit projects, such as the Light Rail Transit (LRT) extension, traffic congestion will act as a catalyst towards achieving a higher transit mode share.

The findings of this report, along with previously approved traffic studies in the area, suggest that the study area will experience traffic congestion as the Orleans community continues to expand. As a result of this growth, those who choose to travel by automobile should expect significant delays at the majority of the study area intersections during peak commuting hours.

The Brian Coburn Boulevard Extension, west of Mer Bleue Road to Navan Road, is scheduled to occur as part of Phase 1 (2014 – 2019) of the TMP. This facility will provide motorists with an alternative east / west corridor to travel to and from the Orleans community. Although the Phase 1 extension of Brian Coburn Boulevard is planned to be two-lanes (i.e. one lane of travel in each direction), the TMP recommends ultimately widening the facility to a four-lane cross-section. While the widening of Brian Coburn Boulevard to its ultimate four lane cross-section is not currently part of the TMP's "Affordable Network", in future planning exercises the City should consider advancing the timing of the widening to help alleviate the current and projected congestion in Orleans.

As shown in the aforementioned analyses, the study area would benefit from the implementation of the Vanguard Drive Extension. This facility would alleviate some of the congestion occurring on Innes Road as motorists divert onto Vanguard Drive to avoid Innes Road. It is our understanding that the City of Ottawa will be undertaking the Environmental Assessment (EA) for the Vanguard Drive Extension in 2017. Based on the findings of this report and the operational deficiencies projected at the intersection of Tenth Line Road at Vanguard Drive, it is recommended that the study area for the Vanguard Drive EA include the Vanguard Drive intersection with Tenth Line Road.

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While adding additional roadway capacity is one way to help alleviate traffic congestion, another way is to continue to invest in transit infrastructure, which is what the City of Ottawa is currently doing. Stage 2 of Ottawa's Light Rail Transit is scheduled to occur by 2023 and is planned to extend as far east as Trim Road in Orleans. The LRT extension will provide residents of Orleans with high-capacity, fast and reliable transit service which will attract more residents to use transit as their primary means of transportation. As more residents choose to use transit, the transit modal share in the area will increase, and, conversely, the auto modal share will decrease. This shift in modal share will result in fewer vehicles on the road and less traffic congestion.

To further alleviate anticipated congestion in the Orleans area, the City should consider advancing the timing of the Cumberland Transitway to provide residents with an alternate and viable option for public transit. This recommendation is consistent with previously approved traffic studies in the area (i.e. *Summerside West Phase 2 Transportation Impact Study*, Stantec 2016).

If the aforementioned recommendations are not implemented, commuters from the Orleans area will continue to experience significant delays and traffic congestion which is consistent with the affordability gap planned for in the City's Transportation Master Plan. As such, and based on the transportation evaluation presented in this study, SmartREIT's proposed development in Orleans should be permitted to proceed from a transportation perspective.

STANTEC CONSULTING LTD.

(Original signed and stamped)

Robert Vastag, RPP
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Appendix A Turning Movement Counts
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Appendix A TURNING MOVEMENT COUNTS

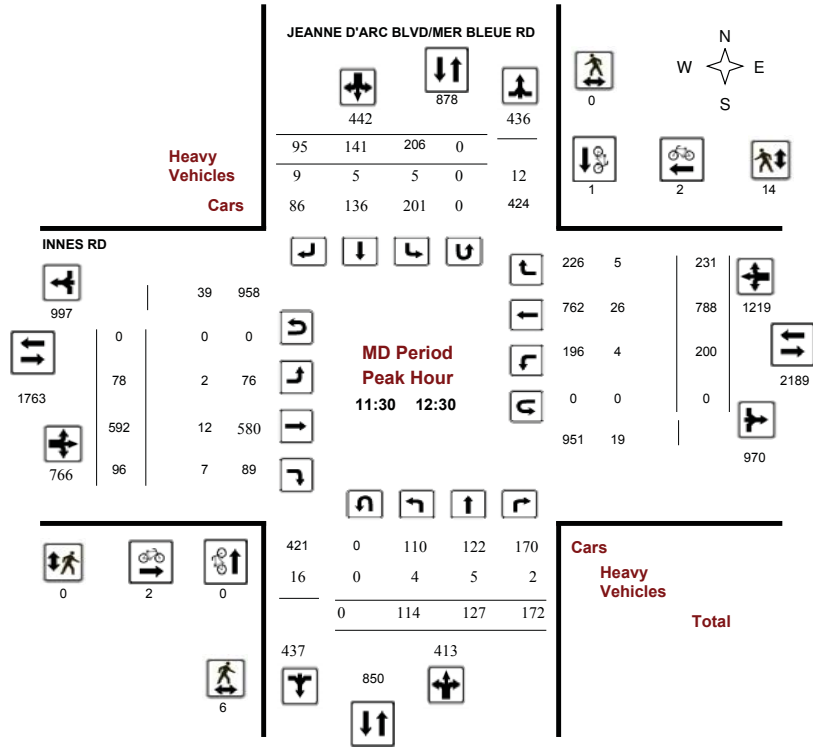


Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram
INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Survey Date: Friday, July 25, 2014
Start Time: 07:00

WO No: 29377
Device: Jamar Technologies, Inc



Comments

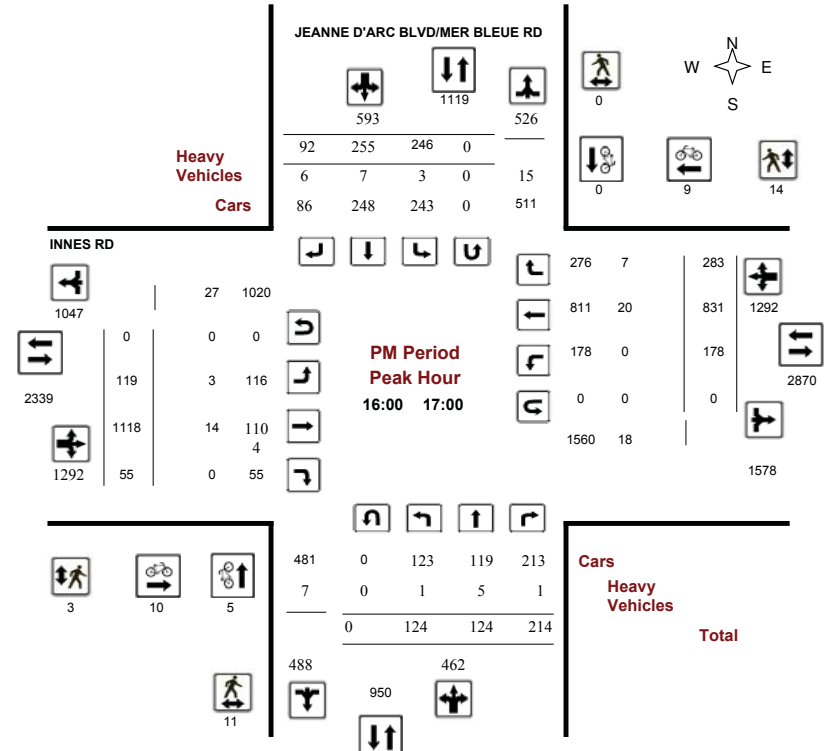


Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram
INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

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Comments



Public Works - Traffic Services

W.O. 29377

Turning Movement Count - 15 Minute Summary Report

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Survey Date: Friday, July 25, 2014

Total Observed U-Turns

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

JEANNE D'ARC BLVD/MER BLEUE RD

INNES RD

Table with columns for Time Period, LT, ST, RT, N TOT, S TOT, E TOT, W TOT, STR TOT, Grand Total. Rows show 15-minute intervals from 07:00 to 17:45.

NOTE: U-Turns are included in Totals.

Comment:



Public Works - Traffic Services

Work Order 29377

Turning Movement Count - Full Study Summary Report

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Survey Date: Friday, July 25, 2014

Total Observed U-Turns

AADT Factor

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

.90

Full Study

Table with columns for Period, LT, ST, RT, NB TOT, SB TOT, EB TOT, WB TOT, STR TOT, Grand Total. Rows show 15-minute intervals from 07:00 to 17:45, plus sub-totals and expansion factors.

Comments:

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



Public Works - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
 29377

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Count Date: Friday, July 25, 2014

Start Time: 07:00

Time Period	JEANNE D'ARC BLVD/MER BLEUE RD			INNES RD			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 08:00	1	0	1	0	10	10	11
08:00 09:00	0	1	1	0	14	14	15
09:00 10:00	1	3	4	2	5	7	11
11:30 12:30	0	1	1	2	2	4	5
12:30 13:30	0	0	0	0	15	15	15
15:00 16:00	2	1	3	3	18	21	24
16:00 17:00	5	0	5	10	9	19	24
17:00 18:00	2	0	2	4	4	8	10
Total	11	6	17	21	77	98	115

Comment:



Public Works - Traffic Services

W.O.
 29377

Turning Movement Count - Heavy Vehicle Report

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Survey Date: Friday, July 25, 2014

Time Period	JEANNE D'ARC BLVD/MER BLEUE RD									INNES RD									Grand Total
	Northbound				Southbound					Eastbound				Westbound					
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	
07:00 08:00	5	7	3	15	4	6	10	20	35	7	29	2	38	0	23	7	30	68	103
08:00 09:00	6	9	1	16	2	4	4	10	26	2	19	1	22	2	25	9	36	58	84
09:00 10:00	5	6	4	15	1	2	1	4	19	5	13	1	19	0	28	6	34	53	72
11:30 12:30	4	5	2	11	5	5	9	19	30	2	12	7	21	4	26	5	35	56	86
12:30 13:30	2	6	2	10	7	1	0	8	18	1	8	2	11	2	23	2	27	38	56
15:00 16:00	4	3	2	9	4	6	1	11	20	4	22	1	27	2	27	7	36	63	83
16:00 17:00	1	5	1	7	3	7	6	16	23	3	14	0	17	0	20	7	27	44	67
17:00 18:00	3	0	1	4	4	0	4	8	12	3	7	0	10	1	21	7	29	39	51
Sub Total	30	41	16	87	30	31	35	96	183	27	124	14	165	11	193	50	254	419	602
U-Turns (Heavy Vehicles)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	30	41	16	87	30	31	35	96	183	27	124	14	165	11	193	50	254	419	602

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.

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



Public Works - Traffic Services

Work Order
29377

Turning Movement Count - Pedestrian Volume Report

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Count Date: Friday, July 25, 2014

Start Time: 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	2	2	2
07:15 07:30	0	0	0	0	2	2	2
07:30 07:45	1	0	1	0	0	0	1
07:45 08:00	1	0	1	0	2	2	3
07:00 08:00	2	0	2	0	6	6	8
08:00 08:15	0	0	0	0	3	3	3
08:15 08:30	0	0	0	0	2	2	2
08:30 08:45	0	0	0	0	4	4	4
08:45 09:00	0	0	0	0	1	1	1
08:00 09:00	0	0	0	0	10	10	10
09:00 09:15	0	0	0	2	3	5	5
09:15 09:30	1	0	1	1	3	4	5
09:30 09:45	1	0	1	0	0	0	1
09:45 10:00	2	0	2	5	0	5	7
09:00 10:00	4	0	4	8	6	14	18
11:30 11:45	2	0	2	0	2	2	4
11:45 12:00	0	0	0	0	6	6	6
12:00 12:15	3	0	3	0	2	2	5
12:15 12:30	1	0	1	0	4	4	5
11:30 12:30	6	0	6	0	14	14	20
12:30 12:45	0	0	0	0	1	1	1
12:45 13:00	2	0	2	0	1	1	3
13:00 13:15	4	0	4	2	2	4	8
13:15 13:30	0	0	0	0	0	0	0
12:30 13:30	6	0	6	2	4	6	12
15:00 15:15	0	0	0	0	4	4	4
15:15 15:30	0	0	0	0	7	7	7
15:30 15:45	2	0	2	0	7	7	9
15:45 16:00	13	0	13	1	5	6	19
15:00 16:00	15	0	15	1	23	24	39
16:00 16:15	0	0	0	0	1	1	1
16:15 16:30	1	0	1	1	1	2	3
16:30 16:45	6	0	6	0	5	5	11
16:45 17:00	4	0	4	2	7	9	13
16:00 17:00	11	0	11	3	14	17	28
17:00 17:15	1	0	1	3	3	6	7
17:15 17:30	4	0	4	0	3	3	7
17:30 17:45	2	0	2	2	2	4	6
17:45 18:00	1	0	1	0	2	2	3
17:00 18:00	8	0	8	5	10	15	23
Total	52	0	52	19	87	106	158

Comment:



Public Works - Traffic Services

Work Order
29377

Turning Movement Count - 15 Min U-Turn Total Report

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Survey Date: Friday, July 25, 2014

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

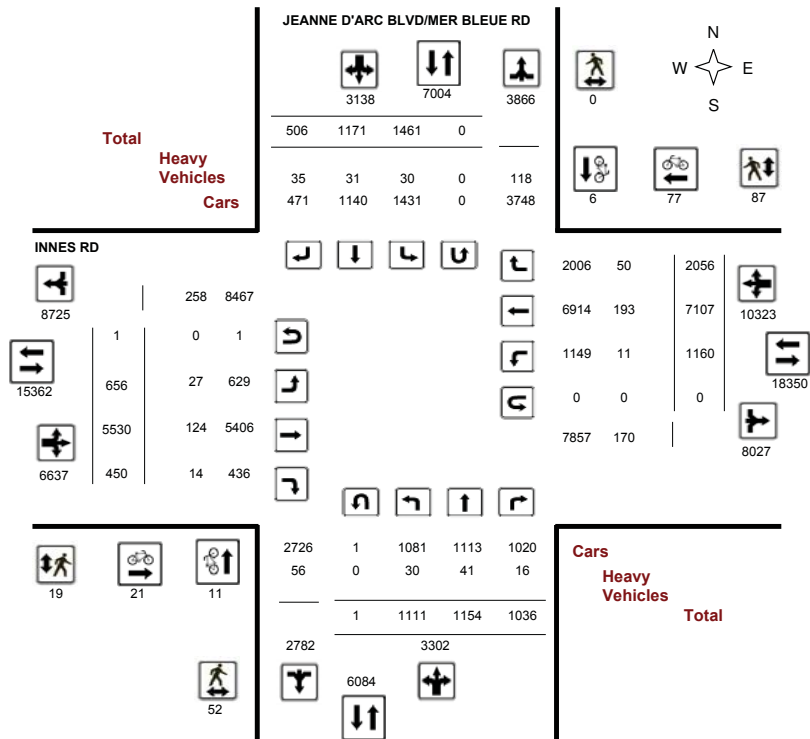


Public Works - Traffic Services
Turning Movement Count - Full Study Diagram

INNES RD @ JEANNE D'ARC BLVD/MER BLEUE RD

Survey Date: Friday, July 25, 2014

WO#: 29377
 Device: Jamar Technologies, Inc



Comments

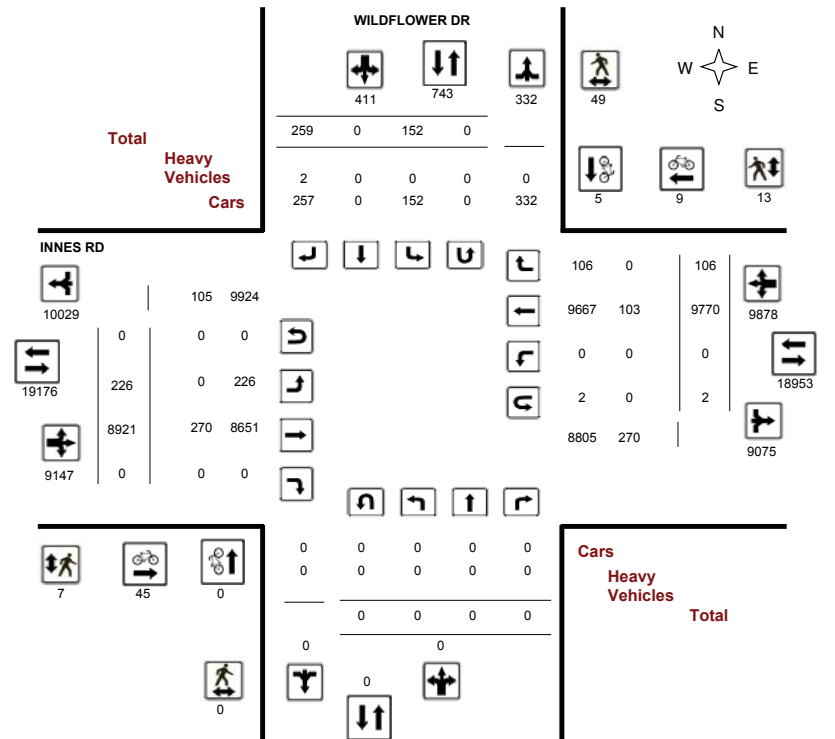


Public Works - Traffic Services
Turning Movement Count - Full Study Diagram

INNES RD @ WILDFLOWER DR

Survey Date: Tuesday, August 04, 2015

WO#: 35062
 Device: Jamar Technologies, Inc



Comments



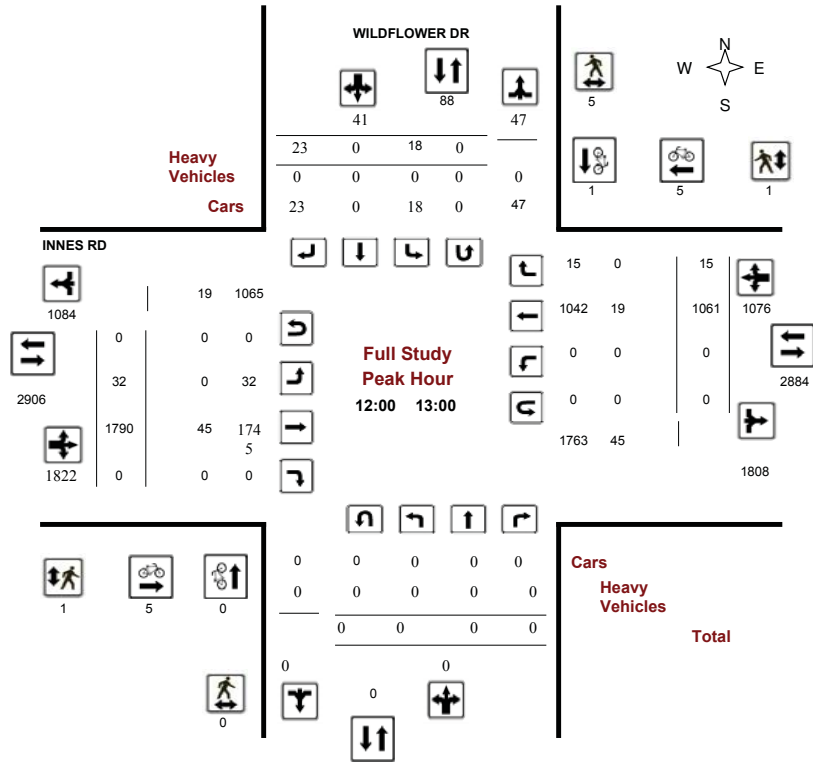
Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ WILDFLOWER DR

Survey Date: Tuesday, August 04, 2015
Start Time: 07:00

WO No: 35062
Device: Jamar Technologies, Inc



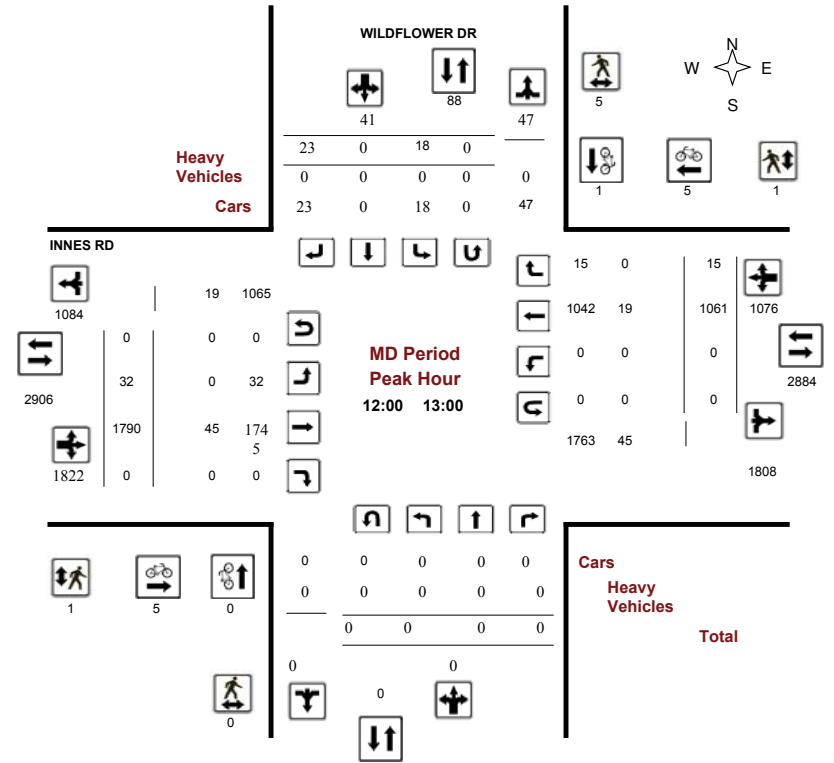
Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

INNES RD @ WILDFLOWER DR

Survey Date: Tuesday, August 04, 2015
Start Time: 07:00

WO No: 35062
Device: Jamar Technologies, Inc





Public Works - Traffic Services

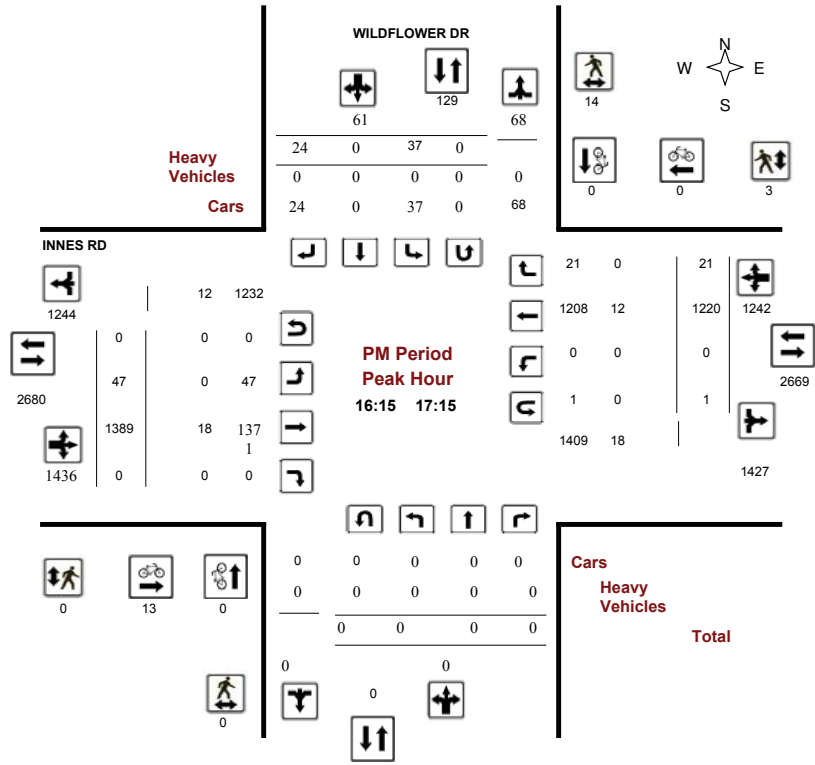
Turning Movement Count - Peak Hour Diagram

INNES RD @ WILDFLOWER DR

Survey Date: Tuesday, August 04, 2015

Start Time: 07:00

WO No: 35062
Device: Jamar Technologies, Inc



Public Works - Traffic Services

W.O. 35062

Turning Movement Count - 15 Minute Summary Report

INNES RD @ WILDFLOWER DR

Survey Date: Tuesday, August 04, 2015

Total Observed U-Turns

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

		WILDFLOWER DR				INNES RD															
		Northbound		Southbound		Eastbound		Westbound													
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total	
07:00	07:15	0	0	0	0	1	0	9	10	10	1	95	0	96	0	406	1	407	503	513	
07:15	07:30	0	0	0	0	1	0	9	10	10	5	128	0	133	0	323	0	323	456	466	
07:30	07:45	0	0	0	0	3	0	15	18	18	3	176	0	179	0	439	1	440	619	637	
07:45	08:00	0	0	0	0	4	0	8	12	12	2	164	0	166	0	322	1	323	489	501	
08:00	08:15	0	0	0	0	4	0	14	18	18	6	196	0	202	0	395	2	397	599	617	
08:15	08:30	0	0	0	0	4	0	12	16	16	1	130	0	131	0	431	0	431	562	578	
08:30	08:45	0	0	0	0	0	0	8	8	8	1	183	0	184	0	316	0	316	500	508	
08:45	09:00	0	0	0	0	2	0	12	14	14	4	185	0	189	0	303	4	307	496	510	
09:00	09:15	0	0	0	0	0	0	5	5	5	3	145	0	148	0	306	0	306	454	459	
09:15	09:30	0	0	0	0	3	0	16	19	19	6	214	0	220	0	339	0	339	559	578	
09:30	09:45	0	0	0	0	5	0	13	18	18	8	185	0	193	0	302	8	310	503	521	
09:45	10:00	0	0	0	0	6	0	8	14	14	8	187	0	195	0	307	5	312	507	521	
11:30	11:45	0	0	0	0	3	0	4	7	7	8	440	0	448	0	196	0	196	644	651	
11:45	12:00	0	0	0	0	8	0	3	11	11	6	372	0	378	0	223	2	225	603	614	
12:00	12:15	0	0	0	0	7	0	2	9	9	8	363	0	371	0	237	2	239	610	619	
12:15	12:30	0	0	0	0	4	0	10	14	14	14	533	0	547	0	213	5	218	765	779	
12:30	12:45	0	0	0	0	4	0	3	7	7	3	546	0	549	0	296	4	300	849	856	
12:45	13:00	0	0	0	0	3	0	8	11	11	7	348	0	355	0	315	4	319	674	685	
13:00	13:15	0	0	0	0	3	0	7	10	10	7	302	0	309	0	239	1	240	549	559	
13:15	13:30	0	0	0	0	2	0	13	15	15	4	307	0	311	0	263	11	274	585	600	
15:00	15:15	0	0	0	0	0	0	6	6	6	8	291	0	299	0	249	2	251	550	556	
15:15	15:30	0	0	0	0	7	0	15	22	22	16	270	0	286	0	332	2	334	620	642	
15:30	15:45	0	0	0	0	10	0	1	11	11	5	266	0	271	0	271	5	276	547	558	
15:45	16:00	0	0	0	0	1	0	11	12	12	8	298	0	306	0	462	4	466	772	784	
16:00	16:15	0	0	0	0	7	0	2	9	9	6	244	0	250	0	180	1	181	431	440	
16:15	16:30	0	0	0	0	8	0	5	13	13	18	383	0	401	0	327	7	335	736	749	
16:30	16:45	0	0	0	0	3	0	11	14	14	8	331	0	339	0	287	7	294	633	647	
16:45	17:00	0	0	0	0	14	0	4	18	18	10	318	0	328	0	281	4	285	613	631	
17:00	17:15	0	0	0	0	12	0	4	16	16	11	357	0	368	0	325	3	328	696	712	
17:15	17:30	0	0	0	0	2	0	4	6	6	8	320	0	328	0	287	9	296	624	630	
17:30	17:45	0	0	0	0	10	0	12	22	22	12	361	0	373	0	298	3	302	675	697	
17:45	18:00	0	0	0	0	11	0	5	16	16	11	283	0	294	0	300	8	308	602	618	
TOTAL:		0	0	0	0	152	0	259	411	411	226	8921	0	9147	0	9770	106	9878	19025	19436	

Note: U-Turns are included in Totals.

Comment:



Public Works - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
35062

INNES RD @ WILDFLOWER DR

Count Date: Tuesday, August 04, 2015

Start Time: 07:00

Time Period	WILDFLOWER DR			INNES RD			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 08:00	0	0	0	4	2	6	6
08:00 09:00	0	0	0	6	0	6	6
09:00 10:00	0	1	1	5	0	5	6
11:30 12:30	0	0	0	4	0	4	4
12:30 13:30	0	1	1	4	7	11	12
15:00 16:00	0	3	3	5	0	5	8
16:00 17:00	0	0	0	9	0	9	9
17:00 18:00	0	0	0	8	0	8	8
Total	0	5	5	45	9	54	59

Comment:

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



Public Works - Traffic Services
Turning Movement Count - Heavy Vehicle Report

W.O.
35062

INNES RD @ WILDFLOWER DR

Survey Date: Tuesday, August 04, 2015

Time Period	WILDFLOWER DR									INNES RD									Grand Total	
	Northbound				Southbound					Eastbound				Westbound						
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT		
07:00 08:00	0	0	0	0	0	0	0	1	1	1	0	31	0	31	0	9	0	9	40	41
08:00 09:00	0	0	0	0	0	0	0	0	0	0	0	42	0	42	0	19	0	19	61	61
09:00 10:00	0	0	0	0	0	0	0	0	0	0	0	43	0	43	0	18	0	18	61	61
11:30 12:30	0	0	0	0	0	0	0	0	0	0	0	38	0	38	0	6	0	6	44	44
12:30 13:30	0	0	0	0	0	0	1	1	1	1	0	41	0	41	0	20	0	20	61	62
15:00 16:00	0	0	0	0	0	0	0	0	0	0	0	28	0	28	0	12	0	12	40	40
16:00 17:00	0	0	0	0	0	0	0	0	0	0	0	19	0	19	0	11	0	11	30	30
17:00 18:00	0	0	0	0	0	0	0	0	0	0	0	28	0	28	0	8	0	8	36	36
Sub Total	0	0	0	0	0	0	2	2	2	2	0	270	0	270	0	103	0	103	373	375
U-Turns (Heavy Vehicles)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	2	2	2	0	270	0	270	0	103	0	103	373	375

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.



Public Works - Traffic Services

Work Order
35062

Turning Movement Count - Pedestrian Volume Report

INNES RD @ WILDFLOWER DR

Count Date: Tuesday, August 04, 2015

Start Time: 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	1	1	0	2	2	3
07:30 07:45	0	1	1	0	0	0	1
07:45 08:00	0	0	0	0	0	0	0
07:00 08:00	0	2	2	0	2	2	4
08:00 08:15	0	1	1	0	1	1	2
08:15 08:30	0	2	2	0	0	0	2
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	6	6	0	1	1	7
08:00 09:00	0	9	9	0	2	2	11
09:00 09:15	0	4	4	0	0	0	4
09:15 09:30	0	4	4	0	0	0	4
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	2	0	2	2
09:00 10:00	0	8	8	2	0	2	10
11:30 11:45	0	2	2	2	0	2	4
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	1	1	0	0	0	1
12:15 12:30	0	2	2	1	0	1	3
11:30 12:30	0	5	5	3	0	3	8
12:30 12:45	0	0	0	1	0	1	1
12:45 13:00	0	2	2	0	0	0	2
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	2	2	2
12:30 13:30	0	2	2	0	3	3	5
15:00 15:15	0	3	3	1	0	1	4
15:15 15:30	0	5	5	1	0	1	6
15:30 15:45	0	1	1	0	2	2	3
15:45 16:00	0	0	0	0	1	1	1
15:00 16:00	0	9	9	2	3	5	14
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	5	5	0	1	1	6
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	7	7	0	2	2	9
16:00 17:00	0	12	12	0	3	3	15
17:00 17:15	0	2	2	0	0	0	2
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
17:00 18:00	0	2	2	0	0	0	2
Total	0	49	49	7	13	20	69

Comment:



Public Works - Traffic Services

Work Order
35062

Turning Movement Count - 15 Min U-Turn Total Report

INNES RD @ WILDFLOWER DR

Survey Date: Tuesday, August 04, 2015

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



Public Works - Traffic Services

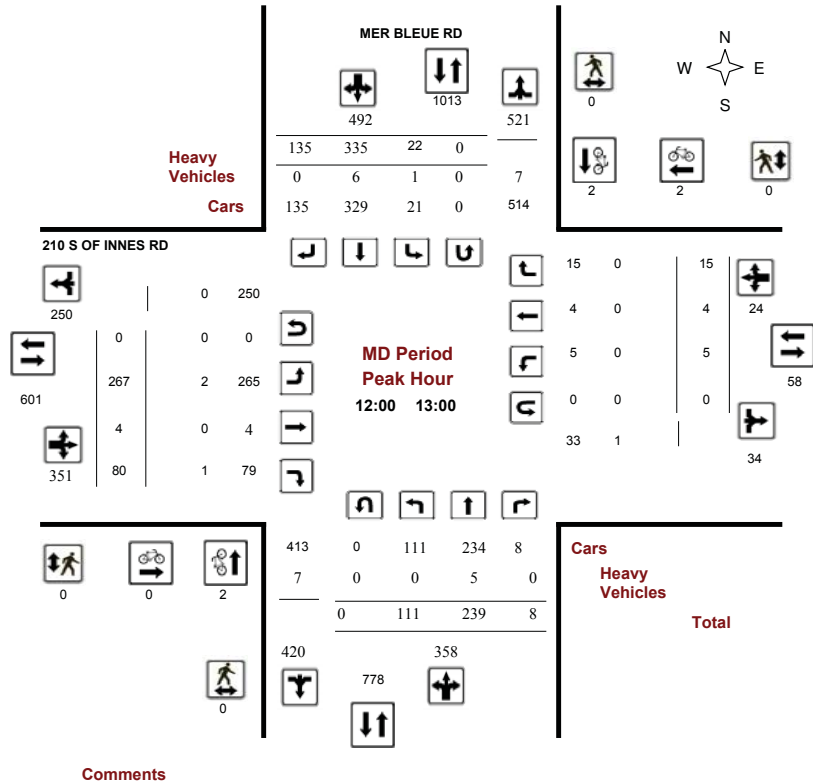
Turning Movement Count - Peak Hour Diagram

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015

Start Time: 07:00

WO No: 35282
Device: Jamar Technologies, Inc



Public Works - Traffic Services

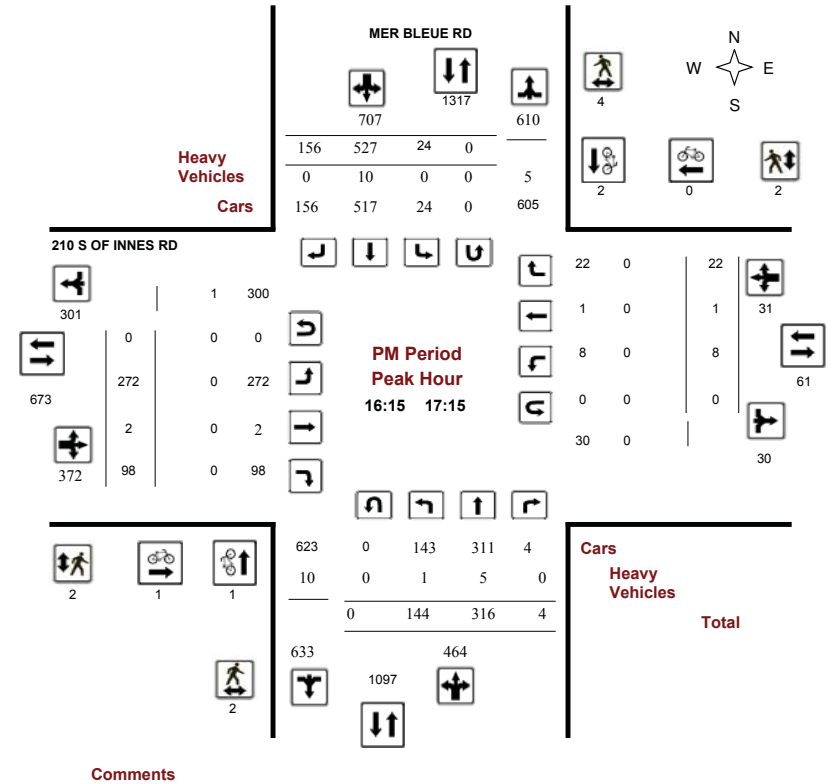
Turning Movement Count - Peak Hour Diagram

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015

Start Time: 07:00

WO No: 35282
Device: Jamar Technologies, Inc



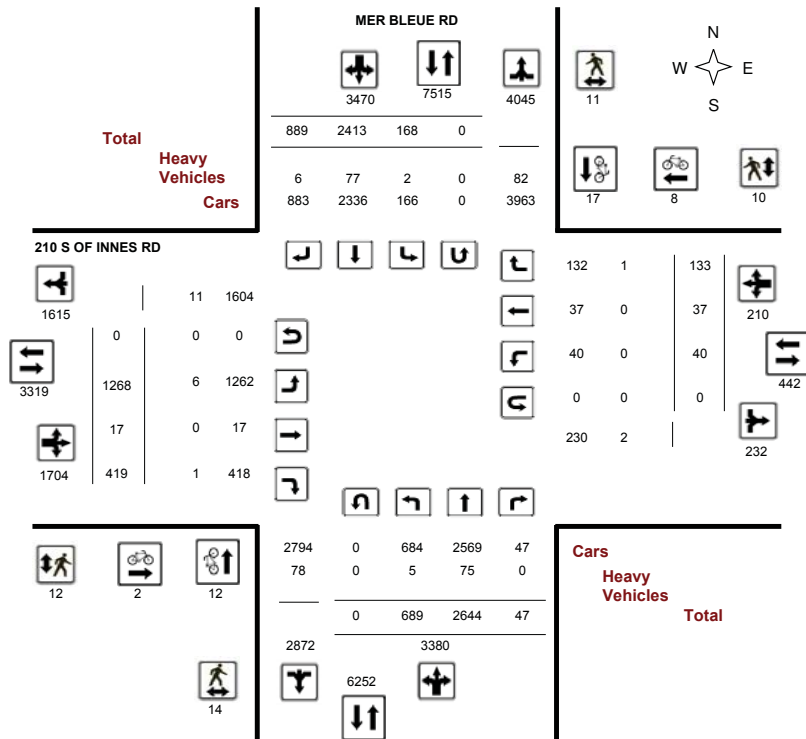


Public Works - Traffic Services
Turning Movement Count - Full Study Diagram

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015

WO#: 35282
Device: Jamar Technologies, Inc



Comments



Public Works - Traffic Services

Work Order
35282

Turning Movement Count - Full Study Summary Report

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015

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

Full Study

Period	MER BLEUE RD					210 S OF INNES RD					WB TOT	STR TOT	Grand Total						
	Northbound		Southbound			Eastbound		Westbound											
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT			
07:00 08:00	33	462	8	503	25	193	22	240	743	14	3	6	23	2	19	15	36	59	802
08:00 09:00	55	410	4	469	19	183	51	253	722	32	0	19	51	3	1	11	15	66	788
09:00 10:00	75	346	10	431	20	169	93	282	713	76	3	23	102	6	2	5	13	115	828
11:30 12:30	80	229	8	317	13	241	148	402	719	193	5	56	254	6	7	19	32	286	1005
12:30 13:30	107	273	5	385	26	300	147	473	858	236	0	77	313	3	3	14	20	333	1191
15:00 16:00	96	272	5	373	23	354	144	521	894	237	2	71	310	8	2	22	32	342	1236
16:00 17:00	126	321	4	451	21	485	169	675	1126	277	1	98	376	6	1	21	28	404	1530
17:00 18:00	117	331	3	451	21	488	115	624	1075	203	3	69	275	6	2	26	34	309	1384
Sub Total	689	2644	47	3380	168	2413	889	3470	6850	1268	17	419	1704	40	37	133	210	1914	8764
U Turns	0		0			0		0			0			0			0		
Total	689	2644	47	3380	168	2413	889	3470	6850	1268	17	419	1704	40	37	133	210	1914	8764
EQ 12Hr	958	3675	65	4698	234	3354	1236	4823	9521	1763	24	582	2369	56	51	185	292	2661	12182
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.	1.39																		
AVG 12Hr	862	3308	59	4228	210	3019	1112	4341	8569	1586	21	524	2132	50	46	166	263	2395	10964
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.	.90																		
AVG 24Hr	1129	4333	77	5539	275	3954	1457	5687	11226	2078	28	687	2793	66	61	218	344	3137	14363
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.	1.31																		

Comments:

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



Public Works - Traffic Services

W.O. 35282

Turning Movement Count - 15 Minute Summary Report

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

MER BLEUE RD

210 S OF INNES RD

Table with columns: Time Period, LT, ST, RT, N TOT, S TOT, E TOT, W TOT, STR TOT, Grand Total. Rows show 15-minute intervals from 07:00 to 18:00.

NOTE: U-Turns are included in Totals.

Comment:



Public Works - Traffic Services

Work Order 35282

Turning Movement Count - Cyclist Volume Report

MER BLEUE RD @ 210 S OF INNES RD

Count Date: Friday, August 21, 2015

Start Time: 07:00

MER BLEUE RD

210 S OF INNES RD

Table with columns: Time Period, Northbound, Southbound, Street Total, Eastbound, Westbound, Street Total, Grand Total. Rows show 15-minute intervals from 07:00 to 18:00.

Comment:

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



Public Works - Traffic Services

W.O. 35282

Turning Movement Count - Heavy Vehicle Report

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT), and Grand Total. Includes sub-totals for U-Turns and a final Total row.

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.



Public Works - Traffic Services

Work Order 35282

Turning Movement Count - Pedestrian Volume Report

MER BLEUE RD @ 210 S OF INNES RD

Count Date: Friday, August 21, 2015

Start Time: 07:00

Table with columns for Time Period, NB Approach (E or W Crossing), SB Approach (E or W Crossing), Total, EB Approach (N or S Crossing), WB Approach (N or S Crossing), Total, and Grand Total. Shows pedestrian volume data for various time intervals.

Comment:



Public Works - Traffic Services

Work Order
35282

Turning Movement Count - 15 Min U-Turn Total Report

MER BLEUE RD @ 210 S OF INNES RD

Survey Date: Friday, August 21, 2015

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

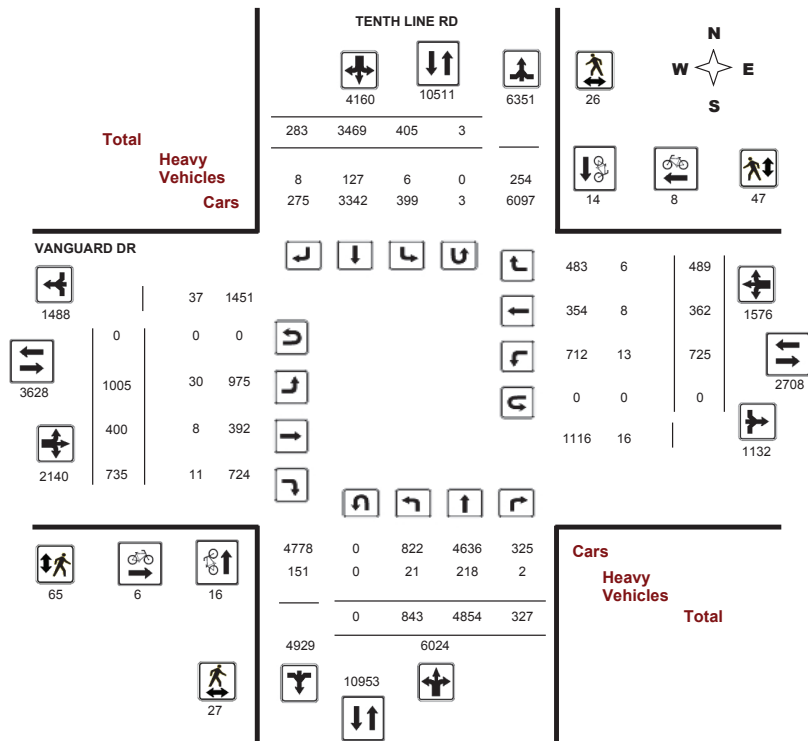


Public Works - Traffic Services
Turning Movement Count - Full Study Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

WO#: 35199
 Device: Jamar Technologies, Inc



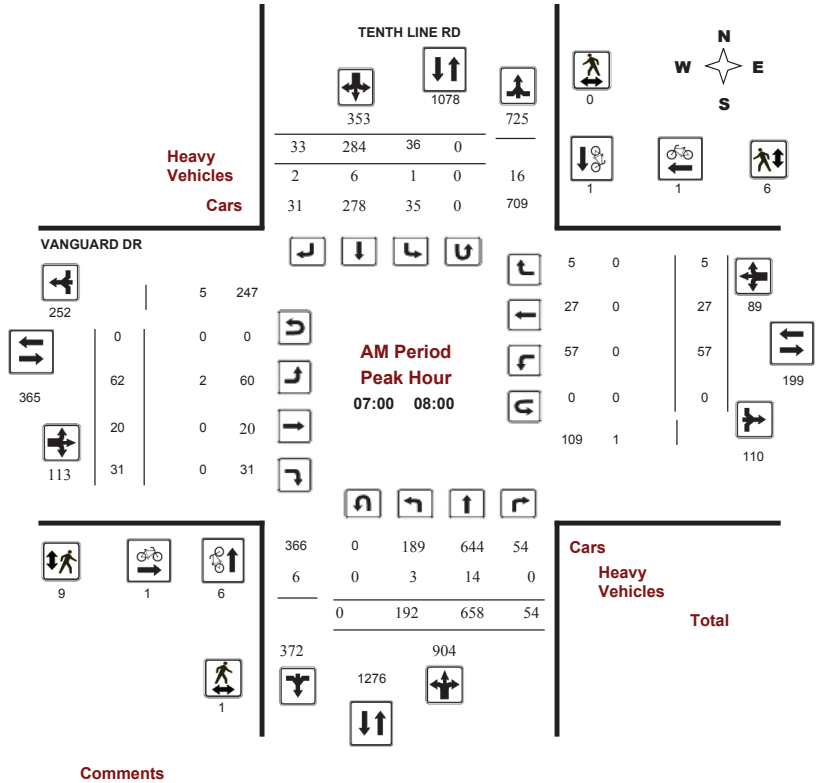
Public Works - Traffic Services
Turning Movement Count - Peak Hour Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

Start Time: 07:00

WO No: 35199
 Device: Jamar Technologies, Inc





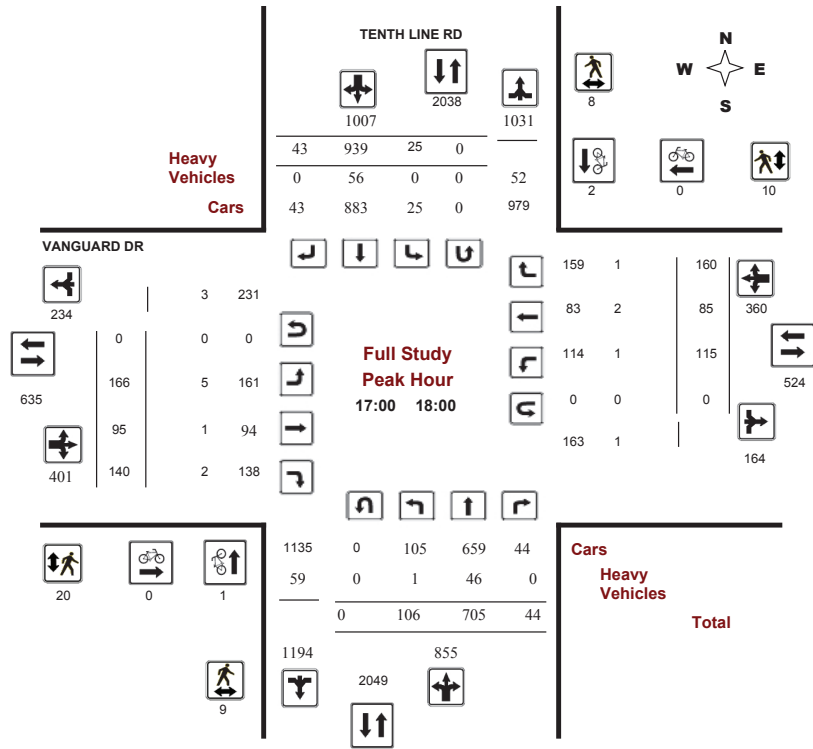
Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015
Start Time: 07:00

WO No: 35199
Device: Jamar Technologies, Inc



Comments



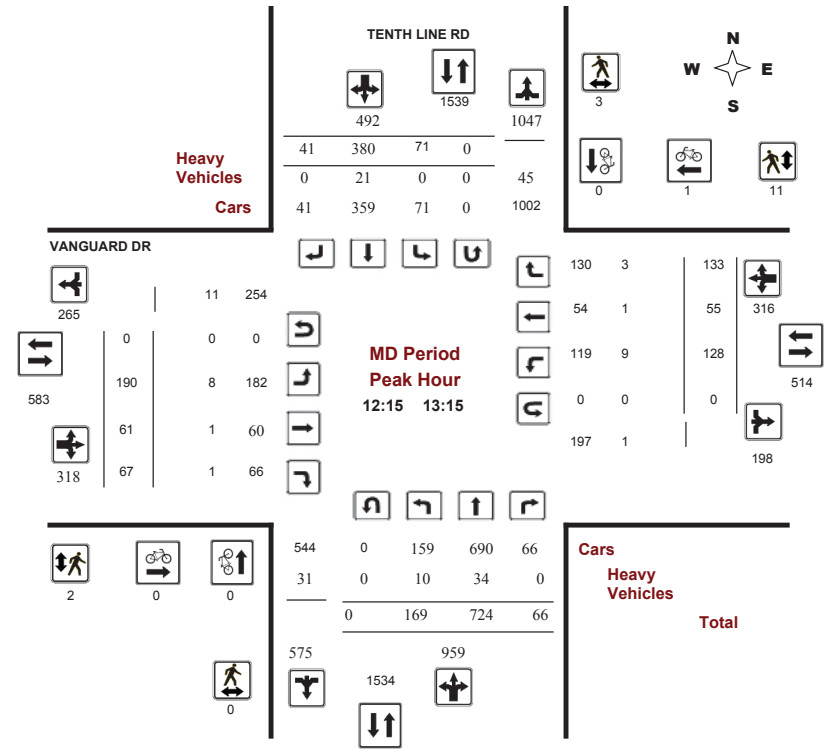
Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015
Start Time: 07:00

WO No: 35199
Device: Jamar Technologies, Inc



Comments



Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

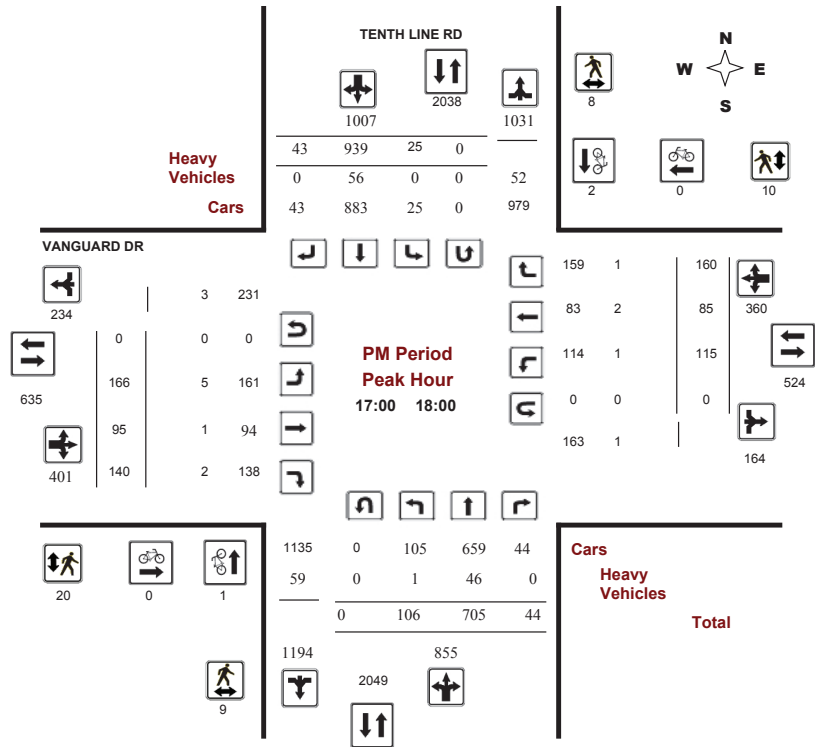
TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

Start Time: 07:00

WO No: 35199

Device: Jamar Technologies, Inc



Comments



Public Works - Traffic Services

Work Order 35199

Turning Movement Count - Full Study Summary Report

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

Total Observed U-Turns

Northbound: 0	Southbound: 3
Eastbound: 0	Westbound: 0

AADT Factor

.90

Full Study

Period	TENTH LINE RD								VANGUARD DR								Grand Total		
	Northbound				Southbound				Eastbound				Westbound						
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT		WB TOT	STR TOT
07:00 08:00	192	658	54	904	36	284	33	353	1257	62	20	31	113	57	27	5	89	202	1459
08:00 09:00	11	518	5	534	8	228	26	262	796	87	30	24	141	55	13	35	103	244	1040
09:00 10:00	22	629	14	665	20	237	42	299	964	62	19	34	115	61	17	48	126	241	1205
11:30 12:30	62	605	41	708	18	324	14	356	1064	119	25	98	242	86	37	51	174	416	1480
12:30 13:30	145	655	61	861	59	404	33	496	1357	149	54	49	252	94	41	119	254	506	1863
15:00 16:00	146	475	43	664	139	472	51	662	1326	182	88	162	432	126	76	33	235	667	1993
16:00 17:00	159	609	65	833	100	581	41	722	1555	178	69	197	444	131	66	38	235	679	2234
17:00 18:00	106	705	44	855	25	939	43	1007	1862	166	95	140	401	115	85	160	360	761	2623
Sub Total	843	4854	327	6024	405	3469	283	4157	10181	1005	400	735	2140	725	362	489	1576	3716	13897
U Turns	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	3
Total	843	4854	327	6024	405	3469	283	4160	10184	1005	400	735	2140	725	362	489	1576	3716	13900
EQ 12Hr	1172	6747	455	8373	563	4822	393	5782	14155	1397	556	1022	2975	1008	503	680	2191	5166	19321
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																1.39			
AVG 12Hr	1055	6072	409	7536	507	4340	354	5204	12740	1257	500	919	2677	907	453	612	1972	4649	17389
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																.90			
AVG 24Hr	1382	7955	536	9872	664	5685	464	6817	16689	1647	656	1205	3507	1188	593	801	2583	6090	22779
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																1.31			

Comments:

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



Public Works - Traffic Services

W.O. 35199

Turning Movement Count - 15 Minute Summary Report

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 3
Eastbound: 0 Westbound: 0

TENTH LINE RD

VANGUARD DR

Table with columns for Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT, STR TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT, STR TOT), and Grand Total. Rows represent 15-minute intervals from 07:00 to 17:45.

TOTAL: 843 4854 327 6024 405 3469 283 4160 10184 1005 400 735 2140 725 362 489 1576 3716 13900

Note: U-Turns are included in Totals. Comment:



Public Works - Traffic Services

Work Order

35199

Turning Movement Count - Pedestrian Volume Report

TENTH LINE RD @ VANGUARD DR

Count Date: Tuesday, August 18, 2015

Start Time: 07:00

Table with columns for Time Period, NB Approach (E or W Crossing), SB Approach (E or W Crossing), Total, EB Approach (N or S Crossing), WB Approach (N or S Crossing), Total, and Grand Total. Rows represent 15-minute intervals from 07:00 to 17:45.

Comment:



Public Works - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
 35199

TENTH LINE RD @ VANGUARD DR

Count Date: Tuesday, August 18, 2015

Start Time: 07:00

Time Period	TENTH LINE RD			VANGUARD DR			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 08:00	6	1	7	1	1	2	9
08:00 09:00	1	0	1	0	0	0	1
09:00 10:00	2	0	2	0	0	0	2
11:30 12:30	0	3	3	0	1	1	4
12:30 13:30	0	0	0	0	0	0	0
15:00 16:00	1	5	6	4	6	10	16
16:00 17:00	5	3	8	1	0	1	9
17:00 18:00	1	2	3	0	0	0	3
Total	16	14	30	6	8	14	44

Comment:



Public Works - Traffic Services
Turning Movement Count - Heavy Vehicle Report

W.O.
 35199

TENTH LINE RD @ VANGUARD DR

Survey Date: Tuesday, August 18, 2015

Time Period	TENTH LINE RD								VANGUARD DR								W TOT	STR TOT	Grand Total
	Northbound				Southbound				Eastbound				Westbound						
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT			
07:00 08:00	3	14	0	17	1	6	2	9	26	2	0	0	2	0	0	0	0	2	28
08:00 09:00	1	13	0	14	0	5	2	7	21	3	3	0	6	0	1	0	1	7	28
09:00 10:00	1	31	0	32	0	14	0	14	46	0	0	1	1	0	0	0	0	1	47
11:30 12:30	1	53	1	55	2	12	2	16	71	5	1	1	7	1	1	0	2	9	80
12:30 13:30	10	33	0	43	0	18	0	18	61	8	0	0	8	8	1	3	12	20	81
15:00 16:00	3	10	1	14	2	11	1	14	28	5	2	6	13	2	2	2	6	19	47
16:00 17:00	1	18	0	19	1	5	1	7	26	2	1	1	4	1	1	0	2	6	32
17:00 18:00	1	46	0	47	0	56	0	56	103	5	1	2	8	1	2	1	4	12	115
Sub Total	21	218	2	241	6	127	8	141	382	30	8	11	49	13	8	6	27	76	458
U-Turns (Heavy Vehicles)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	21	218	2	241	6	127	8	141	382	30	8	11	49	13	8	6	27	76	458

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.

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

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix B Site Traffic Volumes
January 4, 2017

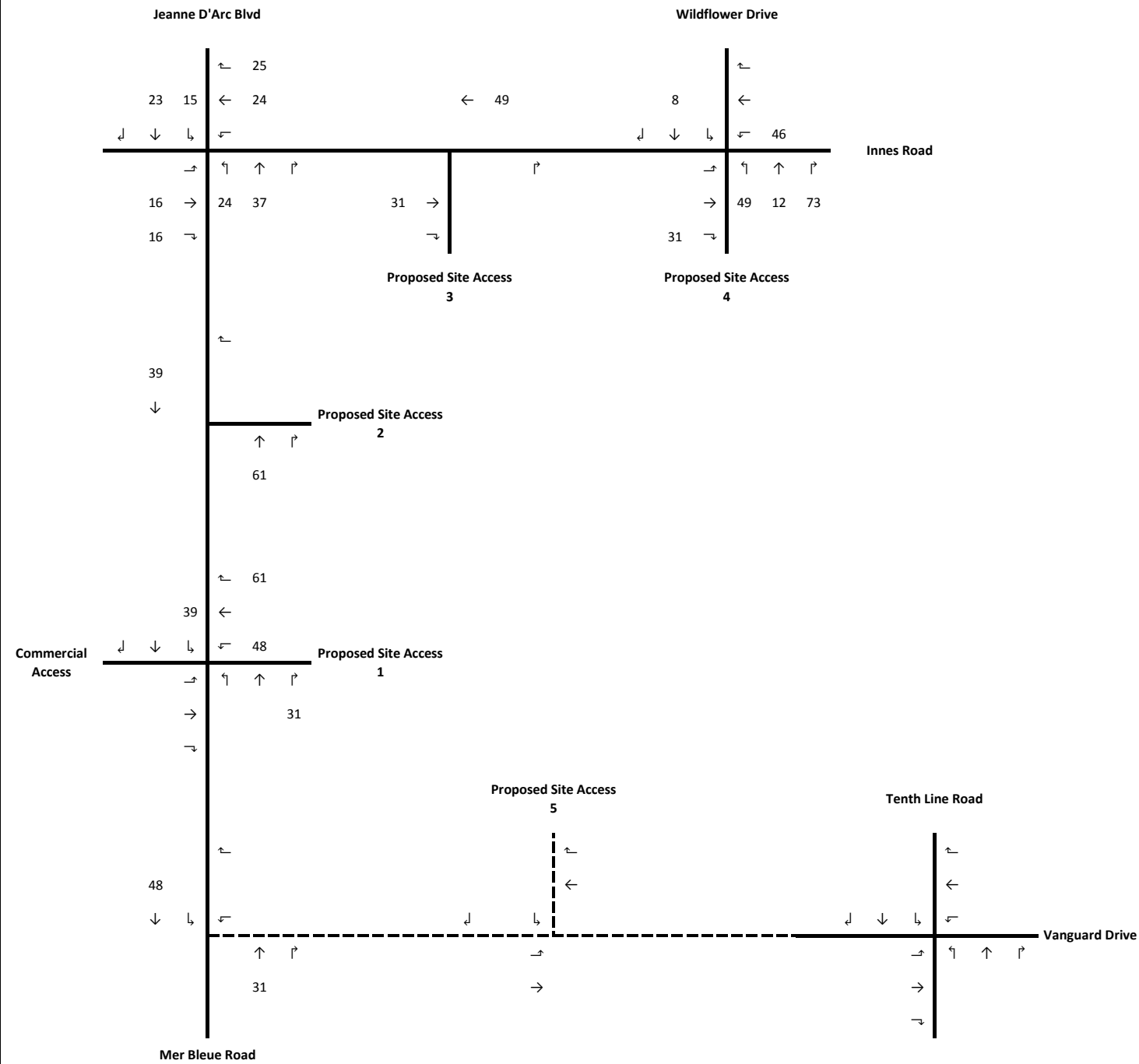
Appendix B SITE TRAFFIC VOLUMES

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

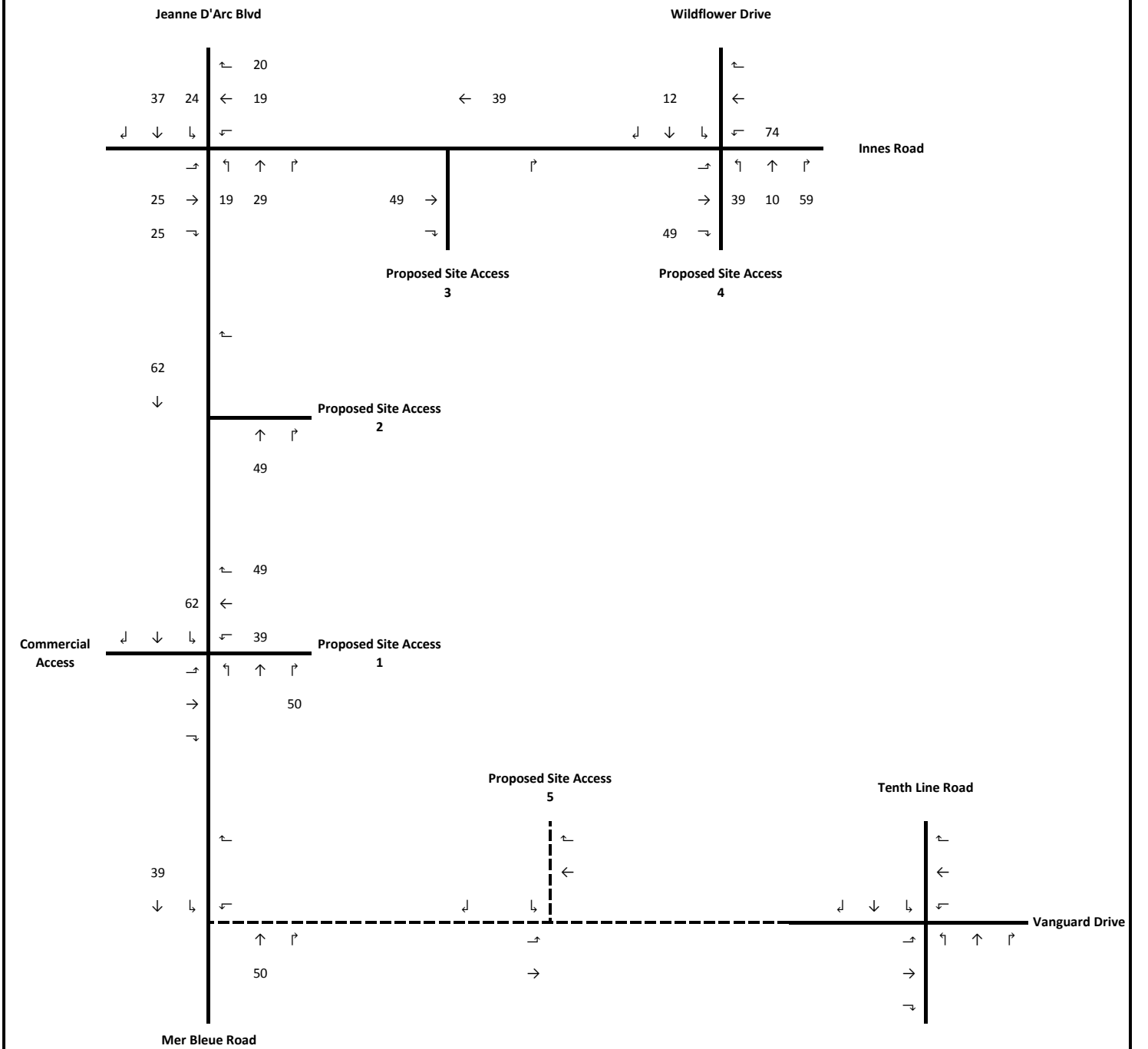
Appendix B Site Traffic Volumes
January 4, 2017

**B.1 SITE TRAFFIC VOLUMES - WITHOUT THE VANGUARD DRIVE
EXTENSION**

AM Peak Hour

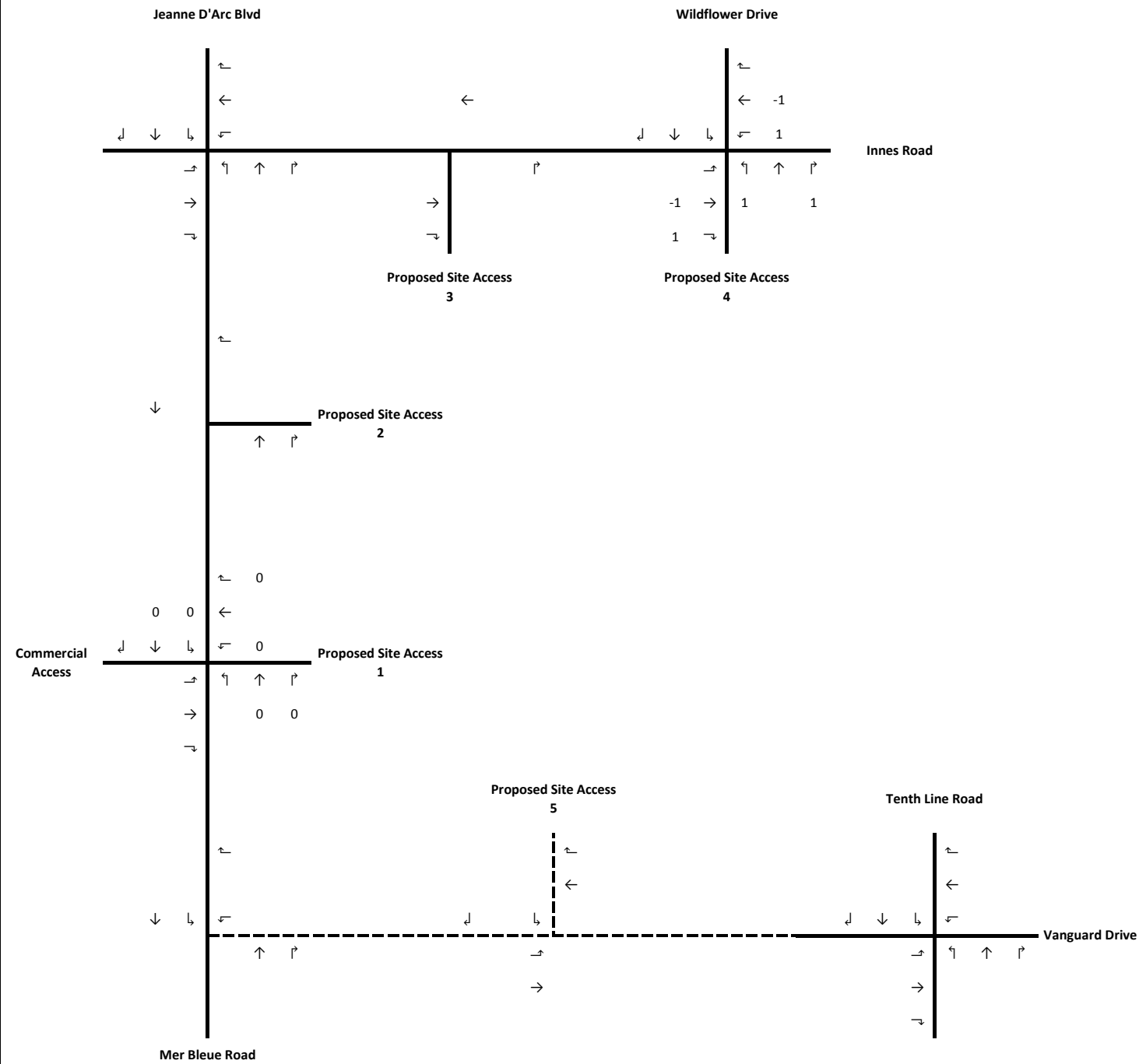


PM Peak Hour

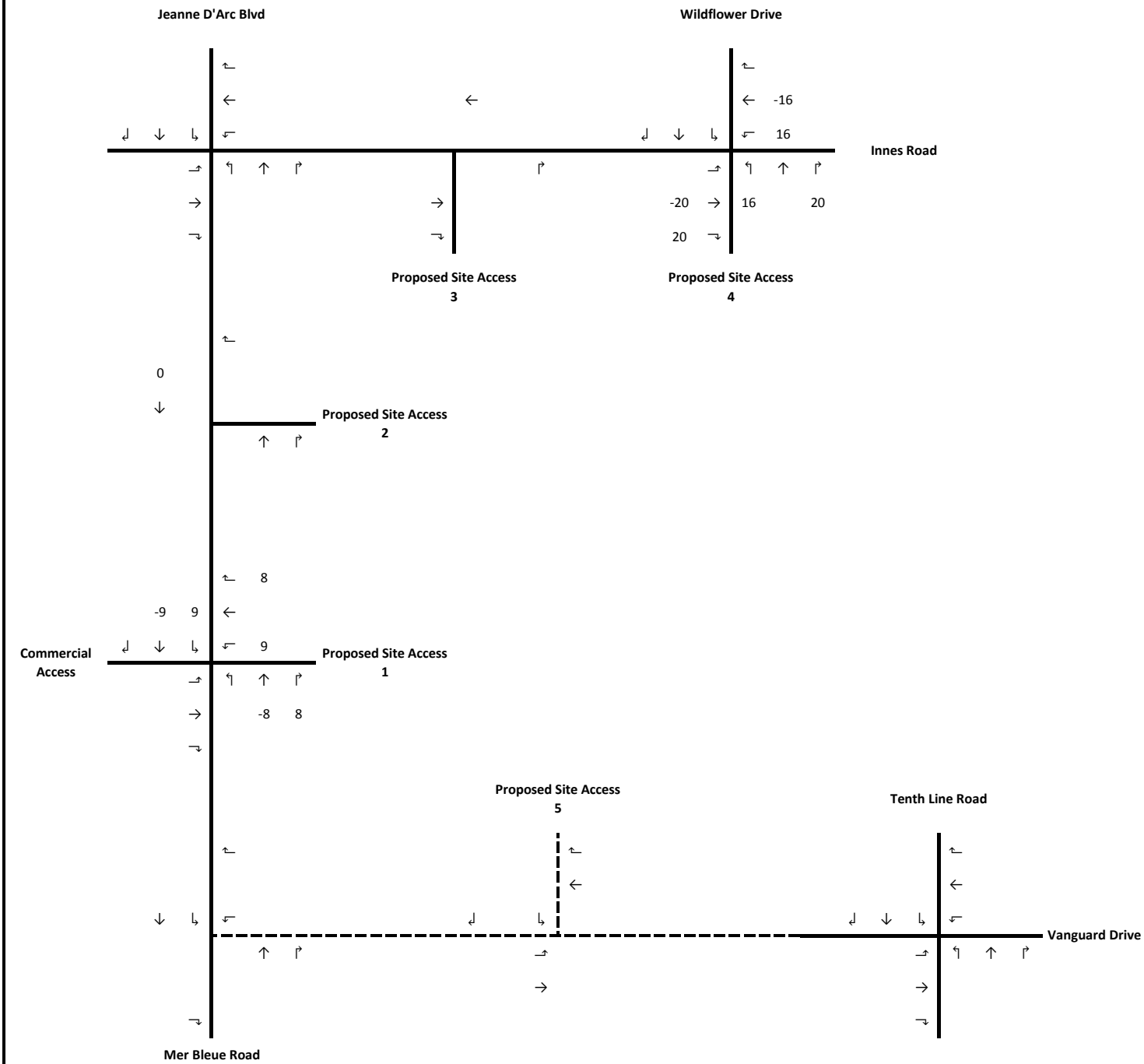


SmartREIT
 Orleans Development
 Site Trips
 without the Vanguard Drive Extension

AM Peak Hour

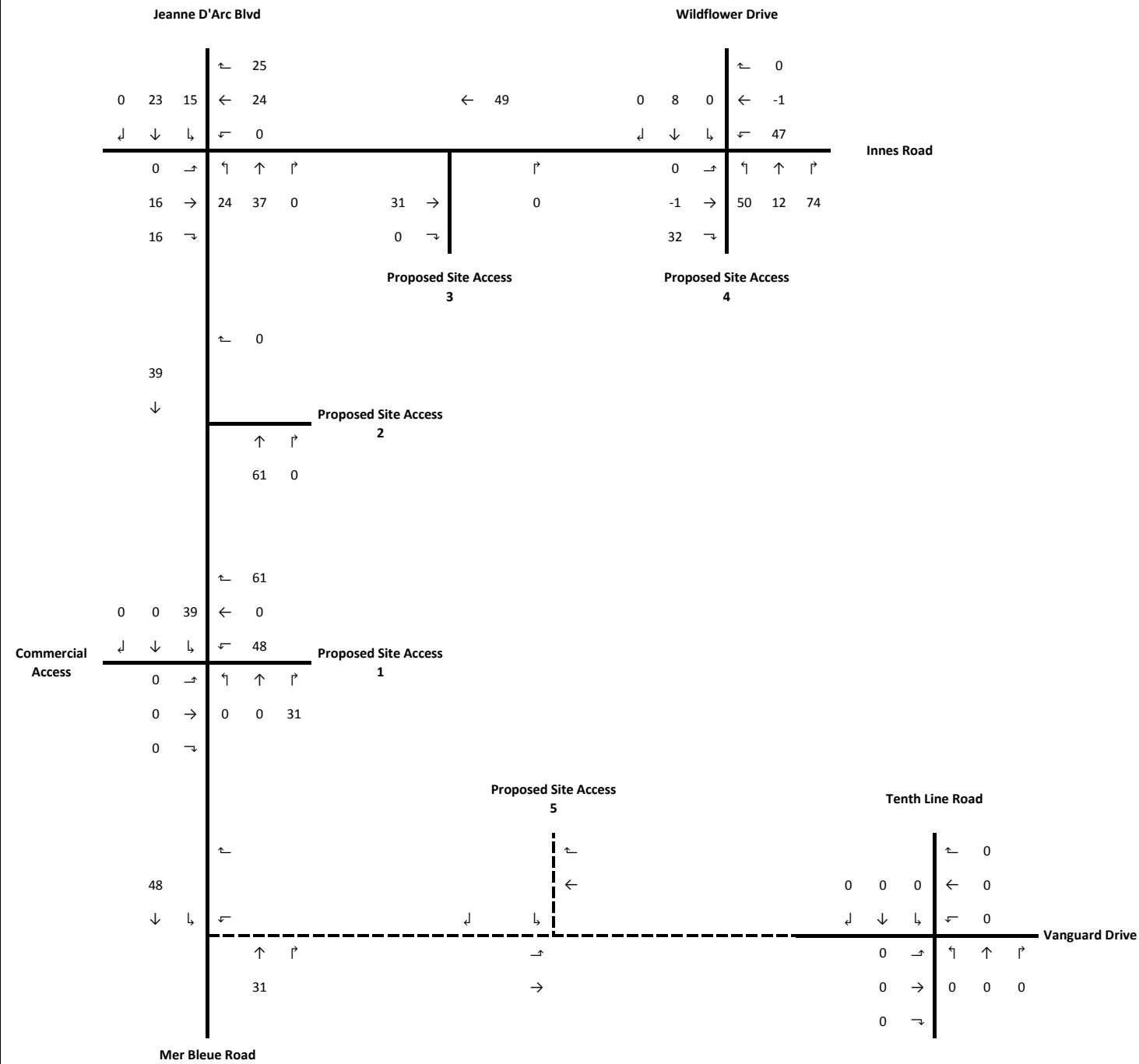


PM Peak Hour

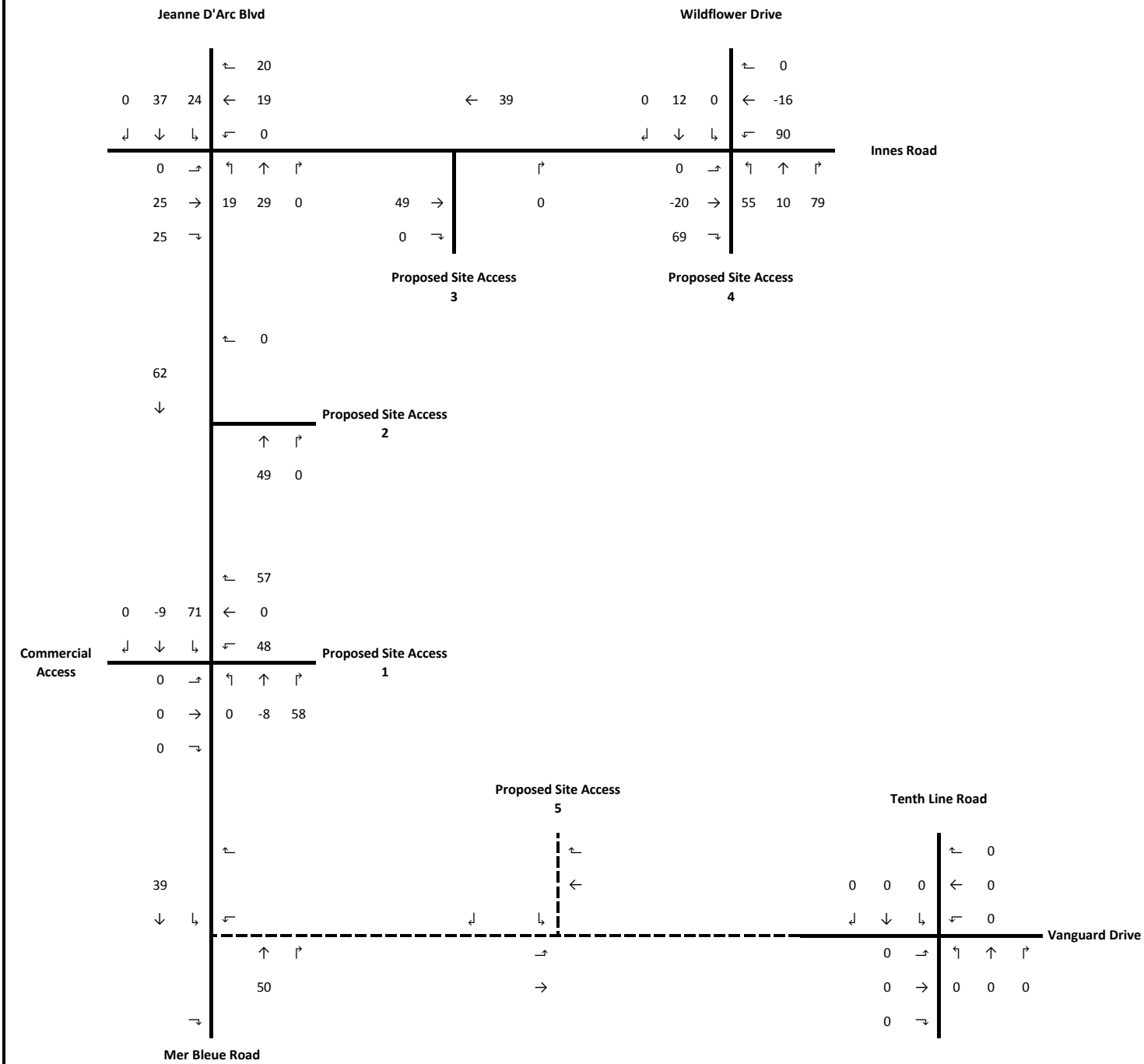


SmartREIT
 Orleans Development
 Pass-By Trips
 without the Vanguard Drive Extension

AM Peak Hour



PM Peak Hour



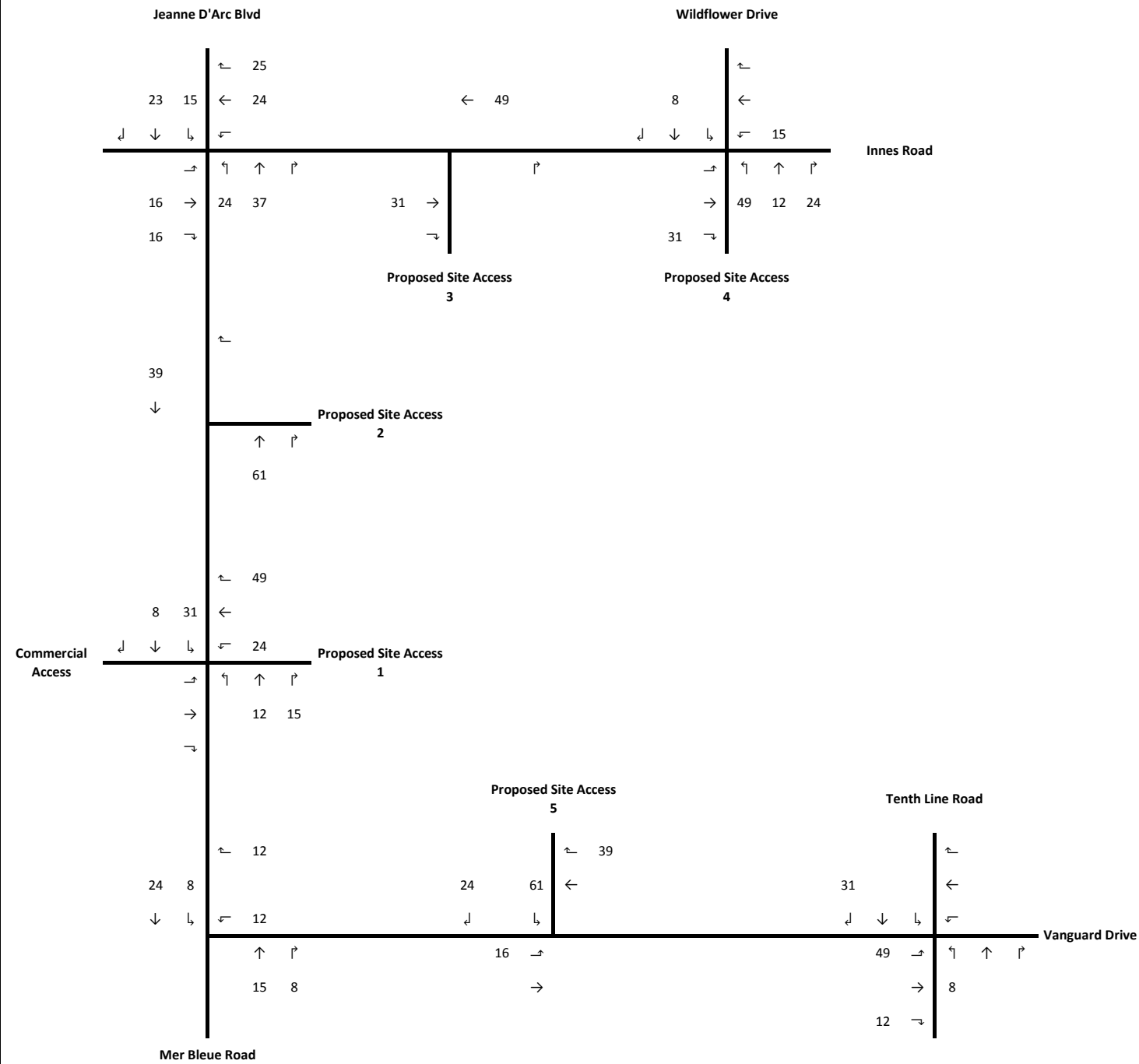
SmartREIT
 Orleans Development
 Net New Site Trips
 without the Vanguard Drive Extension

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

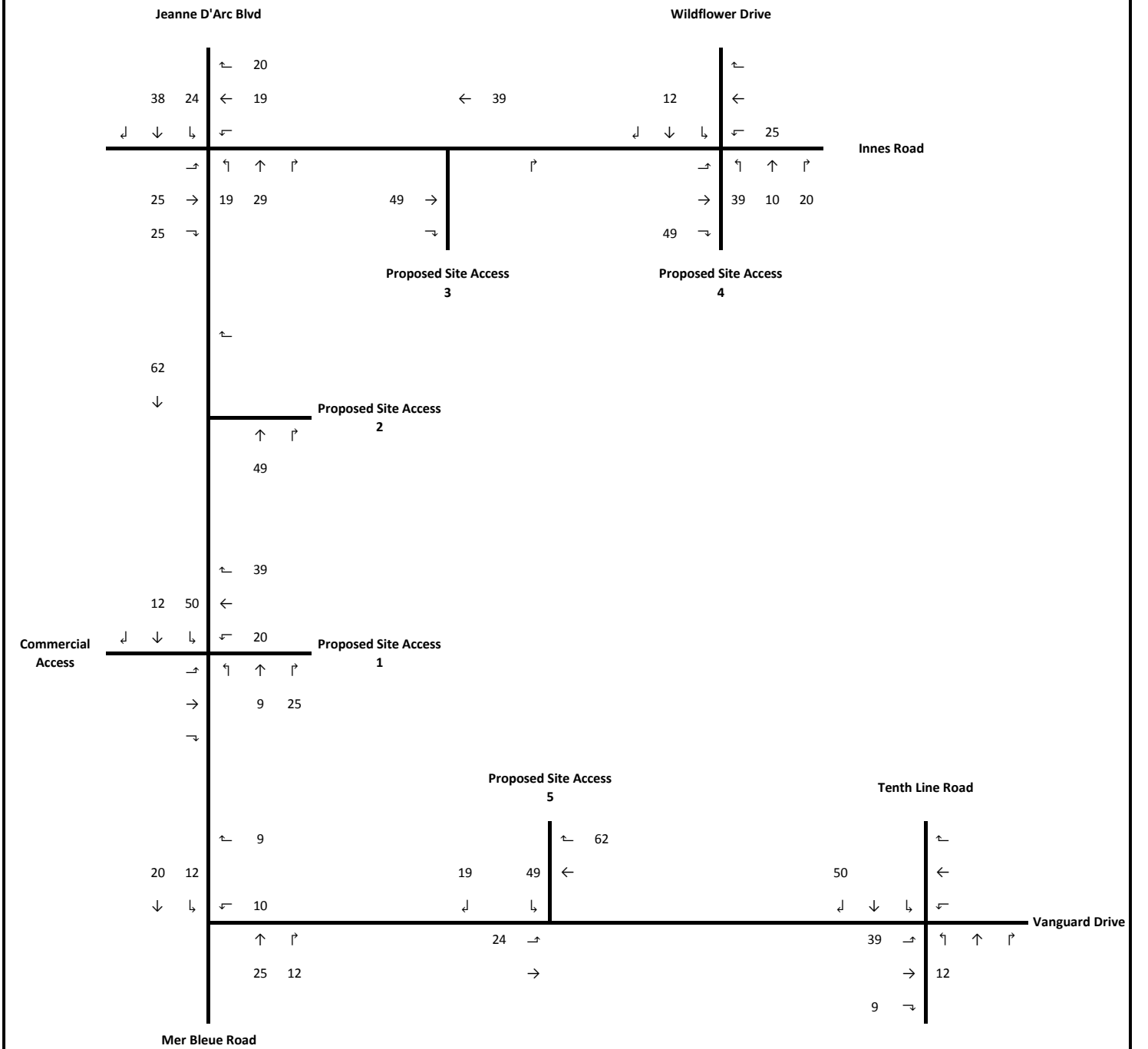
Appendix B Site Traffic Volumes
January 4, 2017

B.2 SITE TRAFFIC VOLUMES - WITH THE VANGUARD DRIVE EXTENSION

AM Peak Hour

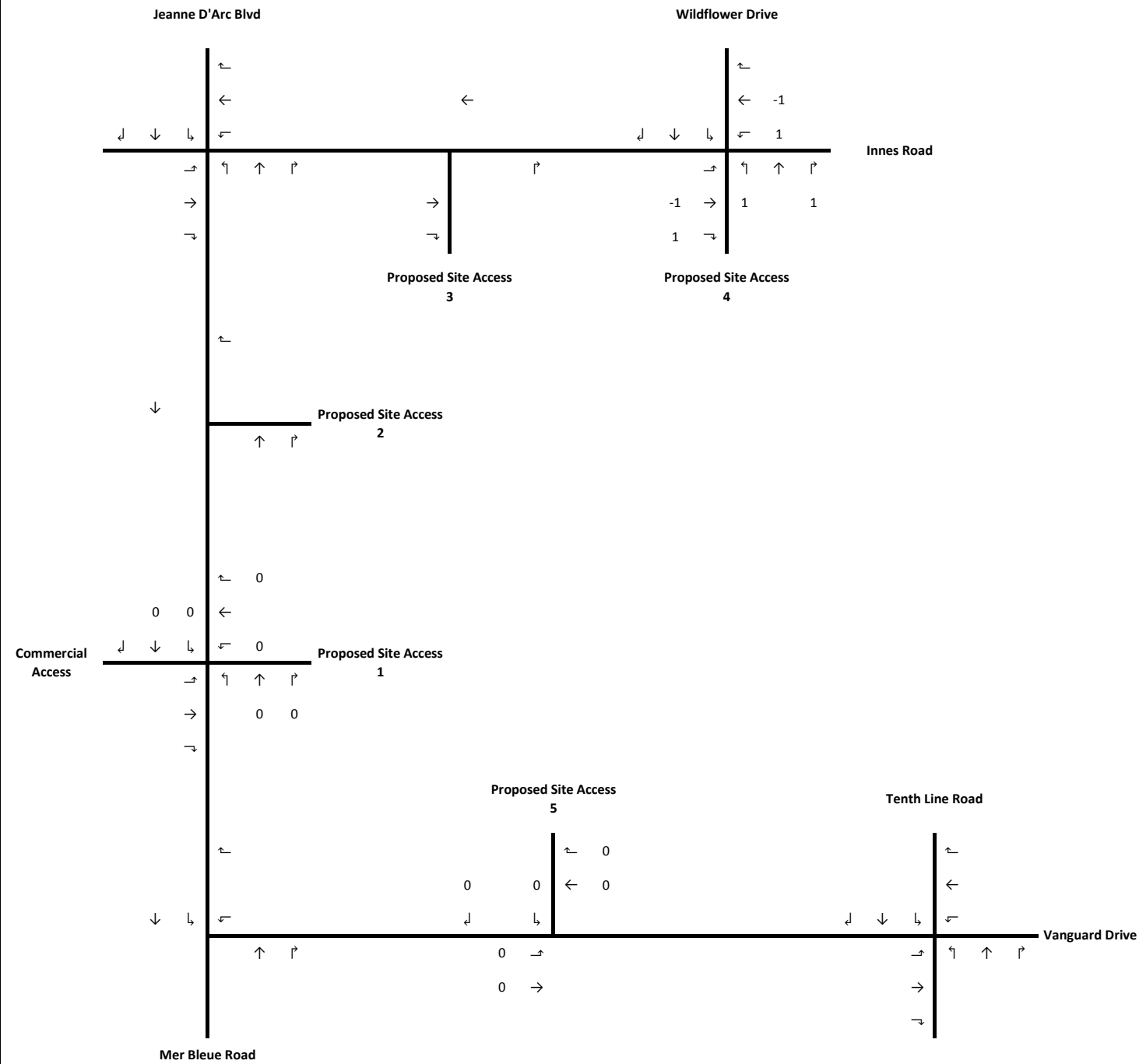


PM Peak Hour

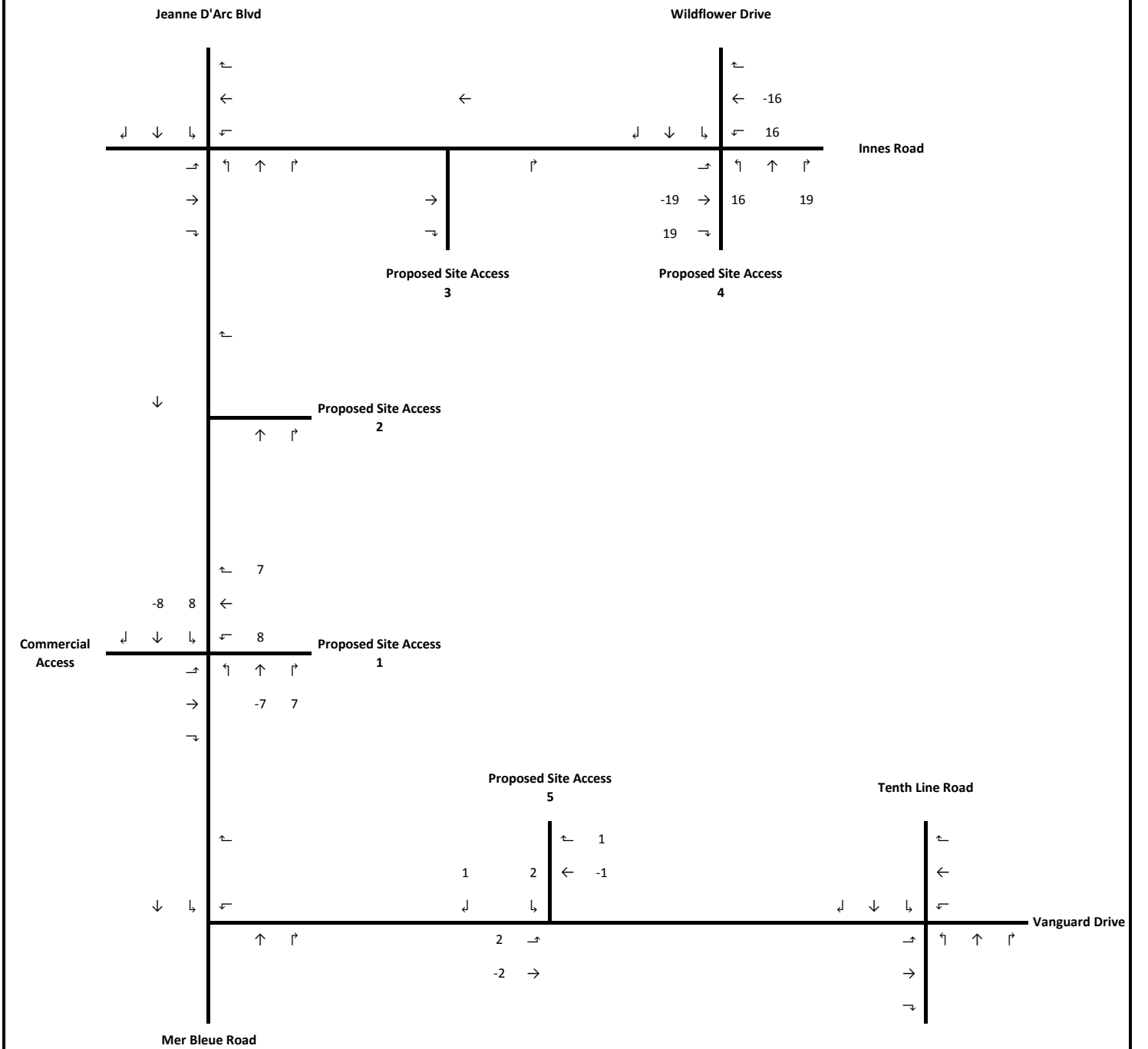


SmartREIT
 Orleans Development
 Site Trips
 with the Vanguard Drive Extension

AM Peak Hour

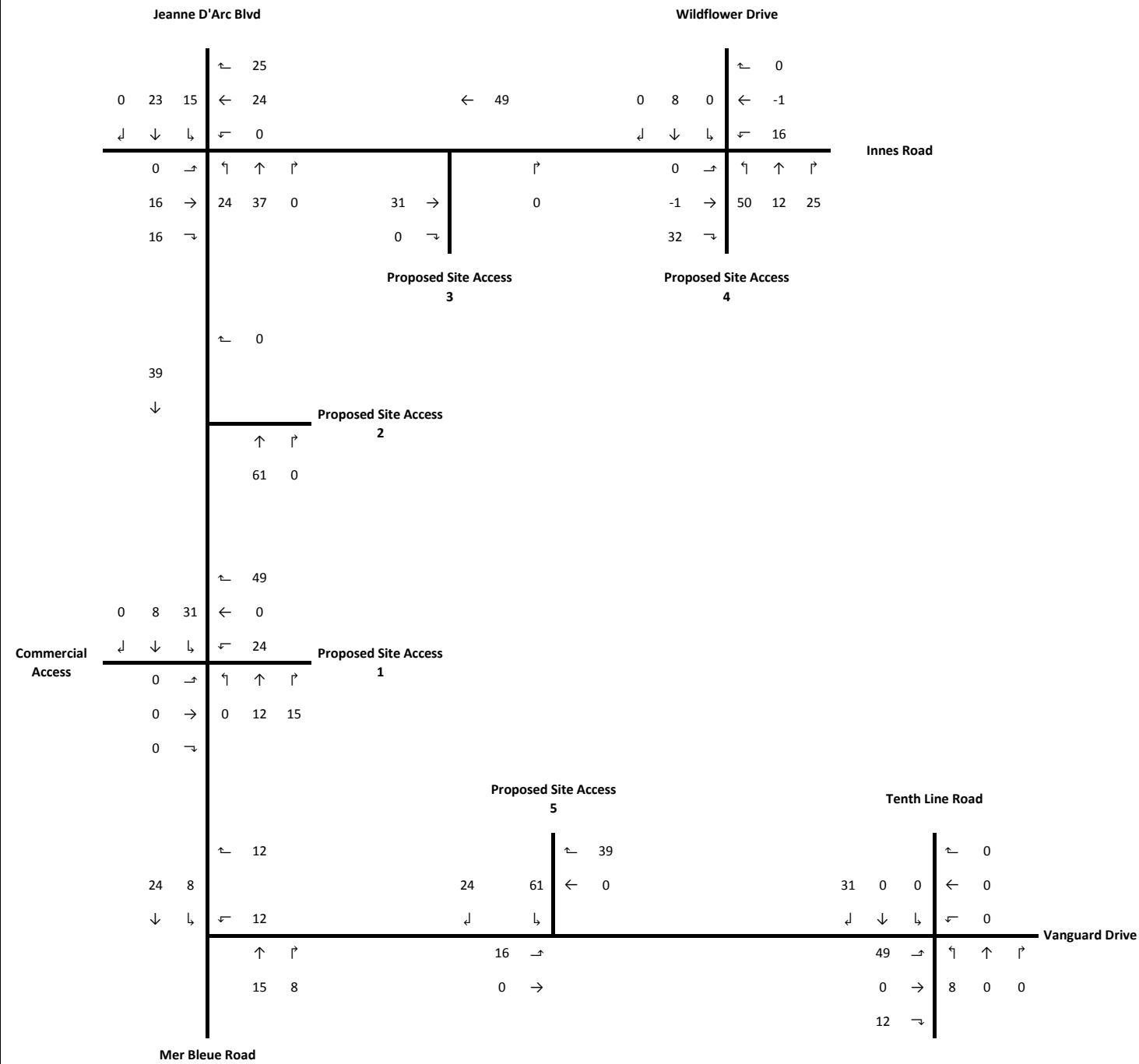


PM Peak Hour

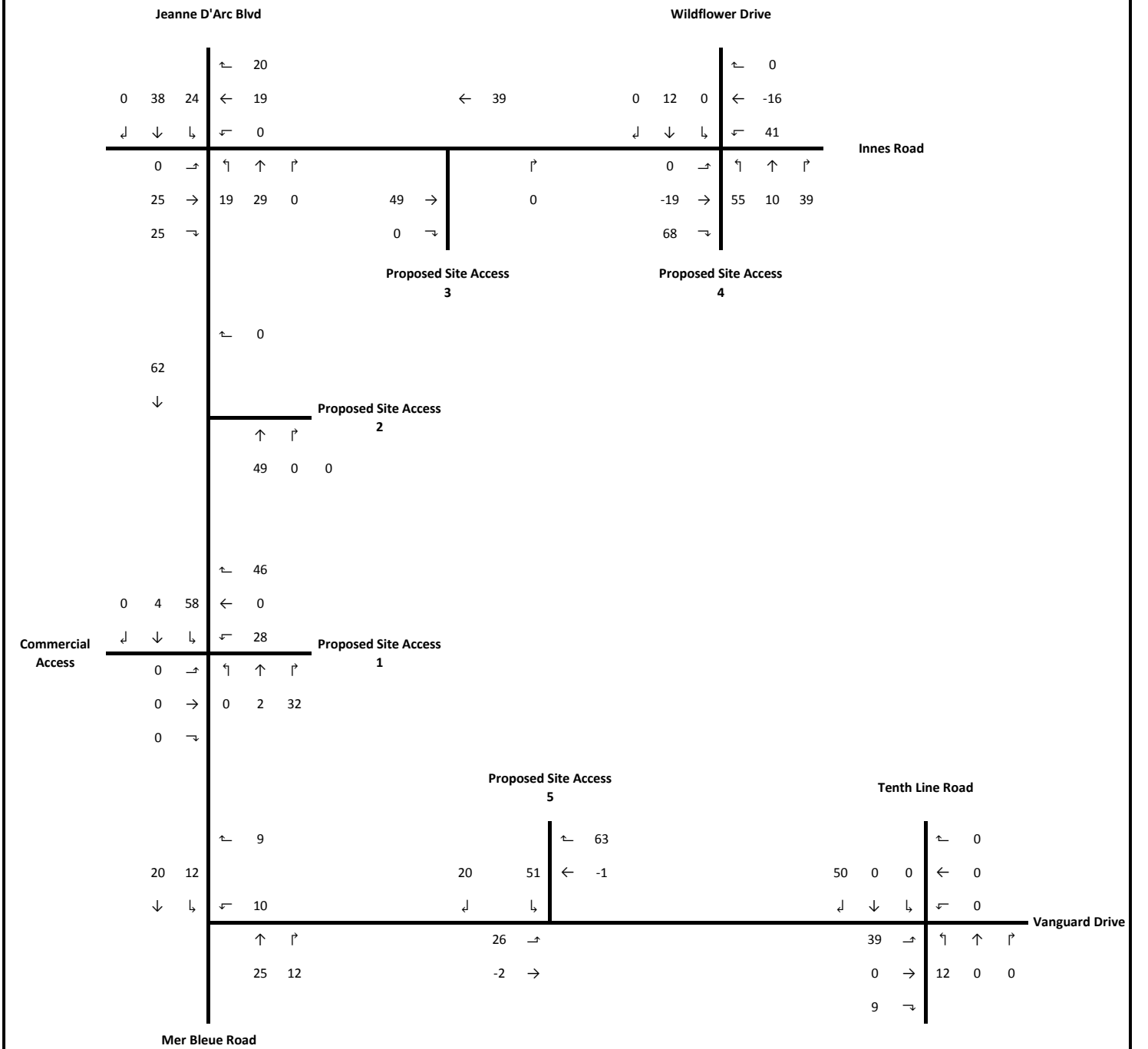


SmartREIT
 Orleans Development
 Pass-By Trips
 with the Vanguard Drive Extension

AM Peak Hour



PM Peak Hour



SmartREIT
 Orleans Development
 Net New Site Trips
 with the Vanguard Drive Extension

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix C Intersection Performance Worksheets
January 4, 2017

Appendix C INTERSECTION PERFORMANCE WORKSHEETS

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix C Intersection Performance Worksheets
January 4, 2017

C.1 2016 EXISTING CONDITIONS

Queues
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2016 Existing AM

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	630	42	137	1323	336	208	298	180	162
v/c Ratio	0.35	0.39	0.05	0.32	0.77	0.36	0.43	0.66	0.55	0.51
Control Delay	15.8	20.2	0.1	9.2	24.3	4.7	45.2	46.9	53.6	36.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	20.2	0.1	9.2	24.3	4.7	45.2	46.9	53.6	36.2
Queue Length 50th (m)	5.5	46.4	0.0	10.4	125.7	11.2	21.0	28.5	19.1	11.3
Queue Length 95th (m)	12.5	62.2	0.0	17.7	#166.5	31.0	31.9	40.8	30.0	21.3
Internal Link Dist (m)		116.7		292.9			191.3		134.6	
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	188	1612	802	423	1713	932	482	675	329	682
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	0.35	0.39	0.05	0.32	0.77	0.36	0.43	0.44	0.55	0.24

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2016 Existing AM

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	60	580	39	126	1217	309	191	206	68	166	96	53
Future Volume (vph)	60	580	39	126	1217	309	191	206	68	166	96	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3264		3288	3208	
Flt Permitted	0.10	1.00	1.00	0.35	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	181	3390	1517	620	3390	1517	3288	3264		3288	3208	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	630	42	137	1323	336	208	224	74	180	104	58
RTOR Reduction (vph)	0	0	22	0	0	170	0	31	0	0	53	0
Lane Group Flow (vph)	65	630	20	137	1323	166	208	267	0	180	109	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	57.8	52.3	52.3	61.8	54.3	54.3	16.2	14.2		11.0	9.0	
Effective Green, g (s)	57.8	52.3	52.3	61.8	54.3	54.3	16.2	14.2		11.0	9.0	
Actuated g/C Ratio	0.53	0.48	0.48	0.56	0.49	0.49	0.15	0.13		0.10	0.08	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	170	1611	721	421	1673	748	484	421		328	262	
v/s Ratio Prot	0.02	0.19		c0.02	c0.39		c0.06	c0.08		c0.05	0.03	
v/s Ratio Perm	0.18		0.01	0.16		0.11						
v/c Ratio	0.38	0.39	0.03	0.33	0.79	0.22	0.43	0.63		0.55	0.42	
Uniform Delay, d1	16.8	18.6	15.3	11.9	23.1	15.8	42.7	45.4		47.1	48.0	
Progression Factor	1.00	1.00	1.00	0.68	0.88	1.80	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.7	0.1	0.4	3.2	0.6	0.6	3.1		1.9	1.1	
Delay (s)	18.3	19.3	15.4	8.4	23.4	29.1	43.3	48.5		49.0	49.1	
Level of Service	B	B	B	A	C	C	D	D		D	D	
Approach Delay (s)		19.0			23.4			46.4			49.0	
Approach LOS		B			C			D			D	

Intersection Summary

HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues
2: Innes Road & Wildflower Drive

SmartREIT Orleans
2016 Existing AM

	↖	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	872	1746	16	53
v/c Ratio	0.07	0.30	0.60	0.14	0.40
Control Delay	2.4	1.7	4.4	49.9	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	1.7	4.4	49.9	31.2
Queue Length 50th (m)	0.3	11.1	51.3	3.3	3.5
Queue Length 95th (m)	m0.9	17.6	82.2	10.0	15.4
Internal Link Dist (m)		292.9	121.0	48.5	
Turn Bay Length (m)	40.0		20.0		
Base Capacity (vph)	177	2899	2899	340	333
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	0.07	0.30	0.60	0.05	0.16

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Innes Road & Wildflower Drive

SmartREIT Orleans
2016 Existing AM

	↖	→	←	↙	↘	
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖↗	↖↗		↖	↗
Traffic Volume (vph)	12	802	1603	4	15	49
Future Volume (vph)	12	802	1603	4	15	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2		5.9	5.9
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1695	3390	3389		1695	1517
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	207	3390	3389		1695	1517
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	872	1742	4	16	53
RTOR Reduction (vph)	0	0	0	0	0	34
Lane Group Flow (vph)	13	872	1746	0	16	19
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	91.7	91.7	91.7		6.2	6.2
Effective Green, g (s)	91.7	91.7	91.7		6.2	6.2
Actuated g/C Ratio	0.83	0.83	0.83		0.06	0.06
Clearance Time (s)	6.2	6.2	6.2		5.9	5.9
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	172	2826	2825		95	85
v/s Ratio Prot		0.26	c0.52		0.01	
v/s Ratio Perm	0.06					c0.01
v/c Ratio	0.08	0.31	0.62		0.17	0.22
Uniform Delay, d1	1.6	2.0	3.1		49.4	49.6
Progression Factor	0.71	0.67	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.3	0.4		0.8	1.3
Delay (s)	1.9	1.6	3.5		50.3	50.9
Level of Service	A	A	A		D	D
Approach Delay (s)		1.6	3.5		50.8	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.1
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access

SmartREIT Orleans

2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	91	35	7	10	99	407	9	28	184	98
v/c Ratio	0.45	0.14	0.04	0.04	0.12	0.17	0.01	0.04	0.08	0.09
Control Delay	31.4	10.6	21.3	14.2	5.7	4.9	0.0	5.3	4.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	10.6	21.3	14.2	5.7	4.9	0.0	5.3	4.7	1.7
Queue Length 50th (m)	9.6	0.3	0.7	0.2	3.8	8.4	0.0	1.0	3.5	0.0
Queue Length 95th (m)	20.6	6.4	3.5	3.5	10.4	16.1	0.0	4.0	7.8	4.6
Internal Link Dist (m)		56.1		76.2		461.2			191.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	618	728	605	729	804	2404	1090	649	2404	1104
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	0.05	0.01	0.01	0.12	0.17	0.01	0.04	0.08	0.09

Intersection Summary

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access

SmartREIT Orleans

2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	84	3	29	6	2	7	91	374	8	26	169	90
Future Volume (vph)	84	3	29	6	2	7	91	374	8	26	169	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1540		1695	1570		1695	3390	1517	1695	3390	1517
Flt Permitted	0.75	1.00		0.73	1.00		0.64	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	1340	1540		1310	1570		1135	3390	1517	915	3390	1517
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	3	32	7	2	8	99	407	9	28	184	98
RTOR Reduction (vph)	0	28	0	0	7	0	0	0	3	0	0	32
Lane Group Flow (vph)	91	7	0	7	3	0	99	407	6	28	184	66
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	8.4	8.4		8.4	8.4		44.0	44.0	44.0	44.0	44.0	44.0
Effective Green, g (s)	8.4	8.4		8.4	8.4		44.0	44.0	44.0	44.0	44.0	44.0
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	172	197		168	201		763	2280	1020	615	2280	1020
v/s Ratio Prot		0.00			0.00			c0.12				0.05
v/s Ratio Perm	c0.07			0.01			0.09		0.00	0.03		0.04
v/c Ratio	0.53	0.04		0.04	0.02		0.13	0.18	0.01	0.05	0.08	0.06
Uniform Delay, d1	26.7	25.0		25.0	24.9		3.8	4.0	3.5	3.6	3.7	3.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.1		0.1	0.0		0.4	0.2	0.0	0.1	0.1	0.1
Delay (s)	29.6	25.0		25.1	24.9		4.2	4.2	3.5	3.8	3.8	3.8
Level of Service	C	C		C	C		A	A	A	A	A	A
Approach Delay (s)		28.3			25.0			4.1				3.8
Approach LOS		C			C			A				A

Intersection Summary

HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	65.4	Sum of lost time (s)	13.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues
4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	56	63	34	211	723	60	39	312	36
v/c Ratio	0.52	0.29	0.49	0.19	0.26	0.26	0.05	0.07	0.11	0.03
Control Delay	59.8	25.8	58.6	40.9	4.2	3.3	1.0	3.5	2.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	25.8	58.6	40.9	4.2	3.3	1.0	3.5	2.9	1.2
Queue Length 50th (m)	14.1	4.4	13.0	5.8	9.5	17.3	0.0	1.5	6.4	0.0
Queue Length 95th (m)	27.0	15.5	25.5	14.6	21.1	28.8	2.9	4.7	12.0	2.2
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	261	350	255	351	826	2794	1260	554	2794	1256
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	0.26	0.16	0.25	0.10	0.26	0.26	0.05	0.07	0.11	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis
4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖		↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	63	20	31	58	27	5	194	665	55	36	287	33
Future Volume (vph)	63	20	31	58	27	5	194	665	55	36	287	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1622		1695	1745		1695	3390	1517	1695	3390	1517
Flt Permitted	0.73	1.00		0.72	1.00		0.56	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)	1311	1622		1286	1745		1003	3390	1517	672	3390	1517
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	22	34	63	29	5	211	723	60	39	312	36
RTOR Reduction (vph)	0	31	0	0	5	0	0	0	12	0	0	7
Lane Group Flow (vph)	68	25	0	63	29	0	211	723	48	39	312	29
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	9.8	9.8		9.8	9.8		88.3	88.3	88.3	88.3	88.3	88.3
Effective Green, g (s)	9.8	9.8		9.8	9.8		88.3	88.3	88.3	88.3	88.3	88.3
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	116	144		114	155		805	2721	1217	539	2721	1217
v/s Ratio Prot		0.02			0.02			c0.21			0.09	
v/s Ratio Perm	c0.05			0.05			0.21		0.03	0.06		0.02
v/c Ratio	0.59	0.17		0.55	0.19		0.26	0.27	0.04	0.07	0.11	0.02
Uniform Delay, d1	48.2	46.4		48.0	46.4		2.7	2.7	2.2	2.3	2.4	2.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	0.6		5.7	0.6		0.8	0.2	0.1	0.3	0.1	0.0
Delay (s)	55.5	46.9		53.7	47.0		3.5	3.0	2.3	2.5	2.4	2.2
Level of Service	E	D		D	D		A	A	A	A	A	A
Approach Delay (s)		51.6			51.4			3.0			2.4	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2016 Existing AM

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	132	1239	61	198	922	314	179	487	273	385
v/c Ratio	0.43	0.82	0.08	0.80	0.57	0.35	0.48	0.84	0.72	0.77
Control Delay	17.4	37.6	0.2	54.6	24.6	2.8	57.9	48.2	66.4	59.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	37.6	0.2	54.6	24.6	2.8	57.9	48.2	66.4	59.5
Queue Length 50th (m)	14.5	148.4	0.0	26.0	90.7	7.0	22.2	42.4	35.0	46.0
Queue Length 95th (m)	25.6	179.2	0.0	#78.5	119.1	10.7	33.8	60.9	49.2	62.2
Internal Link Dist (m)		116.7			292.9			191.3		134.6
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	326	1511	748	247	1616	887	424	655	422	574
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	0.40	0.82	0.08	0.80	0.57	0.35	0.42	0.74	0.65	0.67

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2016 Existing AM

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↘	↖	↖↗	↘	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	121	1140	56	182	848	289	165	165	283	251	260	94
Future Volume (vph)	121	1140	56	182	848	289	165	165	283	251	260	94
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3069		3288	3255	
Flt Permitted	0.23	1.00	1.00	0.09	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	412	3390	1517	152	3390	1517	3288	3069		3288	3255	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	132	1239	61	198	922	314	179	179	308	273	283	102
RTOR Reduction (vph)	0	0	34	0	0	164	0	146	0	0	29	0
Lane Group Flow (vph)	132	1239	27	198	922	150	179	341	0	273	356	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	67.4	57.9	57.9	75.4	61.9	61.9	14.8	18.5		15.1	18.8	
Effective Green, g (s)	67.4	57.9	57.9	75.4	61.9	61.9	14.8	18.5		15.1	18.8	
Actuated g/C Ratio	0.52	0.45	0.45	0.58	0.48	0.48	0.11	0.14		0.12	0.14	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	307	1509	675	248	1614	722	374	436		381	470	
v/s Ratio Prot	0.03	0.37		c0.08	c0.27		0.05	c0.11		c0.08	0.11	
v/s Ratio Perm	0.19		0.02	c0.38		0.10						
v/c Ratio	0.43	0.82	0.04	0.80	0.57	0.21	0.48	0.78		0.72	0.76	
Uniform Delay, d1	17.4	31.5	20.4	30.4	24.5	19.8	54.0	53.8		55.4	53.4	
Progression Factor	1.00	1.00	1.00	1.28	0.90	0.72	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	5.1	0.1	14.7	1.3	0.6	1.0	8.9		6.3	6.9	
Delay (s)	18.4	36.7	20.5	53.7	23.3	14.9	55.0	62.7		61.7	60.3	
Level of Service	B	D	C	D	C	B	D	E		E	E	
Approach Delay (s)		34.3			25.7			60.6			60.9	
Approach LOS		C			C			E			E	

Intersection Summary

HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues
2: Innes Road & Wildflower Drive

SmartREIT Orleans
2016 Existing AM

	↖	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	51	1768	1431	40	26
v/c Ratio	0.19	0.60	0.49	0.36	0.21
Control Delay	2.1	1.9	3.3	66.4	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	1.9	3.3	66.4	23.1
Queue Length 50th (m)	1.2	30.0	40.0	10.0	0.0
Queue Length 95th (m)	m1.7	36.8	58.7	21.5	9.0
Internal Link Dist (m)		292.9	121.0	48.5	
Turn Bay Length (m)	40.0		20.0		
Base Capacity (vph)	268	2944	2938	288	279
Starvation Cap Reductn	0	10	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.60	0.49	0.14	0.09

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Innes Road & Wildflower Drive

SmartREIT Orleans
2016 Existing AM

	↖	→	←	↙	↘	
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖↗	↖↗		↖	↗
Traffic Volume (vph)	47	1627	1295	21	37	24
Future Volume (vph)	47	1627	1295	21	37	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2		5.9	5.9
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1695	3390	3382		1695	1517
Flt Permitted	0.17	1.00	1.00		0.95	1.00
Satd. Flow (perm)	308	3390	3382		1695	1517
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	1768	1408	23	40	26
RTOR Reduction (vph)	0	0	0	0	0	25
Lane Group Flow (vph)	51	1768	1431		40	1
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	110.5	110.5	110.5		7.4	7.4
Effective Green, g (s)	110.5	110.5	110.5		7.4	7.4
Actuated g/C Ratio	0.85	0.85	0.85		0.06	0.06
Clearance Time (s)	6.2	6.2	6.2		5.9	5.9
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	261	2881	2874		96	86
v/s Ratio Prot		c0.52	0.42		c0.02	
v/s Ratio Perm	0.17					0.00
v/c Ratio	0.20	0.61	0.50		0.42	0.02
Uniform Delay, d1	1.8	3.1	2.5		59.2	57.9
Progression Factor	0.48	0.41	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.6	0.1		2.9	0.1
Delay (s)	1.8	1.8	2.7		62.1	57.9
Level of Service	A	A	A		E	E
Approach Delay (s)		1.8	2.7		60.5	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.1
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access

SmartREIT Orleans

2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	296	109	9	25	157	347	4	26	578	170
v/c Ratio	0.73	0.20	0.02	0.05	0.43	0.22	0.01	0.06	0.36	0.21
Control Delay	29.4	4.4	13.1	6.3	17.3	10.9	0.0	11.5	12.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	4.4	13.1	6.3	17.3	10.9	0.0	11.5	12.0	3.2
Queue Length 50th (m)	27.9	0.2	0.7	0.1	10.4	10.6	0.0	1.4	19.3	0.0
Queue Length 95th (m)	50.0	8.1	3.1	4.0	31.6	23.4	0.0	6.3	39.3	9.9
Internal Link Dist (m)		56.1		76.2		125.8			191.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	661	815	613	776	366	1602	746	459	1602	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	0.45	0.13	0.01	0.03	0.43	0.22	0.01	0.06	0.36	0.21

Intersection Summary

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access

SmartREIT Orleans

2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	272	2	98	8	1	22	144	319	4	24	532	156
Future Volume (vph)	272	2	98	8	1	22	144	319	4	24	532	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1522		1695	1527		1695	3390	1517	1695	3390	1517
Flt Permitted	0.74	1.00		0.69	1.00		0.43	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	1322	1522		1225	1527		775	3390	1517	970	3390	1517
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	296	2	107	9	1	24	157	347	4	26	578	170
RTOR Reduction (vph)	0	74	0	0	17	0	0	0	2	0	0	89
Lane Group Flow (vph)	296	35	0	9	8	0	157	347	2	26	578	81
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	18.1	18.1		18.1	18.1		28.0	28.0	28.0	28.0	28.0	28.0
Effective Green, g (s)	18.1	18.1		18.1	18.1		28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	404	466		375	467		367	1606	718	459	1606	718
v/s Ratio Prot		0.02			0.01			0.10			0.17	
v/s Ratio Perm	c0.22			0.01			c0.20		0.00	0.03		0.05
v/c Ratio	0.73	0.07		0.02	0.02		0.43	0.22	0.00	0.06	0.36	0.11
Uniform Delay, d1	18.3	14.6		14.3	14.3		10.3	9.1	8.2	8.4	9.9	8.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	0.1		0.0	0.0		3.6	0.3	0.0	0.2	0.6	0.3
Delay (s)	25.1	14.6		14.4	14.3		13.9	9.4	8.2	8.6	10.5	9.0
Level of Service	C	B		B	B		B	A	A	A	B	A
Approach Delay (s)		22.3			14.3			10.8			10.1	
Approach LOS		C			B			B			B	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

11: Vanguard Drive & Tenth Line Road

SmartREIT Orleans

2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	183	257	126	269	116	774	48	27	1030	47
v/c Ratio	1.03	0.57	0.67	0.59	0.42	0.35	0.05	0.07	0.47	0.05
Control Delay	121.7	35.8	60.1	34.0	16.0	10.0	2.2	8.3	11.3	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.7	35.8	60.1	34.0	16.0	10.0	2.2	8.3	11.3	2.2
Queue Length 50th (m)	~46.1	40.9	26.9	40.0	12.1	39.9	0.0	2.2	58.8	0.0
Queue Length 95th (m)	#91.2	68.0	#54.1	68.0	26.8	50.5	4.0	5.7	72.7	4.0
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	177	449	187	457	273	2209	1005	382	2209	1004
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.57	0.67	0.59	0.42	0.35	0.05	0.07	0.47	0.05

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

11: Vanguard Drive & Tenth Line Road

SmartREIT Orleans

2016 Existing AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	168	96	141	116	86	162	107	712	44	25	948	43
Future Volume (vph)	168	96	141	116	86	162	107	712	44	25	948	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	0.95	1.00	1.00
Frt	1.00	0.91		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1625		1695	1609		1695	3390	1517	1695	3390	1517
Flt Permitted	0.40	1.00		0.42	1.00		0.23	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	714	1625		752	1609		419	3390	1517	587	3390	1517
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	104	153	126	93	176	116	774	48	27	1030	47
RTOR Reduction (vph)	0	44	0	0	57	0	0	0	17	0	0	16
Lane Group Flow (vph)	183	213	0	126	212	0	116	774	31	27	1030	31
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	29.9	29.9		29.9	29.9		78.2	78.2	78.2	78.2	78.2	78.2
Effective Green, g (s)	29.9	29.9		29.9	29.9		78.2	78.2	78.2	78.2	78.2	78.2
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.65	0.65	0.65	0.65	0.65	0.65
Clearance Time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	404		187	400		273	2209	988	382	2209	988
v/s Ratio Prot		0.13			0.13			0.23			c0.30	
v/s Ratio Perm	c0.26			0.17			0.28		0.02	0.05		0.02
v/c Ratio	1.03	0.53		0.67	0.53		0.42	0.35	0.03	0.07	0.47	0.03
Uniform Delay, d1	45.0	38.9		40.6	39.0		10.1	9.4	7.4	7.6	10.5	7.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	76.8	1.2		9.2	1.3		4.8	0.4	0.1	0.4	0.7	0.1
Delay (s)	121.9	40.2		49.9	40.2		14.9	9.9	7.5	8.0	11.2	7.5
Level of Service	F	D		D	D		B	A	A	A	B	A
Approach Delay (s)		74.2			43.3			10.4				10.9
Approach LOS		E			D			B				B

Intersection Summary

HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix C Intersection Performance Worksheets
January 4, 2017

C.2 2026 FUTURE BACKGROUND CONDITIONS

Queues
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2026 FBG AM

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	722	217	183	1230	376	457	786	230	526
v/c Ratio	0.75	0.61	0.32	0.69	0.78	0.42	0.78	0.89	0.61	0.78
Control Delay	93.7	35.1	5.0	37.9	31.8	3.5	57.7	57.3	57.9	54.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.7	35.1	5.0	37.9	31.8	3.5	57.7	57.3	57.9	54.6
Queue Length 50th (m)	13.8	74.4	0.0	25.9	128.6	0.0	53.2	90.3	27.0	60.3
Queue Length 95th (m)	#46.9	109.2	23.1	#62.5	#194.3	27.4	78.6	#160.0	43.4	#107.4
Internal Link Dist (m)		116.7		151.9			97.1		134.6	
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	88	1188	672	264	1577	906	679	884	498	672
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	0.75	0.61	0.32	0.69	0.78	0.42	0.67	0.89	0.46	0.78

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2026 FBG AM

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	66	722	217	183	1230	376	457	666	120	230	468	58
Future Volume (vph)	66	722	217	183	1230	376	457	666	120	230	468	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.4	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3313		3288	3334	
Flt Permitted	0.14	1.00	1.00	0.22	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	253	3390	1517	385	3390	1517	3288	3313		3288	3334	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	722	217	183	1230	376	457	666	120	230	468	58
RTOR Reduction (vph)	0	0	141	0	0	201	0	12	0	0	8	0
Lane Group Flow (vph)	66	722	76	183	1230	175	457	774	0	230	518	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2		1		6		4		7		3
Permitted Phases	2		2	6		6				8		3
Actuated Green, G (s)	42.0	42.0	42.0	55.8	55.8	55.8	21.3	31.6		13.7	24.0	
Effective Green, g (s)	42.0	42.0	42.0	55.8	55.8	55.8	21.3	31.6		13.7	24.0	
Actuated g/C Ratio	0.35	0.35	0.35	0.46	0.46	0.46	0.18	0.26		0.11	0.20	
Clearance Time (s)	6.4	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	88	1186	530	263	1576	705	583	872		375	666	
v/s Ratio Prot		0.21		0.04	c0.36		c0.14	c0.23		0.07	0.16	
v/s Ratio Perm	0.26		0.05	0.28		0.12						
v/c Ratio	0.75	0.61	0.14	0.70	0.78	0.25	0.78	0.89		0.61	0.78	
Uniform Delay, d1	34.4	32.2	26.7	21.8	27.0	19.4	47.2	42.5		50.6	45.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.7	2.4	0.6	8.1	4.0	0.8	7.2	12.4		3.0	5.9	
Delay (s)	89.1	34.6	27.3	29.9	31.0	20.3	54.3	54.9		53.6	51.4	
Level of Service	F	C	C	C	C	C	D	D		D	D	
Approach Delay (s)		36.6			28.6			54.7			52.1	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	60		

c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 FBG AM

	↖	→	↗	←	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	1038	159	1634	105	56	17	68
v/c Ratio	0.08	0.40	0.45	0.63	0.59	0.22	0.10	0.28
Control Delay	6.4	5.6	11.5	8.2	49.1	14.4	32.2	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	5.6	11.5	8.2	49.1	14.4	32.2	23.1
Queue Length 50th (m)	0.6	31.1	9.7	66.0	17.2	1.5	2.6	5.7
Queue Length 95th (m)	3.5	62.7	40.3	142.3	35.3	12.9	8.7	18.5
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0					20.0		
Base Capacity (vph)	160	2590	354	2599	310	417	314	407
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.40	0.45	0.63	0.34	0.13	0.05	0.17

Intersection Summary

HCM Signalized Intersection Capacity Analysis

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 FBG AM

	↖	→	↗	←	↖	↑	↗	↓	↖			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	13	1008	30	159	1630	4	105	10	46	17	14	54
Future Volume (vph)	13	1008	30	159	1630	4	105	10	46	17	14	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3375		1695	3389		1695	1564		1695	1572	
Flt Permitted	0.12	1.00		0.26	1.00		0.71	1.00		0.72	1.00	
Satd. Flow (perm)	208	3375		463	3389		1272	1564		1286	1572	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	13	1008	30	159	1630	4	105	10	46	17	14	54
RTOR Reduction (vph)	0	2	0	0	0	0	0	40	0	0	27	0
Lane Group Flow (vph)	13	1036	0	159	1634	0	105	16	0	17	41	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	66.6	66.6		66.6	66.6		11.3	11.3		11.3	11.3	
Effective Green, g (s)	66.6	66.6		66.6	66.6		11.3	11.3		11.3	11.3	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.13	0.13		0.13	0.13	
Clearance Time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	153	2497		342	2507		159	196		161	197	
v/s Ratio Prot		0.31			c0.48			0.01			0.03	
v/s Ratio Perm	0.06			0.34			c0.08			0.01		
v/c Ratio	0.08	0.42		0.46	0.65		0.66	0.08		0.11	0.21	
Uniform Delay, d1	3.2	4.4		4.6	5.9		37.5	34.8		34.9	35.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.5		1.0	0.6		10.3	0.2		0.3	0.5	
Delay (s)	4.3	4.9		5.6	6.5		47.8	34.9		35.2	35.9	
Level of Service	A	A		A	A		D	C		D	D	
Approach Delay (s)		4.9			6.4			43.3			35.7	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.1
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1

SmartREIT Orleans

2026 FBG AM

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	32	61	38	91	1085	59	110	683	90
v/c Ratio	0.43	0.13	0.31	0.15	0.18	0.45	0.05	0.36	0.29	0.08
Control Delay	30.6	11.0	27.1	10.2	6.6	6.6	1.9	10.9	5.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	11.0	27.1	10.2	6.6	6.6	1.9	10.9	5.4	1.7
Queue Length 50th (m)	8.5	0.3	6.1	0.2	3.6	28.6	0.0	5.0	15.3	0.0
Queue Length 95th (m)	22.1	7.3	17.0	7.8	12.7	59.5	4.3	22.8	31.8	5.4
Internal Link Dist (m)		56.1		76.2		125.8			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	610	736	614	734	492	2386	1085	304	2386	1094
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	0.04	0.10	0.05	0.18	0.45	0.05	0.36	0.29	0.08

Intersection Summary

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1

SmartREIT Orleans

2026 FBG AM

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	84	3	29	61	2	36	91	1085	59	110	683	90
Future Volume (vph)	84	3	29	61	2	36	91	1085	59	110	683	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1542		1695	1531		1695	3390	1517	1695	3390	1517
Flt Permitted	0.73	1.00		0.74	1.00		0.39	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1307	1542		1314	1531		699	3390	1517	432	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	3	29	61	2	36	91	1085	59	110	683	90
RTOR Reduction (vph)	0	25	0	0	31	0	0	0	20	0	0	30
Lane Group Flow (vph)	84	7	0	61	7	0	91	1085	39	110	683	60
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	8.1	8.1		8.1	8.1		42.4	42.4	42.4	42.4	42.4	42.4
Effective Green, g (s)	8.1	8.1		8.1	8.1		42.4	42.4	42.4	42.4	42.4	42.4
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	166	196		167	195		466	2263	1012	288	2263	1012
v/s Ratio Prot		0.00			0.00			c0.32				0.20
v/s Ratio Perm	c0.06			0.05			0.13		0.03	0.25		0.04
v/c Ratio	0.51	0.03		0.37	0.03		0.20	0.48	0.04	0.38	0.30	0.06
Uniform Delay, d1	25.8	24.3		25.3	24.3		4.0	5.2	3.6	4.7	4.4	3.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.1		1.4	0.1		0.9	0.7	1.1	3.8	0.3	0.1
Delay (s)	28.3	24.3		26.7	24.3		5.0	5.9	3.7	8.6	4.7	3.8
Level of Service	C	C		C	C		A	A	A	A	A	A
Approach Delay (s)		27.2			25.8			5.7			5.1	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	13.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Queues
4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 FBG AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	69	56	63	36	213	1203	60	40	832	37
v/c Ratio	0.47	0.26	0.44	0.18	0.45	0.45	0.05	0.13	0.31	0.03
Control Delay	47.2	21.3	45.9	32.1	8.5	4.8	1.2	5.0	3.9	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	21.3	45.9	32.1	8.5	4.8	1.2	5.0	3.9	1.3
Queue Length 50th (m)	11.4	3.5	10.3	4.8	11.2	33.2	0.0	1.5	19.6	0.0
Queue Length 95th (m)	25.8	15.6	24.1	14.3	40.8	66.1	3.7	6.4	38.6	2.8
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	305	404	299	410	473	2693	1217	305	2693	1213
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	0.23	0.14	0.21	0.09	0.45	0.45	0.05	0.13	0.31	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis
4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 FBG AM

	↖	→	↘	←	↙	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖		↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	69	22	34	63	30	6	213	1203	60	40	832	37
Future Volume (vph)	69	22	34	63	30	6	213	1203	60	40	832	37
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1622		1695	1740		1695	3390	1517	1695	3390	1517
Flt Permitted	0.73	1.00		0.72	1.00		0.33	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1309	1622		1286	1740		596	3390	1517	384	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	22	34	63	30	6	213	1203	60	40	832	37
RTOR Reduction (vph)	0	31	0	0	5	0	0	0	14	0	0	9
Lane Group Flow (vph)	69	25	0	63	31	0	213	1203	46	40	832	28
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	9.0	9.0		9.0	9.0		69.1	69.1	69.1	69.1	69.1	69.1
Effective Green, g (s)	9.0	9.0		9.0	9.0		69.1	69.1	69.1	69.1	69.1	69.1
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.77	0.77	0.77	0.77	0.77	0.77
Clearance Time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	130	162		128	174		457	2602	1164	294	2602	1164
v/s Ratio Prot		0.02			0.02			0.35			0.25	
v/s Ratio Perm	c0.05			0.05			c0.36		0.03	0.10		0.02
v/c Ratio	0.53	0.16		0.49	0.18		0.47	0.46	0.04	0.14	0.32	0.02
Uniform Delay, d1	38.5	37.0		38.3	37.1		3.8	3.8	2.5	2.7	3.2	2.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	0.5		3.0	0.5		3.4	0.6	1.0	1.0	0.3	0.0
Delay (s)	42.7	37.5		41.3	37.6		7.2	4.4	2.6	3.7	3.5	2.5
Level of Service	D	D		D	D		A	A	A	A	A	A
Approach Delay (s)		40.3			40.0			4.7			3.5	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	67	1176	29	0	868
Future Vol, veh/h	0	67	1176	29	0	868
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	67	1176	29	0	868
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1610	588	0	0	1176	0
Stage 1	1176	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	95	452	-	-	590	-
Stage 1	255	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	95	452	-	-	590	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	255	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.3	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	452	590	-		
HCM Lane V/C Ratio	-	0.148	-	-		
HCM Control Delay (s)	-	14.3	0	-		
HCM Lane LOS	-	B	A	-		
HCM 95th %tile Q(veh)	-	0.5	0	-		

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1007	65	0	1789	0	44
Future Vol, veh/h	1007	65	0	1789	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1007	65	0	1789	0	44
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1072	0	1935	536
Stage 1	-	-	-	-	1040	-
Stage 2	-	-	-	-	895	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	646	-	58	489
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	359	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	646	-	58	489
Mov Cap-2 Maneuver	-	-	-	-	58	-
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	359	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		13.1		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	489	-	-	646	-	
HCM Lane V/C Ratio	0.09	-	-	-	-	
HCM Control Delay (s)	13.1	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Queues
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2026 FBG PM

	↖	→	↗	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	1204	334	246	1011	378	382	1002	346	855
v/c Ratio	0.85	1.15	0.50	1.08	0.83	0.48	0.81	1.16	0.76	1.06
Control Delay	78.4	315.0	8.4	244.0	39.7	8.1	65.7	335.1	62.1	175.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	315.0	8.4	244.0	39.7	8.1	65.7	335.1	62.1	175.1
Queue Length 50th (m)	17.8	~175.0	6.7	~57.3	71.7	0.0	45.1	~139.7	40.5	~118.2
Queue Length 95th (m)	#59.6	#255.7	44.0m	#118.4	#173.7	39.3	#78.2	#215.4	#67.2	#187.2
Internal Link Dist (m)		116.7		151.9			97.1		134.6	
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	157	1050	673	228	1217	787	495	865	495	810
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	0.85	1.15	0.50	1.08	0.83	0.48	0.77	1.16	0.70	1.06

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2026 FBG PM

	↖	→	↗	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖	↖↗	↖	↖
Traffic Volume (vph)	133	1204	334	246	1011	378	382	609	393	346	752	103
Future Volume (vph)	133	1204	334	246	1011	378	382	609	393	346	752	103
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3191		3288	3329	
Flt Permitted	0.13	1.00	1.00	0.09	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	234	3390	1517	166	3390	1517	3288	3191		3288	3329	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	133	1204	334	246	1011	378	382	609	393	346	752	103
RTOR Reduction (vph)	0	0	203	0	0	242	0	87	0	0	9	0
Lane Group Flow (vph)	133	1204	131	246	1011	136	382	915	0	346	846	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	43.2	37.2	37.2	55.0	43.1	43.1	17.2	29.3		16.6	28.9	
Effective Green, g (s)	43.2	37.2	37.2	55.0	43.1	43.1	17.2	29.3		16.6	28.9	
Actuated g/C Ratio	0.36	0.31	0.31	0.46	0.36	0.36	0.14	0.24		0.14	0.24	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	1050	470	227	1217	544	471	779		454	801	
v/s Ratio Prot	0.04	0.36		c0.11	0.30		c0.12	c0.29		0.11	0.25	
v/s Ratio Perm	0.26		0.09	c0.39		0.09						
v/c Ratio	0.85	1.15	0.28	1.08	0.83	0.25	0.81	1.17		0.76	1.06	
Uniform Delay, d1	30.4	41.4	31.3	34.9	35.1	27.1	49.8	45.4		49.8	45.5	
Progression Factor	1.00	1.00	1.00	1.58	0.96	2.30	1.00	1.00		1.00	1.00	
Incremental Delay, d2	41.1	276.8	1.5	208.2	5.5	0.9	11.1	329.3		7.8	133.0	
Delay (s)	71.5	318.2	32.8	263.3	39.3	63.2	60.9	374.6		57.6	178.5	
Level of Service	E	F	C	F	D	E	E	F		E	F	
Approach Delay (s)		241.5			78.5			288.0			143.7	
Approach LOS		F			E			F			F	

Intersection Summary

HCM 2000 Control Delay	187.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	111.8%	ICU Level of Service	H
Analysis Period (min)	60		

c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 FBG PM

	↖	→	↗	←	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	1876	179	1496	135	105	41	42
v/c Ratio	0.22	0.90	0.79	0.65	0.73	0.35	0.24	0.17
Control Delay	3.3	12.4	56.1	13.7	73.5	15.1	47.3	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.3	12.4	56.1	13.7	73.5	15.1	47.3	23.0
Queue Length 50th (m)	1.4	68.1	25.3	102.7	30.7	3.1	8.6	3.1
Queue Length 95th (m)	m2.4	m71.1	#81.1	176.4	57.0	22.4	20.9	14.8
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0					20.0		
Base Capacity (vph)	242	2096	234	2316	242	362	222	321
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.90	0.76	0.65	0.56	0.29	0.18	0.13

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Site Access #4/Wildflower Drive & Innes Road

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2026 FBG PM

	↖	→	↗	←	↖	↑	↗	↓	↖			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	52	1816	60	179	1473	23	135	15	90	41	15	27
Future Volume (vph)	52	1816	60	179	1473	23	135	15	90	41	15	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.5	6.2		4.5	6.2		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3374		1695	3382		1695	1555		1695	1612	
Flt Permitted	0.13	1.00		0.05	1.00		0.73	1.00		0.67	1.00	
Satd. Flow (perm)	239	3374		90	3382		1302	1555		1196	1612	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	1816	60	179	1473	23	135	15	90	41	15	27
RTOR Reduction (vph)	0	2	0	0	1	0	0	77	0	0	23	0
Lane Group Flow (vph)	52	1874	0	179	1495	0	135	28	0	41	19	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	79.6	74.5		90.8	81.2		17.1	17.1		17.1	17.1	
Effective Green, g (s)	79.6	74.5		90.8	81.2		17.1	17.1		17.1	17.1	
Actuated g/C Ratio	0.66	0.62		0.76	0.68		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.5	6.2		4.5	6.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	2094		225	2288		185	221		170	229	
v/s Ratio Prot	0.01	c0.56		c0.08	0.44			0.02			0.01	
v/s Ratio Perm	0.15			0.52			c0.10			0.03		
v/c Ratio	0.24	0.89		0.80	0.65		0.73	0.13		0.24	0.08	
Uniform Delay, d1	8.5	19.4		37.2	11.2		49.2	44.9		45.7	44.6	
Progression Factor	0.67	0.52		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.7		19.7	0.7		14.5	0.3		0.7	0.2	
Delay (s)	5.7	10.8		56.8	11.9		63.7	45.2		46.4	44.8	
Level of Service	A	B		E	B		E	D		D	D	
Approach Delay (s)		10.6			16.7			55.6			45.6	
Approach LOS		B			B			E			D	

Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	60		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1

SmartREIT Orleans

2026 FBG PM

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	103	117	65	144	990	62	147	1247	156
v/c Ratio	0.85	0.24	0.38	0.15	0.79	0.48	0.07	0.55	0.60	0.16
Control Delay	62.6	14.1	32.8	8.1	55.9	11.8	2.7	22.4	13.7	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	14.1	32.8	8.1	55.9	11.8	2.7	22.4	13.7	2.0
Queue Length 50th (m)	47.5	5.8	17.8	0.1	19.5	51.5	0.0	15.4	72.6	0.0
Queue Length 95th (m)	#101.4	21.4	37.6	11.7	#71.2	84.4	6.3	#56.7	120.8	10.2
Internal Link Dist (m)		56.1		76.2		125.8			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	390	510	375	508	182	2071	951	268	2071	987
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	0.70	0.20	0.31	0.13	0.79	0.48	0.07	0.55	0.60	0.16

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1

SmartREIT Orleans

2026 FBG PM

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	272	5	98	117	1	64	144	990	62	147	1247	156
Future Volume (vph)	272	5	98	117	1	64	144	990	62	147	1247	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1530		1695	1521		1695	3390	1517	1695	3390	1517
Flt Permitted	0.71	1.00		0.69	1.00		0.17	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	1275	1530		1232	1521		298	3390	1517	440	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	272	5	98	117	1	64	144	990	62	147	1247	156
RTOR Reduction (vph)	0	46	0	0	48	0	0	0	24	0	0	61
Lane Group Flow (vph)	272	57	0	117	17	0	144	990	38	147	1247	95
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	24.0	24.0		24.0	24.0		58.2	58.2	58.2	58.2	58.2	58.2
Effective Green, g (s)	24.0	24.0		24.0	24.0		58.2	58.2	58.2	58.2	58.2	58.2
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.61	0.61	0.61	0.61	0.61	0.61
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	321	385		310	383		182	2072	927	268	2072	927
v/s Ratio Prot		0.04			0.01			0.29			0.37	
v/s Ratio Perm	c0.21			0.09			c0.48		0.02	0.33		0.06
v/c Ratio	0.85	0.15		0.38	0.04		0.79	0.48	0.04	0.55	0.60	0.10
Uniform Delay, d1	33.9	27.7		29.4	26.9		13.9	10.2	7.4	10.8	11.4	7.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.5	0.2		0.8	0.0		34.3	0.8	0.1	8.1	1.3	0.2
Delay (s)	55.3	27.8		30.2	27.0		48.3	11.0	7.5	18.9	12.7	7.9
Level of Service	E	C		C	C		D	B	A	B	B	A
Approach Delay (s)		47.8			29.0			15.3				12.8
Approach LOS		D			C			B				B

Intersection Summary

HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	95.2	Sum of lost time (s)	13.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

Queues
4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 FBG PM

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	184	260	128	272	118	1709	49	28	1898	48
v/c Ratio	1.02	0.57	0.67	0.59	0.87	0.85	0.05	0.22	1.01	0.05
Control Delay	202.2	35.6	61.0	33.8	92.4	26.3	1.0	11.7	75.9	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	202.2	35.6	61.0	33.8	92.4	26.3	1.0	11.7	75.9	1.0
Queue Length 50th (m)	~44.8	41.3	27.3	40.5	13.4	179.7	0.0	2.2	~230.5	0.0
Queue Length 95th (m)	#105.6	80.3	#66.1	81.2	#59.0	#292.2	3.4	6.1	#347.8	3.2
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	180	455	190	464	136	2015	934	130	1884	878
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.57	0.67	0.59	0.87	0.85	0.05	0.22	1.01	0.05

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 FBG PM

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	184	105	155	128	94	178	118	1709	49	28	1898	48
Future Volume (vph)	184	105	155	128	94	178	118	1709	49	28	1898	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	0.95	1.00	0.95
Frt	1.00	0.91		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1625		1695	1609		1695	3390	1517	1695	3390	1517
Flt Permitted	0.40	1.00		0.42	1.00		0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	714	1625		751	1609		103	3390	1517	107	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	184	105	155	128	94	178	118	1709	49	28	1898	48
RTOR Reduction (vph)	0	44	0	0	57	0	0	0	21	0	0	21
Lane Group Flow (vph)	184	216	0	128	215	0	118	1709	28	28	1898	27
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	30.4	30.4		30.4	30.4		74.5	69.1	69.1	69.7	66.7	66.7
Effective Green, g (s)	30.4	30.4		30.4	30.4		74.5	69.1	69.1	69.7	66.7	66.7
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.62	0.58	0.58	0.58	0.56	0.56
Clearance Time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	180	411		190	407		135	1952	873	101	1884	843
v/s Ratio Prot		0.13			0.13		c0.04	0.50		0.01	c0.56	
v/s Ratio Perm	c0.26			0.17			0.50		0.02	0.15		0.02
v/c Ratio	1.02	0.53		0.67	0.53		0.87	0.88	0.03	0.28	1.01	0.03
Uniform Delay, d1	44.8	38.6		40.3	38.6		31.2	21.8	11.0	19.1	26.6	12.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	157.1	1.2		9.5	1.2		58.3	6.3	0.1	1.5	48.8	0.1
Delay (s)	201.9	39.8		49.8	39.9		89.5	28.1	11.1	20.6	75.5	12.1
Level of Service	F	D		D	D		F	C	B	C	E	B
Approach Delay (s)		107.0			43.1			31.5			73.2	
Approach LOS		F			D			C			E	

Intersection Summary

- HCM 2000 Control Delay: 57.1, HCM 2000 Level of Service: E
- HCM 2000 Volume to Capacity ratio: 1.00
- Actuated Cycle Length (s): 120.0, Sum of lost time (s): 17.5
- Intersection Capacity Utilization: 109.5%, ICU Level of Service: H
- Analysis Period (min): 60
- c Critical Lane Group

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	103	1281	45	0	1332
Future Vol, veh/h	0	103	1281	45	0	1332
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	103	1281	45	0	1332
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1947	641	0	0	1281	0
Stage 1	1281	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	57	417	-	-	538	-
Stage 1	225	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	57	417	-	-	538	-
Mov Cap-2 Maneuver	57	-	-	-	-	-
Stage 1	225	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	16.5	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	417	538	-		
HCM Lane V/C Ratio	-	0.247	-	-		
HCM Control Delay (s)	-	16.5	0	-		
HCM Lane LOS	-	C	A	-		
HCM 95th %tile Q(veh)	-	1	0	-		

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1829	114	0	1635	0	99
Future Vol, veh/h	1829	114	0	1635	0	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1829	114	0	1635	0	99
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1943	0	2704	972
Stage 1	-	-	-	-	1886	-
Stage 2	-	-	-	-	818	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	298	-	17	252
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	394	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	298	-	17	252
Mov Cap-2 Maneuver	-	-	-	-	17	-
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	394	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	28.5			
HCM LOS			D			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	252	-	-	298	-	
HCM Lane V/C Ratio	0.393	-	-	-	-	
HCM Control Delay (s)	28.5	-	-	0	-	
HCM Lane LOS	D	-	-	A	-	
HCM 95th %tile Q(veh)	1.9	-	-	0	-	

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix C Intersection Performance Worksheets
January 4, 2017

**C.3 2026 TOTAL FUTURE CONDITIONS – WITHOUT THE VANGUARD
DRIVE EXTENSION**

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2026 Total AM - without Vanguard Drive

	↖	→	↗	↙	←	↖	↗	↙	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	738	233	183	1254	401	481	823	245	549
v/c Ratio	0.51	0.66	0.35	0.67	0.94	0.48	0.82	0.95	0.63	0.83
Control Delay	33.0	37.8	5.3	32.9	55.5	4.6	60.1	72.9	57.8	58.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	37.8	5.3	32.9	55.5	4.6	60.1	72.9	57.8	58.8
Queue Length 50th (m)	8.4	78.1	0.0	25.1	153.0	0.0	56.0	98.9	28.7	65.5
Queue Length 95th (m)	#21.0	114.6	24.8	#48.3	#242.4	34.4	#89.1	#180.5	45.6	#118.0
Internal Link Dist (m)		116.7		151.9				97.1		134.6
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	130	1122	658	277	1328	838	652	867	495	664
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	0.51	0.66	0.35	0.66	0.94	0.48	0.74	0.95	0.49	0.83

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2026 Total AM - without Vanguard Drive

	↖	→	↗	↙	←	↖	↗	↙	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	66	738	233	183	1254	401	481	703	120	245	491	58
Future Volume (vph)	66	738	233	183	1254	401	481	703	120	245	491	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3316		3288	3336	
Flt Permitted	0.10	1.00	1.00	0.20	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	179	3390	1517	349	3390	1517	3288	3316		3288	3336	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	738	233	183	1254	401	481	703	120	245	491	58
RTOR Reduction (vph)	0	0	156	0	0	248	0	11	0	0	7	0
Lane Group Flow (vph)	66	738	77	183	1254	153	481	812	0	245	542	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	43.8	39.8	39.8	55.8	45.8	45.8	21.6	31.0		14.2	23.6	
Effective Green, g (s)	43.8	39.8	39.8	55.8	45.8	45.8	21.6	31.0		14.2	23.6	
Actuated g/C Ratio	0.36	0.33	0.33	0.46	0.38	0.38	0.18	0.26		0.12	0.20	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	115	1124	503	274	1293	578	591	856		389	656	
v/s Ratio Prot	0.02	0.22		c0.06	c0.37		c0.15	c0.24		0.07	0.16	
v/s Ratio Perm	0.19		0.05	0.25		0.10						
v/c Ratio	0.57	0.66	0.15	0.67	0.97	0.26	0.81	0.95		0.63	0.83	
Uniform Delay, d1	29.4	34.3	28.2	22.0	36.4	25.5	47.3	43.7		50.4	46.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.9	3.0	0.6	6.2	29.1	1.1	9.0	27.1		3.2	9.0	
Delay (s)	36.4	37.3	28.9	28.2	65.6	26.6	56.3	70.8		53.6	55.2	
Level of Service	D	D	C	C	E	C	E	E		D	E	
Approach Delay (s)		35.4			53.3			65.4			54.7	
Approach LOS		D			D			E			D	

Intersection Summary

HCM 2000 Control Delay	53.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	60		

c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 Total AM - without Vanguard Drive

	↖	→	↗	↖	↖	↖	↖	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	1069	206	1633	155	142	17	76
v/c Ratio	0.10	0.46	0.70	0.70	0.69	0.38	0.08	0.25
Control Delay	8.7	7.8	28.1	11.5	51.3	11.1	29.0	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	7.8	28.1	11.5	51.3	11.1	29.0	21.2
Queue Length 50th (m)	0.7	38.3	18.8	78.3	25.3	3.2	2.5	6.6
Queue Length 95th (m)	4.2	74.8	#80.9	162.7	48.2	21.2	8.3	19.5
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0					20.0		
Base Capacity (vph)	127	2315	293	2332	308	471	282	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.46	0.70	0.70	0.50	0.30	0.06	0.18

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 Total AM - without Vanguard Drive

	↖	→	↗	↖	↖	↖	↖	↖	↖	↖	↖	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖	↖
Traffic Volume (vph)	13	1007	62	206	1629	4	155	22	120	17	22	54
Future Volume (vph)	13	1007	62	206	1629	4	155	22	120	17	22	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3361		1695	3389		1695	1558		1695	1594	
Flt Permitted	0.10	1.00		0.24	1.00		0.71	1.00		0.65	1.00	
Satd. Flow (perm)	185	3361		427	3389		1263	1558		1157	1594	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	13	1007	62	206	1629	4	155	22	120	17	22	54
RTOR Reduction (vph)	0	4	0	0	0	0	0	99	0	0	25	0
Lane Group Flow (vph)	13	1065	0	206	1633	0	155	43	0	17	51	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Effective Green, g (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.18	0.18		0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127	2311		293	2330		224	276		205	283	
v/s Ratio Prot		0.32			0.48			0.03			0.03	
v/s Ratio Perm	0.07			c0.48			c0.12			0.01		
v/c Ratio	0.10	0.46		0.70	0.70		0.69	0.16		0.08	0.18	
Uniform Delay, d1	4.7	6.4		8.5	8.5		34.7	31.3		30.9	31.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.7		7.7	1.0		9.3	0.3		0.2	0.3	
Delay (s)	6.3	7.1		16.2	9.4		44.0	31.6		31.1	31.7	
Level of Service	A	A		B	A		D	C		C	C	
Approach Delay (s)		7.1			10.2			38.0			31.6	
Approach LOS		A			B			D			C	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.1
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	32	109	99	91	1085	90	149	683	90
v/c Ratio	0.41	0.11	0.50	0.33	0.19	0.47	0.08	0.51	0.29	0.08
Control Delay	28.9	10.5	31.3	15.7	7.3	7.3	1.9	17.2	6.0	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	10.5	31.3	15.7	7.3	7.3	1.9	17.2	6.0	1.9
Queue Length 50th (m)	8.6	0.3	11.3	4.7	3.8	30.6	0.0	8.4	16.4	0.0
Queue Length 95th (m)	22.0	7.2	27.3	18.1	13.7	64.5	5.8	#45.7	34.7	5.8
Internal Link Dist (m)		56.1		76.2		125.8			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	580	739	616	741	480	2329	1070	292	2329	1070
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	0.04	0.18	0.13	0.19	0.47	0.08	0.51	0.29	0.08

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	84	3	29	109	2	97	91	1085	90	149	683	90
Future Volume (vph)	84	3	29	109	2	97	91	1085	90	149	683	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1542		1695	1522		1695	3390	1517	1695	3390	1517
Flt Permitted	0.69	1.00		0.74	1.00		0.39	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1236	1542		1314	1522		699	3390	1517	426	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	3	29	109	2	97	91	1085	90	149	683	90
RTOR Reduction (vph)	0	25	0	0	44	0	0	0	31	0	0	31
Lane Group Flow (vph)	84	7	0	109	55	0	91	1085	59	149	683	59
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	9.1	9.1		9.1	9.1		41.2	41.2	41.2	41.2	41.2	41.2
Effective Green, g (s)	9.1	9.1		9.1	9.1		41.2	41.2	41.2	41.2	41.2	41.2
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.65	0.65	0.65	0.65	0.65	0.65
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	221		188	218		454	2206	987	277	2206	987
v/s Ratio Prot		0.00			0.04			0.32				0.20
v/s Ratio Perm	0.07			c0.08			0.13		0.04	c0.35		0.04
v/c Ratio	0.47	0.03		0.58	0.25		0.20	0.49	0.06	0.54	0.31	0.06
Uniform Delay, d1	24.9	23.3		25.3	24.1		4.4	5.7	4.0	5.9	4.8	4.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.1		4.4	0.6		1.0	0.8	0.1	7.5	0.4	0.1
Delay (s)	26.9	23.4		29.7	24.7		5.4	6.5	4.1	13.4	5.2	4.1
Level of Service	C	C		C	C		A	A	A	B	A	A
Approach Delay (s)		25.9			27.3			6.2			6.4	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans

2026 Total AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	69	56	63	36	213	1203	60	40	832	37
v/c Ratio	0.47	0.26	0.44	0.18	0.45	0.45	0.05	0.13	0.31	0.03
Control Delay	47.2	21.3	45.9	32.1	8.5	4.8	1.2	5.0	3.9	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	21.3	45.9	32.1	8.5	4.8	1.2	5.0	3.9	1.3
Queue Length 50th (m)	11.4	3.5	10.3	4.8	11.2	33.2	0.0	1.5	19.6	0.0
Queue Length 95th (m)	25.8	15.6	24.1	14.3	40.8	66.1	3.7	6.4	38.6	2.8
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	305	404	299	410	473	2693	1217	305	2693	1213
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	0.23	0.14	0.21	0.09	0.45	0.45	0.05	0.13	0.31	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans

2026 Total AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	69	22	34	63	30	6	213	1203	60	40	832	37
Future Volume (vph)	69	22	34	63	30	6	213	1203	60	40	832	37
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1622		1695	1740		1695	3390	1517	1695	3390	1517
Flt Permitted	0.73	1.00		0.72	1.00		0.33	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1309	1622		1286	1740		596	3390	1517	384	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	22	34	63	30	6	213	1203	60	40	832	37
RTOR Reduction (vph)	0	31	0	0	5	0	0	0	14	0	0	9
Lane Group Flow (vph)	69	25	0	63	31	0	213	1203	46	40	832	28
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	9.0	9.0		9.0	9.0		69.1	69.1	69.1	69.1	69.1	69.1
Effective Green, g (s)	9.0	9.0		9.0	9.0		69.1	69.1	69.1	69.1	69.1	69.1
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.77	0.77	0.77	0.77	0.77	0.77
Clearance Time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	130	162		128	174		457	2602	1164	294	2602	1164
v/s Ratio Prot		0.02			0.02			0.35			0.25	
v/s Ratio Perm	c0.05			0.05			c0.36		0.03	0.10		0.02
v/c Ratio	0.53	0.16		0.49	0.18		0.47	0.46	0.04	0.14	0.32	0.02
Uniform Delay, d1	38.5	37.0		38.3	37.1		3.8	3.8	2.5	2.7	3.2	2.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	0.5		3.0	0.5		3.4	0.6	1.0	1.0	0.3	0.0
Delay (s)	42.7	37.5		41.3	37.6		7.2	4.4	2.6	3.7	3.5	2.5
Level of Service	D	D		D	D		A	A	A	A	A	A
Approach Delay (s)		40.3			40.0			4.7			3.5	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	67	1237	29	0	907
Future Vol, veh/h	0	67	1237	29	0	907
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	67	1237	29	0	907
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1691	619	0	0	1237	0
Stage 1	1237	-	-	-	-	-
Stage 2	454	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	84	432	-	-	559	-
Stage 1	237	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	84	432	-	-	559	-
Mov Cap-2 Maneuver	84	-	-	-	-	-
Stage 1	237	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	432	559	-	
HCM Lane V/C Ratio	-	-	0.155	-	-	
HCM Control Delay (s)	-	-	14.9	0	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.5	0	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1038	65	0	1839	0	44
Future Vol, veh/h	1038	65	0	1839	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1038	65	0	1839	0	44
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1103	0	1991	552
Stage 1	-	-	-	-	1071	-
Stage 2	-	-	-	-	920	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	629	-	53	477
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	349	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	629	-	53	477
Mov Cap-2 Maneuver	-	-	-	-	53	-
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	349	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		13.3		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	477	-	-	629	-	
HCM Lane V/C Ratio	0.092	-	-	-	-	
HCM Control Delay (s)	13.3	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2026 Total PM - without Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	1229	359	246	1030	398	401	1031	370	892
v/c Ratio	0.85	1.14	0.52	1.19	0.87	0.50	0.84	1.22	0.77	1.10
Control Delay	80.7	301.2	8.4	413.1	37.3	2.3	68.2	443.4	61.9	239.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.7	301.2	8.4	413.1	37.3	2.3	68.2	443.4	61.9	239.3
Queue Length 50th (m)	18.1	~177.7	7.4	~58.6	111.5	0.0	47.6	~147.2	43.5	~124.3
Queue Length 95th (m)	#64.9	#259.3	47.1 m	#124.4 m	#186.0 m	m9.1	#84.1	#223.0	#74.5	#194.8
Internal Link Dist (m)		116.7		151.9				97.1		134.6
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	156	1079	696	207	1186	789	495	845	495	813
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	0.85	1.14	0.52	1.19	0.87	0.50	0.81	1.22	0.75	1.10

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2026 Total PM - without Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	133	1229	359	246	1030	398	401	638	393	370	789	103
Future Volume (vph)	133	1229	359	246	1030	398	401	638	393	370	789	103
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3196		3288	3331	
Flt Permitted	0.11	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	192	3390	1517	170	3390	1517	3288	3196		3288	3331	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	133	1229	359	246	1030	398	401	638	393	370	789	103
RTOR Reduction (vph)	0	0	214	0	0	259	0	78	0	0	8	0
Lane Group Flow (vph)	133	1229	145	246	1030	139	401	953	0	370	884	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	44.9	38.2	38.2	52.5	42.0	42.0	17.5	28.8		17.5	29.0	
Effective Green, g (s)	44.9	38.2	38.2	52.5	42.0	42.0	17.5	28.8		17.5	29.0	
Actuated g/C Ratio	0.37	0.32	0.32	0.44	0.35	0.35	0.15	0.24		0.15	0.24	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155	1079	482	207	1186	530	479	767		479	804	
v/s Ratio Prot	0.05	0.36		c0.10	c0.30		c0.12	c0.30		0.11	0.27	
v/s Ratio Perm	0.27		0.10	c0.41		0.09						
v/c Ratio	0.86	1.14	0.30	1.19	0.87	0.26	0.84	1.24		0.77	1.10	
Uniform Delay, d1	28.6	40.9	30.8	33.3	36.4	27.9	49.9	45.6		49.3	45.5	
Progression Factor	1.00	1.00	1.00	1.50	0.80	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	45.3	263.2	1.6	377.9	7.7	1.0	13.4	447.6		8.0	200.4	
Delay (s)	73.9	304.1	32.4	427.8	36.8	5.9	63.3	493.2		57.3	245.9	
Level of Service	E	F	C	F	D	A	E	F		E	F	
Approach Delay (s)		229.7			86.9			372.8			190.6	
Approach LOS		F			F			F			F	

Intersection Summary

- HCM 2000 Control Delay 216.0 HCM 2000 Level of Service F
- HCM 2000 Volume to Capacity ratio 1.18
- Actuated Cycle Length (s) 120.0 Sum of lost time (s) 25.0
- Intersection Capacity Utilization 114.1% ICU Level of Service H
- Analysis Period (min) 60
- c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 Total PM - without Vanguard Drive

	↖	→	↗	↖	↖	↖	↖	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	1925	269	1480	190	194	41	54
v/c Ratio	0.30	1.04	0.96	0.60	0.87	0.48	0.30	0.18
Control Delay	12.0	100.5	109.3	9.3	94.5	13.5	49.3	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	100.5	109.3	9.3	94.5	13.5	49.3	25.9
Queue Length 50th (m)	4.8	~263.2	~53.6	82.3	43.3	4.9	8.4	5.3
Queue Length 95th (m)	m4.9	m237.0	#127.3	124.2	#95.7	34.0	22.0	19.1
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0					20.0		
Base Capacity (vph)	173	1844	281	2467	237	423	146	325
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.04	0.96	0.60	0.80	0.46	0.28	0.17

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 Total PM - without Vanguard Drive

	↖	→	↗	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖	
Traffic Volume (vph)	52	1796	129	269	1457	23	190	25	169	41	27	27	
Future Volume (vph)	52	1796	129	269	1457	23	190	25	169	41	27	27	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)	6.2	6.2		6.0	6.2		5.9	5.9		5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.93		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1695	3356		1695	3382		1695	1551		1695	1650		
Flt Permitted	0.18	1.00		0.06	1.00		0.72	1.00		0.44	1.00		
Satd. Flow (perm)	316	3356		99	3382		1288	1551		793	1650		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	52	1796	129	269	1457	23	190	25	169	41	27	27	
RTOR Reduction (vph)	0	5	0	0	1	0	0	140	0	0	22	0	
Lane Group Flow (vph)	52	1920	0	269	1479	0	190	54	0	41	32	0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	6			8			4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	65.8	65.8		87.5	87.5		20.4	20.4		20.4	20.4		
Effective Green, g (s)	65.8	65.8		87.5	87.5		20.4	20.4		20.4	20.4		
Actuated g/C Ratio	0.55	0.55		0.73	0.73		0.17	0.17		0.17	0.17		
Clearance Time (s)	6.2	6.2		6.0	6.2		5.9	5.9		5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	173	1840		280	2466		218	263		134	280		
v/s Ratio Prot		c0.57		c0.13	0.44			0.03			0.02		
v/s Ratio Perm	0.16			0.57			c0.15			0.05			
v/c Ratio	0.30	1.04		0.96	0.60		0.87	0.20		0.31	0.11		
Uniform Delay, d1	14.7	27.1		42.5	7.8		48.5	42.8		43.6	42.1		
Progression Factor	0.71	0.66		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.4	80.8		72.6	0.4		38.1	0.4		1.3	0.2		
Delay (s)	10.9	98.7		115.1	8.2		86.6	43.2		44.9	42.3		
Level of Service	B	F		F	A		F	D		D	D		
Approach Delay (s)		96.4			24.7			64.7			43.4		
Approach LOS		F			C			E			D		

Intersection Summary

HCM 2000 Control Delay	62.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	109.0%	ICU Level of Service	H
Analysis Period (min)	60		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total PM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	103	165	121	144	982	120	218	1238	156
v/c Ratio	0.83	0.23	0.49	0.25	0.88	0.51	0.13	0.88	0.64	0.17
Control Delay	53.6	14.6	30.9	8.9	88.5	12.8	2.5	65.8	15.0	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	14.6	30.9	8.9	88.5	12.8	2.5	65.8	15.0	2.3
Queue Length 50th (m)	40.7	6.6	22.1	3.1	19.2	47.9	0.0	28.9	67.7	0.0
Queue Length 95th (m)	#90.4	21.0	45.9	17.9	#70.1	85.2	9.4	#93.1	121.8	10.8
Internal Link Dist (m)		56.1		76.2		125.8			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	419	561	426	587	163	1943	920	248	1943	935
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	0.65	0.18	0.39	0.21	0.88	0.51	0.13	0.88	0.64	0.17

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total PM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	272	5	98	165	1	120	144	982	120	218	1238	156
Future Volume (vph)	272	5	98	165	1	120	144	982	120	218	1238	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1530		1695	1519		1695	3390	1517	1695	3390	1517
Flt Permitted	0.68	1.00		0.69	1.00		0.16	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1212	1530		1232	1519		286	3390	1517	434	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	272	5	98	165	1	120	144	982	120	218	1238	156
RTOR Reduction (vph)	0	35	0	0	69	0	0	0	51	0	0	67
Lane Group Flow (vph)	272	68	0	165	52	0	144	982	69	218	1238	89
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	22.9	22.9		22.9	22.9		48.2	48.2	48.2	48.2	48.2	48.2
Effective Green, g (s)	22.9	22.9		22.9	22.9		48.2	48.2	48.2	48.2	48.2	48.2
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	330	416		335	413		163	1942	869	248	1942	869
v/s Ratio Prot		0.04			0.03			0.29				0.37
v/s Ratio Perm	c0.22			0.13			c0.50		0.05	0.50		0.06
v/c Ratio	0.82	0.16		0.49	0.13		0.88	0.51	0.08	0.88	0.64	0.10
Uniform Delay, d1	28.7	23.3		25.7	23.1		15.5	10.8	8.0	15.4	12.1	8.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.3	0.2		1.1	0.1		64.1	0.9	0.2	43.9	1.6	0.2
Delay (s)	46.0	23.5		26.9	23.2		79.6	11.7	8.2	59.3	13.7	8.4
Level of Service	D	C		C	C		E	B	A	E	B	A
Approach Delay (s)		39.8			25.3			19.2				19.4
Approach LOS		D			C			B				B

Intersection Summary

HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	84.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 Total PM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	184	260	128	272	118	1709	49	28	1898	48
v/c Ratio	1.02	0.57	0.67	0.59	0.87	0.85	0.05	0.22	1.01	0.05
Control Delay	202.2	35.6	61.0	33.8	92.4	26.3	1.0	11.7	75.9	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	202.2	35.6	61.0	33.8	92.4	26.3	1.0	11.7	75.9	1.0
Queue Length 50th (m)	~44.8	41.3	27.3	40.5	13.4	179.7	0.0	2.2	~230.5	0.0
Queue Length 95th (m)	#105.6	80.3	#66.1	81.2	#59.0	#292.2	3.4	6.1	#347.8	3.2
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	180	455	190	464	136	2015	934	130	1884	878
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.57	0.67	0.59	0.87	0.85	0.05	0.22	1.01	0.05

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 Total PM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	184	105	155	128	94	178	118	1709	49	28	1898	48
Future Volume (vph)	184	105	155	128	94	178	118	1709	49	28	1898	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1625		1695	1609		1695	3390	1517	1695	3390	1517
Flt Permitted	0.40	1.00		0.42	1.00		0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	714	1625		751	1609		103	3390	1517	107	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	184	105	155	128	94	178	118	1709	49	28	1898	48
RTOR Reduction (vph)	0	44	0	0	57	0	0	0	21	0	0	21
Lane Group Flow (vph)	184	216	0	128	215	0	118	1709	28	28	1898	27
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	30.4	30.4		30.4	30.4		74.5	69.1	69.1	69.7	66.7	66.7
Effective Green, g (s)	30.4	30.4		30.4	30.4		74.5	69.1	69.1	69.7	66.7	66.7
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.62	0.58	0.58	0.58	0.56	0.56
Clearance Time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	180	411		190	407		135	1952	873	101	1884	843
v/s Ratio Prot		0.13			0.13		c0.04	0.50		0.01	c0.56	
v/s Ratio Perm	c0.26			0.17			0.50		0.02	0.15		0.02
v/c Ratio	1.02	0.53		0.67	0.53		0.87	0.88	0.03	0.28	1.01	0.03
Uniform Delay, d1	44.8	38.6		40.3	38.6		31.2	21.8	11.0	19.1	26.6	12.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	157.1	1.2		9.5	1.2		58.3	6.3	0.1	1.5	48.8	0.1
Delay (s)	201.9	39.8		49.8	39.9		89.5	28.1	11.1	20.6	75.5	12.1
Level of Service	F	D		D	D		F	C	B	C	E	B
Approach Delay (s)		107.0			43.1			31.5			73.2	
Approach LOS		F			D			C			E	

Intersection Summary

- HCM 2000 Control Delay: 57.1, HCM 2000 Level of Service: E
- HCM 2000 Volume to Capacity ratio: 1.00
- Actuated Cycle Length (s): 120.0, Sum of lost time (s): 17.5
- Intersection Capacity Utilization: 109.5%, ICU Level of Service: H
- Analysis Period (min): 60
- c Critical Lane Group

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	103	1329	45	0	1394
Future Vol, veh/h	0	103	1329	45	0	1394
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	103	1329	45	0	1394
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2026	665	0	0	1329	0
Stage 1	1329	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	50	403	-	-	515	-
Stage 1	212	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	50	403	-	-	515	-
Mov Cap-2 Maneuver	50	-	-	-	-	-
Stage 1	212	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	17	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	403	515	-	
HCM Lane V/C Ratio	-	-	0.256	-	-	
HCM Control Delay (s)	-	-	17	0	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	1	0	-	

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1878	114	0	1674	0	99
Future Vol, veh/h	1878	114	0	1674	0	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1878	114	0	1674	0	99
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1992	0	2772	996
Stage 1	-	-	-	-	1935	-
Stage 2	-	-	-	-	837	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	285	-	15	243
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	385	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	285	-	15	243
Mov Cap-2 Maneuver	-	-	-	-	15	-
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	385	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	29.9			
HCM LOS			D			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	243	-	-	285	-	
HCM Lane V/C Ratio	0.407	-	-	-	-	
HCM Control Delay (s)	29.9	-	-	0	-	
HCM Lane LOS	D	-	-	A	-	
HCM 95th %tile Q(veh)	2	-	-	0	-	

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix C Intersection Performance Worksheets
January 4, 2017

**C.4 2026 TOTAL FUTURE CONDITIONS – WITH THE VANGUARD DRIVE
EXTENSION**

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2026 Total AM - with Vanguard Drive

	↖	→	↗	↙	←	↖	↗	↙	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	703	245	183	1152	368	548	890	233	584
v/c Ratio	0.76	0.66	0.38	0.74	0.78	0.42	0.83	0.90	0.62	0.83
Control Delay	98.0	39.3	5.6	46.1	34.4	3.9	59.0	56.4	57.8	57.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.0	39.3	5.6	46.1	34.4	3.9	59.0	56.4	57.8	57.6
Queue Length 50th (m)	14.1	76.0	0.0	27.6	123.8	0.0	63.7	102.0	27.3	68.0
Queue Length 95th (m)	#47.2	111.7	26.7	#71.2	#193.5	29.0	#99.6	#178.0	43.8	#117.8
Internal Link Dist (m)		116.7		151.9			97.1		134.6	
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	87	1071	647	246	1472	867	728	984	498	705
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	0.76	0.66	0.38	0.74	0.78	0.42	0.75	0.90	0.47	0.83

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2026 Total AM - with Vanguard Drive

	↖	→	↗	↙	←	↖	↗	↙	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	66	703	245	183	1152	368	548	770	120	233	526	58
Future Volume (vph)	66	703	245	183	1152	368	548	770	120	233	526	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.4	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3322		3288	3340	
Flt Permitted	0.16	1.00	1.00	0.20	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	278	3390	1517	359	3390	1517	3288	3322		3288	3340	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	703	245	183	1152	368	548	770	120	233	526	58
RTOR Reduction (vph)	0	0	168	0	0	208	0	10	0	0	7	0
Lane Group Flow (vph)	66	703	77	183	1152	160	548	880	0	233	577	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2		1		6		4		7		8
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	37.9	37.9	37.9	52.1	52.1	52.1	24.0	35.2		13.8	25.0	
Effective Green, g (s)	37.9	37.9	37.9	52.1	52.1	52.1	24.0	35.2		13.8	25.0	
Actuated g/C Ratio	0.32	0.32	0.32	0.43	0.43	0.43	0.20	0.29		0.12	0.21	
Clearance Time (s)	6.4	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	87	1070	479	246	1471	658	657	974		378	695	
v/s Ratio Prot		0.21		0.05	c0.34		c0.17	c0.26		0.07	0.17	
v/s Ratio Perm	0.24		0.05	0.27		0.11						
v/c Ratio	0.76	0.66	0.16	0.74	0.78	0.24	0.83	0.90		0.62	0.83	
Uniform Delay, d1	36.9	35.4	29.6	24.3	29.1	21.5	46.1	40.8		50.6	45.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	57.4	3.2	0.7	12.3	4.4	0.9	9.7	13.5		3.0	8.9	
Delay (s)	94.4	38.6	30.3	36.6	33.5	22.4	55.8	54.3		53.6	54.4	
Level of Service	F	D	C	D	C	C	E	D		D	D	
Approach Delay (s)		40.3			31.4			54.9			54.2	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	43.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	60		

c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	1022	135	1498	155	82	17	76
v/c Ratio	0.08	0.44	0.43	0.64	0.69	0.25	0.08	0.24
Control Delay	7.8	7.6	13.2	10.3	51.1	13.4	28.8	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	7.6	13.2	10.3	51.1	13.4	28.8	17.1
Queue Length 50th (m)	0.6	35.8	9.1	66.4	25.3	3.2	2.5	4.8
Queue Length 95th (m)	3.9	70.3	35.1	135.8	48.1	16.3	8.3	17.6
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0						20.0	
Base Capacity (vph)	159	2315	311	2331	310	435	308	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.43	0.64	0.50	0.19	0.06	0.18

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↘	↓	↙			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (vph)	13	960	62	135	1494	4	155	22	60	17	22	54
Future Volume (vph)	13	960	62	135	1494	4	155	22	60	17	22	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3359		1695	3389		1695	1588		1695	1594	
Flt Permitted	0.13	1.00		0.25	1.00		0.71	1.00		0.70	1.00	
Satd. Flow (perm)	231	3359		454	3389		1263	1588		1256	1594	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	13	960	62	135	1494	4	155	22	60	17	22	54
RTOR Reduction (vph)	0	4	0	0	0	0	49	0	0	35	0	0
Lane Group Flow (vph)	13	1018	0	135	1498	0	155	33	0	17	41	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Effective Green, g (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.18	0.18		0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	158	2310		312	2330		224	282		223	283	
v/s Ratio Prot		0.30			c0.44			0.02			0.03	
v/s Ratio Perm	0.06			0.30			c0.12			0.01		
v/c Ratio	0.08	0.44		0.43	0.64		0.69	0.12		0.08	0.14	
Uniform Delay, d1	4.6	6.3		6.2	7.9		34.7	31.1		30.8	31.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.6		1.0	0.6		9.3	0.2		0.1	0.2	
Delay (s)	5.7	6.9		7.2	8.5		44.0	31.2		31.0	31.5	
Level of Service	A	A		A	A		D	C		C	C	
Approach Delay (s)		6.9			8.4			39.6			31.4	
Approach LOS		A			A			D			C	

Intersection Summary

HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.1
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	32	85	87	91	1231	74	141	738	90
v/c Ratio	0.44	0.12	0.42	0.33	0.20	0.52	0.07	0.58	0.31	0.08
Control Delay	30.5	10.9	29.6	19.0	7.0	7.4	1.8	22.7	5.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	10.9	29.6	19.0	7.0	7.4	1.8	22.7	5.7	1.7
Queue Length 50th (m)	8.6	0.3	8.7	5.3	3.6	35.1	0.0	8.1	17.1	0.0
Queue Length 95th (m)	22.2	7.3	22.2	18.1	13.2	74.3	5.0	#46.9	35.7	5.5
Internal Link Dist (m)		56.1		76.2		160.0			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	595	749	625	741	460	2359	1078	245	2359	1083
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	0.04	0.14	0.12	0.20	0.52	0.07	0.58	0.31	0.08

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	84	3	29	85	2	85	91	1231	74	141	738	90
Future Volume (vph)	84	3	29	85	2	85	91	1231	74	141	738	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1542		1695	1523		1695	3390	1517	1695	3390	1517
Flt Permitted	0.70	1.00		0.74	1.00		0.37	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1250	1542		1314	1523		663	3390	1517	351	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	3	29	85	2	85	91	1231	74	141	738	90
RTOR Reduction (vph)	0	25	0	0	29	0	0	0	25	0	0	31
Lane Group Flow (vph)	84	7	0	85	58	0	91	1231	49	141	738	59
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	8.2	8.2		8.2	8.2		41.1	41.1	41.1	41.1	41.1	41.1
Effective Green, g (s)	8.2	8.2		8.2	8.2		41.1	41.1	41.1	41.1	41.1	41.1
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.66	0.66	0.66	0.66	0.66	0.66
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	164	202		172	200		437	2236	1000	231	2236	1000
v/s Ratio Prot		0.00			0.04			0.36				0.22
v/s Ratio Perm	c0.07			0.06			0.14		0.03	c0.40		0.04
v/c Ratio	0.51	0.03		0.49	0.29		0.21	0.55	0.05	0.61	0.33	0.06
Uniform Delay, d1	25.2	23.6		25.1	24.4		4.2	5.7	3.7	6.0	4.6	3.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1		2.2	0.8		1.1	1.0	1.1	12.0	0.4	0.1
Delay (s)	27.9	23.7		27.4	25.2		5.3	6.6	3.8	18.0	5.0	3.9
Level of Service	C	C		C	C		A	A	A	B	A	A
Approach Delay (s)		26.7			26.3			6.4			6.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↓	↘	↙
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	118	115	63	36	355	1069	60	40	832	68
v/c Ratio	0.69	0.40	0.43	0.16	0.79	0.41	0.05	0.12	0.32	0.06
Control Delay	71.8	17.4	55.6	39.7	26.7	5.6	1.2	5.3	4.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	17.4	55.6	39.7	26.7	5.6	1.2	5.3	4.9	1.2
Queue Length 50th (m)	26.8	4.6	13.8	6.3	42.0	38.0	0.0	2.0	26.8	0.0
Queue Length 95th (m)	50.8	25.7	30.1	17.3	#153.6	68.2	4.2	7.1	48.2	4.4
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	229	351	199	309	449	2611	1182	341	2611	1184
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	0.52	0.33	0.32	0.12	0.79	0.41	0.05	0.12	0.32	0.06

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↓	↘	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	118	22	93	63	30	6	355	1069	60	40	832	68
Future Volume (vph)	118	22	93	63	30	6	355	1069	60	40	832	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1568		1695	1740		1695	3390	1517	1695	3390	1517
Flt Permitted	0.73	1.00		0.64	1.00		0.33	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	1309	1568		1140	1740		584	3390	1517	443	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	118	22	93	63	30	6	355	1069	60	40	832	68
RTOR Reduction (vph)	0	81	0	0	5	0	0	0	14	0	0	16
Lane Group Flow (vph)	118	34	0	63	31	0	355	1069	46	40	832	52
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	15.7	15.7		15.7	15.7		92.4	92.4	92.4	92.4	92.4	92.4
Effective Green, g (s)	15.7	15.7		15.7	15.7		92.4	92.4	92.4	92.4	92.4	92.4
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.77	0.77	0.77	0.77	0.77	0.77
Clearance Time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	171	205		149	227		449	2610	1168	341	2610	1168
v/s Ratio Prot		0.02			0.02			0.32			0.25	
v/s Ratio Perm	c0.09			0.06			c0.61		0.03	0.09		0.03
v/c Ratio	0.69	0.17		0.42	0.14		0.79	0.41	0.04	0.12	0.32	0.04
Uniform Delay, d1	49.8	46.3		48.0	46.1		8.1	4.6	3.3	3.5	4.2	3.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.0	0.4		1.9	0.3		14.6	0.5	0.1	0.7	0.3	0.1
Delay (s)	61.8	46.7		49.9	46.4		22.7	5.1	3.3	4.2	4.5	3.4
Level of Service	E	D		D	D		C	A	A	A	A	A
Approach Delay (s)		54.4			48.7			9.2			4.4	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	67	1371	29	0	954
Future Vol, veh/h	0	67	1371	29	0	954
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	67	1371	29	0	954
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1848	686	0	0	1371	0
Stage 1	1371	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	66	390	-	-	497	-
Stage 1	201	-	-	-	-	-
Stage 2	590	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	66	390	-	-	497	-
Mov Cap-2 Maneuver	66	-	-	-	-	-
Stage 1	201	-	-	-	-	-
Stage 2	590	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	16.1	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	390	497	-		
HCM Lane V/C Ratio	-	0.172	-	-		
HCM Control Delay (s)	-	16.1	0	-		
HCM Lane LOS	-	C	A	-		
HCM 95th %tile Q(veh)	-	0.6	0	-		

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	991	65	0	1703	0	44
Future Vol, veh/h	991	65	0	1703	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	991	65	0	1703	0	44
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1056	0	1876	528
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	852	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	655	-	63	495
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	378	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	655	-	63	495
Mov Cap-2 Maneuver	-	-	-	-	63	-
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	378	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	13			
HCM LOS			B			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	495	-	-	655	-	
HCM Lane V/C Ratio	0.089	-	-	-	-	
HCM Control Delay (s)	13	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Queues
7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	←	↖	↑	↗	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	12	146	1258	55	797
v/c Ratio	0.06	0.60	0.50	0.21	0.32
Control Delay	29.9	28.1	5.8	6.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	28.1	5.8	6.7	4.5
Queue Length 50th (m)	1.7	10.2	33.8	2.1	17.6
Queue Length 95th (m)	6.8	31.2	73.8	9.6	37.7
Internal Link Dist (m)	174.0		128.5		160.0
Turn Bay Length (m)	25.0		25.0		
Base Capacity (vph)	448	457	2503	260	2505
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	0.03	0.32	0.50	0.21	0.32

Intersection Summary

HCM Signalized Intersection Capacity Analysis
7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2026 Total AM - with Vanguard Drive

	←	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↑↓		↖	↗
Traffic Volume (vph)	12	146	1250	8	55	797
Future Volume (vph)	12	146	1250	8	55	797
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1695	1517	3387		1695	3390
Flt Permitted	0.95	1.00	1.00		0.20	1.00
Satd. Flow (perm)	1695	1517	3387		353	3390
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	146	1250	8	55	797
RTOR Reduction (vph)	0	66	0	0	0	0
Lane Group Flow (vph)	12	80	1258	0	55	797
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	9.7	9.7	61.5		61.5	61.5
Effective Green, g (s)	9.7	9.7	61.5		61.5	61.5
Actuated g/C Ratio	0.12	0.12	0.74		0.74	0.74
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	197	176	2503		260	2505
v/s Ratio Prot	0.01		0.37			0.24
v/s Ratio Perm		0.05			0.16	
v/c Ratio	0.06	0.45	0.50		0.21	0.32
Uniform Delay, d1	32.7	34.3	4.5		3.4	3.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	1.9	0.7		1.9	0.3
Delay (s)	32.8	36.1	5.2		5.2	4.0
Level of Service	C	D	A		A	A
Approach Delay (s)	35.9		5.2			4.1
Approach LOS	D		A			A

Intersection Summary

HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	3					
Movement						
	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	16	47	134	39	61	24
Future Vol, veh/h	16	47	134	39	61	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	250	0	-
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	16	47	134	39	61	24
Major/Minor						
	Major1		Major2		Minor2	
Conflicting Flow All	134	0	-	0	213	134
Stage 1	-	-	-	-	134	-
Stage 2	-	-	-	-	79	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	-	3,518	3,318
Pot Cap-1 Maneuver	1451	-	-	-	775	915
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1451	-	-	-	766	915
Mov Cap-2 Maneuver	-	-	-	-	766	-
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	934	-
Approach						
	EB		WB		SB	
HCM Control Delay, s	1.9		0		10	
HCM LOS					B	
Minor Lane/Major Mvmt						
	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1451	-	-	-	803	
HCM Lane V/C Ratio	0.011	-	-	-	0.106	
HCM Control Delay (s)	7.5	-	-	-	10	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2026 Total PM - with Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	1101	389	246	970	372	444	1074	331	1030
v/c Ratio	0.84	1.11	0.55	1.12	0.86	0.49	0.87	1.21	0.69	1.22
Control Delay	78.3	250.7	7.7	301.0	43.3	7.8	71.7	419.6	56.9	454.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.3	250.7	7.7	301.0	43.3	7.8	71.7	419.6	56.9	454.5
Queue Length 50th (m)	18.8	~155.7	3.9	~54.7	78.1	3.5	53.0	~153.7	38.4	~157.0
Queue Length 95th (m)	#63.2	#232.8	46.0 m	#120.4 m	#173.1 m	m31.4	#94.0	#231.1	60.8	#232.8
Internal Link Dist (m)		116.7		151.9			97.1		134.6	
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	158	994	703	220	1130	753	523	890	495	841
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	0.84	1.11	0.55	1.12	0.86	0.49	0.85	1.21	0.67	1.22

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2026 Total PM - with Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	133	1101	389	246	970	372	444	681	393	331	927	103
Future Volume (vph)	133	1101	389	246	970	372	444	681	393	331	927	103
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3204		3288	3339	
Flt Permitted	0.12	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	220	3390	1517	178	3390	1517	3288	3204		3288	3339	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	133	1101	389	246	970	372	444	681	393	331	927	103
RTOR Reduction (vph)	0	0	259	0	0	248	0	68	0	0	7	0
Lane Group Flow (vph)	133	1101	130	246	970	124	444	1006	0	331	1023	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	41.8	35.2	35.2	51.4	40.0	40.0	18.6	30.8		17.6	30.0	
Effective Green, g (s)	41.8	35.2	35.2	51.4	40.0	40.0	18.6	30.8		17.6	30.0	
Actuated g/C Ratio	0.35	0.29	0.29	0.43	0.33	0.33	0.16	0.26		0.15	0.25	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	994	444	220	1130	505	509	822		482	834	
v/s Ratio Prot	0.05	0.32		c0.11	c0.29		c0.14	c0.31		0.10	0.31	
v/s Ratio Perm	0.25		0.09	c0.37		0.08						
v/c Ratio	0.85	1.11	0.29	1.12	0.86	0.25	0.87	1.22		0.69	1.23	
Uniform Delay, d1	30.1	42.4	32.8	33.7	37.4	29.0	49.5	44.6		48.6	45.0	
Progression Factor	1.00	1.00	1.00	1.60	0.95	2.01	1.00	1.00		1.00	1.00	
Incremental Delay, d2	41.1	210.9	1.7	261.2	7.2	0.9	17.8	413.7		4.1	419.8	
Delay (s)	71.3	253.3	34.5	315.1	42.8	59.1	67.3	458.3		52.7	464.8	
Level of Service	E	F	C	F	D	E	E	F		D	F	
Approach Delay (s)		185.9			88.8			344.0			364.6	
Approach LOS		F			F			F			F	

Intersection Summary

- HCM 2000 Control Delay 239.9 HCM 2000 Level of Service F
- HCM 2000 Volume to Capacity ratio 1.15
- Actuated Cycle Length (s) 120.0 Sum of lost time (s) 25.0
- Intersection Capacity Utilization 111.1% ICU Level of Service H
- Analysis Period (min) 60
- c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 Total PM - with Vanguard Drive

	↖	→	↗	↖	↗	↖	↗	↖	↗
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	52	1758	175	1393	190	132	41	54	
v/c Ratio	0.21	0.88	0.80	0.63	0.86	0.37	0.22	0.18	
Control Delay	4.3	16.4	59.5	14.4	92.4	15.0	45.0	25.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.3	16.4	59.5	14.4	92.4	15.0	45.0	25.6	
Queue Length 50th (m)	1.9	81.7	25.5	102.8	43.1	4.9	8.2	5.3	
Queue Length 95th (m)	m2.0	m78.0	#72.5	153.4	#94.7	27.8	21.1	19.1	
Internal Link Dist (m)		117.0		121.0		27.1		48.5	
Turn Bay Length (m)	40.0					20.0			
Base Capacity (vph)	248	2007	236	2226	241	380	203	331	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.21	0.88	0.74	0.63	0.79	0.35	0.20	0.16	

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2026 Total PM - with Vanguard Drive

	↖	→	↗	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖↗	↖	↖	↖	↖↗
Traffic Volume (vph)	52	1630	128	175	1370	23	190	25	107	41	27	27	
Future Volume (vph)	52	1630	128	175	1370	23	190	25	107	41	27	27	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.5	6.2		4.5	6.2		5.9	5.9		5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.93		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1695	3353		1695	3382		1695	1567		1695	1650		
Flt Permitted	0.15	1.00		0.05	1.00		0.72	1.00		0.61	1.00		
Satd. Flow (perm)	267	3353		94	3382		1288	1567		1084	1650		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	1630	128	175	1370	23	190	25	107	41	27	27	
RTOR Reduction (vph)	0	4	0	0	1	0	0	89	0	0	22	0	
Lane Group Flow (vph)	52	1754	0	175	1392	0	190	43	0	41	32	0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6		8	8		4	4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	76.5	71.7		87.4	78.1		20.5	20.5		20.5	20.5		
Effective Green, g (s)	76.5	71.7		87.4	78.1		20.5	20.5		20.5	20.5		
Actuated g/C Ratio	0.64	0.60		0.73	0.65		0.17	0.17		0.17	0.17		
Clearance Time (s)	4.5	6.2		4.5	6.2		5.9	5.9		5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	227	2003		217	2201		220	267		185	281		
v/s Ratio Prot	0.01	c0.52		c0.07	0.41			0.03			0.02		
v/s Ratio Perm	0.14			0.51			c0.15			0.04			
v/c Ratio	0.23	0.88		0.81	0.63		0.86	0.16		0.22	0.11		
Uniform Delay, d1	9.4	20.4		35.9	12.4		48.4	42.4		42.9	42.1		
Progression Factor	0.71	0.67		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.1	1.5		22.1	0.6		35.2	0.3		0.6	0.2		
Delay (s)	6.9	15.2		58.0	13.0		83.6	42.7		43.5	42.2		
Level of Service	A	B		E	B		F	D		D	D		
Approach Delay (s)		14.9			18.1			66.8			42.8		
Approach LOS		B			B			E			D		

Intersection Summary

HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	60		

- c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total PM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	103	145	111	144	1078	94	205	1418	156
v/c Ratio	0.94	0.25	0.50	0.25	0.92	0.49	0.09	0.79	0.64	0.15
Control Delay	110.8	19.1	46.4	8.3	108.4	11.4	1.7	42.7	14.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.0
Total Delay	110.8	19.1	46.4	8.3	108.4	11.9	1.7	42.7	14.6	1.5
Queue Length 50th (m)	62.8	8.2	29.5	0.2	27.6	63.2	0.0	32.2	97.7	0.0
Queue Length 95th (m)	#134.0	26.9	57.2	18.4	#48.9	92.4	7.0	#100.3	145.9	9.3
Internal Link Dist (m)		56.1		76.2		160.0			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	297	417	299	453	156	2221	1025	260	2221	1047
Starvation Cap Reductn	0	0	0	0	0	621	0	0	390	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	0.92	0.25	0.48	0.25	0.92	0.67	0.09	0.79	0.77	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2026 Total PM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	272	5	98	145	1	110	144	1078	94	205	1418	156
Future Volume (vph)	272	5	98	145	1	110	144	1078	94	205	1418	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	0.95	1.00	0.95
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1530		1695	1519		1695	3390	1517	1695	3390	1517
Flt Permitted	0.69	1.00		0.69	1.00		0.13	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1223	1530		1232	1519		238	3390	1517	397	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	272	5	98	145	1	110	144	1078	94	205	1418	156
RTOR Reduction (vph)	0	45	0	0	84	0	0	0	32	0	0	54
Lane Group Flow (vph)	272	58	0	145	27	0	144	1078	62	205	1418	102
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	28.1	28.1		28.1	28.1		78.0	78.0	78.0	78.0	78.0	78.0
Effective Green, g (s)	28.1	28.1		28.1	28.1		78.0	78.0	78.0	78.0	78.0	78.0
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.65	0.65	0.65	0.65	0.65	0.65
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	288	360		290	358		155	2220	993	260	2220	993
v/s Ratio Prot		0.04			0.02			0.32			0.42	
v/s Ratio Perm	c0.22			0.12			c0.60		0.04	0.52		0.07
v/c Ratio	0.94	0.16		0.50	0.08		0.93	0.49	0.06	0.79	0.64	0.10
Uniform Delay, d1	44.7	36.1		39.4	35.4		18.1	10.4	7.4	14.7	12.2	7.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.0	0.2		1.4	0.1		89.4	0.8	0.1	24.3	1.4	0.2
Delay (s)	104.8	36.3		40.8	35.5		107.5	11.2	7.5	38.9	13.6	7.8
Level of Service	F	D		D	D		F	B	A	D	B	A
Approach Delay (s)		86.0			38.5			21.4			16.0	
Approach LOS		F			D			C			B	

Intersection Summary

HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 Total PM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	437	128	272	216	1623	49	28	1898	97
v/c Ratio	0.94	0.77	1.13	0.54	1.21	0.80	0.05	0.35	1.15	0.12
Control Delay	111.9	37.1	375.7	36.2	462.6	22.1	5.2	35.2	316.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.9	37.1	375.7	36.2	462.6	22.1	5.2	35.2	316.2	5.5
Queue Length 50th (m)	51.1	66.5	~34.9	48.0	~47.3	144.8	1.7	4.0	~277.4	2.2
Queue Length 95th (m)	#117.1	#143.7	#84.9	87.3	#113.1	223.0	7.6	16.7	#378.8	13.6
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	238	567	113	500	178	2039	924	79	1644	776
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	0.94	0.77	1.13	0.54	1.21	0.80	0.05	0.35	1.15	0.13

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2026 Total PM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	223	105	332	128	94	178	216	1623	49	28	1898	97
Future Volume (vph)	223	105	332	128	94	178	216	1623	49	28	1898	97
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1581		1695	1609		1695	3390	1517	1695	3390	1517
Flt Permitted	0.45	1.00		0.21	1.00		0.06	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	795	1581		380	1609		112	3390	1517	163	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	223	105	332	128	94	178	216	1623	49	28	1898	97
RTOR Reduction (vph)	0	95	0	0	20	0	0	0	12	0	0	41
Lane Group Flow (vph)	223	342	0	128	252	0	216	1623	37	28	1898	56
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	35.9	35.9		35.9	35.9		72.2	72.2	72.2	58.2	58.2	58.2
Effective Green, g (s)	35.9	35.9		35.9	35.9		72.2	72.2	72.2	58.2	58.2	58.2
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.60	0.60	0.60	0.49	0.49	0.49
Clearance Time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	237	472		113	481		178	2039	912	79	1644	735
v/s Ratio Prot		0.22			0.16		c0.08	0.48			0.56	
v/s Ratio Perm	0.28			c0.34			c0.65		0.02	0.17		0.04
v/c Ratio	0.94	0.73		1.13	0.52		1.21	0.80	0.04	0.35	1.15	0.08
Uniform Delay, d1	41.0	37.6		42.0	35.0		37.8	18.3	9.8	19.2	30.9	16.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	67.1	5.7		335.7	1.0		435.0	3.4	0.1	12.4	286.1	0.2
Delay (s)	108.1	43.3		377.7	36.0		472.8	21.7	9.8	31.6	317.0	16.7
Level of Service	F	D		F	D		F	C	A	C	F	B
Approach Delay (s)		65.2			145.4			73.0			298.6	
Approach LOS		E			F			E			F	

Intersection Summary

HCM 2000 Control Delay	169.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	122.6%	ICU Level of Service	H
Analysis Period (min)	60		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	103	1415	45	0	1561
Future Vol, veh/h	0	103	1415	45	0	1561
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	103	1415	45	0	1561

Major/Minor	Minor1	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	2196	708	0	0	1415	0
Stage 1	1415	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	38	377	-	-	478	-
Stage 1	190	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	38	377	-	-	478	-
Mov Cap-2 Maneuver	38	-	-	-	-	-
Stage 1	190	-	-	-	-	-
Stage 2	412	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	377	478	-
HCM Lane V/C Ratio	-	0.273	-	-
HCM Control Delay (s)	-	18.1	0	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	1.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1711	114	0	1588	0	99
Future Vol, veh/h	1711	114	0	1588	0	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1711	114	0	1588	0	99

Major/Minor	Major1	Major2	Minor1	Major1	Major2	Minor1
Conflicting Flow All	0	0	1825	0	2562	913
Stage 1	-	-	-	-	1768	-
Stage 2	-	-	-	-	794	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	331	-	21	276
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	406	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	331	-	21	276
Mov Cap-2 Maneuver	-	-	-	-	21	-
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	406	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	25.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	276	-	-	331	-
HCM Lane V/C Ratio	0.359	-	-	-	-
HCM Control Delay (s)	25.3	-	-	0	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0	-

Queues

7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2026 Total PM - with Vanguard Drive

	↖	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	10	95	1233	179	1482
v/c Ratio	0.07	0.45	0.44	0.57	0.53
Control Delay	35.2	15.5	3.7	14.3	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.2
Total Delay	35.2	15.5	3.7	14.3	4.5
Queue Length 50th (m)	1.6	0.0	25.7	8.6	35.1
Queue Length 95th (m)	6.4	15.9	54.2	#60.8	76.4
Internal Link Dist (m)	174.0		128.5		160.0
Turn Bay Length (m)	25.0		25.0		
Base Capacity (vph)	358	395	2783	314	2785
Starvation Cap Reductn	0	0	0	0	472
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.24	0.44	0.57	0.64

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2026 Total PM - with Vanguard Drive

	↖	↗	↑	↘	↓	
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↑↓		↖	↗
Traffic Volume (vph)	10	95	1221	12	179	1482
Future Volume (vph)	10	95	1221	12	179	1482
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1695	1517	3385		1695	3390
Flt Permitted	0.95	1.00	1.00		0.21	1.00
Satd. Flow (perm)	1695	1517	3385		382	3390
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	95	1221	12	179	1482
RTOR Reduction (vph)	0	89	0	0	0	0
Lane Group Flow (vph)	10	6	1233	0	179	1482
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	5.7	5.7	68.9		68.9	68.9
Effective Green, g (s)	5.7	5.7	68.9		68.9	68.9
Actuated g/C Ratio	0.07	0.07	0.80		0.80	0.80
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	111	99	2693		303	2697
v/s Ratio Prot	c0.01		0.36			0.44
v/s Ratio Perm		0.00			c0.47	
v/c Ratio	0.09	0.06	0.46		0.59	0.55
Uniform Delay, d1	38.0	37.9	2.8		3.4	3.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.3	0.6		8.5	0.8
Delay (s)	38.4	38.2	3.4		11.9	4.0
Level of Service	D	D	A		B	A
Approach Delay (s)	38.2		3.4			4.9
Approach LOS	D		A			A

Intersection Summary

HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	86.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	2.2					
Movement						
	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	26	165	85	63	50	20
Future Vol, veh/h	26	165	85	63	50	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	250	0	-
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	26	165	85	63	50	20
Major/Minor						
	Major1		Major2		Minor2	
Conflicting Flow All	85	0	-	0	302	85
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	-	3,518	3,318
Pot Cap-1 Maneuver	1512	-	-	-	690	974
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	819	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1512	-	-	-	678	974
Mov Cap-2 Maneuver	-	-	-	-	678	-
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	805	-
Approach						
	EB		WB		SB	
HCM Control Delay, s	1		0		10.4	
HCM LOS					B	
Minor Lane/Major Mvmt						
	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1512	-	-	-	742	
HCM Lane V/C Ratio	0.017	-	-	-	0.094	
HCM Control Delay (s)	7.4	-	-	-	10.4	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix C Intersection Performance Worksheets
January 4, 2017

**C. 5 2031 ULTIMATE CONDITIONS – WITHOUT THE VANGUARD DRIVE
EXTENSION**

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2031 Ultimate AM - without Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	776	256	189	1344	416	560	950	253	592
v/c Ratio	0.53	0.75	0.40	0.72	1.05	0.51	0.85	1.04	0.64	0.92
Control Delay	36.3	43.4	5.8	38.6	150.8	6.1	61.2	154.8	58.0	74.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	43.4	5.8	38.6	150.8	6.1	61.2	154.8	58.0	74.4
Queue Length 50th (m)	9.0	87.1	0.0	26.8	~189.6	4.0	64.9	~126.8	29.6	72.8
Queue Length 95th (m)	#23.8	#128.8	27.8	#63.3	#274.7	43.9	#106.3	#213.0	47.0	#132.1
Internal Link Dist (m)		116.7		151.9			97.1		134.6	
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	130	1033	640	267	1280	815	704	910	495	644
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	0.53	0.75	0.40	0.71	1.05	0.51	0.80	1.04	0.51	0.92

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mer Bleue Road & Innes Road

SmartREIT Orleans

2031 Ultimate AM - without Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖↗	↖	↖	↖
Traffic Volume (vph)	69	776	256	189	1344	416	560	827	123	253	531	61
Future Volume (vph)	69	776	256	189	1344	416	560	827	123	253	531	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3324		3288	3338	
Flt Permitted	0.11	1.00	1.00	0.16	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	195	3390	1517	277	3390	1517	3288	3324		3288	3338	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	776	256	189	1344	416	560	827	123	253	531	61
RTOR Reduction (vph)	0	0	178	0	0	247	0	9	0	0	7	0
Lane Group Flow (vph)	69	776	78	189	1344	169	560	941	0	253	585	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	40.6	36.6	36.6	54.2	44.1	44.1	24.0	32.5		14.4	22.9	
Effective Green, g (s)	40.6	36.6	36.6	54.2	44.1	44.1	24.0	32.5		14.4	22.9	
Actuated g/C Ratio	0.34	0.31	0.31	0.45	0.37	0.37	0.20	0.27		0.12	0.19	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	115	1033	462	261	1245	557	657	900		394	637	
v/s Ratio Prot	0.02	0.23		c0.07	c0.40		c0.17	c0.28		0.08	0.18	
v/s Ratio Perm	0.18		0.05	0.26		0.11						
v/c Ratio	0.60	0.75	0.17	0.72	1.08	0.30	0.85	1.05		0.64	0.92	
Uniform Delay, d1	32.0	37.6	30.6	23.8	37.9	27.0	46.3	43.8		50.3	47.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.4	5.2	0.8	10.1	160.6	1.4	11.5	114.0		3.6	23.4	
Delay (s)	40.4	42.8	31.3	33.8	198.6	28.4	57.8	157.8		54.0	71.0	
Level of Service	D	D	C	C	F	C	E	F		D	E	
Approach Delay (s)		40.0			146.3			120.7			65.9	
Approach LOS		D			F			F			E	

Intersection Summary

HCM 2000 Control Delay	104.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	60		

c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2031 Ultimate AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	14	1117	206	1742	155	142	17	79
v/c Ratio	0.13	0.48	0.75	0.75	0.69	0.38	0.08	0.26
Control Delay	10.1	8.0	34.0	12.7	51.4	11.8	29.0	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	8.0	34.0	12.7	51.4	11.8	29.0	23.5
Queue Length 50th (m)	0.7	41.1	20.1	89.3	25.3	3.9	2.5	8.0
Queue Length 95th (m)	4.8	80.3	#83.9	#215.0	48.2	22.1	8.3	21.1
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0						20.0	
Base Capacity (vph)	104	2316	275	2331	308	467	282	408
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.48	0.75	0.75	0.50	0.30	0.06	0.19

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2031 Ultimate AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↓	↖			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖	↖
Traffic Volume (vph)	14	1055	62	206	1737	5	155	22	120	17	22	57
Future Volume (vph)	14	1055	62	206	1737	5	155	22	120	17	22	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3362		1695	3389		1695	1558		1695	1591	
Flt Permitted	0.09	1.00		0.22	1.00		0.71	1.00		0.65	1.00	
Satd. Flow (perm)	152	3362		400	3389		1259	1558		1157	1591	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	1055	62	206	1737	5	155	22	120	17	22	57
RTOR Reduction (vph)	0	4	0	0	0	0	0	95	0	0	21	0
Lane Group Flow (vph)	14	1113	0	206	1742	0	155	47	0	17	58	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Effective Green, g (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.18	0.18		0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	104	2312		275	2330		223	276		205	282	
v/s Ratio Prot		0.33			0.51			0.03			0.04	
v/s Ratio Perm	0.09			c0.51			c0.12			0.01		
v/c Ratio	0.13	0.48		0.75	0.75		0.70	0.17		0.08	0.21	
Uniform Delay, d1	4.8	6.6		9.0	9.0		34.7	31.4		30.9	31.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	0.7		11.4	1.4		9.5	0.3		0.2	0.4	
Delay (s)	7.5	7.3		20.4	10.4		44.2	31.7		31.1	32.0	
Level of Service	A	A		C	B		D	C		C	C	
Approach Delay (s)		7.3			11.4			38.2			31.8	
Approach LOS		A			B			D			C	

Intersection Summary

HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.1
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

Queues

SmartREIT Orleans

3: Mer Bleue Road & Commercial Site Access/Site Access #1 2031 Ultimate AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	32	109	99	91	1291	90	149	749	90
v/c Ratio	0.41	0.11	0.50	0.36	0.20	0.55	0.08	0.68	0.32	0.08
Control Delay	28.9	10.5	31.3	20.9	7.6	8.3	1.9	33.6	6.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	10.5	31.3	20.9	7.6	8.3	1.9	33.6	6.1	1.9
Queue Length 50th (m)	8.6	0.3	11.3	7.2	3.9	40.1	0.0	10.3	18.5	0.0
Queue Length 95th (m)	22.0	7.2	27.3	21.1	14.1	86.4	5.8	#53.8	38.8	5.8
Internal Link Dist (m)		56.1		76.2		125.8			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	580	739	616	728	450	2329	1070	218	2329	1070
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	0.04	0.18	0.14	0.20	0.55	0.08	0.68	0.32	0.08

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

SmartREIT Orleans

3: Mer Bleue Road & Commercial Site Access/Site Access #1 2031 Ultimate AM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	84	3	29	109	2	97	91	1291	90	149	749	90
Future Volume (vph)	84	3	29	109	2	97	91	1291	90	149	749	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	0.95	1.00	0.95
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1542		1695	1522		1695	3390	1517	1695	3390	1517
Flt Permitted	0.69	1.00		0.74	1.00		0.37	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1236	1542		1314	1522		655	3390	1517	317	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	3	29	109	2	97	91	1291	90	149	749	90
RTOR Reduction (vph)	0	25	0	0	23	0	0	0	31	0	0	31
Lane Group Flow (vph)	84	7	0	109	76	0	91	1291	59	149	749	59
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	9.1	9.1		9.1	9.1		41.2	41.2	41.2	41.2	41.2	41.2
Effective Green, g (s)	9.1	9.1		9.1	9.1		41.2	41.2	41.2	41.2	41.2	41.2
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.65	0.65	0.65	0.65	0.65	0.65
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	221		188	218		426	2206	987	206	2206	987
v/s Ratio Prot		0.00			0.05			0.38			0.22	
v/s Ratio Perm	0.07			c0.08			0.14		0.04	c0.47		0.04
v/c Ratio	0.47	0.03		0.58	0.35		0.21	0.59	0.06	0.72	0.34	0.06
Uniform Delay, d1	24.9	23.3		25.3	24.4		4.5	6.2	4.0	7.3	5.0	4.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.1		4.4	1.0		1.1	1.1	0.1	21.9	0.4	0.1
Delay (s)	26.9	23.4		29.7	25.4		5.6	7.4	4.1	29.2	5.4	4.1
Level of Service	C	C		C	C		A	A	A	C	A	A
Approach Delay (s)		25.9			27.6			7.1			8.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate AM - without Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	72	59	66	37	223	1306	63	42	867	38
v/c Ratio	0.48	0.27	0.45	0.18	0.49	0.49	0.05	0.16	0.32	0.03
Control Delay	47.5	21.0	46.3	32.0	9.8	5.2	1.2	5.6	4.1	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	21.0	46.3	32.0	9.8	5.2	1.2	5.6	4.1	1.4
Queue Length 50th (m)	11.9	3.6	10.8	4.9	12.5	38.3	0.0	1.7	21.0	0.0
Queue Length 95th (m)	26.6	16.1	25.0	14.5	49.0	77.2	3.9	7.1	41.5	2.9
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	305	405	299	410	454	2686	1215	266	2686	1210
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	0.24	0.15	0.22	0.09	0.49	0.49	0.05	0.16	0.32	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate AM - without Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	72	23	36	66	31	6	223	1306	63	42	867	38
Future Volume (vph)	72	23	36	66	31	6	223	1306	63	42	867	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1621		1695	1741		1695	3390	1517	1695	3390	1517
Flt Permitted	0.73	1.00		0.72	1.00		0.32	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	1308	1621		1282	1741		572	3390	1517	337	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	72	23	36	66	31	6	223	1306	63	42	867	38
RTOR Reduction (vph)	0	32	0	0	5	0	0	0	15	0	0	9
Lane Group Flow (vph)	72	27	0	66	32	0	223	1306	48	42	867	29
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	9.2	9.2		9.2	9.2		68.9	68.9	68.9	68.9	68.9	68.9
Effective Green, g (s)	9.2	9.2		9.2	9.2		68.9	68.9	68.9	68.9	68.9	68.9
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.77	0.77	0.77	0.77	0.77	0.77
Clearance Time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	133	165		131	177		437	2595	1161	257	2595	1161
v/s Ratio Prot		0.02			0.02			0.39			0.26	
v/s Ratio Perm	c0.06			0.05			c0.39		0.03	0.12		0.02
v/c Ratio	0.54	0.16		0.50	0.18		0.51	0.50	0.04	0.16	0.33	0.03
Uniform Delay, d1	38.4	36.9		38.2	36.9		4.1	4.0	2.6	2.8	3.3	2.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5	0.5		3.1	0.5		4.3	0.7	1.1	1.4	0.3	0.0
Delay (s)	42.9	37.3		41.3	37.4		8.3	4.7	2.6	4.2	3.7	2.6
Level of Service	D	D		D	D		A	A	A	A	A	A
Approach Delay (s)		40.4			39.9			5.1			3.7	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	67	1443	29	0	976
Future Vol, veh/h	0	67	1443	29	0	976
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	67	1443	29	0	976
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1931	722	0	0	1443	0
Stage 1	1443	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	58	369	-	-	466	-
Stage 1	184	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	58	369	-	-	466	-
Mov Cap-2 Maneuver	58	-	-	-	-	-
Stage 1	184	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	16.9	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	369	466	-	
HCM Lane V/C Ratio	-	-	0.182	-	-	
HCM Control Delay (s)	-	-	16.9	0	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.7	0	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1087	65	0	1949	0	44
Future Vol, veh/h	1087	65	0	1949	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1087	65	0	1949	0	44
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1152	0	2095	576
Stage 1	-	-	-	-	1120	-
Stage 2	-	-	-	-	975	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	602	-	45	460
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	326	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	602	-	45	460
Mov Cap-2 Maneuver	-	-	-	-	45	-
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	326	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	13.7			
HCM LOS			B			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	460	-	-	602	-	
HCM Lane V/C Ratio	0.096	-	-	-	-	
HCM Control Delay (s)	13.7	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2031 Ultimate PM - without Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	1312	428	260	1086	412	443	1103	382	984
v/c Ratio	0.96	1.24	0.60	1.20	0.90	0.52	0.90	1.32	0.78	1.23
Control Delay	138.7	468.7	10.9	435.1	40.0	2.9	79.9	626.2	62.0	459.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	138.7	468.7	10.9	435.1	40.0	2.9	79.9	626.2	62.0	459.3
Queue Length 50th (m)	18.9	~201.3	13.6	~62.0	111.8	0.0	53.4	~167.8	45.1	~150.0
Queue Length 95th (m)	#70.7	#285.4	64.8 m	#129.5 m	#198.1 m	14.0	#97.2	#246.2	#78.2	#224.2
Internal Link Dist (m)		116.7		151.9			97.1		134.6	
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	145	1062	714	216	1203	797	495	833	495	802
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	0.96	1.24	0.60	1.20	0.90	0.52	0.89	1.32	0.77	1.23

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2031 Ultimate PM - without Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	139	1312	428	260	1086	412	443	685	418	382	876	108
Future Volume (vph)	139	1312	428	260	1086	412	443	685	418	382	876	108
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3197		3288	3334	
Flt Permitted	0.11	1.00	1.00	0.09	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	190	3390	1517	168	3390	1517	3288	3197		3288	3334	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	139	1312	428	260	1086	412	443	685	418	382	876	108
RTOR Reduction (vph)	0	0	239	0	0	259	0	77	0	0	8	0
Lane Group Flow (vph)	139	1312	189	260	1086	153	443	1026	0	382	976	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	43.7	37.6	37.6	53.7	42.6	42.6	17.9	28.4		17.9	28.6	
Effective Green, g (s)	43.7	37.6	37.6	53.7	42.6	42.6	17.9	28.4		17.9	28.6	
Actuated g/C Ratio	0.36	0.31	0.31	0.45	0.36	0.36	0.15	0.24		0.15	0.24	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	145	1062	475	216	1203	538	490	756		490	794	
v/s Ratio Prot	0.05	0.39		c0.11	c0.32		c0.13	c0.32		0.12	0.29	
v/s Ratio Perm	0.30		0.12	c0.43		0.10						
v/c Ratio	0.96	1.24	0.40	1.20	0.90	0.28	0.90	1.36		0.78	1.23	
Uniform Delay, d1	32.1	41.2	32.3	34.1	36.7	27.8	50.2	45.8		49.2	45.7	
Progression Factor	1.00	1.00	1.00	1.52	0.80	0.34	1.00	1.00		1.00	1.00	
Incremental Delay, d2	108.0	432.4	2.5	400.9	10.0	1.0	25.4	651.6		8.1	425.3	
Delay (s)	140.1	473.6	34.8	452.7	39.4	10.5	75.6	697.4		57.3	471.0	
Level of Service	F	F	C	F	D	B	E	F		E	F	
Approach Delay (s)		349.0			93.7		519.2				355.3	
Approach LOS		F			F		F				F	

Intersection Summary

- HCM 2000 Control Delay 322.0 HCM 2000 Level of Service F
- HCM 2000 Volume to Capacity ratio 1.23
- Actuated Cycle Length (s) 120.0 Sum of lost time (s) 25.0
- Intersection Capacity Utilization 119.9% ICU Level of Service H
- Analysis Period (min) 60
- c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2031 Ultimate PM - without Vanguard Drive

	↖	→	↗	↖	↗	↖	↗	↖	↗
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	55	2042	269	1564	190	194	43	55	
v/c Ratio	0.34	1.09	0.93	0.63	0.87	0.48	0.32	0.18	
Control Delay	11.9	180.0	95.2	9.9	94.8	13.5	49.9	25.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.9	180.0	95.2	9.9	94.8	13.5	49.9	25.4	
Queue Length 50th (m)	4.9	~288.8	~49.0	91.0	43.3	4.9	8.8	5.3	
Queue Length 95th (m)	m4.6	m234.2	#124.5	139.1	#95.8	34.0	22.7	19.3	
Internal Link Dist (m)		117.0		121.0		27.1		48.5	
Turn Bay Length (m)	40.0					20.0			
Base Capacity (vph)	160	1876	288	2466	236	423	146	326	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	1.09	0.93	0.63	0.81	0.46	0.29	0.17	

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans

2031 Ultimate PM - without Vanguard Drive

	↖	→	↗	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	55	1913	129	269	1540	24	190	25	169	43	27	28	
Future Volume (vph)	55	1913	129	269	1540	24	190	25	169	43	27	28	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)	6.2	6.2		4.5	6.2		5.9	5.9		5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Flt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.92		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1695	3358		1695	3382		1695	1551		1695	1648		
Flt Permitted	0.16	1.00		0.06	1.00		0.72	1.00		0.44	1.00		
Satd. Flow (perm)	287	3358		100	3382		1287	1551		793	1648		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	55	1913	129	269	1540	24	190	25	169	43	27	28	
RTOR Reduction (vph)	0	4	0	0	1	0	0	140	0	0	23	0	
Lane Group Flow (vph)	55	2038	0	269	1563	0	190	54	0	43	32	0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	6			8			4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	66.9	66.9		87.5	87.5		20.4	20.4		20.4	20.4		
Effective Green, g (s)	66.9	66.9		87.5	87.5		20.4	20.4		20.4	20.4		
Actuated g/C Ratio	0.56	0.56		0.73	0.73		0.17	0.17		0.17	0.17		
Clearance Time (s)	6.2	6.2		4.5	6.2		5.9	5.9		5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	160	1872		286	2466		218	263		134	280		
v/s Ratio Prot		c0.61		c0.13	0.46			0.03			0.02		
v/s Ratio Perm	0.19			0.56			c0.15			0.05			
v/c Ratio	0.34	1.09		0.94	0.63		0.87	0.20		0.32	0.11		
Uniform Delay, d1	14.5	26.5		42.1	8.2		48.5	42.8		43.7	42.1		
Progression Factor	0.69	0.65		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.5	160.7		58.3	0.5		38.1	0.4		1.4	0.2		
Delay (s)	10.5	178.0		100.3	8.7		86.6	43.2		45.1	42.3		
Level of Service	B	F		F	A		F	D		D	D		
Approach Delay (s)		173.6			22.2			64.7			43.6		
Approach LOS		F			C			E			D		

Intersection Summary

HCM 2000 Control Delay	98.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	111.2%	ICU Level of Service	H
Analysis Period (min)	60		

c Critical Lane Group

Queues

SmartREIT Orleans

3: Mer Bleue Road & Commercial Site Access/Site Access #1 2031 Ultimate PM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	103	165	121	144	1096	120	218	1411	156
v/c Ratio	0.94	0.25	0.56	0.27	0.93	0.50	0.12	0.87	0.64	0.15
Control Delay	109.4	18.9	48.4	8.9	111.7	11.7	1.6	62.2	14.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	109.4	18.9	48.4	8.9	111.7	11.7	1.6	62.2	14.7	1.6
Queue Length 50th (m)	62.7	8.1	34.1	0.9	27.9	65.5	0.0	38.7	97.8	0.0
Queue Length 95th (m)	#133.5	26.8	65.1	20.0	#49.3	95.9	8.1	#111.0	146.2	9.4
Internal Link Dist (m)		56.1		76.2		125.8			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	299	422	304	462	155	2211	1031	250	2211	1044
Starvation Cap Reductn	0	0	0	0	0	0	0	0	386	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	0.91	0.24	0.54	0.26	0.93	0.50	0.12	0.87	0.77	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

SmartREIT Orleans

3: Mer Bleue Road & Commercial Site Access/Site Access #1 2031 Ultimate PM - without Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	272	5	98	165	1	120	144	1096	120	218	1411	156
Future Volume (vph)	272	5	98	165	1	120	144	1096	120	218	1411	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	0.95	1.00	0.95
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1530		1695	1519		1695	3390	1517	1695	3390	1517
Flt Permitted	0.68	1.00		0.69	1.00		0.13	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1212	1530		1232	1519		240	3390	1517	386	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	272	5	98	165	1	120	144	1096	120	218	1411	156
RTOR Reduction (vph)	0	45	0	0	88	0	0	0	42	0	0	54
Lane Group Flow (vph)	272	58	0	165	33	0	144	1096	78	218	1411	102
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	28.4	28.4		28.4	28.4		77.6	77.6	77.6	77.6	77.6	77.6
Effective Green, g (s)	28.4	28.4		28.4	28.4		77.6	77.6	77.6	77.6	77.6	77.6
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.65	0.65	0.65	0.65	0.65	0.65
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	289	365		294	362		156	2210	989	251	2210	989
v/s Ratio Prot		0.04			0.02			0.32			0.42	
v/s Ratio Perm	c0.22			0.13			c0.60		0.05	0.56		0.07
v/c Ratio	0.94	0.16		0.56	0.09		0.92	0.50	0.08	0.87	0.64	0.10
Uniform Delay, d1	44.5	35.9		39.8	35.2		18.1	10.6	7.6	16.6	12.3	7.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	58.2	0.2		2.5	0.1		85.6	0.8	0.2	40.5	1.4	0.2
Delay (s)	102.6	36.1		42.3	35.4		103.7	11.4	7.7	57.1	13.8	7.9
Level of Service	F	D		D	D		F	B	A	E	B	A
Approach Delay (s)		84.3			39.4			20.9				18.5
Approach LOS		F			D			C				B

Intersection Summary


HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate PM - without Vanguard Drive



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	193	272	133	285	123	1779	51	29	2009	50
v/c Ratio	1.07	0.58	0.70	0.60	0.92	0.89	0.06	0.22	1.08	0.06
Control Delay	261.5	35.6	63.2	34.2	121.5	30.5	1.2	12.2	179.7	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	261.5	35.6	63.2	34.2	121.5	30.5	1.2	12.2	179.7	1.2
Queue Length 50th (m)	-50.4	43.5	28.4	43.2	14.6	199.1	0.0	2.3	-277.6	0.0
Queue Length 95th (m)	#111.7	84.0	#69.5	85.3	#63.1	#315.6	3.7	6.4	#381.8	3.6
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	180	468	190	475	133	1990	923	130	1864	869
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.58	0.70	0.60	0.92	0.89	0.06	0.22	1.08	0.06


Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate PM - without Vanguard Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	193	110	162	133	99	186	123	1779	51	29	2009	50
Future Volume (vph)	193	110	162	133	99	186	123	1779	51	29	2009	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1625		1695	1610		1695	3390	1517	1695	3390	1517
Flt Permitted	0.39	1.00		0.41	1.00		0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	691	1625		729	1610		105	3390	1517	108	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	193	110	162	133	99	186	123	1779	51	29	2009	50
RTOR Reduction (vph)	0	44	0	0	56	0	0	0	22	0	0	23
Lane Group Flow (vph)	193	228	0	133	229	0	123	1779	29	29	2009	28
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	31.3	31.3		31.3	31.3		73.4	68.2	68.2	69.0	66.0	66.0
Effective Green, g (s)	31.3	31.3		31.3	31.3		73.4	68.2	68.2	69.0	66.0	66.0
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.61	0.57	0.57	0.58	0.55	0.55
Clearance Time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	180	423		190	419		133	1926	862	101	1864	834
v/s Ratio Prot		0.14			0.14		c0.04	0.52		0.01	c0.59	
v/s Ratio Perm	c0.28			0.18			0.53		0.02	0.16		0.02
v/c Ratio	1.07	0.54		0.70	0.55		0.92	0.92	0.03	0.29	1.08	0.03
Uniform Delay, d1	44.4	38.1		40.1	38.2		32.5	23.5	11.4	21.4	27.0	12.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	218.4	1.3		11.3	1.5		88.0	10.5	0.1	1.6	152.3	0.1
Delay (s)	262.7	39.5		51.4	39.7		120.4	34.0	11.5	23.0	179.3	12.4
Level of Service	F	D		D	D		F	C	B	C	F	B
Approach Delay (s)		132.1			43.4			38.9			173.2	
Approach LOS		F			D			D			F	

Intersection Summary

HCM 2000 Control Delay	105.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	60		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	103	1443	45	0	1564
Future Vol, veh/h	0	103	1443	45	0	1564
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	103	1443	45	0	1564

Major/Minor	Minor1	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	2225	722	0	0	1443	0
Stage 1	1443	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	37	369	-	-	466	-
Stage 1	184	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	37	369	-	-	466	-
Mov Cap-2 Maneuver	37	-	-	-	-	-
Stage 1	184	-	-	-	-	-
Stage 2	411	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	369	466	-
HCM Lane V/C Ratio	-	0.279	-	-
HCM Control Delay (s)	-	18.5	0	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	1.2	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1998	114	0	1758	0	99
Future Vol, veh/h	1998	114	0	1758	0	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1998	114	0	1758	0	99

Major/Minor	Major1	Major2	Minor1	Major1	Major2	Minor1
Conflicting Flow All	0	0	2112	0	2934	1056
Stage 1	-	-	-	-	2055	-
Stage 2	-	-	-	-	879	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	256	-	12	222
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	366	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	256	-	12	222
Mov Cap-2 Maneuver	-	-	-	-	12	-
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	366	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	34.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	222	-	-	256	-
HCM Lane V/C Ratio	0.446	-	-	-	-
HCM Control Delay (s)	34.1	-	-	0	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	2.3	-	-	0	-

**SMARTREIT ORLEANS 2025 MER BLEUE ROAD
COMMUNITY TRANSPORTATION STUDY**

Appendix C Intersection Performance Worksheets
January 4, 2017

**C.6 2031 ULTIMATE CONDITIONS – WITH THE VANGUARD DRIVE
EXTENSION**

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	740	269	188	1242	384	627	1017	241	627
v/c Ratio	0.53	0.76	0.43	0.72	1.01	0.49	0.91	1.04	0.63	0.94
Control Delay	37.3	45.6	6.2	39.9	105.9	5.3	70.2	151.8	57.8	79.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	45.6	6.2	39.9	105.9	5.3	70.2	151.8	57.8	79.3
Queue Length 50th (m)	9.4	84.4	0.0	27.5	~170.5	0.8	74.4	~135.7	28.2	76.7
Queue Length 95th (m)	#23.6	#130.8	29.9	#64.3	#252.5	36.9	#126.5	#224.9	45.0	#135.9
Internal Link Dist (m)		116.7		151.9		70.0		97.1		134.6
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	131	969	625	266	1224	789	704	974	495	668
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	0.53	0.76	0.43	0.71	1.01	0.49	0.89	1.04	0.49	0.94

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	69	740	269	188	1242	384	627	894	123	241	566	61
Future Volume (vph)	69	740	269	188	1242	384	627	894	123	241	566	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3329		3288	3341	
Flt Permitted	0.12	1.00	1.00	0.16	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	208	3390	1517	279	3390	1517	3288	3329		3288	3341	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	740	269	188	1242	384	627	894	123	241	566	61
RTOR Reduction (vph)	0	0	192	0	0	246	0	9	0	0	6	0
Lane Group Flow (vph)	69	740	77	188	1242	138	627	1008	0	241	621	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	38.3	34.3	34.3	52.2	42.1	42.1	25.1	34.8		14.1	23.8	
Effective Green, g (s)	38.3	34.3	34.3	52.2	42.1	42.1	25.1	34.8		14.1	23.8	
Actuated g/C Ratio	0.32	0.29	0.29	0.44	0.35	0.35	0.21	0.29		0.12	0.20	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	115	968	433	260	1189	532	687	965		386	662	
v/s Ratio Prot	0.02	0.22		c0.07	c0.37		c0.19	c0.30		0.07	0.19	
v/s Ratio Perm	0.17		0.05	0.24		0.09						
v/c Ratio	0.60	0.76	0.18	0.72	1.04	0.26	0.91	1.05		0.62	0.94	
Uniform Delay, d1	33.0	39.2	32.2	24.7	39.0	27.8	46.4	42.6		50.4	47.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.4	6.0	0.9	10.1	106.9	1.2	20.7	112.3		3.2	28.8	
Delay (s)	41.4	45.1	33.1	34.8	145.8	29.0	67.1	154.9		53.6	76.2	
Level of Service	D	D	C	C	F	C	E	F		D	E	
Approach Delay (s)		41.9			109.6			121.4			69.9	
Approach LOS		D			F			F			E	

Intersection Summary

HCM 2000 Control Delay	93.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	60		

c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	14	1069	135	1607	155	82	17	79
v/c Ratio	0.11	0.46	0.46	0.69	0.69	0.25	0.08	0.25
Control Delay	8.6	7.8	14.5	11.2	51.4	13.4	28.8	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	7.8	14.5	11.2	51.4	13.4	28.8	20.9
Queue Length 50th (m)	0.7	38.4	9.4	75.9	25.3	3.2	2.5	6.8
Queue Length 95th (m)	4.3	74.8	38.1	157.0	48.2	16.4	8.3	19.8
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0					20.0		
Base Capacity (vph)	132	2314	293	2331	308	433	307	414
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.46	0.46	0.69	0.50	0.19	0.06	0.19

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↓	↘			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖	↖
Traffic Volume (vph)	14	1007	62	135	1602	5	155	22	60	17	22	57
Future Volume (vph)	14	1007	62	135	1602	5	155	22	60	17	22	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3361		1695	3389		1695	1588		1695	1591	
Flt Permitted	0.11	1.00		0.24	1.00		0.71	1.00		0.70	1.00	
Satd. Flow (perm)	194	3361		427	3389		1259	1588		1256	1591	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	1007	62	135	1602	5	155	22	60	17	22	57
RTOR Reduction (vph)	0	4	0	0	0	0	49	0	0	27	0	0
Lane Group Flow (vph)	14	1065	0	135	1607	0	155	33	0	17	52	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Effective Green, g (s)	61.9	61.9		61.9	61.9		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.18	0.18		0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	133	2311		293	2330		223	282		223	282	
v/s Ratio Prot		0.32			c0.47			0.02			0.03	
v/s Ratio Perm	0.07			0.32			c0.12			0.01		
v/c Ratio	0.11	0.46		0.46	0.69		0.70	0.12		0.08	0.18	
Uniform Delay, d1	4.7	6.4		6.4	8.3		34.7	31.1		30.8	31.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.7		1.2	0.9		9.5	0.2		0.1	0.3	
Delay (s)	6.3	7.1		7.6	9.2		44.2	31.2		31.0	31.8	
Level of Service	A	A		A	A		D	C		C	C	
Approach Delay (s)		7.1			9.1			39.7			31.6	
Approach LOS		A			A			D			C	

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.1
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	32	85	87	91	1437	74	141	804	90
v/c Ratio	0.44	0.12	0.42	0.35	0.21	0.61	0.07	0.78	0.34	0.08
Control Delay	30.5	10.9	29.6	22.7	7.3	8.5	1.8	53.1	5.9	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	10.9	29.6	22.7	7.3	8.5	1.8	53.1	5.9	1.7
Queue Length 50th (m)	8.6	0.3	8.7	6.9	3.7	45.2	0.0	10.7	19.1	0.0
Queue Length 95th (m)	22.2	7.3	22.2	19.9	13.6	99.0	5.0	#36.4	39.7	5.5
Internal Link Dist (m)		56.1		76.2		160.0			70.3	
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	595	749	625	734	431	2359	1078	180	2359	1083
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	0.04	0.14	0.12	0.21	0.61	0.07	0.78	0.34	0.08

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	84	3	29	85	2	85	91	1437	74	141	804	90
Future Volume (vph)	84	3	29	85	2	85	91	1437	74	141	804	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1542		1695	1523		1695	3390	1517	1695	3390	1517
Flt Permitted	0.70	1.00		0.74	1.00		0.35	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	1250	1542		1314	1523		619	3390	1517	258	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	3	29	85	2	85	91	1437	74	141	804	90
RTOR Reduction (vph)	0	25	0	0	16	0	0	0	25	0	0	31
Lane Group Flow (vph)	84	7	0	85	71	0	91	1437	49	141	804	59
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	8.2	8.2		8.2	8.2		41.1	41.1	41.1	41.1	41.1	41.1
Effective Green, g (s)	8.2	8.2		8.2	8.2		41.1	41.1	41.1	41.1	41.1	41.1
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.66	0.66	0.66	0.66	0.66	0.66
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	164	202		172	200		408	2236	1000	170	2236	1000
v/s Ratio Prot		0.00			0.05			0.42			0.24	
v/s Ratio Perm	c0.07			0.06			0.15		0.03	c0.55		0.04
v/c Ratio	0.51	0.03		0.49	0.36		0.22	0.64	0.05	0.83	0.36	0.06
Uniform Delay, d1	25.2	23.6		25.1	24.6		4.2	6.3	3.7	8.0	4.7	3.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1		2.2	1.1		1.3	1.4	0.1	44.9	0.5	0.1
Delay (s)	27.9	23.7		27.4	25.7		5.5	7.7	3.8	52.9	5.2	3.9
Level of Service	C	C		C	C		A	A	A	D	A	A
Approach Delay (s)		26.7			26.5			7.4			11.6	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	121	118	66	37	365	1306	63	42	867	69
v/c Ratio	0.70	0.41	0.45	0.16	0.85	0.50	0.05	0.17	0.33	0.06
Control Delay	72.5	17.4	56.4	39.8	35.6	6.5	1.2	6.4	5.1	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.5	17.4	56.4	39.8	35.6	6.5	1.2	6.4	5.1	1.2
Queue Length 50th (m)	27.5	4.8	14.5	6.5	49.1	52.4	0.0	2.3	28.7	0.0
Queue Length 95th (m)	52.0	26.1	31.2	17.8	#163.6	94.2	4.3	8.2	50.7	4.5
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	228	352	196	309	430	2605	1180	253	2605	1181
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	0.53	0.34	0.34	0.12	0.85	0.50	0.05	0.17	0.33	0.06

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖		↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	121	23	95	66	31	6	365	1306	63	42	867	69
Future Volume (vph)	121	23	95	66	31	6	365	1306	63	42	867	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1569		1695	1741		1695	3390	1517	1695	3390	1517
Flt Permitted	0.73	1.00		0.63	1.00		0.31	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1308	1569		1123	1741		560	3390	1517	330	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	121	23	95	66	31	6	365	1306	63	42	867	69
RTOR Reduction (vph)	0	82	0	0	5	0	0	0	15	0	0	16
Lane Group Flow (vph)	121	36	0	66	32	0	365	1306	48	42	867	53
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	15.9	15.9		15.9	15.9		92.2	92.2	92.2	92.2	92.2	92.2
Effective Green, g (s)	15.9	15.9		15.9	15.9		92.2	92.2	92.2	92.2	92.2	92.2
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.77	0.77	0.77	0.77	0.77	0.77
Clearance Time (s)	6.1	6.1		6.1	6.1		5.8	5.8	5.8	5.8	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	173	207		148	230		430	2604	1165	253	2604	1165
v/s Ratio Prot		0.02			0.02			0.39			0.26	
v/s Ratio Perm	c0.09			0.06			c0.65		0.03	0.13		0.03
v/c Ratio	0.70	0.17		0.45	0.14		0.85	0.50	0.04	0.17	0.33	0.05
Uniform Delay, d1	49.8	46.2		48.0	46.0		9.3	5.2	3.3	3.7	4.3	3.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.4	0.4		2.1	0.3		21.8	0.7	1.1	1.4	0.3	0.1
Delay (s)	62.2	46.6		50.1	46.3		31.0	5.9	3.4	5.1	4.7	3.4
Level of Service	E	D		D	D		C	A	A	A	A	A
Approach Delay (s)		54.5			48.7			11.1			4.6	
Approach LOS		D			D			B			A	

Intersection Summary

HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	67	1577	29	0	1023
Future Vol, veh/h	0	67	1577	29	0	1023
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	67	1577	29	0	1023
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2089	789	0	0	1577	0
Stage 1	1577	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	45	333	-	-	414	-
Stage 1	155	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	45	333	-	-	414	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	155	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	18.5	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	333	414	-		
HCM Lane V/C Ratio	-	0.201	-	-		
HCM Control Delay (s)	-	18.5	0	-		
HCM Lane LOS	-	C	A	-		
HCM 95th %tile Q(veh)	-	0.8	0	-		

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1039	65	0	1814	0	44
Future Vol, veh/h	1039	65	0	1814	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1039	65	0	1814	0	44
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1104	0	1979	552
Stage 1	-	-	-	-	1072	-
Stage 2	-	-	-	-	907	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	628	-	54	477
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	354	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	628	-	54	477
Mov Cap-2 Maneuver	-	-	-	-	54	-
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	354	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	13.3			
HCM LOS			B			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	477	-	-	628	-	
HCM Lane V/C Ratio	0.092	-	-	-	-	
HCM Control Delay (s)	13.3	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Queues
7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	12	146	1464	55	863
v/c Ratio	0.06	0.62	0.59	0.28	0.35
Control Delay	30.3	33.8	7.1	9.7	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	33.8	7.1	9.7	5.0
Queue Length 50th (m)	1.7	14.0	47.5	2.5	21.4
Queue Length 95th (m)	6.8	35.7	103.7	12.8	44.7
Internal Link Dist (m)	174.0		128.5		160.0
Turn Bay Length (m)	25.0		25.0		
Base Capacity (vph)	392	392	2491	194	2493
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	0.03	0.37	0.59	0.28	0.35
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2031 Ultimate AM - with Vanguard Drive

	↖	↗	↑	↘	↓	
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↑↓		↖	↗
Traffic Volume (vph)	12	146	1456	8	55	863
Future Volume (vph)	12	146	1456	8	55	863
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1695	1517	3387		1695	3390
Flt Permitted	0.95	1.00	1.00		0.15	1.00
Satd. Flow (perm)	1695	1517	3387		265	3390
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	146	1456	8	55	863
RTOR Reduction (vph)	0	46	0	0	0	0
Lane Group Flow (vph)	12	100	1464	0	55	863
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	10.8	10.8	63.5		63.5	63.5
Effective Green, g (s)	10.8	10.8	63.5		63.5	63.5
Actuated g/C Ratio	0.13	0.13	0.74		0.74	0.74
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	212	189	2492		194	2494
v/s Ratio Prot	0.01		0.43			0.25
v/s Ratio Perm		0.07			0.21	
v/c Ratio	0.06	0.53	0.59		0.28	0.35
Uniform Delay, d1	33.3	35.4	5.3		3.8	4.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	2.7	1.0		3.7	0.4
Delay (s)	33.4	38.0	6.3		7.5	4.4
Level of Service	C	D	A		A	A
Approach Delay (s)	37.7		6.3			4.6
Approach LOS	D		A			A
Intersection Summary						
HCM 2000 Control Delay			7.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			86.3		Sum of lost time (s)	12.0
Intersection Capacity Utilization			62.4%		ICU Level of Service	B
Analysis Period (min)			60			
c Critical Lane Group						

Intersection						
Int Delay, s/veh	3					
Movement						
	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	16	47	134	39	61	24
Future Vol, veh/h	16	47	134	39	61	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	250	0	-
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	16	47	134	39	61	24
Major/Minor						
	Major1		Major2		Minor2	
Conflicting Flow All	134	0	-	0	213	134
Stage 1	-	-	-	-	134	-
Stage 2	-	-	-	-	79	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	-	3,518	3,318
Pot Cap-1 Maneuver	1451	-	-	-	775	915
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1451	-	-	-	766	915
Mov Cap-2 Maneuver	-	-	-	-	766	-
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	934	-
Approach						
	EB		WB		SB	
HCM Control Delay, s	1.9		0		10	
HCM LOS					B	
Minor Lane/Major Mvmt						
	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1451	-	-	-	803	
HCM Lane V/C Ratio	0.011	-	-	-	0.106	
HCM Control Delay (s)	7.5	-	-	-	10	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

Queues

1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	1183	458	260	1026	386	486	1146	343	1122
v/c Ratio	0.93	1.11	0.62	1.21	0.85	0.49	0.98	1.39	0.69	1.40
Control Delay	121.0	259.2	10.3	457.6	42.8	8.8	116.5	738.3	56.8	758.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.0	259.2	10.3	457.6	42.8	8.8	116.5	738.3	56.8	758.2
Queue Length 50th (m)	18.9	~168.1	12.2	~61.7	84.8	8.6	59.5	~181.3	39.9	~186.2
Queue Length 95th (m)	#67.2	#248.0	66.4 m	#119.8 m	#180.4 m	36.9 m	#110.3	#261.3	#66.1	#265.4
Internal Link Dist (m)		116.7		151.9				97.1		134.6
Turn Bay Length (m)	100.0		90.0	140.0		100.0	70.0		50.0	
Base Capacity (vph)	149	1062	740	214	1203	787	495	826	495	803
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	0.93	1.11	0.62	1.21	0.85	0.49	0.98	1.39	0.69	1.40

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: Mer Bleue Road & Innes Road

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	139	1183	458	260	1026	386	486	728	418	343	1014	108
Future Volume (vph)	139	1183	458	260	1026	386	486	728	418	343	1014	108
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	3288	3205		3288	3341	
Flt Permitted	0.12	1.00	1.00	0.09	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	210	3390	1517	168	3390	1517	3288	3205		3288	3341	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	139	1183	458	260	1026	386	486	728	418	343	1014	108
RTOR Reduction (vph)	0	0	265	0	0	249	0	68	0	0	7	0
Lane Group Flow (vph)	139	1183	193	260	1026	137	486	1078	0	343	1115	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		4	7		8	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	43.5	37.6	37.6	53.5	42.6	42.6	18.1	28.4		18.1	28.6	
Effective Green, g (s)	43.5	37.6	37.6	53.5	42.6	42.6	18.1	28.4		18.1	28.6	
Actuated g/C Ratio	0.36	0.31	0.31	0.45	0.36	0.36	0.15	0.24		0.15	0.24	
Clearance Time (s)	6.1	6.4	6.4	6.1	6.4	6.4	6.3	6.2		6.3	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	149	1062	475	213	1203	538	495	758		495	796	
v/s Ratio Prot	0.05	0.35		c0.11	c0.30		c0.15	c0.34		0.10	0.33	
v/s Ratio Perm	0.29		0.13	c0.43		0.09						
v/c Ratio	0.93	1.11	0.41	1.22	0.85	0.25	0.98	1.42		0.69	1.40	
Uniform Delay, d1	32.1	41.2	32.4	33.9	35.8	27.4	50.8	45.8		48.3	45.7	
Progression Factor	1.00	1.00	1.00	1.60	1.01	2.60	1.00	1.00		1.00	1.00	
Incremental Delay, d2	86.8	220.5	2.6	428.4	6.1	0.8	64.2	768.0		4.3	729.5	
Delay (s)	118.8	261.7	35.0	482.6	42.4	72.1	115.0	813.8		52.6	775.2	
Level of Service	F	F	D	F	D	E	F	F		D	F	
Approach Delay (s)		192.2			117.7		605.7				606.0	
Approach LOS		F			F		F				F	

Intersection Summary

HCM 2000 Control Delay	368.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	118.2%	ICU Level of Service	H
Analysis Period (min)	60		

c Critical Lane Group

Queues

2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	1874	175	1478	190	132	43	55
v/c Ratio	0.25	0.95	0.84	0.68	0.86	0.37	0.23	0.18
Control Delay	4.7	18.6	68.7	16.7	92.4	15.0	45.3	25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	18.6	68.7	16.7	92.4	15.0	45.3	25.2
Queue Length 50th (m)	2.3	239.3	26.3	120.3	43.1	4.9	8.7	5.3
Queue Length 95th (m)	m2.3	m82.2	#78.7	181.3	#94.8	27.8	21.8	19.3
Internal Link Dist (m)		117.0		121.0		27.1		48.5
Turn Bay Length (m)	40.0					20.0		
Base Capacity (vph)	220	1978	215	2178	241	380	203	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.95	0.81	0.68	0.79	0.35	0.21	0.17

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
2: Site Access #4/Wildflower Drive & Innes Road

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	→	↘	←	↙	↑	↘	↓	↙			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	
Traffic Volume (vph)	55	1746	128	175	1454	24	190	25	107	43	27	28
Future Volume (vph)	55	1746	128	175	1454	24	190	25	107	43	27	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1695	3355		1695	3382		1695	1567		1695	1648	
Flt Permitted	0.12	1.00		0.05	1.00		0.72	1.00		0.61	1.00	
Satd. Flow (perm)	219	3355		94	3382		1287	1567		1085	1648	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	55	1746	128	175	1454	24	190	25	107	43	27	28
RTOR Reduction (vph)	0	4	0	0	1	0	0	89	0	0	23	0
Lane Group Flow (vph)	55	1870	0	175	1477	0	190	43	0	43	32	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	75.6	70.5		86.6	76.0		20.6	20.6		20.6	20.6	
Effective Green, g (s)	75.6	70.5		86.6	76.0		20.6	20.6		20.6	20.6	
Actuated g/C Ratio	0.63	0.59		0.72	0.63		0.17	0.17		0.17	0.17	
Clearance Time (s)	6.2	6.2		6.2	6.2		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	200	1971		209	2141		220	269		186	282	
v/s Ratio Prot	0.01	c0.56		c0.07	c0.44			0.03			0.02	
v/s Ratio Perm	0.16			0.53			c0.15			0.04		
v/c Ratio	0.28	0.95		0.84	0.69		0.86	0.16		0.23	0.11	
Uniform Delay, d1	10.9	23.1		37.9	14.3		48.3	42.3		42.9	42.0	
Progression Factor	0.75	0.69		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.5		29.3	0.9		35.2	0.3		0.6	0.2	
Delay (s)	8.2	17.3		67.3	15.3		83.5	42.6		43.5	42.2	
Level of Service	A	B		E	B		F	D		D	D	
Approach Delay (s)		17.1			20.8			66.7			42.8	
Approach LOS		B			C			E			D	

Intersection Summary

HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	60		

c Critical Lane Group

Queues

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	103	145	111	144	1192	94	205	1591	156
v/c Ratio	0.94	0.24	0.50	0.26	0.91	0.54	0.09	0.92	0.87	0.18
Control Delay	110.8	9.4	46.4	11.2	100.7	12.2	1.7	95.5	30.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	3.8	0.0
Total Delay	110.8	9.4	46.4	11.2	100.7	12.8	1.7	95.5	34.2	5.4
Queue Length 50th (m)	62.8	0.9	29.5	2.7	19.2	73.5	0.0	42.9	164.6	5.2
Queue Length 95th (m)	#134.0	18.4	57.2	21.5	#70.6	108.1	7.0	#109.7	#267.5	18.8
Internal Link Dist (m)		56.1	76.2		160.0			70.3		
Turn Bay Length (m)	20.0		20.0		65.0		65.0	50.0		60.0
Base Capacity (vph)	297	446	299	442	159	2221	1025	222	1839	872
Starvation Cap Reductn	0	0	0	0	0	589	0	0	163	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	0.92	0.23	0.48	0.25	0.91	0.73	0.09	0.92	0.95	0.18

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

3: Mer Bleue Road & Commercial Site Access/Site Access #1 SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	→	↗	←	↖	↑	↗	↘	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	272	5	98	145	1	110	144	1192	94	205	1591	156
Future Volume (vph)	272	5	98	145	1	110	144	1192	94	205	1591	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1530		1695	1519		1695	3390	1517	1695	3390	1517
Flt Permitted	0.69	1.00		0.69	1.00		0.06	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	1223	1530		1232	1519		101	3390	1517	408	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	272	5	98	145	1	110	144	1192	94	205	1591	156
RTOR Reduction (vph)	0	75	0	0	73	0	0	0	32	0	0	49
Lane Group Flow (vph)	272	28	0	145	38	0	144	1192	62	205	1591	107
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	28.1	28.1		28.1	28.1		78.0	78.0	78.0	64.6	64.6	64.6
Effective Green, g (s)	28.1	28.1		28.1	28.1		78.0	78.0	78.0	64.6	64.6	64.6
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.65	0.65	0.65	0.54	0.54	0.54
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	288	360		290	358		159	2220	993	221	1838	822
v/s Ratio Prot		0.02			0.02		c0.05	0.35			0.47	
v/s Ratio Perm	c0.22			0.12			c0.54		0.04	0.50		0.07
v/c Ratio	0.94	0.08		0.50	0.11		0.91	0.54	0.06	0.93	0.87	0.13
Uniform Delay, d1	44.7	35.4		39.4	35.6		32.3	10.9	7.4	25.1	23.5	13.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.0	0.1		1.4	0.1		65.8	0.9	0.1	68.4	6.2	0.3
Delay (s)	104.8	35.5		40.8	35.8		98.1	11.9	7.5	93.5	29.7	13.7
Level of Service	F	D		D	D		F	B	A	F	C	B
Approach Delay (s)		85.7			38.6			20.3			35.1	
Approach LOS		F			D			C			D	

Intersection Summary

HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	19.4
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	60		

c Critical Lane Group

Queues

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	448	133	285	221	1779	51	29	2009	100
v/c Ratio	1.02	0.84	1.27	0.53	1.25	0.96	0.06	0.22	1.22	0.13
Control Delay	184.6	48.4	587.7	28.9	524.0	44.5	1.4	14.2	435.2	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	184.6	48.4	587.7	28.9	524.0	44.5	1.4	14.2	435.2	5.8
Queue Length 50th (m)	~56.4	81.1	~39.3	39.9	~50.9	~234.3	0.0	2.6	~306.1	2.5
Queue Length 95th (m)	#125.0	#166.9	#90.3	79.5	#117.6	#332.3	4.1	7.2	#410.3	14.1
Internal Link Dist (m)		108.7		129.8		185.3			131.6	
Turn Bay Length (m)	25.0		25.0		50.0		45.0	150.0		45.0
Base Capacity (vph)	227	535	105	537	177	1860	868	130	1644	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.84	1.27	0.53	1.25	0.96	0.06	0.22	1.22	0.13

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

4: Vanguard Drive & Tenth Line Road

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	232	110	338	133	99	186	221	1779	51	29	2009	100
Future Volume (vph)	232	110	338	133	99	186	221	1779	51	29	2009	100
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1695	1582		1695	1610		1695	3390	1517	1695	3390	1517
Flt Permitted	0.43	1.00		0.20	1.00		0.06	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	761	1582		354	1610		112	3390	1517	123	3390	1517
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	232	110	338	133	99	186	221	1779	51	29	2009	100
RTOR Reduction (vph)	0	62	0	0	56	0	0	0	24	0	0	41
Lane Group Flow (vph)	232	386	0	133	229	0	221	1779	27	29	2009	59
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	35.9	35.9		35.9	35.9		72.0	63.6	63.6	61.2	58.2	58.2
Effective Green, g (s)	35.9	35.9		35.9	35.9		72.0	63.6	63.6	61.2	58.2	58.2
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.60	0.53	0.53	0.51	0.49	0.49
Clearance Time (s)	6.1	6.1		6.1	6.1		5.6	5.8	5.8	5.6	5.8	5.8
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	227	473		105	481		178	1796	804	102	1644	735
v/s Ratio Prot		0.24			0.14		c0.09	0.52		0.01	0.59	
v/s Ratio Perm	0.30			c0.38			c0.66		0.02	0.14		0.04
v/c Ratio	1.02	0.82		1.27	0.48		1.24	0.99	0.03	0.28	1.22	0.08
Uniform Delay, d1	42.0	39.0		42.0	34.4		37.7	27.9	13.5	25.4	30.9	16.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	142.2	11.3		550.9	0.7		481.7	34.6	0.1	1.5	405.6	0.2
Delay (s)	184.3	50.3		593.0	35.1		519.4	62.5	13.6	27.0	436.5	16.8
Level of Service	F	D		F	D		F	E	B	C	F	B
Approach Delay (s)		96.0			212.6			110.5			411.3	
Approach LOS		F			F			F			F	

Intersection Summary

- HCM 2000 Control Delay: 238.4
- HCM 2000 Volume to Capacity ratio: 1.28
- Actuated Cycle Length (s): 120.0
- Intersection Capacity Utilization: 127.1%
- Analysis Period (min): 60
- HCM 2000 Level of Service: F
- Sum of lost time (s): 17.5
- ICU Level of Service: H
- c Critical Lane Group

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	103	1529	45	0	1731
Future Vol, veh/h	0	103	1529	45	0	1731
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	400	-	-
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	0	103	1529	45	0	1731
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2395	765	0	0	1529	0
Stage 1	1529	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	28	346	-	-	432	-
Stage 1	165	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	28	346	-	-	432	-
Mov Cap-2 Maneuver	28	-	-	-	-	-
Stage 1	165	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	19.8	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	346	432	-		
HCM Lane V/C Ratio	-	0.298	-	-		
HCM Control Delay (s)	-	19.8	0	-		
HCM Lane LOS	-	C	A	-		
HCM 95th %tile Q(veh)	-	1.3	0	-		

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1830	114	0	1672	0	99
Future Vol, veh/h	1830	114	0	1672	0	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	1830	114	0	1672	0	99
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1944	0	2723	972
Stage 1	-	-	-	-	1887	-
Stage 2	-	-	-	-	836	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	298	-	17	252
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	386	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	298	-	17	252
Mov Cap-2 Maneuver	-	-	-	-	17	-
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	386	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	28.5			
HCM LOS			D			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	252	-	-	298	-	
HCM Lane V/C Ratio	0.393	-	-	-	-	
HCM Control Delay (s)	28.5	-	-	0	-	
HCM Lane LOS	D	-	-	A	-	
HCM 95th %tile Q(veh)	1.9	-	-	0	-	

Queues
7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	10	95	1347	179	1655
v/c Ratio	0.07	0.47	0.49	0.67	0.60
Control Delay	34.6	20.7	4.2	22.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.3
Total Delay	34.6	20.7	4.2	22.8	5.5
Queue Length 50th (m)	1.6	3.1	31.3	10.5	45.3
Queue Length 95th (m)	6.3	19.0	67.7	#68.2	103.5
Internal Link Dist (m)	174.0		128.5		160.0
Turn Bay Length (m)	25.0		25.0		
Base Capacity (vph)	355	378	2767	269	2769
Starvation Cap Reductn	0	0	0	0	423
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.25	0.49	0.67	0.71

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
7: Mer Bleue Road & Vanguard Drive

SmartREIT Orleans
2031 Ultimate PM - with Vanguard Drive

	↖	↗	↑	↘	↓	
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↑↔		↘	↙↙
Traffic Volume (vph)	10	95	1335	12	179	1655
Future Volume (vph)	10	95	1335	12	179	1655
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1695	1517	3386		1695	3390
Flt Permitted	0.95	1.00	1.00		0.19	1.00
Satd. Flow (perm)	1695	1517	3386		330	3390
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	95	1335	12	179	1655
RTOR Reduction (vph)	0	71	0	0	0	0
Lane Group Flow (vph)	10	24	1347	0	179	1655
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	6.3	6.3	68.9		68.9	68.9
Effective Green, g (s)	6.3	6.3	68.9		68.9	68.9
Actuated g/C Ratio	0.07	0.07	0.79		0.79	0.79
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	122	109	2675		260	2678
v/s Ratio Prot	0.01		0.40			0.49
v/s Ratio Perm		c0.02			c0.54	
v/c Ratio	0.08	0.22	0.50		0.69	0.62
Uniform Delay, d1	37.8	38.1	3.2		4.2	3.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	1.1	0.7		14.9	1.1
Delay (s)	38.0	39.2	3.9		19.1	4.8
Level of Service	D	D	A		B	A
Approach Delay (s)	39.1		3.9			6.2
Approach LOS	D		A			A

Intersection Summary

HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

Intersection						
Int Delay, s/veh	2.2					
Movement						
	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	26	165	85	63	50	20
Future Vol, veh/h	26	165	85	63	50	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	250	0	-
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	26	165	85	63	50	20
Major/Minor						
	Major1		Major2		Minor2	
Conflicting Flow All	85	0	-	0	302	85
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2,218	-	-	-	3,518	3,318
Pot Cap-1 Maneuver	1512	-	-	-	690	974
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	819	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1512	-	-	-	678	974
Mov Cap-2 Maneuver	-	-	-	-	678	-
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	805	-
Approach						
	EB		WB		SB	
HCM Control Delay, s	1		0		10.4	
HCM LOS					B	
Minor Lane/Major Mvmt						
	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1512	-	-	-	742	
HCM Lane V/C Ratio	0.017	-	-	-	0.094	
HCM Control Delay (s)	7.4	-	-	-	10.4	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	