TRAFFIC IMPACT STUDY

Proposed Gas Station Development with A&W
Drive-Thru Restaurant
815 King Street East, Gananoque, ON

January 2024

Prepared For

Mr. Mudassar Khan

c/o
Mr. Joshua Salama-Frakes
Blueprint2build
[redacted]

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January 3, 2024

Mr. Mudassar Khan
c/o Mr. Joshua Salama-Frakes
14 Cardido Drive
Whitchurch Stouffville, ON L4A 2G5

Re: **Proposed Gas Station Development with A&W Drive-Thru Restaurant, 815 King Street East, Gananoque, ON, Traffic Impact Study**

Dear Mr. Khan,

TRANS-PLAN is pleased to submit this Traffic Impact Study for the proposed gas station with a convenience store and an A&W drive-thru restaurant at 815 King Street East located on the southwest corner of Highway 2 / King Street and Days Road in the Town of Gananoque, Ontario. The layout of the site plan includes a right-in right-out access off Highway 2 / King Street East and an access off Days Road. The proposed parking supply is 26 total parking spaces including two accessible spaces.

Our Traffic Impact Study findings indicate that the proposed development including the proposed right-in right-out would have minimal impact on the existing road network due to similarities in traffic operations between future background and total conditions. As a result, there would be no additional roadway improvements required to accommodate the proposed developments aside from the construction of the site accesses.

Sincerely,

Anil Seegobin, P.Eng.
Partner and Engineer

Trans-Plan Transportation Inc.
Transportation Consultants

Shuja Zaidi
Traffic Analyst

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1. INTRODUCTION

Trans-Plan has been retained by blueprint2build to complete a Traffic Impact Study (TIS) for the proposed gas station, convenience store, and drive-thru restaurant located at the corner of Highway 2 / King Street and Days Road in the Town of Gananoque, Ontario.

This Traffic Impact Study includes the following components:

- Review and assessment of the existing road network
- Assessment of future background conditions based on anticipated traffic growth, area developments and planned transportation improvements in the study area
- Assessment of the impact of site-generated traffic on the adjacent roadway network under future total traffic conditions at five years (2030) and ten years (2035) after an assumed two-year build-out
- Determination of roadway and intersection improvements, as required, to accommodate the proposed development

Prior to commencing this study, staff at the Ministry of Transportation of Ontario (MTO) were contacted to discuss the scope and methodology and were provided with a study Terms of Reference in February 2021.

2. SITE LOCATION

The currently unoccupied site, shown in Figure 1, is located on the southwest corner of Highway 2 / King Street East and Days Road. Surrounding land uses in the study area are predominantly commercial along Highway 2 / King Street East with residential neighbourhoods connecting off the road in both north and south directions.

3. PROPOSED DEVELOPMENT

The proposed development consists of a gas station with 8 gas pumping positions and a convenience store building and an A&W restaurant to share a building with a GFA of 324 square metres. The proposed restaurant includes a drive-thru facility. The total parking supply for the site is 26 spaces which include 2 accessible parking spaces and one loading space is provided. The site is proposed to be accessible via an existing access connecting to Highway 2 / King Street East and a second existing access off Days Road. A right-in right-out access is proposed for the existing site access on the main road of Highway 2 / King Street East. The proposed site plan, prepared by blueprint2build, is shown in Figure 2.

4. EXISTING CONDITIONS

4.1 Road Network

The study area roadway characteristics are shown in Figure 3. The boundary roadways located in the study area are described as follows:

Thousand Islands Parkway is a provincial roadway under the jurisdiction of the MTO which links the site and its environs with other communities along the north shore of the St. Lawrence River. The roadway extends easterly via an interchange with Highway 401 in Gananoque and continues eastward towards the

City of Brockville. It generally consists of two travel lanes; one in each direction. The posted speed limit on the roadway is 80 km/h.

Highway 2 is a roadway under the jurisdiction of the MTO that generally runs in an east-west direction, providing a route between westbound Thousand Islands Parkway and eastbound Highway 401. While the roadway continues westward as County Road 2 under the jurisdiction of the United Counties of Leeds and Grenville, the subject site lies within an MTO-controlled area. The posted speed limit on Highway 2 is 70 km/h, while the posted speed limit on County Road 2 just west of the subject site is 50 km/h.

King Street East is a major arterial under the jurisdiction of the Town of Gananoque that generally runs in an east-west direction and connects with Highway 2. The posted speed limit on King Street East is 50 km/h and has one lane of travel in each direction.

Days Road is a local road whose western endpoint forms an intersection with Highway 2/King Street East and runs in an east-west direction near the subject site before curving towards the St. Lawrence River at its eastern endpoint. The roadway connects several residential communities to Highway 2.

4.2 Site Visit and Traffic Counts

To determine existing operating conditions in the study area, the MTO was contacted for recent turning movement data for the study area intersections. The counts MTO provided were prior to the COVID-19 pandemic, and those counts would not be reflective of actual operating conditions. However, Trans-Plan conducted turning movement counts (TMCs) on Tuesday December 5, 2023 at nearby intersections. Figure 4 shows the existing traffic volumes for the weekday AM and PM peak hours in the study area.

Table 1 provides a summary of the count time along with the morning and evening peak hours for each intersection. Source information along with intersection TMC diagrams are provided in Appendix A.

Table 1 – Intersection Turning Movement Count Details

Intersection	Count Date / Time	Count Hours	Peak Hours
Highway 2 at Thousand Islands Parkway Westbound On/Off Ramps	December 5, 2023 (Tuesday)	7:00am - 9:30am 4:00pm - 6:30pm	7:00am - 8:00am 4:00pm - 5:00pm
Highway 2 at Thousand Islands Parkway Eastbound On/Off Ramps	December 5, 2023 (Tuesday)	7:00am - 9:30am 4:00pm - 6:30pm	7:30am - 8:30am 4:00pm - 5:00pm
Highway 2/King Street East at Days Road	December 5, 2023 (Tuesday)	7:00am - 9:30am 4:00pm - 6:30pm	7:30am - 8:30am 4:00pm - 5:00pm

5. FUTURE BACKGROUND CONDITIONS

Future background traffic volumes were determined based on a review of planned developments and future traffic volume growth in the study area. Planned roadway improvements are also discussed in this section.

5.1 Horizon Years

The study horizon years are detailed as follows:

- Existing conditions, year 2023/2024
- Assumed two-year build-out of development, year 2025
- 5-year horizon period, year 2030: five years after build-out of development
- 10-year horizon period, year 2035: ten years after build-out of development

5.2 Background Growth Rate

To determine the predicted growth in roadway traffic volumes within the study area, an analysis of historical Annual Average Daily Traffic (AADT) volume data was completed for both eastbound and westbound movements of Highway 2/King Street East and Highway 401. The analysis of the historical traffic data can be found in Appendix B. An annual growth rate of 1.0 percent was applied to Highway 2 and King Street East for each study horizon year, while an annual growth rate of 2.8 percent was applied to the Highway 401 interchanges for each study horizon year.

5.3 Planned Background and Roadway Developments

Based on correspondence with the MTO and the Township of Leeds and the Thousand Islands, there are no notable background developments or roadway improvements planned in the study area. There are no notable background developments shown on the Town's and County's websites. Future background traffic volumes for horizon years 2025, 2030, and 2035 for weekday AM and PM peak hours are shown in Figure 5, Figure 6, and Figure 7 respectively.

6. SITE TRAFFIC

6.1 Trip Generation

Trips for the proposed development were generated using the Institute of Transportation Engineers (ITE) Trip Generation manual, 11th edition. The ITE Land Use Code 945 for Gasoline/Service Station with Convenience Market and ITE Land Use Code 934 for Fast-Food Restaurant with Drive-Through Window were used to determine suitable trip rates as the fast-food partner has been confirmed as an A&W drive-through restaurant. The site trip generation is shown in Table 2. Note that ITE Land Use Code 945 is applied in this scenario as the proposed number of vehicle fueling positions is eight (8).

Pass-by trips are a subset of trip generation and are classified as trips from the existing roadway volumes in the network that access the proposed development as an intermediate stop before continuing to another destination along the same travel route. Pass-by trip rates for the relevant land use types were obtained from the ITE Trip Generation Handbook. An additional reduction of 10 percent was applied to account for the internal interaction of uses between the gas station, the convenience store, and the restaurant. Table 2 shows the site trips generated by the proposed land uses.

Table 2 – Site Trip Generation

Land Use	Size (sq.ft. GFA)		Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Gasoline/ Service Station with Convenience Market (ITE Code 945)	1.7 /1000 sq.ft (2-8 vhp)	Distribution	50%	50%	100%	50%	50%	100%
		Equation	Average Rate: 40.59			Average Rate: 48.48		
		Rate	20.30	20.30	40.59	24.24	24.24	48.48
		Trips	35	34	69	41	41	82
		Pass-by (62% AM, 56% PM)	21	21	42	23	23	46
		New Trips	14	13	27	18	18	36
Fast Food Restaurant with Drive-Through Window (ITE Code 934)	1.8 sq. ft.	Distribution	51%	49%	100%	52%	48%	100%
		Average Rate	Average Rate: 44.61			Average Rate: 33.03		
		Rate	22.75	21.86	44.61	17.18	15.85	33.03
		Trips	41	39	80	31	28	59
		Pass-by (49% AM, 50% PM)	20	20	40	15	15	30
		New Trips	21	19	40	16	13	29
Internal Trip Reduction (10%)			2	2	4	2	1	3
Total Pass-by Trips			41	41	82	38	38	76
Total New Site Trips			33	30	63	32	30	62

The subject site is expected to generate approximately 63 and 62 new two-way trips in the weekday AM and PM peak hours, respectively.

6.2 Trip Distribution and Assignment

Site trips and pass-by trips were distributed to the surrounding road network based on existing travel patterns. Eastbound vehicles making site trips are assumed to enter the site from the Highway 2 site access, while westbound vehicles were distributed evenly between the two site accesses. Vehicles exiting the site were also distributed evenly between the two site accesses. Site trips were assigned to and from surrounding travel routes. The site traffic assignment for the weekday AM and PM peak hours are shown in Figure 8, with pass-by trips shown in Figure 9.

7. FUTURE TOTAL TRAFFIC CONDITIONS

Site traffic volumes and pass-by trips were added to the 2025, 2030, and 2035 future background traffic volumes to obtain the future total traffic volumes for the weekday AM and PM peak hours for the study year horizon. The total traffic volumes for the mentioned horizon years are shown in Figure 10, Figure 11, and Figure 12 respectively.

7.1 Capacity Analysis

A capacity analysis was performed for the study area intersection and site driveways using Synchro analysis software, version 11.0. The capacity analysis results for the 2025, 2030, and 2035 horizon years for the weekday AM and PM peak hours are shown in Table 3, Table 4, and Table 5, respectively. Capacity Analysis Sheets and Level of Service (LOS) definitions are provided in Appendix C and Appendix D, respectively.

According to the General Guidelines for the Preparation of Traffic Impact Studies outlined by the Ministry of Transportation (MTO), a volume-to-capacity (v/c) ratio of 0.85 or less is considered acceptable for the overall intersection. The results of the capacity analysis and queuing analysis are summarized in this section for each intersection:

Site Access (west) and King Street East

Under existing conditions in the weekday AM and PM peak hours, the intersection operates at a good LOS of A with minimal delays.

Horizon Years 2025, 2030, and 2035

Under future background and total conditions, the movements at the unsignalized intersection are expected to operate at an acceptable LOS of B or better, with delays at the northbound right movement of up to 11 seconds.

In summary, the intersection is expected to satisfy future traffic demands during weekday AM and PM peak hours.

Site Access (east) and Days Road

Under existing conditions, the intersection operates at a good LOS of A with minimal delays during the peak hours included in the analysis.

Horizon Years 2025, 2030, and 2035

Under future background and total conditions, the movements at the intersection are expected to continue operating at a good LOS of A with minimal delays.

In summary, the intersection is expected to operate with minimal delays during future weekday AM and PM peak hours.

County Road 2/King Street East and Days Road

Under existing conditions in the weekday AM and PM peak hours, the intersection operates at a good LOS of B or better with delays of up to 12 seconds at the northbound left/right movement.

Horizon Years 2025, 2030, and 2035

Under future background and total conditions, the intersection is expected to operate at a good LOS of B or better, with delays at the northbound left/right movement of up to 14 seconds.

In summary, the intersection is expected to operate with minimal delays under future conditions.

County Road 2 and Thousand Islands Parkway / Highway 401 Eastbound On-Ramp

Under existing conditions in the weekday AM and PM peak hours, the intersection operates at an overall v/c ratio of 0.38 in the weekday AM peak hour and a good LOS of A. Delays of up to 12 seconds are expected at the southbound movements.

Horizon Years 2025, 2030, and 2035

Under future background and total conditions, the intersection is expected to operate at a v/c ratio of 0.44 in the weekday AM peak hour and a good LOS of A, with the individual movements all operating at a LOS of B or better. In summary, the intersection is expected to operate with minimal delays within the study's horizon years.

County Road 2 and Thousand Islands Parkway / Highway 401 Westbound Off-Ramp

Under existing conditions in the weekday AM and PM peak hours, the intersection operates at an overall v/c ratio of 0.36 in the weekday PM peak hour and a good LOS of A. Delays of up to 13 seconds are expected at the northbound movement.

Horizon Years 2025, 2030, and 2035

Under future background and total conditions, the intersection is expected to operate at a v/c ratio of 0.44 in the weekday PM peak hour and a good LOS of A in the weekday PM peak hour. All individual movements are expected to operate at a good LOS of B or better with minimal delays. In summary, the intersection is expected to operate acceptably under future conditions.

Table 3 - Capacity Analysis Results, Existing 2023/2024 vs 2025 Conditions

Intersection	Existing 2023/2024 Traffic Conditions						Background 2025 Traffic Conditions						Total 2025 Traffic			Total 2035 Traffic		
Movement	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Site Access (west) & King Street East																		
Eastbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Westbound Through		0	A		0	A		0	A		0	A		0	A		0	A
Northbound Right		0	A		0	A		0	A		0	A		10	A		11	B
Days Road & Site Access (east)																		
Eastbound Left / Right		0	A		0	A		0	A		0	A		9	A		9	A
Northbound Through / Left		0	A		0	A		0	A		0	A		0	A		0	A
Southbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Days Road & King Street East/County Road 2																		
Eastbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Westbound Through / Left		0	A		0	A		0	A		0	A		2	A		1	A
Northbound Left / Right		12	B		12	B		12	B		12	B		13	B		13	B
TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2	**0.38**	**6**	**A**	**0.31**	**6**	**A**	**0.39**	**6**	**A**	**0.32**	**6**	**A**	**0.42**	**7**	**A**	**0.33**	**6**	**A**
Eastbound Through	0.31	6	A	0.35	6	A	0.32	6	A	0.35	6	A	0.34	6	A	0.37	6	A
Eastbound Right	0.04	5	A	0.07	0	A	0.04	5	A	0.07	0	A	0.04	5	A	0.08	0	A
Westbound Left	0.00	5	A	0.02	5	A	0.00	5	A	0.02	5	A	0.00	5	A	0.02	5	A
Westbound Through	0.45	6	A	0.34	6	A	0.45	6	A	0.34	6	A	0.49	7	A	0.36	6	A
Southbound Through / Left	0.14	11	B	0.21	12	B	0.15	11	B	0.22	13	B	0.15	11	B	0.22	13	B
Southbound Right	0.03	10	B	0.03	12	B	0.03	10	B	0.04	12	B	0.03	10	B	0.04	12	B
TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2	**0.32**	**6**	**A**	**0.36**	**7**	**A**	**0.32**	**7**	**A**	**0.36**	**8**	**A**	**0.34**	**7**	**A**	**0.38**	**8**	**A**
Eastbound Left	0.16	6	A	0.09	5	A	0.18	7	A	0.11	6	A	0.19	7	A	0.11	6	A
Eastbound Through	0.29	6	A	0.39	6	A	0.33	7	A	0.44	8	A	0.35	7	A	0.46	8	A
Westbound Through	0.36	6	A	0.26	6	A	0.41	7	A	0.29	7	A	0.45	8	A	0.30	7	A
Westbound Right	0.05	5	A	0.02	5	A	0.05	6	A	0.02	6	A	0.05	6	A	0.02	6	A
Northbound Through / Left / Right	0.15	11	B	0.26	13	B	0.12	10	A	0.21	12	B	0.13	10	A	0.22	12	B

Table 4 - Capacity Analysis Results, Existing 2023/2024 vs 2030 Conditions

Intersection	Existing 2023/2024 Traffic Conditions						Background 2030 Traffic Conditions						Total 2030 Traffic Conditions					
Movement	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Site Access (west) & King Street East																		
Eastbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Westbound Through		0	A		0	A		0	A		0	A		0	A		0	A
Northbound Right		0	A		0	A		0	A		0	A		10	A		11	B
Days Road & Site Access (east)																		
Eastbound Left / Right		0	A		0	A		0	A		0	A		9	A		9	A
Northbound Through / Left		0	A		0	A		0	A		0	A		0	A		0	A
Southbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Days Road & King Street East/County Road 2																		
Eastbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Westbound Through / Left		0	A		0	A		0	A		0	A		2	A		1	A
Northbound Left / Right		12	B		12	B		12	B		13	B		13	B		14	B
TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2	**0.38**	**6**	**A**	**0.31**	**6**	**A**	**0.40**	**8**	**A**	**0.33**	**7**	**A**	**0.42**	**8**	**A**	**0.34**	**7**	**A**
Eastbound Through	0.31	6	A	0.35	6	A	0.38	7	A	0.41	7	A	0.40	7	A	0.43	8	A
Eastbound Right	0.04	5	A	0.07	0	A	0.04	6	A	0.08	0	A	0.05	6	A	0.08	0	A
Westbound Left	0.00	5	A	0.02	5	A	0.01	6	A	0.02	6	A	0.01	6	A	0.02	6	A
Westbound Through	0.45	6	A	0.34	6	A	0.54	8	A	0.40	7	A	0.57	8	A	0.42	8	A
Southbound Through / Left	0.14	11	B	0.21	12	B	0.11	9	A	0.18	11	B	0.11	9	A	0.18	11	B
Southbound Right	0.03	10	B	0.03	12	B	0.04	9	A	0.04	11	B	0.04	9	A	0.04	11	B
TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2	**0.32**	**6**	**A**	**0.36**	**7**	**A**	**0.34**	**7**	**A**	**0.39**	**8**	**A**	**0.31**	**7**	**A**	**0.41**	**8**	**A**
Eastbound Left	0.16	6	A	0.09	5	A	0.19	7	A	0.11	6	A	0.15	6	A	0.12	7	A
Eastbound Through	0.29	6	A	0.39	6	A	0.35	7	A	0.46	8	A	0.27	6	A	0.48	8	A
Westbound Through	0.36	6	A	0.26	6	A	0.44	7	A	0.31	7	A	0.34	6	A	0.32	7	A
Westbound Right	0.05	5	A	0.02	5	A	0.05	6	A	0.02	6	A	0.05	5	A	0.02	6	A
Northbound Through / Left / Right	0.15	11	B	0.26	13	B	0.16	10	A	0.26	12	B	0.19	13	B	0.27	12	B

Table 5 - Capacity Analysis Results, Existing 2023/2024 vs 2035 Conditions

Intersection	Existing 2023/2024 Traffic Conditions						Background 2035 Traffic Conditions						Total 2035 Traffic Conditions					
Movement	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Site Access (west) & King Street East																		
Eastbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Westbound Through		0	A		0	A		0	A		0	A		0	A		0	A
Northbound Right		0	A		0	A		0	A		0	A		10	A		11	B
Days Road & Site Access (east)																		
Eastbound Left / Right		0	A		0	A		0	A		0	A		9	A		9	A
Northbound Through / Left		0	A		0	A		0	A		0	A		0	A		0	A
Southbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Days Road & King Street East/County Road 2																		
Eastbound Through / Right		0	A		0	A		0	A		0	A		0	A		0	A
Westbound Through / Left		0	A		0	A		0	A		0	A		2	A		1	A
Northbound Left / Right		12	B		12	B		12	B		13	B		13	B		14	B
TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2	**0.38**	**6**	**A**	**0.31**	**6**	**A**	**0.42**	**8**	**A**	**0.36**	**7**	**A**	**0.44**	**8**	**A**	**0.37**	**7**	**A**
Eastbound Through	0.31	6	A	0.35	6	A	0.40	7	A	0.43	8	A	0.42	7	A	0.45	8	A
Eastbound Right	0.04	5	A	0.07	0	A	0.04	6	A	0.08	0	A	0.05	6	A	0.08	0	A
Westbound Left	0.00	5	A	0.02	5	A	0.01	6	A	0.02	6	A	0.01	6	A	0.02	6	A
Westbound Through	0.45	6	A	0.34	6	A	0.56	8	A	0.42	8	A	0.61	9	A	0.44	8	A
Southbound Through / Left	0.14	11	B	0.21	12	B	0.12	9	A	0.21	11	B	0.12	9	A	0.21	11	B
Southbound Right	0.03	10	B	0.03	12	B	0.04	9	A	0.05	11	B	0.04	9	A	0.05	11	B
TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2	**0.32**	**6**	**A**	**0.36**	**7**	**A**	**0.31**	**7**	**A**	**0.43**	**8**	**A**	**0.33**	**7**	**A**	**0.44**	**8**	**A**
Eastbound Left	0.16	6	A	0.09	5	A	0.15	6	A	0.12	7	A	0.16	6	A	0.13	7	A
Eastbound Through	0.29	6	A	0.39	6	A	0.27	6	A	0.49	8	A	0.28	6	A	0.51	8	A
Westbound Through	0.36	6	A	0.26	6	A	0.34	6	A	0.32	7	A	0.36	6	A	0.34	7	A
Westbound Right	0.05	5	A	0.02	5	A	0.05	5	A	0.02	6	A	0.05	5	A	0.02	6	A
Northbound Through / Left / Right	0.15	11	B	0.26	13	B	0.22	13	B	0.30	12	B	0.24	13	B	0.32	12	B

8. CONCLUSION

Our conclusions of this Traffic Impact Study, for the proposed development located at the southwest corner of Highway 2 / King Street East and Days Road in the Town of Gananoque, are summarized as follows:

Traffic Impact Study

- The subject site is currently unoccupied, and the proposed development consists of a gas station with 8 gas pumping positions, a convenience store building, and an A&W restaurant (with drive-thru) to share a building with a GFA of 324 square metres. The total parking supply for the site is 26 spaces (including 2 accessible spaces) and a loading zone is provided. The site is proposed to be accessible via an existing access connecting to Highway 2 / King Street East which is proposed to be a right-in right-out access and a second existing access off Days Road.
- Trans-Plan was provided historical counts by MTO which were prior to the COVID-19 pandemic and those counts would not be reflective of actual operating conditions. However, Trans-Plan conducted turning movement counts (TMCs) on Tuesday December 5, 2023, at nearby intersections.
- Based on correspondence with the MTO and the Township of Leeds and the Thousand Islands, there are no notable background developments or roadway improvements planned in the study area. There are no notable background developments shown on the Town's and County's websites.
- Based on the ITE Trip Generation Manual, 11th Edition, the subject site is expected to generate approximately 63 and 62 new two-way trips in the weekday AM and PM hours, respectively.
- Our capacity analysis results have shown that the intersections near the subject site currently operate at an excellent LOS of A and are expected to operate similarly under future conditions for the weekday AM and PM Peak Hour.
- The proposed right-in right-out access onto Highway 2 / King Street East is expected to operate at a good LOS of B with minimal delays while the site access onto Days Road is expected to operate at an excellent LOS of A with minimal delays under future conditions.
- The proposed right-in right-out access allows traffic flow to be prioritized on Highway 2 / King Stret East. The frequency and severity of conflict movements will be less and the proposed right-in right-out access allows for safe entry and exit for all vehicles accessing the site.

Overall, the proposed right-in right-out site access, as well as the subject site, is expected to have minimal impact on the traffic operations of the study area based on our review of operational conditions between future background and total volume scenarios.

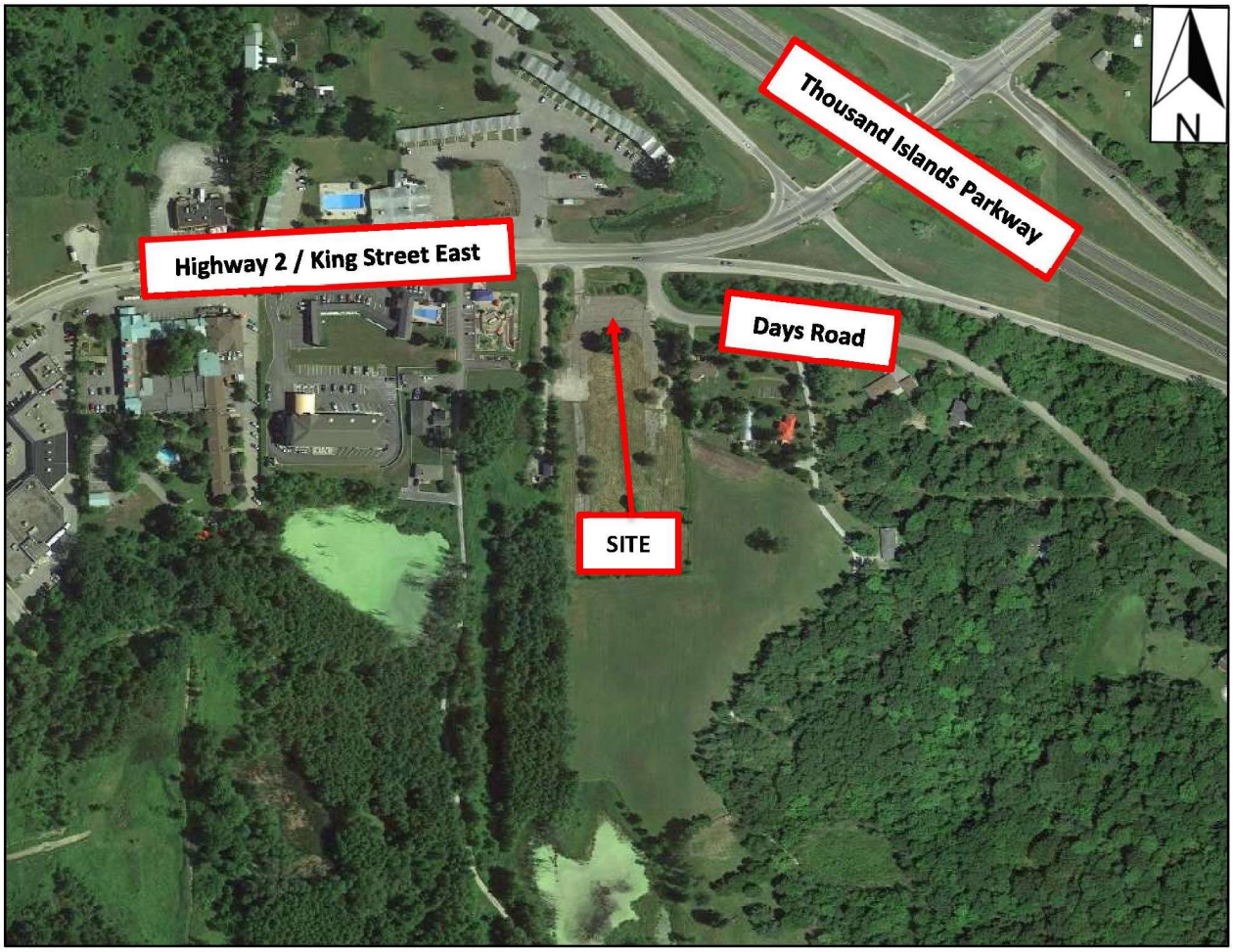
Respectfully submitted,

Anil Seegobin, P.Eng.
Partner and Engineer

Shuja Zaidi
Traffic Analyst

Trans-Plan Transportation Inc.
Transportation Consultants

Figure 1 – Site Location



Source : Google Earth

Figure 2 - Site Plan

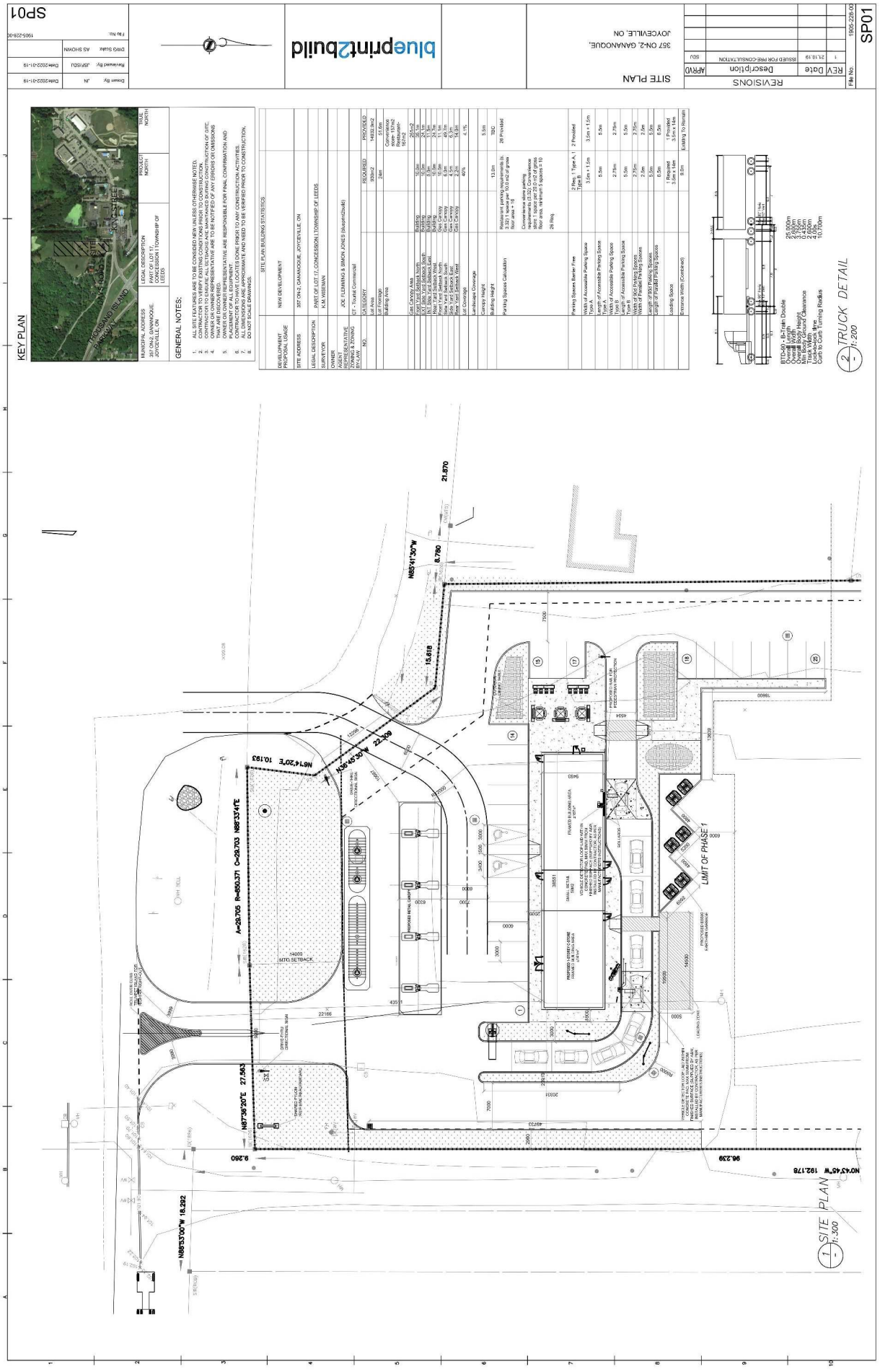
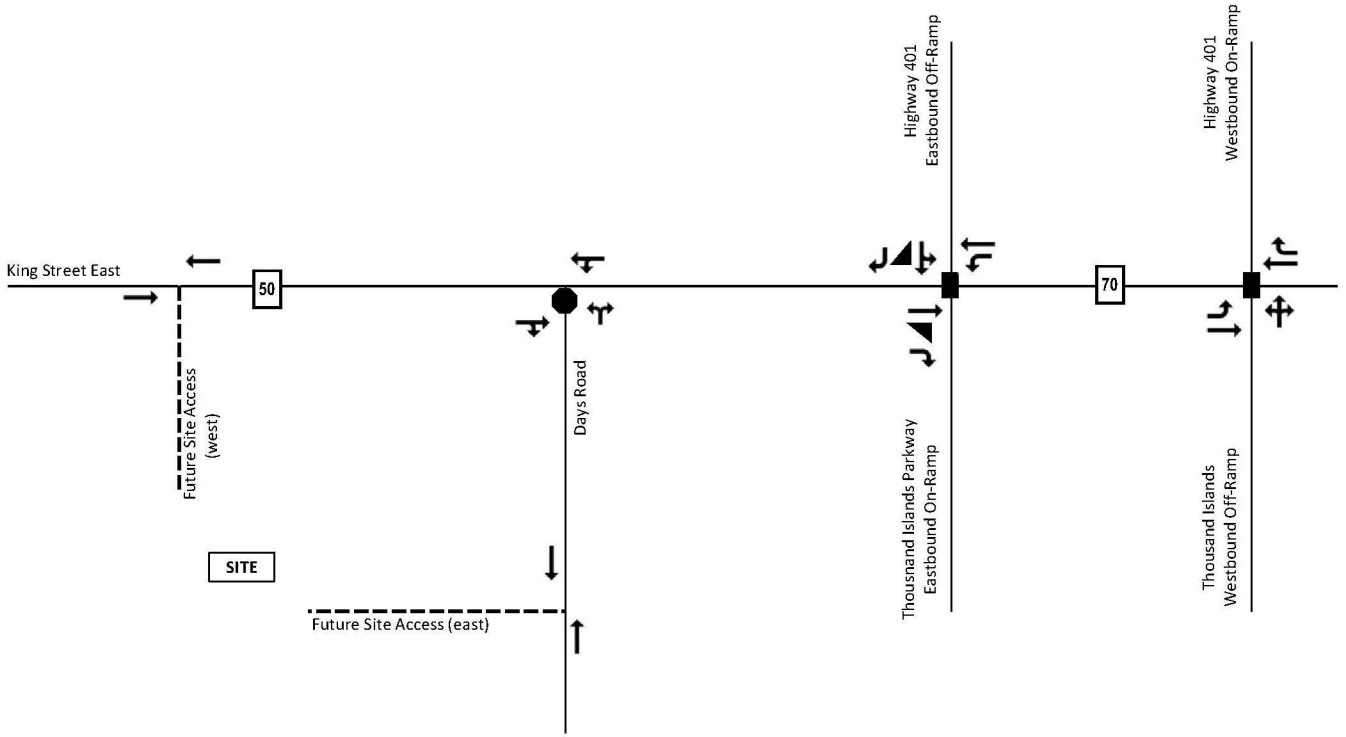


Figure 3: Existing Study Area Roadway Characteristics

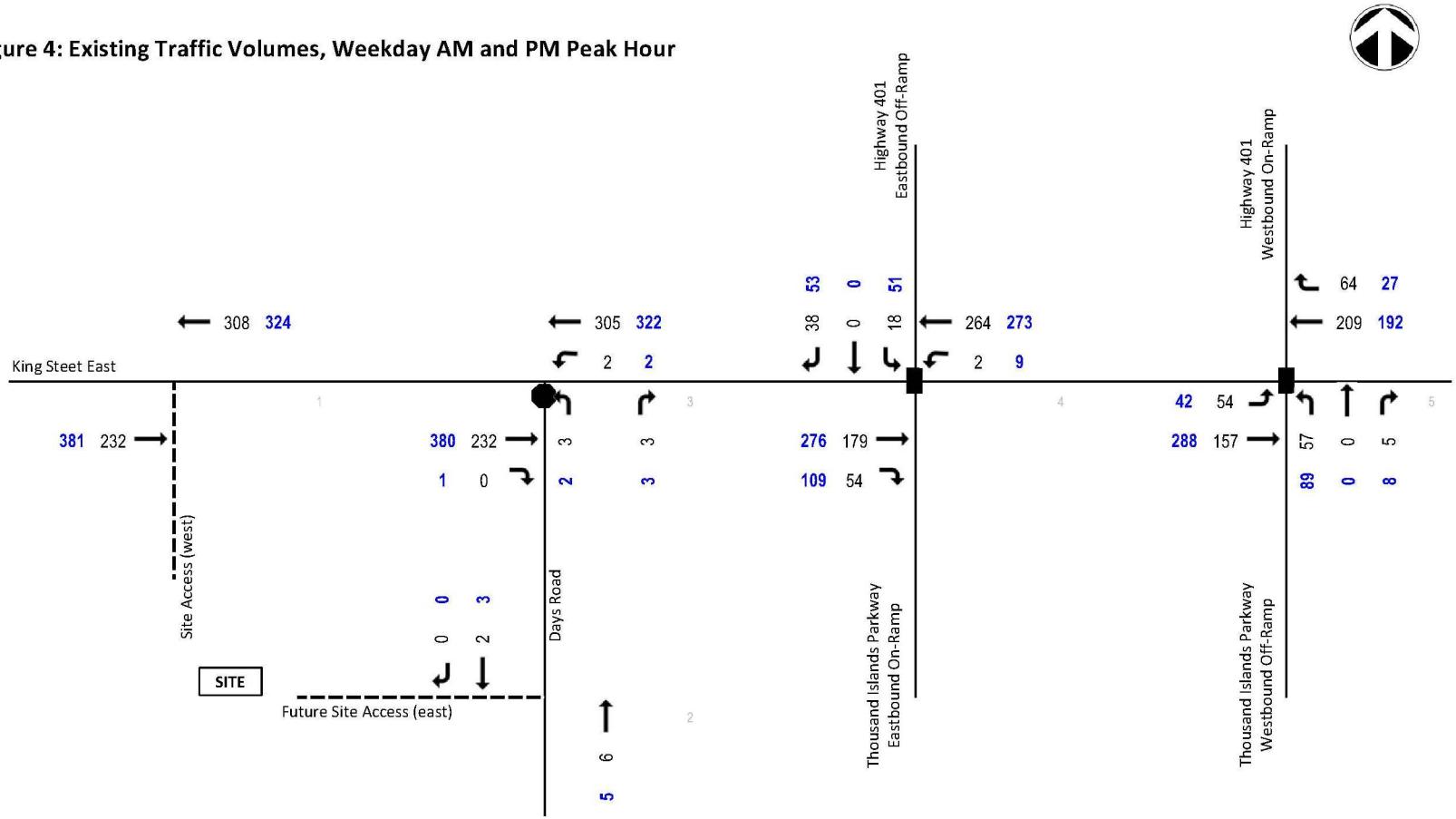


LEGEND

- Stop Sign
- Traffic Signal
- Channelized Right Turn
- Lane Configuration
- 40 Posted Speed Limit

Schematic; Not To Scale

Figure 4: Existing Traffic Volumes, Weekday AM and PM Peak Hour

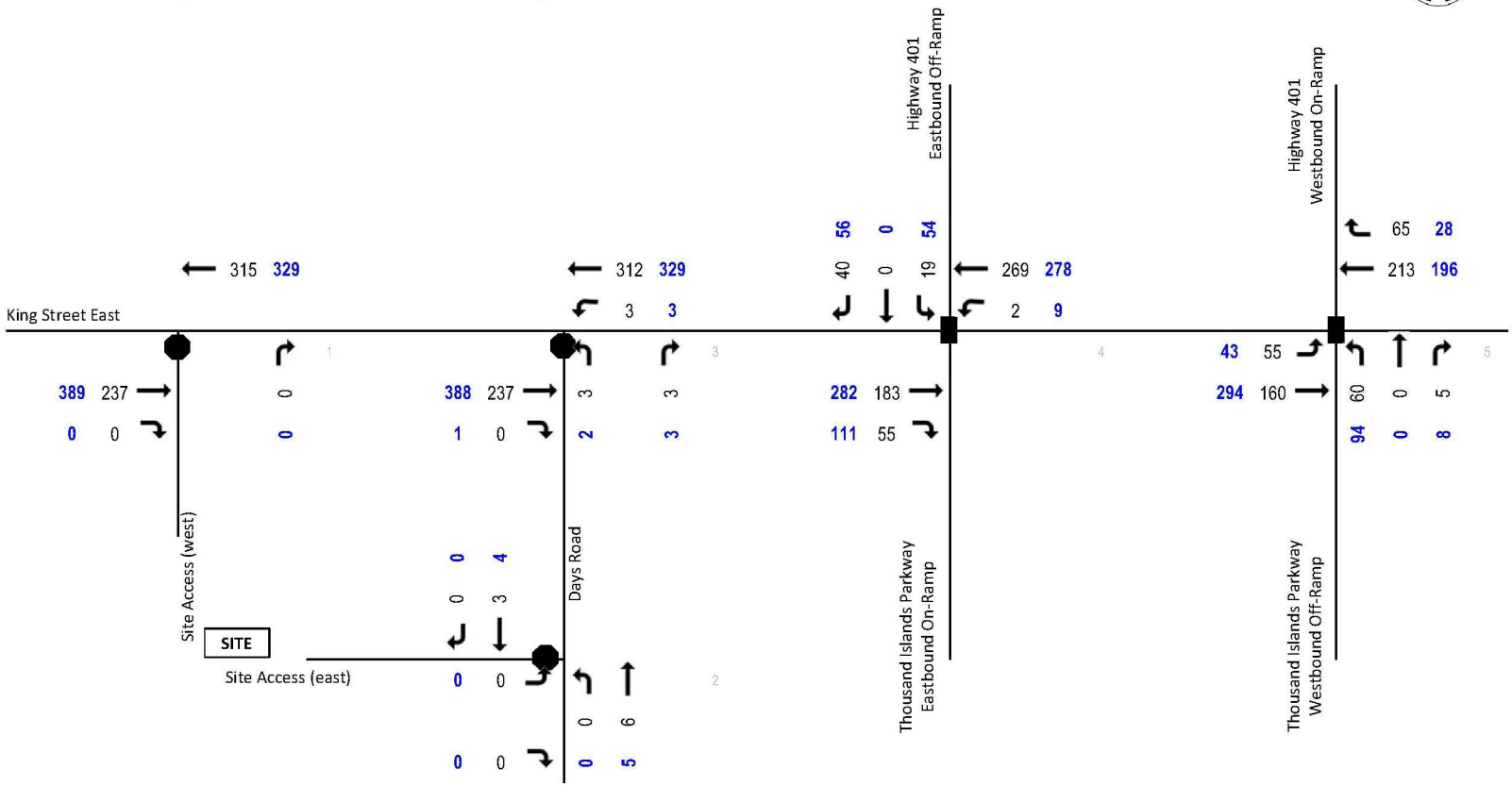


LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

Figure 5: 2025 Background Traffic Volumes, Weekday AM and PM Peak Hour

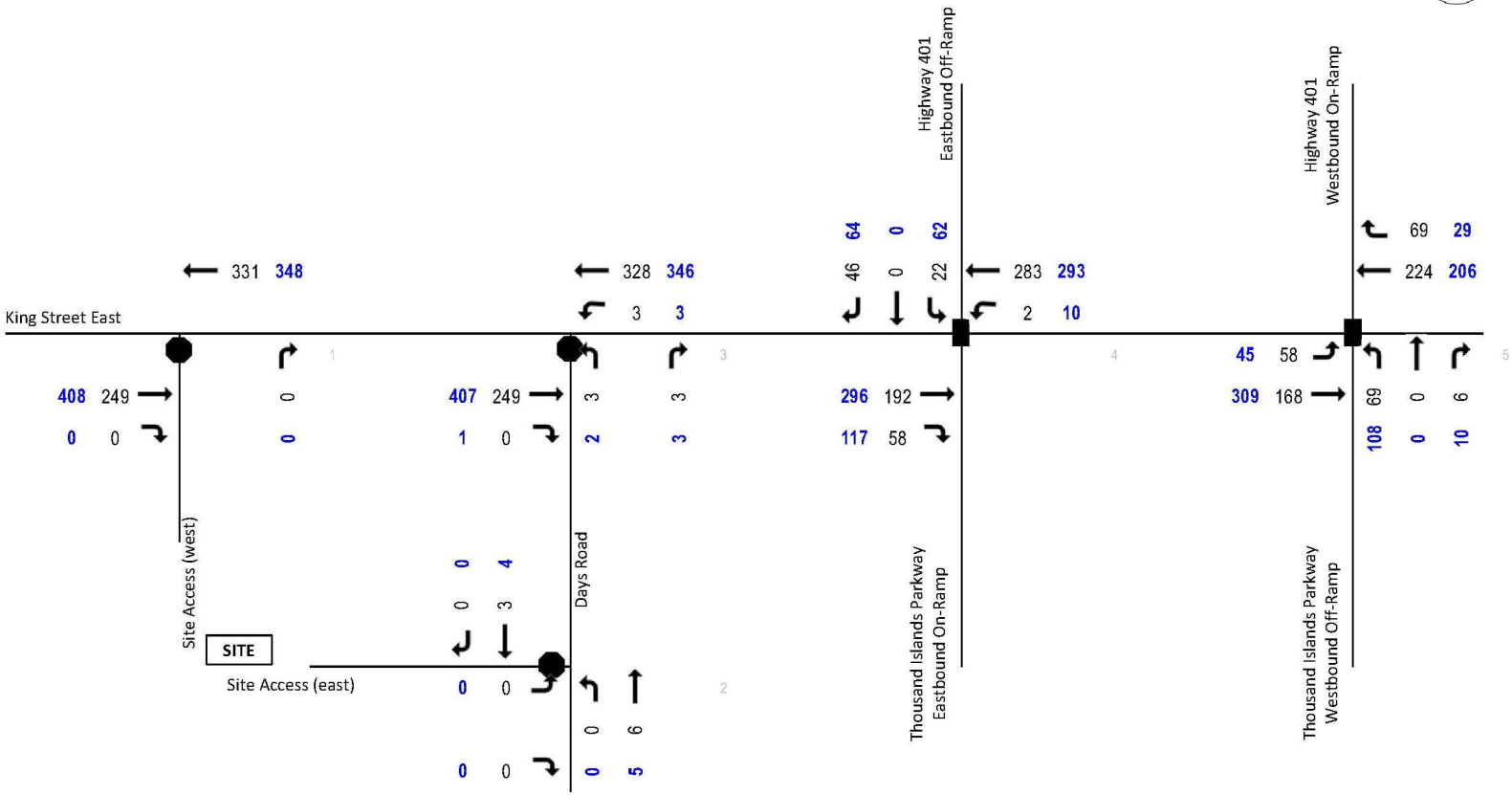


LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

Figure 6: 2030 Background Traffic Volumes, Weekday AM and PM Peak Hour

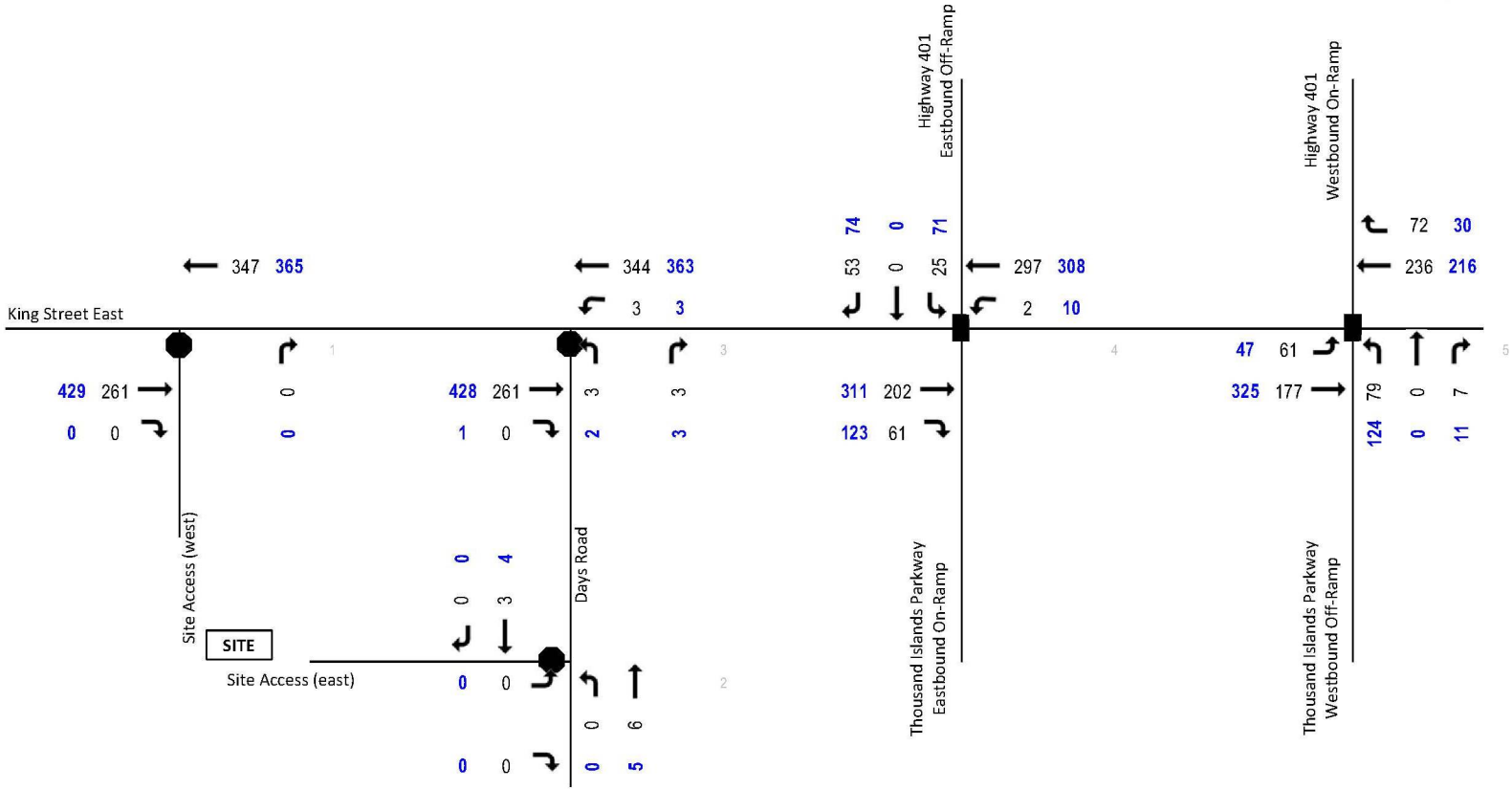


LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

Figure 7: 2035 Background Traffic Volumes, Weekday AM and PM Peak Hour

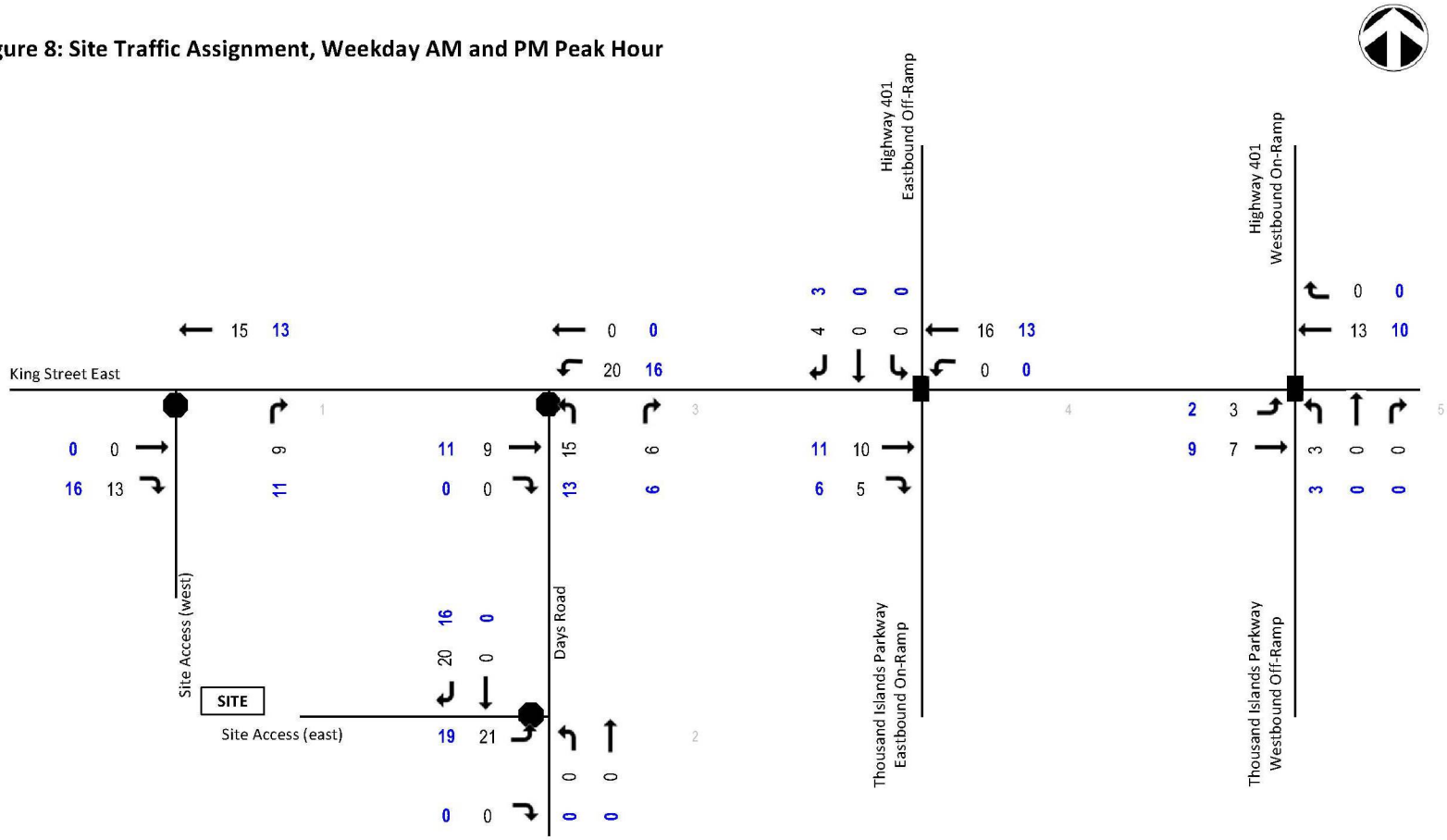


LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

Figure 8: Site Traffic Assignment, Weekday AM and PM Peak Hour



LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

Figure 9: Pass-By Trips, Weekday AM and PM Peak Hour

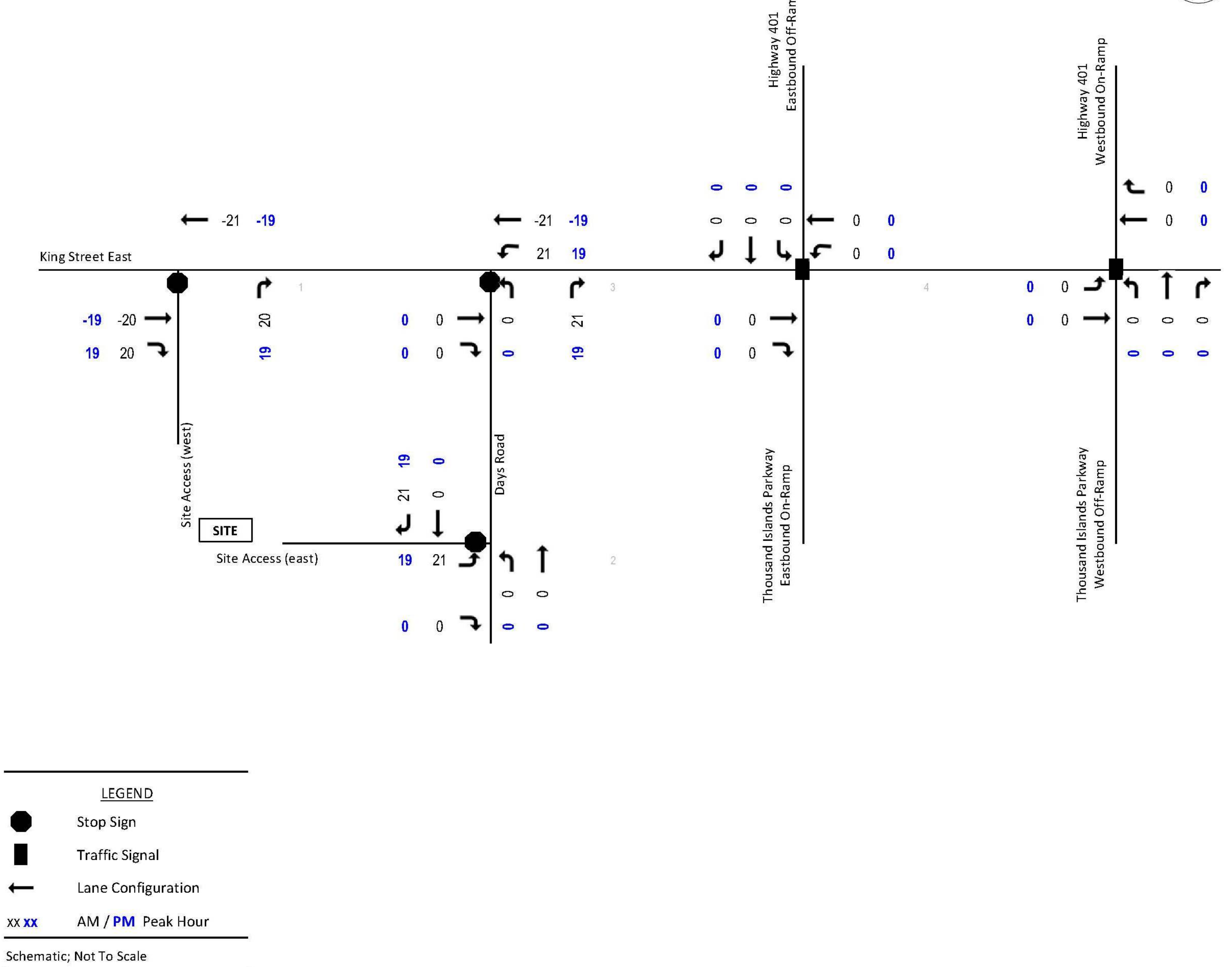
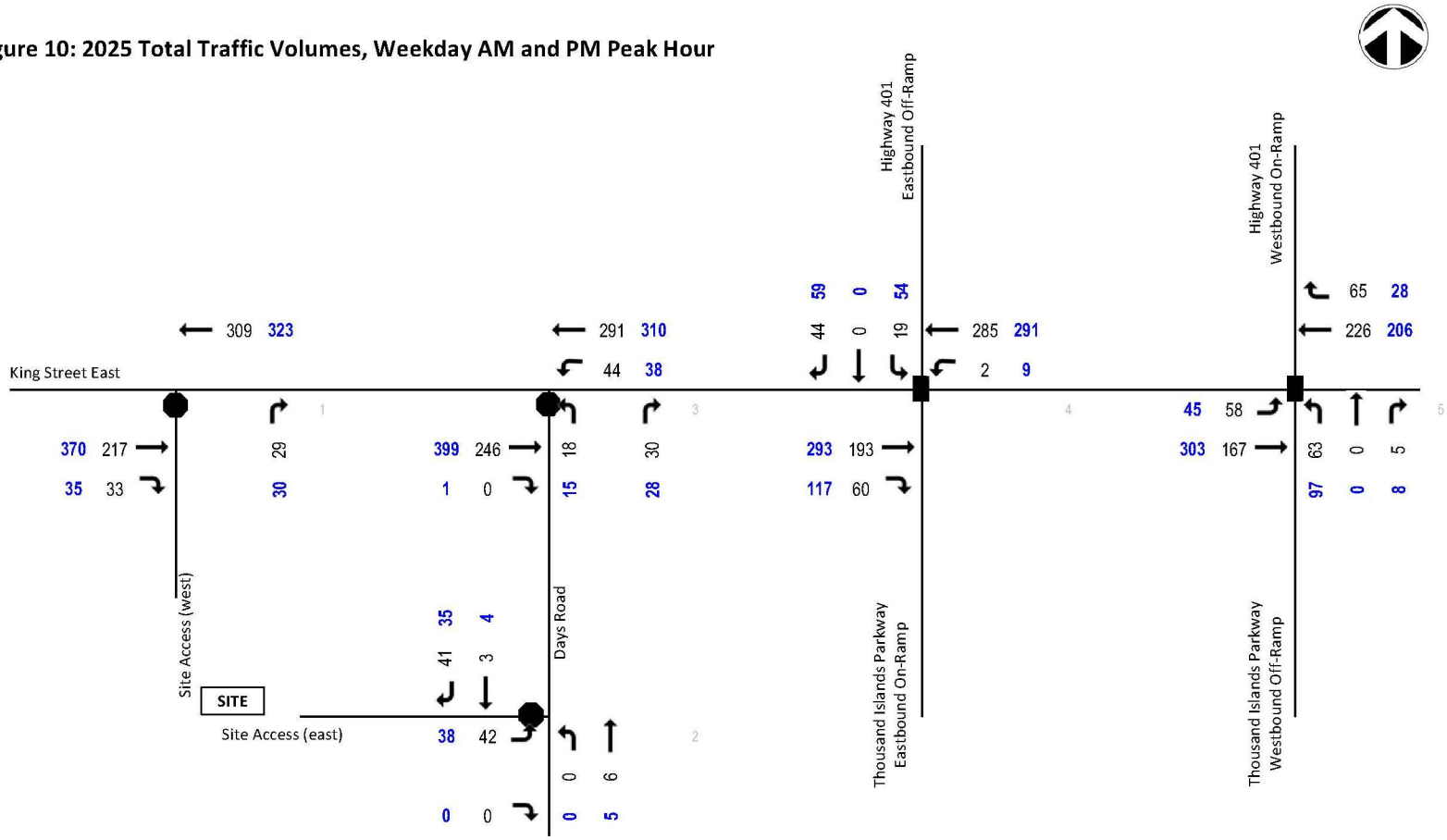


Figure 10: 2025 Total Traffic Volumes, Weekday AM and PM Peak Hour

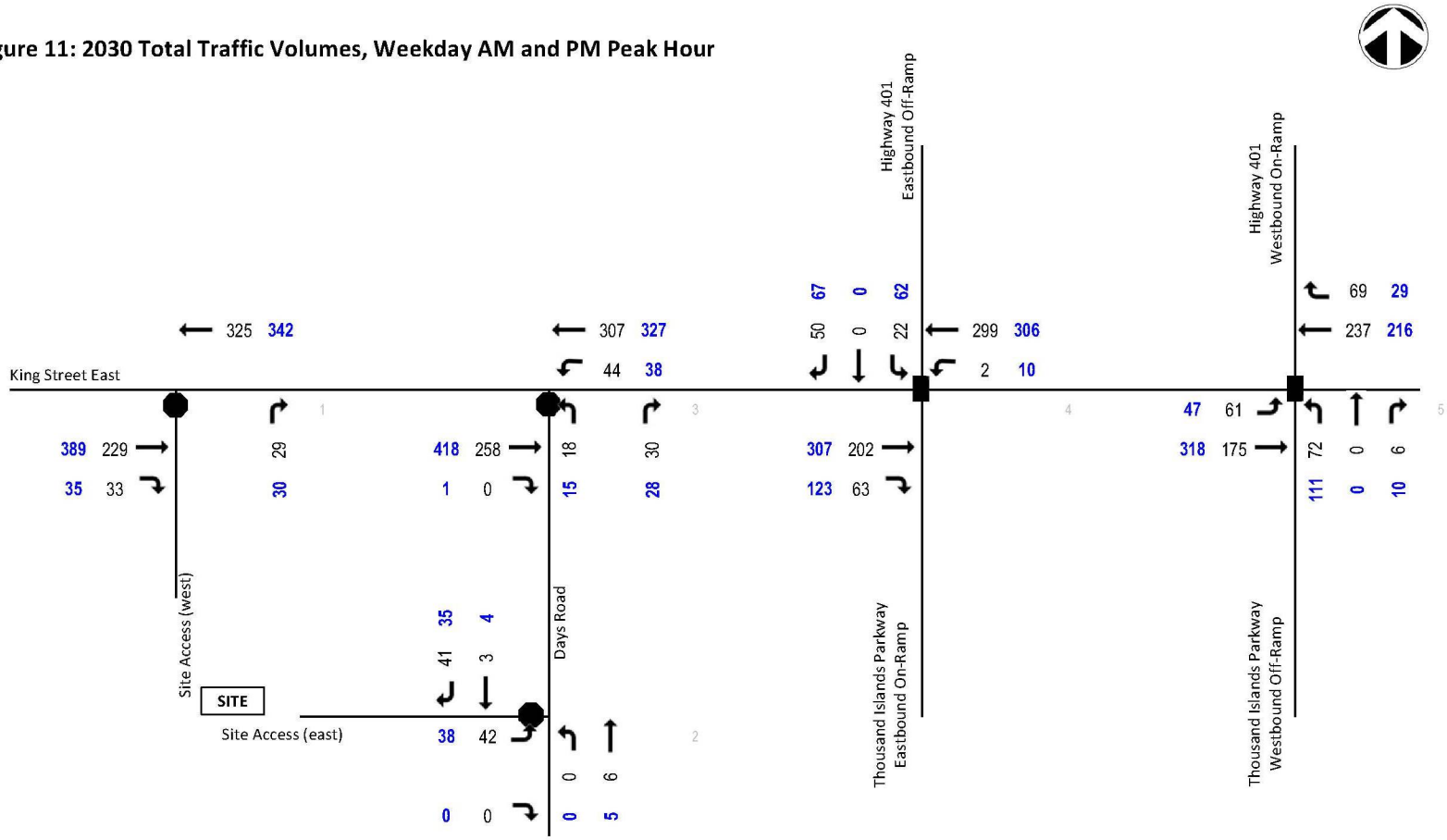


LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

Figure 11: 2030 Total Traffic Volumes, Weekday AM and PM Peak Hour

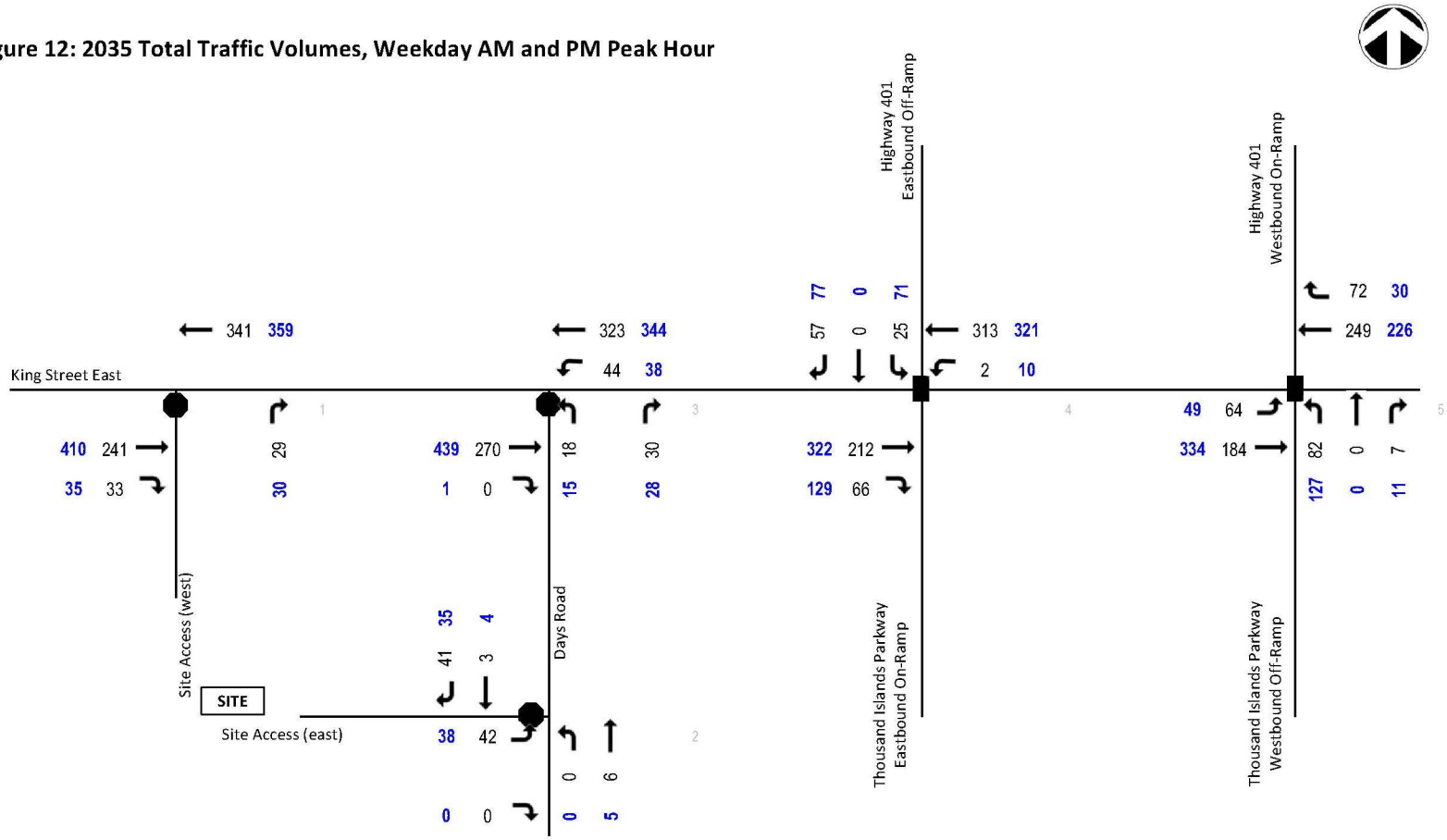


LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

Figure 12: 2035 Total Traffic Volumes, Weekday AM and PM Peak Hour



LEGEND

- Stop Sign
- Traffic Signal
- ← Lane Configuration
- xx **xx** AM / **PM** Peak Hour

Schematic; Not To Scale

APPENDICES

Appendix A – Turning Movement Counts

Appendix B – Background Traffic Information

Appendix C – Capacity Analysis Sheets

Appendix D – Level of Service Definitions

APPENDIX A

Turning Movement Counts

TRANS-PLAN
transportation engineering

Turning Movement Count Diagram

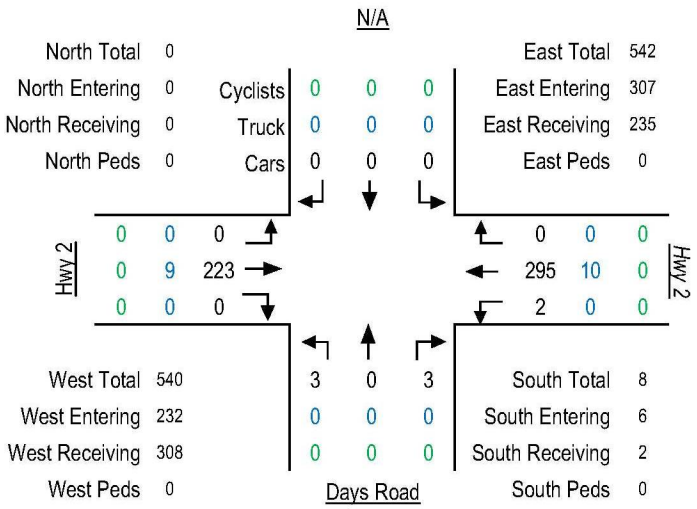
Intersection: Highway 2 and Days Road

Intersection ID:

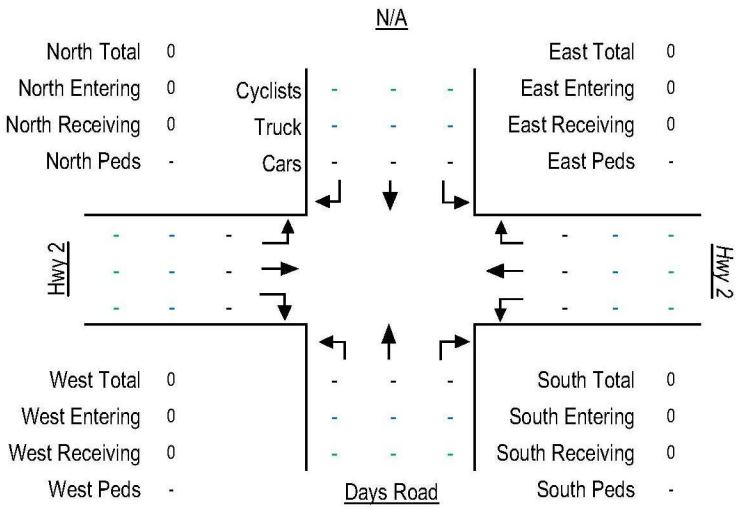
Municipality: Gananoque, Ontario

Date: Tuesday December 5, 2023

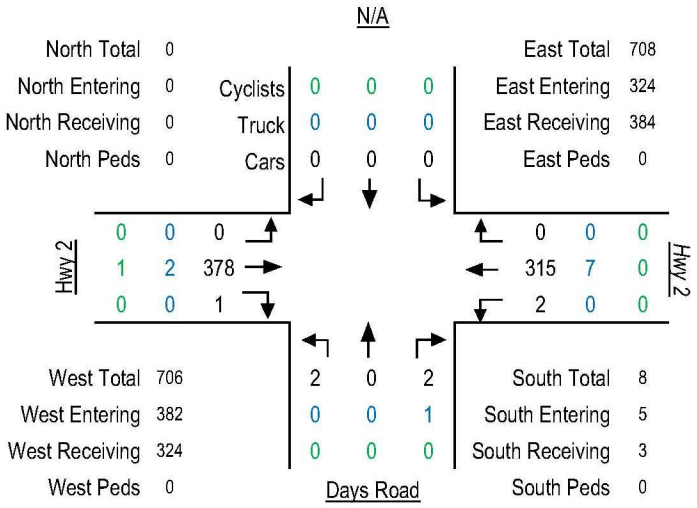
AM Peak Hour: 7:30 to 8:30



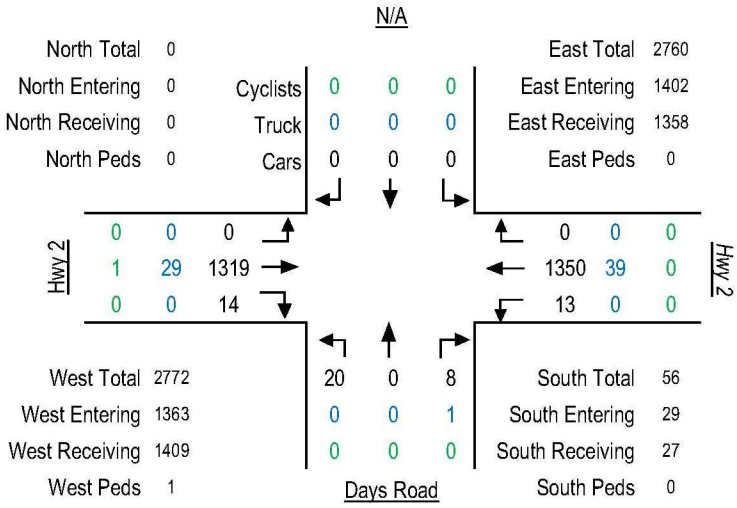
MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00



Total 8-Hour Count



TRANS-PLAN
transportation engineering

Turning Movement Count Diagram

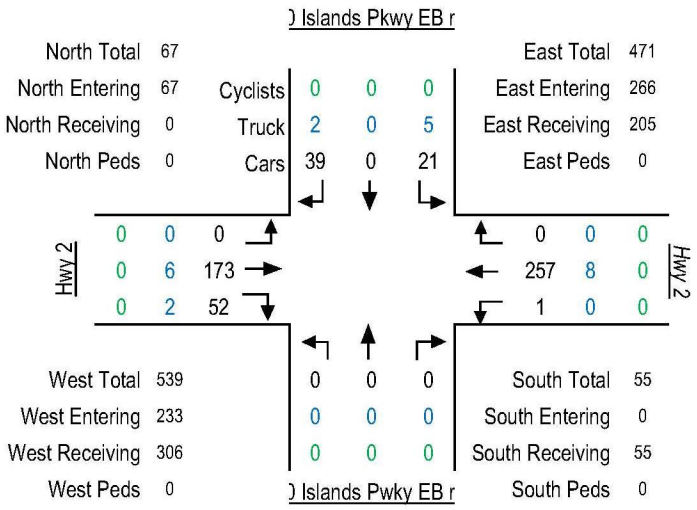
Intersection: Highway 2 and 1000 Islands Parkway Eastbound Ramps

Intersection ID:

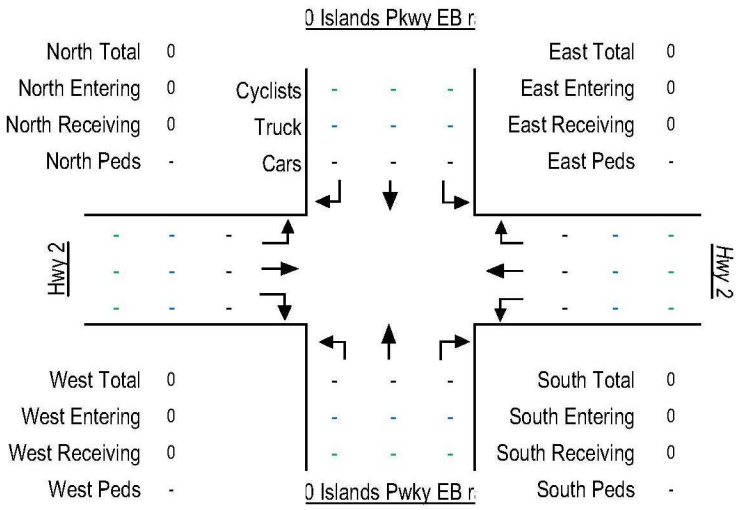
Municipality: Gananoque, Ontario

Date: Tuesday December 5, 2023

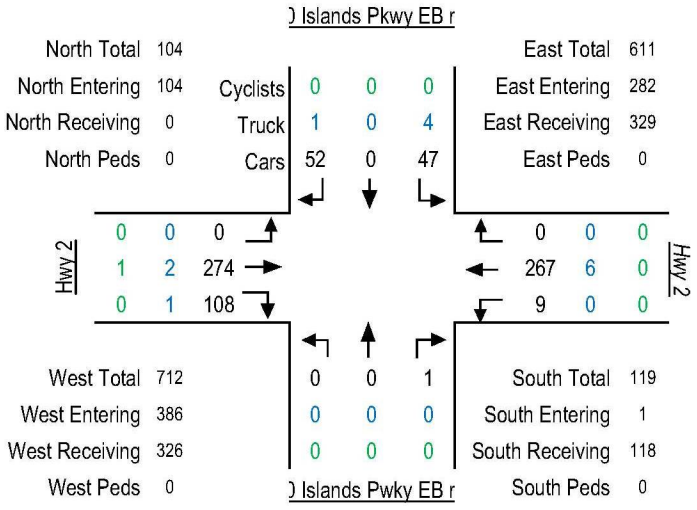
AM Peak Hour: 7:30 to 8:30



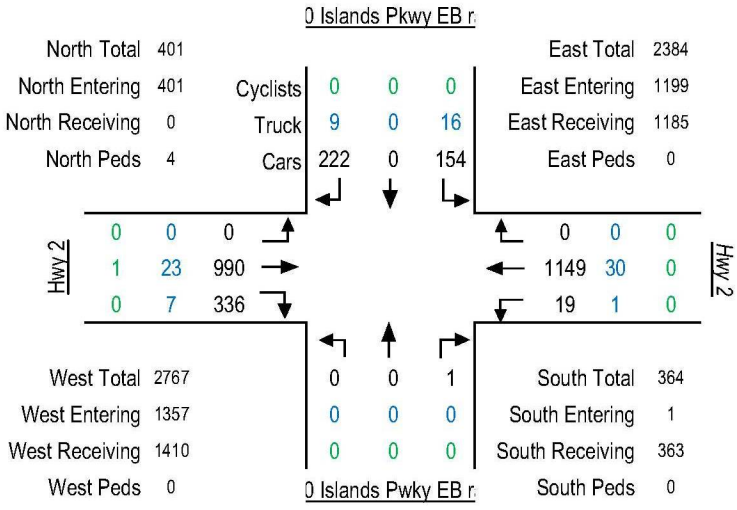
MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00



Total 8-Hour Count



TRANS-PLAN
transportation engineering

Turning Movement Count Diagram

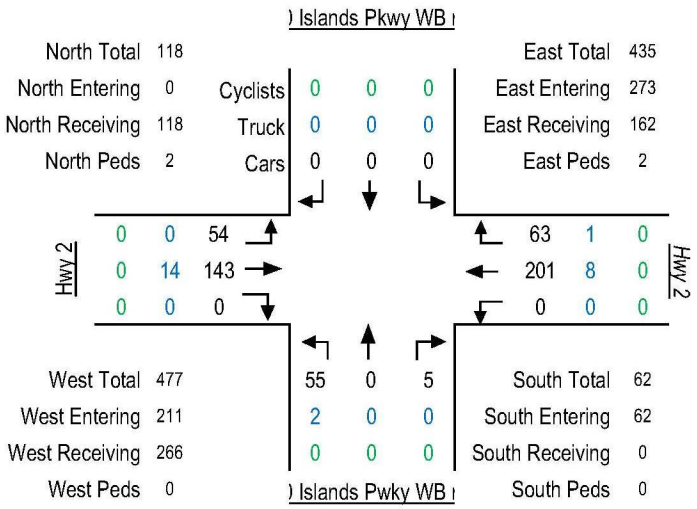
Intersection: Highway 2 and 1000 Islands Parkway Westbound Ramps

Intersection ID:

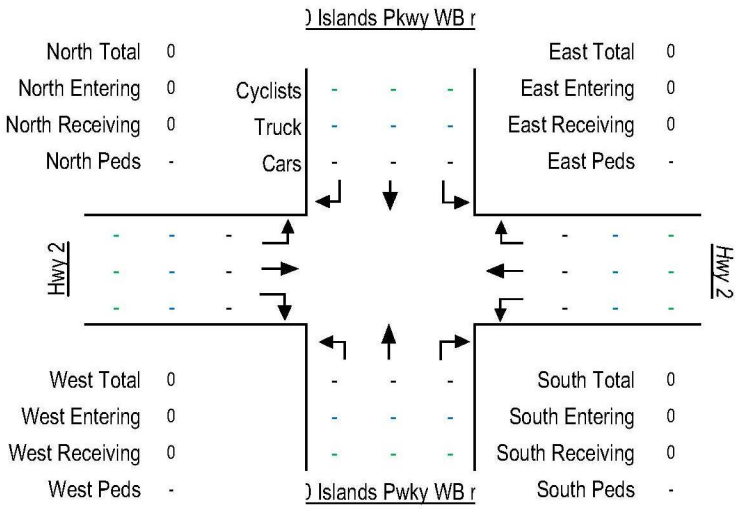
Municipality: Gananoque, Ontario

Date: Tuesday December 5, 2023

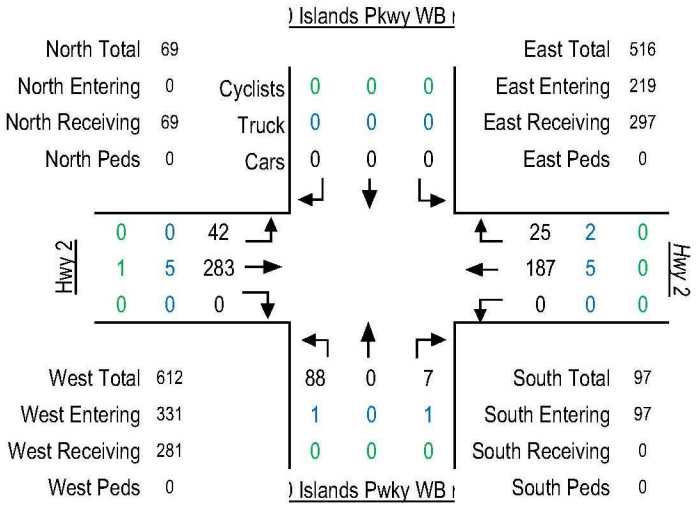
AM Peak Hour: 7:00 to 8:00



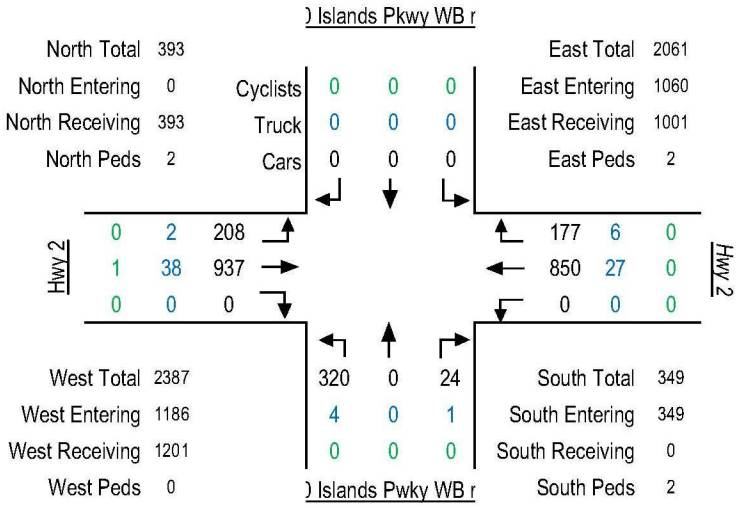
MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00



Total 8-Hour Count



APPENDIX B

Background Traffic Information

The Town of Gananoque

30 King Street East
Gananoque, Ontario, K7G 1E9

Site Code: 00000016
Station ID:
KING ST EAST
EAST OF HOLIDAY INN ENTRANCE
Latitude: 0' 0.0000 Undefined

Start	02-Dec-13		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST
12:00 AM	*	*	*	*	26	36	22	35	27	43	43	52	59	66	35	46
01:00	*	*	*	*	15	24	18	25	37	42	40	49	29	34	28	35
02:00	*	*	*	*	15	34	13	27	23	36	26	34	21	24	20	31
03:00	*	*	*	*	11	25	16	18	26	26	18	25	13	30	17	25
04:00	*	*	*	*	13	29	21	30	21	29	19	34	15	13	18	27
05:00	*	*	*	*	62	57	60	72	49	56	29	33	21	29	44	49
06:00	*	*	*	*	143	180	133	172	108	181	63	89	45	68	98	138
07:00	*	*	*	*	246	**356**	252	**372**	263	344	104	121	57	85	184	256
08:00	*	*	248	**329**	242	304	266	325	258	**345**	175	204	153	152	224	276
09:00	*	*	248	307	**271**	289	232	321	313	322	253	306	175	209	249	**292**
10:00	*	*	265	271	209	243	262	285	306	319	318	**346**	250	270	268	289
11:00	*	*	**276**	277	261	246	**270**	280	**340**	316	**321**	311	**340**	**301**	**301**	288
12:00 PM	*	*	326	302	288	277	332	267	323	342	359	314	342	331	328	306
01:00	*	*	287	278	293	295	337	325	361	365	370	**338**	350	**348**	333	325
02:00	*	*	303	290	285	258	329	321	437	384	353	316	**413**	329	353	316
03:00	*	*	399	299	**415**	295	425	325	**476**	348	**402**	308	354	321	**412**	316
04:00	*	*	**421**	**330**	397	**333**	**465**	**385**	470	**388**	334	289	297	283	397	**335**
05:00	*	*	387	276	346	274	377	285	390	310	267	222	246	232	336	266
06:00	*	*	234	218	272	206	285	268	278	218	218	235	171	194	243	223
07:00	*	*	184	160	192	166	183	155	220	183	167	162	161	184	184	168
08:00	*	*	146	90	139	124	160	147	157	146	125	125	110	131	140	127
09:00	*	*	125	90	123	93	120	77	124	132	129	89	170	81	132	94
10:00	*	*	65	83	81	81	69	80	145	110	98	104	62	85	87	90
11:00	*	*	58	29	67	34	77	53	105	81	84	60	46	32	73	48
Lane	0	0	3972	3629	4412	4259	4724	4650	5257	5066	4315	4166	3900	3832	4504	4366
Day	0		7601		8671		9374		10323		8481		7732		8870	
AM Peak	-	-	11:00	08:00	09:00	07:00	11:00	07:00	11:00	08:00	11:00	10:00	11:00	11:00	11:00	09:00
Vol.	-	-	276	329	271	356	270	372	340	345	321	346	340	301	301	292
PM Peak	-	-	16:00	16:00	15:00	16:00	16:00	16:00	15:00	16:00	15:00	13:00	14:00	13:00	15:00	16:00
Vol.	-	-	421	330	415	333	465	385	476	388	402	338	413	348	412	335

The Town of Gananoque

30 King Street East
Gananoque, Ontario, K7G 1E9

Site Code: 00000016
Station ID:
KING ST EAST
EAST OF HOLIDAY INN ENTRANCE
Latitude: 0' 0.0000 Undefined

Start	09-Dec-13		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST
12:00 AM	14	20	21	38	*	*	*	*	*	*	*	*	*	*	18	29
01:00	6	19	17	22	*	*	*	*	*	*	*	*	*	*	12	20
02:00	16	18	14	23	*	*	*	*	*	*	*	*	*	*	15	20
03:00	15	20	12	20	*	*	*	*	*	*	*	*	*	*	14	20
04:00	12	28	15	34	*	*	*	*	*	*	*	*	*	*	14	31
05:00	42	42	47	66	*	*	*	*	*	*	*	*	*	*	44	54
06:00	108	158	112	187	*	*	*	*	*	*	*	*	*	*	110	172
07:00	210	330	**222**	**416**	*	*	*	*	*	*	*	*	*	*	216	**373**
08:00	217	**341**	*	*	*	*	*	*	*	*	*	*	*	*	217	341
09:00	190	252	*	*	*	*	*	*	*	*	*	*	*	*	190	252
10:00	211	258	*	*	*	*	*	*	*	*	*	*	*	*	211	258
11:00	**252**	235	*	*	*	*	*	*	*	*	*	*	*	*	**252**	235
12:00 PM	272	260	*	*	*	*	*	*	*	*	*	*	*	*	272	260
01:00	269	289	*	*	*	*	*	*	*	*	*	*	*	*	269	289
02:00	318	**339**	*	*	*	*	*	*	*	*	*	*	*	*	318	**339**
03:00	380	269	*	*	*	*	*	*	*	*	*	*	*	*	380	269
04:00	**398**	287	*	*	*	*	*	*	*	*	*	*	*	*	**398**	287
05:00	349	280	*	*	*	*	*	*	*	*	*	*	*	*	349	280
06:00	210	183	*	*	*	*	*	*	*	*	*	*	*	*	210	183
07:00	167	139	*	*	*	*	*	*	*	*	*	*	*	*	167	139
08:00	123	114	*	*	*	*	*	*	*	*	*	*	*	*	123	114
09:00	105	69	*	*	*	*	*	*	*	*	*	*	*	*	105	69
10:00	77	69	*	*	*	*	*	*	*	*	*	*	*	*	77	69
11:00	68	30	*	*	*	*	*	*	*	*	*	*	*	*	68	30
Lane	4029	4049	460	806	0	0	0	0	0	0	0	0	0	0	4049	4133
Day	8078		1266		0		0		0		0		0		8182	
AM Peak	11:00	08:00	07:00	07:00	-	-	-	-	-	-	-	-	-	-	11:00	07:00
Vol.	252	341	222	416	-	-	-	-	-	-	-	-	-	-	252	373
PM Peak	16:00	14:00	-	-	-	-	-	-	-	-	-	-	-	-	16:00	14:00
Vol.	398	339	-	-	-	-	-	-	-	-	-	-	-	-	398	339

Comb. Total	8078	8867	8671	9374	10323	8481	7732	17052

ADT ADT 8,790 AADT 8,790

APPENDIX C

Capacity Analysis Results

HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Existing> AM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	6	2	0
Future Volume (Veh/h)	0	0	0	6	2	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	2	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	9	2	2			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9	2	2			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1011	1082	1620			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	7	2
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1620	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		6.7%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Existing> AM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	232	0	0	308	0	0
Future Volume (Veh/h)	232	0	0	308	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	252	0	0	335	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				156		
pX, platoon unblocked						
vC, conflicting volume			252		587	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			252		587	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1313		472	787

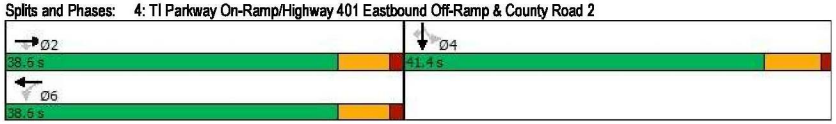
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	252	335	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.15	0.20	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		19.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	179	54	2	264	0	38
Future Volume (vph)	179	54	2	264	0	38
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		2	6			4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.5	26.5	26.5	26.5	25.5	25.5
Total Split (s)	38.6	38.6	38.6	38.6	41.4	41.4
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4	5.4
All-Red Time (s)	1.5	1.5	1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.3	21.3	21.3	21.3	14.2	14.2
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.52	0.52
v/c Ratio	0.15	0.05	0.00	0.21	0.03	0.06
Control Delay	5.0	2.5	6.0	5.2	12.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	2.5	6.0	5.2	12.1	5.4
LOS	A	A	A	A	B	A
Approach Delay	4.4			5.2	7.6	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 27.1			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.21			
Intersection Signal Delay: 5.1		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	232	0	2	305	3	3
Future Volume (Veh/h)	232	0	2	305	3	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	276	0	2	363	4	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				111		
pX, platoon unblocked					0.93	
vC, conflicting volume			276		643	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			276		576	276
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1287		444	763

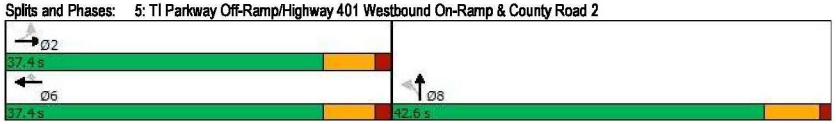
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	276	365	8
Volume Left	0	2	4
Volume Right	0	0	4
cSH	1700	1287	561
Volume to Capacity	0.16	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.1	11.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.5
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	54	157	209	64	0
Future Volume (vph)	54	157	209	64	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	21.9	21.9	21.9	21.9	13.7
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.49
v/c Ratio	0.07	0.13	0.17	0.06	0.08
Control Delay	5.5	5.1	5.1	2.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	5.1	5.1	2.5	7.0
LOS	A	A	A	A	A
Approach Delay		5.2	4.5		7.0
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 27.9			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.17			
Intersection Signal Delay: 5.1		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	179	54	2	264	0	0	0	0	18	0	38
Future Volume (vph)	0	179	54	2	264	0	0	0	0	18	0	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1615	1805	1863						1444	1482
Flt Permitted		1.00	1.00	0.63	1.00						0.95	1.00
Satd. Flow (perm)		1810	1615	1192	1863						1444	1482
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	208	63	2	307	0	0	0	0	21	0	44
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	0	0	0	40
Lane Group Flow (vph)	0	208	23	2	307	0	0	0	0	0	21	4
Heavy Vehicles (%)	0%	5%	0%	0%	2%	0%	0%	0%	0%	25%	0%	9%
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		9.1	9.1	9.1	9.1						2.5	2.5
Effective Green, g (s)		9.1	9.1	9.1	9.1						2.5	2.5
Actuated g/C Ratio		0.37	0.37	0.37	0.37						0.10	0.10
Clearance Time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		669	597	440	689						146	150
v/s Ratio Prot		0.11			c0.16							
v/s Ratio Perm			0.01	0.00							0.01	0.00
v/c Ratio		0.31	0.04	0.00	0.45						0.14	0.03
Uniform Delay, d1		5.5	5.0	4.9	5.8						10.1	10.0
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.0	0.0	0.5						0.5	0.1
Delay (s)		5.8	5.0	4.9	6.3						10.5	10.0
Level of Service		A	A	A	A						B	B
Approach Delay (s)		5.6			6.3			0.0			10.2	
Approach LOS		A			A			A			B	

Intersection Summary					
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	24.6	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Existing> PM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	381	0	0	324	0	0
Future Volume (Veh/h)	381	0	0	324	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	414	0	0	352	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				158		
pX, platoon unblocked					0.98	
vC, conflicting volume			414		766	414
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			414		751	414
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1145		371	638

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	414	352	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.24	0.21	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		23.4%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2

<Existing> AM Peak Hour
12-13-2023

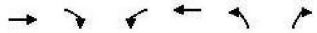
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	157	0	0	209	64	57	0	5	0	0	0
Future Volume (vph)	54	157	0	0	209	64	57	0	5	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1751	1759			1845	1550		1793				
Flt Permitted	0.61	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1117	1759			1845	1550		1793				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	64	185	0	0	246	75	67	0	6	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	45	0	0	0	0
Lane Group Flow (vph)	64	185	0	0	246	28	0	28	0	0	0	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	3%	8%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	9.3	9.3			9.3	9.3		2.6				
Effective Green, g (s)	9.3	9.3			9.3	9.3		2.6				
Actuated g/C Ratio	0.37	0.37			0.37	0.37		0.10				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	412	649			680	572		184				
v/s Ratio Prot		0.11			c0.13							
v/s Ratio Perm	0.06					0.02		0.02				
v/c Ratio	0.16	0.29			0.36	0.05		0.15				
Uniform Delay, d1	5.3	5.6			5.8	5.1		10.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.2	0.2			0.3	0.0		0.4				
Delay (s)	5.5	5.8			6.1	5.1		10.7				
Level of Service	A	A			A	A		B				
Approach Delay (s)		5.8			5.9			10.7			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	25.2	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Days Road & King Street East/County Road 2

<Existing> PM Peak Hour
12-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	380	1	2	322	2	3
Future Volume (Veh/h)	380	1	2	322	2	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	400	1	2	339	2	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				113		
pX, platoon unblocked					0.94	
vC, conflicting volume			401		744	400
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			401		695	400
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1158		383	650

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	401	341	5
Volume Left	0	2	2
Volume Right	1	0	3
cSH	1700	1158	508
Volume to Capacity	0.24	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.1	12.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.2
Approach LOS			B

Intersection Summary				
Average Delay			0.1	
Intersection Capacity Utilization			30.1%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Existing> PM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	5	3	0
Future Volume (Veh/h)	0	0	0	5	3	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	5	3	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	8	3	3			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	8	3	3			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1013	1081	1619			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	5	3
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1619	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay			0.0	
Intersection Capacity Utilization			6.7%	ICU Level of Service A
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis <Existing> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	276	109	9	273	0	0	0	0	51	0	53
Future Volume (vph)	0	276	109	9	273	0	0	0	0	51	0	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	4.0	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1615	1805	1881						1736	1599
Flt Permitted		1.00	1.00	0.58	1.00						0.95	1.00
Satd. Flow (perm)		1863	1615	1108	1881						1736	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	288	114	9	284	0	0	0	0	53	0	55
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	47
Lane Group Flow (vph)	0	288	114	9	284	0	0	0	0	0	53	8
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%
Turn Type		NA	Free	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			Free	6						4		4
Actuated Green, G (s)		14.3	32.0	14.3	14.3						4.7	4.7
Effective Green, g (s)		14.3	32.0	14.3	14.3						4.7	4.7
Actuated g/C Ratio		0.45	1.00	0.45	0.45						0.15	0.15
Clearance Time (s)		6.5		6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		832	1615	495	840						254	234
v/s Ratio Prot		c0.15			0.15							
v/s Ratio Perm			0.07	0.01							0.03	0.01
v/c Ratio		0.35	0.07	0.02	0.34						0.21	0.03
Uniform Delay, d1		5.8	0.0	4.9	5.8						12.0	11.7
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.1	0.0	0.2						0.4	0.1
Delay (s)		6.0	0.1	5.0	6.0						12.4	11.8
Level of Service		A	A	A	A						B	B
Approach Delay (s)		4.4			6.0			0.0			12.1	
Approach LOS		A			A			A			B	

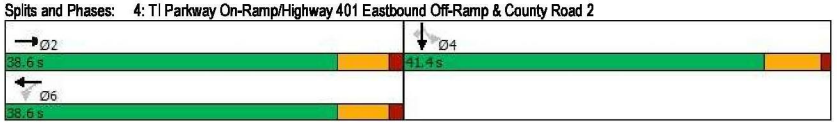
Intersection Summary				
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	32.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Timings <Existing> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	276	109	9	273	0	53
Future Volume (vph)	276	109	9	273	0	53
Turn Type	NA	Free	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		Free	6			4
Detector Phase	2		6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0		20.0	20.0	10.0	10.0
Minimum Split (s)	26.5		26.5	26.5	25.5	25.5
Total Split (s)	38.6		38.6	38.6	41.4	41.4
Total Split (%)	48.3%		48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0		5.0	5.0	5.4	5.4
All-Red Time (s)	1.5		1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5		6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	None	None
Act Effct Green (s)	22.7	33.4	22.7	22.7	13.1	13.1
Actuated g/C Ratio	0.68	1.00	0.68	0.68	0.39	0.39
v/c Ratio	0.23	0.07	0.01	0.22	0.08	0.08
Control Delay	6.7	0.1	6.3	6.7	13.2	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	0.1	6.3	6.7	13.2	5.6
LOS	A	A	A	A	B	A
Approach Delay	4.8			6.6	9.3	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 33.4			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.23			
Intersection Signal Delay: 6.1		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



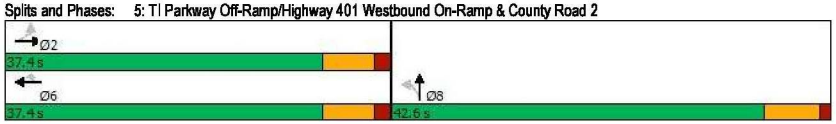
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	288	0	0	192	27	89	0	8	0	0	0
Future Volume (vph)	42	288	0	0	192	27	89	0	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1736	1863			1881	1568		1767				
Flt Permitted	0.62	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1138	1863			1881	1568		1767				
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	324	0	0	216	30	100	0	9	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	17	0	43	0	0	0	0
Lane Group Flow (vph)	47	324	0	0	216	13	0	66	0	0	0	0
Heavy Vehicles (%)	4%	2%	0%	0%	1%	3%	0%	0%	20%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	14.3	14.3			14.3	14.3		4.7				
Effective Green, g (s)	14.3	14.3			14.3	14.3		4.7				
Actuated g/C Ratio	0.44	0.44			0.44	0.44		0.15				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	503	824			832	694		257				
v/s Ratio Prot		c0.17			0.11							
v/s Ratio Perm	0.04					0.01		0.04				
v/c Ratio	0.09	0.39			0.26	0.02		0.26				
Uniform Delay, d1	5.2	6.1			5.7	5.1		12.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.3			0.2	0.0		0.5				
Delay (s)	5.3	6.4			5.8	5.1		12.8				
Level of Service	A	A			A	A		B				
Approach Delay (s)		6.2			5.7			12.8			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	32.3	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	42	288	192	27	0
Future Volume (vph)	42	288	192	27	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	22.8	22.8	22.8	22.8	13.1
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.39
v/c Ratio	0.06	0.26	0.17	0.03	0.15
Control Delay	6.7	7.0	6.5	1.9	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	7.0	6.5	1.9	9.2
LOS	A	A	A	A	A
Approach Delay		6.9	6.0		9.2
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 33.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 7.0		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	6	3	0
Future Volume (Veh/h)	0	0	0	6	3	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	3	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	10	3	3			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	10	3	3			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1010	1081	1619			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	7	3
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1619	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		6.7%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	237	0	0	315	0	0
Future Volume (Veh/h)	237	0	0	315	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	258	0	0	342	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				156		
pX, platoon unblocked						
vC, conflicting volume			258		600	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			258		600	258
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1307		464	781

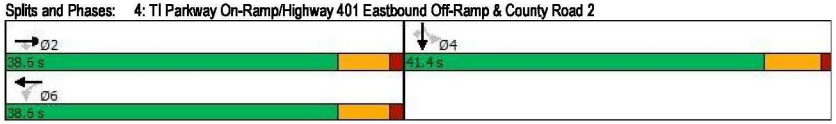
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	258	342	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.15	0.20	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		19.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	183	55	2	269	0	40
Future Volume (vph)	183	55	2	269	0	40
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		2	6			4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.5	26.5	26.5	26.5	25.5	25.5
Total Split (s)	38.6	38.6	38.6	38.6	41.4	41.4
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4	5.4
All-Red Time (s)	1.5	1.5	1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.2	21.2	21.2	21.2	14.3	14.3
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.53	0.53
v/c Ratio	0.15	0.05	0.00	0.21	0.03	0.06
Control Delay	5.0	2.5	6.0	5.2	12.1	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	2.5	6.0	5.2	12.1	5.7
LOS	A	A	A	A	B	A
Approach Delay	4.4			5.2	7.7	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 27			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.21			
Intersection Signal Delay: 5.1		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	237	0	3	312	3	3
Future Volume (Veh/h)	237	0	3	312	3	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	282	0	4	371	4	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				111		
pX, platoon unblocked					0.92	
vC, conflicting volume			282		661	282
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			282		590	282
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1280		432	757

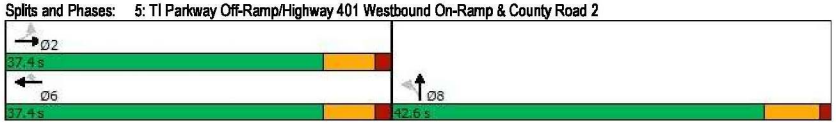
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	282	375	8
Volume Left	0	4	4
Volume Right	0	0	4
cSH	1700	1280	550
Volume to Capacity	0.17	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.4
Control Delay (s)	0.0	0.1	11.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.6
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	55	160	213	65	0
Future Volume (vph)	55	160	213	65	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	21.1	21.1	21.1	21.1	14.5
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.47
v/c Ratio	0.09	0.16	0.20	0.07	0.09
Control Delay	6.8	6.6	6.7	2.5	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	6.6	6.7	2.5	7.7
LOS	A	A	A	A	A
Approach Delay		6.6	5.7		7.7
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 31.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.20			
Intersection Signal Delay: 6.3		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	183	55	2	269	0	0	0	0	19	0	40
Future Volume (vph)	0	183	55	2	269	0	0	0	0	19	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1615	1805	1863						1444	1482
Flt Permitted		1.00	1.00	0.62	1.00						0.95	1.00
Satd. Flow (perm)		1810	1615	1187	1863						1444	1482
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	213	64	2	313	0	0	0	0	22	0	47
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	0	0	0	42
Lane Group Flow (vph)	0	213	24	2	313	0	0	0	0	0	22	5
Heavy Vehicles (%)	0%	5%	0%	0%	2%	0%	0%	0%	0%	25%	0%	9%
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		9.1	9.1	9.1	9.1						2.5	2.5
Effective Green, g (s)		9.1	9.1	9.1	9.1						2.5	2.5
Actuated g/C Ratio		0.37	0.37	0.37	0.37						0.10	0.10
Clearance Time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		669	597	439	689						146	150
v/s Ratio Prot		0.12			c0.17							
v/s Ratio Perm			0.01	0.00							0.02	0.00
v/c Ratio		0.32	0.04	0.00	0.45						0.15	0.03
Uniform Delay, d1		5.5	5.0	4.9	5.9						10.1	10.0
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.0	0.0	0.5						0.5	0.1
Delay (s)		5.8	5.0	4.9	6.3						10.6	10.0
Level of Service		A	A	A	A						B	B
Approach Delay (s)		5.6			6.3			0.0			10.2	
Approach LOS		A			A			A			B	

Intersection Summary					
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	24.6	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis <Background 2025> PM Peak Hour
1: Site Access (west) & King Street East 12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	389	0	0	329	0	0
Future Volume (Veh/h)	389	0	0	329	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	423	0	0	358	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				158		
pX, platoon unblocked					0.98	
vC, conflicting volume			423		781	423
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			423		764	423
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1136		363	631

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	423	358	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.25	0.21	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		23.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis <Background 2025> AM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	160	0	0	213	65	60	0	5	0	0	0
Future Volume (vph)	55	160	0	0	213	65	60	0	5	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1751	1759			1845	1550		1794				
Flt Permitted	0.60	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1112	1759			1845	1550		1794				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	65	188	0	0	251	76	71	0	6	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	51	0	42	0	0	0	0
Lane Group Flow (vph)	65	188	0	0	251	25	0	35	0	0	0	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	3%	8%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	8.6	8.6			8.6	8.6		4.3				
Effective Green, g (s)	8.6	8.6			8.6	8.6		4.3				
Actuated g/C Ratio	0.33	0.33			0.33	0.33		0.16				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	365	577			605	508		294				
v/s Ratio Prot		0.11			c0.14							
v/s Ratio Perm	0.06					0.02		0.02				
v/c Ratio	0.18	0.33			0.41	0.05		0.12				
Uniform Delay, d1	6.3	6.6			6.8	6.0		9.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.2	0.3			0.5	0.0		0.2				
Delay (s)	6.5	7.0			7.3	6.0		9.5				
Level of Service	A	A			A	A		A				
Approach Delay (s)		6.8			7.0			9.5			0.0	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.32				
Actuated Cycle Length (s)	26.2	Sum of lost time (s)	13.3		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Days Road & King Street East/County Road 2

<Background 2025> PM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	388	1	3	329	2	3
Future Volume (Veh/h)	388	1	3	329	2	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	408	1	3	346	2	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				113		
pX, platoon unblocked					0.94	
vC, conflicting volume			409		760	408
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			409		710	408
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1150		373	643

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	409	349	5
Volume Left	0	3	2
Volume Right	1	0	3
cSH	1700	1150	499
Volume to Capacity	0.24	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.2
Control Delay (s)	0.0	0.1	12.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.3
Approach LOS			B

Intersection Summary				
Average Delay			0.1	
Intersection Capacity Utilization			30.5%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Background 2025> PM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	5	4	0
Future Volume (Veh/h)	0	0	0	5	4	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	5	4	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	9	4	4			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9	4	4			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1011	1080	1618			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	5	4
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1618	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay			0.0	
Intersection Capacity Utilization			6.7%	ICU Level of Service A
Analysis Period (min)			15	

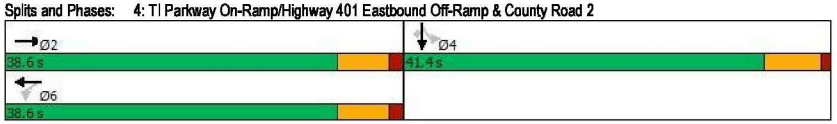
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	282	111	9	278	0	0	0	0	54	0	56
Future Volume (vph)	0	282	111	9	278	0	0	0	0	54	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	4.0	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1615	1805	1881						1736	1599
Flt Permitted		1.00	1.00	0.58	1.00						0.95	1.00
Satd. Flow (perm)		1863	1615	1102	1881						1736	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	294	116	9	290	0	0	0	0	56	0	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	294	116	9	290	0	0	0	0	0	56	8
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%
Turn Type		NA	Free	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			Free	6						4		4
Actuated Green, G (s)		14.3	31.9	14.3	14.3						4.6	4.6
Effective Green, g (s)		14.3	31.9	14.3	14.3						4.6	4.6
Actuated g/C Ratio		0.45	1.00	0.45	0.45						0.14	0.14
Clearance Time (s)		6.5		6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		835	1615	494	843						250	230
v/s Ratio Prot		c0.16			0.15							
v/s Ratio Perm			0.07	0.01							0.03	0.01
v/c Ratio		0.35	0.07	0.02	0.34						0.22	0.04
Uniform Delay, d1		5.8	0.0	4.9	5.7						12.1	11.7
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.1	0.0	0.2						0.5	0.1
Delay (s)		6.0	0.1	4.9	6.0						12.5	11.8
Level of Service		A	A	A	A						B	B
Approach Delay (s)		4.3			6.0			0.0			12.2	
Approach LOS		A			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	31.9	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	282	111	9	278	0	56
Future Volume (vph)	282	111	9	278	0	56
Turn Type	NA	Free	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		Free	6			4
Detector Phase	2		6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0		20.0	20.0	10.0	10.0
Minimum Split (s)	26.5		26.5	26.5	25.5	25.5
Total Split (s)	38.6		38.6	38.6	41.4	41.4
Total Split (%)	48.3%		48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0		5.0	5.0	5.4	5.4
All-Red Time (s)	1.5		1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5		6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	None	None
Act Effct Green (s)	22.6	33.3	22.6	22.6	13.2	13.2
Actuated g/C Ratio	0.68	1.00	0.68	0.68	0.40	0.40
v/c Ratio	0.23	0.07	0.01	0.23	0.08	0.09
Control Delay	6.7	0.1	6.3	6.7	13.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	0.1	6.3	6.7	13.2	5.5
LOS	A	A	A	A	B	A
Approach Delay	4.8			6.7	9.3	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 33.3			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.23			
Intersection Signal Delay: 6.1		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



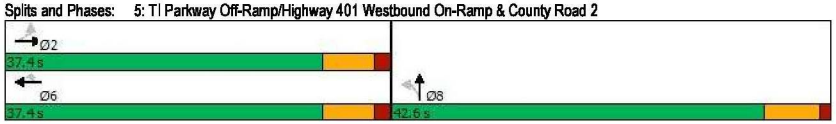
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	294	0	0	196	28	94	0	8	0	0	0
Future Volume (vph)	43	294	0	0	196	28	94	0	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1736	1863			1881	1568		1769				
Flt Permitted	0.62	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1134	1863			1881	1568		1769				
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	48	330	0	0	220	31	106	0	9	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	18	0	40	0	0	0	0
Lane Group Flow (vph)	48	330	0	0	220	13	0	75	0	0	0	0
Heavy Vehicles (%)	4%	2%	0%	0%	1%	3%	0%	0%	20%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	13.6	13.6			13.6	13.6		6.8				
Effective Green, g (s)	13.6	13.6			13.6	13.6		6.8				
Actuated g/C Ratio	0.40	0.40			0.40	0.40		0.20				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	457	751			759	632		356				
v/s Ratio Prot		c0.18			0.12							
v/s Ratio Perm	0.04					0.01		0.04				
v/c Ratio	0.11	0.44			0.29	0.02		0.21				
Uniform Delay, d1	6.3	7.3			6.8	6.0		11.2				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.4			0.2	0.0		0.3				
Delay (s)	6.4	7.7			7.0	6.1		11.5				
Level of Service	A	A			A	A		B				
Approach Delay (s)		7.5			6.9			11.5			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	33.7	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	43	294	196	28	0
Future Volume (vph)	43	294	196	28	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	21.0	21.0	21.0	21.0	13.5
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.37
v/c Ratio	0.07	0.31	0.21	0.03	0.17
Control Delay	7.0	8.3	7.6	2.0	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	8.3	7.6	2.0	9.7
LOS	A	A	A	A	A
Approach Delay		8.2	6.9		9.7
Approach LOS		A	A		A

Intersection Summary		
Cycle Length: 80		
Actuated Cycle Length: 36.8		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.31		
Intersection Signal Delay: 8.0	Intersection LOS: A	
Intersection Capacity Utilization 58.3%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



HCM Unsignalized Intersection Capacity Analysis <Background 2030> AM Peak Hour
2: Days Road & Site Access (east) 12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	6	3	0
Future Volume (Veh/h)	0	0	0	6	3	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	3	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	10	3	3			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	10	3	3			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1010	1081	1619			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	7	3
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1619	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		6.7%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis <Background 2030> AM Peak Hour
1: Site Access (west) & King Street East 12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	249	0	0	331	0	0
Future Volume (Veh/h)	249	0	0	331	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	271	0	0	360	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				156		
pX, platoon unblocked					0.97	
vC, conflicting volume			271		631	271
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			271		606	271
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1292		447	768

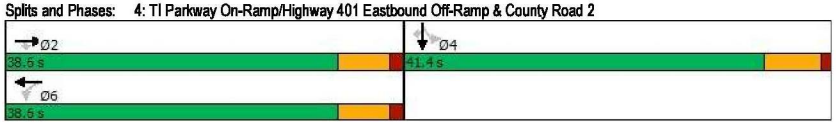
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	271	360	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.16	0.21	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		20.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	192	58	2	283	0	46
Future Volume (vph)	192	58	2	283	0	46
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		2	6			4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.5	26.5	26.5	26.5	25.5	25.5
Total Split (s)	38.6	38.6	38.6	38.6	41.4	41.4
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4	5.4
All-Red Time (s)	1.5	1.5	1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	20.4	20.4	20.4	20.4	15.4	15.4
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.51	0.51
v/c Ratio	0.18	0.06	0.00	0.26	0.04	0.07
Control Delay	6.5	2.5	6.0	6.9	13.2	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	2.5	6.0	6.9	13.2	5.6
LOS	A	A	A	A	B	A
Approach Delay	5.6			6.9	8.1	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 30.1			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	249	0	3	328	3	3
Future Volume (Veh/h)	249	0	3	328	3	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	296	0	4	390	4	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				111		
pX, platoon unblocked					0.89	
vC, conflicting volume			296		694	296
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			296		595	296
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1265		415	743

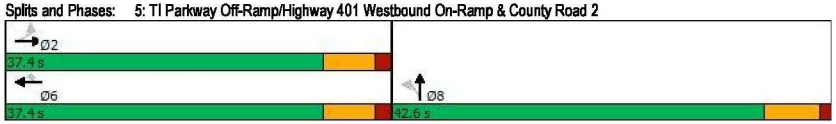
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	296	394	8
Volume Left	0	4	4
Volume Right	0	0	4
cSH	1700	1265	532
Volume to Capacity	0.17	0.00	0.02
Queue Length 95th (m)	0.0	0.1	0.4
Control Delay (s)	0.0	0.1	11.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.9
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	58	168	224	69	0
Future Volume (vph)	58	168	224	69	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.9	20.9	20.9	20.9	14.8
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.48
v/c Ratio	0.09	0.17	0.21	0.08	0.10
Control Delay	6.8	6.6	6.8	2.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	6.6	6.8	2.4	8.2
LOS	A	A	A	A	A
Approach Delay		6.7	5.7		8.2
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 30.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.21			
Intersection Signal Delay: 6.4		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	192	58	2	283	0	0	0	0	22	0	46
Future Volume (vph)	0	192	58	2	283	0	0	0	0	22	0	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1615	1805	1863						1444	1482
Flt Permitted		1.00	1.00	0.62	1.00						0.95	1.00
Satd. Flow (perm)		1810	1615	1176	1863						1444	1482
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	223	67	2	329	0	0	0	0	26	0	53
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	223	22	2	329	0	0	0	0	0	26	9
Heavy Vehicles (%)	0%	5%	0%	0%	2%	0%	0%	0%	0%	25%	0%	9%
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		8.4	8.4	8.4	8.4						4.2	4.2
Effective Green, g (s)		8.4	8.4	8.4	8.4						4.2	4.2
Actuated g/C Ratio		0.33	0.33	0.33	0.33						0.16	0.16
Clearance Time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		593	529	385	611						236	243
v/s Ratio Prot		0.12			c0.18							
v/s Ratio Perm			0.01	0.00							0.02	0.01
v/c Ratio		0.38	0.04	0.01	0.54						0.11	0.04
Uniform Delay, d1		6.6	5.9	5.8	7.0						9.1	9.0
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.0	0.0	0.9						0.2	0.1
Delay (s)		7.0	5.9	5.8	7.9						9.3	9.1
Level of Service		A	A	A	A						A	A
Approach Delay (s)		6.7			7.9			0.0			9.1	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.40				
Actuated Cycle Length (s)	25.6	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis <Background 2030> PM Peak Hour
1: Site Access (west) & King Street East 12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	408	0	0	348	0	0
Future Volume (Veh/h)	408	0	0	348	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	443	0	0	378	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				158		
pX, platoon unblocked					0.95	
vC, conflicting volume			443		821	443
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			443		782	443
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1117		343	615

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	443	378	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.26	0.22	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		24.8%	ICU Level of Service	A
Analysis Period (min)		15		

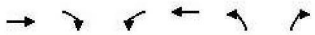
HCM Signalized Intersection Capacity Analysis <Background 2030> AM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	168	0	0	224	69	69	0	6	0	0	0
Future Volume (vph)	58	168	0	0	224	69	69	0	6	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1751	1759			1845	1550		1794				
Flt Permitted	0.60	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1099	1759			1845	1550		1794				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	68	198	0	0	264	81	81	0	7	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	55	0	42	0	0	0	0
Lane Group Flow (vph)	68	198	0	0	264	26	0	46	0	0	0	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	3%	8%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	8.5	8.5			8.5	8.5		4.3				
Effective Green, g (s)	8.5	8.5			8.5	8.5		4.3				
Actuated g/C Ratio	0.33	0.33			0.33	0.33		0.16				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	357	572			600	504		295				
v/s Ratio Prot		0.11			c0.14							
v/s Ratio Perm	0.06					0.02		0.03				
v/c Ratio	0.19	0.35			0.44	0.05		0.16				
Uniform Delay, d1	6.3	6.7			6.9	6.0		9.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.3	0.4			0.5	0.0		0.2				
Delay (s)	6.6	7.1			7.4	6.1		9.6				
Level of Service	A	A			A	A		A				
Approach Delay (s)		6.9			7.1			9.6			0.0	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	26.1	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis <Background 2030> PM Peak Hour
3: Days Road & King Street East/County Road 2 12-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	407	1	3	346	2	3
Future Volume (Veh/h)	407	1	3	346	2	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	428	1	3	364	2	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				113		
pX, platoon unblocked					0.91	
vC, conflicting volume			429		798	428
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			429		732	428
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1130		354	626

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	429	367	5
Volume Left	0	3	2
Volume Right	1	0	3
cSH	1700	1130	479
Volume to Capacity	0.25	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.3
Control Delay (s)	0.0	0.1	12.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.6
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis <Background 2030> PM Peak Hour
2: Days Road & Site Access (east) 12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	5	4	0
Future Volume (Veh/h)	0	0	0	5	4	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	5	4	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	9	4	4			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9	4	4			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1011	1080	1618			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	5	4
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1618	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis <Background 2030> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	296	117	10	293	0	0	0	0	62	0	64
Future Volume (vph)	0	296	117	10	293	0	0	0	0	62	0	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	4.0	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1615	1805	1881						1736	1599
Flt Permitted		1.00	1.00	0.57	1.00						0.95	1.00
Satd. Flow (perm)		1863	1615	1088	1881						1736	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	308	122	10	305	0	0	0	0	65	0	67
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	53
Lane Group Flow (vph)	0	308	122	10	305	0	0	0	0	0	65	14
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%
Turn Type		NA	Free	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			Free	6						4		4
Actuated Green, G (s)		13.6	33.4	13.6	13.6						6.8	6.8
Effective Green, g (s)		13.6	33.4	13.6	13.6						6.8	6.8
Actuated g/C Ratio		0.41	1.00	0.41	0.41						0.20	0.20
Clearance Time (s)		6.5		6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		758	1615	443	765						353	325
v/s Ratio Prot		c0.17			0.16							
v/s Ratio Perm			0.08	0.01							0.04	0.01
v/c Ratio		0.41	0.08	0.02	0.40						0.18	0.04
Uniform Delay, d1		7.0	0.0	5.9	7.0						11.0	10.7
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	0.0	0.3						0.3	0.1
Delay (s)		7.4	0.1	5.9	7.3						11.3	10.7
Level of Service		A	A	A	A						B	B
Approach Delay (s)		5.3			7.3			0.0			11.0	
Approach LOS		A			A			A			B	

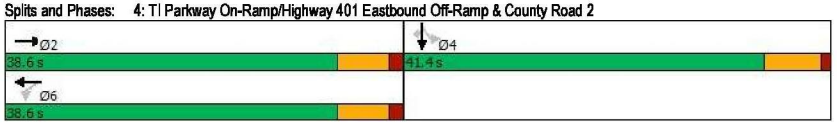
Intersection Summary				
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	33.4	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Timings <Background 2030> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	296	117	10	293	0	64
Future Volume (vph)	296	117	10	293	0	64
Turn Type	NA	Free	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		Free	6			4
Detector Phase	2		6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0		20.0	20.0	10.0	10.0
Minimum Split (s)	26.5		26.5	26.5	25.5	25.5
Total Split (s)	38.6		38.6	38.6	41.4	41.4
Total Split (%)	48.3%		48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0		5.0	5.0	5.4	5.4
All-Red Time (s)	1.5		1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5		6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	None	None
Act Effct Green (s)	20.9	36.5	20.9	20.9	13.8	13.8
Actuated g/C Ratio	0.57	1.00	0.57	0.57	0.38	0.38
v/c Ratio	0.29	0.08	0.02	0.28	0.10	0.10
Control Delay	8.0	0.1	6.4	8.0	13.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	0.1	6.4	8.0	13.9	5.3
LOS	A	A	A	A	B	A
Approach Delay	5.8			7.9	9.5	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.5			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.29			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



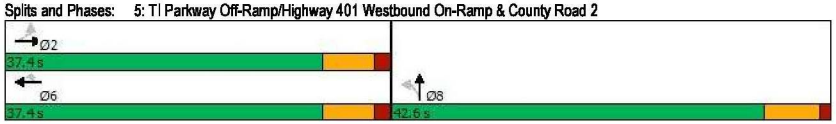
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	309	0	0	206	29	108	0	10	0	0	0
Future Volume (vph)	45	309	0	0	206	29	108	0	10	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1736	1863			1881	1568		1767				
Flt Permitted	0.61	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1123	1863			1881	1568		1767				
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	51	347	0	0	231	33	121	0	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	20	0	40	0	0	0	0
Lane Group Flow (vph)	51	347	0	0	231	13	0	92	0	0	0	0
Heavy Vehicles (%)	4%	2%	0%	0%	1%	3%	0%	0%	20%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	13.5	13.5			13.5	13.5		6.8				
Effective Green, g (s)	13.5	13.5			13.5	13.5		6.8				
Actuated g/C Ratio	0.40	0.40			0.40	0.40		0.20				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	451	748			755	630		357				
v/s Ratio Prot		c0.19			0.12							
v/s Ratio Perm	0.05					0.01		0.05				
v/c Ratio	0.11	0.46			0.31	0.02		0.26				
Uniform Delay, d1	6.3	7.4			6.9	6.1		11.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.5			0.2	0.0		0.4				
Delay (s)	6.4	7.8			7.1	6.1		11.7				
Level of Service	A	A			A	A		B				
Approach Delay (s)		7.7			7.0			11.7			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	33.6	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	45	309	206	29	0
Future Volume (vph)	45	309	206	29	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.9	20.9	20.9	20.9	14.1
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.38
v/c Ratio	0.08	0.33	0.22	0.04	0.19
Control Delay	7.2	8.5	7.7	2.1	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	8.5	7.7	2.1	10.4
LOS	A	A	A	A	B
Approach Delay		8.3	7.0		10.4
Approach LOS		A	A		B

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	6	3	0
Future Volume (Veh/h)	0	0	0	6	3	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	3	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	10	3	3			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	10	3	3			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1010	1081	1619			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	7	3
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1619	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		6.7%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	261	0	0	347	0	0
Future Volume (Veh/h)	261	0	0	347	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	284	0	0	377	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				156		
pX, platoon unblocked					0.96	
vC, conflicting volume			284		661	284
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			284		624	284
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1278		430	755

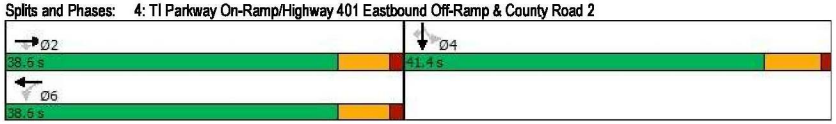
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	284	377	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.17	0.22	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		21.6%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	202	61	2	297	0	53
Future Volume (vph)	202	61	2	297	0	53
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		2	6			4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.5	26.5	26.5	26.5	25.5	25.5
Total Split (s)	38.6	38.6	38.6	38.6	41.4	41.4
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4	5.4
All-Red Time (s)	1.5	1.5	1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	20.4	20.4	20.4	20.4	15.6	15.6
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.52	0.52
v/c Ratio	0.19	0.06	0.00	0.27	0.04	0.08
Control Delay	6.6	2.5	6.0	7.0	13.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	2.5	6.0	7.0	13.2	5.3
LOS	A	A	A	A	B	A
Approach Delay	5.6			7.0	7.8	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 30			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	261	0	3	344	3	3
Future Volume (Veh/h)	261	0	3	344	3	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	311	0	4	410	4	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				111		
pX, platoon unblocked					0.88	
vC, conflicting volume			311		729	311
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			311		621	311
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1249		394	729

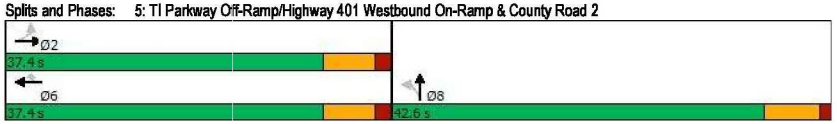
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	311	414	8
Volume Left	0	4	4
Volume Right	0	0	4
cSH	1700	1249	512
Volume to Capacity	0.18	0.00	0.02
Queue Length 95th (m)	0.0	0.1	0.4
Control Delay (s)	0.0	0.1	12.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.1
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	61	177	236	72	0
Future Volume (vph)	61	177	236	72	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	23.0	23.0	23.0	23.0	12.6
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.37
v/c Ratio	0.10	0.17	0.22	0.08	0.15
Control Delay	6.9	6.7	6.8	2.4	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	6.7	6.8	2.4	8.9
LOS	A	A	A	A	A
Approach Delay		6.7	5.8		8.9
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 33.9			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay: 6.6		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	202	61	2	297	0	0	0	0	25	0	53
Future Volume (vph)	0	202	61	2	297	0	0	0	0	25	0	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1615	1805	1863						1444	1482
Flt Permitted		1.00	1.00	0.61	1.00						0.95	1.00
Satd. Flow (perm)		1810	1615	1163	1863						1444	1482
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	235	71	2	345	0	0	0	0	29	0	62
RTOR Reduction (vph)	0	0	48	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	235	23	2	345	0	0	0	0	0	29	10
Heavy Vehicles (%)	0%	5%	0%	0%	2%	0%	0%	0%	0%	25%	0%	9%
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		8.4	8.4	8.4	8.4						4.2	4.2
Effective Green, g (s)		8.4	8.4	8.4	8.4						4.2	4.2
Actuated g/C Ratio		0.33	0.33	0.33	0.33						0.16	0.16
Clearance Time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		593	529	381	611						236	243
v/s Ratio Prot		0.13			c0.19							
v/s Ratio Perm			0.01	0.00							0.02	0.01
v/c Ratio		0.40	0.04	0.01	0.56						0.12	0.04
Uniform Delay, d1		6.6	5.9	5.8	7.1						9.1	9.0
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.0	0.0	1.2						0.2	0.1
Delay (s)		7.1	5.9	5.8	8.3						9.4	9.1
Level of Service		A	A	A	A						A	A
Approach Delay (s)		6.8			8.3			0.0			9.2	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	25.6	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis <Background 2035> PM Peak Hour
1: Site Access (west) & King Street East 12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	429	0	0	365	0	0
Future Volume (Veh/h)	429	0	0	365	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	466	0	0	397	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				158		
pX, platoon unblocked					0.94	
vC, conflicting volume			466		863	466
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			466		821	466
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1095		323	597

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	466	397	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.27	0.23	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		25.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis <Background 2035> AM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

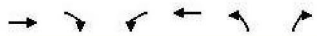
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	177	0	0	236	72	79	0	7	0	0	0
Future Volume (vph)	61	177	0	0	236	72	79	0	7	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1751	1759			1845	1550		1794				
Flt Permitted	0.59	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1085	1759			1845	1550		1794				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	72	208	0	0	278	85	93	0	8	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	43	0	0	0	0
Lane Group Flow (vph)	72	208	0	0	278	38	0	58	0	0	0	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	3%	8%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	14.5	14.5			14.5	14.5		4.7				
Effective Green, g (s)	14.5	14.5			14.5	14.5		4.7				
Actuated g/C Ratio	0.45	0.45			0.45	0.45		0.14				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	484	784			823	691		259				
v/s Ratio Prot		0.12			c0.15							
v/s Ratio Perm	0.07					0.02		0.03				
v/c Ratio	0.15	0.27			0.34	0.05		0.22				
Uniform Delay, d1	5.3	5.7			5.9	5.1		12.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.2			0.2	0.0		0.4				
Delay (s)	5.5	5.8			6.1	5.1		12.7				
Level of Service	A	A			A	A		B				
Approach Delay (s)		5.7			5.9			12.7			0.0	
Approach LOS		A			A			B			A	

Intersection Summary					
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.31				
Actuated Cycle Length (s)	32.5	Sum of lost time (s)	13.3		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Days Road & King Street East/County Road 2

<Background 2035> PM Peak Hour
12-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	428	1	3	363	2	3
Future Volume (Veh/h)	428	1	3	363	2	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	451	1	3	382	2	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				113		
pX, platoon unblocked					0.91	
vC, conflicting volume			452		840	452
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			452		771	452
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1109		333	608

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	452	385	5
Volume Left	0	3	2
Volume Right	1	0	3
cSH	1700	1109	457
Volume to Capacity	0.27	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.3
Control Delay (s)	0.0	0.1	13.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	13.0
Approach LOS			B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		32.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Background 2035> PM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	5	4	0
Future Volume (Veh/h)	0	0	0	5	4	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	5	4	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	9	4	4			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9	4	4			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1011	1080	1618			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	5	4
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1618	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

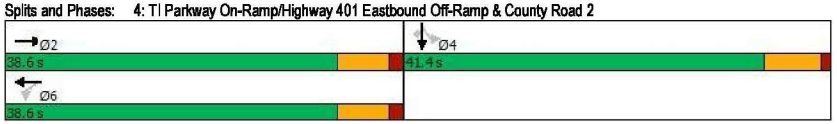
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	311	123	10	308	0	0	0	0	71	0	74
Future Volume (vph)	0	311	123	10	308	0	0	0	0	71	0	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	4.0	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1615	1805	1881						1736	1599
Flt Permitted		1.00	1.00	0.56	1.00						0.95	1.00
Satd. Flow (perm)		1863	1615	1073	1881						1736	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	324	128	10	321	0	0	0	0	74	0	77
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	61
Lane Group Flow (vph)	0	324	128	10	321	0	0	0	0	0	74	16
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%
Turn Type		NA	Free	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			Free	6						4		4
Actuated Green, G (s)		13.5	33.3	13.5	13.5						6.8	6.8
Effective Green, g (s)		13.5	33.3	13.5	13.5						6.8	6.8
Actuated g/C Ratio		0.41	1.00	0.41	0.41						0.20	0.20
Clearance Time (s)		6.5		6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		755	1615	435	762						354	326
v/s Ratio Prot		c0.17			0.17							
v/s Ratio Perm			0.08	0.01							0.04	0.01
v/c Ratio		0.43	0.08	0.02	0.42						0.21	0.05
Uniform Delay, d1		7.1	0.0	5.9	7.1						11.0	10.6
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	0.0	0.4						0.3	0.1
Delay (s)		7.5	0.1	6.0	7.5						11.3	10.7
Level of Service		A	A	A	A						B	B
Approach Delay (s)		5.4			7.4			0.0			11.0	
Approach LOS		A			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	33.3	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	311	123	10	308	0	74
Future Volume (vph)	311	123	10	308	0	74
Turn Type	NA	Free	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		Free	6			4
Detector Phase	2		6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0		20.0	20.0	10.0	10.0
Minimum Split (s)	26.5		26.5	26.5	25.5	25.5
Total Split (s)	38.6		38.6	38.6	41.4	41.4
Total Split (%)	48.3%		48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0		5.0	5.0	5.4	5.4
All-Red Time (s)	1.5		1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5		6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	None	None
Act Effct Green (s)	20.8	36.4	20.8	20.8	14.1	14.1
Actuated g/C Ratio	0.57	1.00	0.57	0.57	0.39	0.39
v/c Ratio	0.30	0.08	0.02	0.30	0.11	0.12
Control Delay	8.1	0.1	6.4	8.1	14.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	0.1	6.4	8.1	14.0	5.1
LOS	A	A	A	A	B	A
Approach Delay	5.9			8.0	9.4	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.4			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.30			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



HCM Signalized Intersection Capacity Analysis <Background 2035> PM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	325	0	0	216	30	124	0	11	0	0	0
Future Volume (vph)	47	325	0	0	216	30	124	0	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1736	1863			1881	1568		1769				
Flt Permitted	0.61	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1111	1863			1881	1568		1769				
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	53	365	0	0	243	34	139	0	12	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	20	0	40	0	0	0	0
Lane Group Flow (vph)	53	365	0	0	243	14	0	111	0	0	0	0
Heavy Vehicles (%)	4%	2%	0%	0%	1%	3%	0%	0%	20%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	13.5	13.5			13.5	13.5		7.0				
Effective Green, g (s)	13.5	13.5			13.5	13.5		7.0				
Actuated g/C Ratio	0.40	0.40			0.40	0.40		0.21				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	443	744			751	626		366				
v/s Ratio Prot		c0.20			0.13							
v/s Ratio Perm	0.05					0.01		0.06				
v/c Ratio	0.12	0.49			0.32	0.02		0.30				
Uniform Delay, d1	6.4	7.6			7.0	6.1		11.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.5			0.3	0.0		0.5				
Delay (s)	6.5	8.1			7.3	6.2		11.8				
Level of Service	A	A			A	A		B				
Approach Delay (s)		7.9			7.1			11.8			0.0	
Approach LOS		A			A			B			A	

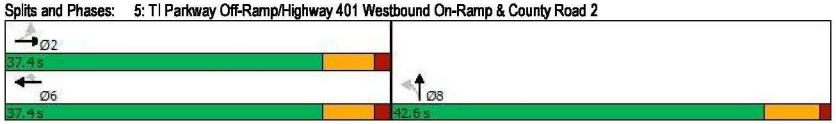
Intersection Summary				
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	33.8	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Timings <Background 2035> PM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	47	325	216	30	0
Future Volume (vph)	47	325	216	30	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.9	20.9	20.9	20.9	14.4
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.39
v/c Ratio	0.08	0.35	0.23	0.04	0.21
Control Delay	7.4	8.8	7.9	2.3	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	8.8	7.9	2.3	11.0
LOS	A	A	A	A	B
Approach Delay		8.6	7.2		11.0
Approach LOS		A	A		B

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.9			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.35			
Intersection Signal Delay: 8.6		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Total 2025> AM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	0	0	6	3	48
Future Volume (Veh/h)	50	0	0	6	3	48
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	0	0	7	3	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	36	29	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36	29	55			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	100	100			
cM capacity (veh/h)	977	1046	1550			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	54	7	55
Volume Left	54	0	0
Volume Right	0	0	52
cSH	977	1550	1700
Volume to Capacity	0.06	0.00	0.03
Queue Length 95th (m)	1.4	0.0	0.0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	13.3%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Total 2025> AM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	212	39	0	308	0	35
Future Volume (Veh/h)	212	39	0	308	0	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	230	42	0	335	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				156		
pX, platoon unblocked						
vC, conflicting volume			272		586	251
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			272		586	251
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			1291		473	788

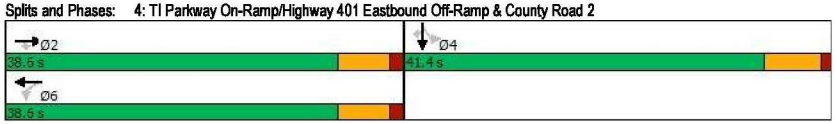
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	272	335	38
Volume Left	0	0	0
Volume Right	42	0	38
cSH	1700	1700	788
Volume to Capacity	0.16	0.20	0.05
Queue Length 95th (m)	0.0	0.0	1.2
Control Delay (s)	0.0	0.0	9.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.8
Approach LOS			A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	23.5%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	195	60	2	288	0	44
Future Volume (vph)	195	60	2	288	0	44
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		2	6			4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.5	26.5	26.5	26.5	25.5	25.5
Total Split (s)	38.6	38.6	38.6	38.6	41.4	41.4
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4	5.4
All-Red Time (s)	1.5	1.5	1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.1	21.1	21.1	21.1	14.5	14.5
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.54	0.54
v/c Ratio	0.16	0.05	0.00	0.23	0.03	0.06
Control Delay	5.0	2.5	6.0	5.3	12.1	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	2.5	6.0	5.3	12.1	5.6
LOS	A	A	A	A	B	A
Approach Delay	4.4			5.3	7.6	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 26.8			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.23			
Intersection Signal Delay: 5.2		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	247	0	51	287	21	35
Future Volume (Veh/h)	247	0	51	287	21	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	294	0	61	342	25	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				111		
pX, platoon unblocked					0.90	
vC, conflicting volume			294		758	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			294		679	294
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		93	94
cM capacity (veh/h)			1268		359	745

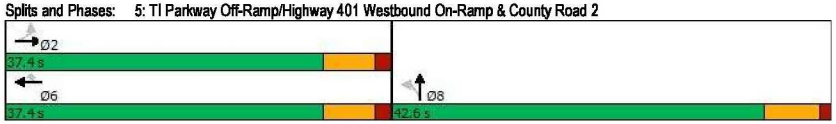
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	294	403	67
Volume Left	0	61	25
Volume Right	0	0	42
cSH	1700	1268	532
Volume to Capacity	0.17	0.05	0.13
Queue Length 95th (m)	0.0	1.2	3.4
Control Delay (s)	0.0	1.6	12.7
Lane LOS		A	B
Approach Delay (s)	0.0	1.6	12.7
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	58	169	228	65	0
Future Volume (vph)	58	169	228	65	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.9	20.9	20.9	20.9	14.8
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.48
v/c Ratio	0.09	0.17	0.21	0.07	0.09
Control Delay	6.8	6.6	6.8	2.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	6.6	6.8	2.5	7.9
LOS	A	A	A	A	A
Approach Delay		6.7	5.8		7.9
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 30.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.21			
Intersection Signal Delay: 6.4		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	195	60	2	288	0	0	0	0	19	0	44
Future Volume (vph)	0	195	60	2	288	0	0	0	0	19	0	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1615	1805	1863						1444	1482
Flt Permitted		1.00	1.00	0.62	1.00						0.95	1.00
Satd. Flow (perm)		1810	1615	1172	1863						1444	1482
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	227	70	2	335	0	0	0	0	22	0	51
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	0	0	0	46
Lane Group Flow (vph)	0	227	26	2	335	0	0	0	0	0	22	5
Heavy Vehicles (%)	0%	5%	0%	0%	2%	0%	0%	0%	0%	25%	0%	9%
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		9.0	9.0	9.0	9.0						2.5	2.5
Effective Green, g (s)		9.0	9.0	9.0	9.0						2.5	2.5
Actuated g/C Ratio		0.37	0.37	0.37	0.37						0.10	0.10
Clearance Time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		664	593	430	684						147	151
v/s Ratio Prot		0.13			c0.18							
v/s Ratio Perm			0.02	0.00							0.02	0.00
v/c Ratio		0.34	0.04	0.00	0.49						0.15	0.03
Uniform Delay, d1		5.6	5.0	4.9	6.0						10.0	9.9
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.0	0.0	0.6						0.5	0.1
Delay (s)		5.9	5.0	4.9	6.5						10.5	10.0
Level of Service		A	A	A	A						B	B
Approach Delay (s)		5.7			6.5			0.0			10.2	
Approach LOS		A			A			A			B	

Intersection Summary					
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	24.5	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Total 2035> PM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	369	37	0	322	0	32
Future Volume (Veh/h)	369	37	0	322	0	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	401	40	0	350	0	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				158		
pX, platoon unblocked						
vC, conflicting volume			441		771	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			441		771	421
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			1119		368	632

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	441	350	35
Volume Left	0	0	0
Volume Right	40	0	35
cSH	1700	1700	632
Volume to Capacity	0.26	0.21	0.06
Queue Length 95th (m)	0.0	0.0	1.4
Control Delay (s)	0.0	0.0	11.0
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		31.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2

<Total 2025> AM Peak Hour
12-13-2023

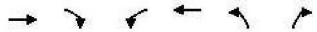
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	169	0	0	228	65	64	0	5	0	0	0
Future Volume (vph)	58	169	0	0	228	65	64	0	5	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1751	1759			1845	1550		1795				
Flt Permitted	0.59	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1095	1759			1845	1550		1795				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	68	199	0	0	268	76	75	0	6	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	51	0	42	0	0	0	0
Lane Group Flow (vph)	68	199	0	0	268	25	0	39	0	0	0	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	3%	8%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	8.5	8.5			8.5	8.5		4.3				
Effective Green, g (s)	8.5	8.5			8.5	8.5		4.3				
Actuated g/C Ratio	0.33	0.33			0.33	0.33		0.16				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	356	572			600	504		295				
v/s Ratio Prot		0.11			c0.15							
v/s Ratio Perm	0.06					0.02		0.02				
v/c Ratio	0.19	0.35			0.45	0.05		0.13				
Uniform Delay, d1	6.3	6.7			6.9	6.0		9.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.3	0.4			0.5	0.0		0.2				
Delay (s)	6.6	7.1			7.5	6.1		9.5				
Level of Service	A	A			A	A		A				
Approach Delay (s)		6.9			7.2			9.5			0.0	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.34				
Actuated Cycle Length (s)	26.1	Sum of lost time (s)	13.3		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Days Road & King Street East/County Road 2

<Total 2035> PM Peak Hour
12-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	400	1	41	308	16	31
Future Volume (Veh/h)	400	1	41	308	16	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	421	1	43	324	17	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				113		
pX, platoon unblocked					0.93	
vC, conflicting volume			422		832	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			422		778	422
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		95	95
cM capacity (veh/h)			1137		325	632

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	422	367	50
Volume Left	0	43	17
Volume Right	1	0	33
cSH	1700	1137	478
Volume to Capacity	0.25	0.04	0.10
Queue Length 95th (m)	0.0	0.9	2.8
Control Delay (s)	0.0	1.3	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	1.3	13.4
Approach LOS			B

Intersection Summary				
Average Delay		1.4		
Intersection Capacity Utilization		52.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Total 2035> PM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	0	0	5	4	38
Future Volume (Veh/h)	42	0	0	5	4	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	0	5	4	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	30	24	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30	24	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	985	1052	1563			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	5	45
Volume Left	46	0	0
Volume Right	0	0	41
cSH	985	1563	1700
Volume to Capacity	0.05	0.00	0.03
Queue Length 95th (m)	1.2	0.0	0.0
Control Delay (s)	8.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.8	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		4.2		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis <Total 2035> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	294	118	9	292	0	0	0	0	54	0	59
Future Volume (vph)	0	294	118	9	292	0	0	0	0	54	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	4.0	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1615	1805	1881						1736	1599
Flt Permitted		1.00	1.00	0.57	1.00						0.95	1.00
Satd. Flow (perm)		1863	1615	1090	1881						1736	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	306	123	9	304	0	0	0	0	56	0	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	306	123	9	304	0	0	0	0	0	56	9
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%
Turn Type		NA	Free	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			Free	6						4		4
Actuated Green, G (s)		14.3	31.9	14.3	14.3						4.6	4.6
Effective Green, g (s)		14.3	31.9	14.3	14.3						4.6	4.6
Actuated g/C Ratio		0.45	1.00	0.45	0.45						0.14	0.14
Clearance Time (s)		6.5		6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		835	1615	488	843						250	230
v/s Ratio Prot		c0.16			0.16							
v/s Ratio Perm			0.08	0.01							0.03	0.01
v/c Ratio		0.37	0.08	0.02	0.36						0.22	0.04
Uniform Delay, d1		5.8	0.0	4.9	5.8						12.1	11.7
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.1	0.0	0.3						0.5	0.1
Delay (s)		6.1	0.1	4.9	6.1						12.5	11.8
Level of Service		A	A	A	A						B	B
Approach Delay (s)		4.4			6.0			0.0			12.2	
Approach LOS		A			A			A			B	

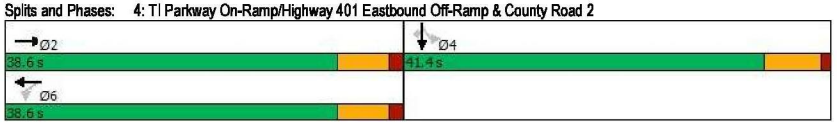
Intersection Summary				
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	31.9	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Timings <Total 2035> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	294	118	9	292	0	59
Future Volume (vph)	294	118	9	292	0	59
Turn Type	NA	Free	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		Free	6			4
Detector Phase	2		6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0		20.0	20.0	10.0	10.0
Minimum Split (s)	26.5		26.5	26.5	25.5	25.5
Total Split (s)	38.6		38.6	38.6	41.4	41.4
Total Split (%)	48.3%		48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0		5.0	5.0	5.4	5.4
All-Red Time (s)	1.5		1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5		6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	None	None
Act Effct Green (s)	22.5	33.2	22.5	22.5	13.5	13.5
Actuated g/C Ratio	0.68	1.00	0.68	0.68	0.41	0.41
v/c Ratio	0.24	0.08	0.01	0.24	0.08	0.09
Control Delay	6.8	0.1	6.3	6.7	13.2	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	0.1	6.3	6.7	13.2	5.4
LOS	A	A	A	A	B	A
Approach Delay	4.9			6.7	9.2	
Approach LOS	A			A	A	

Intersection Summary		
Cycle Length: 80		
Actuated Cycle Length: 33.2		
Natural Cycle: 55		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.24		
Intersection Signal Delay: 6.1	Intersection LOS: A	
Intersection Capacity Utilization 58.3%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



HCM Signalized Intersection Capacity Analysis <Total 2035> PM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	304	0	0	206	28	98	0	8	0	0	0
Future Volume (vph)	45	304	0	0	206	28	98	0	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1736	1863			1881	1568		1771				
Flt Permitted	0.61	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1123	1863			1881	1568		1771				
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	51	342	0	0	231	31	110	0	9	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	18	0	40	0	0	0	0
Lane Group Flow (vph)	51	342	0	0	231	13	0	79	0	0	0	0
Heavy Vehicles (%)	4%	2%	0%	0%	1%	3%	0%	0%	20%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	13.6	13.6			13.6	13.6		6.8				
Effective Green, g (s)	13.6	13.6			13.6	13.6		6.8				
Actuated g/C Ratio	0.40	0.40			0.40	0.40		0.20				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	453	751			759	632		357				
v/s Ratio Prot		c0.18			0.12							
v/s Ratio Perm	0.05					0.01		0.04				
v/c Ratio	0.11	0.46			0.30	0.02		0.22				
Uniform Delay, d1	6.3	7.3			6.8	6.0		11.2				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.4			0.2	0.0		0.3				
Delay (s)	6.4	7.8			7.1	6.1		11.6				
Level of Service	A	A			A	A		B				
Approach Delay (s)		7.6			6.9			11.6			0.0	
Approach LOS		A			A			B			A	

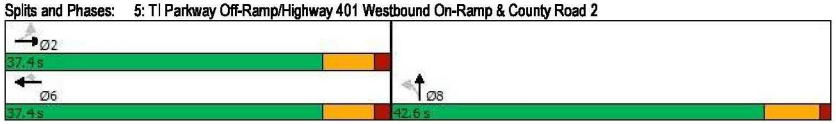
Intersection Summary				
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	33.7	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Timings <Total 2035> PM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	45	304	206	28	0
Future Volume (vph)	45	304	206	28	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.9	20.9	20.9	20.9	13.8
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.38
v/c Ratio	0.08	0.32	0.22	0.03	0.17
Control Delay	7.1	8.4	7.7	2.0	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	8.4	7.7	2.0	9.9
LOS	A	A	A	A	A
Approach Delay		8.2	7.0		9.9
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.32			
Intersection Signal Delay: 8.1		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Total 2030> AM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	0	0	6	3	48
Future Volume (Veh/h)	50	0	0	6	3	48
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	0	0	7	3	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	36	29	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36	29	55			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	100	100			
cM capacity (veh/h)	977	1046	1550			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	54	7	55
Volume Left	54	0	0
Volume Right	0	0	52
cSH	977	1550	1700
Volume to Capacity	0.06	0.00	0.03
Queue Length 95th (m)	1.4	0.0	0.0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	13.3%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Total 2030> AM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	224	39	0	324	0	35
Future Volume (Veh/h)	224	39	0	324	0	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	243	42	0	352	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				156		
pX, platoon unblocked						
vC, conflicting volume			285		616	264
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			285		616	264
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			1277		454	775

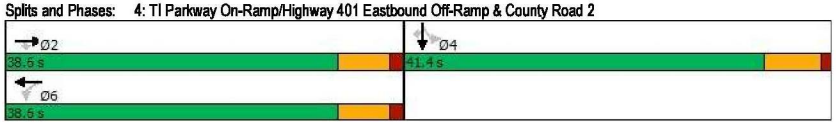
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	285	352	38
Volume Left	0	0	0
Volume Right	42	0	38
cSH	1700	1700	775
Volume to Capacity	0.17	0.21	0.05
Queue Length 95th (m)	0.0	0.0	1.2
Control Delay (s)	0.0	0.0	9.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.9
Approach LOS			A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	24.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	204	63	2	302	0	50
Future Volume (vph)	204	63	2	302	0	50
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		2	6			4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.5	26.5	26.5	26.5	25.5	25.5
Total Split (s)	38.6	38.6	38.6	38.6	41.4	41.4
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4	5.4
All-Red Time (s)	1.5	1.5	1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	20.4	20.4	20.4	20.4	15.7	15.7
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.52	0.52
v/c Ratio	0.19	0.07	0.00	0.28	0.03	0.07
Control Delay	6.6	2.5	6.0	7.0	13.2	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	2.5	6.0	7.0	13.2	5.4
LOS	A	A	A	A	B	A
Approach Delay	5.6			7.0	7.9	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 30			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.28			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	259	0	51	303	21	35
Future Volume (Veh/h)	259	0	51	303	21	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	308	0	61	361	25	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				111		
pX, platoon unblocked					0.87	
vC, conflicting volume			308		791	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			308		687	308
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		93	94
cM capacity (veh/h)			1253		342	732

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	308	422	67
Volume Left	0	61	25
Volume Right	0	0	42
cSH	1700	1253	514
Volume to Capacity	0.18	0.05	0.13
Queue Length 95th (m)	0.0	1.2	3.6
Control Delay (s)	0.0	1.6	13.1
Lane LOS		A	B
Approach Delay (s)	0.0	1.6	13.1
Approach LOS			B

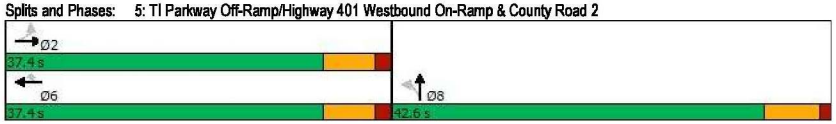
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Timings <Total 2030> AM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	61	177	239	69	0
Future Volume (vph)	61	177	239	69	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	23.0	23.0	23.0	23.0	12.5
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.37
v/c Ratio	0.10	0.17	0.22	0.08	0.13
Control Delay	6.9	6.7	6.8	2.4	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	6.7	6.8	2.4	8.6
LOS	A	A	A	A	A
Approach Delay		6.7	5.8		8.6
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 33.9			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



HCM Signalized Intersection Capacity Analysis <Total 2030> AM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	204	63	2	302	0	0	0	0	22	0	50
Future Volume (vph)	0	204	63	2	302	0	0	0	0	22	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1615	1805	1863						1444	1482
Flt Permitted		1.00	1.00	0.61	1.00						0.95	1.00
Satd. Flow (perm)		1810	1615	1161	1863						1444	1482
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	237	73	2	351	0	0	0	0	26	0	58
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	0	0	0	48
Lane Group Flow (vph)	0	237	24	2	351	0	0	0	0	0	26	10
Heavy Vehicles (%)	0%	5%	0%	0%	2%	0%	0%	0%	0%	25%	0%	9%
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		8.4	8.4	8.4	8.4						4.2	4.2
Effective Green, g (s)		8.4	8.4	8.4	8.4						4.2	4.2
Actuated g/C Ratio		0.33	0.33	0.33	0.33						0.16	0.16
Clearance Time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		593	529	380	611						236	243
v/s Ratio Prot		0.13			c0.19							
v/s Ratio Perm			0.01	0.00							0.02	0.01
v/c Ratio		0.40	0.05	0.01	0.57						0.11	0.04
Uniform Delay, d1		6.7	5.9	5.8	7.1						9.1	9.0
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.0	0.0	1.3						0.2	0.1
Delay (s)		7.1	5.9	5.8	8.4						9.3	9.1
Level of Service		A	A	A	A						A	A
Approach Delay (s)		6.8			8.4			0.0			9.1	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	25.6	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Total 2030> PM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	388	37	0	341	0	32
Future Volume (Veh/h)	388	37	0	341	0	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	422	40	0	371	0	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				158		
pX, platoon unblocked					0.97	
vC, conflicting volume			462		813	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			462		790	442
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			1099		347	615

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	462	371	35
Volume Left	0	0	0
Volume Right	40	0	35
cSH	1700	1700	615
Volume to Capacity	0.27	0.22	0.06
Queue Length 95th (m)	0.0	0.0	1.4
Control Delay (s)	0.0	0.0	11.2
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.2
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		32.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2

<Total 2030> AM Peak Hour
12-13-2023

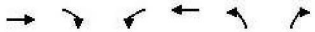
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	177	0	0	239	69	73	0	6	0	0	0
Future Volume (vph)	61	177	0	0	239	69	73	0	6	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1751	1759			1845	1550		1795				
Flt Permitted	0.59	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1082	1759			1845	1550		1795				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	72	208	0	0	281	81	86	0	7	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	45	0	43	0	0	0	0
Lane Group Flow (vph)	72	208	0	0	281	36	0	50	0	0	0	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	3%	8%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	14.5	14.5			14.5	14.5		4.7				
Effective Green, g (s)	14.5	14.5			14.5	14.5		4.7				
Actuated g/C Ratio	0.45	0.45			0.45	0.45		0.14				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	482	784			823	691		259				
v/s Ratio Prot		0.12			c0.15							
v/s Ratio Perm	0.07					0.02		0.03				
v/c Ratio	0.15	0.27			0.34	0.05		0.19				
Uniform Delay, d1	5.3	5.7			5.9	5.1		12.2				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.2			0.2	0.0		0.4				
Delay (s)	5.5	5.8			6.1	5.1		12.6				
Level of Service	A	A			A	A		B				
Approach Delay (s)		5.7			5.9			12.6			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	32.5	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Days Road & King Street East/County Road 2

<Total 2030> PM Peak Hour
12-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	419	1	41	325	16	31
Future Volume (Veh/h)	419	1	41	325	16	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	441	1	43	342	17	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				113		
pX, platoon unblocked					0.90	
vC, conflicting volume			442		870	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			442		801	442
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		94	95
cM capacity (veh/h)			1118		307	616

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	442	385	50
Volume Left	0	43	17
Volume Right	1	0	33
cSH	1700	1118	459
Volume to Capacity	0.26	0.04	0.11
Queue Length 95th (m)	0.0	1.0	2.9
Control Delay (s)	0.0	1.3	13.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.3	13.8
Approach LOS			B

Intersection Summary				
Average Delay		1.4		
Intersection Capacity Utilization		54.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Total 2030> PM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	0	0	5	4	38
Future Volume (Veh/h)	42	0	0	5	4	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	0	5	4	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	30	24	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30	24	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	985	1052	1563			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	5	45
Volume Left	46	0	0
Volume Right	0	0	41
cSH	985	1563	1700
Volume to Capacity	0.05	0.00	0.03
Queue Length 95th (m)	1.2	0.0	0.0
Control Delay (s)	8.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.8	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		4.2		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis <Total 2030> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	308	124	10	307	0	0	0	0	62	0	67
Future Volume (vph)	0	308	124	10	307	0	0	0	0	62	0	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	4.0	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1615	1805	1881						1736	1599
Flt Permitted		1.00	1.00	0.57	1.00						0.95	1.00
Satd. Flow (perm)		1863	1615	1075	1881						1736	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	321	129	10	320	0	0	0	0	65	0	70
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	56
Lane Group Flow (vph)	0	321	129	10	320	0	0	0	0	0	65	14
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%
Turn Type		NA	Free	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			Free	6						4		4
Actuated Green, G (s)		13.5	33.3	13.5	13.5						6.8	6.8
Effective Green, g (s)		13.5	33.3	13.5	13.5						6.8	6.8
Actuated g/C Ratio		0.41	1.00	0.41	0.41						0.20	0.20
Clearance Time (s)		6.5		6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		755	1615	435	762						354	326
v/s Ratio Prot		c0.17			0.17							
v/s Ratio Perm			0.08	0.01							0.04	0.01
v/c Ratio		0.43	0.08	0.02	0.42						0.18	0.04
Uniform Delay, d1		7.1	0.0	5.9	7.1						11.0	10.6
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	0.0	0.4						0.3	0.1
Delay (s)		7.5	0.1	6.0	7.5						11.2	10.7
Level of Service		A	A	A	A						B	B
Approach Delay (s)		5.4			7.4			0.0			10.9	
Approach LOS		A			A			A			B	

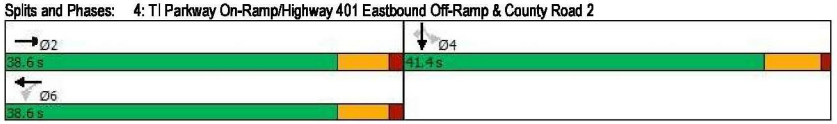
Intersection Summary				
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	33.3	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Timings <Total 2030> PM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	308	124	10	307	0	67
Future Volume (vph)	308	124	10	307	0	67
Turn Type	NA	Free	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		Free	6			4
Detector Phase	2		6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0		20.0	20.0	10.0	10.0
Minimum Split (s)	26.5		26.5	26.5	25.5	25.5
Total Split (s)	38.6		38.6	38.6	41.4	41.4
Total Split (%)	48.3%		48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0		5.0	5.0	5.4	5.4
All-Red Time (s)	1.5		1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5		6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	None	None
Act Effct Green (s)	20.8	36.4	20.8	20.8	14.1	14.1
Actuated g/C Ratio	0.57	1.00	0.57	0.57	0.39	0.39
v/c Ratio	0.30	0.08	0.02	0.30	0.10	0.11
Control Delay	8.1	0.1	6.4	8.1	13.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	0.1	6.4	8.1	13.9	5.2
LOS	A	A	A	A	B	A
Approach Delay	5.8			8.0	9.4	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.4			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.30			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



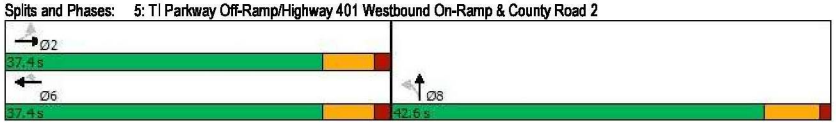
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	319	0	0	216	29	112	0	10	0	0	0
Future Volume (vph)	47	319	0	0	216	29	112	0	10	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1736	1863			1881	1568		1768				
Flt Permitted	0.61	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1111	1863			1881	1568		1768				
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	53	358	0	0	243	33	126	0	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	20	0	40	0	0	0	0
Lane Group Flow (vph)	53	358	0	0	243	13	0	97	0	0	0	0
Heavy Vehicles (%)	4%	2%	0%	0%	1%	3%	0%	0%	20%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	13.5	13.5			13.5	13.5		6.9				
Effective Green, g (s)	13.5	13.5			13.5	13.5		6.9				
Actuated g/C Ratio	0.40	0.40			0.40	0.40		0.20				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	445	746			753	628		361				
v/s Ratio Prot		c0.19			0.13							
v/s Ratio Perm	0.05					0.01		0.05				
v/c Ratio	0.12	0.48			0.32	0.02		0.27				
Uniform Delay, d1	6.4	7.5			7.0	6.1		11.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.5			0.3	0.0		0.4				
Delay (s)	6.5	8.0			7.2	6.1		11.7				
Level of Service	A	A			A	A		B				
Approach Delay (s)		7.8			7.1			11.7			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	33.7	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	47	319	216	29	0
Future Volume (vph)	47	319	216	29	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.9	20.9	20.9	20.9	14.2
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.39
v/c Ratio	0.08	0.34	0.23	0.04	0.19
Control Delay	7.3	8.6	7.8	2.1	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	8.6	7.8	2.1	10.6
LOS	A	A	A	A	B
Approach Delay		8.5	7.1		10.6
Approach LOS		A	A		B

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.34			
Intersection Signal Delay: 8.4		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Total 2035> AM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	0	0	6	3	48
Future Volume (Veh/h)	50	0	0	6	3	48
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	0	0	7	3	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	36	29	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36	29	55			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	100	100			
cM capacity (veh/h)	977	1046	1550			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	54	7	55
Volume Left	54	0	0
Volume Right	0	0	52
cSH	977	1550	1700
Volume to Capacity	0.06	0.00	0.03
Queue Length 95th (m)	1.4	0.0	0.0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	13.3%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Total 2035> AM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	236	39	0	340	0	35
Future Volume (Veh/h)	236	39	0	340	0	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	257	42	0	370	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				156		
pX, platoon unblocked					1.00	
vC, conflicting volume			299		648	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			299		648	278
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			1262		435	761

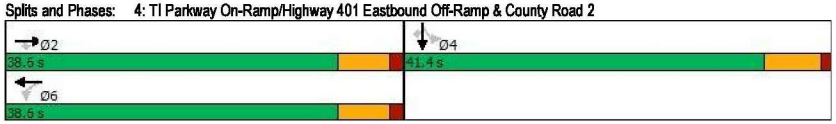
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	299	370	38
Volume Left	0	0	0
Volume Right	42	0	38
cSH	1700	1700	761
Volume to Capacity	0.18	0.22	0.05
Queue Length 95th (m)	0.0	0.0	1.3
Control Delay (s)	0.0	0.0	10.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	10.0
Approach LOS			A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	24.8%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	214	66	2	316	0	57
Future Volume (vph)	214	66	2	316	0	57
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		2	6			4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.5	26.5	26.5	26.5	25.5	25.5
Total Split (s)	38.6	38.6	38.6	38.6	41.4	41.4
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4	5.4
All-Red Time (s)	1.5	1.5	1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	20.3	20.3	20.3	20.3	16.0	16.0
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.54	0.54
v/c Ratio	0.20	0.07	0.00	0.29	0.04	0.08
Control Delay	6.6	2.4	6.0	7.1	13.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	2.4	6.0	7.1	13.2	5.2
LOS	A	A	A	A	B	A
Approach Delay	5.6			7.1	7.7	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 29.9			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.29			
Intersection Signal Delay: 6.6		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	271	0	51	319	21	35
Future Volume (Veh/h)	271	0	51	319	21	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	323	0	61	380	25	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				111		
pX, platoon unblocked					0.86	
vC, conflicting volume			323		825	323
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			323		714	323
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		92	94
cM capacity (veh/h)			1237		325	718

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	323	441	67
Volume Left	0	61	25
Volume Right	0	0	42
cSH	1700	1237	495
Volume to Capacity	0.19	0.05	0.14
Queue Length 95th (m)	0.0	1.2	3.7
Control Delay (s)	0.0	1.6	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	1.6	13.4
Approach LOS			B

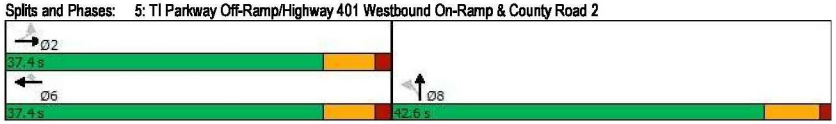
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Timings <Total 2035> AM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	64	186	251	72	0
Future Volume (vph)	64	186	251	72	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	22.8	22.8	22.8	22.8	12.9
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.38
v/c Ratio	0.10	0.18	0.24	0.08	0.15
Control Delay	6.9	6.7	6.9	2.4	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	6.7	6.9	2.4	9.1
LOS	A	A	A	A	A
Approach Delay		6.7	5.9		9.1
Approach LOS		A	A		A

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 33.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 6.6		Intersection LOS: A	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



HCM Signalized Intersection Capacity Analysis <Total 2035> AM Peak Hour
4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	214	66	2	316	0	0	0	0	25	0	57
Future Volume (vph)	0	214	66	2	316	0	0	0	0	25	0	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1615	1805	1863						1444	1482
Flt Permitted		1.00	1.00	0.60	1.00						0.95	1.00
Satd. Flow (perm)		1810	1615	1149	1863						1444	1482
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	249	77	2	367	0	0	0	0	29	0	66
RTOR Reduction (vph)	0	0	52	0	0	0	0	0	0	0	0	55
Lane Group Flow (vph)	0	249	25	2	367	0	0	0	0	0	29	11
Heavy Vehicles (%)	0%	5%	0%	0%	2%	0%	0%	0%	0%	25%	0%	9%
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		8.3	8.3	8.3	8.3						4.2	4.2
Effective Green, g (s)		8.3	8.3	8.3	8.3						4.2	4.2
Actuated g/C Ratio		0.33	0.33	0.33	0.33						0.16	0.16
Clearance Time (s)		6.5	6.5	6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		589	525	373	606						237	244
v/s Ratio Prot		0.14			c0.20							
v/s Ratio Perm			0.02	0.00							0.02	0.01
v/c Ratio		0.42	0.05	0.01	0.61						0.12	0.04
Uniform Delay, d1		6.7	5.9	5.8	7.2						9.1	9.0
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.5	0.0	0.0	1.7						0.2	0.1
Delay (s)		7.2	5.9	5.8	8.9						9.3	9.0
Level of Service		A	A	A	A						A	A
Approach Delay (s)		6.9			8.9			0.0			9.1	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.44				
Actuated Cycle Length (s)	25.5	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1: Site Access (west) & King Street East

<Total 2035> PM Peak Hour
12-13-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	409	37	0	358	0	32
Future Volume (Veh/h)	409	37	0	358	0	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	445	40	0	389	0	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				158		
pX, platoon unblocked					0.96	
vC, conflicting volume			485		854	465
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			485		827	465
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			1078		328	597

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	485	389	35
Volume Left	0	0	0
Volume Right	40	0	35
cSH	1700	1700	597
Volume to Capacity	0.29	0.23	0.06
Queue Length 95th (m)	0.0	0.0	1.5
Control Delay (s)	0.0	0.0	11.4
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		33.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2

<Total 2035> AM Peak Hour
12-13-2023

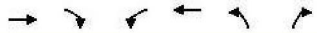
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	186	0	0	251	72	83	0	7	0	0	0
Future Volume (vph)	64	186	0	0	251	72	83	0	7	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1751	1759			1845	1550		1795				
Flt Permitted	0.58	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1068	1759			1845	1550		1795				
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	75	219	0	0	295	85	98	0	8	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	43	0	0	0	0
Lane Group Flow (vph)	75	219	0	0	295	38	0	63	0	0	0	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	3%	8%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	14.4	14.4			14.4	14.4		4.7				
Effective Green, g (s)	14.4	14.4			14.4	14.4		4.7				
Actuated g/C Ratio	0.44	0.44			0.44	0.44		0.15				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	474	781			820	688		260				
v/s Ratio Prot		0.12			c0.16							
v/s Ratio Perm	0.07					0.02		0.04				
v/c Ratio	0.16	0.28			0.36	0.05		0.24				
Uniform Delay, d1	5.4	5.7			6.0	5.1		12.3				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.2	0.2			0.3	0.0		0.5				
Delay (s)	5.5	5.9			6.2	5.2		12.8				
Level of Service	A	A			A	A		B				
Approach Delay (s)		5.8			6.0			12.8			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	32.4	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Days Road & King Street East/County Road 2

<Total 2035> PM Peak Hour
12-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	440	1	41	342	16	31
Future Volume (Veh/h)	440	1	41	342	16	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	463	1	43	360	17	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				113		
pX, platoon unblocked					0.90	
vC, conflicting volume			464		910	464
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			464		841	464
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		94	94
cM capacity (veh/h)			1097		288	599

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	464	403	50
Volume Left	0	43	17
Volume Right	1	0	33
cSH	1700	1097	438
Volume to Capacity	0.27	0.04	0.11
Queue Length 95th (m)	0.0	1.0	3.1
Control Delay (s)	0.0	1.3	14.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.3	14.3
Approach LOS			B

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		56.8%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Days Road & Site Access (east)

<Total 2035> PM Peak Hour
12-13-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	0	0	5	4	38
Future Volume (Veh/h)	42	0	0	5	4	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	0	5	4	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	30	24	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30	24	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	985	1052	1563			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	5	45
Volume Left	46	0	0
Volume Right	0	0	41
cSH	985	1563	1700
Volume to Capacity	0.05	0.00	0.03
Queue Length 95th (m)	1.2	0.0	0.0
Control Delay (s)	8.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.8	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		4.2		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

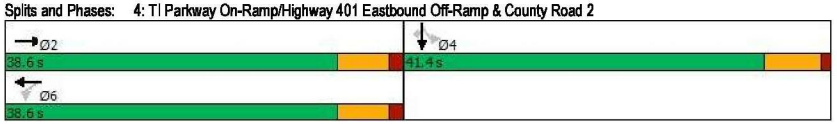
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	323	130	10	322	0	0	0	0	71	0	77
Future Volume (vph)	0	323	130	10	322	0	0	0	0	71	0	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	4.0	6.5	6.5						6.5	6.5
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1615	1805	1881						1736	1599
Flt Permitted		1.00	1.00	0.56	1.00						0.95	1.00
Satd. Flow (perm)		1863	1615	1061	1881						1736	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	336	135	10	335	0	0	0	0	74	0	80
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	64
Lane Group Flow (vph)	0	336	135	10	335	0	0	0	0	0	74	16
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%
Turn Type		NA	Free	Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			Free	6						4		4
Actuated Green, G (s)		13.5	33.3	13.5	13.5						6.8	6.8
Effective Green, g (s)		13.5	33.3	13.5	13.5						6.8	6.8
Actuated g/C Ratio		0.41	1.00	0.41	0.41						0.20	0.20
Clearance Time (s)		6.5		6.5	6.5						6.5	6.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		755	1615	430	762						354	326
v/s Ratio Prot		c0.18			0.18							
v/s Ratio Perm			0.08	0.01							0.04	0.01
v/c Ratio		0.45	0.08	0.02	0.44						0.21	0.05
Uniform Delay, d1		7.2	0.0	5.9	7.2						11.0	10.7
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	0.0	0.4						0.3	0.1
Delay (s)		7.6	0.1	6.0	7.6						11.3	10.7
Level of Service		A	A	A	A						B	B
Approach Delay (s)		5.5			7.5			0.0			11.0	
Approach LOS		A			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	33.3	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	323	130	10	322	0	77
Future Volume (vph)	323	130	10	322	0	77
Turn Type	NA	Free	Perm	NA	NA	Perm
Protected Phases	2			6	4	
Permitted Phases		Free	6			4
Detector Phase	2		6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0		20.0	20.0	10.0	10.0
Minimum Split (s)	26.5		26.5	26.5	25.5	25.5
Total Split (s)	38.6		38.6	38.6	41.4	41.4
Total Split (%)	48.3%		48.3%	48.3%	51.8%	51.8%
Yellow Time (s)	5.0		5.0	5.0	5.4	5.4
All-Red Time (s)	1.5		1.5	1.5	1.1	1.1
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5		6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	None	None
Act Effct Green (s)	20.8	36.4	20.8	20.8	14.1	14.1
Actuated g/C Ratio	0.57	1.00	0.57	0.57	0.39	0.39
v/c Ratio	0.32	0.08	0.02	0.31	0.11	0.12
Control Delay	8.2	0.1	6.4	8.2	14.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	0.1	6.4	8.2	14.0	5.0
LOS	A	A	A	A	B	A
Approach Delay	5.9			8.1	9.3	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.4			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.32			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: TI Parkway On-Ramp/Highway 401 Eastbound Off-Ramp & County Road 2



HCM Signalized Intersection Capacity Analysis <Total 2035> PM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	335	0	0	226	30	128	0	11	0	0	0
Future Volume (vph)	49	335	0	0	226	30	128	0	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7			6.7	6.7		6.6				
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.96				
Satd. Flow (prot)	1736	1863			1881	1568		1770				
Flt Permitted	0.60	1.00			1.00	1.00		0.96				
Satd. Flow (perm)	1099	1863			1881	1568		1770				
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	55	376	0	0	254	34	144	0	12	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	20	0	40	0	0	0	0
Lane Group Flow (vph)	55	376	0	0	254	14	0	116	0	0	0	0
Heavy Vehicles (%)	4%	2%	0%	0%	1%	3%	0%	0%	20%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	13.5	13.5			13.5	13.5		7.0				
Effective Green, g (s)	13.5	13.5			13.5	13.5		7.0				
Actuated g/C Ratio	0.40	0.40			0.40	0.40		0.21				
Clearance Time (s)	6.7	6.7			6.7	6.7		6.6				
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)	438	744			751	626		366				
v/s Ratio Prot		c0.20			0.14							
v/s Ratio Perm	0.05					0.01		0.07				
v/c Ratio	0.13	0.51			0.34	0.02		0.32				
Uniform Delay, d1	6.4	7.6			7.0	6.1		11.4				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	0.1	0.5			0.3	0.0		0.5				
Delay (s)	6.5	8.2			7.3	6.2		11.9				
Level of Service	A	A			A	A		B				
Approach Delay (s)		8.0			7.2			11.9			0.0	
Approach LOS		A			A			B			A	

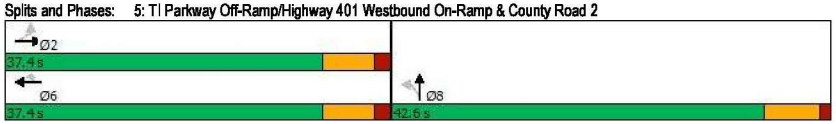
Intersection Summary				
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	33.8	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Timings <Total 2035> PM Peak Hour
5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2 12-13-2023

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Configurations					
Traffic Volume (vph)	49	335	226	30	0
Future Volume (vph)	49	335	226	30	0
Turn Type	Perm	NA	NA	Perm	NA
Protected Phases		2	6		8
Permitted Phases	2			6	
Detector Phase	2	2	6	6	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	32.6
Total Split (s)	37.4	37.4	37.4	37.4	42.6
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.4
All-Red Time (s)	1.7	1.7	1.7	1.7	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.6
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.9	20.9	20.9	20.9	14.4
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.39
v/c Ratio	0.09	0.36	0.24	0.04	0.22
Control Delay	7.5	9.0	8.1	2.3	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	9.0	8.1	2.3	11.1
LOS	A	A	A	A	B
Approach Delay		8.8	7.4		11.1
Approach LOS		A	A		B

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 36.9			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: TI Parkway Off-Ramp/Highway 401 Westbound On-Ramp & County Road 2



APPENDIX D

Level of Service Definitions

LEVEL OF SERVICE ANALYSIS AT SIGNALIZED INTERSECTIONS

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". The term Level of Service implies a qualitative measure of traffic flow at an intersection. It is dependent upon vehicle delay and vehicle queue lengths at the approaches. Specifically, Level of Service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. The following table describes the characteristics of each level:

Level of Service	Features	Stopped Delay per Vehicle (sec)
A	At this level of service, almost no signal phase is fully utilized by traffic. Very seldom does a vehicle wait longer than one red indication. The approach appears open, turning movements are easily made and drivers have freedom of operation.	≤ 5.0
B	At this level, an occasional signal phase is fully utilized and many phases approach full use. Many drivers begin to feel somewhat restricted within platoons of vehicles approaching the intersection.	> 5.0 and ≤ 15.0
C	At this level, the operation is stable though with more frequent fully utilized signal phases. Drivers feel more restricted and occasionally may have to wait more than one red signal indication, and queues may develop behind turning vehicles. This level is normally employed in urban intersection design.	> 15.0 and ≤ 25.0
D	At this level, the motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough cycles with lower demand to permit occasional clearance of developing queues and prevent excessive backups.	> 25.0 and ≤ 40.0
E	At this level, capacity is reached. There are long queues of vehicles waiting upstream of the intersection and delays to vehicles may extend to several signal cycles.	> 40.0 and ≤ 60.0
F	At this level, saturation occurs, with vehicle demand exceeding the available capacity.	> 60.0

LEVEL OF SERVICE ANALYSIS AT UNSIGNALIZED INTERSECTIONS[1]

The term "level of service" implies a qualitative measure of traffic flow at an intersection. It is dependent upon the vehicle delay and vehicle queue lengths at approaches. The level of service at unsignalized intersections is often related to the delay accumulated by flows on the minor streets, caused by all other conflicting movements. The following table describes the characteristics of each level.

Level of Service	Features
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.
E	Very long traffic delays occur. Operations approach the capacity of the intersection.
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.

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(1) Highway Capacity Manual - Special Report No. 209, Transportation Research Board, 1985.