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WEST SIDE WOODS SUBDIVISION TRAFFIC IMPACT STUDY

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Traffic Impact Study for West Side Woods Subdivision

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1.0 EXECUTIVE SUMMARY

This traffic impact study (TIS) evaluates site access and potential traffic impacts associated with the West Side Woods Subdivision. The 58.85-acre development is located in the south ½ of Section 23 and north ½ of Section 26, Township 10 North, Range 4 West of the Principal Montana Meridian, in Lewis and Clark County, Montana. As proposed, the West Side Woods Subdivision will include 92 single-family residential lots, 4 multi-family lots with 80 condo units, and 4 open space lots. The property is currently used as vacant open space. Traffic from the internal access roads of the proposed subdivision will access Park Drive at two locations and Hauser Boulevard at two locations. Traffic will utilize Park Drive, Hauser Boulevard, and Knight Street to access Granite Avenue to the east and proceed north to Euclid Avenue (U.S. Highway 12). A vicinity map is provided in Appendix A.

West Side Woods Subdivision is proposed to be constructed in four phases, beginning in 2026. A 4-year build-out horizon is anticipated for development, with completion and final plat for Phase 1 and Phase 2 in 2026, completion and final plat for Phase 3 in 2028, and completion and final plat for Phase 4 in 2030. The preliminary plat is provided in Appendix B.

In August 2020, October 2021, September 2022, and March 2025 Abelin Traffic Services (ATS) collected traffic count data on Granite Avenue, Hauser Boulevard, and Highway 12. Data was also obtained from a 2017 intersection count conducted by the Montana Department of Transportation (MDT) at Granite Street and Highway 12 (Euclid Avenue). Trip generation for West Side Woods Subdivision was based on rates reported in the ***Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition*** and the ***Trip Generation Handbook***. Trips were generated for the proposed development according to expected size and type of land use.

Using the data collected for this project, ATS provided a Level of Service (LOS) analysis at area intersections for each phase of the development. This evaluation was conducted in accordance with the procedures outlined in the Transportation Research Board's *Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis* and the Highway Capacity Software (HCS) version 8.2. The intersections of Hauser Boulevard/Granite Avenue, Knight Street/Granite Avenue, and Granite Street/Highway 12 as currently developed can handle the additional traffic from the proposed subdivision.

The proposed subdivision is anticipated to add up to 1,407 trips per day between Hauser Boulevard and Granite Avenue at full-build-out of the subdivision. The two primary routes to Granite Avenue will be via Hauser Boulevard with 80% of the vehicle trips and Knight Street with 20% of vehicle trips. Hauser Boulevard is currently an east/west collector road, and traffic counts indicate that the road currently carries 605 vehicles per day. At full build-out of the subdivision, Hauser Boulevard between Park Drive and Granite Avenue is anticipated to have 1,731 vehicle trips per day. Knight Street is currently a local road that services approximately 30 single-family residential homes within Overlook Estates Subdivision. Knight Street currently has approximately 283 vehicle trips per day and at full build-out Knight Street will have 564 vehicle trips per day. It is anticipated that 80% of the traffic from Hauser

Boulevard, from the development, will utilize Granite Avenue to the north to access Highway 12 (Euclid Avenue) and 20% will utilize Hauser Boulevard to the east to access other parts of Helena or utilize other routes to get to Highway 12 (Euclid Avenue). Granite Avenue is currently a minor collector and traffic counts collected by ATS indicate a current traffic volume of 612 vehicle trips per day. In 2020 and 2021 the City of Helena was working on a water and sewer installation project on the west side of Helena. Based on the traffic collected to date it appears the construction project was pushing additional traffic to Granite Street to access Highway 12. The project was completed in 2021, and it appears from the traffic counts that the traffic has dispersed to preconstruction patterns. At full build-out of the subdivision, Granite Avenue from Hauser Boulevard to Euclid Avenue (U.S. Highway 12) is anticipated to have 1,738 vehicle trips per day. All other roads adjacent to the subdivision will have varying amounts of traffic from several different access points but are anticipated to carry less than 1,500 trips per day.

The analysis presented in this report indicates that internal roads and roads directly adjacent to the subdivision will convey less than 1,500 vehicle trips per day at full build-out of the subdivision and would be classified as local roads. Knight Street with the anticipated traffic will remain a local road. Hauser Boulevard between Park Drive and Granite Avenue and Granite Avenue between Hauser Boulevard and Euclid Avenue (U.S. Highway 12) will experience the highest increase in traffic by the proposed subdivision. Based on the preliminary plat review of the subdivision by the City of Helena and preliminary plat and annexation conditions or approval, the City is requiring improvements to several adjacent roads to account for subdivision traffic impacts. For Phase 1 and 2, these improvements include Hauser Boulevard from Granite Avenue to the subdivision constructed to a local road standard including curb and gutter, asphalt, and boulevard sidewalks, Granite Avenue from Hauser Boulevard to Knight Street to a major collector standards with curb and gutter, asphalt, and boulevard sidewalks, installation of a traffic calming measures at Hauser Boulevard and Granite Avenue intersection, pedestrian actuated crosswalk signs on Granite Avenue at the Kessler School crossing, and bulb outs at the Granite Avenue and east leg of the Knight Street intersection. For Phase 3 these improvements would include Park Drive from Woodward Avenue to Hauser Boulevard, constructed to local road standards with curb and gutter, asphalt, and boulevard sidewalks. For Phase 4 these improvements would include constructing Granite Avenue from Hauser Boulevard to Floweree Street to minor collector standards including curb and gutter, asphalt and boulevard sidewalks and constructing Floweree Street from Park Drive to Granite to local road standards including curb and gutter, asphalt, and boulevard sidewalks.

Pedestrian counts were also conducted at the crosswalk at the intersection of Overlook Boulevard and Granite Street in front of Kessler School in 2021 and 2022. Pedestrian counts remained relatively similar during the two time periods. In order to increase safety at the school for pedestrians, the applicant has volunteered to install pedestrian actuated flashing crosswalk signs north and south of the crossing as well as install a streetlight at the intersection. These measures will provide better visibility of the intersection to drivers and will make this crossing safer for pedestrians. The applicant is also proposing to install bulb

outs on Granite Street as well as electronic flashing speed limit signs on the south end at the intersection with Knight Street to improve safety adjacent to the school. A new school bond was passed in the fall of 2025 that will reconstruct Kessler School over the next several years. Due to the school improvements the proposed offsite traffic improvements at Kessler School will be deferred until after construction of the new school.

2.0 EXISTING AREA ANALYSIS

The West Side Woods Subdivision will develop an existing 58.85 acres of vacant open space land on Helena's west side into a residential subdivision. The project is located west of Granite Avenue and south of Euclid Avenue (U.S. Highway 12), see vicinity map in Appendix A. The site is currently in Lewis and Clark County, and the applicant is requesting the City of Helena annex the proposed project. This would require annexation of adjacent roads including Park Drive, Hauser Boulevard from Park Drive east to Granite Avenue, and Floweree Street from Park Drive to Granite Avenue. Granite Avenue from Hauser Boulevard to Euclid Avenue (U.S. Highway 12) is currently within the City of Helena.

Regional and direct access will be provided via the area's existing road network. Hauser Boulevard is located adjacent to the northeast corner of the subdivision for approximately 650-ft. Park Drive is located adjacent to the east side of the subdivision for approximately 1,450-ft. It is anticipated that the majority of traffic will utilize Hauser Boulevard to access Granite Avenue approximately 300-ft to the east. Then proceed north along Granite Avenue for approximately 1,500-ft to Euclid Avenue (U.S. Highway 12). The preliminary plat is provided in Appendix B and shows how the proposed roads from the subdivision integrate with the existing roads. The study area selected for the project includes all major intersections which will be significantly impacted by the development. The majority of traffic from the project (80%) will use Granite Avenue to reach Euclid Avenue and will continue east into Helena. Traffic impacts east of Granite Avenue will be low and likely well distributed across multiple routes and intersections; therefore, no additional analysis was conducted east of Granite Avenue for this study.

2.1 PARK DRIVE

Park Drive is a local road that extends to the southwest from Hauser Boulevard and provides access to six residential homes along the south side of the street. Park Drive currently has a gravel surface and ends at an intersection with Flowerree Street to the south. The intersection of Park Drive and Hauser Boulevard is uncontrolled.

2.2 HAUSER BOULEVARD

Hauser Boulevard is an east/west local road that provides access to the residential homes on the west side of Helena. The road currently has a paved surface east of Granite Avenue with several sections currently being resurfaced. West of Granite Avenue the road surface becomes gravel and Hauser Boulevard splits at an intersection with Park Drive. The posted speed limit is 25 MPH. All cross-streets are STOP controlled east of Granite Avenue. Traffic data collected

in 2019 by the City of Helena indicates that the road currently carries 700 VPD between the intersection of Park Drive and Granite Avenue.

2.3 Granite Avenue

Granite Avenue is a minor collector roadway that extends south from Highway 12 past Kessler Elementary School and into the residential areas on Mount Helena. South of Highway 12 the road has a paved width of 36 feet with curb and gutter and on-street parking along the east side of the road. The road narrows south of Knight Street and has a rural 24-foot paved cross-section. All cross-streets are STOP controlled, including Hauser Boulevard. The posted speed limit is 15 MPH near the Kessler Elementary School during school hours and then becomes 25 MPH south of Knight Street. Traffic counts conducted by ATS suggest an ADT Volume of 1,600 VPD south of Highway 12.

2.4 Knight Street

Knight Street is an east/west local road that provides access to the residential homes west of Granite Avenue. The road currently has an urban cross-section and a paved surface width of 30 feet with on-street parking. Knight Street currently provides access to 30 residential homes located within the Overlook Estates subdivision.

2.5 Other Users

All projects need to consider additional transportation users such as pedestrians, bicycles, and buses. There are existing facilities sidewalks located on Granite Avenue from Euclid Avenue (U.S. Highway 12) south to Knight Street. Sidewalks are also present throughout the Overlook Estates Subdivision north of the West Side Woods Subdivision location. The remaining adjacent street network does not currently have any existing bike or pedestrian facilities.

With the preliminary approval of the subdivision several preliminary plat and annexation conditions require improvements to the adjacent street network to provide for pedestrian connectivity. These include boulevard sidewalks on Hauser Boulevard to Granite Avenue, boulevard sidewalks on Granite Avenue from Floweree Street to Knight Street, and Boulevard sidewalks on Park Drive from Flowerree Street to Hauser Boulevard. There are also several traffic calming measures including bulb outs at the intersection of Hauser Boulevard and Granite Avenue, bulbouts at Granite Avenue and the east leg of the Knight Street intersection, bike lane along Granite from Knight to Hauser, pedestrian actuated crosswalks signs on Granite Avenue at the Kessler School Crosswalk. With Phase 1 and 2 engineering design, plans have been approved by the city for improvements to Hauser Boulevard and Granite Avenue including the traffic calming improvements.

All internal streets will be designed to include sidewalks including ADA ramps at intersections. Portions of Park Drive and Hauser Boulevard adjacent to the proposed subdivision will be improved to meet City of Helena standards including sidewalks and ADA ramps. Hauser Boulevard connects on the north to the Overlook Estates Subdivision's internal road and

sidewalk network. All internal sidewalks will connect to Hauser Boulevard and pedestrians will be able to access sidewalks from the subdivision down Hauser Boulevard, down Knight Street or Overlook Boulevard to Granite Avenue and then down to Euclid Avenue (U.S. Highway 12). This will provide a continuous sidewalk network from the subdivision to the Kessler School.

Further, an extensive trail network is planned throughout the subdivision and open space that would connect to proposed street sidewalks as well as existing City of Helena trail system and open space to the south of the project site. This will provide expanded opportunity for walking and biking trails that connect to the wider City of Helena trail network.

Currently, the City of Helena transit system does not provide service to this area of the city. The Capital Shuttle goes as far as Laurel Street on the west side, which is approximately 12 blocks from the proposed project site. There are no plans to add a transit stop for the proposed project.

2.6 Adjacent Current and Future Development

The properties surrounding the project site are currently developed single-family residential which are located to the west, east, and north of the project site, commercial development to the west, and existing open space to the south. The City of Helena currently owns open space to the south and therefore it is not anticipated that development will occur on these lands. The remaining parcels are already developed with existing land uses and are not anticipated to be developed further. There are no existing roads that abut the property to the west and due to the extremely steep topography and existing development, it would be difficult to connect or extend roadways to the west; therefore, no road extensions are planned. There is an existing road that abuts the subdivision on the north, Overlook Boulevard. There is currently an approximately 20-ft drop-off from the property to the finished grade of the existing street. Due to topography and City of Helena road design standards, it is not proposed to connect a roadway with the existing Overlook Boulevard. All other proposed streets connect to existing streets and roads adjacent to the proposed subdivision.

3.0 SITE DEVELOPMENT CHARACTERISTICS

The proposed West Side Woods Subdivision will develop 92 single-family residential lots, 80 condo units on 4 lots, and 4 open space lots. The subdivision is proposed to be annexed into the City of Helena and therefore all infrastructure will be required to meet City of Helena subdivision regulations and design standards where possible.

3.1 Site Access

The development will have primary access from Hauser Boulevard, Park Drive, and a proposed internal street network.

A. Primary Access – Primary access will be provided from Granite Avenue via Hauser Boulevard and Park Drive.

B. Secondary Access – Some traffic may utilize Knight Street to the north and over to Granite Street, but this is anticipated to be a small percentage of traffic.

C. Internal Access – Proposed subdivision traffic will be distributed throughout the subdivision via proposed internal access roads. All internal access roads will be local streets constructed to meet City of Helena local street standards. There are several dead-end streets located throughout the proposed subdivision. The dead-end streets are necessary due to topographic constraints of the site. All dead-end streets are provided with a cul-de-sac meeting City of Helena requirements for emergency access.

D. Additional Secondary Access Considerations - The site is bound by existing development on the west and south. The existing residential and commercial development to the west of the project site does not provide an opportunity to extend proposed streets to the west to connect to existing road networks. Further, due to the steep drop off from the west property line to the nearest adjacent road to the west it would be difficult to construct a road meeting the City of Helena road standards if easements or right-of-way could be obtained. This route was not further analyzed due to the need for easements or rights-of-way crossing multiple private properties. There is a small section of the property that abuts Highway 12 (Euclid Avenue) right-of-way in the northwest corner of the subdivision. In this location there is a very large cut section (approximately 50-ft) down to the roadway from the property. It would not be possible to construct a connection to Highway 12 in this location due to the elevation difference and requirements to meet the City of Helena road design standards. Discussions with MDT indicated that a connection at this location would not be permitted, see correspondence from MDT in Appendix F. Overlook Boulevard within Overlook Estates abuts the property on the north side. There is a large cut at this dead-end street (approximately 20-ft) from the existing ground on the property. It would not be possible to construct a street that meets the grade requirements for the City of Helena to connect to the existing Overlook Boulevard. Finally, there are two drainages that cross through the subject property.

3.2 Project Phasing

The proposed West Side Woods Subdivision is proposed to be developed in four phases starting in 2026. The build-out is assumed to be completed by 2030. Below are the details of the project phasing. The plat, included in Appendix B, shows the proposed phasing.

A. Phase 1 – Construction and final plat by the end of 2026. Phase 1 will include 28 single-family residential lots, 28 condo units on 2 multi-family lots, and 1 open space lot.

B. Phase 2 – Construction and final plat by the end of 2026. Phase 2 will include 10 single-family residential lots and 20 condo units on 1 multi-family lot, and 1 open space lot.

C. Phase 3 – Construction and final plat by the end of 2028. Phase 3 will include 43 single-family residential lots and 1 open space lot.

D. Phase 4 – Construction and final plat by the end of 2030. Phase 4 will include 11 single-family residential lots, 32 condo units on 1 multi-family lot, and 1 open space lot.

4.0 EXISTING SYSTEM TRAFFIC ANALYSIS

4.1 MANUAL TRAFFIC COUNT

ATS collected traffic data for this project on three separate occasions. The first set of traffic counts used for the analysis were collected in this area in August 2020. This data collection included traffic counts on Granite Avenue and Hauser Boulevard. Due to the COVID-19 outbreak, this data was supplemented heavily with historic traffic information and data from a 2017 intersection count conducted by MDT at Granite Avenue and Highway 12. This information was used for the original 2020 traffic analysis for this project.

To answer questions from the City of Helena with the first application, ATS performed a pedestrian count at the Overlook Boulevard crosswalk on Granite Avenue in May of 2021 to develop pedestrian crossing recommendations for this location. ATS then conducted a second round of data collection along Granite Avenue the week of October 12-14, 2021, to address public comment on the first application. This data indicated that overall traffic volumes in this area were similar to those collected by ATS in 2020 along Granite Avenue and Hauser Boulevard and was similar to the data collected by MDT at the intersection of Granite and Highway 12 in 2017. Peak-hour traffic volumes at the intersection of Granite Avenue and Highway 12 collected in October of 2021 were eight percent lower than the data collected by MDT in 2017. Daily traffic data collected on Knight Street in October 2021 was nearly identical to the 2020 data collected by ATS (300 VPD) and the traffic data collected along Granite Avenue in October 2021 was lower than the data collected on the same segment in 2020.

In September 2022, Abelin Traffic Services again collected traffic count data on Granite Avenue and performed a 10-hour intersection count at Highway 12. ATS also recorded peak school-hour intersection turning movement counts on Granite Avenue at Knight Street and Overlook Boulevard including pedestrian counts to provide the most up-to-date information for traffic volumes in this area. Overall traffic volume counts in this area have been extremely consistent over the past five years. The multi-day traffic count conducted at the intersection of Highway 12 by MDT in September of 2017 were within 3-5% of the 10-hour traffic volume counts conducted by ATS in September of 2022. This matches all the available historic traffic data for this area. Traffic volumes on Granite Avenue reduced significantly between the original count in 2020 and the count in 2022. The City of Helena was working on construction of the west side water and sewer project in 2020 and 2021. The project was the installation of water and sewer mains within existing streets on Helena's west side. It is likely that due to the ongoing construction work east of Granite Avenue to install water and sewer mains, traffic in the area was rerouting during construction to avoid the construction area. As construction was completed in late 2021, traffic redistributed itself to other roads in the area other than Granite Avenue to access Highway 12. This would explain the significant decrease in traffic between 2020 and 2022 on Granite Avenue. The manual traffic count data collected

in 2020, 2021, and 2022 are provided in Appendix C. The critical information collected from these three studies is summarized in Table 1 below.

Traffic data was collected again on Granite Avenue in April of 2023. This data collection effort includes an additional 12-hour turning movement count for the intersection of Highway 12 and Granite Avenue, including pedestrian counts. The April 2023 traffic counts were consistent with past traffic counting efforts for this area and were lower than the data collected in September of 2022.

For this TIS update, ATS conducted a fourth round of data collection along Granite Avenue during the week of March 24-28, 2025. This data indicated that overall traffic volumes in this area were similar to all of the previously collected data along Granite Avenue. The traffic counts conducted in March of 2025 showed a minimal increase in traffic since the April 2023 counts. These updates match all available historic traffic data for this area which do not indicate major traffic volumes changes in this area over the past five years. The information collected from these five studies is as follows:

Table 1. Traffic Data Collection and Trends 2020-2025

	2020	2021	2022	2023	2025
Highway 12 & Granite Ave. Peak-Hour Traffic Volume	1,080 VPH	1,113 VPH	1,198 VPH	1,024 VPH	1,031 VPH
Granite Avenue ADT	1,617 VPD	728 VPD	584 VPD	553 VPH	612 VPD
Overlook Boulevard Crosswalk AM Peak Pedestrian Counts	No data	24 PPH	21 PPH	21 PPH	No data collected
Overlook Boulevard Crosswalk PM Peak Pedestrian Counts	No data	72 PPH	55 PPH	60 PPH	No data collected
Project Anticipated Generated VPD	1,509 VPD	1,443 VPD	1,407 VPD	1,407 VPD	1,407 VPD

4.2 Historic Traffic Data

Historic traffic data was also collected for Highway 12 and Hauser Boulevard from the Montana Department of Transportation and the City of Helena. The data for this location is presented in Table 2. The historic traffic data indicates that traffic volume in this area has been consistent for the last ten years.

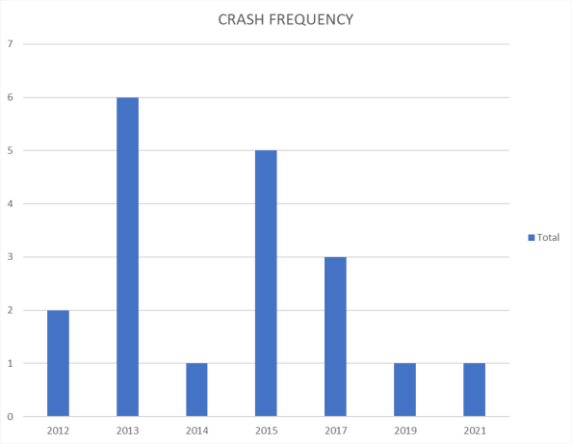
Table 2. Historic Traffic Data

Location	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
US 12 E of Williams #25-7C-005	10,360	9,234	9,822	9,826	9,777	8,917	6,308	10,188	10,402	10,340
US 12 W of Joslyn #25-7C-006	11,480	11,701	11,837	12,003	11,943	11,303	11,755	11,607	11,851	11,780
Hauser Blvd W of Linden #25-7B-033	220	782	600	609	492	458	495	645	649	605
Hauser Blvd E of Laurel # 25-7B-032	840	730	724	735	739	687	742	572	575	577

4.3 Vehicle Crash Data

Upon request MDT supplied crash data tables for the most recent 10-year period available (2012-2021) encompassing the intersection of US Highway 12 and Granite Street. Nineteen crashes were reported within the study area (11 coded to US Highway 12, 7 coded to Broadwater Avenue and 1 coded to Granite St.)

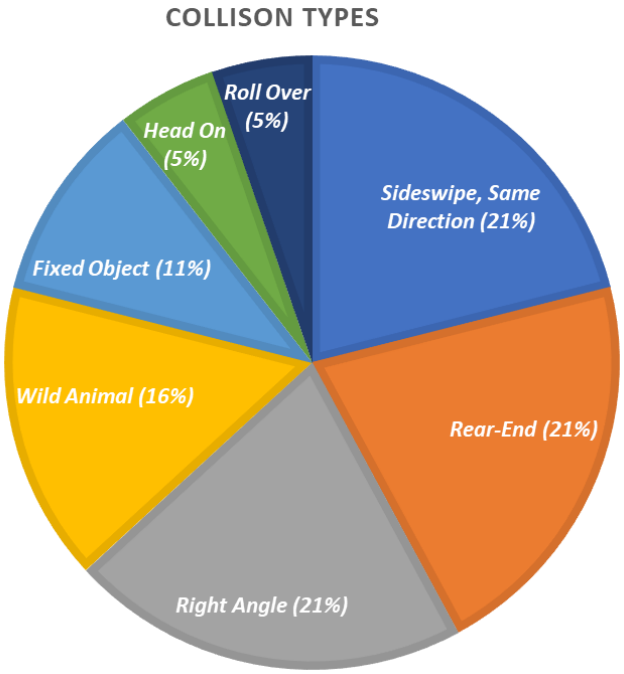
Figure 1. Crash Frequency



Fifty-eight percent (11/19) of the overall crash experiences occurred in 2013 and 2015 with crashes reported during 4 of the first 5 consecutive years in the dataset. Whereas the trend in the past 4 years has been one crash reported every other year. All three crashes reported in 2017 were coded to the Broadwater Avenue leg of the intersection. The 10-year crash history data show a downward trend in the crash experience at this location. Updated data was

collected for the intersection which identified one crash in 2022 and one in 2023. The crash data indicated the majority of collisions resulted in property damage only with only four injuries or possibly injury crashes reported in the last ten years. There were no definable trends pinpointing a correctable condition.

Figure 2. Crash Type



5.0 TRIP GENERATION

ATS performed a trip generation analysis to determine the anticipated future traffic volumes from the proposed development using the trip generation rates contained in Trip Generation (Institute of Transportation Engineers, Eleventh Edition). These rates are the national standard and are based on the most current information available to planners. A vehicle "trip" is defined as any trip that either begins or ends at the development site. ATS determined that the critical traffic impacts on the intersections and roadways would occur during the weekday morning and evening peak hours. According to the ITE trip generation rates, the development would produce 97 AM peak hour trips (25in/72out), 125 PM peak hour trips (78in/47out), and 1,407 daily trips at full buildout. These generation totals are 100 VPD less than previous studies for this project based on the latest information.

The West Side Woods Subdivision is anticipated to be constructed over 4 years. Development of the lots will be dictated by market demand. This report assumes the development reaches full build-out by the design year of 2030. The land uses expected within the development are discussed in further detail below.

Single-Family Residential #210 – ITE *Trip Generation* defines this land use as single-family detached homes on individual lots. Trip generation is typically based on the number of dwelling units. West Side Woods Subdivision is planned to develop 92 single-family residential lots.

Condominium #230 - ITE *Trip Generation* defines this land use as ownership units that have at least one other owned unit within the same building or structure. Trip generation is typically based on the number of dwelling units. West Side Woods Subdivision is planned to develop 80 condo units over three lots.

Table 3 provides estimated trip generations by phase for the anticipated uses for West Side Woods Subdivision.

Table 3. West Side Woods Subdivision Expected Trip Generation by Phase

Land Use	ITE Code	Quantity	Rate	Weekday Trip Ends	AM Peak Hour		PM Peak Hour	
					Rate	Trips	Rate	Trips
Phase 1 - 2026								
Single-Family	210	28	9.43	264	0.7	20 (5 in/15 out)	0.94	26 (16 in/10 out)
Condominium	220	28	6.74	189	0.4	11 (3 in/8 out)	0.51	14 (9 in/5 out)
Subtotal				**453**		**31 (8 in/23 out)**		**40 (25 in/15 out)**
Phase 2 - 2026								
Single-Family	210	10	9.43	94	0.7	7 (2 in/5 out)	0.94	9 (6 in/3 out)
Condominium	220	20	6.74	135	0.4	8 (2 in/6 out)	0.51	10 (6 in/4 out)
Subtotal				**682**		**46 (12 in/34 out)**		**59 (37 in/22 out)**
Land Use	**ITE Code**	**Quantity**	**Rate**	**Weekday Trip Ends**	**AM Peak Hour**		**PM Peak Hour**	
					Rate	**Trips**	**Rate**	**Trips**
Phase 3 - 2028								
Single-Family	210	43	9.43	405	0.7	30 (8 in/22 out)	0.94	40 (25 in/15 out)
Subtotal				**1,087**		**76 (20 in/26 out)**		**99 (62 in/37 out)**
30								
Single-Family	210	11	9.43	104	0.7	8 (2 in/6 out)	0.94	10 (6 in/4 out)
Condominium	220	32	6.74	216	0.4	13 (3 in/10 out)	0.51	16 (10 in/6 out)
Total at Full Build-out				**1,407**		**97 (25 in/72 out)**		**125 (78 in/47 out)**

Average weekday trips and peak hour generation have been estimated based on the ITE average generation rate. The estimated volumes do not necessarily reflect the level of traffic anticipated to enter and exit the development. The actual peak hour volumes anticipated to enter and exit the development are discussed in the following sections of the report.

Peak school traffic and peak commuter traffic do not generally occur at the same time. The MDT data from 2017 and the ATS data from 2022 and 2023 for the intersection of Granite Avenue and Highway 12 clearly showed separate peak periods in both the AM and PM traffic hours for commuter and school traffic. During the morning, the peak commuter period was 7:45-8:00 and the peak school period was 8:15-8:30. In the afternoon, the peak school period was 3:15-3:30 and the peak commuter period was 5:00-5:15. In order to accurately assess the traffic conditions for both commuter and school traffic ATS ran a traffic analysis for both time periods. Most of the traffic from the proposed residential homes in the West Side Woods Major Subdivision will be commuter traffic which will occur during the standard morning and evening commuter peak traffic periods. Traffic generation from the development will be significantly less during the peak school traffic periods. For the purposes of this report, it was assumed that the development would produce 50% of its peak-traffic during the PM peak period of school traffic but 100% during the AM peak period even though it is highly likely that many residents will avoid driving by Kessler School during the morning peak periods due to the known congestion in this area and the availability of other routes.

6.0 TRIP DISTRIBUTION

Traffic for the West Side Woods Subdivision will primarily access existing adjacent streets, Park Drive and Hauser Boulevard. It is anticipated at full build-out of the subdivision that the majority of traffic will utilize Hauser Boulevard, 80% of vehicle trips per day or 844 vehicle trips, between Park Drive and Granite Avenue to access Granite Avenue and ultimately Euclid Avenue (U.S. Highway 12). The remaining 20% of vehicle trips per day or 563 vehicle trips per day will utilize Hauser Boulevard to Knight Street to access Granite Avenue and ultimately Euclid Avenue (U.S. Highway 12). Trip distribution splits are shown in Figure 3 and traffic volumes by phase for Hauser Boulevard, Granite Avenue, and Knight Street are shown in Table 4.

Figure 3. Trip Distribution

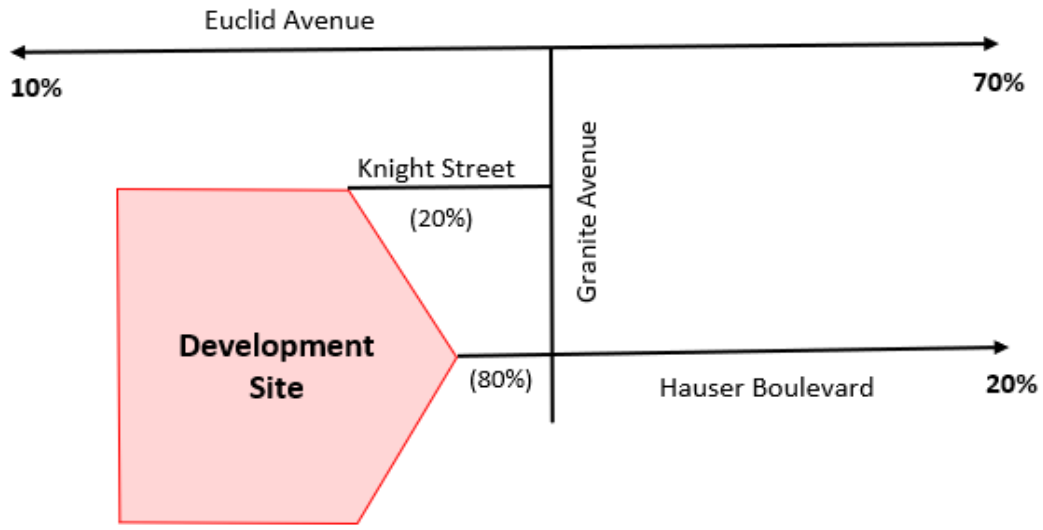


Table 4. Traffic Volume Impacts by Phase

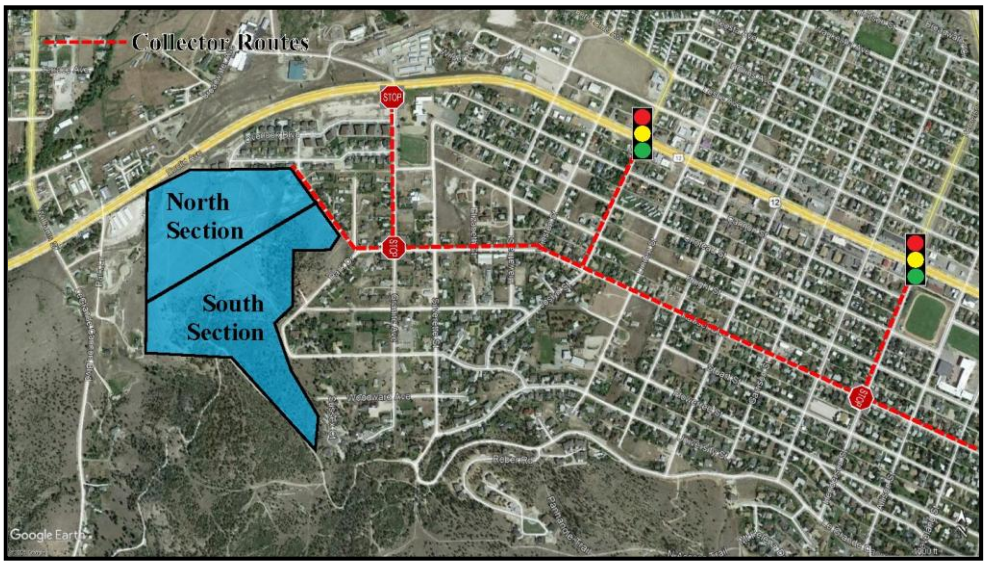
		80%	20%	80%
	ADT Volume	Hauser	Knight	Granite
Trip Generation	Existing	605	283	612
Phase 1	453	967	374	974
Phase 2	682	1,151	419	1,158
Phase 3	1,087	1,475	500	1,482
ase 4	1,407	1,731	564	1,738

Trip distribution and road assignments for this project were based on the layout of the proposed project and the available travel routes. The analysis predicts that 20% of traffic from the project will use Knight Street at full build-out. The primary reason why 20% of traffic was attributed to Knight Street includes the potential travel routes, travel distances, and travel speeds. For all residential properties in the southern portion of the development, which comprises approximately 50% of the residences, the route along Knight Street will be longer and slower than using Hauser Boulevard. Of the remaining traffic, the majority of traffic will have route paths using Hauser Boulevard matching existing traffic patterns.

The total travel distance to reach the intersection of Knight Street and Granite Avenue using Knight Street for residents living in the northern portion of the development is 1,320 feet. Getting to the same intersection using Hauser Boulevard to Granite Avenue is 1,890 feet, an

added distance of 570 feet. However, the Knight Street local route is significantly narrower and allows slower travel than the Hauser Boulevard collector route. Overall, the travel times for using these two different routes is nearly identical depending on driver speeds with a maximum difference of approximately 15 seconds. When viewed by phase, Phase 1 and 2 of the proposed development will be more focused on the northern end of the property and have a greater impact on roads to the north such as Knight Street and Hauser, but Phases 3 and 4 will be focused on the southern portion of the development and will not have as high of an impact to the north of the property. The TIS likely also overestimates that total traffic impacts from the project because no reductions for pass-by, internally captured trips, shared trips, or walking were included in the calculations to provide a more conservative overall result to the traffic analysis. Figure 4 shows the split between the north and south on the project site in relation to the collector roads in the area. The figure clearly shows that there are multiple collector routes that access Highway 12 east of the development besides Granite Avenue.

Figure 4. Collector Routes



7.0 OPERATIONAL ANALYSIS

Using the data collected for this project, ATS conducted a Level of Service (LOS) analysis at area intersections. This evaluation was conducted in accordance with the procedures outlined in the Transportation Research Board's *Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis* and the Highway Capacity Software (HCS) 2022 version 8.2. Intersections are graded from A to F representing the average delay that a vehicle entering an intersection can expect. Typically, a LOS of C or better is considered acceptable for peak-hour conditions. Modeling data is provided in Appendix D. A summary of LOS analysis for multiple scenarios is provided in Tables 5 through 10.

Table 5. Existing 2026 Level of Service Commuter Peak

	AM Peak Period		PM Peak Period	
Intersection	Delay (Sec.)	LOS	Delay (Sec.)	LOS
Granite Avenue & Highway 12	11.8/19.3	B/C	12.4/24.7	B/C
Granite Avenue & Knight Street	9.2	A	9.0	A
Granite Avenue & Hauser Blvd	9.6/9.2	A/A	9.1/8.9	A/A

Table 6. Existing 2026 Level of Service Summary School Traffic

	AM Peak Period		PM Peak Period	
Intersection	Delay (Sec.)	LOS	Delay (Sec.)	LOS
Granite Avenue & Highway 12	12.4/21.6	B/C	13.3/29.6	B/D
Granite Avenue & Knight Street	9.5	A	9.1	A
Granite Avenue & Hauser Blvd	10.0/9.5	B/A	9.3/9.1	A/A

Table 7. 2030 No Build Level of Service Summary Commuter Peak-

	AM Peak Period		PM Peak Period	
Intersection	Delay (Sec.)	LOS	Delay (Sec.)	LOS
Granite Avenue & Highway 12	11.4/25.3	B/D	18.1/21.5	C/C
Granite Avenue & Knight Street	9.1	A	8.9	A
Granite Avenue & Hauser Blvd	9.1/8.5	A/A	9.2/8.9	A/A

Table 8. 2030 No Build Level of Service Summary School Traffic

	AM Peak Period		PM Peak Period	
Intersection	Delay (Sec.)	LOS	Delay (Sec.)	LOS
Granite Avenue & Highway 12	12.0/29.5	B/D	21.2/25.1	C/D
Granite Avenue & Knight Street	9.4	A	9.1	A
Granite Avenue & Hauser Blvd	9.3/8.6	A/A	9.3/9.0	A/A

Table 9. Projected 2030 Level of Service Summary Commuter Peak by Phase

Phase		AM Peak Period		PM Peak Period	
	Intersection	Delay (Sec.)	LOS	Delay (Sec.)	LOS
1	Granite Avenue & Highway 12	12.4/20.7	B/C	13.2/28.6	B/D
	Granite Avenue & Knight Street	9.5	A	9.2	A
	Granite Avenue & Hauser Blvd	9.9/9.3	A/A	9.3/9.2	A/A
2	Granite Avenue & Highway 12	12.8/21.8	B/C	13.7/31.6	B/D
	Granite Avenue & Knight Street	9.6	A	9.3	A
	Granite Avenue & Hauser Blvd	10.1/9.4	B/A	9.4/9.3	A/A
3	Granite Avenue & Highway 12	13.6/23.5	B/C	14.8/37.2	B/E
	Granite Avenue & Knight Street	9.9	A	9.6	A
	Granite Avenue & Hauser Blvd	10.4/9.5	B/A	9.6/9.5	A/A
4	Granite Avenue & Highway 12	14.2/24.9	B/C	15.7/42.8	C/E
	Granite Avenue & Knight Street	10.1	B	9.6	A
	Granite Avenue & Hauser Blvd	10.7/9.6	B/A	9.7/9.6	A/A

Table 10. Projected 2030 Level of Service Summary School Traffic

Phase		AM Peak Period		PM Peak Period	
	Intersection	Delay (Sec.)	LOS	Delay (Sec.)	LOS
1	Granite Avenue & Highway 12	12.0/27.5	B/D	19.6/23.2	C/C
	Granite Avenue & Knight Street	9.5	B	9.0	A
	Granite Avenue & Hauser Blvd	9.3/8.6	A/A	9.2/9.0	A/A
2	Granite Avenue & Highway 12	12.4/29.3	B/D	20.9/24.7	C/C
	Granite Avenue & Knight Street	9.7	A	9.1	A
	Granite Avenue & Hauser Blvd	9.4/8.7	A/A	9.3/9.1	A/A
3	Granite Avenue & Highway 12	13.1/32.0	B/D	22.9/26.8	C/D
	Granite Avenue & Knight Street	9.9	A	9.3	A
	Granite Avenue & Hauser Blvd	9.6/8.8	A/A	9.3/9.2	A/A
4	Granite Avenue & Highway 12	13.7/34.4	B/D	25.2/29.1	D/D
	Granite Avenue & Knight Street	10.2	B	9.4	A
	Granite Avenue & Hauser Blvd	9.8/8.8	A/A	9.4/9.3	A/A

The operational analysis shows that all intersections continue to function at the acceptable levels of service, LOS C or better, through Phase 4 with the exception of the Granite Avenue and Highway 12 intersection, which goes from a LOS C/D to a LOS D/D for the PM peak period in the design year 2030

7.1 Queuing Analysis

ATS performed a vehicle queuing analysis for the intersection of Granite Avenue and Highway 12 (Euclid Avenue) based on the traffic modeling and LOS calculations. The vehicle queuing analysis suggests that the 95% vehicle queue is currently approximately 1-2 vehicles and would be expected to rise to 2-3 vehicles with Phase 1 of the proposed development and background traffic growth in this area. By Phase 4 it is expected the vehicle queue will rise to 3-4 vehicles.

Table 11. Granite and Euclid Queuing Analysis

	AM Peak Period 95% Queue Length		PM Peak Period 95% Queue Length	
Period	NB Vehicles	SB Vehicles	NB Vehicles	SB Vehicles
2025 Commuter Peak	0.9	0.2	0.4	0.7
2025 School Peak	0.7	0.3	1.9	0.4
2029 Commuter No Build	1.0	0.2	0.5	0.9
2029 School No Build	0.9	0.4	2.5	0.5
Commuter With Phase 1	1.1	0.2	0.6	0.8
School With Phase 1	0.9	0.3	2.2	0.4
Commuter With Phase 2	1.2	0.2	0.7	1.0
School With Phase 2	1.1	0.4	2.5	0.4
Commuter With Phase 3	1.5	0.2	0.9	1.1
School With Phase 3	1.3	0.4	2.9	0.5
Commuter With Phase 4	1.7	0.2	1.0	1.3
School With Phase 4	1.5	0.4	3.3	0.6

7.2 Signal Warrant Analysis

As requested by the City of Helena, a study was performed at the intersection of Euclid Avenue (Hwy 12) and Granite Avenue to determine if this intersection meets signalization warrants now or in the future. This study was completed in accordance with the procedures outlined in the 2023 11th Edition of the Manual on Uniform Traffic Control Devices (MUTCD). The study was based on traffic data collected in March 2025 by ATS and information from the traffic impact study produced for the West Side development. It should be noted that the new 2025 traffic data for this intersection is less than the volumes collected in 2022 and approximately the same as the data collected in 2017. The full signal warrant analysis is provided in Appendix E.

The analysis concludes that based on the 2025 traffic data collected for this project, traffic signal warrants are not currently met at the intersection of Euclid Avenue and Granite

Avenue, and it is not likely that a traffic signal will become warranted due to the construction of the West Side Woods development.

It is likely that this intersection will eventually need to be signalized in the future, but not due to the West Side Woods Development. It is most probable the traffic warrants for signalization will be largely due to potential future development on the north side of Euclid Avenue which would require left-turn movements onto Highway 12 from Granite Avenue. It should also be noted that the development of a traffic signal at this location will encourage drivers to use the Granite Avenue route because of the easier access to Highway 12. A traffic signal at this location would likely increase the peak-hour congestion in front of Kessler School and traffic volumes, vehicles queuing, and vehicle speeds would likely increase with the installation of a traffic signal. At this time there is insufficient evidence that a traffic signal will become warranted at this location due to the construction of West Side Woods development.

7.3 Crosswalk Evaluation

ATS performed a crosswalk evaluation for the existing pedestrian crossings on Granite Avenue at Overlook Boulevard and Knight Street adjacent to Kessler School. The studies were performed Monday 5-17-2021 to Wednesday 5-19-2021, Thursday 9-22-2022, and Tuesday 4-25-2023 to determine if the existing crosswalk warrants additional traffic controls now or in the future with the development of the West Side Woods Subdivision. Data was collected during two hour-long periods in the morning and afternoon corresponding to the pick-up and drop-off times for Kessler School. The results of the data collection are shown below. Field observations indicated that the crosswalk functions adequately and does not create large back-up of traffic. Compliance with the crosswalk was near 100%.

Table 12. 2021 Vehicle & Pedestrian Activity Overlook Boulevard Crosswalk-

	Average Vehicles Per Hour	Average Pedestrians Per Hour
AM Summary	279	24
PM Summary	244	72

*Based on data collected Monday 5-17-21 to Wednesday 5-19-21.

Table 13. 2022 Vehicle & Pedestrian Activity

	Average Vehicles Per Hour	Average Pedestrians Per Hour Overlook Boulevard	Average Pedestrians Per Hour Knight Street
AM Summary	227	21	7
PM Summary	213	55	18

*Based on data collected Thursday 9-22-22.

Table 14. 2023 Vehicle & Pedestrian Activity

	Average Vehicles Per Hour	Average Pedestrians Per Hour Overlook Boulevard	Average Pedestrians Per Hour Knight Street
AM Summary	197	28	30
PM Summary	167	60	54

*Based on data collected Thursday 4-25-23.

8.0 RELATIONSHIP TO LONG RANGE TRANSPORTATION PLAN

The analysis shown in this TIS is consistent with the information provided in the *Greater Helena Area Long Range Transportation Plan, 2014 Update* (LRTP) for the intersection of Granite Avenue and Highway 12. The LRTP indicated that the intersection of Granite Avenue and Euclid Avenue (U.S. Highway 12) functioned at LOS D(AM)/E(PM) and projected an LOS of F(AM)/F(PM) by 2035 but did not recommend capacity improvements at the intersection. The LRTP did recommend the installation of a flashing pedestrian crossing at Granite Avenue, which was installed in 2020.

There is no existing dedicated bicycle facilities currently located near or adjacent to the proposed development. Currently, local users share the existing road network in the area with vehicles. The subdivision proposes construction of local streets meeting the City of Helena standards. No dedicated bike facilities are proposed. Open space hiking and mountain biking trails are proposed throughout the subdivision that can be used to access existing City of Helena open space lands to the south. Some bicycle improvements are identified in the LRTP on Granite Street which include revisions to the existing bulb outs at Kessler School, so they are more bike friendly and buffered bike lanes on Highway 12. These are outside the scope of this project as no improvements are proposed to Granite Avenue or Highway 12 with this project.

There is no existing sidewalk networks located near the subdivision with the exception of the Overlook Estates subdivision to the north of the development. It is proposed to construct Hauser Boulevard along the east boundary of the subdivision to City of Helena standards including sidewalks. The sidewalks from internal subdivision roads will connect to the new Hauser Boulevard sidewalks and will connect to the existing sidewalks in Overlook Estates providing for a continuous sidewalk network from the subdivision through Overlook Estates to the Kessler School and Highway 12. The LRTP does not include recommended sidewalk projects in the vicinity of the proposed subdivision.

No transit stops are currently located near the proposed subdivision, and it is not anticipated that new transit locations will be developed in the West Side Woods area in the near future. The LRTP does not identify any transit improvements on the west side of Helena.

9.0 RECOMMENDATIONS AND CONCLUSIONS

This report indicates that the traffic generated at full build-out of the West Side Woods Subdivision can be adequately accommodated by the proposed access roads and recommended improvements to the local area transportation network. The analysis presented in this report indicates that all intersections except Granite Avenue and Euclid (U.S. Highway 12) will operate at a LOS B or better in the design year with West Side Woods Subdivision anticipated traffic. Therefore, the following recommendations by phase are presented based on this study:

Phase 1 Recommended Improvements

- Livezey Avenue, Livezey Court, Lee Court and Crowley Court shall be designed and constructed to City of Helena local road standards.
- The intersection of Livezey Avenue and Lee Court will be an uncontrolled intersection.
- Livezey Avenue and Crowley Court access to Hauser Boulevard will require stop sign control.
- An emergency access road from the intersection of Livezey Avenue and Lee Drive shall be constructed to a minimum 24-ft gravel surface south to Park Avenue following the future alignment for Lee Drive and Brakeman Avenue. A minimum 30-ft emergency access easement shall be provided on the Phase 1 final plat. Emergency access shall be maintained by the applicant or the HOA until the final alignment is constructed with Phase 3 and dedicated to the City of Helena.
- Hauser Boulevard, directly adjacent to the proposed subdivision, to Park Drive should be improved to the City of Helena local road standards, based on annexation conditions.
- Hauser Boulevard from Park Drive to Granite Avenue should be improved to a City of Helena minor collector standard, based on the annexation conditions.

- Pedestrian connectivity will be provided via internal sidewalks on both sides of all internal roads. The sidewalks will connect to sidewalk improvements proposed on Hauser Boulevard. Pedestrians will then be able to utilize the sidewalks on Knight Street and Overlook Boulevard to connect to Granite Avenue at Kessler School. A trail system will also be provided that will connect through the open space lots and the internal roads. The trail system will connect with existing City of Helena open space on the south side the subdivision providing pedestrian and bicycle access to the wider City of Helena trail system.
- The developer has agreed, in cooperation with Kessler School and Helena School District staff, to install a pedestrian actuated flashing crosswalk sign at the current crosswalk at the Overlook Boulevard and Granite Avenue intersection as well as a streetlight to provide for better pedestrian safety at this location. Further, the developer has agreed to the installation of bulb outs on the south end of the Kessler School property at the east leg of the Knight Street and Granite Avenue intersection as well as a flashing electronic speed limit sign south of this intersection in an effort to slow traffic speeds through the school area. With the passage of the new school bond in the fall of 2025 and the reconstruction of Kessler School in the next couple of years, these improvements are recommended to be deferred until the new school is constructed.

Phase 2 Recommended Improvements

- Livezey Court shall be designed and constructed to City of Helena local road standards.
- Pedestrian connectivity will be provided via internal sidewalks on both sides of all internal roads. The sidewalks will connect to sidewalk improvements proposed on Hauser Boulevard. Pedestrians will then be able to utilize the sidewalks on Knight Street and Overlook Boulevard to connect to Granite Avenue at Kessler School. A trail system will also be provided that will connect through the open space lots and the internal roads. The trail system will connect with existing City of Helena open space on the south side the subdivision providing pedestrian and bicycle access to the wider City of Helena trail system.

Phase 3 Recommended Improvements

- Brakeman Avenue, Brakeman Court, and Lee Drive shall be designed and constructed to City of Helena local road standards.
- The intersection of Brakeman Avenue and Lee Drive will be an uncontrolled intersection.
- Brakeman Avenue access to Park Drive will require stop sign control.
- Park Drive directly adjacent to the proposed subdivision should be improved to the City of Helena local road standards.

- Pedestrian connectivity will be provided via internal sidewalks on both sides of all internal roads. The sidewalks will connect to sidewalk improvements proposed on Hauser Boulevard. Pedestrians will then be able to utilize the sidewalks on Knight Street and Overlook Boulevard to connect to Granite Avenue at Kessler School. A trail system will also be provided that will connect through the open space lots and the internal roads. The trail system will connect with existing City of Helena open space on the south side the subdivision providing pedestrian and bicycle access to the wider City of Helena trail system.

Phase 4 Recommended Improvements

- Flowerree Court shall be designed and constructed to City of Helena local road standards.
- Flowerree Court access to Park Drive will require stop sign control.
- Pedestrian connectivity will be provided via internal sidewalks on both sides of all internal roads. The sidewalks will connect to sidewalk improvements proposed on Hauser Boulevard. Pedestrians will then be able to utilize the sidewalks on Knight Street and Overlook Boulevard to connect to Granite Avenue at Kessler School. A trail system will also be provided that will connect through the open space lots and the internal roads. The trail system will connect with existing City of Helena open space on the south side the subdivision providing pedestrian and bicycle access to the wider City of Helena trail system.
- Stripping should be added to the south leg of the Highway 12 and Granite Avenue intersection to separate right and left turn lanes. The road section appears to be wide enough at this location to add two turn lanes in this location. This will be assessed further with infrastructure planning for Phase 4 construction.

The signal warrant analysis indicates that a signal is not warranted based on anticipated traffic from the development. Additionally, the LRTP indicates the LOS for the intersection as E/F in 2035 with no recommendations for improvements.

APPENDIX A

Vicinity Map

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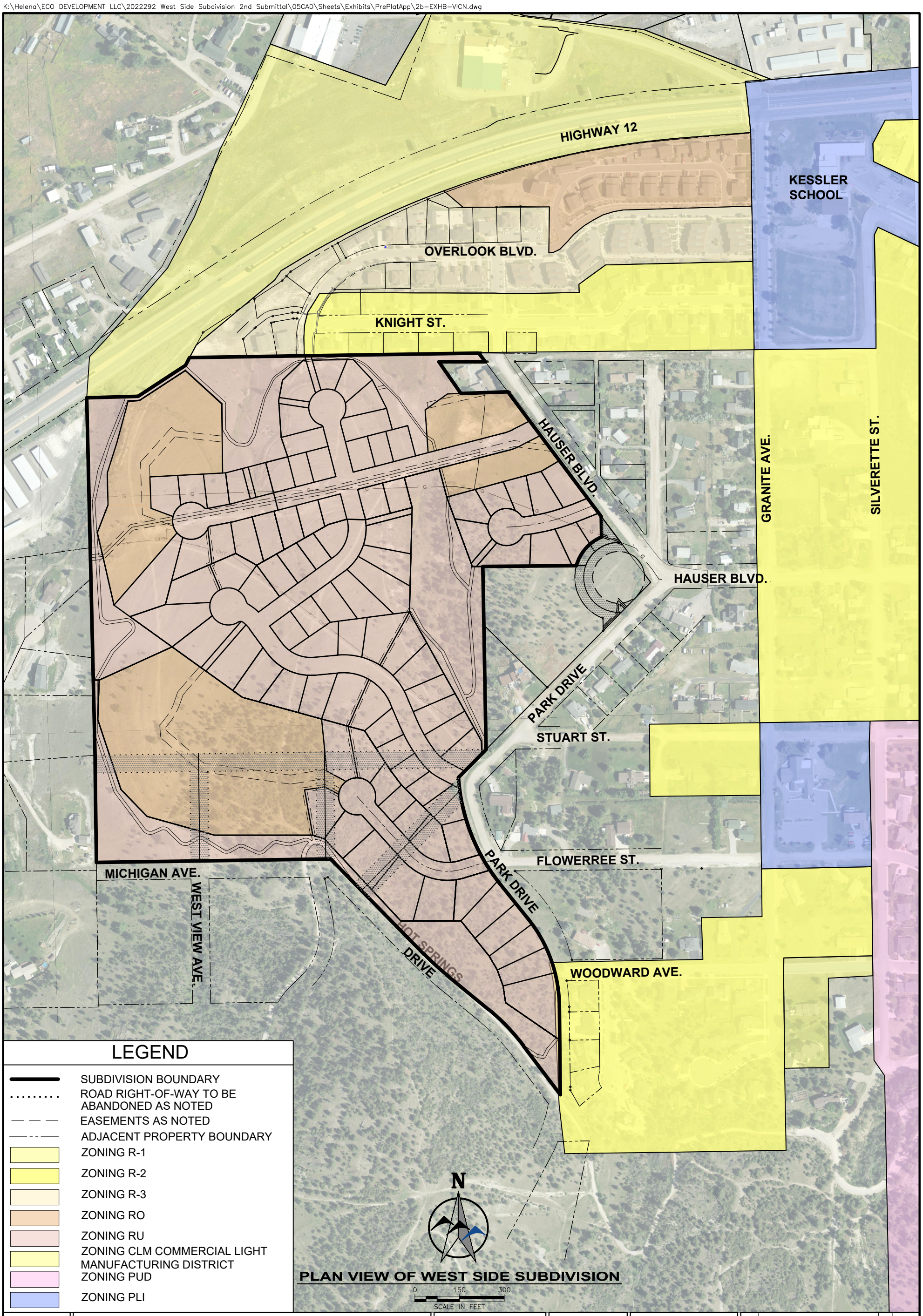


LEGEND

- SUBDIVISION BOUNDARY
- ROAD RIGHT-OF-WAY TO BE ABANDONED AS NOTED
- EASEMENTS AS NOTED
- ADJACENT PROPERTY BOUNDARY
- ZONING R-1
- ZONING R-2
- ZONING R-3
- ZONING RO
- ZONING RU
- ZONING CLM COMMERCIAL LIGHT MANUFACTURING DISTRICT
- ZONING PUD
- ZONING PLI

N

PLAN VIEW OF WEST SIDE SUBDIVISION

0 150 300

SCALE IN FEET

2b

ECO DEVELOPMENT, LLC

WEST SIDE WOODS MAJOR SUBDIVISION

VICINITY MAP

WWC ENGINEERING

1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962

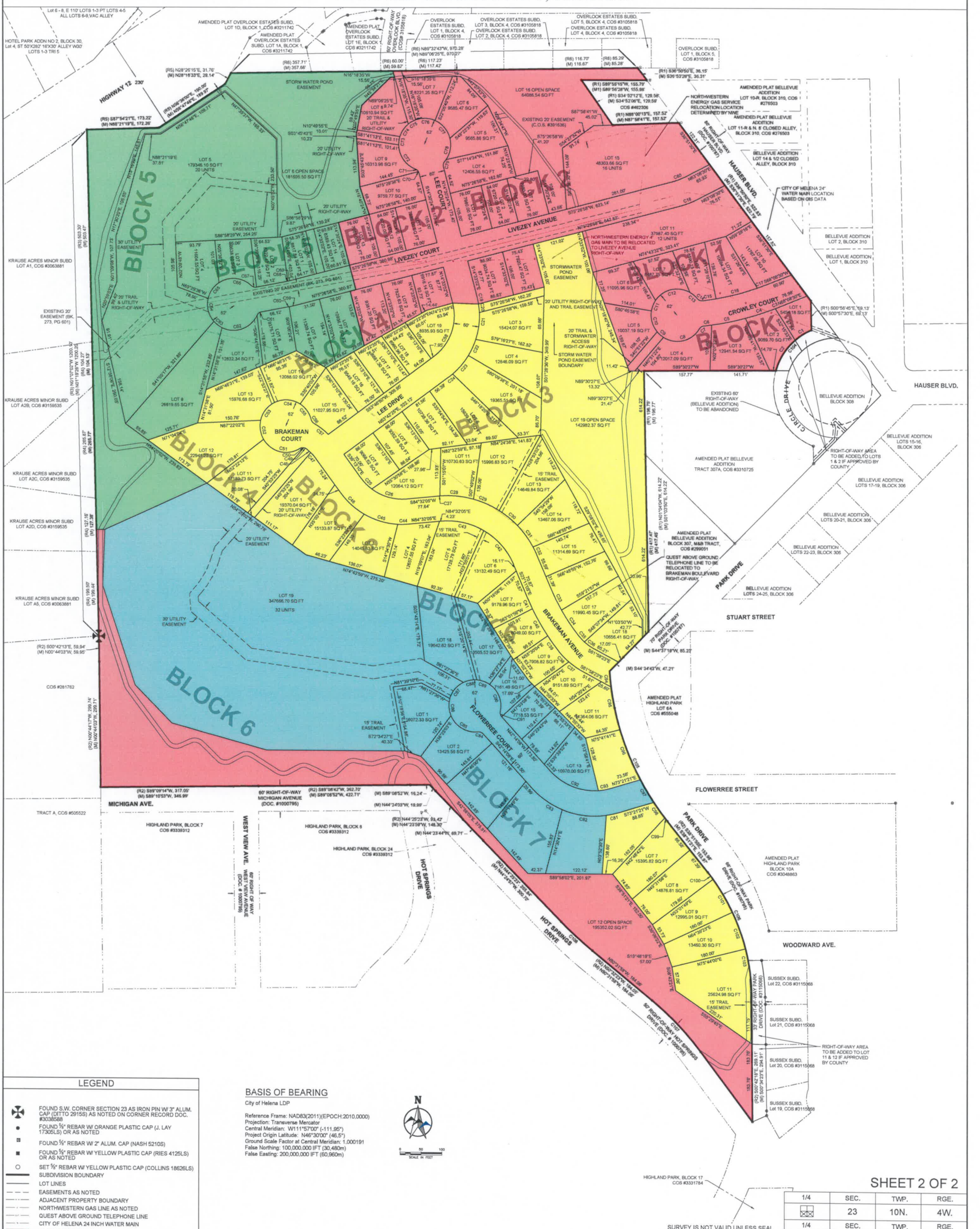
PROJECT:	2022-292
DESIGNED:	JMF
DRAWN:	DLC
CHECKED:	DDP
APPROVED:	JMF
DATE:	SEPTEMBER 15, 2022

APPENDIX B

Preliminary Plat

WEST SIDE WOODS SUBDIVISION PRELIMINARY PLAT

LOCATED IN THE SOUTH 1/2 OF SECTION 23, AND THE NORTH 1/2 OF SECTION 26, TOWNSHIP 10 NORTH, RANGE 4 WEST P.M.M., LEWIS AND CLARK COUNTY, MONTANA



LEGEND

- FOUND S.W. CORNER SECTION 23 AS IRON PIN W/ 3" ALUM. CAP (DITTO 2915S) AS NOTED ON CORNER RECORD DOC. #3038588
- FOUND ⅝" REBAR W/ ORANGE PLASTIC CAP (J. LAY 17305LS) OR AS NOTED
- FOUND ⅝" REBAR W/ 2" ALUM. CAP (NASH 5210S)
- FOUND ⅝" REBAR W/ YELLOW PLASTIC CAP (RIES 4125LS) OR AS NOTED
- SET ⅝" REBAR W/ YELLOW PLASTIC CAP (COLLINS 18626LS)
- SUBDIVISION BOUNDARY
- LOT LINES
- EASEMENTS AS NOTED
- ADJACENT PROPERTY BOUNDARY
- NORTHWESTERN GAS LINE AS NOTED
- QUEST ABOVE GROUND TELEPHONE LINE
- CITY OF HELENA 24 INCH WATER MAIN
- PHASE 1 BOUNDARY
- PHASE 2 BOUNDARY
- PHASE 3 BOUNDARY
- PHASE 4 BOUNDARY

(M) MEASURED (THIS SURVEY)
(R1) RECORD (CERTIFICATE OF SURVEY #3310725)
(R2) RECORD (CERTIFICATE OF SURVEY #3339312)
(R3) RECORD (CERTIFICATE OF SURVEY #3063881)
(R4) RECORD (CERTIFICATE OF SURVEY #3159535)
(R5) RECORD (STATE OF MT STATE HIGHWAY COMMISSION RIGHT-OF-WAY PLAN F_249(30))
(R6) RECORD (CERTIFICATE OF SURVEY #3211742)
(R7) RECORD (CERTIFICATE OF SURVEY #3105818)

BASIS OF BEARING

City of Helena LDP

Reference Frame: NAD83(2011)(EPOCH:2010.0000)
Projection: Transverse Mercator
Central Meridian: W111°57'00" (-111.95°)
Project Origin Latitude: N46°30'00" (46.5°)
Ground Scale Factor at Central Meridian: 1.000191
False Northing: 100,000.000 IFT (30,480m)
False Easting: 200,000.000 IFT (60,960m)

N

0 50 100
SCALE IN FEET

SURVEY IS NOT VALID UNLESS SEAL CONTAINS THE SIGNATURE OF THE PROFESSIONAL LAND SURVEYOR.

CERTIFICATE OF SURVEYOR

MONTANA DAVID L. COLLINS 18626LS LICENSED PROFESSIONAL LAND SURVEYOR

DRAFT

DAVID L. COLLINS, PLS Date

SHEET 2 OF 2

1/4	SEC.	TWP.	RGE.
☒	23	10N.	4W.
1/4	SEC.	TWP.	RGE.
☒	26	10N.	4W.

ECO DEVELOPMENT LLC

WEST SIDE WOODS SUBDIVISION

JOB#: 2020-216

REVISIONS	
Date	By
11/2022	DLC

WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962

Drawn By: DLC | Checked By: DDP | Date: 8/2022 | Scale: 1" 100'

PLOT STYLE: 11x17.ctb | PLOT DATE: 11/15/2022 | FILE PATH: K:\Helena\ECO DEVELOPMENT LLC\2020\2216 West Side Subdivision 2nd Submittal\ECO ENGINEERING\Preliminary Plat\2020-216_PLAT-SHT2.dwg

APPENDIX C

Traffic Count Data

Turning Movement Count
All Vehicles
Location US12 & Henderson Helena West
Date 9/28/2022 PM, 9/22/2022 AM

	Northbound				Southbound				Eastbound				Westbound				
	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	TOTAL
7:00 - 7:15	2	0	9	0	1	0	0	0	0	65	0	0	2	67	7	0	153
7:15 - 7:30	4	0	9	0	3	0	0	0	0	68	0	0	4	100	5	0	193
7:30 - 7:45	1	0	25	1	2	0	0	0	0	80	1	0	4	116	3	0	233
7:45 - 8:00	5	1	36	0	2	1	0	0	0	113	4	0	6	152	17	0	337
8:00 - 8:15	8	0	42	0	2	0	1	0	0	78	11	0	14	92	13	0	261
8:15 - 8:30	11	0	35	0	1	0	0	1	0	69	15	0	17	97	8	0	254
8:30 - 8:45	3	0	14	0	5	1	0	0	1	78	2	0	2	79	6	0	191
8:45 - 9:00	1	1	10	0	2	0	1	0	0	80	3	0	6	74	5		183
9:00 - 9:15	2	0	7	0	6	0	1	0	1	67	1	0	0	87	7	0	179
9:15 - 9:30	0	1	1	0	3	0	0	0	0	60	0	0	4	82	12	1	164
9:30 - 9:45	2	0	11	0	4	0	2	0	0	60	3	0	4	67	9	0	162
9:45 - 10:00	0	0	10	0	4	0	0	0	1	71	1	0	2	61	9	0	159
10:00 - 10:15	0	0	8	0	6	0	0	0	0	67	0	0	3	105	8	0	197
10:15 - 10:30	1	0	6	0	2	2	2	0	1	61	1	0	9	87	4	0	176
10:30 - 10:45	0	0	9	0	6	0	0	1	1	97	1	0	8	74	12	0	209
10:45 - 11:00	2	0	8	0	6	0	0	0	0	91	5	0	5	86	2	0	205
11:00 - 11:15	0	1	14	0	10	0	2	0	0	87	0	0	6	72	2	0	194
11:15 - 11:30	1	0	6	0	5	1	0	0	0	101	3	0	4	63	4	0	188
11:30 - 11:45	2	0	11	0	4	0	1	0	0	98	1	0	7	79	3	0	206
11:45 - 12:00	1	0	8	0	3	0	0	0	0	94	2	0	3	72	2	0	185
12:00 - 12:15	1	0	8	0	6	0	0	0	2	94	1	0	12	89	4	0	217
12:15 - 12:30	1	1	7	0	7	1	0	0	0	97	1	0	9	86	5	0	215
12:30 - 12:45	0	0	5	1	7	0	1	0	1	81	0	0	6	116	4	0	222
12:45 - 1:00	1	1	13	0	5	0	0	1	0	94	0	0	7	95	15	0	232
1:00 - 1:15	2	0	12	0	11	0	2	0	0	57	0	0	12	84	7	0	187
1:15 - 1:30	0	0	9	0	7	0	1	1	0	76	0	0	11	90	10	0	205
1:30 - 1:45	1	2	9	0	6	0	2	0	0	84	1	0	7	80	3	0	195
1:45 - 2:00	3	0	9	0	7	1	0	0	0	83	0	0	9	81	8	0	201
2:00 - 2:15	0	1	4	0	5	0	0	0	0	95	3	0	13	69	8	0	198
2:15 - 2:30	2	1	6	0	4	1	1	0	0	90	4	0	14	72	8	0	203
2:30 - 2:45	0	0	20	0	13	0	2	0	0	130	5	0	9	80	16	0	275
2:45 - 3:00	1	0	12	0	4	1	0	0	0	106	10	0	18	94	6	0	252
3:00 - 3:15	2	0	20	0	8	1	1	0	2	114	11	0	18	107	8	0	292
3:15 - 3:30	18	0	51	0	7	1	0	0	0	93	3	0	12	97	2	0	284
3:30 - 3:45	5	0	11	0	6	0	1	0	0	124	1	0	17	90	1	0	256
3:45 - 4:00	2	0	4	0	5	0	1	0	1	108	1	0	17	82	6	0	227
4:00 - 4:15	1	0	11	0	6	0	0	0	0	150	2	0	13	110	3	0	296
4:15 - 4:30	0	0	14	0	4	0	0	0	1	126	0	0	16	125	7	0	293
4:30 - 4:45	0	0	17	2	8	0	0	0	0	180	4	0	23	116	2	0	352
4:45 - 5:00	1	0	12	1	13	0	0	0	0	126	2	0	14	85	3	0	257
5:00 - 5:15	2	0	9	1	7	0	2	0	1	97	0	0	14	100	5	0	238
5:15 - 5:30	2	0	8	0	7	0	1	2	2	105	1	0	22	98	4	0	252
5:30 - 5:45	1	0	7	0	4	1	2	0	0	94	0	0	27	82	2	0	220
5:45 - 6:00	0	0	10	0	6	0	1	0	1	88	2	0	20	79	3	0	210
6:00 - 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 - 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 - 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 - 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	92	10	567	6	240	12	28	6	16	4077	106	0	450	3919	278	1	9808

Turning Movement Count
All Vehicles
Location Granite/Kessler School
Date 9/21/2022

	Northbound				Southbound				Left on	Overlook Eastbound				Knight Eastbound					Knight Westbound		Peds	
	Ovrlk	Thr	Knight	Peds	Ovrlk	Thr	RKngt	Knight	Left		Right	Peds	Left		Right	Peds	Total	Left	Right	Overlook	Knight
7:00 - 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 - 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 - 7:45	0	5	0	0	0	3	0	0	13	0	1	0	5	0	3	0	30	0	0	0	0
7:45 - 8:00	0	15	0	0	1	7	1	0	17	0	1	0	2	0	2	0	46	0	3	0	5
8:00 - 8:15	0	25	1	0	9	16	1	0	5	0	0	0	7	0	0	0	64	0	13	4	0
8:15 - 8:30	0	21	0	0	5	28	1	4	1	0	0	0	5	0	2	0	67	0	12	17	2
8:30 - 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 - 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:00 - 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:15 - 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:30 - 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:45 - 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:00 - 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:15 - 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:30 - 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:45 - 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:00 - 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:15 - 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:30 - 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:45 - 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:00 - 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:15 - 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:30 - 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:45 - 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:00 - 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:15 - 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:30 - 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:45 - 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:00 - 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:15 - 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:30 - 2:45	0	6	0	0	5	3	3	0	0	0	0	0	4	1	1	0	23	0	2	0	0
2:45 - 3:00	0	11	0	0	4	7	4	1	2	0	0	0	3	0	1	0	33	1	4	0	0
3:00 - 3:15	2	3	2	0	8	12	1	0	3	0	1	0	3	0	0	0	35	0	2	3	2
3:15 - 3:30	2	11	1	0	8	10	3	5	14	1	1	0	9	0	4	0	69	12	1	52	16
3:30 - 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
3:45 - 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:00 - 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:15 - 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:30 - 4:45	0	5	0	0	5	9	3	1	3	0	0	0	6	0	0	0	32	0	0	0	0
4:45 - 5:00	2	5	0	0	6	4	5	2	6	0	0	0	2	0	0	0	32	0	0	1	0
5:00 - 5:15	1	7	0	0	9	5	4	0	2	0	0	0	4	0	0	0	32	0	2	0	0
5:15 - 5:30	0	8	0	0	6	14	11	0	2	0	0	0	2	0	0	0	43	0	1	0	0
5:30 - 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5:45 - 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:00 - 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:15 - 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:30 - 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:45 - 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	7	122	4	0	66	118	37	13	68	1	4	0	52	1	13	0	506				

Merged Weekly Counts
GraniteStreet2022

from Tue-Sep-20-2022-10-00-AM to Thu-Sep-22-2022-12-59-PM

	9/19/2022	to	9/25/2022							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Week	Weekend	Week Day 85%
Hour	9/19/2022	9/20/2022	9/21/2022	9/22/2022	9/23/2022	9/24/2022	9/25/2022	Day Avg	Avg	Avg Speed
0 - 1	*	*	0	0	*	*	*	0	0	0
1 - 2	*	*	2	0	*	*	*	1	0	37
2 - 3	*	*	0	0	*	*	*	0	0	0
3 - 4	*	*	1	2	*	*	*	1.5	0	22.5
4 - 5	*	*	1	1	*	*	*	1	0	29
5 - 6	*	*	5	8	*	*	*	6.5	0	32.5
6 - 7	*	*	17	10	*	*	*	13.5	0	34.5
7 - 8	*	*	34	39	*	*	*	36.5	0	31.5
8 - 9	*	*	42	48	*	*	*	45	0	30.25
9 - 10	*	*	24	18	*	*	*	21	0	31
10 - 11	*	13	42	27	*	*	*	27.33	0	32.33
11 - 12	*	39	28	32	*	*	*	33	0	33.6
12 - 13	*	32	36	24	*	*	*	30.67	0	34.13
13 - 14	*	33	40	*	*	*	*	36.5	0	32.75
14 - 15	*	32	26	*	*	*	*	29	0	30.85
15 - 16	*	71	57	*	*	*	*	64	0	32
16 - 17	*	67	51	*	*	*	*	59	0	33.35
17 - 18	*	60	57	*	*	*	*	58.5	0	34
18 - 19	*	40	42	*	*	*	*	41	0	35.35
19 - 20	*	28	27	*	*	*	*	27.5	0	32.5
20 - 21	*	25	30	*	*	*	*	27.5	0	31.85
21 - 22	*	8	11	*	*	*	*	9.5	0	31.5
22 - 23	*	4	7	*	*	*	*	5.5	0	33.5
23 - 24	*	1	2	*	*	*	*	1.5	0	40.5
Totals	0	453	582	209	0	0	0			
% of Total	0%	36.41%	46.78%	16.8%	0%	0%	0%			

Merged Weekly Counts
GraniteStreet

from Tue-Oct-12-2021-02-00-PM to Thu-Oct-14-2021-04-59-PM

	10/11/2021	to	10/17/2021							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Week	Weekend	Week Day 85%
Hour	10/11/2021	10/12/2021	10/13/2021	10/14/2021	10/15/2021	10/16/2021	10/17/2021	Day Avg	Avg	Avg Speed
0 - 1	*	*	0	0	*	*	*	0	0	0
1 - 2	*	*	1	0	*	*	*	0.5	0	37
2 - 3	*	*	2	0	*	*	*	1	0	35
3 - 4	*	*	1	2	*	*	*	1.5	0	23
4 - 5	*	*	1	0	*	*	*	0.5	0	29
5 - 6	*	*	2	4	*	*	*	3	0	29
6 - 7	*	*	8	13	*	*	*	10.5	0	37
7 - 8	*	*	32	35	*	*	*	33.5	0	33.5
8 - 9	*	*	63	62	*	*	*	62.5	0	32.35
9 - 10	*	*	33	27	*	*	*	30	0	33.8
10 - 11	*	*	28	36	*	*	*	32	0	34.5
11 - 12	*	*	45	24	*	*	*	34.5	0	34
12 - 13	*	*	50	35	*	*	*	42.5	0	34.75
13 - 14	*	*	37	31	*	*	*	34	0	33.9
14 - 15	*	44	39	37	*	*	*	40	0	32.83
15 - 16	*	68	65	68	*	*	*	67	0	33.5
16 - 17	*	33	64	7	*	*	*	34.67	0	35.33
17 - 18	*	64	58	*	*	*	*	61	0	33.85
18 - 19	*	38	58	*	*	*	*	48	0	35.2
19 - 20	*	29	38	*	*	*	*	33.5	0	33.5
20 - 21	*	22	33	*	*	*	*	27.5	0	34.15
21 - 22	*	14	15	*	*	*	*	14.5	0	34.5
22 - 23	*	4	3	*	*	*	*	3.5	0	36.5
23 - 24	*	2	2	*	*	*	*	2	0	34.5
Totals	0	318	678	381	0	0	0			
% of Total	0%	23.09%	49.24%	27.67%	0%	0%	0%			

Merged Weekly Counts
KnightStreet

from Tue-Oct-12-2021-02-00-PM to Thu-Oct-14-2021-04-59-PM

	10/11/2021	to	10/17/2021							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Week	Weekend	Week Day 85%
Hour	10/11/2021	10/12/2021	10/13/2021	10/14/2021	10/15/2021	10/16/2021	10/17/2021	Day Avg	Avg	Avg Speed
0 - 1	*	*	0	0	*	*	*	0	0	0
1 - 2	*	*	0	0	*	*	*	0	0	0
2 - 3	*	*	0	0	*	*	*	0	0	0
3 - 4	*	*	1	1	*	*	*	1	0	14.5
4 - 5	*	*	1	0	*	*	*	0.5	0	17
5 - 6	*	*	3	2	*	*	*	2.5	0	22.5
6 - 7	*	*	9	11	*	*	*	10	0	23.5
7 - 8	*	*	21	24	*	*	*	22.5	0	22.9
8 - 9	*	*	25	24	*	*	*	24.5	0	24.25
9 - 10	*	*	5	20	*	*	*	12.5	0	24
10 - 11	*	*	9	19	*	*	*	14	0	26.75
11 - 12	*	*	13	18	*	*	*	15.5	0	24.5
12 - 13	*	*	10	11	*	*	*	10.5	0	20.25
13 - 14	*	*	18	21	*	*	*	19.5	0	24.25
14 - 15	*	20	8	19	*	*	*	15.67	0	27.77
15 - 16	*	35	33	22	*	*	*	30	0	24.5
16 - 17	*	32	27	6	*	*	*	21.67	0	26.27
17 - 18	*	29	26	*	*	*	*	27.5	0	24.5
18 - 19	*	19	23	*	*	*	*	21	0	22
19 - 20	*	6	18	*	*	*	*	12	0	22
20 - 21	*	6	3	*	*	*	*	4.5	0	22.75
21 - 22	*	6	5	*	*	*	*	5.5	0	24.25
22 - 23	*	2	4	*	*	*	*	3	0	18
23 - 24	*	5	1	*	*	*	*	3	0	18.5
Totals	0	160	263	198	0	0	0			
% of Total	0%	25.76%	42.35%	31.88%	0%	0%	0%			

Summary of Turning Movement Counts

Study Name Euclid & Granite

Observer CJW

Date 10/13/2021 & 10/14/21

10/13/2021

Cars

	Northbound			Southbound			Eastbound			Westbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total All
4:30 PM	3	0	13	5	0	2	0	141	5	11	82	1	263
4:45 PM	0	0	13	10	0	0	1	135	3	22	110	3	297
5:00 PM	0	0	10	12	1	0	0	106	0	19	89	2	239
5:15 PM	0	0	1	3	0	0	1	64	4	15	76	2	166
Total	3	0	37	30	1	2	2	446	12	67	357	8	965

Pedestrians

	Northbound			Southbound			Eastbound			Westbound			
Start Time	Counte	Clockw	Total	Counte	Clockw	Total	Counte	Clockw	Total	Counte	Clockw	Total	Total All
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	0	0	0	1

10/14/2021

Cars

	Northbound			Southbound			Eastbound			Westbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total All
7:30 AM	4	0	21	5	0	0	0	83	4	8	152	3	280
7:45 AM	9	0	20	3	1	0	0	95	5	12	153	10	308
8:00 AM	8	2	42	3	0	1	0	81	13	9	108	13	280
8:15 AM	12	0	36	3	0	0	1	73	16	14	81	9	245
Total	33	2	119	14	1	1	1	332	38	43	494	35	1113

Cars

	Northbound			Southbound			Eastbound			Westbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total All
3:00 PM	**5**	**0**	**23**	**4**	**0**	**0**	**0**	**91**	**8**	**19**	**76**	**7**	**233**
3:15 PM	**19**	**0**	**48**	**6**	**0**	**0**	**0**	**75**	**7**	**13**	**81**	**4**	**253**
3:30 PM	**3**	**0**	**11**	**8**	**0**	**1**	**2**	**107**	**3**	**17**	**87**	**5**	**244**
Total	27	0	82	18	0	1	2	273	18	49	244	16	730

Summary of Turning Movement Counts

Study Name Hauser & Granite

Observer CJW

Date 10/13/2021 & 10/14/21

10/13/2021

Cars

	Northbound			Southbound			Eastbound			Westbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total All
4:30 PM	0	1	0	1	1	0	0	0	0	0	0	0	3
4:45 PM	0	6	2	0	3	2	1	0	0	0	0	1	15
5:00 PM	0	3	0	1	4	3	0	1	0	0	1	2	15
5:15 PM	0	2	0	0	9	1	0	0	0	3	5	1	21
Total	0	12	2	2	17	6	1	1	0	3	6	4	54

10/14/2021

Cars

	Northbound			Southbound			Eastbound			Westbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total All
7:30 AM	0	2	2	1	1	0	1	0	0	0	0	0	7
7:45 AM	0	6	2	2	1	0	0	1	0	1	1	1	15
8:00 AM	0	6	0	1	1	0	1	3	0	0	0	10	22
8:15 AM	0	7	1	2	6	1	1	4	0	1	0	6	29
Total	0	12	2	2	17	6	1	1	0	3	6	4	54

Cars

	Northbound			Southbound			Eastbound			Westbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total All
3:00 AM	4	0	0	0	5	1	1	2	0	0	1	7	21
3:15 AM	0	4	1	5	2	0	1	2	0	0	1	4	20
3:30 AM	0	2	0	3	5	1	1	1	0	2	0	2	17
Total	4	6	1	8	12	2	3	5	0	2	2	13	58

Study Name Euclid & Granite
Start Date 09/26/2017
Start Time 7:00 AM
Site Code
Project Traffic Safety
Type Road
Classification Totals

	Southbound Approach Southbound				Westbound Approach Westbound				Northbound Approach Northbound				Eastbound Approach Eastbound				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
7:00 AM	0	0	1	0	5	88	1	0	10	0	0	0	0	55	0	0	160
7:15 AM	1	0	1	0	3	126	1	0	21	0	3	0	1	77	2	0	236
7:30 AM	0	0	0	0	13	97	8	0	22	1	5	0	4	108	0	0	258
7:45 AM	0	1	5	0	22	149	9	0	26	0	5	0	4	96	1	0	318
8:00 AM	0	0	4	0	18	97	12	0	33	0	6	0	0	90	0	1	261
8:15 AM	0	1	4	0	10	105	13	0	39	0	5	0	0	84	0	0	261
8:30 AM	1	0	6	0	11	85	6	0	23	0	3	0	0	73	0	0	208
8:45 AM	0	1	4	0	13	89	3	0	13	0	0	0	0	88	0	0	211
9:00 AM	0	1	2	0	5	69	7	0	8	0	1	0	1	66	0	0	160
9:15 AM	0	0	6	0	4	71	2	0	5	0	0	0	0	77	0	0	165
9:30 AM	0	0	7	0	7	81	5	0	5	0	2	0	0	71	1	0	179
9:45 AM	1	0	4	0	6	72	10	0	5	0	1	0	1	67	0	0	167
10:00 AM	0	0	6	0	10	65	3	0	6	0	0	0	0	74	0	0	164
10:15 AM	0	0	6	0	6	76	9	0	4	0	0	0	0	61	1	0	163
10:30 AM	0	0	4	0	7	69	5	0	9	0	0	0	0	76	0	0	170
10:45 AM	0	0	11	0	10	77	4	1	11	0	2	0	1	82	0	0	199
11:00 AM	1	0	5	0	5	60	6	0	8	0	0	0	1	79	1	1	167
11:15 AM	0	0	4	0	3	69	3	0	8	0	1	0	1	74	0	0	163
11:30 AM	0	0	10	0	8	71	13	0	4	0	1	0	2	78	1	0	188
11:45 AM	0	1	4	0	5	57	8	0	8	0	1	0	1	97	2	0	184
12:00 PM	0	0	3	0	9	68	3	0	8	0	1	0	3	69	0	0	164
12:15 PM	0	0	9	0	6	79	10	0	6	0	0	0	0	100	1	0	211
12:30 PM	0	0	4	0	5	69	6	1	6	0	1	0	0	82	1	1	176
12:45 PM	0	0	11	0	6	74	10	0	6	0	2	0	2	83	0	0	194
1:00 PM	2	0	7	0	6	84	8	0	5	0	1	0	2	70	0	0	185
1:15 PM	0	0	3	0	5	93	8	1	7	0	4	0	1	70	0	0	192
1:30 PM	0	1	4	0	6	94	8	0	15	0	1	0	1	77	0	0	207
1:45 PM	0	1	14	0	2	71	6	0	8	0	2	0	1	82	2	0	189
2:00 PM	0	0	6	0	8	77	11	0	3	1	1	0	4	81	0	0	192
2:15 PM	0	1	12	0	11	87	10	2	3	1	2	0	0	81	1	0	211
2:30 PM	1	0	14	0	3	82	9	0	15	0	3	0	3	91	0	0	221
2:45 PM	0	1	12	0	6	89	8	0	7	0	0	0	4	86	0	0	213
3:00 PM	0	1	9	0	11	94	22	0	4	0	2	0	9	91	2	0	245
3:15 PM	2	1	6	0	7	92	16	0	51	0	13	0	4	89	0	0	281
3:30 PM	1	0	9	0	5	83	11	1	14	0	1	0	3	142	1	0	271
3:45 PM	3	0	7	0	6	104	15	0	11	0	1	0	1	108	0	0	256
4:00 PM	0	0	7	0	1	70	13	0	3	0	1	0	3	139	0	0	237
4:15 PM	0	0	4	0	4	97	11	0	5	2	1	0	3	98	0	0	225
4:30 PM	0	1	0	0	5	98	7	0	6	0	1	0	3	155	0	0	276
4:45 PM	0	0	10	0	8	83	17	0	15	1	2	0	3	130	1	0	270
5:00 PM	1	0	11	0	3	111	11	0	11	0	3	0	0	109	1	0	261
5:15 PM	0	0	8	0	9	94	13	0	6	0	1	0	2	87	2	0	222
5:30 PM	0	0	11	0	8	94	16	0	5	1	0	0	1	108	0	0	244
5:45 PM	0	0	4	0	22	88	21	0	7	3	5	0	0	67	1	0	218
6:00 PM	1	0	12	0	8	77	9	0	9	0	0	0	1	58	0	0	175
6:15 PM	0	0	1	0	3	78	16	0	6	0	0	0	0	70	0	0	174
6:30 PM	0	0	3	0	1	65	17	0	7	0	2	0	3	39	0	0	137
6:45 PM	1	0	5	0	1	50	10	0	9	0	1	0	2	50	0	0	129
7:00 AM	0	1	2	0	4	78	2	0	18	0	0	0	1	71	0	0	177
7:15 AM	0	0	2	0	4	126	2	0	13	0	3	0	0	95	0	0	245
7:30 AM	3	0	2	0	13	111	8	0	22	0	2	0	2	99	0	0	262
7:45 AM	0	0	1	0	13	153	8	0	37	0	5	0	4	120	1	0	342
8:00 AM	0	0	3	0	17	121	9	0	32	1	5	0	14	79	0	0	281
8:15 AM	0	1	2	0	5	96	14	0	28	0	7	0	10	68	0	0	231
8:30 AM	1	1	2	0	7	87	4	1	17	1	1	0	2	79	1	0	204
8:45 AM	0	0	5	0	10	69	8	0	11	0	0	0	0	87	1	0	191
9:00 AM	0	1	4	0	12	91	2	0	4	1	5	0	0	81	0	0	201
9:15 AM	0	0	3	0	11	74	6	1	9	0	1	0	0	69	0	0	174
9:30 AM	0	0	3	0	4	67	4	0	6	0	2	0	0	59	0	0	145
9:45 AM	0	0	9	0	6	72	5	0	8	1	1	0	0	73	0	0	175
10:00 AM	0	0	4	0	7	61	8	0	7	0	2	0	1	66	0	0	156
10:15 AM	0	0	8	0	6	79	2	8	6	0	1	0	2	67	0	0	179
10:30 AM	0	0	2	0	6	70	2	0	4	0	0	0	0	76	0	0	160
10:45 AM	0	0	4	0	5	65	8	0	4	0	0	0	3	90	0	0	179
11:00 AM	1	0	7	0	8	56	3	0	5	0	0	0	0	88	1	1	170
11:15 AM	1	1	10	0	9	82	1	0	10	0	2	0	0	69	1	0	186
11:30 AM	1	0	8	0	7	57	6	0	12	0	0	0	2	87	1	0	181
11:45 AM	0	1	9	0	9	84	7	0	6	0	0	0	4	83	1	1	205
12:00 PM	0	0	8	0	8	86	11	1	4	0	0	0	1	75	0	1	195
12:15 PM	0	0	3	0	10	100	7	0	6	0	1	0	2	78	0	0	207
12:30 PM	0	0	8	0	5	85	10	1	11	0	1	0	0	91	1	0	213

12:45 PM	0	0	10	0	3	73	9	1	6	0	2	0	1	83	0	0	188
1:00 PM	0	1	5	0	5	77	8	0	6	1	2	0	1	94	0	0	200
1:15 PM	0	0	9	0	5	95	10	0	7	0	1	0	0	82	0	0	209
1:30 PM	1	0	5	0	6	82	7	0	10	0	1	0	0	91	1	1	205
1:45 PM	0	0	8	0	6	68	6	0	13	0	2	0	1	77	0	0	181
2:00 PM	0	0	6	0	9	67	6	1	4	0	1	0	1	91	1	0	187
2:15 PM	1	0	5	0	5	93	13	1	5	0	0	0	1	93	1	1	219
2:30 PM	1	0	8	0	5	90	9	0	6	1	1	0	2	96	0	0	219
2:45 PM	0	2	7	0	11	65	12	1	8	0	0	0	8	82	1	0	197
3:00 PM	0	0	13	0	4	61	16	0	3	0	0	0	5	114	2	0	218
3:15 PM	1	1	2	0	3	81	18	0	38	0	15	0	4	93	0	0	256
3:30 PM	1	0	6	0	9	120	5	1	17	1	2	0	2	134	0	0	298
3:45 PM	1	0	5	0	4	89	4	1	8	0	0	0	3	86	1	0	202
4:00 PM	1	0	15	0	4	97	12	1	3	0	1	0	6	111	1	0	252
4:15 PM	0	3	4	0	8	94	16	0	6	0	1	0	3	112	2	0	249
4:30 PM	0	0	6	0	6	130	14	0	10	2	1	0	2	166	1	0	338
4:45 PM	1	0	10	0	4	96	13	0	7	0	5	0	2	115	1	0	254
5:00 PM	2	1	15	0	1	110	16	1	16	1	2	0	1	93	0	0	259
5:15 PM	1	0	7	0	8	109	20	0	16	0	4	0	3	93	0	0	261
5:30 PM	0	0	11	0	11	100	24	0	13	0	1	0	1	79	0	0	240
5:45 PM	0	0	6	0	13	79	20	0	10	0	0	0	2	75	1	0	206
6:00 PM	0	0	7	0	5	78	13	0	6	0	2	0	5	63	0	0	179
6:15 PM	2	1	5	0	1	69	6	1	2	0	1	0	1	97	0	0	186
6:30 PM	0	0	10	0	0	63	12	0	7	0	2	0	1	61	0	0	156
6:45 PM	0	0	3	0	1	48	6	0	11	0	4	0	0	49	0	0	122
7:00 AM	0	0	0	0	5	69	1	0	13	0	1	0	0	60	0	0	149
7:15 AM	0	0	1	0	2	125	5	0	16	0	4	0	0	80	1	0	234
7:30 AM	0	1	1	0	8	115	7	0	25	0	3	0	4	88	0	1	253
7:45 AM	0	0	4	0	14	155	6	0	34	0	5	0	5	107	0	0	330
8:00 AM	0	0	2	0	23	116	8	0	28	1	6	0	18	84	1	0	287
8:15 AM	0	1	6	0	11	118	16	0	30	0	8	0	10	78	0	0	278
8:30 AM	0	0	3	0	12	73	2	0	17	1	3	0	0	87	0	0	198
8:45 AM	0	0	6	0	8	78	4	0	5	0	1	0	2	70	0	0	174
9:00 AM	0	1	2	0	9	62	3	0	5	0	2	0	0	54	0	0	138
9:15 AM	0	0	1	0	2	82	0	0	7	0	0	0	0	67	0	0	159
9:30 AM	1	0	1	0	6	73	2	1	4	1	1	0	0	66	0	0	156
9:45 AM	0	0	5	0	12	93	3	0	3	0	1	0	1	85	0	0	203
10:00 AM	0	0	8	0	7	85	4	0	7	0	1	0	2	82	0	0	196
10:15 AM	0	0	5	0	7	81	7	0	4	0	0	0	1	61	0	0	166
10:30 AM	0	0	6	0	9	67	7	0	10	0	0	0	0	73	0	0	172
10:45 AM	0	0	7	0	9	76	2	0	7	1	0	0	1	81	1	0	185
11:00 AM	0	0	5	0	9	75	5	0	6	1	0	0	2	71	1	0	175
11:15 AM	1	0	7	0	4	71	9	0	7	0	1	0	2	99	1	1	203
11:30 AM	0	0	7	0	2	73	9	1	6	0	0	0	0	76	0	0	174
11:45 AM	0	0	12	0	2	81	9	0	5	0	1	0	0	84	1	1	196
12:00 PM	0	1	7	0	11	82	5	0	3	0	0	0	2	69	0	0	180
12:15 PM	0	0	11	0	9	77	10	2	7	0	2	0	1	90	1	0	210
12:30 PM	0	0	9	0	7	96	10	0	13	0	1	0	2	101	0	0	239
12:45 PM	0	0	8	0	7	74	11	0	13	0	3	0	2	105	0	0	223
1:00 PM	0	0	4	0	6	92	7	0	9	0	0	0	0	70	0	1	189
1:15 PM	1	0	5	0	10	77	6	1	5	0	1	0	1	57	0	0	164
1:30 PM	0	0	8	0	11	71	13	0	3	0	0	0	0	84	1	2	193
1:45 PM	0	1	4	0	14	79	6	0	9	1	1	0	1	104	0	0	220
2:00 PM	0	0	9	0	8	106	6	0	10	0	1	0	1	101	1	0	243
2:15 PM	2	0	15	0	11	92	12	0	5	0	0	0	1	92	2	0	232
2:30 PM	0	0	10	0	2	62	7	0	10	1	1	0	2	117	0	0	212
2:45 PM	0	0	6	0	6	92	18	1	11	1	0	0	5	113	0	0	253
3:00 PM	1	0	4	0	7	82	19	0	7	0	2	0	5	100	2	1	230
3:15 PM	0	1	5	0	8	88	15	0	45	2	16	0	4	111	0	0	295
3:30 PM	1	0	4	0	7	111	15	0	15	0	2	0	2	111	1	0	269
3:45 PM	2	0	10	0	2	91	8	0	15	0	2	0	3	102	0	0	235
4:00 PM	1	0	9	0	3	96	15	0	6	0	3	0	5	139	0	0	277
4:15 PM	1	0	3	0	4	98	13	0	7	1	2	0	1	104	3	0	237
4:30 PM	0	0	10	0	3	120	14	0	8	0	2	0	9	175	0	0	341
4:45 PM	0	0	15	0	3	103	13	1	8	0	0	0	4	153	1	0	301
5:00 PM	1	0	21	0	7	114	10	0	13	1	2	0	2	116	0	0	287
5:15 PM	1	0	18	0	13	104	15	1	8	0	1	0	2	129	0	0	292
5:30 PM	0	0	2	0	5	88	19	0	6	0	2	0	1	101	0	0	224
5:45 PM	0	1	2	0	6	91	23	2	10	1	1	0	1	84	0	0	222
6:00 PM	0	0	2	0	12	89	13	0	11	0	0	0	0	70	2	0	199
6:15 PM	1	0	3	0	3	72	9	0	7	0	5	0	0	78	0	0	178
6:30 PM	0	0	6	0	3	67	13	0	9	0	1	0	1	56	0	0	156
6:45 PM	0	0	9	0	2	58	10	0	10	1	0	0	3	67	0	0	160

LOCATION: Granite& Knight
Date 8/25/2020

All Vehicles

	Northbound				Eastbound				Southbound				Westbound				
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
7:30		2			0		2			3							7
7:45	1	10			0		2			6							19
8:00	1	6			0		2			6	1						16
8:15		7			0		1			5	2						15
4:30	4	4			2		0			2	1						13
4:45	5	8			1		1			4	1						20
5:00	2	5			0		9			7	2						25
5:15	3	9			1		1			3	0						17
	16	51	0	67	4	0	18	22	0	36	7	43	0	0	0	0	
	24%	76%	0%		18%	0%	82%		0%	84%	16%		#####	#####	#####		

	Northbound				Eastbound				Southbound				Westbound				
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
7:30																	0
7:45																	0
8:00																	0
8:15																	0
4:30																	0
4:45																	0
5:00																	0
5:15																	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	#####	#####	#####		#####	#####	#####		#####	#####	#####		#####	#####	#####		

TOTAL

	Northbound				Eastbound				Southbound				Westbound				
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
7:30	0	2	0	0	0	0	2	0	0	3	0	0	0	0	0	0	7
7:45	1	10	0	0	0	0	2	0	0	6	0	0	0	0	0	0	19
8:00	1	6	0	0	0	0	2	0	0	6	1	0	0	0	0	0	16
8:15	0	7	0	0	0	0	1	0	0	5	2	0	0	0	0	0	15
4:30	4	4	0	0	2	0	0	0	0	2	1	0	0	0	0	0	13
4:45	5	8	0	0	1	0	1	0	0	4	1	0	0	0	0	0	20
5:00	2	5	0	0	0	0	9	0	0	7	2	0	0	0	0	0	25
5:15	3	9	0	0	1	0	1	0	0	3	0	0	0	0	0	0	17
	16	51	0	67	4	0	18	22	0	36	7	43	0	0	0	0	
	24%	76%	0%		18%	0%	82%		0%	84%	16%		#####	#####	#####		

LOCATION: Granite& Hauser
Date 8/25/2020

All Vehicles

	Northbound				Eastbound				Southbound				Westbound				
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
7:30	1	3	0		0	0	0		0	0	1		1	0	0		6
7:45	1	2	0		0	1	4		1	4	2		0	0	0		15
8:00	0	5	0		0	1	3		3	3	0		1	0	0		16
8:15	1	3	0		0	2	1		1	2	1		0	0	0		11
4:30	0	1	0		0	0	0		0	3	2		1	0	0		7
4:45	1	2	0		0	0	0		2	5	2		1	1	1		15
5:00	0	1	0		0	1	1		4	1	1		2	1	0		12
5:15	0	2	1		0	0	5		2	8	0		0	0	1		19
	4	19	1	24	0	5	14	19	13	26	9	48	6	2	2	10	
	17%	79%	4%		0%	26%	74%		27%	54%	19%		60%	20%	20%		

	Northbound				Eastbound				Southbound				Westbound				
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
7:30																	0
7:45																	0
8:00																	0
8:15																	0
4:30																	0
4:45																	0
5:00																	0
5:15																	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	#####	#####	#####		#####	#####	#####		#####	#####	#####		#####	#####	#####		

TOTAL

	Northbound				Eastbound				Southbound				Westbound				
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	TOTAL
7:30	1	3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	6
7:45	1	2	0	0	0	1	4	0	1	4	2	0	0	0	0	0	15
8:00	0	5	0	0	0	1	3	0	3	3	0	0	1	0	0	0	16
8:15	1	3	0	0	0	2	1	0	1	2	1	0	0	0	0	0	11
4:30	0	1	0	0	0	0	0	0	0	3	2	0	1	0	0	0	7
4:45	1	2	0	0	0	0	0	0	2	5	2	0	1	1	1	0	15
5:00	0	1	0	0	0	1	1	0	4	1	1	0	2	1	0	0	12
5:15	0	2	1	0	0	0	5	0	2	8	0	0	0	0	1	0	19
	4	19	1	24	0	5	14	19	13	26	9	48	6	2	2	10	
	17%	79%	4%		0%	26%	74%		27%	54%	19%		60%	20%	20%		

Basic Volume Report: GRANITE

Station ID : GRANITE
Info Line 1 : ATS
Info Line 2 : UNICORN 1
GPS Lat/Lon :
DB File : GRANITE.DB

Last Connected Device Type : Unic-L
Version Number : 1.41
Serial Number :

Number of Lanes : 1
Posted Speed Limit : 0.0 mph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.		N/S	Normal	Axle	Yes	

Lane #1 Basic Volume Data From: 11:00 - 08/19/2020 To: 10:59 - 08/24/2020

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
081920	W												117	116	106	110	132	130	155	121	86	81	43	31	15	1243
082020	T	9	1	2	0	2	18	46	96	118	88	69	105	115	113	111	111	123	163	98	69	53	41	23	8	1582
082120	F	5	0	2	0	4	12	47	84	87	89	86	96	120	119	106	98	129	142	101	105	80	42	36	14	1604
082220	S	13	9	6	6	3	11	24	50	74	95	87	101	108	101	73	88	81	86	101	61	64	44	41	14	1341
082320	S	14	5	0	2	1	3	4	22	44	78	87	93	148	89	110	101	80	90	73	65	73	50	21	12	1265
082420	M	3	5	0	4	5	13	42	96	101	74	79														422
Month Total :		44	20	10	12	15	57	163	348	424	424	408	512	607	528	510	530	543	636	494	386	351	220	152	63	7457
Percent :		1%	0%	0%	0%	0%	1%	2%	5%	6%	6%	5%	7%	8%	7%	7%	7%	7%	9%	7%	5%	5%	3%	2%	1%	
ADT :		9	4	2	2	3	11	33	70	85	85	82	102	121	106	102	106	109	127	99	77	70	44	30	13	1492

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	1265	422	0	1243	1582	1604	1341
# Days :	1.0	0.5	0.0	0.5	1.0	1.0	1.0
ADT :	1265	921	0	2295	1582	1604	1341
Percent :	17%	6%	0%	17%	21%	22%	18%

	Total	Percent
Weekday (Mon-Fri) :	4851	65%
ADT :	1617	
Weekend (Sat-Sun) :	2606	35%
ADT :	1303	

Basic Volume Report: HAUSER

Station ID : HAUSER
Info Line 1 : ATS
Info Line 2 : Unicorn # 2
GPS Lat/Lon :
DB File : HAUSER.DB

Last Connected Device Type : Unic-L
Version Number : 1.41
Serial Number : 91434

Number of Lanes : 1
Posted Speed Limit : 0.0 mph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.		E/W	Normal	Axle	Yes	

Lane #1 Basic Volume Data From: 11:00 - 08/19/2020 To: 10:59 - 08/24/2020

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
081920	W												7	9	14	4	17	11	9	4	5	5	3	1	0	89
082020	T	1	1	0	0	0	0	2	7	8	6	8	10	10	9	3	7	6	13	8	3	5	2	2	1	112
082120	F	0	4	0	0	0	0	3	6	7	9	8	11	14	5	8	10	10	20	7	13	6	5	2	1	149
082220	S	1	3	0	0	0	0	2	3	4	4	8	6	12	9	11	9	9	8	5	11	5	8	0	1	119
082320	S	4	2	0	1	0	0	2	2	3	3	6	7	8	8	16	7	7	17	6	12	11	2	0	0	124
082420	M	2	3	0	1	0	0	7	7	9	11	12														52
Month Total :		8	13	0	2	0	0	16	25	31	33	42	41	53	45	42	50	43	67	30	44	32	20	5	3	645
Percent :		1%	2%	0%	0%	0%	0%	2%	4%	5%	5%	7%	6%	8%	7%	7%	8%	7%	10%	5%	7%	5%	3%	1%	0%	
ADT :		2	3	0	0	0	0	3	5	6	7	8	8	11	9	8	10	9	13	6	9	6	4	1	1	129

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	124	52	0	89	112	149	119
# Days :	1.0	0.5	0.0	0.5	1.0	1.0	1.0
ADT :	124	113	0	164	112	149	119
Percent :	19%	8%	0%	14%	17%	23%	18%

	Total	Percent
Weekday (Mon-Fri) :	402	62%
ADT :	134	
Weekend (Sat-Sun) :	243	38%
ADT :	122	

For Project:	GraniteHelena				
Project Notes:					
Location/Name:	Merged				
Report Generated:	4/23/2025	8:26:51 AM			
Speed Intervals	1 MPH				
Time Intervals	Instant				
Traffic Report From	3/26/2025	1:00:00 PM	through	3/27/2025	7:59:59 PM
85th Percentile Speed	32 MPH				
85th Percentile Vehicles	672				
Max Speed	46 MPH	on	3/27/2025	4:33:37 PM	
Total Vehicles	791				
AADT:	612				

Volumes - weekly counts

	Time	5 Day	7 Day
Average Daily		395	395
AM Peak	8:00 AM	70	70
PM Peak	5:00 PM	47	47

Speed

Speed Limit:	35		
85th Percentile Speed:	32		
50th Percentile Speed:	27		
10 MPH Pace Interval:	22.0 MPH	to	32.0 MPH
Average Speed:	27.19		

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Count over limit	N/A	N/A	13	31	N/A	N/A	N/A
% over limit	N/A	N/A	4.2	6.4	N/A	N/A	N/A
Avg Speeder	N/A	N/A	38.1	38.2	N/A	N/A	N/A
Avg Speed	N/A	N/A	26.5	27.6	N/A	N/A	N/A

Class Counts

	Number	%
VEH_SM	6	0.8
VEH_MED	778	98.4
VEH_LG	7	0.9

[VEH_SM=motorcycle, VEH_MED = sedan, VEH_LG = truck]

Merged Monthly Counts
GraniteHelena

from Wed-Mar-26-2025-01-00-PM to Thu-Mar-27-2025-07-59-PM

	Mar 2025									
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Week	Weekend	Week Day 85%
Hour								Day Avg	Avg	Avg Speed
0 - 1	*	*	*	2	*	*	*	2	0	34
1 - 2	*	*	*	0	*	*	*	0	0	0
2 - 3	*	*	*	0	*	*	*	0	0	0
3 - 4	*	*	*	1	*	*	*	1	0	24
4 - 5	*	*	*	1	*	*	*	1	0	30
5 - 6	*	*	*	4	*	*	*	4	0	33
6 - 7	*	*	*	18	*	*	*	18	0	32
7 - 8	*	*	*	44	*	*	*	44	0	31.5
8 - 9	*	*	*	70	*	*	*	70	0	30.3
9 - 10	*	*	*	29	*	*	*	29	0	34
10 - 11	*	*	*	27	*	*	*	27	0	31
11 - 12	*	*	*	35	*	*	*	35	0	31.7
12 - 13	*	*	*	31	*	*	*	31	0	31
13 - 14	*	*	16	34	*	*	*	25	0	31.75
14 - 15	*	*	39	30	*	*	*	34.5	0	30
15 - 16	*	*	42	39	*	*	*	40.5	0	32.15
16 - 17	*	*	44	39	*	*	*	41.5	0	32.75
17 - 18	*	*	49	44	*	*	*	46.5	0	31.5
18 - 19	*	*	43	31	*	*	*	37	0	33.25
19 - 20	*	*	29	2	*	*	*	15.5	0	32.75
20 - 21	*	*	29	*	*	*	*	29	0	29.7
21 - 22	*	*	7	*	*	*	*	7	0	33
22 - 23	*	*	9	*	*	*	*	9	0	31
23 - 24	*	*	3	*	*	*	*	3	0	39
Totals	0	0	310	481	0	0	0			
% of Total	0%	0%	39.19%	60.81%	0%	0%	0%			

Turning Movement Count
All Vehicles
Location Helena - US 12 and Granite
Date 3/27/'2025

	Northbound				Southbound				Eastbound				Westbound				
	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	TOTAL
7:00 - 7:15	6	1	12	0	2	0	0	0	0	71	0	0	2	82	1	0	177
7:15 - 7:30	0	0	8	0	1	0	0	0	0	60	0	0	1	100	3	0	173
7:30 - 7:45	1	0	20	0	3	0	0	0	0	66	2	0	1	79	5	0	177
7:45 - 8:00	3	0	32	0	3	0	0	0	0	101	4	0	4	98	6	0	251
8:00 - 8:15	3	0	29	0	4	0	0	0	0	70	9	0	23	113	8	0	259
8:15 - 8:30	5	1	40	0	4	0	3	0	1	78	14	0	8	86	10	0	250
8:30 - 8:45	2	0	14	0	1	0	0	0	1	77	1	0	4	95	13	0	208
8:45 - 9:00	8	0	12	0	2	0	1	0	1	84	2	0	7	102	11	0	230
9:00 - 9:15	1	0	7	0	8	0	0	0	1	72	1	0	9	98	11	0	208
9:15 - 9:30	0	2	9	0	8	0	0	0	0	65	0	0	6	97	7	0	194
9:30 - 9:45	0	1	9	0	4	0	0	0	1	71	0	0	0	74	7	0	167
9:45 - 10:00	1	0	10	0	4	1	0	0	0	87	1	0	7	74	8	0	193
10:00 - 10:15	0	0	7	0	1	0	0	0	0	74	2	0	6	89	3	0	182
10:15 - 10:30	4	0	6	0	9	0	0	0	1	68	0	0	4	90	7	0	189
10:30 - 10:45	0	1	4	0	5	0	0	0	0	85	3	0	4	91	6	0	199
10:45 - 11:00	0	1	8	0	8	1	0	0	0	102	0	0	8	89	6	0	223
11:00 - 11:15	0	0	6	0	8	1	0	0	2	94	1	0	6	76	10	0	204
11:15 - 11:30	0	0	10	0	5	2	1	0	0	70	1	0	5	98	8	0	200
11:30 - 11:45	1	0	13	0	9	0	0	0	2	109	2	0	14	82	5	0	237
11:45 - 12:00	1	0	13	0	9	0	0	0	0	91	2	0	8	63	6	0	193
12:00 - 12:15	2	0	11	0	10	0	0	0	0	96	2	0	13	81	6	0	221
12:15 - 12:30	1	0	16	0	7	0	1	0	1	86	0	0	8	89	3	0	212
12:30 - 12:45	2	0	5	0	5	0	0	0	0	82	1	0	7	89	6	0	197
12:45 - 1:00	0	1	6	0	7	1	0	0	1	79	0	0	8	83	5	0	191
1:00 - 1:15	3	1	8	0	9	0	1	0	1	81	1	0	8	76	9	0	198
1:15 - 1:30	2	0	8	0	3	0	0	0	2	81	2	0	6	100	10	0	214
1:30 - 1:45	2	0	1	0	10	0	0	0	0	102	1	0	7	98	13	0	234
1:45 - 2:00	2	0	6	0	7	0	0	0	0	90	5	0	10	83	10	0	213
2:00 - 2:15	2	0	4	0	7	0	0	0	0	74	0	0	4	94	12	0	197
2:15 - 2:30	2	0	10	0	9	0	0	0	2	81	2	0	11	94	3	0	214
2:30 - 2:45	1	0	4	0	5	0	0	0	1	87	1	0	8	84	6	0	197
2:45 - 3:00	2	0	9	0	15	0	1	0	0	105	0	0	8	89	2	0	231
3:00 - 3:15	0	0	10	0	7	0	1	0	0	103	10	0	15	97	7	0	250
3:15 - 3:30	12	1	29	0	5	0	0	0	0	110	6	0	15	94	5	0	277
3:30 - 3:45	6	0	14	0	3	0	0	0	1	99	0	0	8	90	3	0	224
3:45 - 4:00	1	0	7	0	7	0	0	0	1	114	2	0	9	101	8	0	250
4:00 - 4:15	2	0	6	0	7	0	0	0	0	96	0	0	5	113	5	0	234
4:15 - 4:30	1	0	8	0	7	1	0	0	2	120	1	0	14	105	8	0	267
4:30 - 4:45	3	0	8	0	5	0	2	0	0	126	3	0	9	87	7	0	250
4:45 - 5:00	2	0	12	0	11	0	2	0	0	144	2	0	17	70	7	0	267
5:00 - 5:15	2	0	14	0	16	0	1	0	0	103	4	0	15	90	2	0	247
5:15 - 5:30	2	0	14	0	9	0	0	0	0	120	2	0	21	94	3	0	265
5:30 - 5:45	2	0	6	0	3	0	0	0	0	95	1	0	24	96	4	0	231
5:45 - 6:00	0	0	9	0	2	0	0	0	0	68	2	0	16	93	2	0	192
6:00 - 6:15	1	0	6	0	4	0	1	0	0	67	1	0	14	72	2	0	168
6:15 - 6:30	2	1	10	0	9	0	0	0	0	72	4	0	15	64	2	0	179
6:30 - 6:45	2	0	12	0	5	0	0	0	0	69	2	0	11	58	1	0	160
6:45 - 7:00	0	0	3	0	9	0	0	0	1	54	5	0	9	78	3	0	162
	95	11	525	0	301	7	15	0	23	4199	105	0	442	4238	295	0	10256

Turning Movement Count
All Vehicles
Location Helena - Granite and Knight
Date March 26, '2025

	Northbound				Southbound				Eastbound				Westbound				
	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	TOTAL
7:00 - 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 - 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 - 7:45	0	14	0	0	0	4	0	0	5	1	2	0	3	0	1	0	30
7:45 - 8:00	1	14	0	0	4	5	0	0	8	0	2	0	0	0	7	0	41
8:00 - 8:15	0	18	2	0	0	9	2	0	4	0	1	0	0	1	5	0	42
8:15 - 8:30	0	19	0	0	3	19	0	0	1	0	1	0	0	1	7	0	51
8:30 - 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 - 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 - 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 - 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 - 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 - 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 - 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 - 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 - 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 - 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 - 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 - 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 - 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 - 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 - 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 - 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 - 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 - 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 - 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 - 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 - 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 - 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 - 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 - 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 - 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 - 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 - 3:15	0	9	0	0	1	7	4	0	2	0	0	0	0	1	2	0	26
3:15 - 3:30	0	6	0	0	5	6	1	0	8	0	3	0	0	0	10	0	39
3:30 - 3:45	2	3	0	0	1	5	4	0	1	0	0	0	0	0	1	0	17
3:45 - 4:00	1	2	0	0	1	3	3	0	2	0	0	0	1	1	0	0	14
4:00 - 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 - 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 - 4:45	0	2	0	0	1	6	5	0	3	0	1	0	0	0	1	0	19
4:45 - 5:00	0	4	0	0	0	6	2	0	1	0	0	0	0	1	0	0	14
5:00 - 5:15	0	5	0	0	0	7	5	0	2	1	0	0	0	0	1	0	21
5:15 - 5:30	0	4	1	0	1	7	3	0	2	0	0	0	0	1	3	0	22
5:30 - 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 - 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 - 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 - 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 - 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 - 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	100	3	0	17	84	29	0	39	2	10	0	4	6	38	0	336

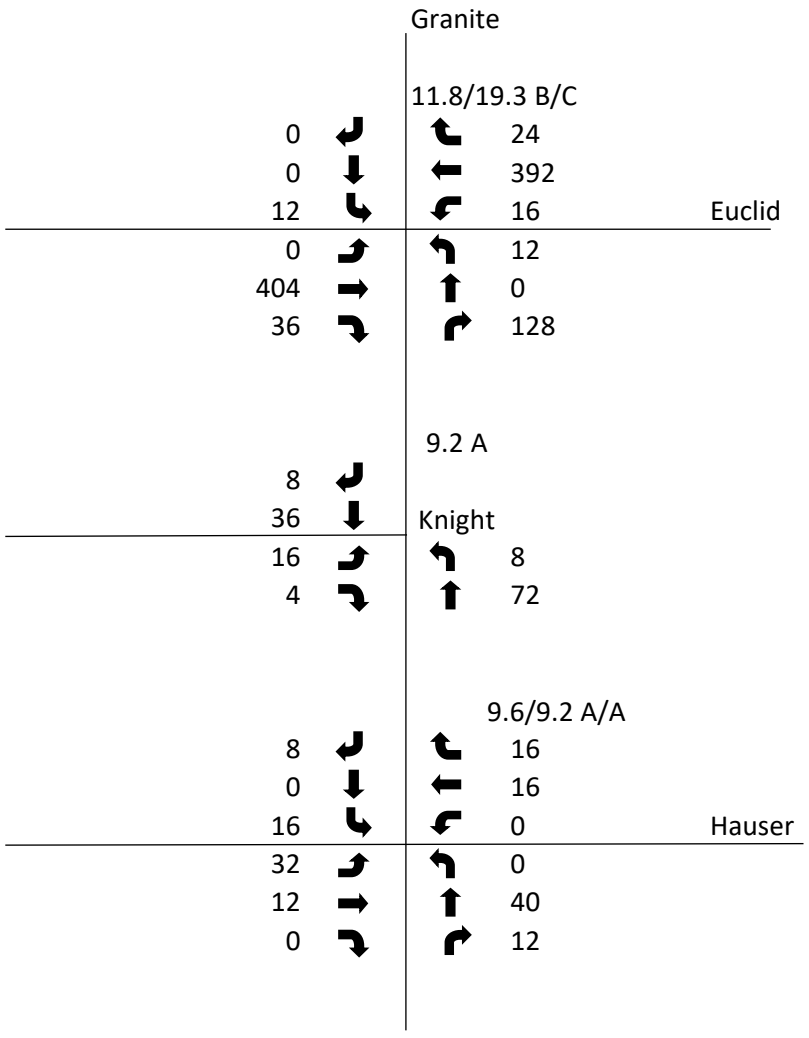
Turning Movement Count
All Vehicles
Location Helena - Granite and Hauser
Date March' 26, 2025

	Northbound				Southbound				Eastbound				Westbound				
	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	Left	Thr	Right	Peds	TOTAL
7:00 - 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 - 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 - 7:45	0	2	3	0	4	0	0	0	2	0	1	0	0	0	0	0	12
7:45 - 8:00	0	1	3	0	4	0	2	0	8	3	0	0	0	4	4	0	29
8:00 - 8:15	0	10	2	0	2	0	3	0	0	0	0	0	0	0	7	0	24
8:15 - 8:30	0	6	1	0	3	3	1	0	3	1	0	0	0	0	7	0	25
8:30 - 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 - 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 - 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 - 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 - 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 - 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 - 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 - 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 - 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 - 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 - 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 - 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 - 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 - 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 - 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 - 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 - 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 - 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 - 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 - 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 - 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 - 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 - 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 - 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 - 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 - 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 - 3:15	0	3	1	0	3	2	1	0	0	0	0	0	0	2	3	0	15
3:15 - 3:30	1	2	0	0	2	4	0	0	3	1	1	0	0	0	3	0	17
3:30 - 3:45	0	4	2	0	0	3	1	0	0	1	0	0	0	2	3	0	16
3:45 - 4:00	2	1	0	0	0	1	0	0	1	1	1	0	1	2	1	0	11
4:00 - 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 - 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 - 4:45	0	0	0	0	0	4	2	0	2	0	0	0	0	2	1	0	11
4:45 - 5:00	0	2	3	0	1	1	3	0	2	1	0	0	1	2	1	0	17
5:00 - 5:15	0	2	0	0	0	6	2	0	3	2	0	0	3	0	0	0	18
5:15 - 5:30	0	1	1	0	2	4	0	0	0	3	0	0	2	2	3	0	18
5:30 - 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 - 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 - 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 - 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 - 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 - 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	34	16	0	21	28	15	0	24	13	3	0	7	16	33	0	213

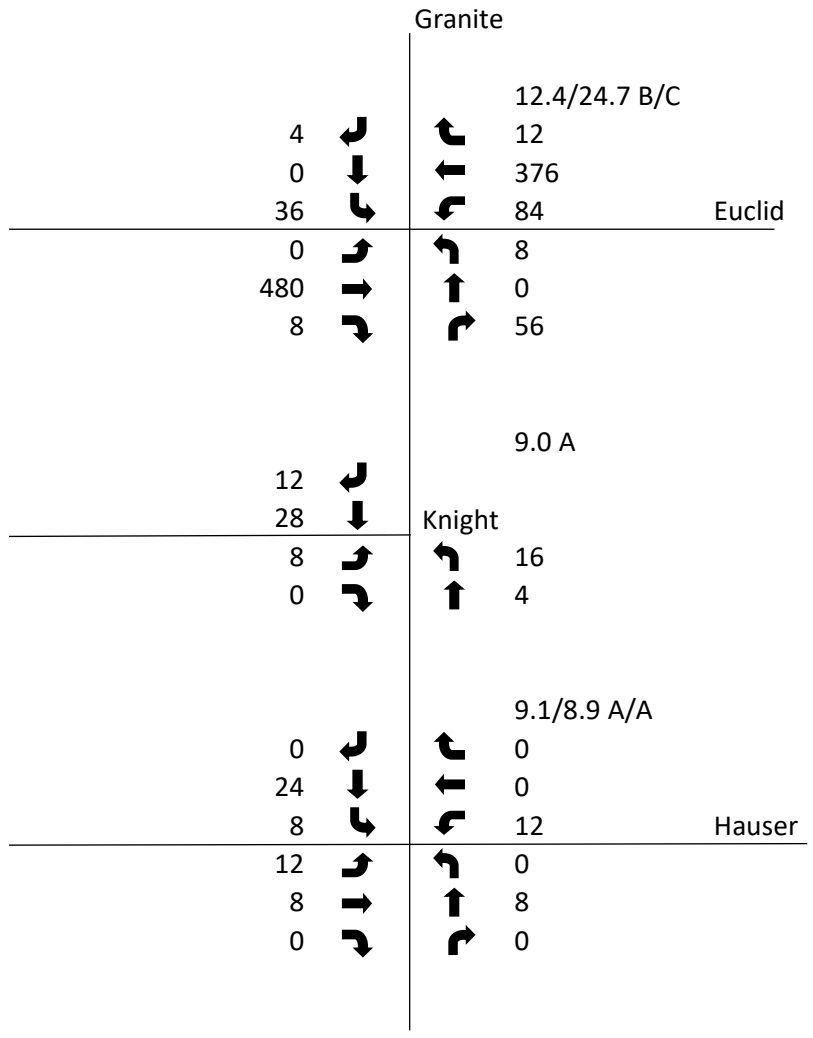
West Side Major Subdivision
Traffic Model Spring 2025

Seasonal Factor 1

AM Peak Hour
(15 min x 4)



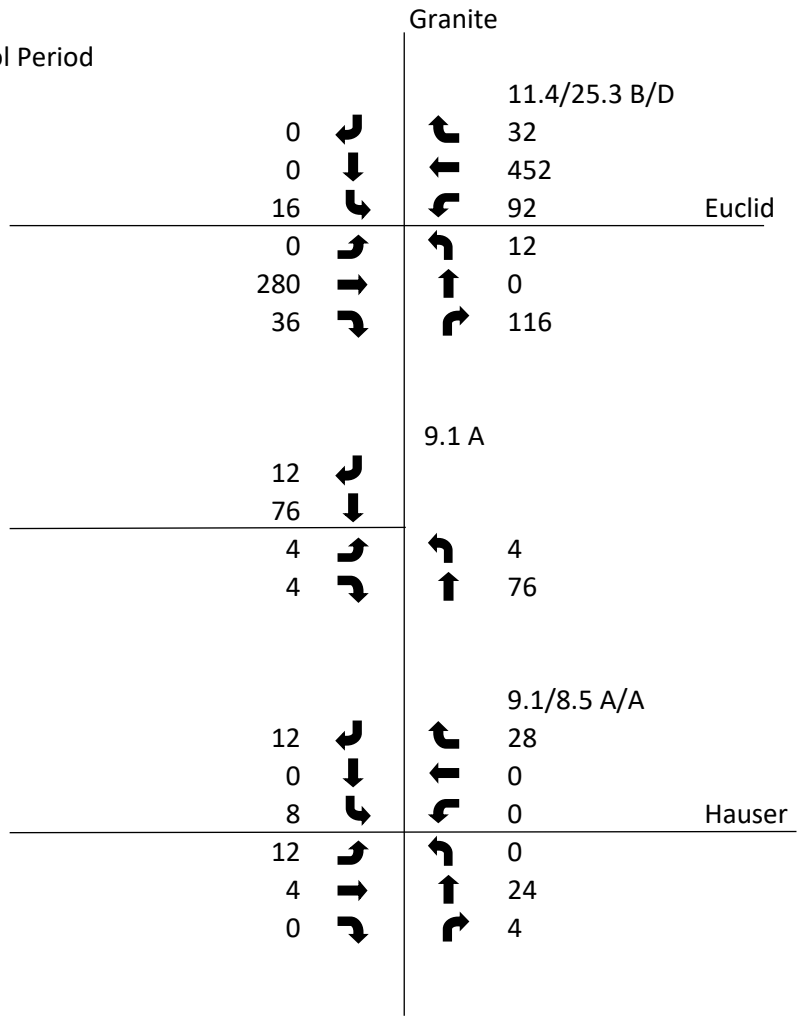
PM Peak Hour
(15 min x 4)



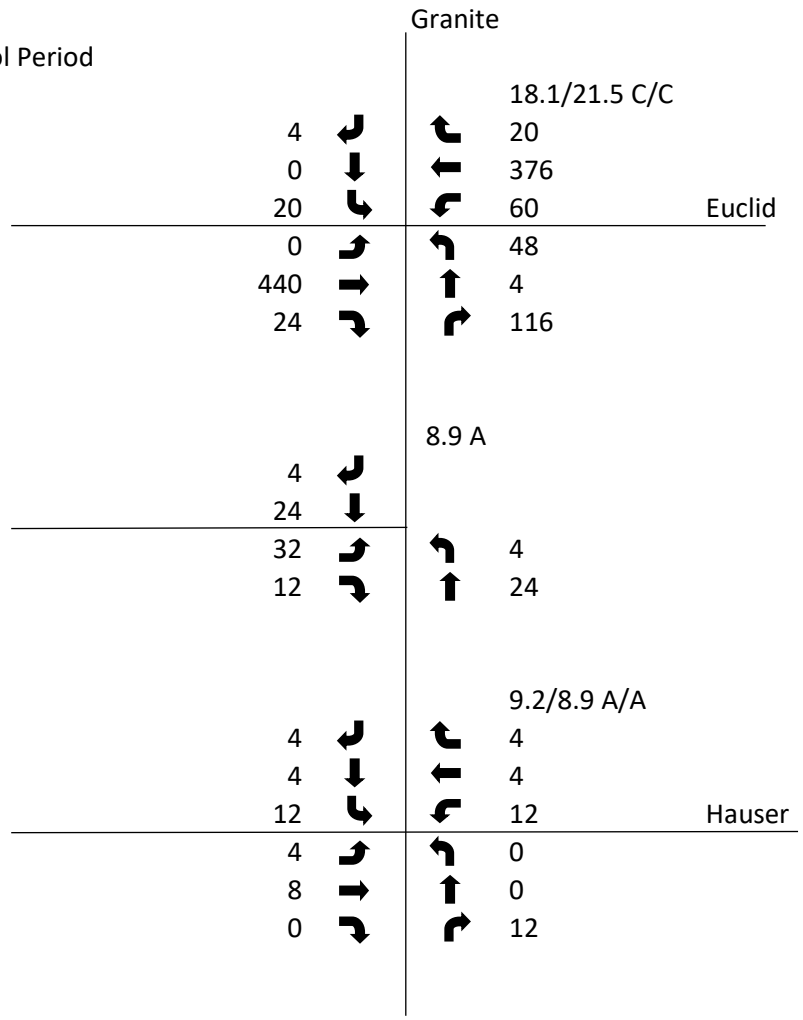
West Side Major Subdivision
Traffic Model Spring 2025

Seasonal Factor 1

AM Peak School Period
(15 min x 4)

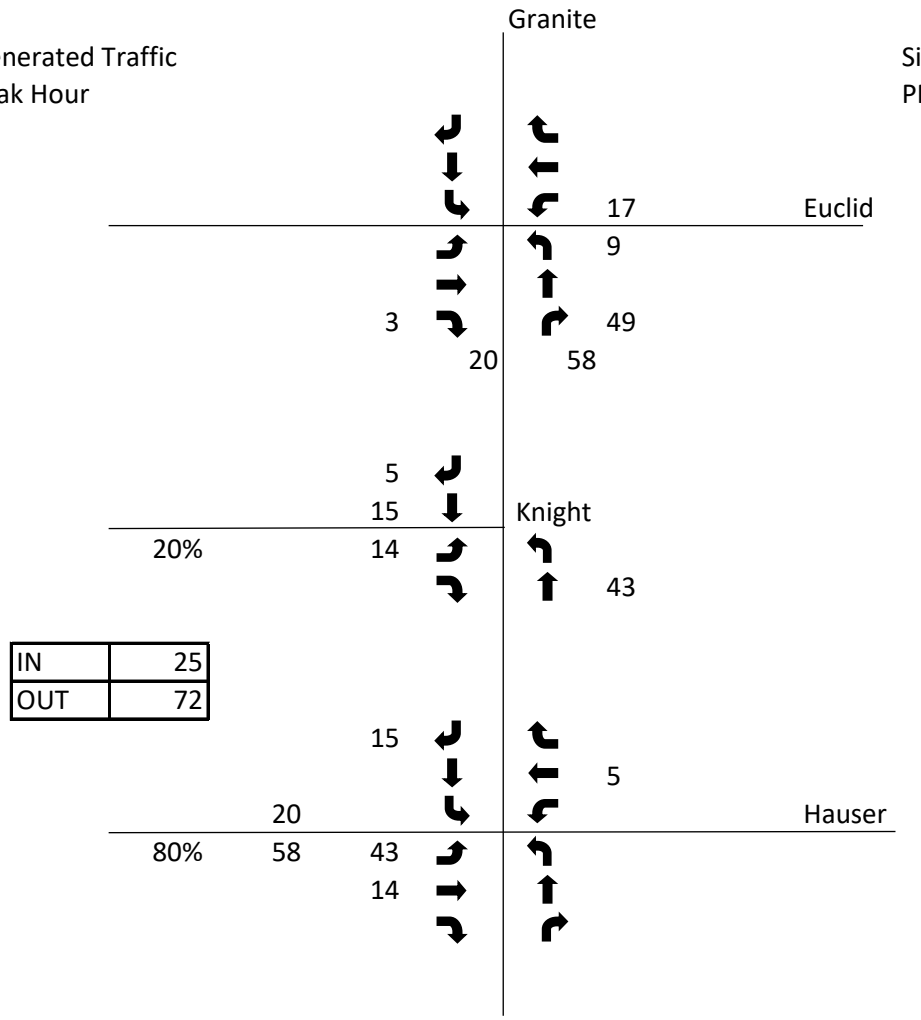


PM Peak School Period
(15 min x 4)



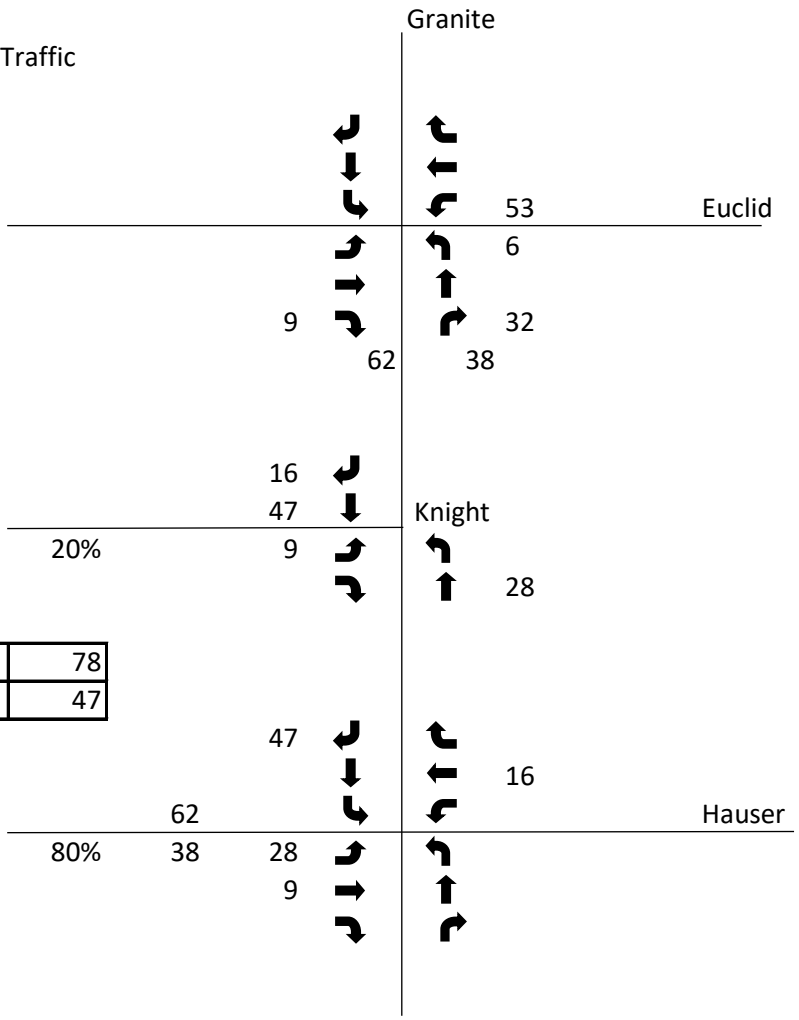
West Side Major Subdivision
Traffic Model Spring 2025

Site Generated Traffic
AM Peak Hour



IN	25
OUT	72

Site Generated Traffic
PM Peak Hour

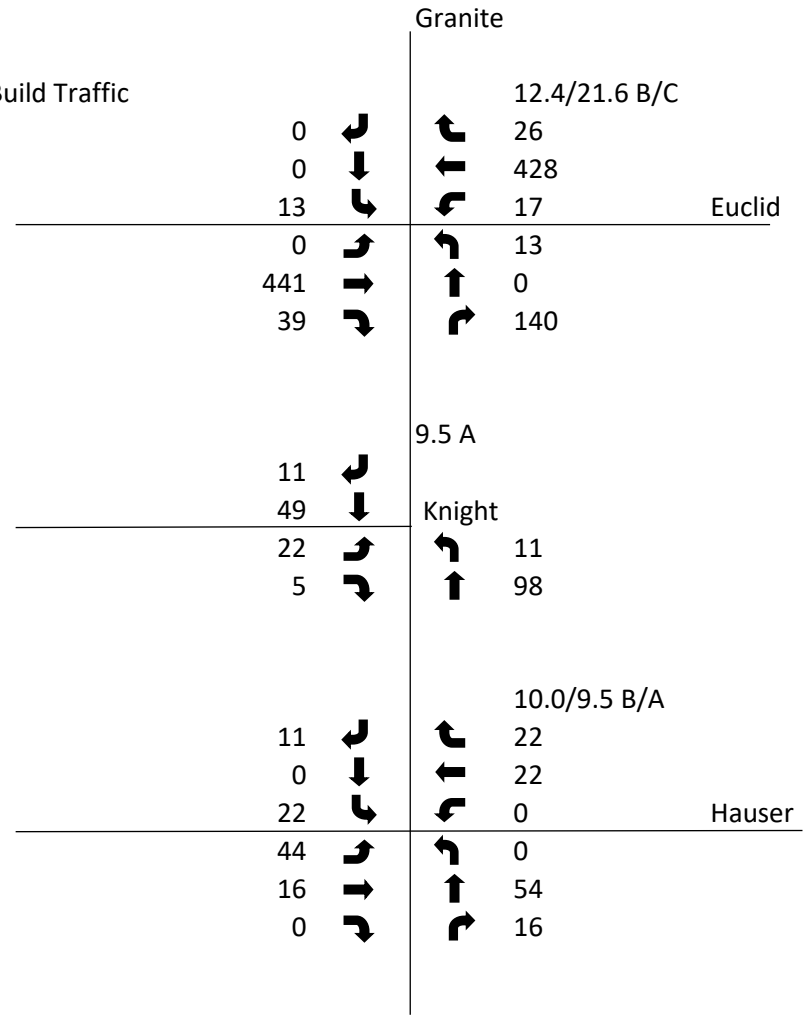


IN	78
OUT	47

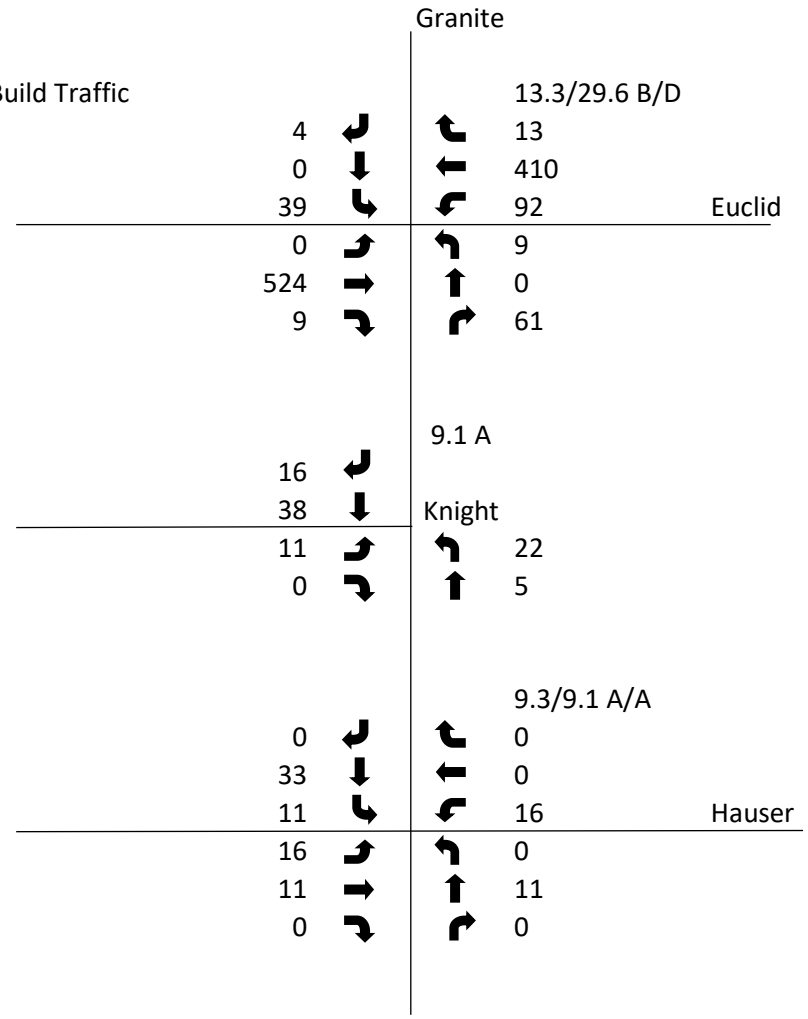
West Side Major Subdivision
Traffic Model

Euclid Growth Factor 1.091
Hauser 1.36

AM Peak Hour
Projected No Build Traffic
2029



PM Peak Hour
Projected No Build Traffic
2029



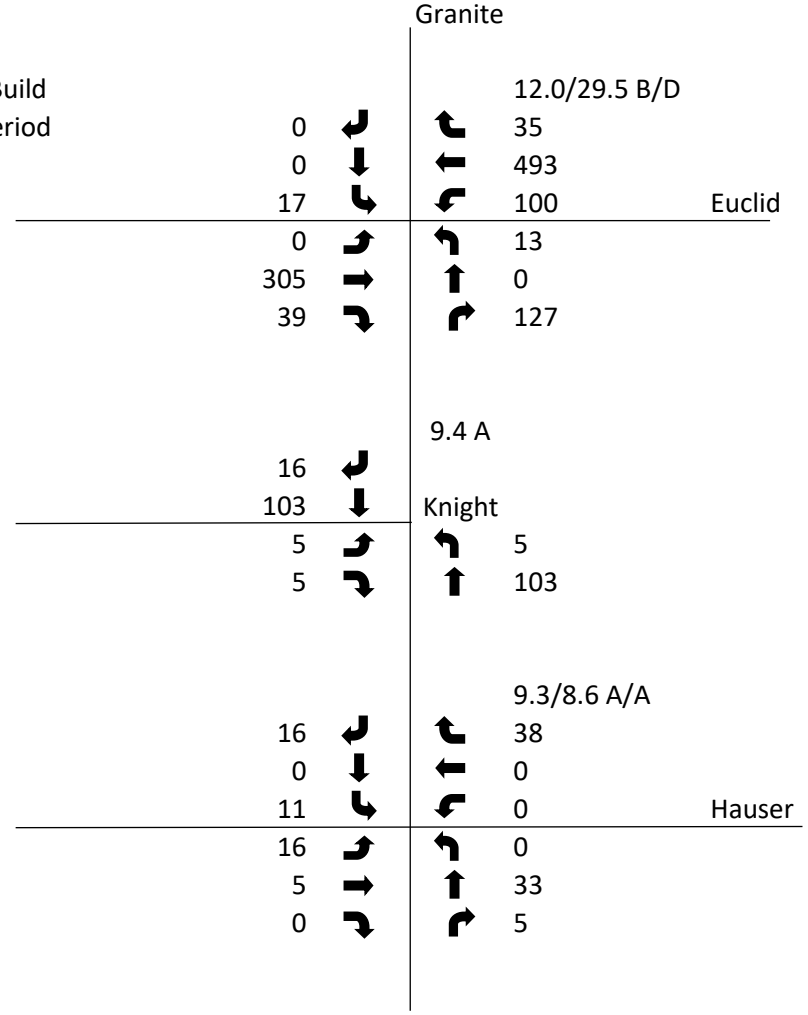
West Side Major Subdivision
Traffic Model

100% Hour Factor

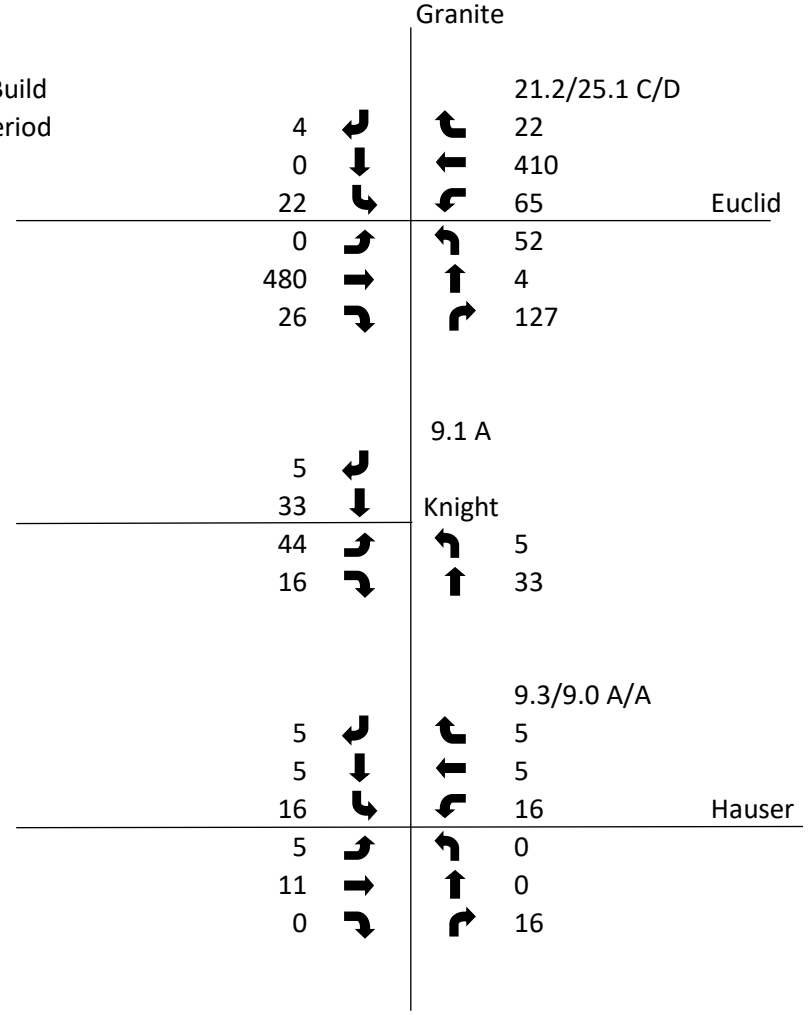
Euclid Growth Factor 1.091
Hauser 1.36

50% Hour Factor

AM Peak Hour
Projected No Build
Peak School Period
2029

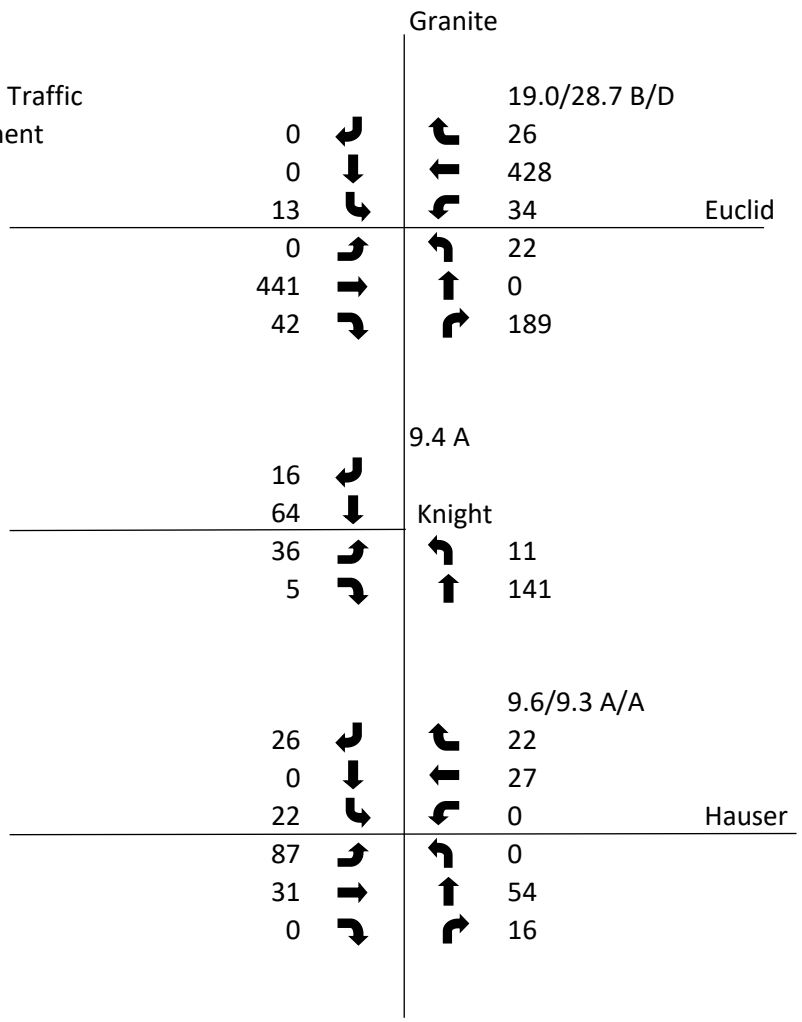


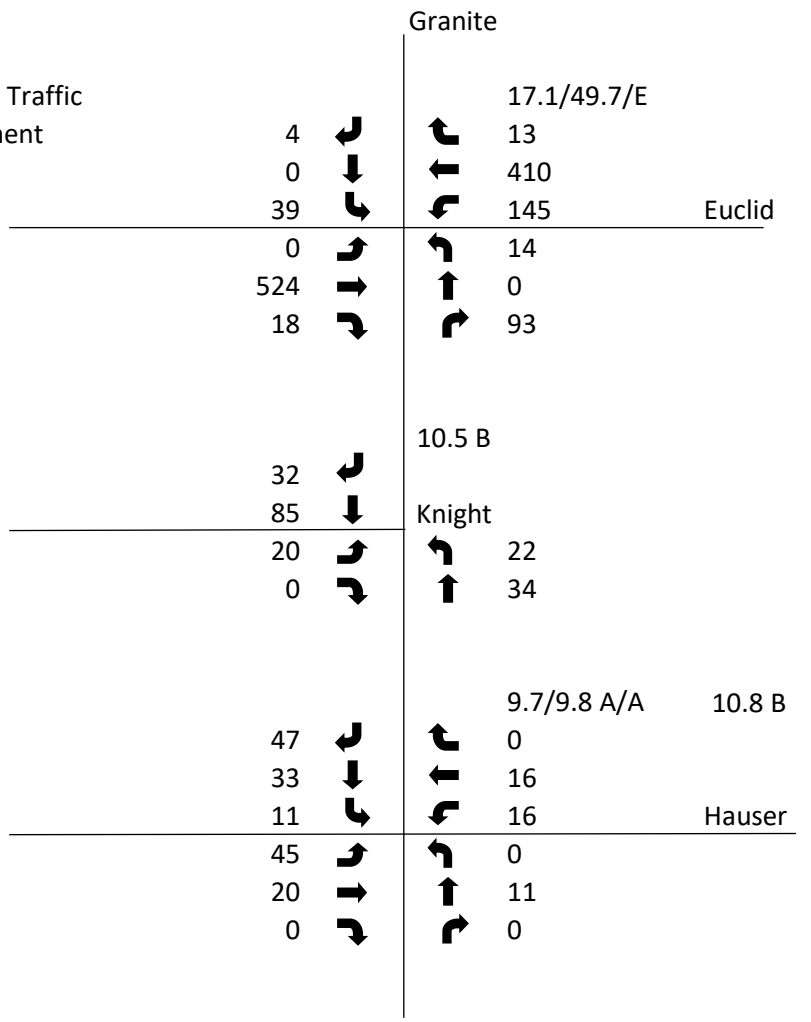
PM Peak Hour
Projected No Build
Peak School Period
2029



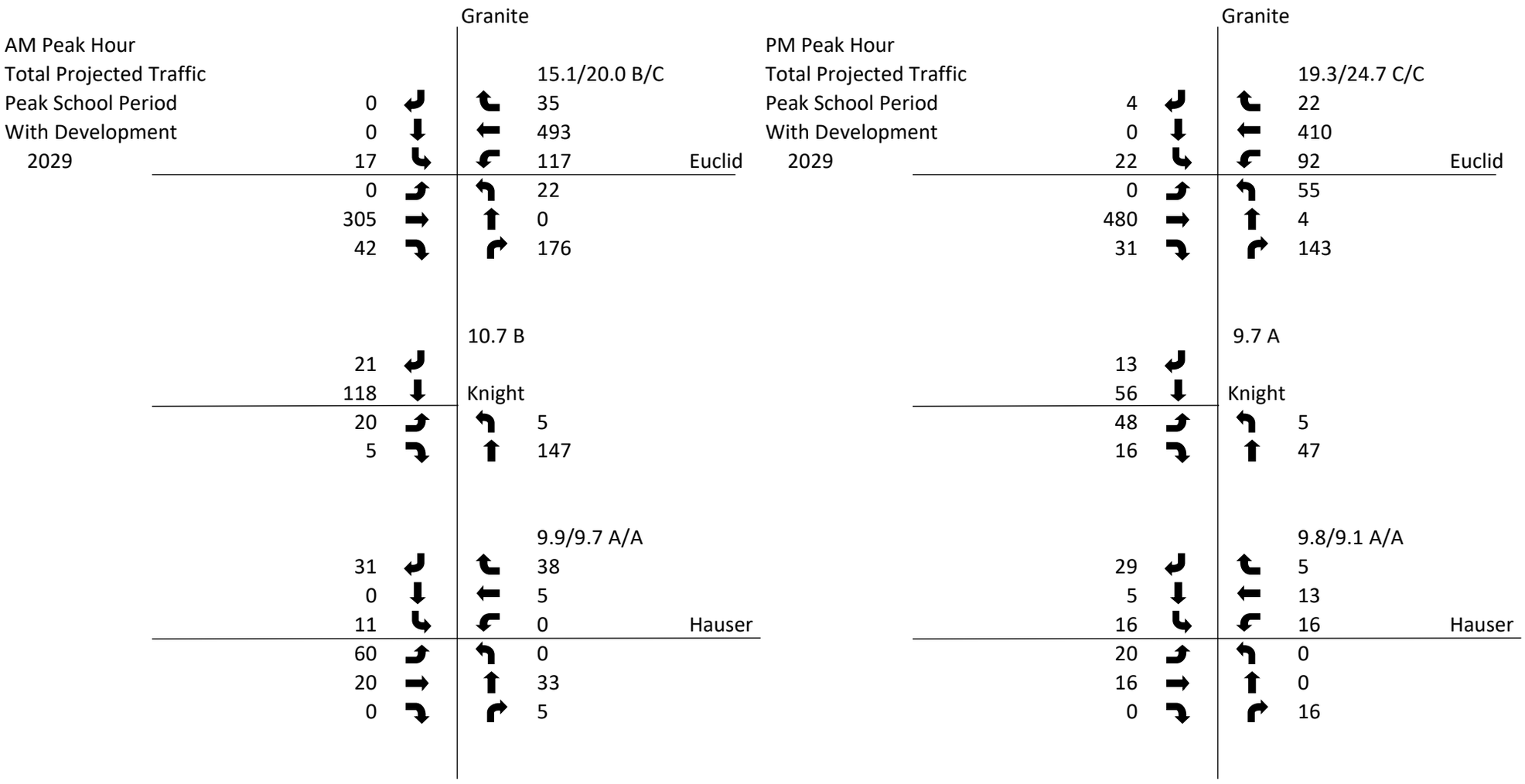
West Side Major Subdivision
Traffic Model

Euclid Growth Factor 1.091
Hauser 1.36





West Side Major Subdivision Traffic Model — 100% Hour Factor — Euclid — Growth Factor 1.091 — Hauser 1.36 — 50% Hour Factor



APPENDIX D

LOS Modeling

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	404	36	16	392	24	12	0	128	12	0	0
Future Vol, veh/h	0	404	36	16	392	24	12	0	128	12	0	0
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	439	39	17	426	26	13	0	139	13	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	452	0	0	478	0	0	707	946	239	693	952	226
Stage 1	-	-	-	-	-	-	459	459	-	474	474	-
Stage 2	-	-	-	-	-	-	248	487	-	220	478	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1105	-	-	1080	-	-	322	260	762	330	258	777
Stage 1	-	-	-	-	-	-	552	565	-	540	556	-
Stage 2	-	-	-	-	-	-	734	549	-	763	554	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1105	-	-	1080	-	-	317	256	762	265	254	777
Mov Cap-2 Maneuver	-	-	-	-	-	-	317	256	-	265	254	-
Stage 1	-	-	-	-	-	-	552	565	-	532	547	-
Stage 2	-	-	-	-	-	-	722	540	-	623	554	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0.31	11.81	19.28
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	680	1105	-	-	1080	-	-	265
HCM Lane V/C Ratio	0.224	-	-	-	0.016	-	-	0.049
HCM Ctrl Dly (s/v)	11.8	0	-	-	8.4	-	-	19.3
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	32	12	0	0	16	16	0	40	12	16	0	8
Future Vol, veh/h	32	12	0	0	16	16	0	40	12	16	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	13	0	0	17	17	0	43	13	17	0	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	91	96	4	91	93	50	9	0	0	57	0	0
Stage 1	39	39	-	50	50	-	-	-	-	-	-	-
Stage 2	52	57	-	41	43	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	893	794	1079	893	797	1018	1611	-	-	1548	-	-
Stage 1	976	862	-	963	853	-	-	-	-	-	-	-
Stage 2	961	848	-	973	859	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	849	785	1079	868	788	1018	1611	-	-	1548	-	-
Mov Cap-2 Maneuver	849	785	-	868	788	-	-	-	-	-	-	-
Stage 1	965	853	-	963	853	-	-	-	-	-	-	-
Stage 2	925	848	-	948	849	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.6	9.22	0	4.9
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1611	-	-	831	888	1000	-	-
HCM Lane V/C Ratio	-	-	-	0.058	0.039	0.011	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.6	9.2	7.4	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	4	8	72	36	8
Future Vol, veh/h	16	4	8	72	36	8
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, %	2	2	2	2	2	2
Mvmt Flow	17	4	9	78	39	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	139	43	48	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	96	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	854	1027	1559	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	928	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	849	1027	1559	-	-	-
Mov Cap-2 Maneuver	849	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	928	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.2	0.73	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	180	-	879	-	-
HCM Lane V/C Ratio	0.006	-	0.025	-	-
HCM Ctrl Dly (s/v)	7.3	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	480	8	84	376	12	8	0	56	36	0	4
Future Vol, veh/h	0	480	8	84	376	12	8	0	56	36	0	4
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	522	9	91	409	13	9	0	61	39	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	422	0	0	530	0	0	913	1130	265	859	1128	211
Stage 1	-	-	-	-	-	-	526	526	-	598	598	-
Stage 2	-	-	-	-	-	-	387	604	-	261	530	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1134	-	-	1033	-	-	228	202	733	250	203	795
Stage 1	-	-	-	-	-	-	503	527	-	456	489	-
Stage 2	-	-	-	-	-	-	608	486	-	721	525	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1134	-	-	1033	-	-	207	184	733	209	185	795
Mov Cap-2 Maneuver	-	-	-	-	-	-	207	184	-	209	185	-
Stage 1	-	-	-	-	-	-	503	527	-	416	446	-
Stage 2	-	-	-	-	-	-	551	443	-	661	525	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.57	12.39	24.71
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	556	1134	-	-	1033	-	-	226
HCM Lane V/C Ratio	0.125	-	-	-	0.088	-	-	0.193
HCM Ctrl Dly (s/v)	12.4	0	-	-	8.8	-	-	24.7
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0.3	-	-	0.7

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	8	0	12	0	0	0	8	0	8	24	0
Future Vol, veh/h	12	8	0	12	0	0	0	8	0	8	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	9	0	13	0	0	0	9	0	9	26	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	52	52	26	57	52	9	26	0	0	9	0	0
Stage 1	43	43	-	9	9	-	-	-	-	-	-	-
Stage 2	9	9	-	48	43	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	947	839	1050	941	839	1073	1588	-	-	1611	-	-
Stage 1	971	859	-	1013	888	-	-	-	-	-	-	-
Stage 2	1013	888	-	966	859	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	942	835	1050	926	835	1073	1588	-	-	1611	-	-
Mov Cap-2 Maneuver	942	835	-	926	835	-	-	-	-	-	-	-
Stage 1	965	854	-	1013	888	-	-	-	-	-	-	-
Stage 2	1013	888	-	951	854	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.12	8.94	0	1.81
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1588	-	-	896	926	450	-	-
HCM Lane V/C Ratio	-	-	-	0.024	0.014	0.005	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.1	8.9	7.2	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	16	4	28	12
Future Vol, veh/h	8	0	16	4	28	12
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, %	2	2	2	2	2	2
Mvmt Flow	9	0	17	4	30	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	76	-	43	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	927	0	1565	-	-	-
Stage 1	986	0	-	-	-	-
Stage 2	983	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	917	-	1565	-	-	-
Mov Cap-2 Maneuver	917	-	-	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	983	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.96	5.86	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1440	-	917	-	-
HCM Lane V/C Ratio	0.011	-	0.009	-	-
HCM Ctrl Dly (s/v)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	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	0	280	36	92	452	32	12	0	116	16	0	0
Future Vol, veh/h	0	280	36	92	452	32	12	0	116	16	0	0
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	304	39	100	491	35	13	0	126	17	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	526	0	0	343	0	0	770	1050	172	861	1052	263
Stage 1	-	-	-	-	-	-	324	324	-	709	709	-
Stage 2	-	-	-	-	-	-	446	726	-	152	343	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1037	-	-	1212	-	-	290	226	842	249	225	735
Stage 1	-	-	-	-	-	-	662	648	-	391	436	-
Stage 2	-	-	-	-	-	-	561	428	-	835	636	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1037	-	-	1212	-	-	266	207	842	194	207	735
Mov Cap-2 Maneuver	-	-	-	-	-	-	266	207	-	194	207	-
Stage 1	-	-	-	-	-	-	662	648	-	359	400	-
Stage 2	-	-	-	-	-	-	515	392	-	710	636	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.32	11.41	25.32
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	700	1037	-	-	1212	-	-	194
HCM Lane V/C Ratio	0.199	-	-	-	0.082	-	-	0.089
HCM Ctrl Dly (s/v)	11.4	0	-	-	8.2	-	-	25.3
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.7	0	-	-	0.3	-	-	0.3

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	4	0	0	0	28	0	24	4	8	0	12
Future Vol, veh/h	12	4	0	0	0	28	0	24	4	8	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	4	0	0	0	30	0	26	4	9	0	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	50	54	7	48	59	28	13	0	0	30	0	0
Stage 1	24	24	-	28	28	-	-	-	-	-	-	-
Stage 2	26	30	-	20	30	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	950	837	1076	953	832	1047	1605	-	-	1582	-	-
Stage 1	994	875	-	989	872	-	-	-	-	-	-	-
Stage 2	991	870	-	999	870	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	917	832	1076	943	828	1047	1605	-	-	1582	-	-
Mov Cap-2 Maneuver	917	832	-	943	828	-	-	-	-	-	-	-
Stage 1	989	870	-	989	872	-	-	-	-	-	-	-
Stage 2	963	870	-	989	865	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.11	8.54	0	2.92
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1605	-	-	894	1047	600	-	-
HCM Lane V/C Ratio	-	-	-	0.019	0.029	0.005	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.1	8.5	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	4	76	76	12
Future Vol, veh/h	4	4	4	76	76	12
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, %	2	2	2	2	2	2
Mvmt Flow	4	4	4	83	83	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	180	89	96	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	809	969	1498	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	807	969	1498	-	-	-
Mov Cap-2 Maneuver	807	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.13	0.37	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	90	-	880	-	-
HCM Lane V/C Ratio	0.003	-	0.01	-	-
HCM Ctrl Dly (s/v)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

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	0	440	24	60	376	20	48	4	116	20	0	4
Future Vol, veh/h	0	440	24	60	376	20	48	4	116	20	0	4
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	478	26	65	409	22	52	4	126	22	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	430	0	0	504	0	0	826	1052	252	791	1054	215
Stage 1	-	-	-	-	-	-	491	491	-	550	550	-
Stage 2	-	-	-	-	-	-	335	561	-	241	504	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1125	-	-	1056	-	-	264	225	747	280	224	790
Stage 1	-	-	-	-	-	-	528	546	-	487	514	-
Stage 2	-	-	-	-	-	-	653	508	-	741	539	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1125	-	-	1056	-	-	247	211	747	214	211	790
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	211	-	214	211	-
Stage 1	-	-	-	-	-	-	528	546	-	457	482	-
Stage 2	-	-	-	-	-	-	609	477	-	611	539	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.14	18.09	21.53
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	456	1125	-	-	1056	-	-	244
HCM Lane V/C Ratio	0.401	-	-	-	0.062	-	-	0.107
HCM Ctrl Dly (s/v)	18.1	0	-	-	8.6	-	-	21.5
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.9	0	-	-	0.2	-	-	0.4

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	8	0	12	4	4	0	0	12	12	4	4
Future Vol, veh/h	4	8	0	12	4	4	0	0	12	12	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	9	0	13	4	4	0	0	13	13	4	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	35	46	7	41	41	7	9	0	0	13	0	0
Stage 1	33	33	-	7	7	-	-	-	-	-	-	-
Stage 2	2	13	-	35	35	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	972	846	1076	962	851	1076	1611	-	-	1605	-	-
Stage 1	984	868	-	1015	890	-	-	-	-	-	-	-
Stage 2	1021	885	-	981	866	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	955	839	1076	945	844	1076	1611	-	-	1605	-	-
Mov Cap-2 Maneuver	955	839	-	945	844	-	-	-	-	-	-	-
Stage 1	976	861	-	1015	890	-	-	-	-	-	-	-
Stage 2	1012	885	-	963	859	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.18	8.9	0	4.36
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1611	-	-	874	945	982	-	-
HCM Lane V/C Ratio	-	-	-	0.015	0.023	0.008	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.2	8.9	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	12	4	24	24	4
Future Vol, veh/h	32	12	4	24	24	4
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, %	2	2	2	2	2	2
Mvmt Flow	35	13	4	26	26	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	63	28	30	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	943	1047	1582	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	940	1047	1582	-	-	-
Mov Cap-2 Maneuver	940	-	-	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	988	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.92	1.04	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	257	-	967	-	-
HCM Lane V/C Ratio	0.003	-	0.049	-	-
HCM Ctrl Dly (s/v)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	441	39	17	428	26	13	0	140	13	0	0
Future Vol, veh/h	0	441	39	17	428	26	13	0	140	13	0	0
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	479	42	18	465	28	14	0	152	14	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	493	0	0	522	0	0	770	1031	261	756	1038	247
Stage 1	-	-	-	-	-	-	501	501	-	516	516	-
Stage 2	-	-	-	-	-	-	270	530	-	240	522	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1066	-	-	1041	-	-	290	232	738	297	229	753
Stage 1	-	-	-	-	-	-	521	541	-	510	532	-
Stage 2	-	-	-	-	-	-	713	525	-	742	529	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1066	-	-	1041	-	-	285	228	738	232	225	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	285	228	-	232	225	-
Stage 1	-	-	-	-	-	-	521	541	-	501	523	-
Stage 2	-	-	-	-	-	-	700	515	-	589	529	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0.31	12.43	21.55
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	650	1066	-	-	1041	-	-	232
HCM Lane V/C Ratio	0.256	-	-	-	0.018	-	-	0.061
HCM Ctrl Dly (s/v)	12.4	0	-	-	8.5	-	-	21.6
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	0.2

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	44	16	0	0	22	22	0	54	16	22	0	11
Future Vol, veh/h	44	16	0	0	22	22	0	54	16	22	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	17	0	0	24	24	0	59	17	24	0	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	124	130	6	124	127	67	12	0	0	76	0	0
Stage 1	54	54	-	67	67	-	-	-	-	-	-	-
Stage 2	71	76	-	57	60	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	850	761	1077	850	763	996	1607	-	-	1523	-	-
Stage 1	959	850	-	943	839	-	-	-	-	-	-	-
Stage 2	939	832	-	955	845	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	791	749	1077	818	751	996	1607	-	-	1523	-	-
Mov Cap-2 Maneuver	791	749	-	818	751	-	-	-	-	-	-	-
Stage 1	943	837	-	943	839	-	-	-	-	-	-	-
Stage 2	891	832	-	921	832	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	10.04	9.45	0	4.93
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1607	-	-	779	857	1000	-	-
HCM Lane V/C Ratio	-	-	-	0.084	0.056	0.016	-	-
HCM Ctrl Dly (s/v)	0	-	-	10	9.5	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	5	11	98	49	11
Future Vol, veh/h	22	5	11	98	49	11
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, %	2	2	2	2	2	2
Mvmt Flow	24	5	12	107	53	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	190	59	65	0	-	0
Stage 1	59	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	799	1006	1537	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	793	1006	1537	-	-	-
Mov Cap-2 Maneuver	793	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	896	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.52	0.74	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	182	-	825	-	-
HCM Lane V/C Ratio	0.008	-	0.036	-	-
HCM Ctrl Dly (s/v)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	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	0	524	9	92	410	13	9	0	61	39	0	4
Future Vol, veh/h	0	524	9	92	410	13	9	0	61	39	0	4
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	570	10	100	446	14	10	0	66	42	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	460	0	0	579	0	0	997	1234	290	938	1232	230
Stage 1	-	-	-	-	-	-	574	574	-	653	653	-
Stage 2	-	-	-	-	-	-	423	660	-	285	579	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1098	-	-	991	-	-	198	175	707	219	176	773
Stage 1	-	-	-	-	-	-	471	501	-	423	462	-
Stage 2	-	-	-	-	-	-	579	458	-	698	499	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1098	-	-	991	-	-	177	158	707	179	158	773
Mov Cap-2 Maneuver	-	-	-	-	-	-	177	158	-	179	158	-
Stage 1	-	-	-	-	-	-	471	501	-	380	415	-
Stage 2	-	-	-	-	-	-	518	412	-	633	499	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.62	13.28	29.61
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	511	1098	-	-	991	-	-	192
HCM Lane V/C Ratio	0.149	-	-	-	0.101	-	-	0.243
HCM Ctrl Dly (s/v)	13.3	0	-	-	9	-	-	29.6
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.3	-	-	0.9

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	11	0	16	0	0	0	11	0	11	33	0
Future Vol, veh/h	16	11	0	16	0	0	0	11	0	11	33	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	12	0	17	0	0	0	12	0	12	36	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	72	72	36	78	72	12	36	0	0	12	0	0
Stage 1	60	60	-	12	12	-	-	-	-	-	-	-
Stage 2	12	12	-	66	60	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	919	819	1037	911	819	1069	1575	-	-	1607	-	-
Stage 1	952	845	-	1009	886	-	-	-	-	-	-	-
Stage 2	1009	886	-	945	845	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	912	813	1037	891	813	1069	1575	-	-	1607	-	-
Mov Cap-2 Maneuver	912	813	-	891	813	-	-	-	-	-	-	-
Stage 1	944	839	-	1009	886	-	-	-	-	-	-	-
Stage 2	1009	886	-	924	839	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.29	9.12	0	1.81
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1575	-	-	869	891	450	-	-
HCM Lane V/C Ratio	-	-	-	0.034	0.02	0.007	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.3	9.1	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	0	22	5	38	16
Future Vol, veh/h	11	0	22	5	38	16
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, %	2	2	2	2	2	2
Mvmt Flow	12	0	24	5	41	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	103	-	59	0	-	0
Stage 1	50	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	895	0	1545	-	-	-
Stage 1	972	0	-	-	-	-
Stage 2	969	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	881	-	1545	-	-	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	969	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.14	6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1467	-	881	-	-
HCM Lane V/C Ratio	0.015	-	0.014	-	-
HCM Ctrl Dly (s/v)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	305	39	100	493	35	13	0	127	17	0	0
Future Vol, veh/h	0	305	39	100	493	35	13	0	127	17	0	0
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	332	42	109	536	38	14	0	138	18	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	574	0	0	374	0	0	838	1144	187	938	1146	287
Stage 1	-	-	-	-	-	-	353	353	-	772	772	-
Stage 2	-	-	-	-	-	-	485	791	-	166	374	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	995	-	-	1181	-	-	259	198	823	219	198	710
Stage 1	-	-	-	-	-	-	637	630	-	358	407	-
Stage 2	-	-	-	-	-	-	532	399	-	820	616	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	995	-	-	1181	-	-	235	180	823	166	180	710
Mov Cap-2 Maneuver	-	-	-	-	-	-	235	180	-	166	180	-
Stage 1	-	-	-	-	-	-	637	630	-	325	370	-
Stage 2	-	-	-	-	-	-	483	362	-	682	616	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.33	11.97	29.46
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	668	995	-	-	1181	-	-	166
HCM Lane V/C Ratio	0.228	-	-	-	0.092	-	-	0.112
HCM Ctrl Dly (s/v)	12	0	-	-	8.4	-	-	29.5
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.9	0	-	-	0.3	-	-	0.4

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	5	0	0	0	38	0	33	5	11	0	16
Future Vol, veh/h	16	5	0	0	0	38	0	33	5	11	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	5	0	0	0	41	0	36	5	12	0	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	68	74	9	65	80	39	17	0	0	41	0	0
Stage 1	33	33	-	39	39	-	-	-	-	-	-	-
Stage 2	36	41	-	27	41	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	924	816	1073	928	810	1033	1600	-	-	1568	-	-
Stage 1	984	868	-	977	863	-	-	-	-	-	-	-
Stage 2	980	861	-	991	861	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	880	810	1073	915	804	1033	1600	-	-	1568	-	-
Mov Cap-2 Maneuver	880	810	-	915	804	-	-	-	-	-	-	-
Stage 1	976	861	-	977	863	-	-	-	-	-	-	-
Stage 2	941	861	-	977	854	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.29	8.63	0	2.98
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1600	-	-	862	1033	611	-	-
HCM Lane V/C Ratio	-	-	-	0.026	0.04	0.008	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.3	8.6	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	5	103	103	16
Future Vol, veh/h	5	5	5	103	103	16
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, %	2	2	2	2	2	2
Mvmt Flow	5	5	5	112	112	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	243	121	129	0	-	0
Stage 1	121	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	745	931	1456	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	742	931	1456	-	-	-
Mov Cap-2 Maneuver	742	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.42	0.35	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	83	-	826	-	-
HCM Lane V/C Ratio	0.004	-	0.013	-	-
HCM Ctrl Dly (s/v)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	480	26	65	410	22	52	4	127	22	0	4
Future Vol, veh/h	0	480	26	65	410	22	52	4	127	22	0	4
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	522	28	71	446	24	57	4	138	24	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	550	0	0	900	1147	275	862	1149	235
Stage 1	-	-	-	-	-	-	536	536	-	599	599	-
Stage 2	-	-	-	-	-	-	364	611	-	263	550	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1088	-	-	1016	-	-	233	198	722	249	197	767
Stage 1	-	-	-	-	-	-	496	522	-	455	489	-
Stage 2	-	-	-	-	-	-	627	483	-	719	514	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1088	-	-	1016	-	-	216	184	722	183	183	767
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	184	-	183	183	-
Stage 1	-	-	-	-	-	-	496	522	-	424	455	-
Stage 2	-	-	-	-	-	-	580	449	-	577	514	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.15	21.22	25.07
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	418	1088	-	-	1016	-	-	207
HCM Lane V/C Ratio	0.476	-	-	-	0.07	-	-	0.136
HCM Ctrl Dly (s/v)	21.2	0	-	-	8.8	-	-	25.1
HCM Lane LOS	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.5	0	-	-	0.2	-	-	0.5

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	11	0	16	5	5	0	0	16	16	5	5
Future Vol, veh/h	5	11	0	16	5	5	0	0	16	16	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	12	0	17	5	5	0	0	17	17	5	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	46	60	8	55	54	9	11	0	0	17	0	0
Stage 1	43	43	-	9	9	-	-	-	-	-	-	-
Stage 2	3	17	-	46	46	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	956	831	1074	943	837	1073	1608	-	-	1600	-	-
Stage 1	971	859	-	1013	888	-	-	-	-	-	-	-
Stage 2	1020	881	-	968	857	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	935	821	1074	919	828	1073	1608	-	-	1600	-	-
Mov Cap-2 Maneuver	935	821	-	919	828	-	-	-	-	-	-	-
Stage 1	961	850	-	1013	888	-	-	-	-	-	-	-
Stage 2	1009	881	-	943	847	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.3	9.01	0	4.48
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1608	-	-	854	925	1007	-	-
HCM Lane V/C Ratio	-	-	-	0.02	0.031	0.011	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.3	9	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	44	16	5	33	33	5
Future Vol, veh/h	44	16	5	33	33	5
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, %	2	2	2	2	2	2
Mvmt Flow	48	17	5	36	36	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	85	39	41	0	-	0
Stage 1	39	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	916	1033	1568	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	913	1033	1568	-	-	-
Mov Cap-2 Maneuver	913	-	-	-	-	-
Stage 1	980	-	-	-	-	-
Stage 2	976	-	-	-	-	-

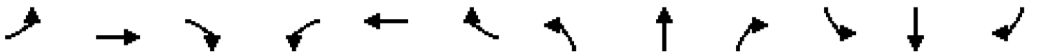
Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.11	0.96	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	237	-	942	-	-
HCM Lane V/C Ratio	0.003	-	0.069	-	-
HCM Ctrl Dly (s/v)	7.3	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-



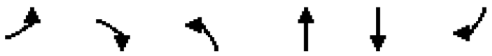
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	441	42	34	428	26	22	0	189	13	0	0
Future Volume (vph)	0	441	42	34	428	26	22	0	189	13	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	15	12	12	12	12	12	12	12	12
Storage Length (ft)	300		0	300		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.991			0.879				
Flt Protected				0.950				0.995			0.950	
Satd. Flow (prot)	2049	3493	0	1947	3507	0	0	1629	0	0	1770	0
Flt Permitted				0.950				0.995			0.950	
Satd. Flow (perm)	2049	3493	0	1947	3507	0	0	1629	0	0	1770	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		962			711			641			445	
Travel Time (s)		21.9			16.2			14.6			10.1	
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
Adj. Flow (vph)	0	479	46	37	465	28	24	0	205	14	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	525	0	37	493	0	0	229	0	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		15			15			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.88	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.2%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	31	0	0	27	22	0	54	16	22	0	26
Future Volume (vph)	87	31	0	0	27	22	0	54	16	22	0	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.939			0.970			0.927	
Flt Protected		0.964									0.977	
Satd. Flow (prot)	0	1796	0	0	1749	0	0	1807	0	0	1687	0
Flt Permitted		0.964									0.977	
Satd. Flow (perm)	0	1796	0	0	1749	0	0	1807	0	0	1687	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		316			734			505			947	
Travel Time (s)		7.2			16.7			11.5			21.5	
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
Adj. Flow (vph)	95	34	0	0	29	24	0	59	17	24	0	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	53	0	0	76	0	0	52	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

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



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	5	11	141	64	16
Future Volume (vph)	36	5	11	141	64	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.985				0.974	
Flt Protected	0.958			0.996		
Satd. Flow (prot)	1758	0	0	1855	1814	0
Flt Permitted	0.958			0.996		
Satd. Flow (perm)	1758	0	0	1855	1814	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	412			947	641	
Travel Time (s)	9.4			21.5	14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	5	12	153	70	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	0	0	165	87	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	524	18	145	410	13	14	0	93	39	0	4
Future Vol, veh/h	0	524	18	145	410	13	14	0	93	39	0	4
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	570	20	158	446	14	15	0	101	42	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	460	0	0	589	0	0	1117	1354	295	1053	1357	230
Stage 1	-	-	-	-	-	-	579	579	-	768	768	-
Stage 2	-	-	-	-	-	-	538	775	-	285	589	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1098	-	-	982	-	-	162	148	702	181	148	773
Stage 1	-	-	-	-	-	-	468	499	-	360	409	-
Stage 2	-	-	-	-	-	-	495	406	-	698	494	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1098	-	-	982	-	-	135	125	702	130	124	773
Mov Cap-2 Maneuver	-	-	-	-	-	-	135	125	-	130	124	-
Stage 1	-	-	-	-	-	-	468	499	-	303	343	-
Stage 2	-	-	-	-	-	-	413	341	-	598	494	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	2.39	15.66	42.83
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	453	1098	-	-	982	-	-	141
HCM Lane V/C Ratio	0.257	-	-	-	0.16	-	-	0.332
HCM Ctrl Dly (s/v)	15.7	0	-	-	9.4	-	-	42.8
HCM Lane LOS	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	1	0	-	-	0.6	-	-	1.3

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	20	0	16	16	0	0	11	0	11	33	47
Future Vol, veh/h	45	20	0	16	16	0	0	11	0	11	33	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	22	0	17	17	0	0	12	0	12	36	51

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	106	97	61	83	123	12	87	0	0	12	0	0
Stage 1	85	85	-	12	12	-	-	-	-	-	-	-
Stage 2	21	12	-	71	111	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	874	793	1004	905	768	1069	1509	-	-	1607	-	-
Stage 1	923	824	-	1009	886	-	-	-	-	-	-	-
Stage 2	998	886	-	939	804	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	847	787	1004	873	762	1069	1509	-	-	1607	-	-
Mov Cap-2 Maneuver	847	787	-	873	762	-	-	-	-	-	-	-
Stage 1	915	818	-	1009	886	-	-	-	-	-	-	-
Stage 2	978	886	-	907	797	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.76	9.62	0	0.88
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1509	-	-	827	813	195	-	-
HCM Lane V/C Ratio	-	-	-	0.085	0.043	0.007	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.8	9.6	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	0	22	34	85	32
Future Vol, veh/h	20	0	22	34	85	32
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, %	2	2	2	2	2	2
Mvmt Flow	22	0	24	37	92	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	195	-	127	0	-	0
Stage 1	110	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	794	0	1459	-	-	-
Stage 1	915	0	-	-	-	-
Stage 2	939	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	781	-	1459	-	-	-
Mov Cap-2 Maneuver	781	-	-	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.74	2.95	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	707	-	781	-	-
HCM Lane V/C Ratio	0.016	-	0.028	-	-
HCM Ctrl Dly (s/v)	7.5	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	305	42	117	493	35	22	0	176	17	0	0
Future Vol, veh/h	0	305	42	117	493	35	22	0	176	17	0	0
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	332	46	127	536	38	24	0	191	18	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	574	0	0	377	0	0	877	1183	189	975	1186	287
Stage 1	-	-	-	-	-	-	354	354	-	809	809	-
Stage 2	-	-	-	-	-	-	522	828	-	166	377	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	995	-	-	1178	-	-	243	188	821	206	187	710
Stage 1	-	-	-	-	-	-	636	629	-	340	392	-
Stage 2	-	-	-	-	-	-	506	384	-	820	614	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	995	-	-	1178	-	-	217	168	821	141	167	710
Mov Cap-2 Maneuver	-	-	-	-	-	-	217	168	-	141	167	-
Stage 1	-	-	-	-	-	-	636	629	-	304	349	-
Stage 2	-	-	-	-	-	-	451	342	-	629	614	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.53	13.72	34.38
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	627	995	-	-	1178	-	-	141
HCM Lane V/C Ratio	0.343	-	-	-	0.108	-	-	0.131
HCM Ctrl Dly (s/v)	13.7	0	-	-	8.4	-	-	34.4
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.5	0	-	-	0.4	-	-	0.4

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	60	20	0	0	5	38	0	33	5	11	0	31
Future Vol, veh/h	60	20	0	0	5	38	0	33	5	11	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	22	0	0	5	41	0	36	5	12	0	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	79	82	17	73	96	39	34	0	0	41	0	0
Stage 1	41	41	-	39	39	-	-	-	-	-	-	-
Stage 2	39	41	-	35	58	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	909	808	1062	917	794	1033	1578	-	-	1568	-	-
Stage 1	974	861	-	977	863	-	-	-	-	-	-	-
Stage 2	977	861	-	981	847	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	860	802	1062	886	788	1033	1578	-	-	1568	-	-
Mov Cap-2 Maneuver	860	802	-	886	788	-	-	-	-	-	-	-
Stage 1	966	854	-	977	863	-	-	-	-	-	-	-
Stage 2	932	861	-	949	840	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.75	8.79	0	1.92
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	845	997	393	-	-
HCM Lane V/C Ratio	-	-	-	0.103	0.047	0.008	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.8	8.8	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	5	5	147	118	21
Future Vol, veh/h	20	5	5	147	118	21
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, %	2	2	2	2	2	2
Mvmt Flow	22	5	5	160	128	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	310	140	151	0	-	0
Stage 1	140	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	682	908	1430	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	679	908	1430	-	-	-
Mov Cap-2 Maneuver	679	-	-	-	-	-
Stage 1	883	-	-	-	-	-
Stage 2	859	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.23	0.25	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	59	-	715	-	-
HCM Lane V/C Ratio	0.004	-	0.038	-	-
HCM Ctrl Dly (s/v)	7.5	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	480	31	92	410	22	55	4	143	22	0	4
Future Vol, veh/h	0	480	31	92	410	22	55	4	143	22	0	4
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	300	-	-	300	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	522	34	100	446	24	60	4	155	24	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	555	0	0	961	1208	278	921	1213	235
Stage 1	-	-	-	-	-	-	539	539	-	658	658	-
Stage 2	-	-	-	-	-	-	423	670	-	263	555	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1088	-	-	1011	-	-	211	182	720	226	180	767
Stage 1	-	-	-	-	-	-	495	520	-	420	460	-
Stage 2	-	-	-	-	-	-	579	454	-	719	511	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1088	-	-	1011	-	-	189	164	720	156	163	767
Mov Cap-2 Maneuver	-	-	-	-	-	-	189	164	-	156	163	-
Stage 1	-	-	-	-	-	-	495	520	-	378	414	-
Stage 2	-	-	-	-	-	-	519	409	-	559	511	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.57	25.2	29.12
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	393	1088	-	-	1011	-	-	177
HCM Lane V/C Ratio	0.559	-	-	-	0.099	-	-	0.159
HCM Ctrl Dly (s/v)	25.2	0	-	-	9	-	-	29.1
HCM Lane LOS	D	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	3.3	0	-	-	0.3	-	-	0.6

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	16	0	16	13	5	0	0	16	16	5	29
Future Vol, veh/h	20	16	0	16	13	5	0	0	16	16	5	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	17	0	17	14	5	0	0	17	17	5	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	63	73	21	58	80	9	37	0	0	17	0	0
Stage 1	56	56	-	9	9	-	-	-	-	-	-	-
Stage 2	7	17	-	49	72	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	931	817	1056	939	810	1073	1574	-	-	1600	-	-
Stage 1	956	848	-	1013	888	-	-	-	-	-	-	-
Stage 2	1015	881	-	964	835	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	900	808	1056	909	801	1073	1574	-	-	1600	-	-
Mov Cap-2 Maneuver	900	808	-	909	801	-	-	-	-	-	-	-
Stage 1	945	839	-	1013	888	-	-	-	-	-	-	-
Stage 2	993	881	-	934	826	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.4	9.25	0	2.33
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1574	-	-	857	883	492	-	-
HCM Lane V/C Ratio	-	-	-	0.046	0.042	0.011	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.4	9.3	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	48	16	5	47	56	13
Future Vol, veh/h	48	16	5	47	56	13
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, %	2	2	2	2	2	2
Mvmt Flow	52	17	5	51	61	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	130	68	75	0	-	0
Stage 1	68	-	-	-	-	-
Stage 2	62	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	864	995	1524	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	961	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	861	995	1524	-	-	-
Mov Cap-2 Maneuver	861	-	-	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	961	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.38	0.71	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	173	-	891	-	-
HCM Lane V/C Ratio	0.004	-	0.078	-	-
HCM Ctrl Dly (s/v)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

APPENDIX E

Signal Warrant Analysis

SIGNALIZATION WARRANT ANALYSIS

As requested by the City of Helena, a study was performed at the intersection of Euclid Avenue (Hwy 12) and Granite Avenue to determine if this intersection meets signalization warrants now or in the future. This study was completed in accordance with the procedures outlined in the 2023 11th Edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). The study was based on traffic data collected in April 2025 by ATS and information from the traffic impact study produced for the West Side development. It should be noted that the new 2025 traffic data for this intersection is less than the volumes collected in 2022 and approximately the same as the data collected in 2017.

The MUTCD outlines nine traffic signal warrants. One or more of these warrants should be met before a traffic signal is installed at an intersection. In order to evaluate these signal warrants, it is necessary to assemble 24-hour traffic volume data, pedestrian volumes, and historic crash trends for an intersection. The individual traffic signal warrants include:

- Warrant 1 – Eight-Hour Vehicular Volume,
- Warrant 2 – Four-Hour Vehicular Volume,
- Warrant 3 – Peak Hour Vehicular Volume,
- Warrant 4 – Pedestrian Volume,
- Warrant 5 – School Crossing,
- Warrant 6 – Coordinated Signal System,
- Warrant 7 – Crash Experience,
- Warrant 8 – Roadway Network
- Warrant 9 – Intersection Near a Grade Crossing.

Additional Considerations
It should also be noted that the MUTCD allows lower minimum threshold volumes for signalization at locations where the speed limit is greater the 40 MPH or the community has a population of less than 10,000. The current posted speed limit on this section of Euclid Avenue is 55 MPH. Therefore, this criterion is met.

The MUTCD allows the elimination of some of the right-turn traffic on the minor approach from the warrant evaluation. Section 4C.01 of the MUTCD stated that:

> "*Similar engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered.*"

In this instance, the intersection with Euclid Avenue does not have a separate right-turn lane, but there is sufficient room in the northbound lane (22 feet) for right-turning vehicles to move past a left-turning vehicle and reach Euclid Avenue. Also, the vast majority (80-90%) of northbound vehicles approaching the intersection turn right onto Euclid Avenue and the approach functions at LOS C. Therefore, it would not be appropriate to include all right-turning vehicles when evaluating the traffic volume warrants for this location.

Additional challenges when evaluating the traffic volume warrants for this location are due to the specific traffic patterns created by Kessler Elementary School. School traffic is typically concentrated in specific time periods which generally fall outside of the normal peak traffic periods created by commuter traffic on adjacent streets. Typically, the peak commuter traffic period will occur between 7:00 and 8:00 AM while the peak school traffic periods will occur after 8:00 AM. Similarly, the peak afternoon school traffic period of 3:00 to 4:00 PM occurs well before the typical peak commuter traffic period between 5:00 and 6:00 PM.

It can also be a challenge to perform precise four-hour and eight-hour warrants based on projected traffic volumes. Typical traffic impact analysis projects focus on peak-hour traffic volumes only and there is little specific guidance to find the fourth or eighth highest generation hour for a residential project.

SIGNALIZATION WARRANTS

Warrant 1 – Eight-Hour Vehicular Volume

MUTCD SECTION 4C.02
"The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.
It is intended that Warrant 1 be treated as a single warrant. If Condition A is satisfied, then the criteria for Warrant 1 is satisfied and Condition B and the combination of Conditions A and B are not needed. Similarly, if Condition B is satisfied, then the criteria for Warrant 1 is satisfied and the combination of Conditions A and B is not needed.

> *Standard: The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exist for each of any 8 hours of an average day:*
> *A. The vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; or*
> *B. The vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.*
> *In applying each condition the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these 8 hours."*

For a roadway with one lane on the minor street and two lanes on the major approach Table 4C-1 gives the minimum vehicular volumes of 420 Vehicles Per Hour (VPH) on the major street and 105 VPH on the minor approach for Condition A. For Condition B the minimum vehicular volume is 630 VPH on the major street and 70 VPH on the minor approach under reduction C (major street exceeds 40 mph).

An analysis of the hourly data for Euclid Avenue indicates that the eighth highest hour has a projected volume of over 700 VPH, which is above the minimum volumes for both Conditions A

and B. The projected eight-hour approaching traffic volume on the northbound approach for Granite Street from the 2025 data is only 44 VPH and is not sufficient to meet this warrant. The future projected traffic volumes from Granite Street in the 8th highest hour with the planned West Side development and the estimated traffic volume growth on from Euclid Avenue indicates a potential peak hour traffic flow from Granite Street of 74 VPH which may be sufficient to meet condition B of the eight-hour vehicle volume warrant if no right-turn reduction is used. However, as described above, the vast majority (80-90%) of traffic at the intersection turns right onto Euclid Avenue. If the right turn volume is reduced by only 21 vehicles (28%) as allowed by the MUTCD, this warrant would not be met. With no hard evidence that background traffic volumes along Euclid Avenue are increasing, it is not likely that the West Side development would increase the traffic volume at this intersection in the 8th highest hour by a sufficient level to meet this warrant, especially if a right-turn traffic reduction is taken into consideration. Therefore, this warrant is not met.

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Sect. 4C.02 December 2009

Warrant 2 – Four-Hour Vehicular Volume

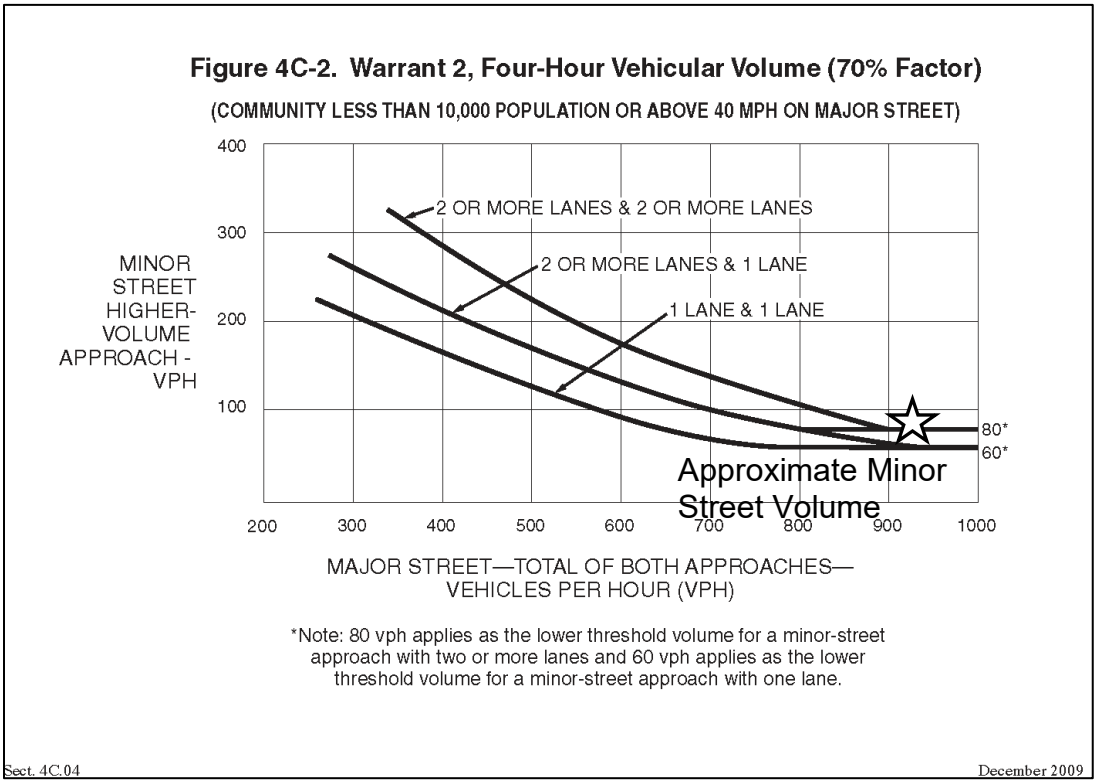
MUTCD SECTION 4C.03

"The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

> *Standard: The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in Figure 4C-1 for the existing combination of approach lanes.*

On the minor street, the higher volume shall not be required to be on the same approach during each of these 4 hours."

The data collected by MDT indicates that the fourth highest hour on this section of Euclid Avenue has over 850 VPH, which is near the limit of the chart for figure 4C-2. Therefore, the minor street approach needs only to meet the minimum volume (80 VPH). The existing 2025 minor leg approach volume at this intersection is approximately 49 VPH in the fourth highest hour which is not sufficient to meet this warrant. The future projected traffic volumes from Granite Street in the 4th highest hour with the planned West Side development and the estimated traffic volume growth on from Euclid Avenue indicates a potential peak hour traffic flow from Granite Street of 84 VPH which may be sufficient to meet condition B of the fourth-hour vehicle volume warrant if no right-turn reduction is used. However, as described above, 80-90% of traffic at the intersection turns right onto Euclid Avenue. If the right turn volume is reduced by 24 vehicles (28%), this warrant would not be met. With no hard evidence that background traffic volumes along Euclid Avenue are increasing, it is not likely that the West Side development would increase the traffic volume at this intersection in the 4th highest hour by a sufficient level to meet this warrant, especially if a right-turn traffic reduction is taken into consideration. Therefore, this warrant is not met.



Warrant 3 – Peak Hour Vehicular Volume

MUTCD SECTION 4C.04

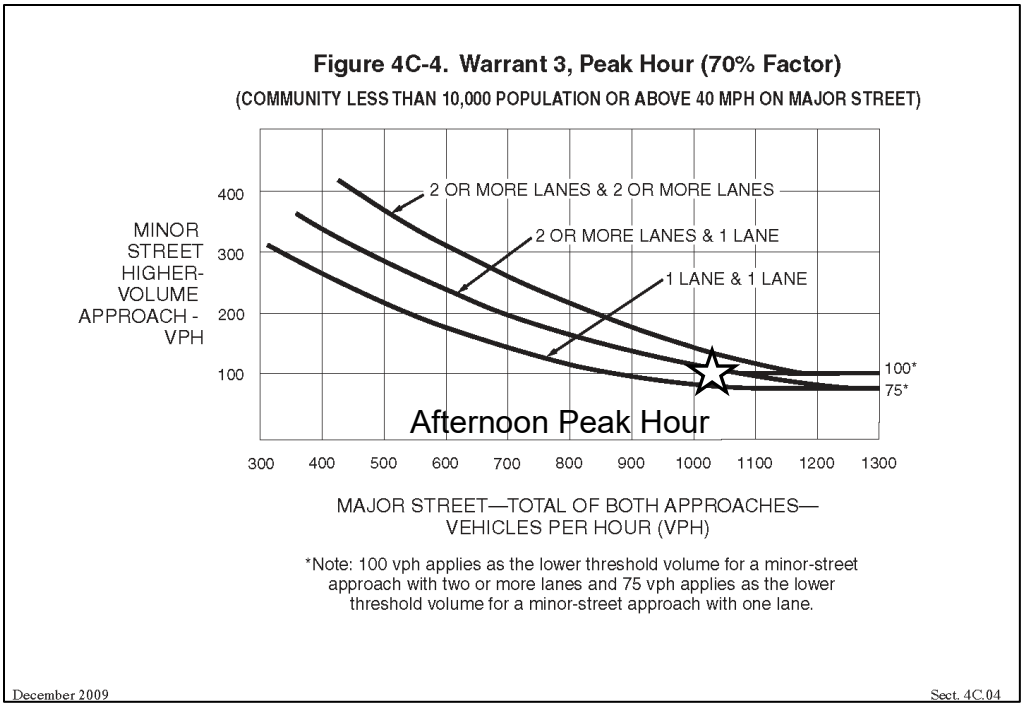
"The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time. The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:
   1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and
   2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
   3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes."

The analysis of the current and projected traffic data indicates that Euclid Avenue has an afternoon peak-hour traffic volume of approximately 1,000 VPH and northbound peak-hour traffic is approximately 52 VPH. If the West Side subdivision increases the peak-hour northbound traffic volume by 30-40 VPH as projected, the intersection would still not just meet this warrant. At this time there is no indication this warrant would be met with the development of the West Side subdivision. Considering the option for residents of the West Side subdivision to use alternate route to leave the site (Hauser Boulevard) if congestion is occurring near Kessler School, it would be unlikely that the development would trigger the peak-hour warrant for this location. It is also unlikely that MDT would accept this future volume warrant as a valid reason for providing signalization at the intersection without supporting field traffic counts. Therefore, this warrant is not met.



Warrant 4 – Pedestrian Volume

MUTCD SECTION 4C.05

"The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

> *Standard: The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:*
>
> *A. For each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings) all fall above the curve in Figure 4C-5; or*
>
> *B. For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings) falls above the curve in Figure 4C-7."*

At this time there is little pedestrian activity crossing this section of Euclid Avenue during most of the day except for some morning and afternoon pedestrian traffic from Kessler School. The analysis of the traffic data performed by MDT in 2018 did find sufficient need for a pedestrian crossing at this location to warrant the installation of the flashing warning beacons in 2020. The traffic data collected by ATS in September of 2025 indicates that only 15 pedestrians crossed Euclid Avenue during the entire 12-hour study period. At this time there is insufficient

information to conclude that the warning beacons installed by MDT are not adequate to meet pedestrian needs in this area. Therefore, this warrant is not met.

Warrant 5 – School Crossing

MUTCD SECTION 4C.06
"The School Crossing signal warrant is intended for application where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal. For the purposes of this warrant, the word "schoolchildren" includes elementary through high school students.

> *Standard: The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period (see Section 7A.03) and there are a minimum of 20 students during the highest crossing hour.*
>
> *Before a decision is made to install a traffic control signal, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing.*
> *The School Crossing signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic."*

Similar to the pedestrian Warrant #4, there is insufficient information to conclude that the warning beacons installed by MDT in 2020 are not adequate to meet pedestrian needs in this area. Therefore, this warrant is not met.

Warrant 6 – Coordinated Signal System

MUTCD SECTION 4C.07
"Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

> *Standard: The need for a traffic control signal shall be considered if an engineering study finds that one of the following criteria is met:*
> *A. On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.*
> *B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation."*

There are existing traffic signals along Euclid Avenue 0.6 miles to the west at Williams Street

and 0.5 miles to the east at Joslyn Street. These existing signals provide acceptable platooning, and there is not likely a need for the signal at Granite Street to provide additional platooning along this section of Euclid Avenue. Therefore, this warrant is not met.

Warrant 7 – Crash Experience

MUTCD SECTION 4C.08
"The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

> *Standard: The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:*
> *A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and*
> *B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and*
> *C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours."*

According to MDT vehicle crash data for this location, a total five crashes have occurred at the intersection of Euclid Avenue and Granite Street in the last five years which is well below the crash rate needed to meet this warrant (five crashes in 12 months). Therefore, the intersection crash warrant is not met.

Warrant 8 – Roadway Network

MUTCD SECTION 4C.09
"Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network."

> *Standard: The need for a traffic control signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:*
> *A. The intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or*
> *B. The intersection has a total existing or immediately projected entering*

volume of at least 1,000 vehicles per hour for each of any 5 hours of a nonnormal business day (Saturday or Sunday). A major route as used in this signal warrant shall have one or more of the following characteristics:

A. It is part of the street or highway system that serves as the principal roadway network for through traffic flow; or
B. It includes rural or suburban highways outside, entering, or traversing a City; or
C. It appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study."

Euclid Avenue is a major urban route and Granite Street is a designated collector route. The intersection of Euclid Avenue and Granite Street currently has over 1,000 vehicles entering per hour but is not projected to meet Warrants 1, 2, or 3 for condition A and is not projected to meet the necessary volumes for condition B. Based on this data, this warrant is not met.

Warrant 9 – Intersection Near a Grade Crossing

MUTCD Section 4C.10

"The Intersection Near a Grade Crossing signal warrant is intended for use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal."

Euclid Avenue has no at-grade railroad crossings in this area. Therefore, this warrant is not met.

WARRANT CONCLUSIONS

Based on the new 2025 traffic data collected for this project, traffic signal warrants are not currently met at the intersection of Euclid Avenue and Granite Street and it is not likely that a traffic signal will become warranted due to the construction of the West Side development.

The traffic impact analysis prepared for the West Side development suggests that the project will not have a major impact on the operations of the Euclid Avenue and Granite Street intersection. The high level of right-turning traffic at the Granite Street intersection limits the overall need for a traffic signal at this location. Additionally, traffic volumes at this location are highly variable due to the influences of the Kessler Elementary School, but school traffic does not generally occur congruently with the primary commuter traffic periods of residential developments. Traffic from the West Side development can also choose to re-route onto other roads on Hauser Boulevard to the east if traffic congestion becomes an issue along Granite Street.

Greater Helena Area Long Range Transportation Plan, 2014 Update indicated that the intersection of Granite Street and Highway 12 functioned at LOS D(AM)/E(PM) and projected an LOS of F(AM)/F(PM) by 2035 but did not recommend capacity improvements at the intersection. The LRTP did recommend the installation of the flashing pedestrian crossing at Granite Street which was installed in 2020.

It is likely that this intersection will eventually need to be signalized in the future. However, it is most probable the traffic warrants for signalization will be largely due to potential future development on the north side of Euclid Avenue which would require left-turns movement onto Highway 12 from Granite Street. If necessary, a formalized northbound right-turn lane could be developed on Granite Street which would eliminate any potential need for a traffic signal for the southern approach. It should also be noted that the development of a traffic signal at this location will encourage drivers to use the Granite Street route because of the easier access to Highway 12. A traffic signal at this location would likely increase the peak-hour congestion in front of Kessler School and traffic volumes, vehicles queuing, and vehicle speeds would likely increase with the installation of a traffic signal. At this time there is insufficient evidence that a traffic signal will become warranted at this location due to the construction of the West Side development.

July14, 2026

Mark Young
City of Helena
316 N Park Ave
Helena, MT 59623

RE: West Side Woods Granite Street Signal Warrant Sensitivity Analysis

Dear Mark, it is my understanding that the City of Helena has requested a sensitivity analysis for the traffic signal warrant study prepared as part of the West Side Woods Development for the Granite Street/Highway 12 intersection. The signal warrant analysis prepared for the project in 2025 did not recommend the installation of a signal at this time due to the borderline warrants and unknown future traffic demands at the intersection. The signal warrant analysis utilized a right-turn reduction factor for the review even though the intersection technically does not have a separated right-turn lane. The study justified the use of the right-turn reduction suggesting:

> "the intersection with Euclid Avenue does not have a separate right-turn lane, but there is sufficient room in the northbound lane (22 feet) for right-turning vehicles to move past a left-turning vehicle and reach Euclid Avenue. Also, the vast majority (80-90%) of northbound vehicles approaching the intersection turn right onto Euclid Avenue and the approach functions at LOS C. Therefore, it would not be appropriate to include all right-turning vehicles when evaluating the traffic volume warrants for this location."

While this method does not technically match the guidance of the MUTCD which recommends using a right-turn reduction only if a dedicated right-turn lane exists, it matches the intent of utilizing a right-turn reduction for this location because left-turn conflicts are relatively rare.

Based on the request from the City, ATS developed a more detailed right-turn reduction sensitivity analysis for the intersection to determine the exact number of right-turns that would need to be eliminated using a right-turn reduction factor to lower the projected traffic volumes below levels that could signify the need for a traffic signal. In this case, this reduction applies only to Warrants 1, 2, and 3 from the MUTCD. No detailed analysis was performed for Warrant 3 (peak hour) as the original study indicated that the intersection does not meet this warrant at full buildout regardless of any right-turn reduction.

To perform this analysis, ATS reviewed the traffic data collected in March 2025 at the intersection of Highway 12 and Granite Street based on the projected future traffic conditions in 2029 with the additional traffic from the West Side Woods development. The detailed traffic volumes and projections are included with this letter. The warrant results with and without a right-turn reduction are shown in **Tables 1 & 2**.

Table 1 shows that Signal Warrants 1 and 2 (8-hour and 4-hour) could be met if no right-turn reduction is applied. However, **Table 2** shows that signal warrants at this location would not be met if a 15% right-turn reduction was applied to the 8-hour warrant and a 36% reduction was applied to the four-hour warrant (see MUTCD Figure 4C-2 below).

130 South Howie Street
Helena, Montana 59601
406-459-1443

Table 1 - Traffic Signal Warrant Summary No Reduction

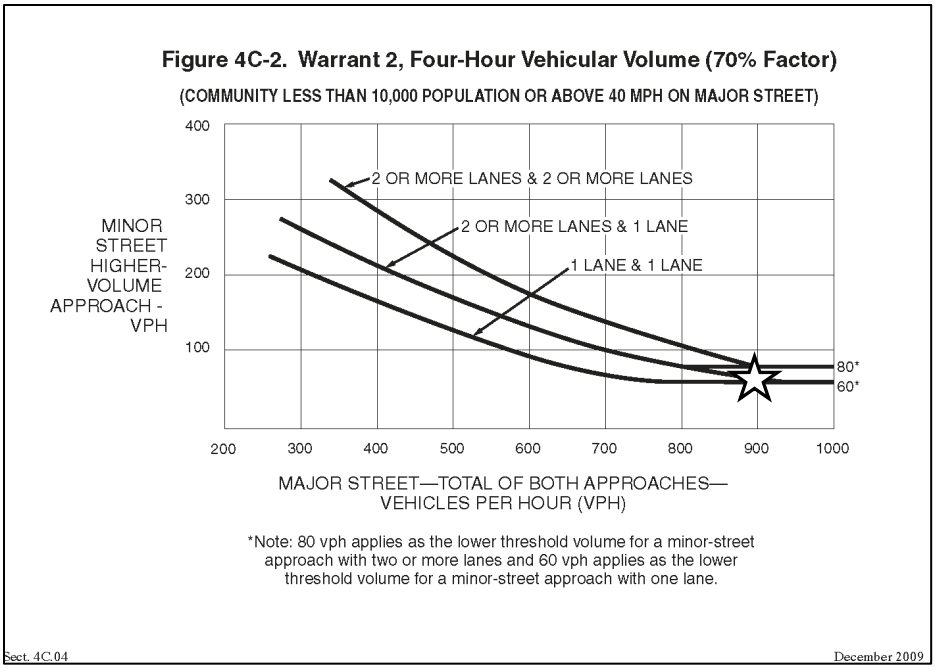
Hour Start Time	Future With Project Volumes						
	8-Hour Warrant (Table 4C-1)						4-Hour Warrant
	Major Street	Minor Street	Condition A (70%)		Condition B (70%)		
			420 min	105 min	630 min	70 min	Fig 4C-2
7:00 AM	748	149	YES	YES	YES	YES	YES
8:00 AM	902	173	YES	YES	YES	YES	YES
9:00 AM	760	81	YES	NO	YES	YES	NO
10:00 AM	805	70	YES	NO	YES	YES	NO
11:00 AM	824	81	YES	NO	YES	YES	YES
12:00 PM	814	82	YES	NO	YES	YES	YES
1:00 PM	868	70	YES	NO	YES	YES	NO
2:00 PM	838	75	YES	NO	YES	YES	NO
3:00 PM	980	129	YES	YES	YES	YES	YES
4:00 PM	1027	91	YES	NO	YES	YES	YES
5:00 PM	933	93	YES	NO	YES	YES	YES
6:00 PM	659	76	YES	NO	YES	YES	NO

8 Hour Signal Warrant Met: **YES - 10 of 8 hours met (Condition B)**
4 Hour Signal Warrant Met: **YES - 6 of 4 hours met**

Table 2 - Traffic Signal Warrant Sensitivity Analysis with Reductions

Hour Start Time	Future With Project Volumes						
	8-Hour Warrant (Table 4C-1)						4-Hour Warrant
	Major Street	Minor Street	Condition A (70%)		Condition B (70%)		
			420 min	105 min	630 min	70 min	Fig 4C-2
7:00 AM	748	127	YES	YES	YES	YES	YES
8:00 AM	902	147	YES	YES	YES	YES	YES
9:00 AM	760	68	YES	NO	YES	NO	NO
10:00 AM	805	59	YES	NO	YES	NO	NO
11:00 AM	824	69	YES	NO	YES	NO	NO
12:00 PM	814	70	YES	NO	YES	YES	NO
1:00 PM	868	60	YES	NO	YES	NO	NO
2:00 PM	838	64	YES	NO	YES	NO	NO
3:00 PM	980	110	YES	YES	YES	YES	YES
4:00 PM	1027	77	YES	NO	YES	YES	NO
5:00 PM	933	79	YES	NO	YES	YES	NO
6:00 PM	659	65	YES	NO	YES	NO	NO

8 Hour Signal Warrant Met: **NO - 6 of 8 hours met with 15% Right-turn Reduction.**
4 Hour Signal Warrant Met: **NO - 3 of 4 hours met with 36% Right-turn Reduction.**



While it could be possible to install a traffic signal at the intersection of Granite Street and Highway 12, the traffic data available for this project does not clearly support the need for this traffic signal. The intersection was reviewed by MDT previously in 2018 and a signal was not approved. MDT will not typically allow an intersection on a State Highway to be signalized unless warrants for a signal are clearly met, which is not expected. The installation of a traffic signal at this location will encourage drivers to use the Granite Street route because of the easier access to Highway 12. However, a traffic signal at this location would likely increase the school-hour congestion in front of Kessler School and traffic volumes, vehicle queues, and vehicle speeds would likely increase with the installation of a traffic signal. With the planned reconfiguration of the pick-up and drop-off areas for Kessler School, peak-hour traffic demands at the intersection of Granite Street and Highway 12 will be further reduced.

It is likely that this intersection will eventually need to be signalized. However, it is most probable traffic warrants for signalization will be largely due to potential future development on the north side of Euclid Avenue which would require left-turn movements onto Highway 12 from Granite Street. If necessary, a formalized northbound right-turn lane could be developed on Granite Street, which would eliminate any potential need for a traffic signal for the southern approach. If you have any questions about this analysis, please feel free to contact me at (406) 459-1443.

Sincerely,



Bob Abelin, P.E. PTOE
Abelin Traffic Services, Inc.

West Side Woods Traffic Signal Sensitivity Analysis

Location: Helena - US 12 and Granite

	Existing Traffic		Growth Factor to 2029			1.091	8 Hour Sensitivity Reduction	4 Hour Sensitivity Reduction
	2025 Major E+W	Minor NB	2029 Major E+W	2029 Minor NB	NEW Westside Traffic	Total Minor NB	15% Minor NB	36% Minor NB
7:00	686	83	748	91	58	149	127	95
8:00	827	114	902	124	49	173	147	111
9:00	697	40	760	44	37	81	68	52
10:00	738	31	805	34	36	70	59	45
11:00	755	44	824	48	33	81	69	52
12:00	746	44	814	48	34	82	70	53
1:00	796	33	868	36	34	70	60	45
2:00	768	34	838	37	38	75	64	48
3:00	898	80	980	87	42	129	110	83
4:00	941	42	1027	46	45	91	77	58
5:00	855	49	933	53	39	93	79	59
6:00	604	37	659	40	36	76	65	49

APPENDIX F

MDT Correspondence

Jeremy Fadness

From: Drew Pearson
Sent: Thursday, August 14, 2025 11:36 AM
To: Jeremy Fadness
Subject: FW: Proposed Stormwater along Euclid Avenue/US 12/N-8, Helena (65.71.1166.01)

WWC ENGINEERING
Drew Pearson, P.E., P.L.S. | Civil Department Manager
1275 Maple Street, Suite F | Helena, MT 59601
O: 406.443.3962 | D: 406.558.3572 | C: 406.459.8536
www.wwcengineering.com

From: Maes, Stephanie <smaes@mt.gov>
Sent: Tuesday, July 27, 2021 11:21 AM
To: Drew Pearson <dpearson@wwcengineering.com>
Cc: Derek Davis <Derek@sussexconstruction.com>; Jeremy Fadness <jfadness@wwcengineering.com>; Brelin, Stanton <sbrelin@mt.gov>; Zody, Joe <jzody@mt.gov>; Pesanti, Jim <jpesanti@mt.gov>; Fogarty, William <wfogarty@mt.gov>
Subject: RE: Proposed Stormwater along Euclid Avenue/US 12/N-8, Helena (65.71.1166.01)

WARNING: This email originated from an external sender. Please use caution when clicking links or opening attachments.

Drew,

MDT traffic and district staff met to discuss your email below asking whether MDT would consider direct access from the West Side Subdivision to Euclid Ave/US 12 at the location proposed in your exhibit west of Helena. Every new access to a roadway presents a conflict point, and the poor sight distance at this location creates a potential safety issue. Therefore, MDT will not allow the approach.

If you have questions or would like to discuss this further, please let me know.

Thank you,
Stephanie

From: Drew Pearson <dpearson@wwcengineering.com>
Sent: Friday, July 23, 2021 10:16 AM
To: Maes, Stephanie <smaes@mt.gov>
Cc: Derek Davis <Derek@sussexconstruction.com>; Jeremy Fadness <jfadness@wwcengineering.com>
Subject: [EXTERNAL] RE: Proposed Stormwater along Euclid Avenue/US 12/N-8, Helena (65.71.1166.01)

Stephanie,

I have a question for MDT regarding the proposed West Side Subdivision that is unrelated to our previous stormwater infrastructure correspondence. The developer recently held a public meeting with adjacent landowners to hear concerns about the proposed subdivision. One issue that was discussed was the additional traffic being routed through local streets to Granite Street and then onto Euclid. Residents implored the developer to consider a direct access from the subdivision onto Euclid. Attached is the location where an approach could be located as the right-of-way of Euclid abuts the proposed subdivision. There are challenges with earthwork and construction at

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