October 17, 2024

Dakota Martonen, PE, PTOE
City of Billings Public Works Department
2224 Montana Avenue
Billings, MT 59101

Reference: Traffic Impact Study Update
Annafeld Subdivision, Sixth Filing, Billings, MT
Project No. 16001.161

Dear Dakota:

The purpose of this letter is to provide a traffic impact study (TIS) update for the Sixth Filing of Annafeld Subdivision, located south of Eva Marie Lane and east of East Lane in Billings, Montana. This development's original masterplan TIS (Josephine Landing Subdivision TIS, February 2016) analyzed the First Filing in detail and the Full Build scenario. Evaluations of subsequent phases were evaluated in several traffic impact studies and updates: a February 2019 TIS for the Second and Third Filings, a December 2020 TIS update for denser commercial land use in Blocks 10 and 12, a September 2021 TIS letter for the Fourth Filing, and a February 2023 TIS letter for the Fifth Filing. The current TIS update provides a detailed analysis of the traffic impacts of the proposed Sixth Filing.

Site Location and Layout

The Sixth Filing of the Annafeld Subdivision development plan proposes the construction of 49 single-family lots and 22 townhomes in the first phase and an additional 15 single-family lots in the second phase. Phase 1 of the subdivision is anticipated to be occupied in 2028, and the remaining units to be occupied by 2030. Figure 1 (Attachment A) illustrates the location of the proposed site. Figure 2 (Attachment A) shows the proposed layout. The Sixth Filing is generally located southwest of the Fifth Filing. The site is anticipated to be accessed via East Lane, Trade Center Avenue, and internal subdivision connections to Eva Marie Lane, St Stephen Boulevard, St Peter Boulevard, and Johanns Meadow Lane. Figure 3 (Attachment A) shows existing street classifications and other characteristics.

Existing Conditions

Existing Conditions (2024) traffic counts were collected at the study intersections on Tuesday, August 13, 2024. Intersection peak hours were found to be from 7:15 – 8:15 AM and 4:15 – 5:15 PM. Raw count data was adjusted for seasonal variation using City

of Billings seasonal adjustment factors. Figure 4 (Attachment A) illustrates the resulting Existing Conditions (2024) AM and PM peak hour turning movement volumes. Traffic volume count worksheets are also included in Attachment B.

Table 1. Existing Conditions (2024) Capacity Calculations Summary

Intersection	Approach	Existing (2024)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
Mullowney Lane & Midland Road/South Frontage Road	EB	35.1	D	4	25.6	C	7
	WB	33.8	C	3	21.5	C	3
	NB	12.2	B	7	19.2	B	7
	SB	5.9	A	3	10.8	B	6
	Intersection	16.1	B	--	17.4	B	--
Intersection Control		*One-Way Stop-Control (NB)*					
South Frontage Road & East Lane	EB	0.0	A	0	0.0	A	0
	WB	0.5	A	0	0.9	A	1
	NB	11.0	B	1	11.6	B	1
	Intersection	0.8	A	--	1.2	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Elysian Road & South Frontage Road	WB	13.4	B	1	17.5	C	2
	NB	0.0	A	0	0.0	A	0
	SB	0.0	A	0	0.2	A	0
	Intersection	2.3	A	--	2.4	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & East Lane	EB	0.2	A	0	0.1	A	0
	WB	0.8	A	0	0.4	A	0
	NB	10.2	B	1	10.3	B	1
	SB	10.1	B	1	10.8	B	0
	Intersection	2.3	A	--	2.3	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & Walter Creek Boulevard	EB	0.2	A	0	0.1	A	0
	WB	2.1	A	1	4.0	A	1
	NB	9.6	A	1	10.3	B	1
	SB	11.1	B	1	12.0	B	1
	Intersection	3.7	A	--	3.5	A	--
Intersection Control		*Signalized*					
Mullowney Lane & Elysian Road	EB	5.7	A	2	6.2	A	2
	WB	11.2	B	2	11.3	B	2
	NB	10.9	B	1	9.7	A	2
	SB	11.0	B	1	9.9	A	3
	Intersection	8.2	A	--	8.7	A	--

Capacity calculations were performed for the study area using Synchro, Version 11, which is based on the Highway Capacity Manual, 7th Edition (Transportation Research Board, 2022). Level of service (LOS) is defined as a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. LOS is a qualitative measure of the performance of an intersection with values ranging from LOS A, indicating good operation and low vehicle delays, to LOS F, which indicates congestion and longer vehicle delays. LOS C is generally considered the minimum acceptable threshold in Montana communities, though exceptions are made in some cases. Existing Conditions (2024) capacity results are shown in Table 1 on the previous page.

Existing Conditions (2024) capacity results show that the eastbound approach at the Mullowney Lane/Midland Road/South Frontage Road intersection operates at LOS D in the AM peak hour with an average approach delay that is barely over the LOS C cutoff value. This intersection has existing 95th percentile queues of up to seven vehicles. The remaining intersections and approaches operate at LOS C or better with minimal queueing. The attached Figure 4 also shows LOS results at each intersection approach, and Existing Conditions (2024) capacity calculation worksheets are included in Attachment C.

Trip Generation

This study utilized Trip Generation, 11th Edition, published by the Institute of Transportation Engineers (ITE), which is the most widely accepted source in the United States for determining trip generation projections. These projections are used to analyze the impacts of a new development on the surrounding area. For the purposes of this study, Land Use Code 210 – Single-Family Detached Housing and Land Use Code 215 – Single-Family Attached Housing were utilized to project trip generation for the proposed single-family homes and townhomes, respectively. Table 2 on the following page presents the results of the trip generation analysis for this study.

The Phase 1 scenario is projected to generate a total of 620 gross average weekday trips, with 45 gross trips (12 entering/33 exiting) generated during the AM peak hour and 59 gross trips (37 entering/22 exiting) generated during the PM peak hour. At full buildout, the Sixth Filing of Annafeld Subdivision is projected to generate a total of 762 gross average weekday trips, with 56 gross trips (14 entering/42 exiting) generated during the AM peak hour and 73 gross trips (46 entering/27 exiting) generated during the PM peak hour.

Table 2. Annafeld Sixth Filing Trip Generation Summary

Land Use	Independent Variable		Average Weekday			AM Peak Hour			PM Peak Hour		
	Intensity	Units	total	enter	exit	total	enter	exit	total	enter	exit
Phases 1											
Single-Family Detached Housing[1]	49	Dwelling Units	462	231	231	34	9	25	46	29	17
Single-Family Attached Housing[2]	22	Dwelling Units	158	79	79	11	3	8	13	8	5
Total Phase 1 Buildout New External Trips			**620**	**310**	**310**	**45**	**12**	**33**	**59**	**37**	**22**
Phases 1 & 2											
Single-Family Detached Housing[1]	64	Dwelling Units	604	302	302	45	11	34	60	38	22
Single-Family Attached Housing[2]	22	Dwelling Units	158	79	79	11	3	8	13	8	5
Total Phases 1 & 2 Buildout New External Trips			**762**	**381**	**381**	**56**	**14**	**42**	**73**	**46**	**27**

(1) Single-Family Detached Housing - Land Use 210* — Units = Dwelling Units
Average Weekday: Average Rate = 9.43 (50% entering/50% exiting)
Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 0.70 (25% entering/75% exiting)
Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 0.94 (63% entering/37% exiting)

(2) Single-Family Attached Housing - Land Use 215* — Units = Dwelling Units
Average Weekday: Average Rate = 7.20 (50% entering/50% exiting)
Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 0.48 (25% entering/75% exiting)
Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 0.57 (59% entering/41% exiting)

**Trip Generation, 11th Edition* , Institute of Transportation Engineers, 2021
***Trip Generation Handbook, 3rd Edition* , Institute of Transportation Engineers, 2017

Trip generation projections provide an estimate of the total number of trips that a proposed development would generate. However, to estimate the net number of new trips made by personal vehicles external to the site, adjustments must often be made to account for internal capture trips, pass-by trips, and trips made by alternate modes.

Internal capture (IC) trips are trips that do not have origins or destinations external to a project site. Since IC trips occur internally, they do not have an impact on external traffic operations. IC trips most often occur in mixed-use developments where residential, commercial, and office-related land uses exhibit a high rate of internal trip exchange. Although the Sixth Filing will be in close proximity to the commercial sites located in Blocks 10 and 12 of the Third Filing (including a coffee shop and deli/bakery), any IC trips to that area have already been accounted for in the analysis of prior filings. It is likely that IC trips will occur from the Sixth Filing but they will balance out with trips that have already been calculated.

Pass-by trips are trips that are made as intermediate stops on the way from the point of origin to a primary trip destination. Pass-by trips are attracted by traffic “passing by” on an adjacent street that offers direct access to that site. Pass-by trips are primarily attracted by commercial-type land uses such as restaurants, convenience markets, and gas stations. Since no commercial land uses exist in the Sixth Filing, these trips were not calculated for the Sixth Filing analysis.

A percentage of trips generated by the Sixth Filing could be made by alternate modes (walking, biking, or transit), as there is a multi-use path along Elysian Road , sidewalks throughout Annafeld Subdivision and the development's proximity to Elysian Elementary School. However, since there are no transit routes currently operating on Elysian Road west of Mullowney Lane and the subdivision is generally separated from Greater Billings, alternate mode trips were conservatively considered to be negligible for this analysis. Some alternate mode trips are possible within the subdivision between filings; however, the adjustments made for IC trips are assumed to account for this.

Trip Distribution, Traffic Assignment, and Future Projections

The trip distribution for this study was based upon that used for previous evaluations of Annafeld Subdivision as well as Existing Conditions (2024) volumes. Figures 5 and 6 (Attachment A) show the distribution percentages and resulting traffic assignments for the AM and PM peak hours for future scenarios.

Phase 1 (2028) and Full Buildout (2030) scenarios were evaluated based on the anticipated Sixth Filing buildout dates. In addition to the site-generated traffic assignments, an annual background traffic increase was calculated to account for additional area development and general population growth in the Billings area. A growth rate of 3.0% was calculated based on historic MDT traffic data and historical analysis of this study area. Trip projections for the remaining buildout of the Fourth Filing of Annafeld Subdivision and Annafeld North Subdivision and the Full Build of the Fifth Filing of Annafeld Subdivision were included in the Phase 1 (2028) and Full Buildout (2030) traffic projections. Trips from these developments were added together with the Sixth Filing of Annafeld Subdivision site trips and existing volumes with anticipated background growth applied to obtain Phase 1 (2028) and Full Buildout (2030) traffic projections, which are shown in Figures 7 and 8 (Attachment A).

Phase 1 (2028) and Full Buildout (2030) Capacity

Phase 1 (2028) and Full Buildout (2030) capacity calculations were performed using the peak hour traffic projections shown in Figures 7 and 8. Peak hour factors (PHFs) for the design years were assumed to be 0.92 for all intersections, per HCM guidelines and common industry practice for future scenarios. The assumed values were utilized to not overestimate future congestion in the study area. The results for each future scenario are shown in Tables 3 and 4 on the pages 7 and 8.

Phase 1 (2028) and Full Buildout (2030) capacity results show that operations are projected to operate similarly to the existing conditions. The eastbound approach at the Mullowney Lane/Midland Road/South Frontage Road intersection is projected to continue to operate near the LOS C/D delay threshold during the AM peak hour. Slight improvements to the delay value are likely due to the future PHF assumption of 0.92. All other intersections and approaches are projected to operate at LOS C or better. Phase 1 (2028) and Full Buildout (2030) capacity worksheets are included in Attachment C.

Auxiliary Turn Lanes

Auxiliary turn lane warrants were evaluated based on the methodology outlined in the MDT Traffic Engineering Manual (November 2007) for Existing Conditions (2024), Phase 1 (2028), and Full Buildout (2030) analysis scenarios. Warrants were not evaluated for turn lanes already present.

- **Elysian Road/South Frontage Road:** A northbound right-turn lane is warranted based on the Existing Conditions (2024) scenario.

- **East Lane/South Frontage Road:** A westbound left-turn lane is projected to be warranted based on the Phase 1 (2028) scenario.

- **Remaining intersections:** No other new turn lanes were found to be warranted at any other study area intersections.

Auxiliary turn lane warrant worksheets for the Existing Conditions (2024), Phase 1 (2028), and Full Buildout (2030) scenarios can be found in Attachment D.

Contribution Calculations

Proposed financial contributions were based on the traffic assignment volumes for the Sixth Filing of Annafeld Subdivision. This analysis showed that this development's portion of critical volumes for the affected intersections are as follows:

- Mullowney Lane/Midland Road/South Frontage Road: 1.75 percent
- South Frontage Road/East Lane: 0.35 percent
- Elysian Road/South Frontage Road: 0.79 percent
- Elysian Road/East Lane: 1.00 percent
- Mullowney Lane/Elysian Road: 2.08 percent

The percentages should be converted into dollar figures based on the current City of Billings intersection cost participation value, which is $450,000.00 as of July 1, 2024. Financial contribution calculation worksheets are included in Attachment E.

Table 3. Phase 1 (2028) Capacity Calculations Summary

Intersection	Approach	Phase 1 (2028)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
Mullowney Lane & Midland Road/South Frontage Road	EB	34.5	C	5	25.3	C	8
	WB	32.7	C	3	20.3	C	3
	NB	13.9	B	9	23.9	C	9
	SB	6.7	A	4	13.6	B	8
	Intersection	16.6	B	--	19.4	B	--
Intersection Control		*One-Way Stop-Control (NB)*					
South Frontage Road & East Lane	EB	0.0	A	0	0.0	A	0
	WB	0.6	A	1	1.1	A	1
	NB	10.2	B	1	12.2	B	1
	Intersection	1.1	A	--	1.5	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Elysian Road & South Frontage Road	WB	14.0	B	1	19.6	C	2
	NB	0.0	A	0	0.0	A	0
	SB	0.6	A	0	0.7	A	1
	Intersection	2.9	A	--	3.2	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & East Lane	EB	0.1	A	0	0.0	A	0
	WB	0.7	A	0	0.3	A	0
	NB	10.7	B	1	10.9	B	1
	SB	10.6	B	1	11.6	B	1
	Intersection	2.5	A	--	2.5	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & Walter Creek Boulevard	EB	0.1	A	0	0.1	A	0
	WB	1.7	A	1	2.8	A	1
	NB	10.4	B	1	11.8	B	1
	SB	12.6	B	1	15.5	C	1
	Intersection	3.0	A	--	2.8	A	--
Intersection Control		*Signalized*					
Mullowney Lane & Elysian Road	EB	5.8	A	4	6.5	A	4
	WB	12.8	B	2	12.4	B	2
	NB	12.6	B	2	10.8	B	3
	SB	12.8	B	2	11.0	B	4
	Intersection	8.6	A	--	9.2	A	--

Table 4. Full Buildout (2030) Capacity Calculations Summary

Intersection	Approach	Full Buildout (2030)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
Mullowney Lane & Midland Road/South Frontage Road	EB	34.1	C	5	25.2	C	8
	WB	32.0	C	4	19.5	B	4
	NB	15.0	B	10	27.0	C	10
	SB	7.3	A	5	15.4	B	9
	Intersection	17.1	B	--	20.8	C	--
Intersection Control		*One-Way Stop-Control (NB)*					
South Frontage Road & East Lane	EB	0.0	A	0	0.0	A	0
	WB	0.5	A	1	1.1	A	1
	NB	10.4	B	1	12.7	B	1
	Intersection	1.1	A	--	1.6	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Elysian Road & South Frontage Road	WB	14.7	A	1	21.5	C	2
	NB	0.0	A	0	0.0	A	0
	SB	0.5	A	0	0.7	A	1
	Intersection	3.0	A	--	3.5	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & East Lane	EB	0.1	A	0	0.0	A	0
	WB	0.7	A	0	0.3	A	0
	NB	10.8	B	1	11.1	B	1
	SB	10.7	B	1	11.9	B	1
	Intersection	2.6	A	--	2.6	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & Walter Creek Boulevard	EB	0.1	A	0	0.1	A	0
	WB	1.7	A	1	2.8	A	1
	NB	10.6	B	1	12.2	B	1
	SB	13.1	B	1	16.1	C	1
	Intersection	3.1	A	--	2.9	A	--
Intersection Control		*Signalized*					
Mullowney Lane & Elysian Road	EB	5.9	A	4	6.6	A	4
	WB	13.1	B	2	12.9	B	2
	NB	13.1	B	2	11.0	B	3
	SB	13.2	B	2	11.3	B	4
	Intersection	8.7	A	--	9.4	A	--

Conclusions & Recommendations

The preceding analysis has shown that the residential units planned for both phases of the Sixth Filing of Annafeld Subdivision will generate approximately 762 gross trips daily. With the projected 6th Filing external trips added to the surrounding roadway network along with background growth and other filings of Annafeld and Annafeld North Subdivisions, the study intersections are anticipated to operate similarly to Existing Conditions (2024).

The evaluation of auxiliary turn lane warrants showed that a northbound right-turn lane is warranted at the Elysian Road/South Frontage Road intersection, and a westbound left-turn lane is projected to be warranted at the East Lane/South Frontage Road intersection by 2028. However, the warranted turn lanes would likely have little to no impact on capacity operations at the respective intersections; any improvements at these intersections should be left up to the discretion of MDT.

If the above improvements are implemented as recommended, traffic on the area street network should continue to operate in a safe and efficient manner. If you have any questions about this assessment, or if additional analysis is required, please feel free to contact me at 406-922-4306 or jstaszcuk@sanbell.com.

Sincerely,

Joey Staszcuk, PE, PTOE, RSP1
Associate Principal | Community Transportation Studio Manager

ROFT/ars/SG/jhs

P:16001.161_Annafeld_6th_Traffic_Letter_10.17.2024

ANNAFELD SIXTH FILING – TIS UPDATE

Project No. 16001.161

ATTACHMENT A
FIGURES

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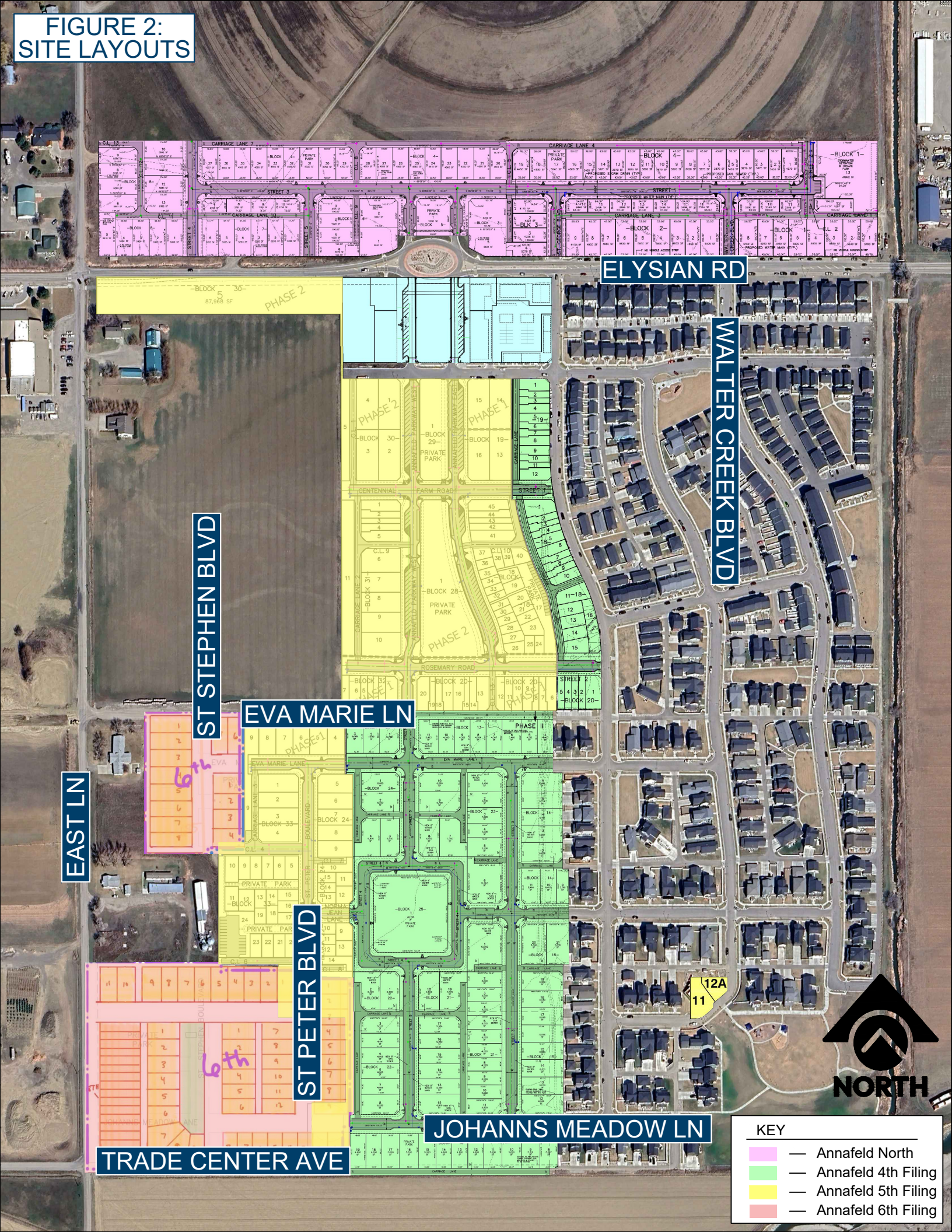
FIGURE 1:
STUDY AREA

FIGURE 2: SITE LAYOUTS



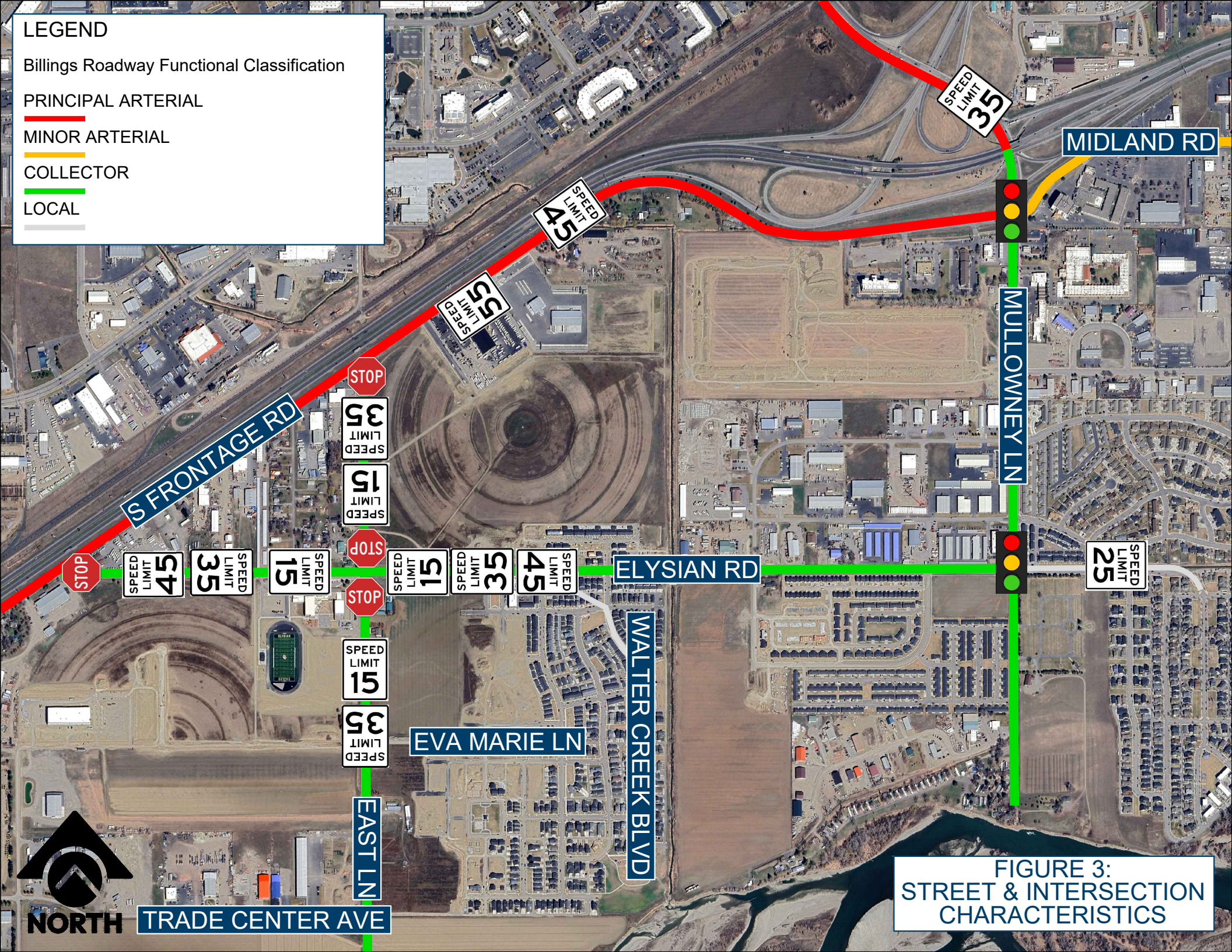


FIGURE 3:
STREET & INTERSECTION CHARACTERISTICS

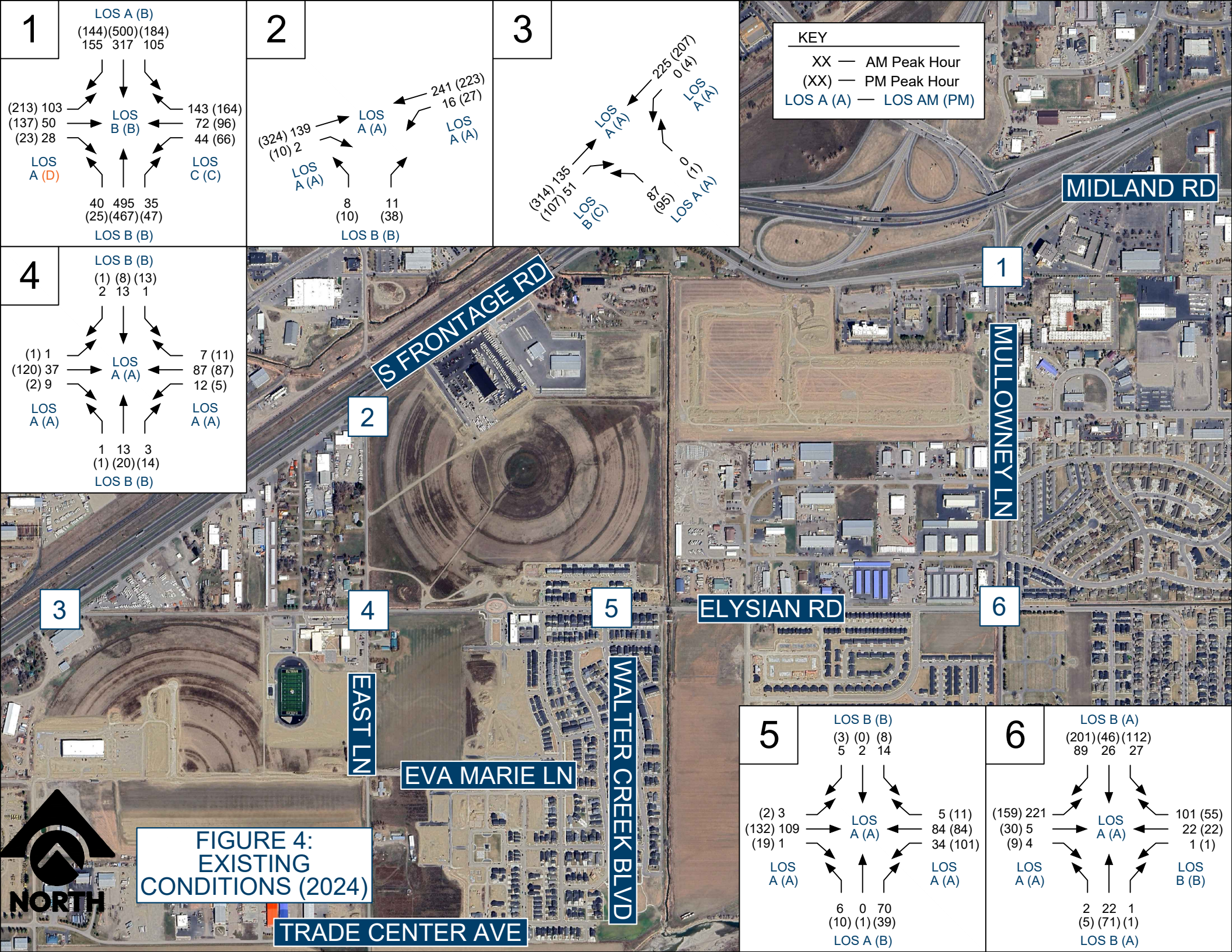


FIGURE 4: EXISTING CONDITIONS (2024)

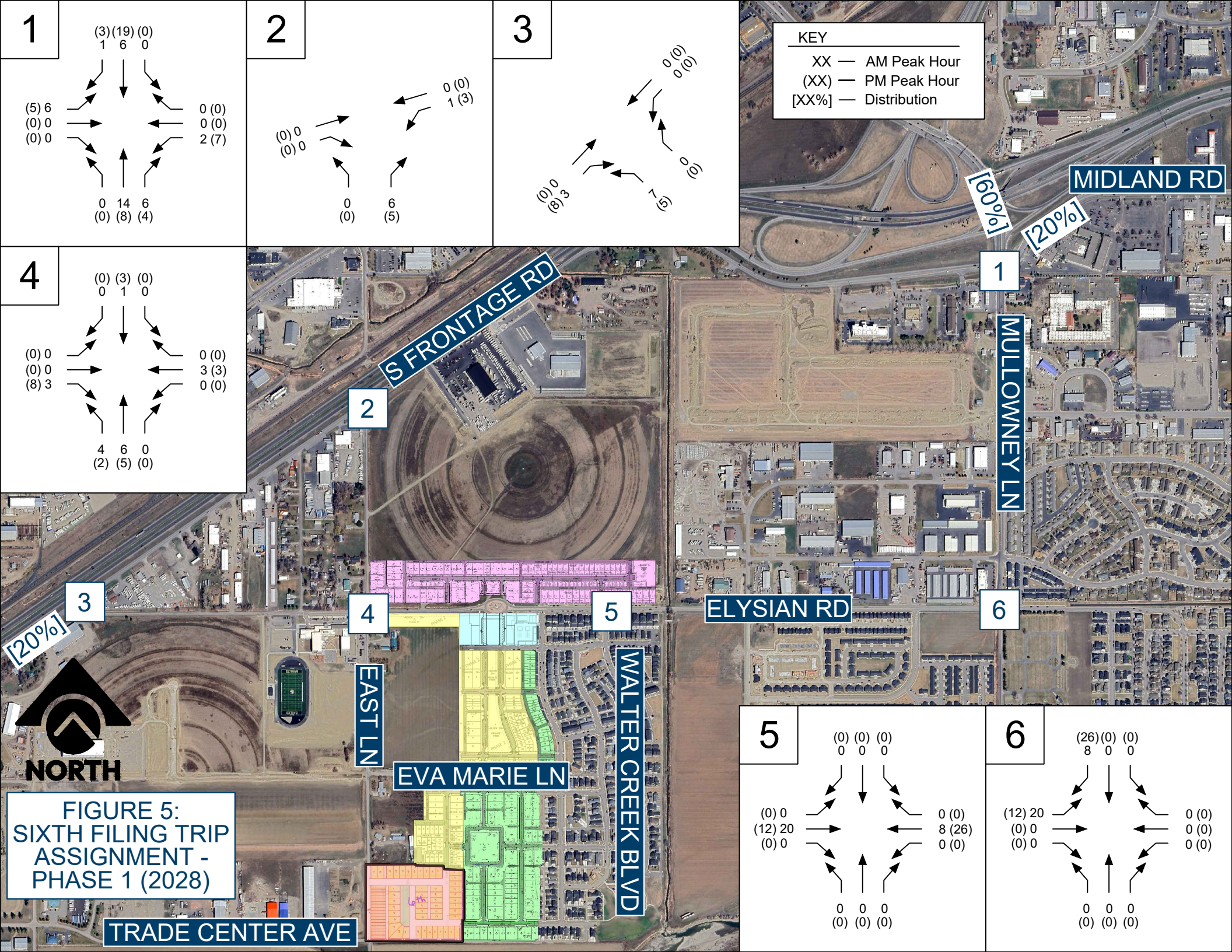


FIGURE 5:
SIXTH FILING TRIP ASSIGNMENT - PHASE 1 (2028)

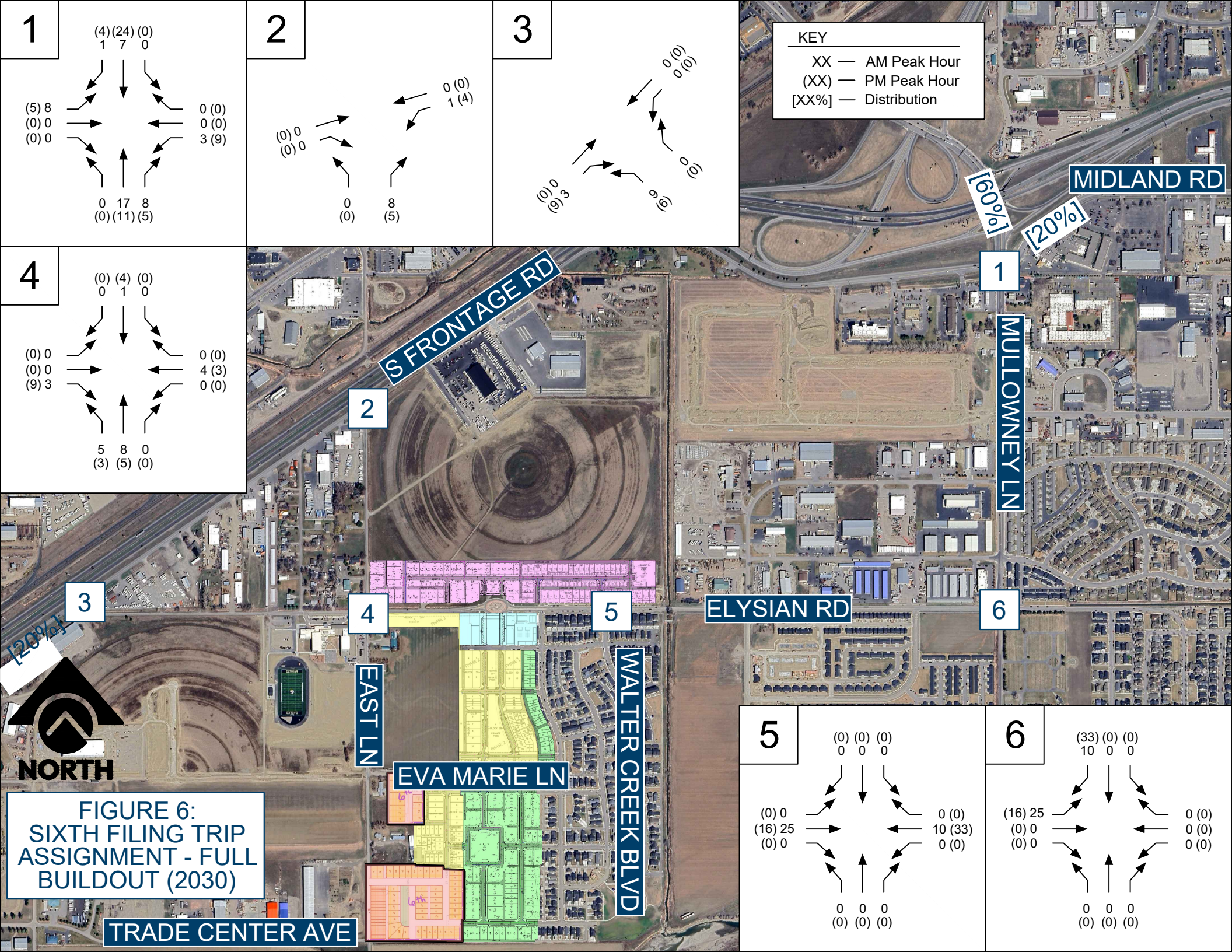


FIGURE 6:
SIXTH FILING TRIP ASSIGNMENT - FULL BUILDOUT (2030)

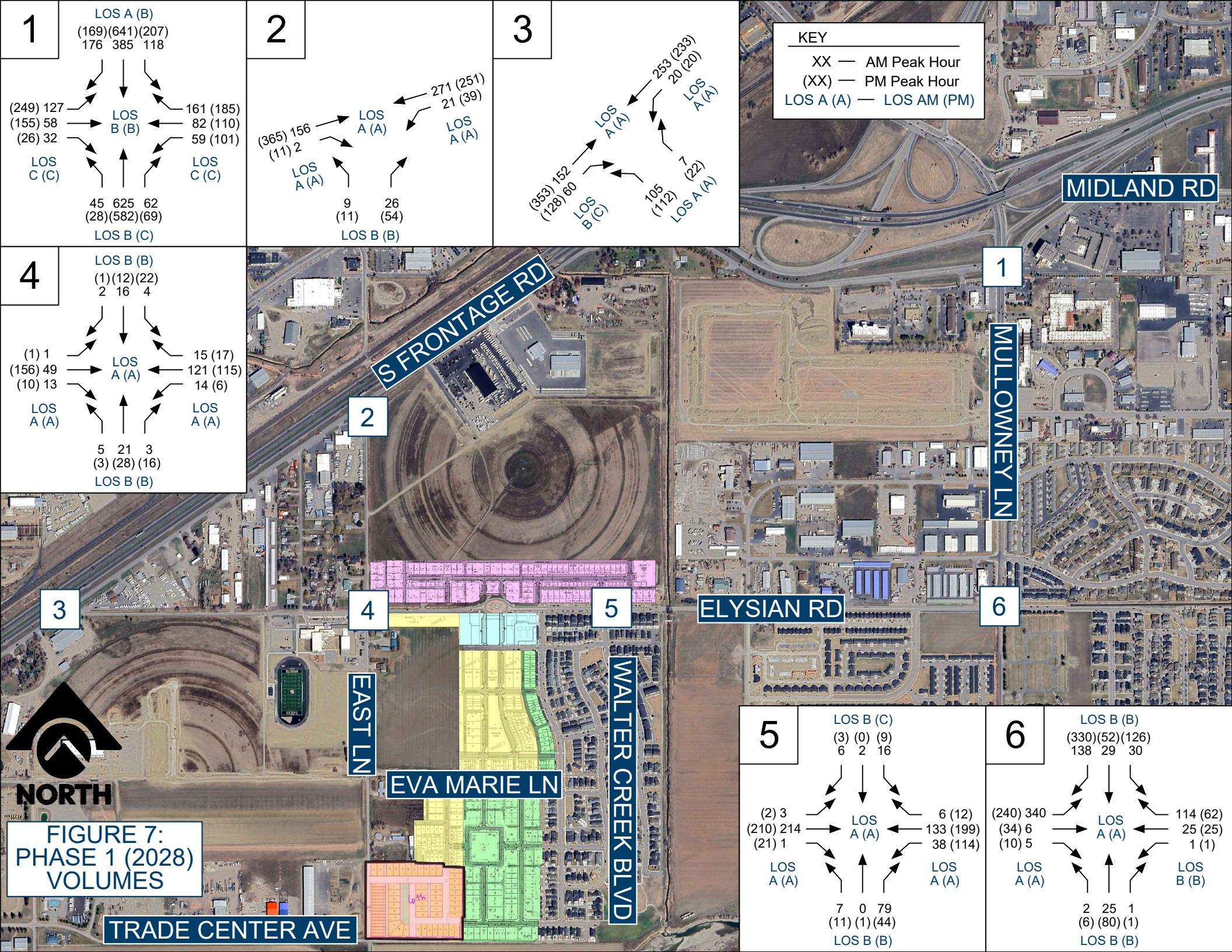


FIGURE 7:
PHASE 1 (2028)
VOLUMES

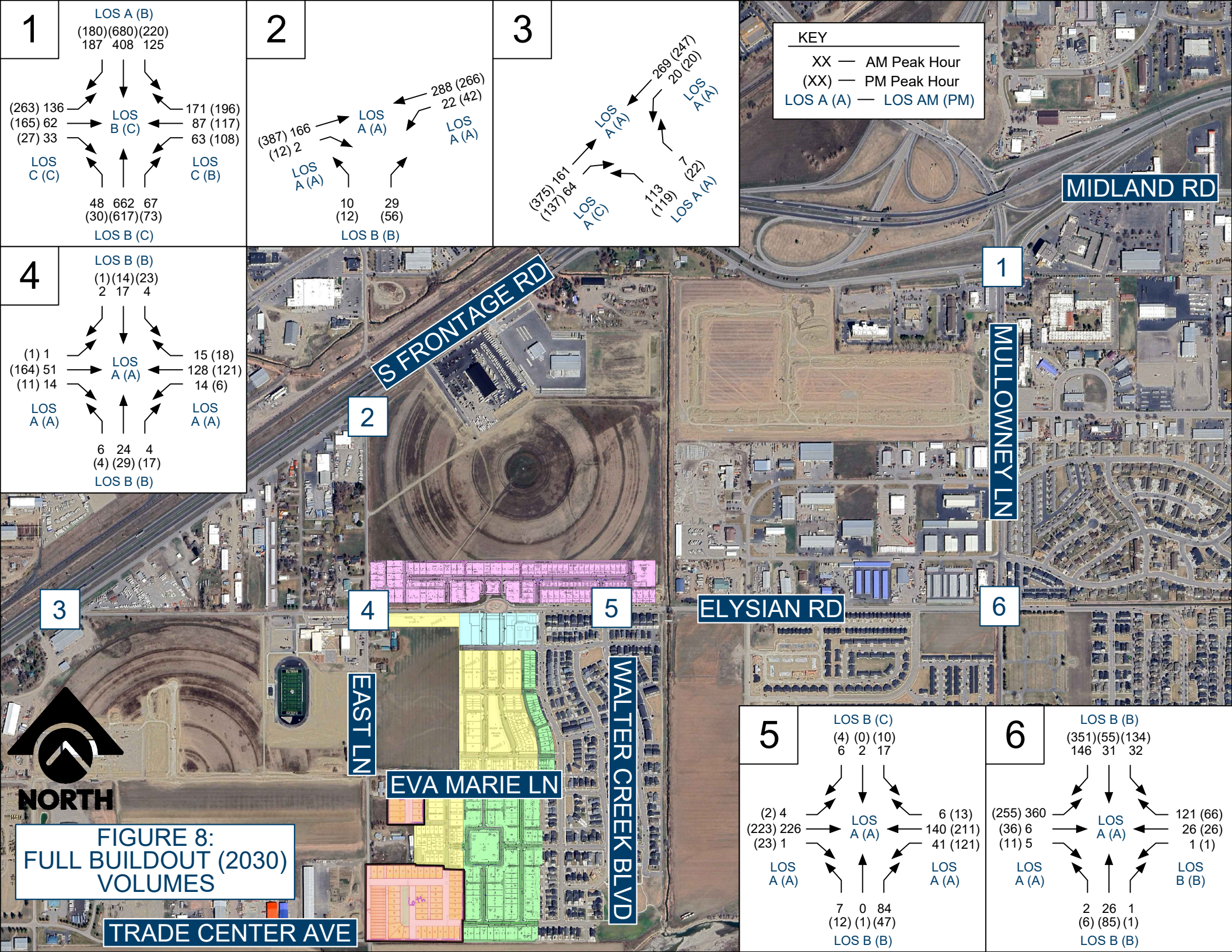


FIGURE 8:
FULL BUILDOUT (2030)
VOLUMES

ANNAFELD SIXTH FILING – TIS UPDATE

Project No. 16001.161

ATTACHMENT B
TRAFFIC VOLUME COUNT WORKSHEETS

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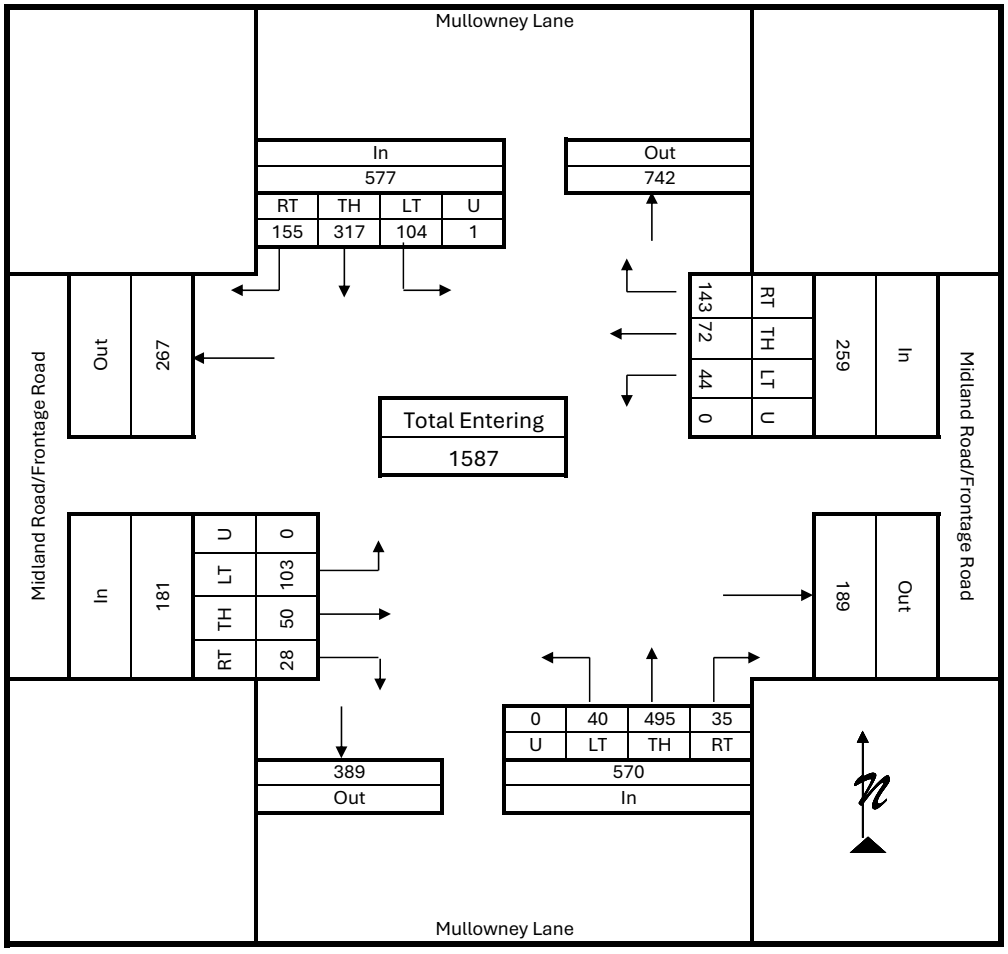
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Mullowney Lane/Midland Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Mullowney Lane	East/West Street:	Midland Road/Frontage Road

Vehicle Volumes and Adjustments

	Mullowney Lane Southbound					Mullowney Lane Northbound					Midland Road/Frontage Road Eastbound					Midland Road/Frontage Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
7:15 AM	37	62	18	1	118	8	126	4	0	138	5	11	22	0	38	27	8	5	0	40	334
7:30 AM	38	67	23	0	128	13	126	8	0	147	8	17	27	0	52	42	19	16	0	77	404
7:45 AM	50	96	36	0	182	8	139	6	0	153	11	16	33	0	60	34	24	12	0	70	465
8:00 AM	30	92	27	0	149	6	104	22	0	132	4	6	21	0	31	40	21	11	0	72	384
Grand Total	155	317	104	1	577	35	495	40	0	570	28	50	103	0	181	143	72	44	0	259	1587
Medium Truck %	1.9	0.9	5.8	0.0	2.1	0.0	3.2	17.5	0.0	4.0	28.6	6.0	3.9	0.0	8.3	7.7	8.3	2.3	0.0	6.9	
Heavy Truck %	1.9	1.6	1.0	0.0	1.6	0.0	0.4	2.5	0.0	0.5	0.0	2.0	3.9	0.0	2.8	0.7	5.6	0.0	0.0	1.9	
Total Truck %	3.9	2.5	6.7	0.0	3.6	0.0	3.6	20.0	0.0	4.6	28.6	8.0	7.8	0.0	11.0	8.4	13.9	2.3	0.0	8.9	
Total %	9.8	20.0	6.6	0.1	36.4	2.2	31.2	2.5	0.0	35.9	1.8	3.2	6.5	0.0	11.4	9.0	4.5	2.8	0.0	16.3	100.0
PHF	0.79	0.79	0.79			0.93	0.93	0.93			0.75	0.75	0.75			0.93	0.93	0.93			0.85



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General Information

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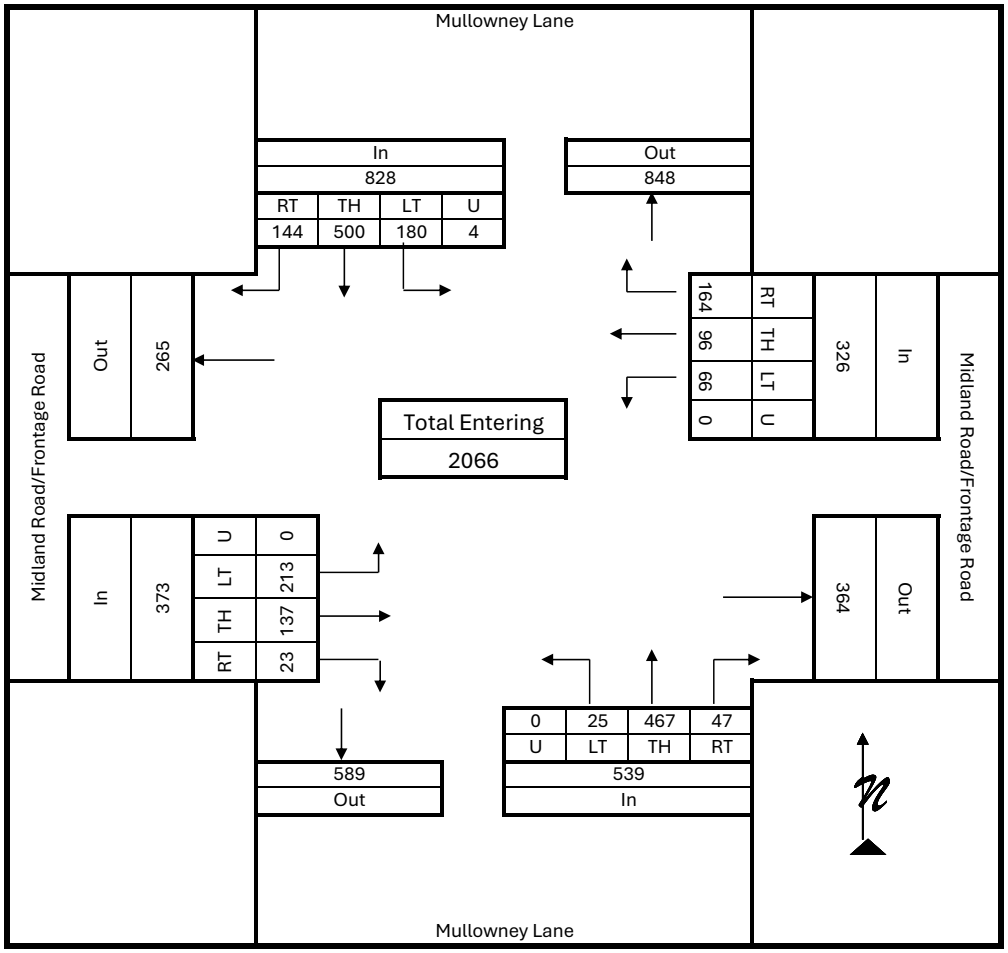
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	PM Peak Hour (4:15 - 5:15 PM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Mullowney Lane	East/West Street:	Midland Road/Frontage Road

Vehicle Volumes and Adjustments

	Mullowney Lane Southbound					Mullowney Lane Northbound					Midland Road/Frontage Road Eastbound					Midland Road/Frontage Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
4:15 PM	41	108	48	2	199	16	104	4	0	124	5	35	50	0	90	37	18	18	0	73	486
4:30 PM	36	149	52	0	237	11	133	4	0	148	5	39	60	0	104	52	26	15	0	93	582
4:45 PM	38	118	40	1	197	11	114	11	0	136	7	23	46	0	76	39	18	19	0	76	485
5:00 PM	29	125	40	1	195	9	116	6	0	131	6	40	57	0	103	36	34	14	0	84	513
Grand Total	144	500	180	4	828	47	467	25	0	539	23	137	213	0	373	164	96	66	0	326	2066
Medium Truck %	7.6	1.0	5.0	0.0	3.0	0.0	0.6	12.0	0.0	1.1	21.7	3.6	0.9	0.0	3.2	2.4	3.1	4.5	0.0	3.1	
Heavy Truck %	1.4	1.0	0.0	0.0	0.8	0.0	0.2	0.0	0.0	0.2	0.0	5.1	2.8	0.0	3.5	1.2	0.0	0.0	0.0	0.6	
Total Truck %	9.0	2.0	5.0	0.0	3.9	0.0	0.9	12.0	0.0	1.3	21.7	8.8	3.8	0.0	6.7	3.7	3.1	4.5	0.0	3.7	
Total %	7.0	24.2	8.7	0.2	40.1	2.3	22.6	1.2	0.0	26.1	1.1	6.6	10.3	0.0	18.1	7.9	4.6	3.2	0.0	15.8	100.0
PHF	0.87	0.87	0.87			0.91	0.91	0.91			0.90	0.90	0.90			0.87	0.87	0.87			0.88



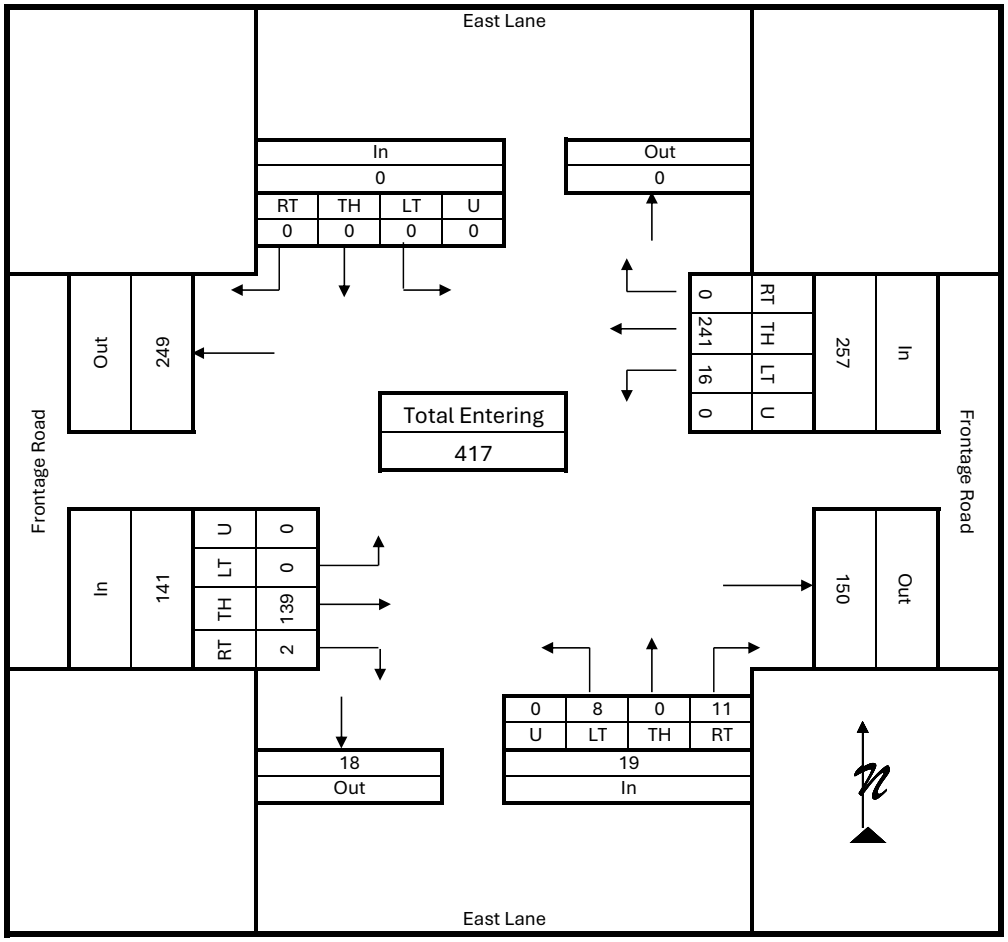
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	East Lane/Frontage Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	East Lane	East/West Street:	Frontage Road

Vehicle Volumes and Adjustments

	East Lane Southbound					East Lane Northbound					Frontage Road Eastbound					Frontage Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
7:15 AM	0	0	0	0	0	4	0	1	0	5	0	28	0	0	28	0	44	2	0	46	79
7:30 AM	0	0	0	0	0	3	0	1	0	4	1	39	0	0	40	0	57	4	0	61	105
7:45 AM	0	0	0	0	0	1	0	2	0	3	0	49	0	0	49	0	82	5	0	87	139
8:00 AM	0	0	0	0	0	3	0	4	0	7	1	23	0	0	24	0	58	5	0	63	94
Grand Total	0	0	0	0	0	11	0	8	0	19	2	139	0	0	141	0	241	16	0	257	417
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	10.5	50.0	9.4	0.0	0.0	9.9	0.0	5.8	0.0	0.0	5.4	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.7	0.0	2.9	6.3	0.0	3.1	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	10.5	50.0	10.1	0.0	0.0	10.6	0.0	8.7	6.3	0.0	8.6	
Total %	0.0	0.0	0.0	0.0	0.0	2.6	0.0	1.9	0.0	4.6	0.5	33.3	0.0	0.0	33.8	0.0	57.8	3.8	0.0	61.6	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.72	0.72	0.72			0.74	0.74	0.74			0.75



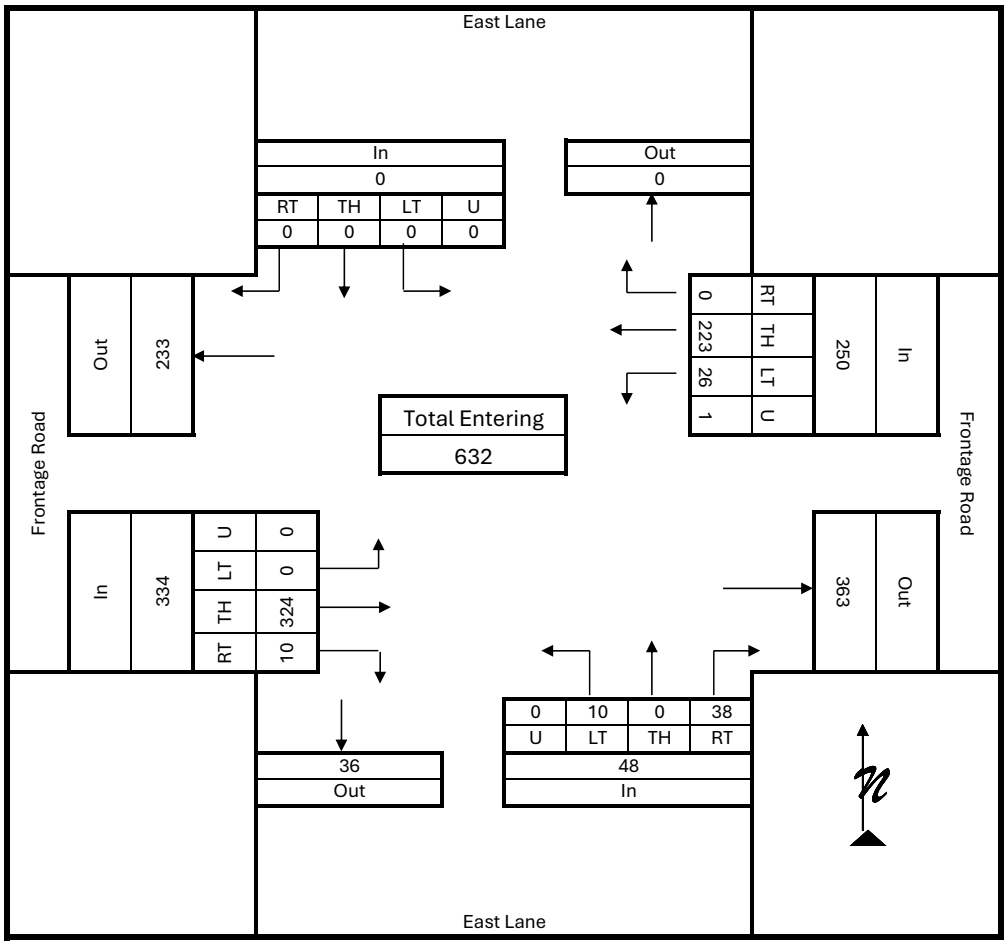
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	East Lane/Frontage Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	PM Peak Hour (4:15 - 5:15 PM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	East Lane	East/West Street:	Frontage Road

Vehicle Volumes and Adjustments

	East Lane Southbound					East Lane Northbound					Frontage Road Eastbound					Frontage Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
4:15 PM	0	0	0	0	0	9	0	4	0	13	1	84	0	0	85	0	51	5	0	56	154
4:30 PM	0	0	0	0	0	10	0	2	0	12	4	89	0	0	93	0	55	10	0	65	170
4:45 PM	0	0	0	0	0	9	0	2	0	11	3	63	0	0	66	0	48	7	0	55	132
5:00 PM	0	0	0	0	0	10	0	2	0	12	2	88	0	0	90	0	69	4	1	74	176
Grand Total	0	0	0	0	0	38	0	10	0	48	10	324	0	0	334	0	223	26	1	250	632
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	3.6	0.0	4.0	3.8	0.0	4.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	2.1	0.0	2.8	0.0	0.0	2.7	0.0	2.2	0.0	0.0	2.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	2.1	0.0	6.5	0.0	0.0	6.3	0.0	6.3	3.8	0.0	6.0	
Total %	0.0	0.0	0.0	0.0	0.0	6.0	0.0	1.6	0.0	7.6	1.6	51.3	0.0	0.0	52.8	0.0	35.3	4.1	0.2	39.6	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.93	0.93	0.93			0.84	0.84	0.84			0.90



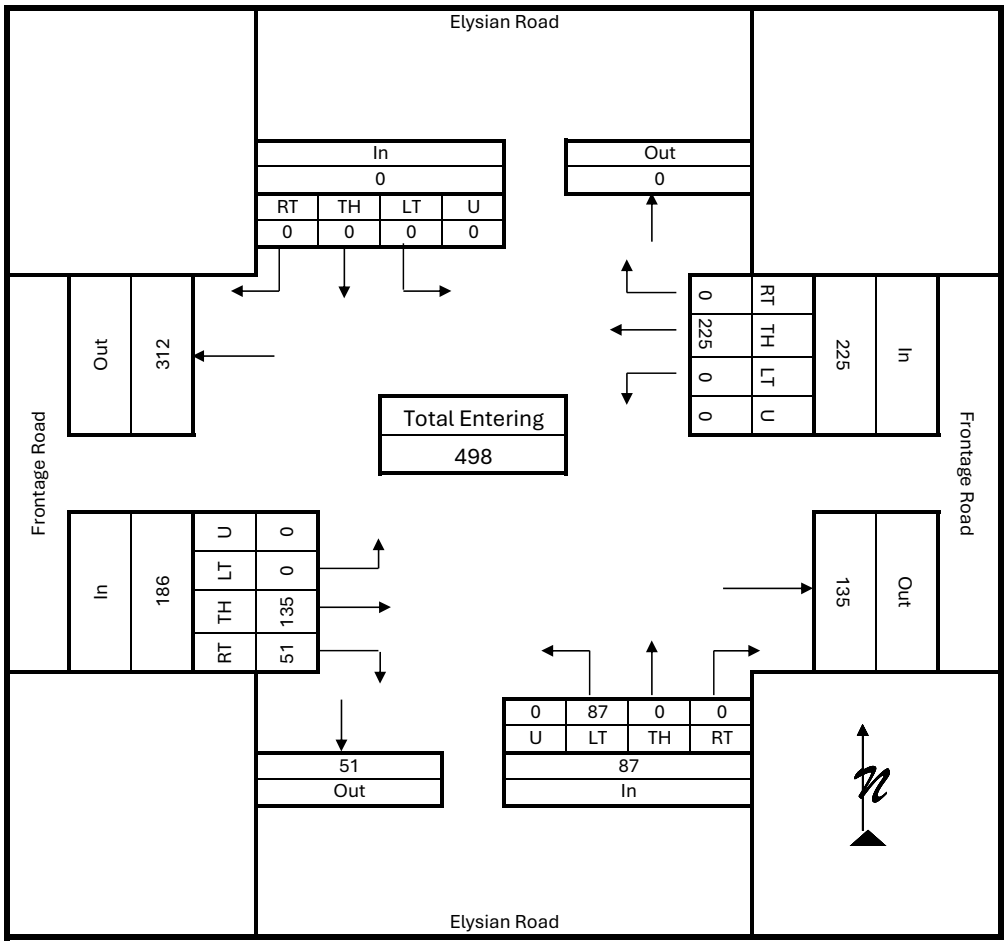
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Elysian Road/Frontage Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Elysian Road	East/West Street:	Frontage Road

Vehicle Volumes and Adjustments

	Elysian Road Southbound					Elysian Road Northbound					Frontage Road Eastbound					Frontage Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
7:15 AM	0	0	0	0	0	0	0	24	0	24	12	27	0	0	39	0	37	0	0	37	100
7:30 AM	0	0	0	0	0	0	0	24	0	24	10	44	0	0	54	0	56	0	0	56	134
7:45 AM	0	0	0	0	0	0	0	27	0	27	12	43	0	0	55	0	76	0	0	76	158
8:00 AM	0	0	0	0	0	0	0	12	0	12	17	21	0	0	38	0	56	0	0	56	106
Grand Total	0	0	0	0	0	0	0	87	0	87	51	135	0	0	186	0	225	0	0	225	498
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	3.4	11.8	11.1	0.0	0.0	11.3	0.0	7.1	0.0	0.0	7.1	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	2.2	0.0	0.0	2.2	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	3.4	11.8	11.9	0.0	0.0	11.8	0.0	9.3	0.0	0.0	9.3	
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.5	0.0	17.5	10.2	27.1	0.0	0.0	37.3	0.0	45.2	0.0	0.0	45.2	100.0
PHF	1.00	1.00	1.00			0.81	0.81	0.81			0.85	0.85	0.85			0.74	0.74	0.74			0.79



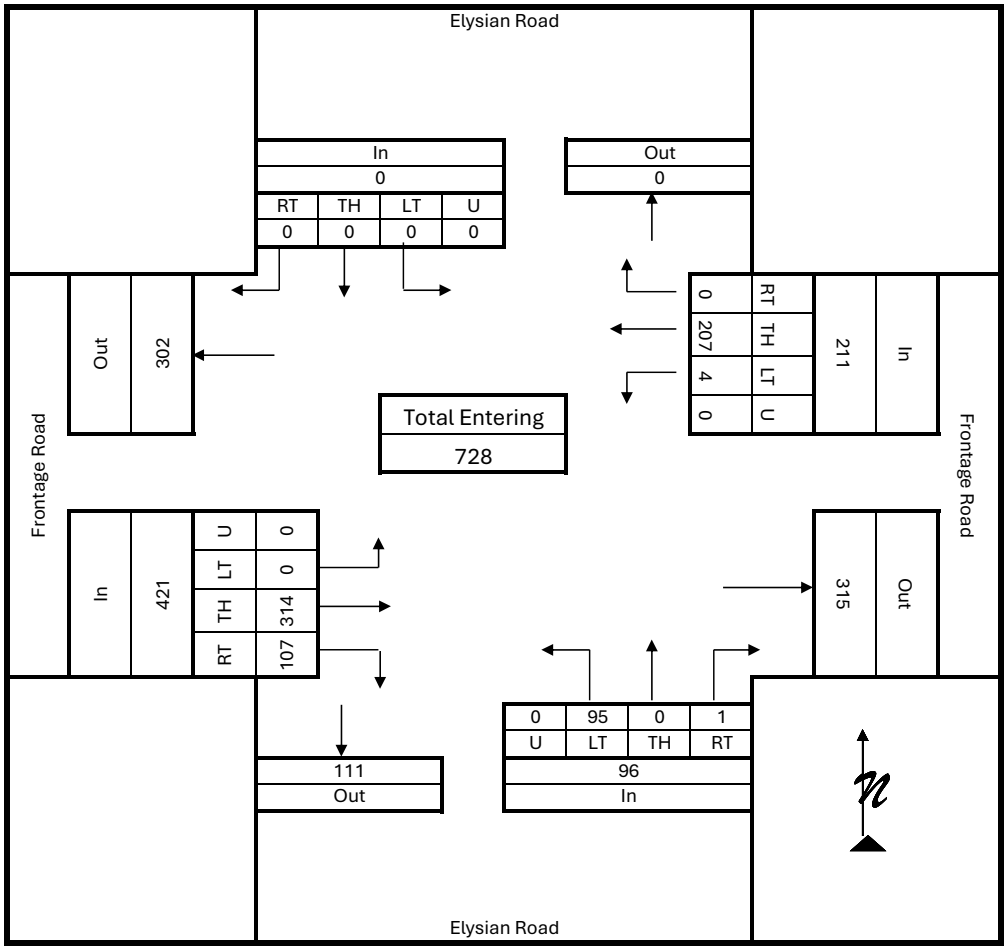
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Elysian Road/Frontage Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	PM Peak Hour (4:15 - 5:15 PM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Elysian Road	East/West Street:	Frontage Road

Vehicle Volumes and Adjustments

	Elysian Road Southbound					Elysian Road Northbound					Frontage Road Eastbound					Frontage Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
4:15 PM	0	0	0	0	0	0	0	15	0	15	21	80	0	0	101	0	43	2	0	45	161
4:30 PM	0	0	0	0	0	0	0	19	0	19	25	85	0	0	110	0	53	0	0	53	182
4:45 PM	0	0	0	0	0	0	0	29	0	29	32	63	0	0	95	0	44	0	0	44	168
5:00 PM	0	0	0	0	0	1	0	32	0	33	29	86	0	0	115	0	67	2	0	69	217
Grand Total	0	0	0	0	0	1	0	95	0	96	107	314	0	0	421	0	207	4	0	211	728
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	5.2	3.7	4.5	0.0	0.0	4.3	0.0	4.8	25.0	0.0	5.2	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.0	0.9	2.5	0.0	0.0	2.1	0.0	2.4	0.0	0.0	2.4	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	6.3	4.7	7.0	0.0	0.0	6.4	0.0	7.2	25.0	0.0	7.6	
Total %	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13.0	0.0	13.2	14.7	43.1	0.0	0.0	57.8	0.0	28.4	0.5	0.0	29.0	100.0
PHF	1.00	1.00	1.00			0.73	0.73	0.73			0.92	0.92	0.92			0.76	0.76	0.76			0.84



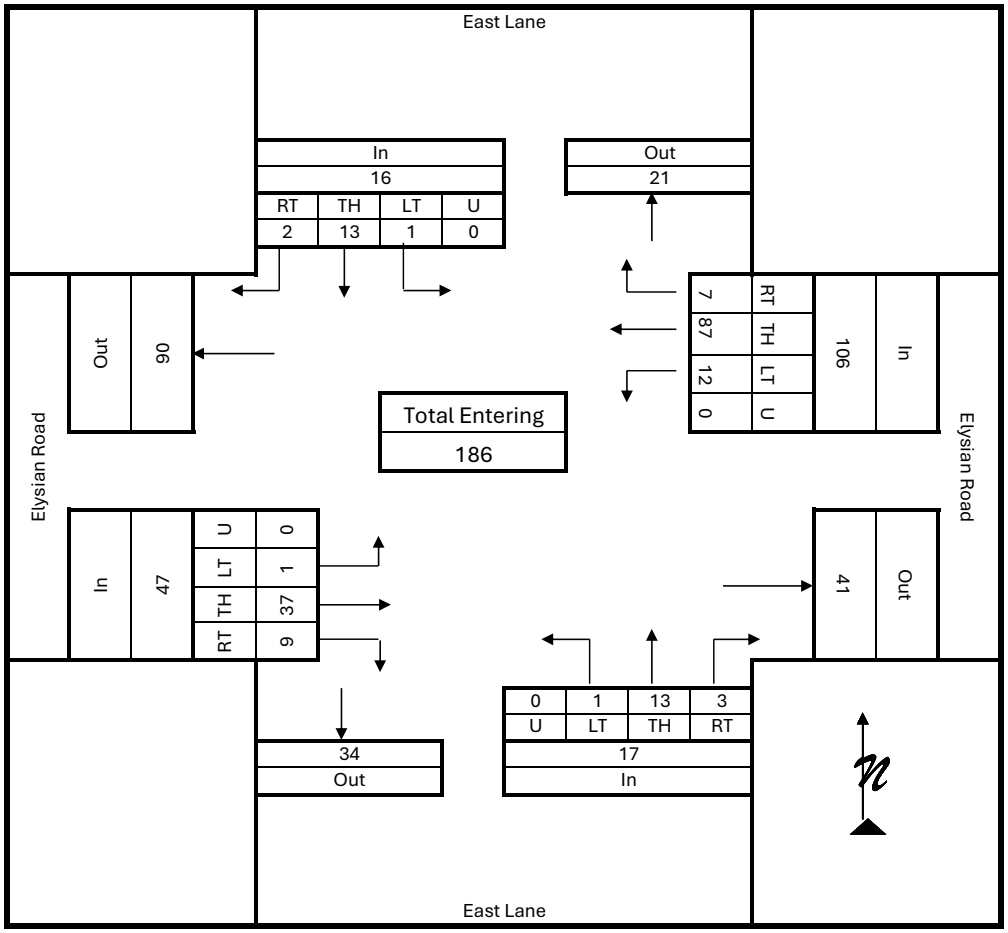
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Elysian Road/East Lane
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	East Lane	East/West Street:	Elysian Road

Vehicle Volumes and Adjustments

	East Lane Southbound					East Lane Northbound					Elysian Road Eastbound					Elysian Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
7:15 AM	0	1	0	0	1	1	3	0	0	4	0	10	0	0	10	1	27	4	0	32	47
7:30 AM	0	5	0	0	5	0	1	0	0	1	5	5	1	0	11	1	23	1	0	25	42
7:45 AM	1	3	0	0	4	2	1	1	0	4	0	11	0	0	11	4	25	2	0	31	50
8:00 AM	1	4	1	0	6	0	8	0	0	8	4	11	0	0	15	1	12	5	0	18	47
Grand Total	2	13	1	0	16	3	13	1	0	17	9	37	1	0	47	7	87	12	0	106	186
Medium Truck %	0.0	15.4	0.0	0.0	12.5	33.3	23.1	100.0	0.0	29.4	55.6	2.7	0.0	0.0	12.8	0.0	2.3	0.0	0.0	1.9	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	15.4	0.0	0.0	12.5	33.3	23.1	100.0	0.0	29.4	55.6	2.7	0.0	0.0	12.8	0.0	2.3	0.0	0.0	1.9	
Total %	1.1	7.0	0.5	0.0	8.6	1.6	7.0	0.5	0.0	9.1	4.8	19.9	0.5	0.0	25.3	3.8	46.8	6.5	0.0	57.0	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			0.85	0.85	0.85			0.93



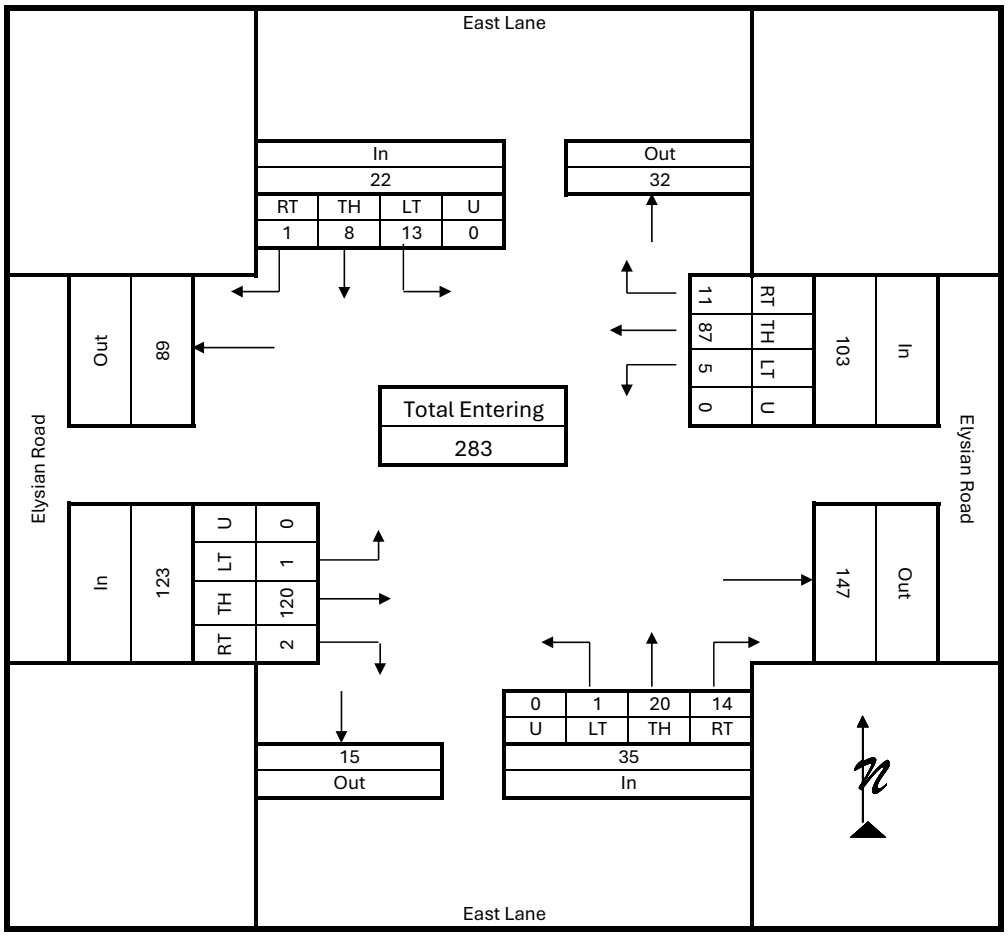
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Elysian Road/East Lane
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	PM Peak Hour (4:15 - 5:15 PM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	East Lane	East/West Street:	Elysian Road

Vehicle Volumes and Adjustments

	East Lane Southbound					East Lane Northbound					Elysian Road Eastbound					Elysian Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
4:15 PM	0	1	1	0	2	3	7	0	0	10	1	23	0	0	24	4	13	2	0	19	55
4:30 PM	1	3	6	0	10	6	5	1	0	12	1	32	0	0	33	2	21	1	0	24	79
4:45 PM	0	4	3	0	7	0	4	0	0	4	0	31	1	0	32	2	21	2	0	25	68
5:00 PM	0	0	3	0	3	5	4	0	0	9	0	34	0	0	34	3	32	0	0	35	81
Grand Total	1	8	13	0	22	14	20	1	0	35	2	120	1	0	123	11	87	5	0	103	283
Medium Truck %	0.0	12.5	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	2.4	0.0	2.3	0.0	0.0	1.9	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	2.9	0.0	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	12.5	0.0	0.0	4.5	0.0	5.0	0.0	0.0	2.9	0.0	3.3	0.0	0.0	3.3	0.0	2.3	0.0	0.0	1.9	
Total %	0.4	2.8	4.6	0.0	7.8	4.9	7.1	0.4	0.0	12.4	0.7	42.4	0.4	0.0	43.5	3.9	30.7	1.8	0.0	36.4	100.0
PHF	1.00	1.00	1.00			0.97	0.97	0.97			0.90	0.90	0.90			0.74	0.74	0.74			0.87



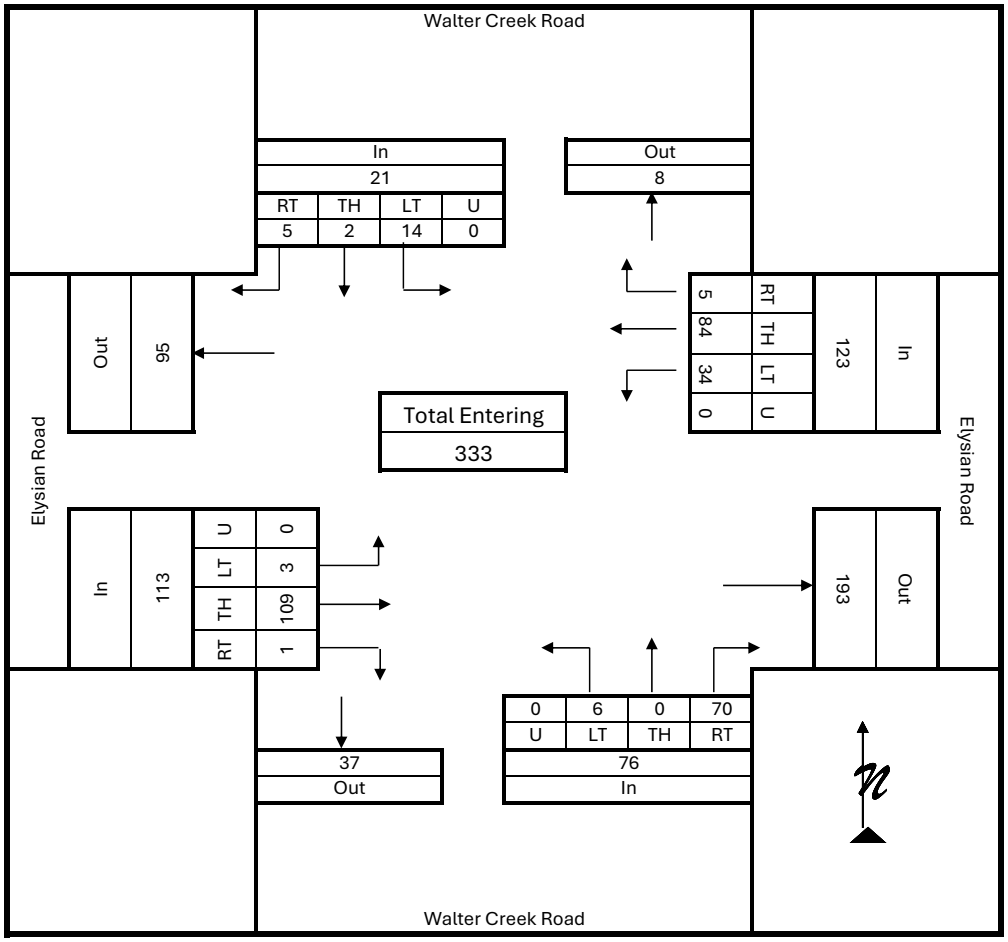
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Elysian Road/Walter Creek Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Walter Creek Road	East/West Street:	Elysian Road

Vehicle Volumes and Adjustments

	Walter Creek Road Southbound					Walter Creek Road Northbound					Elysian Road Eastbound					Elysian Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
7:15 AM	1	0	1	0	2	18	0	2	0	20	0	27	0	0	27	0	21	5	0	26	75
7:30 AM	1	1	6	0	8	17	0	0	0	17	0	21	0	0	21	3	20	8	0	31	77
7:45 AM	3	1	5	0	9	23	0	3	0	26	0	33	1	0	34	1	23	7	0	31	100
8:00 AM	0	0	2	0	2	12	0	1	0	13	1	28	2	0	31	1	20	14	0	35	81
Grand Total	5	2	14	0	21	70	0	6	0	76	1	109	3	0	113	5	84	34	0	123	333
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	33.3	0.0	2.7	0.0	2.4	2.9	0.0	2.4	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	33.3	0.0	2.7	0.0	2.4	2.9	0.0	2.4	
Total %	1.5	0.6	4.2	0.0	6.3	21.0	0.0	1.8	0.0	22.8	0.3	32.7	0.9	0.0	33.9	1.5	25.2	10.2	0.0	36.9	100.0
PHF	0.58	0.58	0.58			0.73	0.73	0.73			0.83	0.83	0.83			0.99	0.99	0.99			0.83



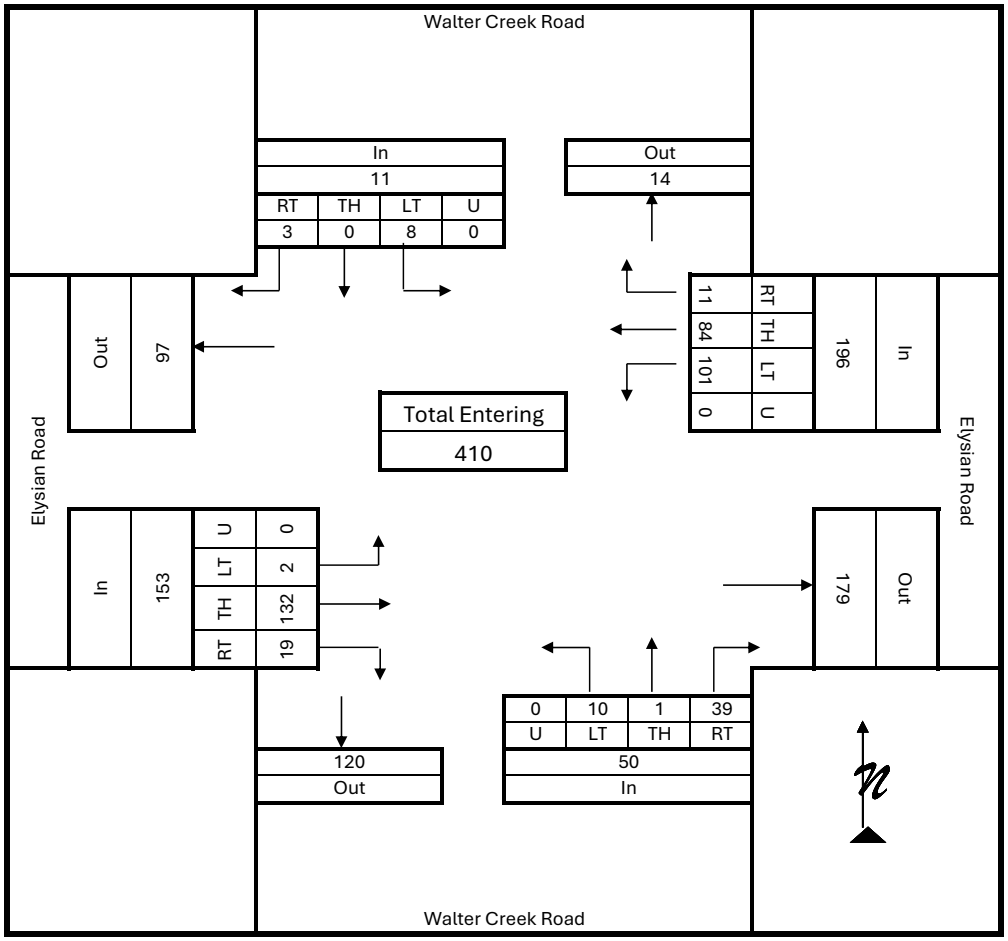
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Elysian Road/Walter Creek Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	PM Peak Hour (4:15 - 5:15 PM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Walter Creek Road	East/West Street:	Elysian Road

Vehicle Volumes and Adjustments

	Walter Creek Road Southbound					Walter Creek Road Northbound					Elysian Road Eastbound					Elysian Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
4:15 PM	0	0	3	0	3	11	1	3	0	15	3	26	0	0	29	2	18	23	0	43	90
4:30 PM	0	0	1	0	1	6	0	1	0	7	3	42	0	0	45	5	26	22	0	53	106
4:45 PM	2	0	1	0	3	11	0	3	0	14	6	31	2	0	39	2	18	28	0	48	104
5:00 PM	1	0	3	0	4	11	0	3	0	14	7	33	0	0	40	2	22	28	0	52	110
Grand Total	3	0	8	0	11	39	1	10	0	50	19	132	2	0	153	11	84	101	0	196	410
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	2.0	0.0	1.5	0.0	0.0	1.3	0.0	1.2	1.0	0.0	1.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	2.0	0.0	2.3	0.0	0.0	2.0	0.0	1.2	1.0	0.0	1.0	
Total %	0.7	0.0	2.0	0.0	2.7	9.5	0.2	2.4	0.0	12.2	4.6	32.2	0.5	0.0	37.3	2.7	20.5	24.6	0.0	47.8	100.0
PHF	0.69	0.69	0.69			0.89	0.89	0.89			0.96	0.96	0.96			0.94	0.94	0.94			0.93



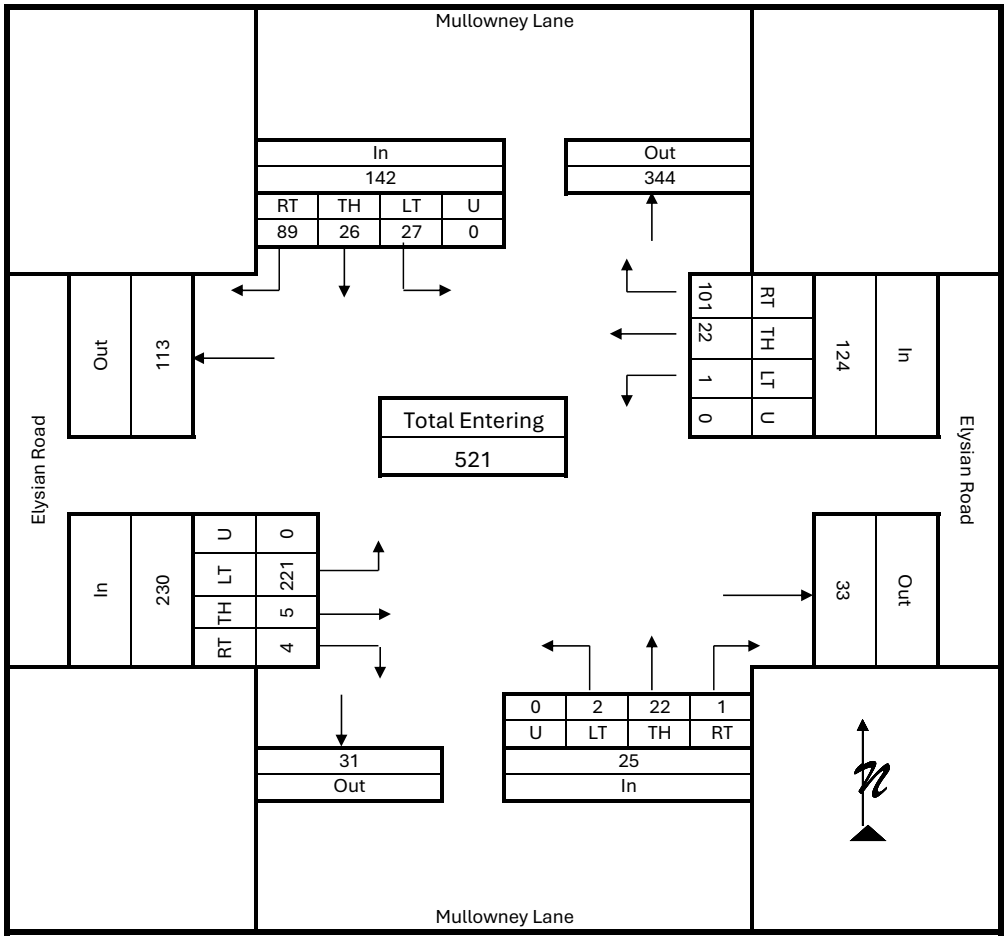
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Mullowney Lane/Elysian Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	AM Peak Hour (7:15 - 8:15 AM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Mullowney Lane	East/West Street:	Elysian Road

Vehicle Volumes and Adjustments

	Mullowney Lane Southbound					Mullowney Lane Northbound					Elysian Road Eastbound					Elysian Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
7:15 AM	20	3	4	0	27	0	6	0	0	6	1	0	52	0	53	24	6	0	0	30	116
7:30 AM	16	7	9	0	32	0	8	0	0	8	0	0	64	0	64	32	4	1	0	37	141
7:45 AM	26	6	5	0	37	0	3	2	0	5	2	2	61	0	65	32	7	0	0	39	146
8:00 AM	27	10	9	0	46	1	5	0	0	6	1	3	44	0	48	13	5	0	0	18	118
Grand Total	89	26	27	0	142	1	22	2	0	25	4	5	221	0	230	101	22	1	0	124	521
Medium Truck %	1.1	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.5	0.0	0.9	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	1.1	0.0	0.0	0.0	0.7	0.0	4.5	0.0	0.0	4.0	25.0	0.0	0.5	0.0	0.9	0.0	0.0	0.0	0.0	0.0	
Total %	17.1	5.0	5.2	0.0	27.3	0.2	4.2	0.4	0.0	4.8	0.8	1.0	42.4	0.0	44.1	19.4	4.2	0.2	0.0	23.8	100.0
PHF	0.96	0.96	0.96			1.00	1.00	1.00			0.88	0.88	0.88			0.79	0.79	0.79			0.89



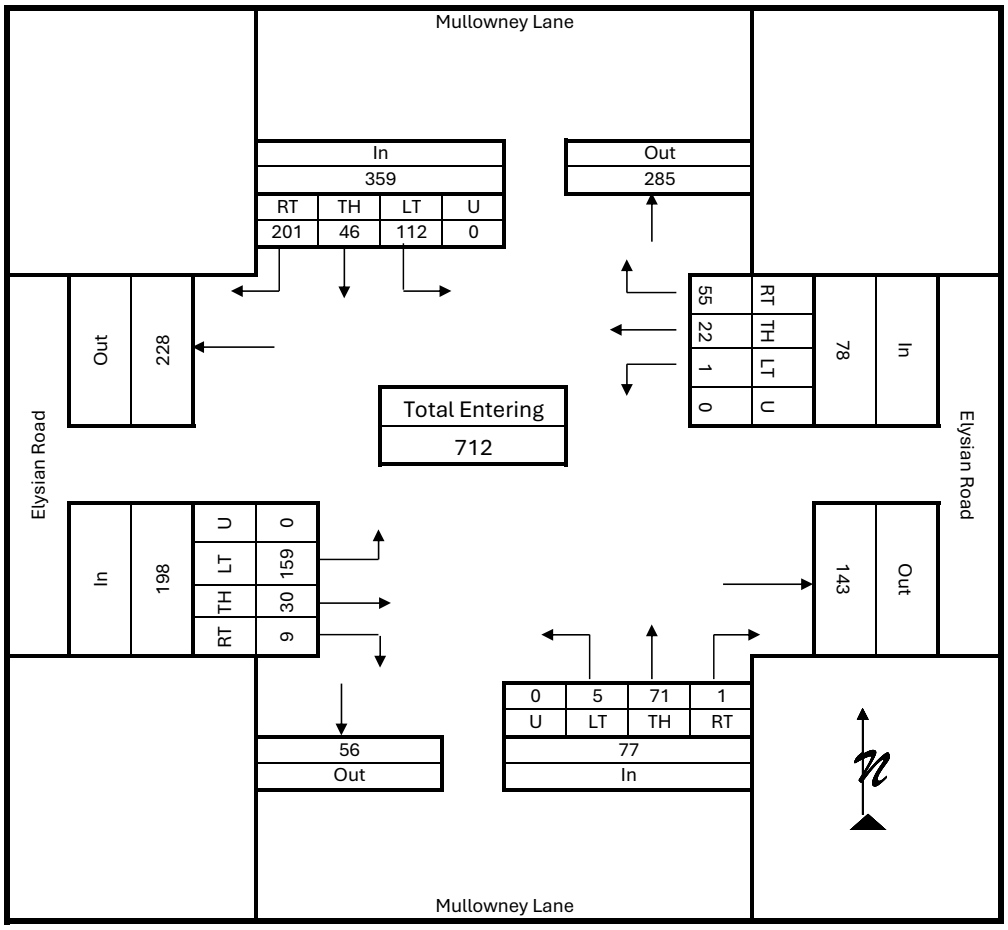
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Kole Ketterling	Intersection:	Mullowney Lane/Elysian Road
Agency/Company:	Sanbell		
Date Performed:	Tuesday, August 13, 2024	Jurisdiction:	City of Billings/MDT
Count Time Period:	PM Peak Hour (4:15 - 5:15 PM)		
Project Number:	16001.161	Project Description:	Annafeld Subdivision 6th Filing
North/South Street:	Mullowney Lane	East/West Street:	Elysian Road

Vehicle Volumes and Adjustments

	Mullowney Lane Southbound					Mullowney Lane Northbound					Elysian Road Eastbound					Elysian Road Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		0.99	0.99	0.99	0.99		
4:15 PM	41	8	28	0	77	1	13	2	0	16	1	10	36	0	47	7	3	0	0	10	150
4:30 PM	58	15	27	0	100	0	12	1	0	13	4	5	43	0	52	17	7	0	0	24	189
4:45 PM	52	12	31	0	95	0	20	1	0	21	1	8	37	0	46	16	4	1	0	21	183
5:00 PM	50	11	26	0	87	0	26	1	0	27	3	7	43	0	53	15	8	0	0	23	190
Grand Total	201	46	112	0	359	1	71	5	0	77	9	30	159	0	198	55	22	1	0	78	712
Medium Truck %	1.0	4.3	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	0.0	4.3	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	1.0	8.7	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	
Total %	28.2	6.5	15.7	0.0	50.4	0.1	10.0	0.7	0.0	10.8	1.3	4.2	22.3	0.0	27.8	7.7	3.1	0.1	0.0	11.0	100.0
PHF	1.00	1.00	1.00			0.71	0.71	0.71			0.93	0.93	0.93			0.85	0.85	0.85			0.94



ANNAFELD SIXTH FILING – TIS UPDATE

Project No. 16001.161

APPENDIX C
CAPACITY CALCULATIONS
WORKSHEETS

Intelligent Infrastructure.
Enduring Communities.

sanbell

Intersection	Approach	Existing (2024)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
Mullowney Lane & Midland Road/South Frontage Road	EB	35.1	D	4	25.6	C	7
	WB	33.8	C	3	21.5	C	3
	NB	12.2	B	7	19.2	B	7
	SB	5.9	A	3	10.8	B	6
	Intersection	16.1	B	--	17.4	B	--
Intersection Control		*One-Way Stop-Control (NB)*					
South Frontage Road & East Lane	EB	0.0	A	0	0.0	A	0
	WB	0.5	A	0	0.9	A	1
	NB	11.0	B	1	11.6	B	1
	Intersection	0.8	A	--	1.2	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Elysian Road & South Frontage Road	WB	13.4	B	1	17.5	C	2
	NB	0.0	A	0	0.0	A	0
	SB	0.0	A	0	0.2	A	0
	Intersection	2.3	A	--	2.4	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & East Lane	EB	0.2	A	0	0.1	A	0
	WB	0.8	A	0	0.4	A	0
	NB	10.2	B	1	10.3	B	1
	SB	10.1	B	1	10.8	B	0
	Intersection	2.3	A	--	2.3	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & Walter Creek Boulevard	EB	0.2	A	0	0.1	A	0
	WB	2.1	A	1	4.0	A	1
	NB	9.6	A	1	10.3	B	1
	SB	11.1	B	1	12.0	B	1
	Intersection	3.7	A	--	3.5	A	--
Intersection Control		*Signalized*					
Mullowney Lane & Elysian Road	EB	5.7	A	2	6.2	A	2
	WB	11.2	B	2	11.3	B	2
	NB	10.9	B	1	9.7	A	2
	SB	11.0	B	1	9.9	A	3
	Intersection	8.2	A	--	8.7	A	--

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	248	10	139	28	30	29	100
v/c Ratio	0.32	0.01	0.33	0.08	0.10	0.08	0.26
Control Delay (s/veh)	5.1	2.9	8.7	16.4	17.0	16.7	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.1	2.9	8.7	16.4	17.0	16.7	7.1
Queue Length 50th (ft)	21	1	5	5	6	5	0
Queue Length 95th (ft)	46	4	42	23	25	24	30
Internal Link Dist (ft)		2570	797	465		2233	
Turn Bay Length (ft)	150				80		150
Base Capacity (vph)	1045	1476	1486	1447	1350	1566	1329
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.01	0.09	0.02	0.02	0.02	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	5	4	1	22	101	2	22	1	27	26	89
Future Volume (veh/h)	221	5	4	1	22	101	2	22	1	27	26	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	0.99		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1750	1409	1750	1750	1750	1750	1682	1750	1750	1750	1736
Adj Flow Rate, veh/h	248	6	4	1	25	113	2	25	1	30	29	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	0	25	0	0	0	0	5	0	0	0	1
Cap, veh/h	871	508	339	139	40	179	157	153	6	421	180	
Arrive On Green	0.17	0.52	0.52	0.15	0.15	0.15	0.10	0.10	0.10	0.10	0.10	0.00
Sat Flow, veh/h	1654	978	652	6	277	1229	94	1493	59	1388	1750	1471
Grp Volume(v), veh/h	248	0	10	139	0	0	28	0	0	30	29	0
Grp Sat Flow(s),veh/h/ln	1654	0	1630	1512	0	0	1646	0	0	1388	1750	1471
Q Serve(g_s), s	2.8	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Cycle Q Clear(g_c), s	2.8	0.0	0.1	2.3	0.0	0.0	0.4	0.0	0.0	0.4	0.4	0.0
Prop In Lane	1.00		0.40	0.01		0.81	0.07		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	871	0	847	358	0	0	316	0	0	421	180	
V/C Ratio(X)	0.28	0.00	0.01	0.39	0.00	0.00	0.09	0.00	0.00	0.07	0.16	
Avail Cap(c_a), veh/h	1828	0	2466	2425	0	0	2361	0	0	2152	2362	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.7	0.0	3.0	10.5	0.0	0.0	10.7	0.0	0.0	10.8	10.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	0.1	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	5.8	0.0	3.0	11.2	0.0	0.0	10.9	0.0	0.0	10.8	11.2	0.0
LnGrp LOS	A		A	B			B			B	B	
Approach Vol, veh/h		258			139			28			59	
Approach Delay, s/veh		5.7			11.2			10.9			11.0	
Approach LOS		A			B			B			B	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		7.3		18.9		7.3	9.8	9.1				
Change Period (Y+Rc), s		* 4.6		5.3		* 4.6	5.3	5.3				
Max Green Setting (Gmax), s		* 35		39.7		* 35	19.7	39.7				
Max Q Clear Time (g_c+I1), s		2.4		2.1		2.4	4.8	4.3				
Green Ext Time (p_c), s		0.1		0.0		0.2	0.6	0.9				

Intersection Summary	
HCM 7th Control Delay, s/veh	8.2
HCM 7th LOS	A

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	87	0	135	51	0	225
Future Vol, veh/h	87	0	135	51	0	225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	3	0	12	12	0	9
Mvmt Flow	110	0	171	65	0	285

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	488	203	0	0	235	0
Stage 1	203	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.43	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	537	843	-	-	1344	-
Stage 1	829	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	537	843	-	-	1344	-
Mov Cap-2 Maneuver	537	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	761	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s/v	13.42	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	537	1344	-
HCM Lane V/C Ratio	-	-	0.205	-	-
HCM Control Delay (s/veh)	-	-	13.4	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	37	9	12	87	7	1	13	3	1	13	2
Future Vol, veh/h	1	37	9	12	87	7	1	13	3	1	13	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	56	0	2	0	100	23	33	0	15	0
Mvmt Flow	1	40	10	13	94	8	1	14	3	1	14	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	101	0	0	49	0	0	173	174	45	172	175	97
Stage 1	-	-	-	-	-	-	47	47	-	123	123	-
Stage 2	-	-	-	-	-	-	126	127	-	49	52	-
Critical Hdwy	4.1	-	-	4.1	-	-	8.1	6.73	6.53	7.1	6.65	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.73	-	6.1	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.73	-	6.1	5.65	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	4.4	4.207	3.597	3.5	4.135	3.3
Pot Cap-1 Maneuver	1504	-	-	1570	-	-	615	683	944	796	696	964
Stage 1	-	-	-	-	-	-	768	816	-	886	770	-
Stage 2	-	-	-	-	-	-	688	752	-	969	827	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1504	-	-	1570	-	-	596	677	944	769	689	964
Mov Cap-2 Maneuver	-	-	-	-	-	-	596	677	-	769	689	-
Stage 1	-	-	-	-	-	-	767	816	-	878	763	-
Stage 2	-	-	-	-	-	-	668	746	-	949	826	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.16	0.83	10.23	10.13
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	706	37	-	-	201	-	-	720
HCM Lane V/C Ratio	0.026	0.001	-	-	0.008	-	-	0.024
HCM Control Delay (s/veh)	10.2	7.4	0	-	7.3	0	-	10.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	8	11	139	2	16	241
Future Vol, veh/h	8	11	139	2	16	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	25	0	10	50	6	9
Mvmt Flow	11	15	185	3	21	321

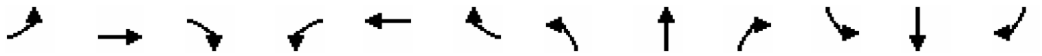
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	551	187	0	0	188	0
Stage 1	187	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Critical Hdwy	6.65	6.2	-	-	4.16	-
Critical Hdwy Stg 1	5.65	-	-	-	-	-
Critical Hdwy Stg 2	5.65	-	-	-	-	-
Follow-up Hdwy	3.725	3.3	-	-	2.254	-
Pot Cap-1 Maneuver	458	861	-	-	1362	-
Stage 1	793	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	450	861	-	-	1362	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	793	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s/v	11.04	0	0.48
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	621	112	-
HCM Lane V/C Ratio	-	-	0.041	0.016	-
HCM Control Delay (s/veh)	-	-	11	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	121	92	52	85	168	47	623	124	555
v/c Ratio	0.60	0.33	0.25	0.31	0.44	0.13	0.35	0.23	0.25
Control Delay (s/veh)	44.9	22.7	31.7	32.8	8.2	13.4	12.5	5.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.9	22.7	31.7	32.8	8.2	13.4	12.5	5.8	4.4
Queue Length 50th (ft)	65	30	26	43	0	11	89	16	32
Queue Length 95th (ft)	96	57	47	68	38	37	160	48	73
Internal Link Dist (ft)		1262		599			350		377
Turn Bay Length (ft)	300		200		175	100		200	
Base Capacity (vph)	378	495	395	509	569	364	1789	563	2201
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.19	0.13	0.17	0.30	0.13	0.35	0.22	0.25

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	50	28	44	72	143	40	495	35	105	317	155
Future Volume (veh/h)	103	50	28	44	72	143	40	495	35	105	317	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1641	1641	1354	1723	1559	1641	1477	1695	1750	1654	1709	1695
Adj Flow Rate, veh/h	121	59	33	52	85	168	47	582	41	124	373	182
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	29	2	14	8	20	4	0	7	3	4
Cap, veh/h	243	196	110	272	310	275	481	1676	118	588	1463	703
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.55	0.55	0.55	0.11	0.69	0.69
Sat Flow, veh/h	1068	985	551	1297	1559	1380	731	3052	215	1576	2125	1021
Grp Volume(v), veh/h	121	0	92	52	85	168	47	307	316	124	284	271
Grp Sat Flow(s),veh/h/ln	1068	0	1537	1297	1559	1380	731	1611	1656	1576	1624	1522
Q Serve(g_s), s	9.7	0.0	4.6	3.2	4.2	10.0	2.8	9.5	9.6	2.5	5.9	6.1
Cycle Q Clear(g_c), s	13.9	0.0	4.6	7.8	4.2	10.0	2.8	9.5	9.6	2.5	5.9	6.1
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.13	1.00		0.67
Lane Grp Cap(c), veh/h	243	0	306	272	310	275	481	885	909	588	1118	1048
V/C Ratio(X)	0.50	0.00	0.30	0.19	0.27	0.61	0.10	0.35	0.35	0.21	0.25	0.26
Avail Cap(c_a), veh/h	385	0	511	445	518	458	481	885	909	631	1118	1048
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	30.7	34.0	30.5	32.9	9.8	11.3	11.3	6.0	5.3	5.3
Incr Delay (d2), s/veh	1.6	0.0	0.5	0.3	0.5	2.2	0.4	1.1	1.1	0.2	0.5	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	1.7	1.0	1.6	3.4	0.5	3.4	3.5	0.7	1.8	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	38.0	0.0	31.2	34.4	31.0	35.1	10.2	12.4	12.4	6.1	5.8	5.9
LnGrp LOS	D		C	C	C	D	B	B	B	A	A	A
Approach Vol, veh/h		213			305			670			679	
Approach Delay, s/veh		35.1			33.8			12.2			5.9	
Approach LOS		D			C			B			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.5	54.4		23.0		67.0		23.0				
Change Period (Y+Rc), s	3.0	5.0		5.1		5.0		5.1				
Max Green Setting (Gmax), s	12.0	35.0		29.9		50.0		29.9				
Max Q Clear Time (g_c+I1), s	4.5	11.6		15.9		8.1		12.0				
Green Ext Time (p_c), s	0.2	4.2		0.8		3.7		1.1				

Intersection Summary												
HCM 7th Control Delay, s/veh			16.1									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	109	1	34	84	5	6	0	70	14	2	5
Future Vol, veh/h	3	109	1	34	84	5	6	0	70	14	2	5
Conflicting Peds, #/hr	4	0	6	6	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	33	2	0	3	2	0	0	0	0	0	0	0
Mvmt Flow	4	131	1	41	101	6	7	0	84	17	2	6

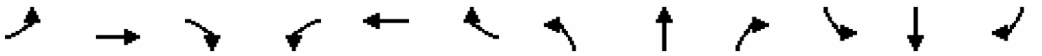
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	111	0	0	139	0	0	329	338	138	329	336	108
Stage 1	-	-	-	-	-	-	145	145	-	190	190	-
Stage 2	-	-	-	-	-	-	184	193	-	139	146	-
Critical Hdwy	4.43	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.497	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1306	-	-	1439	-	-	628	586	916	628	588	951
Stage 1	-	-	-	-	-	-	862	781	-	816	747	-
Stage 2	-	-	-	-	-	-	822	744	-	869	780	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1301	-	-	1431	-	-	598	562	911	550	564	947
Mov Cap-2 Maneuver	-	-	-	-	-	-	598	562	-	550	564	-
Stage 1	-	-	-	-	-	-	855	774	-	790	723	-
Stage 2	-	-	-	-	-	-	791	720	-	787	774	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.21	2.1	9.6	11.13
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	874	1301	-	-	1431	-	-	613
HCM Lane V/C Ratio	0.105	0.003	-	-	0.029	-	-	0.041
HCM Control Delay (s/veh)	9.6	7.8	-	-	7.6	-	-	11.1
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.1

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	169	42	83	82	119	49	214
v/c Ratio	0.26	0.06	0.23	0.17	0.35	0.11	0.38
Control Delay (s/veh)	6.9	4.6	10.5	14.4	17.5	14.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.9	4.6	10.5	14.4	17.5	14.2	5.2
Queue Length 50th (ft)	17	3	5	15	23	9	0
Queue Length 95th (ft)	47	14	36	47	68	32	40
Internal Link Dist (ft)		2570	797	465		2235	
Turn Bay Length (ft)	150				80		150
Base Capacity (vph)	1071	1635	1463	1496	1063	1397	1309
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.06	0.05	0.11	0.04	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	30	9	1	22	55	5	71	1	112	46	201
Future Volume (veh/h)	159	30	9	1	22	55	5	71	1	112	46	201
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.99		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1600	1750	1750	1750	1750	1750	1750	1750	1627	1736
Adj Flow Rate, veh/h	169	32	10	1	23	59	5	76	1	119	49	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	11	0	0	0	0	0	0	0	9	1
Cap, veh/h	798	577	180	140	51	130	155	282	4	514	278	
Arrive On Green	0.13	0.45	0.45	0.12	0.12	0.12	0.17	0.17	0.17	0.17	0.17	0.00
Sat Flow, veh/h	1667	1271	397	13	434	1099	57	1652	21	1334	1627	1471
Grp Volume(v), veh/h	169	0	42	83	0	0	82	0	0	119	49	0
Grp Sat Flow(s),veh/h/ln	1667	0	1668	1545	0	0	1730	0	0	1334	1627	1471
Q Serve(g_s), s	2.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.8	0.7	0.0
Cycle Q Clear(g_c), s	2.0	0.0	0.4	1.3	0.0	0.0	1.1	0.0	0.0	1.9	0.7	0.0
Prop In Lane	1.00		0.24	0.01		0.71	0.06		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	798	0	757	320	0	0	440	0	0	514	278	
V/C Ratio(X)	0.21	0.00	0.06	0.26	0.00	0.00	0.19	0.00	0.00	0.23	0.18	
Avail Cap(c_a), veh/h	1819	0	2512	2463	0	0	2452	0	0	2077	2185	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.6	0.0	4.0	10.8	0.0	0.0	9.5	0.0	0.0	9.8	9.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.2	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.4	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.7	0.0	4.1	11.3	0.0	0.0	9.7	0.0	0.0	10.0	9.6	0.0
LnGrp LOS	A		A	B			A			B	A	
Approach Vol, veh/h		211			83			82			168	
Approach Delay, s/veh		6.2			11.3			9.7			9.9	
Approach LOS		A			B			A			A	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		9.1		17.3		9.1	8.8	8.4				
Change Period (Y+Rc), s		* 4.6		5.3		* 4.6	5.3	5.3				
Max Green Setting (Gmax), s		* 35		39.7		* 35	19.7	39.7				
Max Q Clear Time (g_c+I1), s		3.1		2.4		3.9	4.0	3.3				
Green Ext Time (p_c), s		0.4		0.2		0.6	0.4	0.5				

Intersection Summary	
HCM 7th Control Delay, s/veh	8.7
HCM 7th LOS	A

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	95	1	314	107	4	207
Future Vol, veh/h	95	1	314	107	4	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	6	0	7	5	25	7
Mvmt Flow	113	1	374	127	5	246

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	693	438	0	0	501	0
Stage 1	438	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Critical Hdwy	6.46	6.2	-	-	4.35	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.3	-	-	2.425	-
Pot Cap-1 Maneuver	403	623	-	-	955	-
Stage 1	642	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	401	623	-	-	955	-
Mov Cap-2 Maneuver	401	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	773	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s/v	17.46	0	0.17
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	402	34	-
HCM Lane V/C Ratio	-	-	0.284	0.005	-
HCM Control Delay (s/veh)	-	-	17.5	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	120	2	5	87	11	1	20	14	13	8	1
Future Vol, veh/h	1	120	2	5	87	11	1	20	14	13	8	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	3	0	0	2	0	0	5	0	0	13	0
Mvmt Flow	1	138	2	6	100	13	1	23	16	15	9	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	113	0	0	140	0	0	257	266	139	270	260	106
Stage 1	-	-	-	-	-	-	141	141	-	118	118	-
Stage 2	-	-	-	-	-	-	116	124	-	152	143	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.55	6.2	7.1	6.63	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.55	-	6.1	5.63	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.55	-	6.1	5.63	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.045	3.3	3.5	4.117	3.3
Pot Cap-1 Maneuver	1489	-	-	1455	-	-	700	635	914	687	626	953
Stage 1	-	-	-	-	-	-	866	774	-	892	777	-
Stage 2	-	-	-	-	-	-	893	787	-	856	758	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1489	-	-	1455	-	-	685	632	914	647	623	953
Mov Cap-2 Maneuver	-	-	-	-	-	-	685	632	-	647	623	-
Stage 1	-	-	-	-	-	-	866	773	-	888	774	-
Stage 2	-	-	-	-	-	-	878	784	-	815	758	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.06	0.36	10.27	10.79
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	723	15	-	-	85	-	-	647
HCM Lane V/C Ratio	0.056	0.001	-	-	0.004	-	-	0.039
HCM Control Delay (s/veh)	10.3	7.4	0	-	7.5	0	-	10.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	10	38	324	10	27	223
Future Vol, veh/h	10	38	324	10	27	223
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	3	7	0	4	3
Mvmt Flow	11	42	360	11	30	248

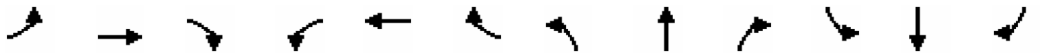
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	673	366	0	0	371	0
Stage 1	366	-	-	-	-	-
Stage 2	308	-	-	-	-	-
Critical Hdwy	6.4	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	423	677	-	-	1176	-
Stage 1	706	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	411	677	-	-	1176	-
Mov Cap-2 Maneuver	411	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	728	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s/v	11.62	0	0.88
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	597	194	-
HCM Lane V/C Ratio	-	-	0.089	0.026	-
HCM Control Delay (s/veh)	-	-	11.6	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	242	182	75	109	186	28	584	209	732
v/c Ratio	0.76	0.42	0.27	0.23	0.35	0.12	0.44	0.42	0.40
Control Delay (s/veh)	39.4	22.0	21.4	20.2	4.9	19.6	18.8	10.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	39.4	22.0	21.4	20.2	4.9	19.6	18.8	10.6	9.2
Queue Length 50th (ft)	102	63	27	39	0	8	96	39	77
Queue Length 95th (ft)	155	99	51	65	35	29	165	87	138
Internal Link Dist (ft)		1262		599			348		377
Turn Bay Length (ft)	300		200		175	100		200	
Base Capacity (vph)	430	582	378	632	648	236	1320	510	1846
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.31	0.20	0.17	0.29	0.12	0.44	0.41	0.40

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	137	23	66	96	164	25	467	47	184	500	144
Future Volume (veh/h)	213	137	23	66	96	164	25	467	47	184	500	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1627	1450	1682	1709	1695	1586	1736	1750	1682	1723	1627
Adj Flow Rate, veh/h	242	156	26	75	109	186	28	531	53	209	568	164
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	4	9	22	5	3	4	12	1	0	5	2	9
Cap, veh/h	373	417	70	351	525	441	354	1169	116	514	1392	401
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.39	0.39	0.39	0.13	0.56	0.56
Sat Flow, veh/h	1066	1360	227	1173	1709	1435	666	3022	301	1602	2493	717
Grp Volume(v), veh/h	242	0	182	75	109	186	28	289	295	209	372	360
Grp Sat Flow(s),veh/h/ln	1066	0	1586	1173	1709	1435	666	1650	1674	1602	1637	1574
Q Serve(g_s), s	16.3	0.0	6.7	4.0	3.5	7.7	2.0	9.8	9.8	5.1	9.7	9.8
Cycle Q Clear(g_c), s	19.8	0.0	6.7	10.7	3.5	7.7	2.0	9.8	9.8	5.1	9.7	9.8
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.18	1.00		0.46
Lane Grp Cap(c), veh/h	373	0	487	351	525	441	354	638	647	514	914	879
V/C Ratio(X)	0.65	0.00	0.37	0.21	0.21	0.42	0.08	0.45	0.46	0.41	0.41	0.41
Avail Cap(c_a), veh/h	442	0	590	427	636	534	354	638	647	559	914	879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	0.0	20.3	24.6	19.2	20.7	14.7	17.1	17.1	10.2	9.5	9.5
Incr Delay (d2), s/veh	2.5	0.0	0.5	0.3	0.2	0.6	0.4	2.3	2.3	0.5	1.3	1.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	2.4	1.1	1.3	2.5	0.3	3.8	3.9	1.6	3.3	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.1	0.0	20.8	24.9	19.4	21.3	15.2	19.4	19.4	10.7	10.8	10.9
LnGrp LOS	C		C	C	B	C	B	B	B	B	B	B
Approach Vol, veh/h		424			370			612			941	
Approach Delay, s/veh		25.6			21.5			19.2			10.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.9	34.0		28.1		46.9		28.1				
Change Period (Y+Rc), s	3.0	5.0		5.1		5.0		5.1				
Max Green Setting (Gmax), s	12.0	22.0		27.9		37.0		27.9				
Max Q Clear Time (g_c+I1), s	7.1	11.8		21.8		11.8		12.7				
Green Ext Time (p_c), s	0.2	2.6		1.1		4.8		1.3				

Intersection Summary												
HCM 7th Control Delay, s/veh			17.4									
HCM 7th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	132	19	101	84	11	10	1	39	8	0	3
Future Vol, veh/h	2	132	19	101	84	11	10	1	39	8	0	3
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	2	0	1	1	0	10	0	0	0	0	0
Mvmt Flow	2	142	20	109	90	12	11	1	42	9	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	102	0	0	166	0	0	468	480	158	462	484	96
Stage 1	-	-	-	-	-	-	160	160	-	313	313	-
Stage 2	-	-	-	-	-	-	308	319	-	149	171	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.2	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.2	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.2	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.59	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1503	-	-	1418	-	-	492	488	892	513	486	966
Stage 1	-	-	-	-	-	-	823	769	-	702	660	-
Stage 2	-	-	-	-	-	-	686	656	-	859	761	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1503	-	-	1412	-	-	450	448	887	449	446	966
Mov Cap-2 Maneuver	-	-	-	-	-	-	450	448	-	449	446	-
Stage 1	-	-	-	-	-	-	819	765	-	648	609	-
Stage 2	-	-	-	-	-	-	631	606	-	814	757	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.1	4	10.31	12.01
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	731	1503	-	-	1412	-	-	526
HCM Lane V/C Ratio	0.074	0.001	-	-	0.077	-	-	0.023
HCM Control Delay (s/veh)	10.3	7.4	-	-	7.8	-	-	12
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.2	-	-	0.1

Intersection	Approach	Phase 1 (2028)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
Mullowney Lane & Midland Road/South Frontage Road	EB	34.5	C	5	25.3	C	8
	WB	32.7	C	3	20.3	C	3
	NB	13.9	B	9	23.9	C	9
	SB	6.7	A	4	13.6	B	8
	Intersection	16.6	B	--	19.4	B	--
Intersection Control		*One-Way Stop-Control (NB)*					
South Frontage Road & East Lane	EB	0.0	A	0	0.0	A	0
	WB	0.6	A	1	1.1	A	1
	NB	10.2	B	1	12.2	B	1
	Intersection	1.1	A	--	1.5	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Elysian Road & South Frontage Road	WB	14.0	B	1	19.6	C	2
	NB	0.0	A	0	0.0	A	0
	SB	0.6	A	0	0.7	A	1
	Intersection	2.9	A	--	3.2	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & East Lane	EB	0.1	A	0	0.0	A	0
	WB	0.7	A	0	0.3	A	0
	NB	10.7	B	1	10.9	B	1
	SB	10.6	B	1	11.6	B	1
	Intersection	2.5	A	--	2.5	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & Walter Creek Boulevard	EB	0.1	A	0	0.1	A	0
	WB	1.7	A	1	2.8	A	1
	NB	10.4	B	1	11.8	B	1
	SB	12.6	B	1	15.5	C	1
	Intersection	3.0	A	--	2.8	A	--
Intersection Control		*Signalized*					
Mullowney Lane & Elysian Road	EB	5.8	A	4	6.5	A	4
	WB	12.8	B	2	12.4	B	2
	NB	12.6	B	2	10.8	B	3
	SB	12.8	B	2	11.0	B	4
	Intersection	8.6	A	--	9.2	A	--

Queues
3: Elysian Rd & Mullowney Ln

10/15/2024

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	370	12	152	30	33	32	150
v/c Ratio	0.46	0.01	0.39	0.10	0.13	0.10	0.38
Control Delay (s/veh)	6.0	2.7	10.0	18.5	19.4	18.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.0	2.7	10.0	18.5	19.4	18.8	7.9
Queue Length 50th (ft)	34	1	6	6	7	7	0
Queue Length 95th (ft)	76	4	48	26	29	28	39
Internal Link Dist (ft)		2570	797	465		2233	
Turn Bay Length (ft)	150				80		150
Base Capacity (vph)	1020	1493	1416	1358	1176	1454	1249
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.01	0.11	0.02	0.03	0.02	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	6	5	1	25	114	2	25	1	30	29	138
Future Volume (veh/h)	340	6	5	1	25	114	2	25	1	30	29	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	0.99		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1750	1477	1750	1750	1750	1750	1695	1750	1750	1750	1736
Adj Flow Rate, veh/h	370	7	5	1	27	124	2	27	1	33	32	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	0	20	0	0	0	0	4	0	0	0	1
Cap, veh/h	917	542	387	119	43	195	134	158	6	384	181	
Arrive On Green	0.24	0.57	0.57	0.16	0.16	0.16	0.10	0.10	0.10	0.10	0.10	0.00
Sat Flow, veh/h	1654	948	677	5	274	1231	77	1532	55	1386	1750	1471
Grp Volume(v), veh/h	370	0	12	152	0	0	30	0	0	33	32	0
Grp Sat Flow(s),veh/h/ln	1654	0	1625	1509	0	0	1664	0	0	1386	1750	1471
Q Serve(g_s), s	4.7	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.0
Cycle Q Clear(g_c), s	4.7	0.0	0.1	2.9	0.0	0.0	0.5	0.0	0.0	0.6	0.5	0.0
Prop In Lane	1.00		0.42	0.01		0.82	0.07		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	917	0	930	358	0	0	298	0	0	384	181	
V/C Ratio(X)	0.40	0.00	0.01	0.42	0.00	0.00	0.10	0.00	0.00	0.09	0.18	
Avail Cap(c_a), veh/h	1588	0	2115	2081	0	0	2047	0	0	1848	2030	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.6	0.0	2.8	12.0	0.0	0.0	12.5	0.0	0.0	12.5	12.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.8	0.0	0.0	0.1	0.0	0.0	0.1	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	5.9	0.0	2.8	12.8	0.0	0.0	12.6	0.0	0.0	12.6	13.0	0.0
LnGrp LOS	A		A	B			B			B	B	
Approach Vol, veh/h		382			152			30			65	
Approach Delay, s/veh		5.8			12.8			12.6			12.8	
Approach LOS		A			B			B			B	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		7.8		22.8		7.8	12.6	10.1				
Change Period (Y+Rc), s		* 4.6		5.3		* 4.6	5.3	5.3				
Max Green Setting (Gmax), s		* 35		39.7		* 35	19.7	39.7				
Max Q Clear Time (g_c+I1), s		2.5		2.1		2.6	6.7	4.9				
Green Ext Time (p_c), s		0.1		0.0		0.2	0.9	0.9				

Intersection Summary	
HCM 7th Control Delay, s/veh	8.6
HCM 7th LOS	A

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	105	7	152	60	20	253
Future Vol, veh/h	105	7	152	60	20	253
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	0	10	10	0	7
Mvmt Flow	114	8	165	65	22	275

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	516	198	0	0	230	0
Stage 1	198	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Critical Hdwy	6.43	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	517	848	-	-	1349	-
Stage 1	833	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	507	848	-	-	1349	-
Mov Cap-2 Maneuver	507	-	-	-	-	-
Stage 1	833	-	-	-	-	-
Stage 2	721	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s/v	14.02	0	0.56
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	520	132	-
HCM Lane V/C Ratio	-	-	0.234	0.016	-
HCM Control Delay (s/veh)	-	-	14	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	49	13	14	121	15	5	21	3	4	16	2
Future Vol, veh/h	1	49	13	14	121	15	5	21	3	4	16	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	3	40	0	2	0	25	12	33	0	10	0
Mvmt Flow	1	53	14	15	132	16	5	23	3	4	17	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	148	0	0	67	0	0	233	241	60	237	240	140
Stage 1	-	-	-	-	-	-	63	63	-	170	170	-
Stage 2	-	-	-	-	-	-	171	178	-	67	70	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.35	6.62	6.53	7.1	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.35	5.62	-	6.1	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.35	5.62	-	6.1	5.6	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.725	4.108	3.597	3.5	4.09	3.3
Pot Cap-1 Maneuver	1446	-	-	1547	-	-	676	644	924	722	648	914
Stage 1	-	-	-	-	-	-	894	824	-	837	743	-
Stage 2	-	-	-	-	-	-	780	733	-	949	822	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1446	-	-	1547	-	-	648	636	924	686	640	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	648	636	-	686	640	-
Stage 1	-	-	-	-	-	-	893	823	-	828	735	-
Stage 2	-	-	-	-	-	-	752	725	-	918	821	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.12	0.69	10.73	10.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	660	27	-	-	164	-	-	667
HCM Lane V/C Ratio	0.048	0.001	-	-	0.01	-	-	0.036
HCM Control Delay (s/veh)	10.7	7.5	0	-	7.4	0	-	10.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.1

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	9	26	156	2	21	271
Future Vol, veh/h	9	26	156	2	21	271
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	20	0	8	50	5	7
Mvmt Flow	10	28	170	2	23	295

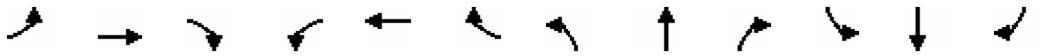
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	511	171	0	0	172	0
Stage 1	171	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Critical Hdwy	6.6	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	492	878	-	-	1387	-
Stage 1	818	-	-	-	-	-
Stage 2	682	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	483	878	-	-	1387	-
Mov Cap-2 Maneuver	483	-	-	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	669	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s/v	10.24	0	0.55
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	725	129	-
HCM Lane V/C Ratio	-	-	0.052	0.016	-
HCM Control Delay (s/veh)	-	-	10.2	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	138	98	64	89	175	49	746	128	609
v/c Ratio	0.64	0.33	0.29	0.31	0.43	0.14	0.42	0.27	0.28
Control Delay (s/veh)	46.0	22.6	32.1	31.9	7.8	13.9	13.7	6.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	46.0	22.6	32.1	31.9	7.8	13.9	13.7	6.4	5.0
Queue Length 50th (ft)	74	32	32	44	0	12	115	18	41
Queue Length 95th (ft)	116	65	59	75	46	42	213	52	94
Internal Link Dist (ft)		1262		599			350		377
Turn Bay Length (ft)	300		200		175	100		200	
Base Capacity (vph)	383	506	393	518	582	353	1770	504	2179
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.19	0.16	0.17	0.30	0.14	0.42	0.25	0.28

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	58	32	59	82	161	45	625	62	118	385	176
Future Volume (veh/h)	127	58	32	59	82	161	45	625	62	118	385	176
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1668	1668	1409	1723	1586	1668	1545	1709	1750	1668	1709	1709
Adj Flow Rate, veh/h	138	63	35	64	89	175	49	679	67	128	418	191
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	25	2	12	6	15	3	0	6	3	3
Cap, veh/h	259	214	119	287	338	299	469	1596	157	524	1465	662
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.53	0.53	0.53	0.11	0.67	0.67
Sat Flow, veh/h	1075	1005	558	1290	1586	1404	727	2984	294	1589	2171	981
Grp Volume(v), veh/h	138	0	98	64	89	175	49	369	377	128	311	298
Grp Sat Flow(s),veh/h/ln	1075	0	1563	1290	1586	1404	727	1624	1655	1589	1624	1529
Q Serve(g_s), s	11.0	0.0	4.7	3.9	4.2	10.1	3.0	12.3	12.3	2.7	6.9	7.1
Cycle Q Clear(g_c), s	15.3	0.0	4.7	8.7	4.2	10.1	3.0	12.3	12.3	2.7	6.9	7.1
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.18	1.00		0.64
Lane Grp Cap(c), veh/h	259	0	333	287	338	299	469	868	885	524	1096	1032
V/C Ratio(X)	0.53	0.00	0.29	0.22	0.26	0.59	0.10	0.43	0.43	0.24	0.28	0.29
Avail Cap(c_a), veh/h	387	0	519	441	527	466	469	868	885	567	1096	1032
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	0.0	29.7	33.4	29.5	31.8	10.4	12.6	12.6	6.9	5.9	5.9
Incr Delay (d2), s/veh	1.7	0.0	0.5	0.4	0.4	1.8	0.4	1.5	1.5	0.2	0.7	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	1.8	1.2	1.6	3.5	0.5	4.4	4.5	0.8	2.1	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	37.6	0.0	30.2	33.8	29.9	33.7	10.9	14.1	14.1	7.2	6.5	6.6
LnGrp LOS	D		C	C	C	C	B	B	B	A	A	A
Approach Vol, veh/h		236			328			795			737	
Approach Delay, s/veh		34.5			32.7			13.9			6.7	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.6	53.1		24.3		65.7		24.3				
Change Period (Y+Rc), s	3.0	5.0		5.1		5.0		5.1				
Max Green Setting (Gmax), s	12.0	35.0		29.9		50.0		29.9				
Max Q Clear Time (g_c+I1), s	4.7	14.3		17.3		9.1		12.1				
Green Ext Time (p_c), s	0.2	4.9		0.8		4.2		1.2				

Intersection Summary			
HCM 7th Control Delay, s/veh		16.6	
HCM 7th LOS		B	

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	214	1	38	133	6	7	0	79	16	2	6
Future Vol, veh/h	3	214	1	38	133	6	7	0	79	16	2	6
Conflicting Peds, #/hr	4	0	6	6	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	33	2	0	3	2	0	0	0	0	0	0	0
Mvmt Flow	3	233	1	41	145	7	8	0	86	17	2	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	155	0	0	240	0	0	474	483	239	474	481	152
Stage 1	-	-	-	-	-	-	246	246	-	234	234	-
Stage 2	-	-	-	-	-	-	228	238	-	239	246	-
Critical Hdwy	4.43	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.497	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1256	-	-	1321	-	-	504	486	805	504	488	900
Stage 1	-	-	-	-	-	-	763	707	-	773	715	-
Stage 2	-	-	-	-	-	-	779	712	-	769	706	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1252	-	-	1314	-	-	479	465	800	433	467	896
Mov Cap-2 Maneuver	-	-	-	-	-	-	479	465	-	433	467	-
Stage 1	-	-	-	-	-	-	756	701	-	746	689	-
Stage 2	-	-	-	-	-	-	747	687	-	684	700	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.11	1.68	10.41	12.58
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	759	1252	-	-	1314	-	-	501
HCM Lane V/C Ratio	0.123	0.003	-	-	0.031	-	-	0.052
HCM Control Delay (s/veh)	10.4	7.9	-	-	7.8	-	-	12.6
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.1	-	-	0.2

Queues
3: Elysian Rd & Mullowney Ln

10/15/2024

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	261	48	95	95	137	57	359
v/c Ratio	0.38	0.06	0.31	0.22	0.45	0.14	0.56
Control Delay (s/veh)	8.4	5.1	13.1	16.8	21.8	16.2	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	8.4	5.1	13.1	16.8	21.8	16.2	6.2
Queue Length 50th (ft)	32	4	7	20	31	12	0
Queue Length 95th (ft)	86	18	45	58	87	40	54
Internal Link Dist (ft)		2570	797	465		2235	
Turn Bay Length (ft)	150				80		150
Base Capacity (vph)	920	1644	1352	1339	943	1265	1229
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.03	0.07	0.07	0.15	0.05	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	34	10	1	25	62	6	80	1	126	52	330
Future Volume (veh/h)	240	34	10	1	25	62	6	80	1	126	52	330
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.99		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1614	1750	1750	1750	1750	1750	1750	1750	1641	1736
Adj Flow Rate, veh/h	261	37	11	1	27	67	7	87	1	137	57	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	10	0	0	0	0	0	0	0	8	1
Cap, veh/h	848	628	187	127	55	133	145	280	3	490	280	
Arrive On Green	0.18	0.49	0.49	0.12	0.12	0.12	0.17	0.17	0.17	0.17	0.17	0.00
Sat Flow, veh/h	1667	1288	383	10	446	1091	68	1641	18	1321	1641	1471
Grp Volume(v), veh/h	261	0	48	95	0	0	95	0	0	137	57	0
Grp Sat Flow(s),veh/h/ln	1667	0	1671	1547	0	0	1727	0	0	1321	1641	1471
Q Serve(g_s), s	3.4	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	1.0	0.9	0.0
Cycle Q Clear(g_c), s	3.4	0.0	0.4	1.7	0.0	0.0	1.4	0.0	0.0	2.4	0.9	0.0
Prop In Lane	1.00		0.23	0.01		0.71	0.07		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	848	0	814	315	0	0	428	0	0	490	280	
V/C Ratio(X)	0.31	0.00	0.06	0.30	0.00	0.00	0.22	0.00	0.00	0.28	0.20	
Avail Cap(c_a), veh/h	1680	0	2293	2247	0	0	2229	0	0	1881	2008	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.7	0.0	3.9	11.9	0.0	0.0	10.5	0.0	0.0	10.9	10.3	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.0	0.0	0.3	0.0	0.0	0.3	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.1	0.4	0.0	0.0	0.4	0.0	0.0	0.6	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.9	0.0	3.9	12.4	0.0	0.0	10.8	0.0	0.0	11.2	10.7	0.0
LnGrp LOS	A		A	B			B			B	B	
Approach Vol, veh/h		309			95			95			194	
Approach Delay, s/veh		6.5			12.4			10.8			11.0	
Approach LOS		A			B			B			B	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5		19.4		9.5	10.6	8.8				
Change Period (Y+Rc), s		* 4.6		5.3		* 4.6	5.3	5.3				
Max Green Setting (Gmax), s		* 35		39.7		* 35	19.7	39.7				
Max Q Clear Time (g_c+I1), s		3.4		2.4		4.4	5.4	3.7				
Green Ext Time (p_c), s		0.5		0.2		0.7	0.6	0.5				

Intersection Summary	
HCM 7th Control Delay, s/veh	9.2
HCM 7th LOS	A

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	112	22	353	128	20	233
Future Vol, veh/h	112	22	353	128	20	233
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	0	5	3	5	5
Mvmt Flow	122	24	384	139	22	253

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	750	453	0	0	523	0
Stage 1	453	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Critical Hdwy	6.45	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	375	611	-	-	1029	-
Stage 1	634	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	365	611	-	-	1029	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s/v	19.56	0	0.68
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	391	142	-
HCM Lane V/C Ratio	-	-	0.372	0.021	-
HCM Control Delay (s/veh)	-	-	19.6	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.7	0.1	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	156	10	6	115	17	3	28	16	22	12	1
Future Vol, veh/h	1	156	10	6	115	17	3	28	16	22	12	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	3	0	0	2	0	0	3	0	0	10	0
Mvmt Flow	1	170	11	7	125	18	3	30	17	24	13	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	143	0	0	180	0	0	322	334	175	334	330	134
Stage 1	-	-	-	-	-	-	177	177	-	147	147	-
Stage 2	-	-	-	-	-	-	145	157	-	187	183	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.53	6.2	7.1	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.53	-	6.1	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.53	-	6.1	5.6	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.027	3.3	3.5	4.09	3.3
Pot Cap-1 Maneuver	1451	-	-	1407	-	-	635	585	874	623	576	920
Stage 1	-	-	-	-	-	-	829	751	-	860	760	-
Stage 2	-	-	-	-	-	-	863	766	-	819	734	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1451	-	-	1407	-	-	616	581	874	576	573	920
Mov Cap-2 Maneuver	-	-	-	-	-	-	616	581	-	576	573	-
Stage 1	-	-	-	-	-	-	829	750	-	856	756	-
Stage 2	-	-	-	-	-	-	843	762	-	770	733	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0.33	10.92	11.63
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	659	11	-	-	76	-	-	581
HCM Lane V/C Ratio	0.078	0.001	-	-	0.005	-	-	0.065
HCM Control Delay (s/veh)	10.9	7.5	0	-	7.6	0	-	11.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.5

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	11	54	365	11	39	251
Future Vol, veh/h	11	54	365	11	39	251
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	3	5	0	3	3
Mvmt Flow	12	59	397	12	42	273

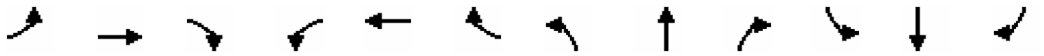
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	760	403	0	0	409	0
Stage 1	403	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Critical Hdwy	6.4	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	377	645	-	-	1145	-
Stage 1	679	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	360	645	-	-	1145	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	681	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s/v	12.22	0	1.11
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	569	242	-
HCM Lane V/C Ratio	-	-	0.124	0.037	-
HCM Control Delay (s/veh)	-	-	12.2	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	271	196	110	120	201	30	708	225	881
v/c Ratio	0.80	0.42	0.37	0.24	0.36	0.15	0.57	0.52	0.49
Control Delay (s/veh)	41.3	21.2	23.1	19.6	4.6	21.5	21.6	13.0	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	41.3	21.2	23.1	19.6	4.6	21.5	21.6	13.0	11.0
Queue Length 50th (ft)	113	66	40	41	0	9	130	45	111
Queue Length 95th (ft)	184	109	75	73	39	32	213	96	185
Internal Link Dist (ft)		1262		599			348		377
Turn Bay Length (ft)	300		200		175	100		200	
Base Capacity (vph)	429	592	372	632	663	196	1249	450	1803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.33	0.30	0.19	0.30	0.15	0.57	0.50	0.49

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	249	155	26	101	110	185	28	582	69	207	641	169
Future Volume (veh/h)	249	155	26	101	110	185	28	582	69	207	641	169
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1654	1477	1695	1709	1709	1614	1736	1750	1695	1723	1654
Adj Flow Rate, veh/h	271	168	28	110	120	201	30	633	75	225	697	184
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	7	20	4	3	3	10	1	0	4	2	7
Cap, veh/h	397	465	78	382	575	487	303	1057	125	442	1347	356
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.36	0.36	0.36	0.13	0.53	0.53
Sat Flow, veh/h	1050	1382	230	1167	1709	1447	590	2962	350	1615	2548	672
Grp Volume(v), veh/h	271	0	196	110	120	201	30	352	356	225	448	433
Grp Sat Flow(s),veh/h/ln	1050	0	1613	1167	1709	1447	590	1650	1663	1615	1637	1583
Q Serve(g_s), s	18.6	0.0	6.9	5.9	3.8	8.0	2.6	13.1	13.1	5.9	13.3	13.3
Cycle Q Clear(g_c), s	22.4	0.0	6.9	12.8	3.8	8.0	3.0	13.1	13.1	5.9	13.3	13.3
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.21	1.00		0.42
Lane Grp Cap(c), veh/h	397	0	543	382	575	487	303	588	593	442	865	837
V/C Ratio(X)	0.68	0.00	0.36	0.29	0.21	0.41	0.10	0.60	0.60	0.51	0.52	0.52
Avail Cap(c_a), veh/h	434	0	600	423	636	538	303	588	593	487	865	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	18.8	23.6	17.8	19.2	16.6	19.7	19.7	12.4	11.5	11.5
Incr Delay (d2), s/veh	3.9	0.0	0.4	0.4	0.2	0.6	0.7	4.4	4.4	0.9	2.2	2.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	2.5	1.6	1.4	2.6	0.4	5.3	5.4	1.9	4.7	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.7	0.0	19.2	24.0	17.9	19.7	17.3	24.2	24.2	13.3	13.7	13.7
LnGrp LOS	C		B	C	B	B	B	C	C	B	B	B
Approach Vol, veh/h		467			431			738			1106	
Approach Delay, s/veh		25.3			20.3			23.9			13.6	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.9	31.8		30.3		44.7		30.3				
Change Period (Y+Rc), s	3.0	5.0		5.1		5.0		5.1				
Max Green Setting (Gmax), s	12.0	22.0		27.9		37.0		27.9				
Max Q Clear Time (g_c+I1), s	7.9	15.1		24.4		15.3		14.8				
Green Ext Time (p_c), s	0.2	2.5		0.8		5.8		1.4				

Intersection Summary												
HCM 7th Control Delay, s/veh			19.4									
HCM 7th LOS			B									

Notes
User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	210	21	114	199	12	11	1	44	9	0	3
Future Vol, veh/h	2	210	21	114	199	12	11	1	44	9	0	3
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	1	1	0	9	0	0	0	0	0
Mvmt Flow	2	228	23	124	216	13	12	1	48	10	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	229	0	0	255	0	0	712	725	246	706	730	223
Stage 1	-	-	-	-	-	-	248	248	-	471	471	-
Stage 2	-	-	-	-	-	-	464	477	-	235	259	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.19	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.581	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1351	-	-	1316	-	-	338	354	798	353	352	822
Stage 1	-	-	-	-	-	-	741	705	-	577	563	-
Stage 2	-	-	-	-	-	-	565	559	-	772	697	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1351	-	-	1311	-	-	304	319	793	299	317	822
Mov Cap-2 Maneuver	-	-	-	-	-	-	304	319	-	299	317	-
Stage 1	-	-	-	-	-	-	737	701	-	523	510	-
Stage 2	-	-	-	-	-	-	510	506	-	722	693	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.07	2.82	11.8	15.52
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	591	1351	-	-	1311	-	-	355
HCM Lane V/C Ratio	0.103	0.002	-	-	0.095	-	-	0.037
HCM Control Delay (s/veh)	11.8	7.7	-	-	8	-	-	15.5
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.3	-	-	0.1

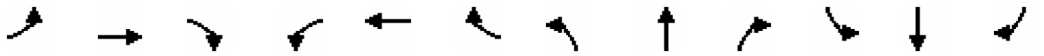
Intersection	Approach	Full Build (2030)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
Mullowney Lane & Midland Road/South Frontage Road	EB	34.1	C	5	25.2	C	8
	WB	32.0	C	4	19.5	B	4
	NB	15.0	B	10	27.0	C	10
	SB	7.3	A	5	15.4	B	9
	Intersection	17.1	B	--	20.8	C	--
Intersection Control		*One-Way Stop-Control (NB)*					
South Frontage Road & East Lane	EB	0.0	A	0	0.0	A	0
	WB	0.5	A	1	1.1	A	1
	NB	10.4	B	1	12.7	B	1
	Intersection	1.1	A	--	1.6	A	--
Intersection Control		*One-Way Stop-Control (WB)*					
Elysian Road & South Frontage Road	WB	14.7	A	1	21.5	C	2
	NB	0.0	A	0	0.0	A	0
	SB	0.5	A	0	0.7	A	1
	Intersection	3.0	A	--	3.5	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & East Lane	EB	0.1	A	0	0.0	A	0
	WB	0.7	A	0	0.3	A	0
	NB	10.8	B	1	11.1	B	1
	SB	10.7	B	1	11.9	B	1
	Intersection	2.6	A	--	2.6	A	--
Intersection Control		*Two-Way Stop-Control (NB/SB)*					
Elysian Road & Walter Creek Boulevard	EB	0.1	A	0	0.1	A	0
	WB	1.7	A	1	2.8	A	1
	NB	10.6	B	1	12.2	B	1
	SB	13.1	B	1	16.1	C	1
	Intersection	3.1	A	--	2.9	A	--
Intersection Control		*Signalized*					
Mullowney Lane & Elysian Road	EB	5.9	A	4	6.6	A	4
	WB	13.1	B	2	12.9	B	2
	NB	13.1	B	2	11.0	B	3
	SB	13.2	B	2	11.3	B	4
	Intersection	8.7	A	--	9.4	A	--

Queues
3: Elysian Rd & Mullowney Ln

10/15/2024

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	391	12	161	31	35	34	159
v/c Ratio	0.48	0.01	0.41	0.10	0.14	0.11	0.40
Control Delay (s/veh)	6.2	2.7	10.0	18.8	19.8	19.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.2	2.7	10.0	18.8	19.8	19.1	7.9
Queue Length 50th (ft)	37	1	6	7	8	7	0
Queue Length 95th (ft)	82	4	49	27	30	29	40
Internal Link Dist (ft)		2570	797	465		2233	
Turn Bay Length (ft)	150				80		150
Base Capacity (vph)	1010	1493	1404	1341	1139	1436	1237
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.01	0.11	0.02	0.03	0.02	0.13

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	6	5	1	26	121	2	26	1	32	31	146
Future Volume (veh/h)	360	6	5	1	26	121	2	26	1	32	31	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	0.99		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1750	1477	1750	1750	1750	1750	1695	1750	1750	1750	1736
Adj Flow Rate, veh/h	391	7	5	1	28	132	2	28	1	35	34	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	0	20	0	0	0	0	4	0	0	0	1
Cap, veh/h	917	552	394	115	45	206	129	162	6	377	184	
Arrive On Green	0.25	0.58	0.58	0.17	0.17	0.17	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1654	948	677	4	268	1237	71	1541	54	1385	1750	1471
Grp Volume(v), veh/h	391	0	12	161	0	0	31	0	0	35	34	0
Grp Sat Flow(s),veh/h/ln	1654	0	1625	1509	0	0	1666	0	0	1385	1750	1471
Q Serve(g_s), s	5.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.0
Cycle Q Clear(g_c), s	5.1	0.0	0.1	3.1	0.0	0.0	0.5	0.0	0.0	0.6	0.6	0.0
Prop In Lane	1.00		0.42	0.01		0.82	0.06		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	917	0	946	366	0	0	296	0	0	377	184	
V/C Ratio(X)	0.43	0.00	0.01	0.44	0.00	0.00	0.10	0.00	0.00	0.09	0.18	
Avail Cap(c_a), veh/h	1536	0	2038	2005	0	0	1974	0	0	1781	1957	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.6	0.0	2.8	12.3	0.0	0.0	12.9	0.0	0.0	13.0	12.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	0.1	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.0	0.0	2.8	13.1	0.0	0.0	13.1	0.0	0.0	13.1	13.4	0.0
LnGrp LOS	A		A	B			B			B	B	
Approach Vol, veh/h		403			161			31			69	
Approach Delay, s/veh		5.9			13.1			13.1			13.2	
Approach LOS		A			B			B			B	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		7.9		23.7		7.9	13.2	10.6				
Change Period (Y+Rc), s		* 4.6		5.3		* 4.6	5.3	5.3				
Max Green Setting (Gmax), s		* 35		39.7		* 35	19.7	39.7				
Max Q Clear Time (g_c+I1), s		2.5		2.1		2.6	7.1	5.1				
Green Ext Time (p_c), s		0.1		0.0		0.2	1.0	1.0				

Intersection Summary	
HCM 7th Control Delay, s/veh	8.7
HCM 7th LOS	A

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	113	7	161	64	20	269
Future Vol, veh/h	113	7	161	64	20	269
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	0	10	10	0	7
Mvmt Flow	123	8	175	70	22	292

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	546	210	0	0	245	0
Stage 1	210	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Critical Hdwy	6.43	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	497	836	-	-	1333	-
Stage 1	823	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	488	836	-	-	1333	-
Mov Cap-2 Maneuver	488	-	-	-	-	-
Stage 1	823	-	-	-	-	-
Stage 2	708	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s/v	14.73	0	0.54
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	500	125	-
HCM Lane V/C Ratio	-	-	0.261	0.016	-
HCM Control Delay (s/veh)	-	-	14.7	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	51	14	14	128	15	6	24	4	4	17	2
Future Vol, veh/h	1	51	14	14	128	15	6	24	4	4	17	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	3	35	0	2	0	20	10	25	0	8	0
Mvmt Flow	1	55	15	15	139	16	7	26	4	4	18	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	155	0	0	71	0	0	244	251	63	248	251	147
Stage 1	-	-	-	-	-	-	65	65	-	178	178	-
Stage 2	-	-	-	-	-	-	179	186	-	71	73	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.6	6.45	7.1	6.58	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.6	-	6.1	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.6	-	6.1	5.58	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.68	4.09	3.525	3.5	4.072	3.3
Pot Cap-1 Maneuver	1437	-	-	1543	-	-	674	638	941	709	642	905
Stage 1	-	-	-	-	-	-	902	825	-	829	741	-
Stage 2	-	-	-	-	-	-	783	731	-	944	823	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1437	-	-	1543	-	-	645	631	941	669	635	905
Mov Cap-2 Maneuver	-	-	-	-	-	-	645	631	-	669	635	-
Stage 1	-	-	-	-	-	-	901	824	-	820	733	-
Stage 2	-	-	-	-	-	-	753	723	-	909	822	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.11	0.66	10.79	10.69
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	659	26	-	-	157	-	-	658
HCM Lane V/C Ratio	0.056	0.001	-	-	0.01	-	-	0.038
HCM Control Delay (s/veh)	10.8	7.5	0	-	7.4	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.1

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	10	29	166	2	22	288
Future Vol, veh/h	10	29	166	2	22	288
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	20	0	7	50	5	6
Mvmt Flow	11	32	180	2	24	313

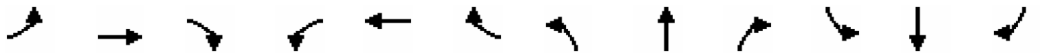
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	542	182	0	0	183	0
Stage 1	182	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Critical Hdwy	6.6	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	471	866	-	-	1375	-
Stage 1	808	-	-	-	-	-
Stage 2	667	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	462	866	-	-	1375	-
Mov Cap-2 Maneuver	462	-	-	-	-	-
Stage 1	808	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s/v	10.41	0	0.54
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	707	128	-
HCM Lane V/C Ratio	-	-	0.06	0.017	-
HCM Control Delay (s/veh)	-	-	10.4	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	148	103	68	95	186	52	793	136	646
v/c Ratio	0.66	0.33	0.30	0.31	0.44	0.15	0.45	0.29	0.30
Control Delay (s/veh)	46.6	22.8	31.9	31.6	7.5	14.4	14.4	6.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	46.6	22.8	31.9	31.6	7.5	14.4	14.4	6.9	5.3
Queue Length 50th (ft)	79	35	34	47	0	13	128	20	47
Queue Length 95th (ft)	125	69	62	78	47	44	230	55	102
Internal Link Dist (ft)		1262		599			350		377
Turn Bay Length (ft)	300		200		175	100		200	
Base Capacity (vph)	384	513	391	528	594	343	1749	484	2162
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.20	0.17	0.18	0.31	0.15	0.45	0.28	0.30

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	62	33	63	87	171	48	662	67	125	408	187
Future Volume (veh/h)	136	62	33	63	87	171	48	662	67	125	408	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1682	1436	1723	1614	1682	1573	1709	1750	1682	1709	1709
Adj Flow Rate, veh/h	148	67	36	68	95	186	52	720	73	136	443	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	23	2	10	5	13	3	0	5	3	3
Cap, veh/h	267	230	123	298	361	317	454	1558	158	500	1440	654
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.52	0.52	0.52	0.11	0.66	0.66
Sat Flow, veh/h	1068	1027	552	1285	1614	1416	715	2976	302	1602	2168	984
Grp Volume(v), veh/h	148	0	103	68	95	186	52	393	400	136	331	315
Grp Sat Flow(s),veh/h/ln	1068	0	1578	1285	1614	1416	715	1624	1653	1602	1624	1528
Q Serve(g_s), s	11.9	0.0	4.9	4.2	4.4	10.6	3.4	13.7	13.7	2.9	7.7	7.9
Cycle Q Clear(g_c), s	16.3	0.0	4.9	9.1	4.4	10.6	3.4	13.7	13.7	2.9	7.7	7.9
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.18	1.00		0.64
Lane Grp Cap(c), veh/h	267	0	353	298	361	317	454	850	865	500	1078	1015
V/C Ratio(X)	0.55	0.00	0.29	0.23	0.26	0.59	0.11	0.46	0.46	0.27	0.31	0.31
Avail Cap(c_a), veh/h	383	0	524	437	536	470	454	850	865	541	1078	1015
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	29.0	32.8	28.8	31.2	11.0	13.5	13.5	7.6	6.4	6.4
Incr Delay (d2), s/veh	1.8	0.0	0.5	0.4	0.4	1.7	0.5	1.8	1.8	0.3	0.7	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	1.8	1.3	1.7	3.6	0.6	5.0	5.1	0.9	2.4	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	37.4	0.0	29.5	33.2	29.2	33.0	11.5	15.3	15.3	7.9	7.1	7.2
LnGrp LOS	D		C	C	C	C	B	B	B	A	A	A
Approach Vol, veh/h		251			349			845			782	
Approach Delay, s/veh		34.1			32.0			15.0			7.3	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.7	52.1		25.2		64.8		25.2				
Change Period (Y+Rc), s	3.0	5.0		5.1		5.0		5.1				
Max Green Setting (Gmax), s	12.0	35.0		29.9		50.0		29.9				
Max Q Clear Time (g_c+I1), s	4.9	15.7		18.3		9.9		12.6				
Green Ext Time (p_c), s	0.2	5.2		0.9		4.5		1.2				

Intersection Summary												
HCM 7th Control Delay, s/veh			17.1									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	226	1	41	140	6	7	0	84	17	2	6
Future Vol, veh/h	4	226	1	41	140	6	7	0	84	17	2	6
Conflicting Peds, #/hr	4	0	6	6	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	2	0	3	2	0	0	0	0	0	0	0
Mvmt Flow	4	246	1	45	152	7	8	0	91	18	2	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	163	0	0	253	0	0	503	513	252	503	510	159
Stage 1	-	-	-	-	-	-	261	261	-	249	249	-
Stage 2	-	-	-	-	-	-	242	252	-	254	261	-
Critical Hdwy	4.35	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.425	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1288	-	-	1307	-	-	482	468	791	482	469	891
Stage 1	-	-	-	-	-	-	748	696	-	760	705	-
Stage 2	-	-	-	-	-	-	766	702	-	754	696	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1283	-	-	1299	-	-	456	446	787	409	448	888
Mov Cap-2 Maneuver	-	-	-	-	-	-	456	446	-	409	448	-
Stage 1	-	-	-	-	-	-	742	690	-	731	678	-
Stage 2	-	-	-	-	-	-	732	676	-	665	689	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.14	1.73	10.57	13.07
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	745	1283	-	-	1299	-	-	473
HCM Lane V/C Ratio	0.133	0.003	-	-	0.034	-	-	0.057
HCM Control Delay (s/veh)	10.6	7.8	-	-	7.9	-	-	13.1
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.2

Queues
3: Elysian Rd & Mullowney Ln

10/15/2024

Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	277	51	101	100	146	60	382
v/c Ratio	0.41	0.06	0.33	0.22	0.46	0.14	0.57
Control Delay (s/veh)	8.9	5.3	13.3	17.0	22.2	16.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	8.9	5.3	13.3	17.0	22.2	16.3	6.2
Queue Length 50th (ft)	35	4	7	22	34	13	0
Queue Length 95th (ft)	96	20	48	62	92	41	55
Internal Link Dist (ft)		2570	797	465		2235	
Turn Bay Length (ft)	150				80		150
Base Capacity (vph)	904	1645	1319	1307	914	1245	1212
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.03	0.08	0.08	0.16	0.05	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	36	11	1	26	66	6	85	1	134	55	351
Future Volume (veh/h)	255	36	11	1	26	66	6	85	1	134	55	351
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.99		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1627	1750	1750	1750	1750	1750	1750	1750	1654	1736
Adj Flow Rate, veh/h	277	39	12	1	28	72	7	92	1	146	60	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	9	0	0	0	0	0	0	0	7	1
Cap, veh/h	851	628	193	122	54	136	139	293	3	491	294	
Arrive On Green	0.19	0.49	0.49	0.12	0.12	0.12	0.18	0.18	0.18	0.18	0.18	0.00
Sat Flow, veh/h	1667	1276	393	9	435	1102	61	1650	17	1315	1654	1471
Grp Volume(v), veh/h	277	0	51	101	0	0	100	0	0	146	60	0
Grp Sat Flow(s),veh/h/ln	1667	0	1669	1545	0	0	1729	0	0	1315	1654	1471
Q Serve(g_s), s	3.7	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	1.1	0.9	0.0
Cycle Q Clear(g_c), s	3.7	0.0	0.5	1.8	0.0	0.0	1.5	0.0	0.0	2.6	0.9	0.0
Prop In Lane	1.00		0.24	0.01		0.71	0.07		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	851	0	821	313	0	0	436	0	0	491	294	
V/C Ratio(X)	0.33	0.00	0.06	0.32	0.00	0.00	0.23	0.00	0.00	0.30	0.20	
Avail Cap(c_a), veh/h	1629	0	2212	2167	0	0	2154	0	0	1812	1955	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.9	0.0	4.0	12.3	0.0	0.0	10.7	0.0	0.0	11.2	10.5	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.6	0.0	0.0	0.3	0.0	0.0	0.3	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.1	0.5	0.0	0.0	0.5	0.0	0.0	0.7	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	7.1	0.0	4.0	12.9	0.0	0.0	11.0	0.0	0.0	11.5	10.9	0.0
LnGrp LOS	A		A	B			B			B	B	
Approach Vol, veh/h		328			101			100			206	
Approach Delay, s/veh		6.6			12.9			11.0			11.3	
Approach LOS		A			B			B			B	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		9.9		20.0		9.9	11.0	9.0				
Change Period (Y+Rc), s		* 4.6		5.3		* 4.6	5.3	5.3				
Max Green Setting (Gmax), s		* 35		39.7		* 35	19.7	39.7				
Max Q Clear Time (g_c+I1), s		3.5		2.5		4.6	5.7	3.8				
Green Ext Time (p_c), s		0.5		0.2		0.8	0.7	0.6				

Intersection Summary	
HCM 7th Control Delay, s/veh	9.4
HCM 7th LOS	A

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	119	22	375	137	20	247
Future Vol, veh/h	119	22	375	137	20	247
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	0	4	3	5	4
Mvmt Flow	129	24	408	149	22	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	794	482	0	0	557	0
Stage 1	482	-	-	-	-	-
Stage 2	312	-	-	-	-	-
Critical Hdwy	6.44	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	354	588	-	-	999	-
Stage 1	617	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	345	588	-	-	999	-
Mov Cap-2 Maneuver	345	-	-	-	-	-
Stage 1	617	-	-	-	-	-
Stage 2	719	-	-	-	-	-

Approach	WB	NE	SW
HCM Control Delay, s/v	21.51	0	0.65
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	WBLn1	SWL	SWT
Capacity (veh/h)	-	-	369	135	-
HCM Lane V/C Ratio	-	-	0.415	0.022	-
HCM Control Delay (s/veh)	-	-	21.5	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2	0.1	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	164	11	6	121	18	4	29	17	23	14	1
Future Vol, veh/h	1	164	11	6	121	18	4	29	17	23	14	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	3	0	0	2	0	0	3	0	0	9	0
Mvmt Flow	1	178	12	7	132	20	4	32	18	25	15	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	151	0	0	190	0	0	339	351	184	351	347	141
Stage 1	-	-	-	-	-	-	186	186	-	154	154	-
Stage 2	-	-	-	-	-	-	152	164	-	196	192	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.53	6.2	7.1	6.59	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.53	-	6.1	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.53	-	6.1	5.59	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.027	3.3	3.5	4.081	3.3
Pot Cap-1 Maneuver	1442	-	-	1396	-	-	619	572	863	608	566	912
Stage 1	-	-	-	-	-	-	820	744	-	853	757	-
Stage 2	-	-	-	-	-	-	855	760	-	810	728	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1442	-	-	1396	-	-	598	569	863	559	562	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	598	569	-	559	562	-
Stage 1	-	-	-	-	-	-	819	743	-	848	753	-
Stage 2	-	-	-	-	-	-	832	757	-	759	728	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0.31	11.08	11.86
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	646	10	-	-	73	-	-	566
HCM Lane V/C Ratio	0.084	0.001	-	-	0.005	-	-	0.073
HCM Control Delay (s/veh)	11.1	7.5	0	-	7.6	0	-	11.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.6

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	12	56	387	12	42	266
Future Vol, veh/h	12	56	387	12	42	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	3	4	0	3	3
Mvmt Flow	13	61	421	13	46	289

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	808	427	0	0	434	0
Stage 1	427	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	6.4	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	353	625	-	-	1121	-
Stage 1	662	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	336	625	-	-	1121	-
Mov Cap-2 Maneuver	336	-	-	-	-	-
Stage 1	662	-	-	-	-	-
Stage 2	662	-	-	-	-	-

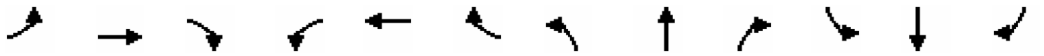
Approach	NB	NE	SW
HCM Control Delay, s/v	12.67	0	1.14
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	543	245	-
HCM Lane V/C Ratio	-	-	0.136	0.041	-
HCM Control Delay (s/veh)	-	-	12.7	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	286	208	117	127	213	33	750	239	935
v/c Ratio	0.82	0.42	0.39	0.25	0.36	0.18	0.62	0.58	0.53
Control Delay (s/veh)	42.5	21.1	23.0	19.2	4.5	22.5	23.1	14.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.5	21.1	23.0	19.2	4.5	22.5	23.1	14.8	11.8
Queue Length 50th (ft)	119	70	42	43	0	10	146	51	126
Queue Length 95th (ft)	#200	116	79	76	40	35	228	101	201
Internal Link Dist (ft)		1262		599			348		377
Turn Bay Length (ft)	300		200		175	100		200	
Base Capacity (vph)	427	598	367	632	670	185	1218	427	1775
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.35	0.32	0.20	0.32	0.18	0.62	0.56	0.53

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	263	165	27	108	117	196	30	617	73	220	680	180
Future Volume (veh/h)	263	165	27	108	117	196	30	617	73	220	680	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1709	1668	1504	1709	1709	1709	1641	1736	1750	1709	1723	1668
Adj Flow Rate, veh/h	286	179	29	117	127	213	33	671	79	239	739	196
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	6	18	3	3	3	8	1	0	3	2	6
Cap, veh/h	407	495	80	397	604	512	274	1006	118	415	1302	345
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.34	0.34	0.34	0.13	0.51	0.51
Sat Flow, veh/h	1032	1400	227	1164	1709	1447	570	2964	349	1628	2545	675
Grp Volume(v), veh/h	286	0	208	117	127	213	33	373	377	239	475	460
Grp Sat Flow(s),veh/h/ln	1032	0	1627	1164	1709	1447	570	1650	1663	1628	1637	1583
Q Serve(g_s), s	20.1	0.0	7.1	6.2	3.9	8.4	3.2	14.5	14.5	6.5	15.0	15.0
Cycle Q Clear(g_c), s	24.0	0.0	7.1	13.3	3.9	8.4	5.2	14.5	14.5	6.5	15.0	15.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.21	1.00		0.43
Lane Grp Cap(c), veh/h	407	0	575	397	604	512	274	560	565	415	838	810
V/C Ratio(X)	0.70	0.00	0.36	0.29	0.21	0.42	0.12	0.67	0.67	0.58	0.57	0.57
Avail Cap(c_a), veh/h	426	0	605	419	636	538	274	560	565	459	838	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	18.0	22.9	16.9	18.4	18.8	21.1	21.2	13.8	12.6	12.6
Incr Delay (d2), s/veh	4.9	0.0	0.4	0.4	0.2	0.5	0.9	6.2	6.2	1.5	2.8	2.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	2.5	1.6	1.4	2.7	0.5	6.1	6.2	2.2	5.4	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.2	0.0	18.4	23.3	17.1	18.9	19.7	27.3	27.3	15.3	15.4	15.5
LnGrp LOS	C		B	C	B	B	B	C	C	B	B	B
Approach Vol, veh/h		494			457			783			1174	
Approach Delay, s/veh		25.2			19.5			27.0			15.4	
Approach LOS		C			B			C			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.9	30.5		31.6		43.4		31.6				
Change Period (Y+Rc), s	3.0	5.0		5.1		5.0		5.1				
Max Green Setting (Gmax), s	12.0	22.0		27.9		37.0		27.9				
Max Q Clear Time (g_c+I1), s	8.5	16.5		26.0		17.0		15.3				
Green Ext Time (p_c), s	0.2	2.3		0.5		6.0		1.5				

Intersection Summary												
HCM 7th Control Delay, s/veh			20.8									
HCM 7th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	223	23	121	211	13	12	1	47	10	0	4
Future Vol, veh/h	2	223	23	121	211	13	12	1	47	10	0	4
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	1	1	0	9	0	0	0	0	0
Mvmt Flow	2	242	25	132	229	14	13	1	51	11	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	243	0	0	271	0	0	756	770	261	749	775	236
Stage 1	-	-	-	-	-	-	263	263	-	499	499	-
Stage 2	-	-	-	-	-	-	492	507	-	249	276	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.19	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.581	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1335	-	-	1298	-	-	316	334	783	331	331	808
Stage 1	-	-	-	-	-	-	727	694	-	557	547	-
Stage 2	-	-	-	-	-	-	545	543	-	759	686	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1335	-	-	1293	-	-	281	298	778	276	296	808
Mov Cap-2 Maneuver	-	-	-	-	-	-	281	298	-	276	296	-
Stage 1	-	-	-	-	-	-	723	691	-	500	491	-
Stage 2	-	-	-	-	-	-	487	488	-	706	682	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.06	2.84	12.22	16.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	564	1335	-	-	1293	-	-	340
HCM Lane V/C Ratio	0.116	0.002	-	-	0.102	-	-	0.045
HCM Control Delay (s/veh)	12.2	7.7	-	-	8.1	-	-	16.1
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0.3	-	-	0.1

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APPENDIX D
AUXILIARY TURN LANE WARRANTS WORKSHEETS

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TURN LANE WARRANTS		East Lane & South Frontage Road		Elysian Road & South Frontage Road		East Lane & Elysian Road	
		AM	PM	AM	PM	AM	PM
2024	EB Right-Turn Lane	NO	NO			NO	NO
	EB Left-Turn Lane					NO	NO
	WB Right-Turn Lane					NO	NO
	WB Left-Turn Lane	NO	NO			NO	NO
	NB Right-Turn Lane			NO	YES		
	SB Left-Turn Lane			NO	NO		
2028	EB Right-Turn Lane	NO	NO			NO	NO
	EB Left-Turn Lane					NO	NO
	WB Right-Turn Lane					NO	NO
	WB Left-Turn Lane	NO	YES			NO	NO
	NB Right-Turn Lane			NO	YES		
	SB Left-Turn Lane			NO	NO		
2030	EB Right-Turn Lane	NO	NO			NO	NO
	EB Left-Turn Lane					NO	NO
	WB Right-Turn Lane					NO	NO
	WB Left-Turn Lane	NO	YES			NO	NO
	NB Right-Turn Lane			NO	YES		
	SB Left-Turn Lane			NO	NO		

Existing Traffic Volumes (2024) - Right-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Total DHV (veh/hr)	Right-Turn Volume During DHV (veh/hr, one direction)	Required Right-Turn Volume for Warranted Lane	Warranted Right-Turn Lane? (Y/N)	Speed Limit at Approach	Adjustment
East & S Frontage EB	AM weekday	141	2	101	N	55	0
	PM weekday	334	10	75	N	55	0
Elysian & S Frontage NB	AM weekday	186	51	95	N	55	0
	PM weekday	421	107	64	Y	55	0
East & Elysian EB	AM weekday	47	9	114	N	35	0
	PM weekday	123	2	104	N	35	0
East & Elysian WB	AM weekday	106	7	106	N	35	0
	PM weekday	103	11	106	N	35	0

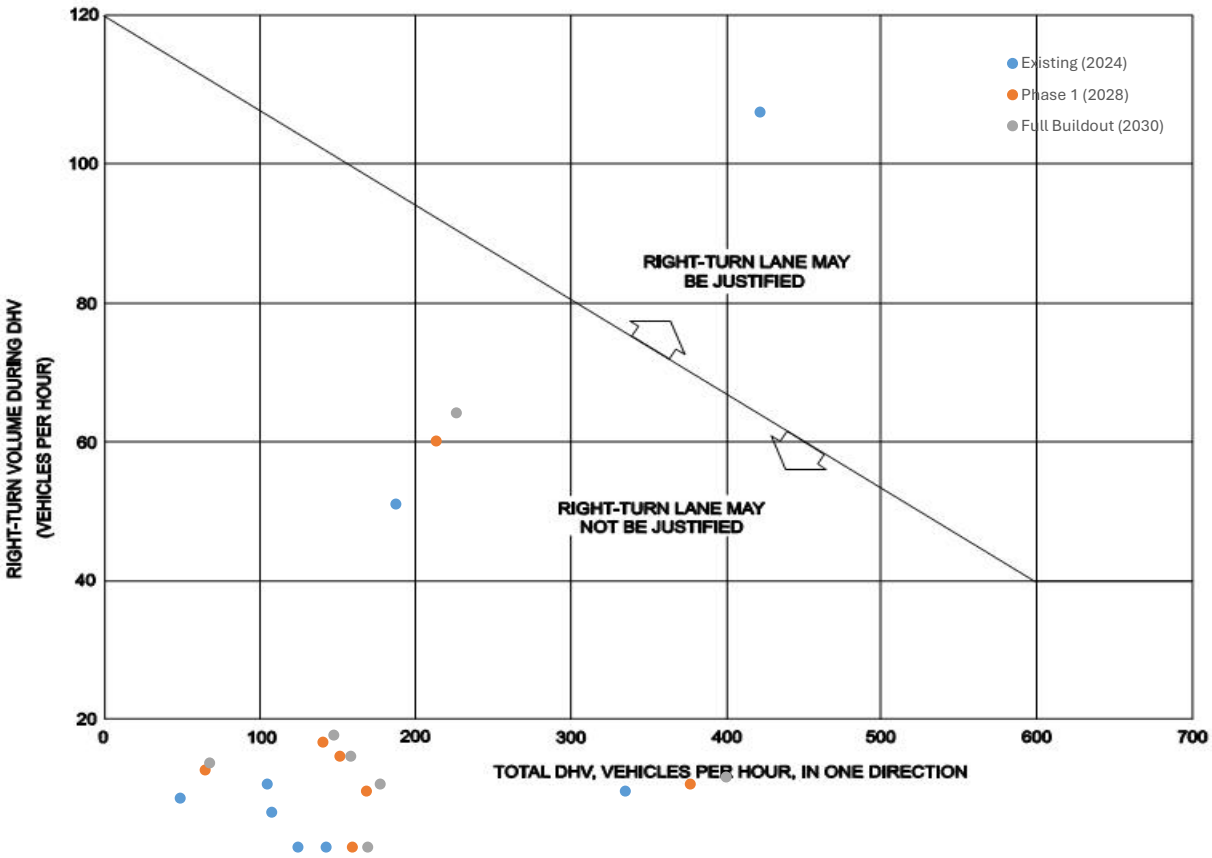
Phase 1 (2028) Traffic Volumes - Right-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Total DHV (veh/hr)	Right-Turn Volume During DHV (veh/hr, one direction)	Required Right-Turn Volume for Warranted Lane	Warranted Right-Turn Lane? (Y/N)	Speed Limit at Approach	Adjustment
East & S Frontage EB	AM weekday	158	2	99	N	55	0
	PM weekday	376	11	70	N	55	0
Elysian & S Frontage NB	AM weekday	212	60	92	N	55	0
	PM weekday	481	128	56	Y	55	0
East & Elysian EB	AM weekday	63	13	112	N	35	0
	PM weekday	167	10	98	N	35	0
East & Elysian WB	AM weekday	150	15	100	N	35	0
	PM weekday	139	17	101	N	35	0

Full Buildout (2030) Traffic Volumes - Right-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Total DHV (veh/hr)	Right-Turn Volume During DHV (veh/hr, one direction)	Required Right-Turn Volume for Warranted Lane	Warranted Right-Turn Lane? (Y/N)	Speed Limit at Approach	Adjustment
East & S Frontage EB	AM weekday	168	2	98	N	55	0
	PM weekday	399	12	67	N	55	0
Elysian & S Frontage NB	AM weekday	225	64	90	N	55	0
	PM weekday	512	137	52	Y	55	0
East & Elysian EB	AM weekday	66	14	111	N	35	0
	PM weekday	176	11	97	N	35	0
East & Elysian WB	AM weekday	157	15	99	N	35	0
	PM weekday	146	18	101	N	35	0

Guidelines for Right-Turn Lanes at Unsignalized Intersections on 2-Lane Highways (Figure 28.4A)



Existing Traffic Volumes (2022) - Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Va = Total advancing traffic volume	Val = Total left-turn volume in advancing traffic	Percent left-turns in Va	Vo = Total opposing traffic volume	Warranted Left-Turn Lane? (Y/N)	Speed Limit at Approach
East & S Frontage WB	AM weekday	257	16	6.2%	141	N	55
	PM weekday	250	27	10.8%	334	N	55
Elysian & S Frontage SB	AM weekday	225	0	0.0%	186	N	55
	PM weekday	211	4	1.9%	421	N	55
East & Elysian EB	AM weekday	47	1	2.1%	106	N	35
	PM weekday	123	1	0.8%	103	N	35
East & Elysian WB	AM weekday	106	12	11.3%	47	N	35
	PM weekday	103	5	4.9%	123	N	35

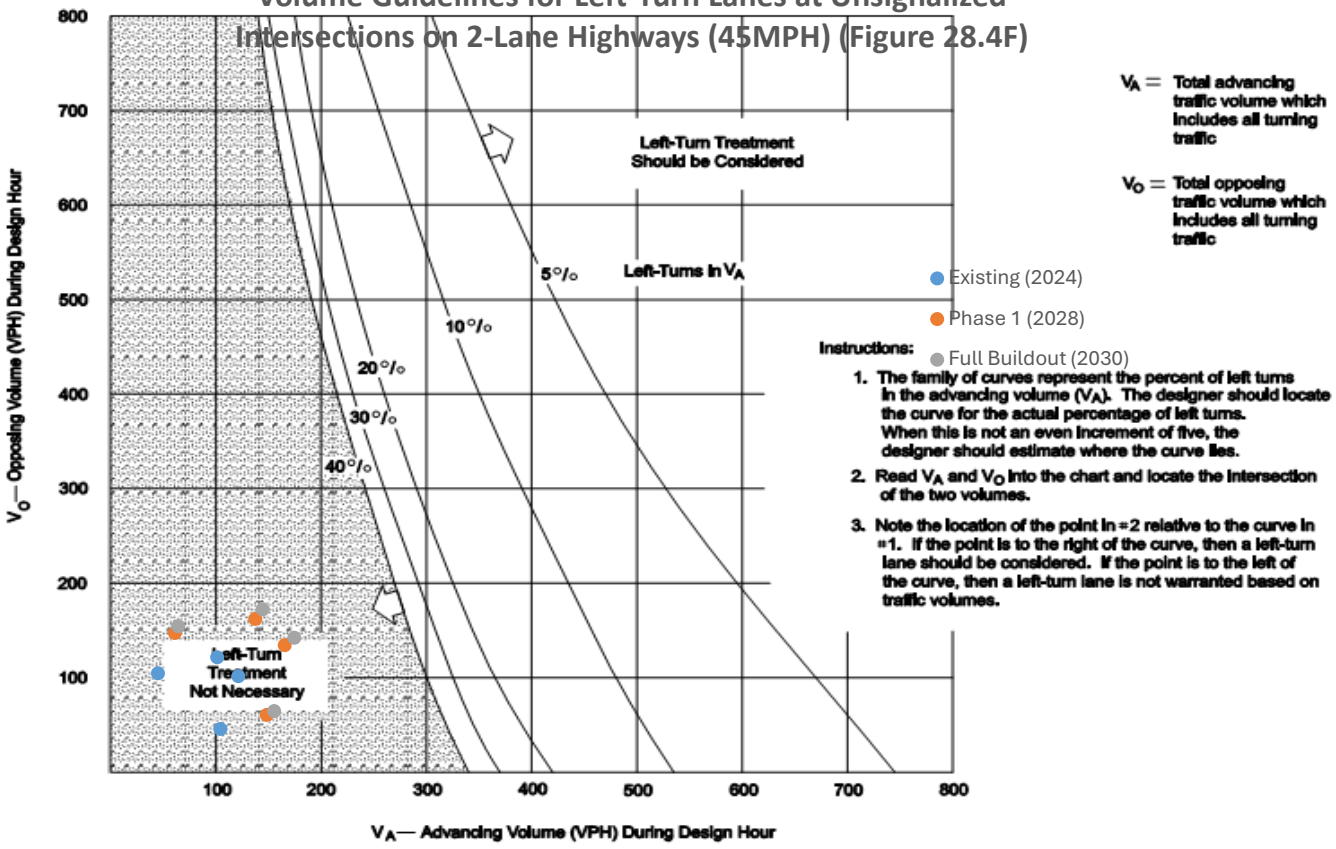
Phase 1 (2028) Traffic Volumes - Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Va = Total advancing traffic volume	Val = Total left-turn volume in advancing traffic	Percent left-turns in Va	Vo = Total opposing traffic volume	Warranted Left-Turn Lane? (Y/N)	Speed Limit at Approach
East & S Frontage WB	AM weekday	292	21	7.2%	258	N	55
	PM weekday	290	39	13.4%	376	Y	55
Elysian & S Frontage SB	AM weekday	273	20	7.3%	211	N	55
	PM weekday	253	20	7.9%	478	N	55
East & Elysian EB	AM weekday	63	1	1.6%	149	N	35
	PM weekday	167	1	0.6%	136	N	35
East & Elysian WB	AM weekday	150	14	9.3%	62	N	35
	PM weekday	139	6	4.3%	164	N	35

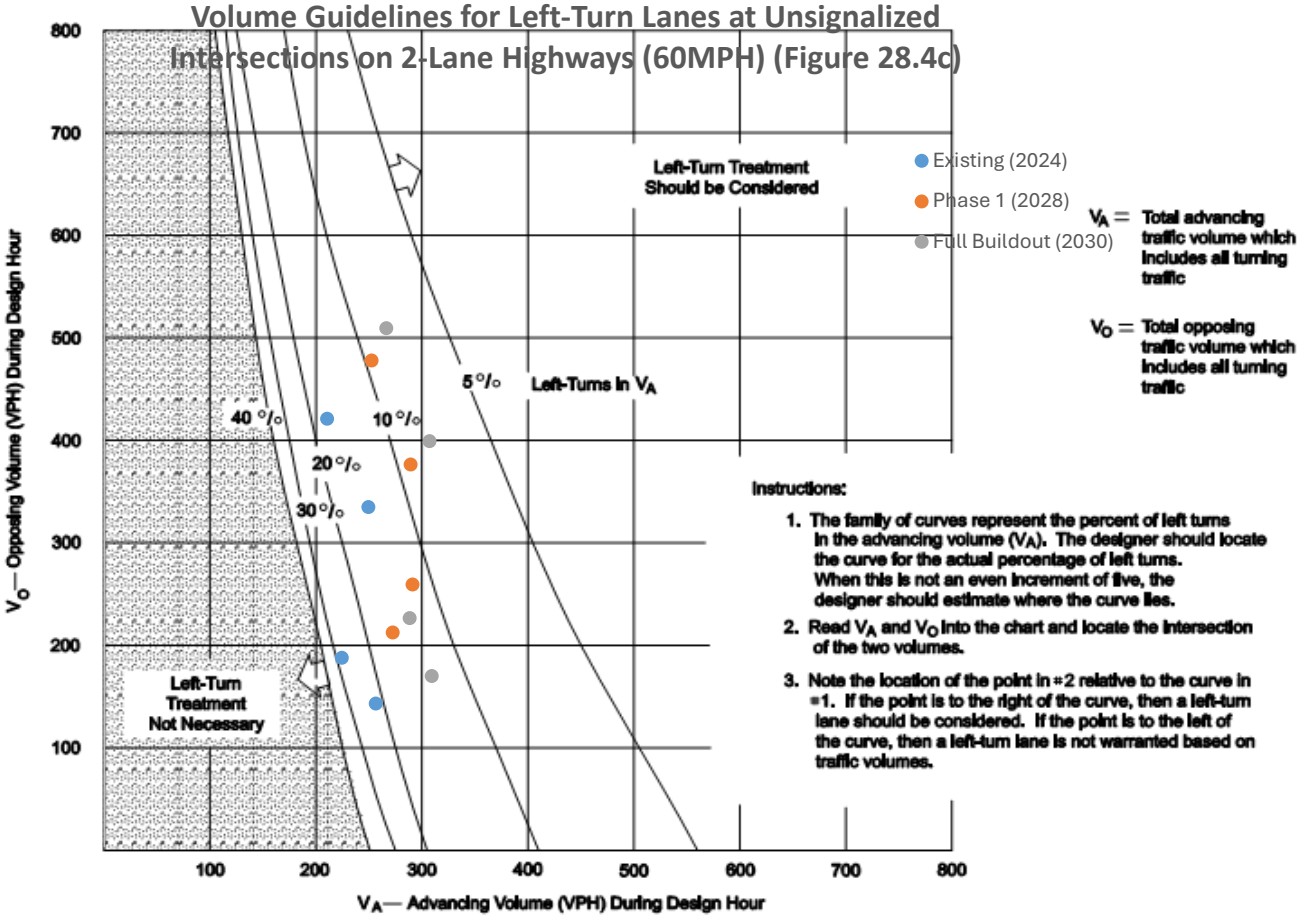
Full Buildout (2030) Traffic Volumes - Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Va = Total advancing traffic volume	Vla = Total left-turn volume in advancing traffic	Percent left-turns in Va	Vo = Total opposing traffic volume	Warranted Left-Turn Lane? (Y/N)	Speed Limit at Approach
East & S Frontage WB	AM weekday	310	22	7.1%	168	N	55
	PM weekday	308	42	13.6%	399	Y	55
Elysian & S Frontage SB	AM weekday	289	20	6.9%	225	N	55
	PM weekday	267	20	7.5%	510	N	55
East & Elysian EB	AM weekday	66	1	1.5%	156	N	35
	PM weekday	176	1	0.6%	144	N	35
East & Elysian WB	AM weekday	157	14	8.9%	66	N	35
	PM weekday	146	6	4.1%	174	N	35

Volume Guidelines for Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways (45MPH) (Figure 28.4F)



Volume Guidelines for Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways (60MPH) (Figure 28.4c)



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APPENDIX E
FINANCIAL CONTRIBUTION CALCULATION WORKSHEETS

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Intersection: Mullowney Lane & S Frontage Rd/Midland Rd - 6th Filing Full Build (2030)

Approach		AM Peak		PM Peak		
		Mvmt Vol.	Lane Vol.	Mvmt Vol.	Lane Vol.	Number of Lanes
NB	T	17	9	11	6	2
	L	0	0	0	0	1
SB	T	7	4	24	12	2
	L	0	0	0	0	1
EB	T	0	0	0	0	1
	L	8	8	5	5	1
WB	T	0	0	0	0	1
	L	3	3	9	9	1
Critical Lane Sum Increase:			17		21	
Critical Lane Sum:			1200		1200	
Peak Hour %:			1.38%		1.75%	
Highest %:			1.75%			

<--- 1200 for 4-leg intersection,
1140 for 3-leg intersection

Intersection: East Lane & S Frontage Road - 6th Filing Full Build (2030)

Approach		AM Peak		PM Peak		
		Mvmt Vol.	Lane Vol.	Mvmt Vol.	Lane Vol.	Number of Lanes
NB	T	0	0	0	0	1
	L	0	0	0	0	1
SB	T	0	0	0	0	1
	L	0	0	0	0	1
EB	T	0	0	0	0	1
	L	0	0	0	0	1
WB	T	0	0	0	0	1
	L	1	1	4	4	1
Critical Lane Sum Increase:			1	4		
Critical Lane Sum:			1140	1140		
Peak Hour %:			0.09%	0.35%		
Highest %:			0.35%			

<--- 1200 for 4-leg intersection,
1140 for 3-leg intersection

Intersection: Elysian Road & S Frontage Road - 6th Filing Full Build (2030)

Approach		AM Peak		PM Peak		
		Mvmt Vol.	Lane Vol.	Mvmt Vol.	Lane Vol.	Number of Lanes
NB	T	0	0	0	0	1
	L	9	9	6	6	1
SB	T	0	0	0	0	1
	L	0	0	0	0	1
EB	T	0	0	0	0	1
	L	0	0	0	0	1
WB	T	0	0	0	0	1
	L	0	0	0	0	1
Critical Lane Sum Increase:			9	6		
Critical Lane Sum:			1140	1140		<--- 1200 for 4-leg intersection, 1140 for 3-leg intersection
Peak Hour %:			0.79%	0.53%		
Highest %:			0.79%			

Intersection: Elysian Road & East Lane - 6th Filing Full Build (2030)

Approach		AM Peak		PM Peak		
		Mvmt Vol.	Lane Vol.	Mvmt Vol.	Lane Vol.	Number of Lanes
NB	T	8	8	5	5	1
	L	5	5	3	3	1
SB	T	1	1	4	4	1
	L	0	0	0	0	1
EB	T	0	0	0	0	1
	L	0	0	0	0	1
WB	T	4	4	3	3	1
	L	0	0	0	0	1
Critical Lane Sum Increase:			**12**	**10**		
Critical Lane Sum:			**1200**	**1200**		<--- 1200 for 4-leg intersection, 1140 for 3-leg intersection
Peak Hour %:			**1.00%**	**0.83%**		
Highest %:			**1.00%**			

Intersection: Mullowney Lane & Elysian Road - 6th Filing Full Build (2030)

Approach		AM Peak		PM Peak		
		Mvmt Vol.	Lane Vol.	Mvmt Vol.	Lane Vol.	Number of Lanes
NB	T	0	0	0	0	1
	L	0	0	0	0	1
SB	T	0	0	0	0	1
	L	0	0	0	0	1
EB	T	0	0	0	0	1
	L	25	25	16	16	1
WB	T	0	0	0	0	1
	L	0	0	0	0	1
Critical Lane Sum Increase:			25		16	
Critical Lane Sum:			1200		1200	<--- 1200 for 4-leg intersection, 1140 for 3-leg intersection
Peak Hour %:			2.08%		1.33%	
Highest %:			2.08%			

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