TRAFFIC IMPACT STUDY

FOR

Steamboat Basecamp Residential and Outdoor Amenity Space

Prepared For:

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Project Description

This long-term traffic impact study analyzes the effects that the Steamboat Basecamp development will have on traffic operations, once both the Steamboat Basecamp Apartments and the Steamboat Basecamp Residential and Outdoor Amenity Space have been completed. A traffic impact study (Steamboat Basecamp TIS) has already been completed for the Steamboat Basecamp Apartments and is included in the Appendix for reference. The combination of both phases of the development will result in sufficient traffic volume to require a long-term traffic study, according to the City's standards. Table 1 shows the scenarios analyzed in the in the Steamboat Basecamp Apartments report, and the scenarios covered in this report. Since the Existing Conditions and both of the year 2022 conditions are unaffected by the Steamboat Basecamp Residential and Outdoor Amenity Space, these three scenarios are merely summarized in this study. A more detailed analysis can be found in the attached study of the Steamboat Basecamp Apartments.

Table 1: Contents of Short-Term and Long-Term Studies

Scenario	Steamboat Basecamp Apartments	Steamboat Basecamp Residential and Outdoor Amenity Space
Existing Conditions	✓	✓ (summary)
Short-Term Background (year 2022)	✓	✓ (summary)
Short-Term Total (year 2022)	✓	✓ (summary)
Long-Term Background (year 2040)		✓
Long-Term Total (year 2040)		✓

The Steamboat Basecamp Residential and Outdoor Amenity Space will include a variety of apartment types, including multifamily housing, an ice skating rink, and a drinking place. Table 2 shows the amenities expected to generate trips from both phases of the development.

Table 2: Basecamp Amenities

Steamboat Basecamp Apartments		Steamboat Basecamp Residential and Outdoor Amenity Space	
Amenity	**Size**	**Amenity**	**Size**
Multifamily Mid-Rise Housing	75 Units	Multifamily Low-Rise Housing	28 Units
Fitness Center	4,090 SQ FT	Multifamily Mid-Rise Housing	0 Units
Restaurant	3,659 SQ FT	Ice Skating Rink	18,293 Sq Ft
		Drinking Place	1,824 Sq Ft

The City of Steamboat Springs has requested that a traffic impact study be prepared for the Steamboat Basecamp Residential and Outdoor Amenity Space. In accordance with City requirements, a scope approval form was submitted to the City of Steamboat, and was approved by Ben Beall, the City Engineer. It is included in the Appendix, and outlines the key items to be analyzed in this study. The traffic impact study has been prepared in accordance with City of Steamboat Springs requirements.

1. Existing Conditions

1.1. Site Characteristics

The Steamboat Basecamp is located on the northeast corner of Elk River Rd & Shield Dr, with site access on each of these roads, as well as one on Curve CT. A vicinity map is provided in Figure 1.

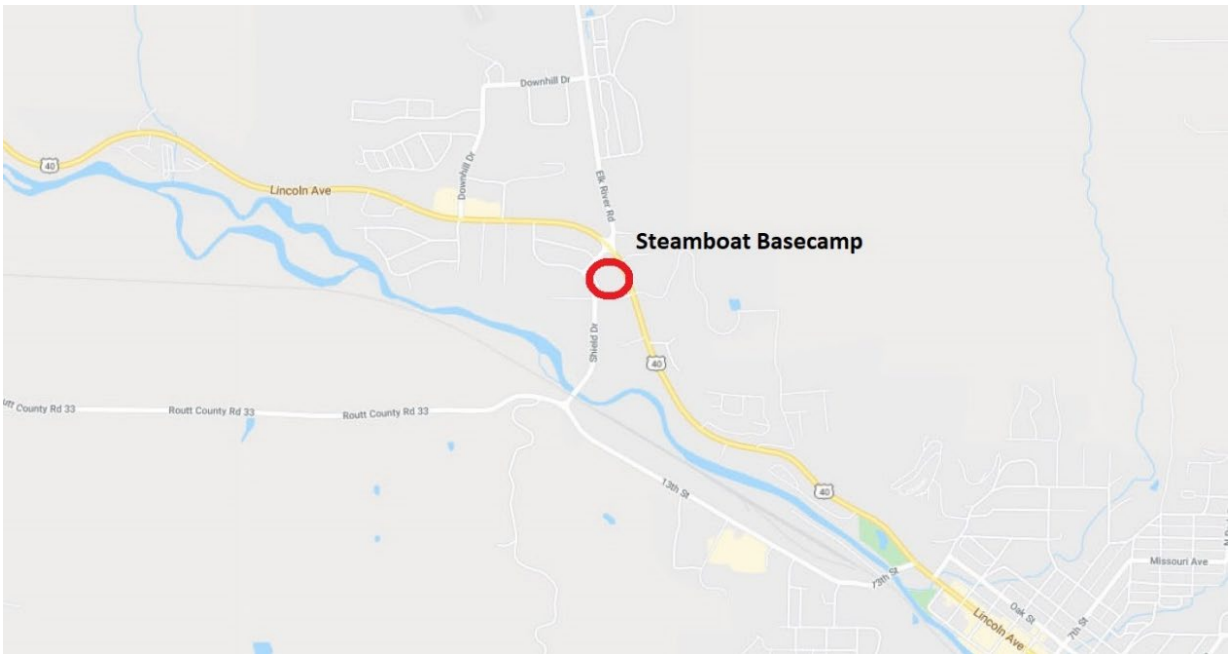


Figure 1: Vicinity Map

The site plan is shown in Figure 2.

Figure 2: Site Plan

Roadways in the vicinity of the site are described below:

Lincoln Avenue (US 40) is an east/west roadway providing access to Elk River Rd, Curve CT, and Downhill Dr, as well as serving as the main travel corridor and gateway into Steamboat Springs. Through the study area, US 40 alternates between a two and four lane arterial roadway with intermittent auxiliary lanes at intersections and access points. This segment of roadway is classified as NR-A by the Colorado Department of Transportation (CDOT). The posted speed limit is 40mph through the study area.

Elk River Rd is a two-lane north/south roadway providing direct access to Steamboat Basecamp. Elk Road intersects US 40 in a signalized intersection to the northwest of the development.

Curve CT is a two-lane east/west roadway between US 40 and Shield Dr. Many of the site trips from the south will use Curve CT to access the site.

Shield Dr is a two-lane north/south roadway between Elk River Rd and Curve CT, and provides direct access to Steamboat Basecamp.

Downhill Drive is a two lane, north/south roadway that intersects US 40 to the west of the site. While the intersection with US 40 is currently stop-controlled, the City has committed to studying the intersection to determine the most appropriate traffic control (roundabout or signal) and to design and construct an improvement in the next few years. The posted speed limit on Downhill Drive is 25mph.

1.2. Volumes

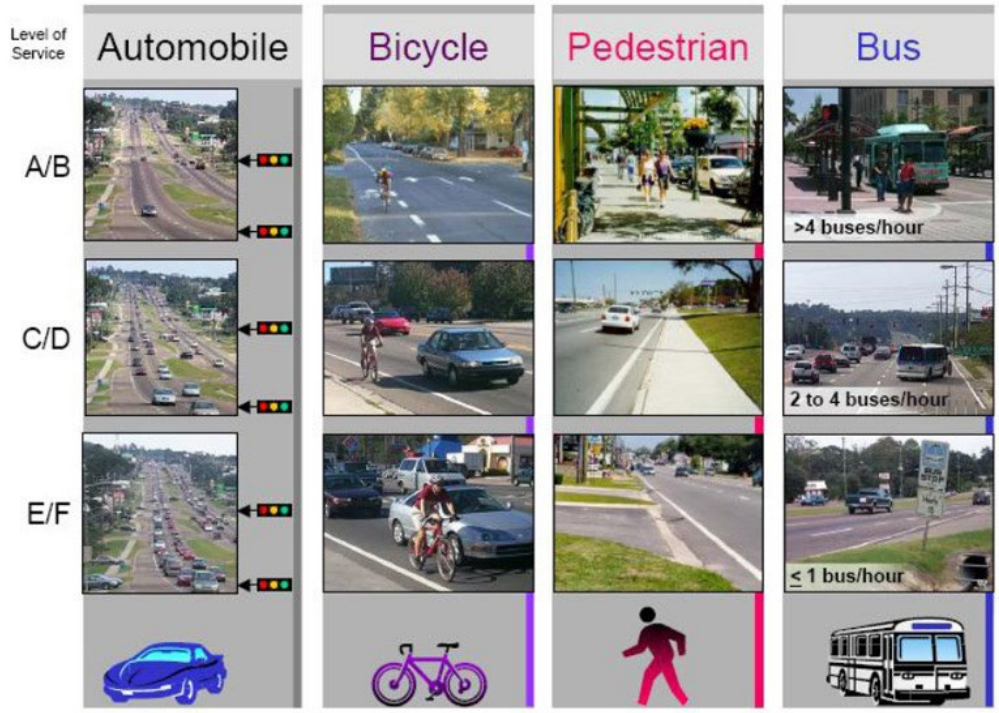
To provide a baseline condition for the traffic study, turning movement counts were taken at the following intersections.

- US 40 & Sunlight Dr/Curve CT
- US 40 & Elk River Rd
- US 40 & Downhill Dr/Riverside Dr
- Curve Plaza & Shield Dr
- Shield Dr & Elk River Rd
- Curve Plaza & Elk River Rd

The counts were collected on Tuesday, March 3, 2020 from 7:00-9:00 AM and 4:00-6:00 PM, and include pedestrian, bicycle, and heavy vehicle data. From these counts, it was determined that the AM peak hour was from 7:45-8:45 AM and the PM peak hour was from 4:45-5:45 PM. The intersection of US 40 & Downhill Dr/Riverside Dr was not included in the traffic models, since the City of Steamboat Springs is planning on constructing intersection improvements at that location in the next several years. The specific nature of the improvements is unknown at this time, making it difficult to accurately model the future scenario at US 40 & Downhill Dr/Riverside Dr. Counts were taken at this intersection in order to assess the percent traffic volume contribution of the Steamboat Basecamp. The traffic counts can be found in the Appendix.

1.3. LOS Criteria

Traffic analyses were conducted in accordance with procedures outlined in the Highway Capacity Manual, and included intersection Level-of-Service (LOS). LOS is a measure of the quality of traffic flow and ranges from LOS A (nearly ideal traffic conditions with very little delay for motorists) to LOS F (poor traffic conditions with long motorist delays). LOS C is typically considered a “good” traffic condition. LOS D or better conditions are typically desirable during peak traffic periods; however, LOS E conditions are not uncommon. LOS F, although undesirable, is also not uncommon for side street traffic movements at full movement, unsignalized intersections with high volume arterial roadways. Figure 3 illustrates examples of LOS for various modes of travel.



Source: FDOT Quality/Level of Service Handbook

Figure 3: LOS Conditions

When reporting delay and LOS, the HCM specifies that at a signalized intersection, the average intersection delay be used to derive the LOS. At a stop-controlled intersection, delay for the worst movement is used. Table 3 provides a summary of the Highway Capacity Manual's LOS Criteria. This study area contains both signalized and unsignalized intersections.

Table 3: LOS Criteria

Level of Service (LOS)	Signalized Intersection	Unsignalized Intersection	Traffic Characteristics
	Average Intersection Delay (sec/veh)	Worst Movement (sec/veh)	
A	<= 10	<= 10	Free Flow / Insignificant Delays
B	> 10-20	> 10-15	Stable Flow / Minimal Delays
C	> 20-35	>15-25	Stable Flow / Acceptable Delays
D	> 35-55	>25-35	Nearing Unstable / Tolerable Delays
E	> 55-80	>35-50	Unstable Flow / Significant Delays
F	> 80	> 50	Forced Flow / Excessive Delays

Where an unsignalized intersection operates at LOS E or F, a volume-to-capacity ratio (V/C) has been reported for the worst-case movement. Where V/C exceeds 1.00, traffic demand during peak periods exceeds the capacity for the movement. This condition will cause queues to

grow, potentially filling auxiliary lanes and blocking adjacent traffic lanes until demand decreases.

1.4. Existing Traffic Operations

Existing traffic operations were evaluated using Synchro 10. The existing traffic models use the March 2020 volumes and the existing roadway geometry. In this scenario, the Steamboat Basecamp has not yet been constructed. Table 4 shows the existing traffic operations.

Table 4: Existing Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh	LOS (V/C)
US 40/Elk River Rd (Signal)	-	30.0	C	-	49.1	D
US 40/Sunlight Dr/Curve CT	WB	14.7	B	WB	29.6	D
Shield Dr/Elk River Rd	SB	10.8	B	SB	12.0	B
Curve Plaza/Elk River Rd/Access #1	EB	11.4	B	EB	15.7	C
Shield Dr/Access #2	SB	7.5	A	-	0.0	A

All of the intersections operate acceptably for the March 2020 conditions. The intersections of US 40 & Elk River Rd and US 40 & Sunlight Dr/Curve CT operate at LOS D in the PM peak, while the remaining intersections operate at LOS C or better. The Synchro result printouts can be found in Appendix C.

2. Short-Term Conditions

The two Short-Term conditions scenarios analyze the network in the year 2022. The traffic operations for the Background Short-Term and Total Short-Term were taken from the Steamboat Basecamp TIS report, and are summarized in the sections below. A more detailed analysis of these scenarios may be found in the Steamboat Basecamp TIS report in the Appendix.

2.1. Short-Term Background Traffic Operations

Traffic operations were evaluated using Synchro 10th Edition. The roadway geometry remains the same as the existing geometry, while the volumes have been increased to the year 2022 projections. Table 5 shows the traffic operations.

Table 5: Short-Term Background Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh	LOS (V/C)
US 40/Elk River Rd (Signal)	-	51.5	D	-	74.8	E
US 40/Sunlight Dr/Curve CT	NBL	28.6	D	EB	628	F (2.17)
Shield Dr/Elk River Rd	SB	12.9	B	SB	15.4	C
Curve Plaza/Elk River Rd/Access #1	EB	14.6	B	EB	38.3	E (0.76)
Shield Dr/Access #2	SB	7.6	A	-	0.0	A

2.2. Short-Term Total Conditions Traffic Operations

The Short-Term Total conditions scenario analyzes the study area in year 2022, assuming that the first phase of development has been completed. There will be three access points to the Steamboat Basecamp, a right-in, right-out (RIRO) adjacent to the shopping plaza on Elk River Rd, a full-movement access on Shield Dr, and a full-movement access on Curve Ct. Table 6 shows the delay and LOS for the Short-Term Total Conditions scenario.

Table 6: Short-Term Total Conditions Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh)	LOS (V/C)
US 40/Elk River Rd (Signal)	-	51.7	D	-	75.0	E
US 40/Sunlight Dr/Curve CT	NBL	34.8	D	EB	1040.1	F (3.05)
Shield Dr/Elk River Rd	SB	13.8	B	SB	16.6	C
Curve Plaza/Elk River Rd/Access #1	EB	16.5	C	EB	49.7	E (0.84)
	WB	8.9	A	WB	9.7	A
Shield Dr/Access #2	WB	12.5	B	WB	12.3	B
Curve Ct/Access #3	SB	10.7	B	SB	11.0	B

The intersection of Curve Plaza/Elk River Rd/Access #1 operates at LOS E in the PM. Access #1 serving the Steamboat Basecamp is expected to experience little to no delay, with the significant delay coming from the left turns exiting the shopping plaza (Curve Plaza). The poor LOS is due to the high traffic volumes generated by the shopping plaza, rather than the Steamboat Basecamp. Volume figures and Synchro printouts can be found in the Appendix.

3. Long-Term Background Conditions

3.1. Background Volumes

The Long-Term Background Conditions analyzes the existing roadway network, with 2040 traffic volume projections. This scenario assumes that the Steamboat Basecamp Apartments have been completed, but the Steamboat Basecamp Residential and Outdoor Amenity Space has yet to be built. Traffic volumes in Steamboat Springs are highly seasonal. Traffic counts were collected in March which is one of the lower volume months. In accordance with City of Steamboat requirements, the existing traffic counts were factored up to reflect conditions typical to the month of July. Using the City's ADT conversion table, the March volumes were factored by 1.59 to convert to the traffic volumes typically experienced in July. The ADT conversion table has been included in the Appendix.

The background growth rate was taken from the CDOT count station #101838 at MP 130.57. The projected 20-year factor is 1.16, yielding an annual growth of 0.75%. The existing counts, after being seasonally adjusted, were then inflated by the 0.75% annual growth in order to generate the 2040 volumes. These volumes can be found in the Appendix.

3.2. Long-Term Background Traffic Operations

Traffic operations were evaluated using Synchro 10. Table 7 shows the delay and LOS for the study intersections.

Table 7: Long-Term Background Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh)	LOS (V/C)
US 40/Elk River Rd (Signal)	-	59.9	E	-	134.1	F
US 40/Sunlight Dr/Curve CT	NBL	83.8	F (0.95)	WB	840.1	F (1.72)
Shield Dr/Elk River Rd	SB	15.6	B	SB	20.0	C
Curve Plaza/Elk River Rd/Access #1	EB	20.1	C	EB	124.5	F (1.12)
Shield Dr/Access #2	WB	13.4	B	WB	13.1	B
Curve Ct/Access #3	SB	11.0	B	SB	11.5	B

When compared to the year 2022 build conditions, the delays have increased due to the background volume growth. The intersection of US 40 & Sunlight Dr/Curve CT is expected to operate at LOS F, with both the left turns onto and off of Curve CT failing. The signalized intersection of US 40 & Elk River Rd is expected to operate at LOS E in the AM and LOS F in the PM. With the increased volumes along Elk River Rd, the intersection of Curve Plaza & Elk River Rd operates at LOS F in the PM, with the eastbound approach exceeding.

4. Long-Term Total Conditions

4.1. Trip Generation

The ITE Trip Generation Manual 10th Edition was used to calculate the number of trips generated the Steamboat Basecamp Residential and Outdoor Amenity Space. Table 8 details the trip generation.

Table 8: Basecamp Residential and Outdoor Amenity Space ITE Trip Generation Calculations

Multifamily Low Rise														
ITE Code	Units	ITE Land Use	Weekday Rate	Weekday Trips	AM Peak Rate	AM Peak Entering %	AM Peak Exiting %	PM Peak Rate	PM Peak Entering %	PM Peak Exiting %	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
220	28	Multifamily Housing (Low-Rise) (General Urban/Suburban)	6.10	170.82	0.51	23%	77%	0.68	63%	37%	3	11	12	7
465	18.29	Ice Skating Rink	-	-	0.16	37%	63%	1.31	55%	45%	1	2	13	11
926	1.83	Drinking Place	-	-	-	-	-	11.48	66%	34%	0	0	14	7

Total Trips			
AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
4	13	39	25

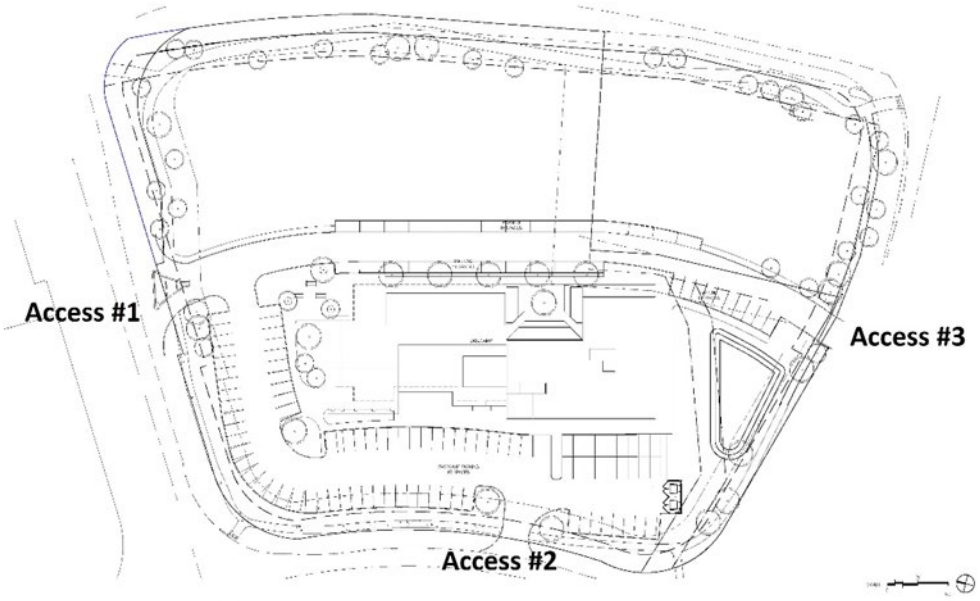
When using a general urban/suburban land use, the ITE Trip Generation Manual estimates that 3% of the AM trips and 4% of the PM trips will use some form of multimodal transportation for the low-rise multifamily housing. It is estimated for a mid-rise multifamily housing in a general urban/suburban setting that 7% of the AM trips and 8% of the PM trips will use multimodal transportation. The numbers shown in the table represent only the vehicular trips.

In addition to using the Trip Generation Manual to calculate the trips generated from the Steamboat Basecamp, it was also used to determine the number of trips entering and exiting the Subaru Dealership adjacent to Access #3. There were no turning movement counts available for this access point, so using the square footage of the dealership building, it was estimated that there would be 20 entering and 7 exiting vehicles in the AM, and 19 entering and 29 exiting vehicles in the PM.

4.2. Site Access and Circulation Evaluation

There will be three access points to the Steamboat Basecamp. Figure 4 shows the location of the three access points to the Basecamp.

Figure 4: Steamboat Basecamp Access Points



The trips generated by the Basecamp will use the access point which results in the shortest trip. Once out of the Basecamp parking lot, the proportion of trips from the east was determined by the existing turning movements. The distribution of trips to the north and west was determined by traffic counts taken for a study conducted for the West End Plaza, just west of Downhill Dr. The West End Plaza is a good indicator of the Basecamp's trip distribution as they are in similar locations relative to the center of Steamboat. In addition, it was estimated that 5% of the generated vehicles would go to/from the shopping center on Curve Plaza, just west of the Steamboat Basecamp. Another 5% were estimated to travel south on Shield Dr. Figure 5 shows the estimated trip distribution.

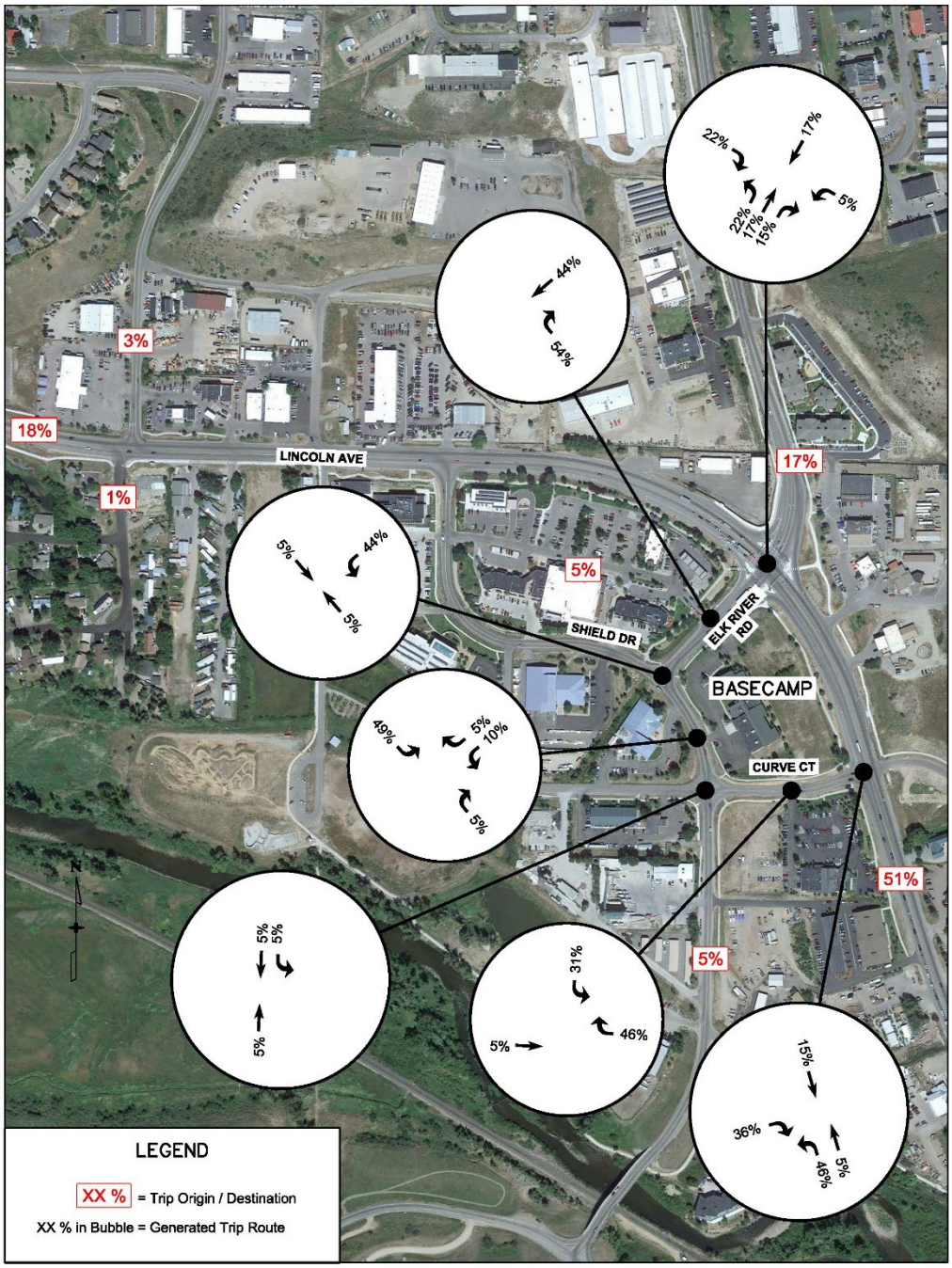


Figure 5:Trip Distribution

4.3. Auxiliary Lanes

Each turning movement on US 40 was assessed to see if SHAC auxiliary lane requirements are met. Since this portion of US 40 is classified as a Non-Rural Regional Highway (NR-A), a volume greater than 10 vehicles per hour (VPH) warrants a left turn deceleration lane, and a volume greater than 25 VPH warrants a right turn deceleration lane. A right turning movement of 50 VPH from the side street warrants an acceleration lane. Table 9 shows the warranted auxiliary lanes which are not already in place.

Table 9: Warranted Auxiliary Lanes

Intersection	Movement	2040 Total Conditions Volume
US 40 & Downhill Dr/Riverside Dr	WBR	186 VPH
US 40 & Sunlight Dr/Curve CT	NBL	201 VPH
	SBL	32 VPH

As noted previously, the US 40 & Downhill Dr/Riverside Dr intersection is the subject of current study by the City of Steamboat Springs. With respect to the US 40 & Sunlight Dr/Curve CT intersection, the Steamboat Basecamp project does not contribute any traffic volume to southbound left turn movement. The intersections at the Basecamp access #2 and access #3 do not require auxiliary lanes.

4.4. Long-Term Total Conditions Traffic Operations

Traffic operations were evaluated for the Long-Term Total Conditions using Synchro 10. This scenario assumes that both phases of the Steamboat Basecamp have been completed, and the third access point has been constructed. The warranted auxiliary lanes have been included in the Synchro models as well. Table 10 shows the delay and LOS. The Synchro printouts can be found in the Appendix.

Table 10: Long-Term Total Conditions Delay and LOS

Intersection	AM			PM		
	Movement	Delay (sec)	LOS (v/c)	Movement	Delay (sec)	LOS (v/c)
US 40/Elk River Rd (Signal)	-	60.0	E	-	134.0	F
US 40/Sunlight Dr/Curve CT	NBL	86.0	F (0.96)	EB	2269.0	F (5.61)
Shield Dr/Elk River Rd	SB	15.7	C	SB	21.7	C
Curve Plaza/Elk River Rd/Access #1	EB	20.6	C	EB	154.8	F (1.20)
	WB	9.0	A	WB	10.0	B
Shield Dr/Access #2	WB	13.3	B	WB	14.0	B
Curve Ct/Access #3	SB	11.1	B	SB	11.7	B

The intersection of Curve Plaza/Access #1 & Elk River Rd was modeled with a RIRO access to the Steamboat Basecamp since that design provides better traffic operations than if both accesses were full movement. The right-in and right-out movements for the Basecamp are expected to experience little to no delay, with the significant delay coming from the left turns exiting the shopping plaza on the other side of Elk River Rd. Since the eastbound approach will be over capacity by the year 2040, alternative designs should be considered. One solution is to make the shopping plaza access a RIRO, however, this will result in out of direction travel. Another possibility is a roundabout, allowing full access to both the Steamboat Basecamp and the shopping plaza.

The intersection of US 40 & Elk River Rd fails in the PM, with a comparable delay to the 2040 Baseline Conditions. Much of this problem stems from the westbound direction on US 40 only having one thru lane, putting it over capacity, and is unrelated to the development. Until an additional westbound thru lane is built, it is unlikely that the intersection of US 40 & Elk River Rd

will operate effectively during the peak hours of demand. The City of Steamboat has identified capacity issues along US-40 in the "US-40 Highway NEPA Study", and has proposed that US-40 be made a four-lane highway through the western side of town, which includes the study area. The intersection of US 40 & Elk River Rd will operate acceptably if US-40 is a four-lane highway through the intersection.

4.5. US 40 & Sunlight Dr/Curve CT

Traffic operations at US 40 & Sunlight Dr/Curve CT remain problematic for the left turns from Sunlight Dr and Curve Ct to US 40. It should be noted that the trips generated by this project do not contribute to the poor traffic conditions for these movements. The left turns out of Sunlight Dr are expected to experience delays exceeding the acceptable limit with or without the construction of Steamboat Basecamp.

The Synchro results also show the northbound left turn from US 40 onto Curve CT failing in the AM, due to an inability to find sufficient gaps in the southbound thru traffic along US 40. Synchro models a mostly uniform rate of arrival for the southbound movement, resulting in few gaps in traffic for the northbound lefts to make their turn. Since the signal of US 40 & Elk River Rd is only 700 feet upstream, the southbound movement will actually be passing Curve CT in platoons, rather than in a more uniform arrival pattern. The platooning effect will provide larger gaps, allowing a longer opportunity of time for the northbound lefts to turn onto Curve CT. The microsimulation extension of Synchro, SimTraffic, was used to analyze this intersection, as it has the ability to more accurately analyze the platooning effects along US 40. The simulation runs from SimTraffic show the northbound left turn movement having a delay of 39.0 seconds (LOS E). LOS D or better conditions are typically desirable during peak traffic periods; however, LOS E conditions are not uncommon, particularly for unsignalized movements onto and off of side streets.

The West Steamboat Springs US Highway 40 Access Study specifies that the intersection of US 40 & Sunlight Dr/Curve CT may be converted to a RIRO if safety or traffic operational problems occur, or if the intersection of US 40 & Loggers Lane, just to the east, is extended to connect US 40 to Shield Dr. The section of the access control plan in the vicinity of US 40 & Sunlight Dr/Curve CT is shown in Figure 6. Converting the intersection of US 40 & Sunlight Dr/Curve CT to a RIRO would divert all of the northbound lefts to the intersection of US 40 & Elk River Rd, which is expected to already be operating at capacity by year 2040. An alternative long-term strategy may be to make the US 40 & Sunlight Dr/Curve CT intersection a 3/4 movement (left-in, right-in, right-out) in order to minimize impacts to the Elk River Rd intersection.

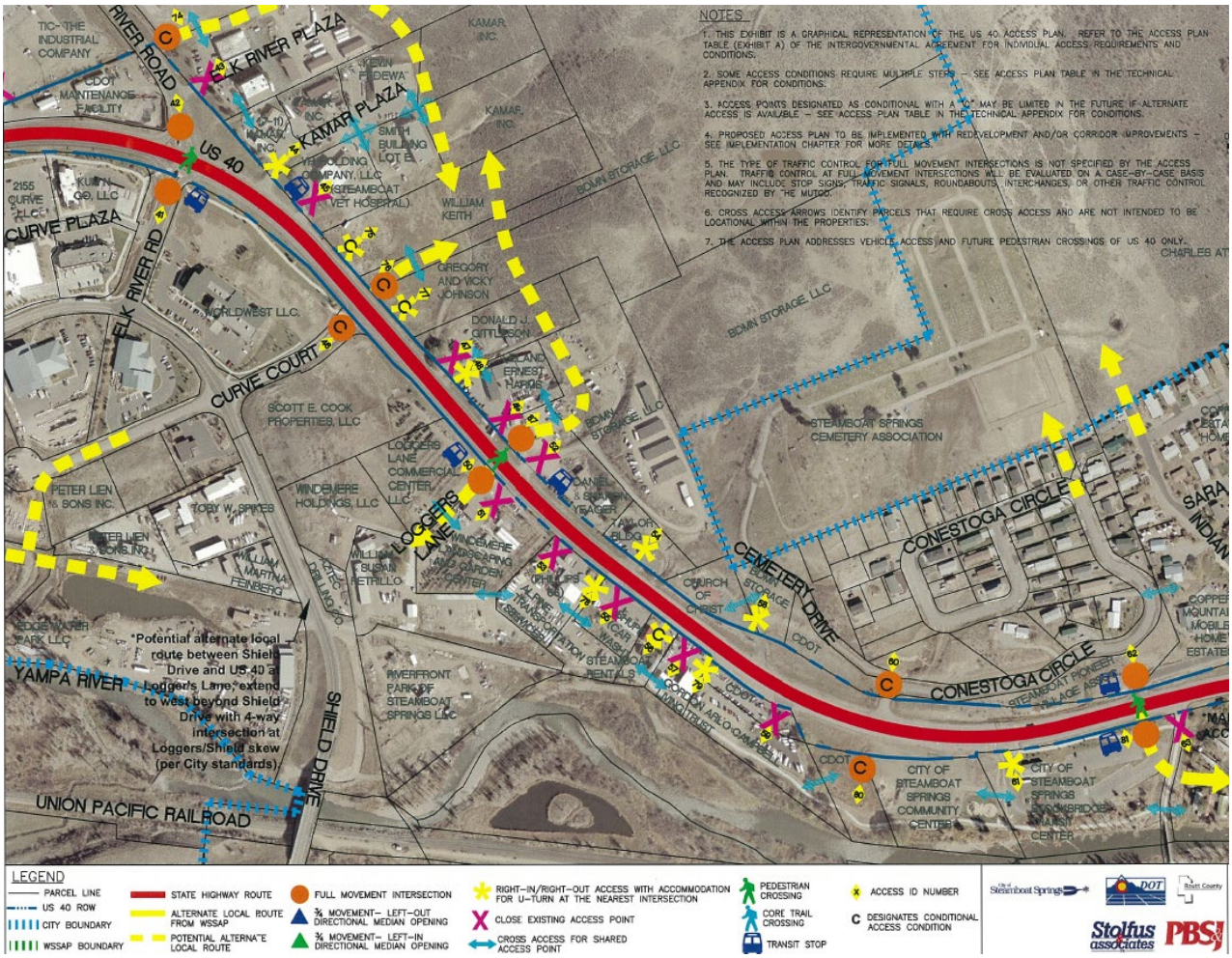


Figure 6: US Highway 40 Access Control Plan

4.6. Queuing

Since the intersections of US 40 & Elk River Rd and Curve Plaza & Elk River Rd are spaced only 210 feet apart, the queueing between the two intersections was analyzed to ensure that neither intersection would be blocked. The northbound left turn moment at the signal of US 40 & Elk River Rd has a projected 95% queue of 196 feet. This puts the back of the queue only 14 feet away from extending into the intersection of Curve Plaza & Elk River Rd. Signage warning drivers not to block the intersection should be installed at the intersection of Curve Plaza & Elk River Rd if queues become problematic in the future. This will reduce the chances of the northbound queue from US 40 & Elk River Rd blocking drivers turning onto and off of Elk River Rd.

4.7. Access Permitting Considerations

In Colorado, all accesses to the state highway are regulated by the Colorado Department of Transportation (CDOT). Colorado's state highway system constitutes a valuable resource and a major public and private investment. It is the purpose of the SHAC to provide procedures and standards to aid in the management of that investment, to protect the public health, safety, and

welfare, to maintain smooth traffic flow, and to protect the functional level of state highways while considering state, regional, and local transportation needs and interests. CDOT requires a state highway access permit application be submitted if the traffic of a facility or operation exceeds 20% of the existing permitted traffic volumes at the access onto a state highway. Using the year 2040 volumes, the Steamboat Basecamp Residential and Outdoor Amenity Space is expected to increase the entering/exiting volumes by 8% at the access of US 40 & Sunlight Dr/Curve CT, and by 4% at the intersection of US 40 & Elk River Rd. Since the increase in volumes from the year 2040 no build to the year 2040 build is expected to be under 20%, no access permit is required.

4.8. Site Contribution

There are future plans to improve the intersection of US 40 & Downhill Dr/Riverside Dr. The City requires a percent contribution to be calculated. The percent contribution for intersection improvements at US 40 & Downhill Dr/Riverside Dr is determined by the percent of the total traffic volumes entering the intersection that is made up of trips going to or from the Steamboat Basecamp Residential and Outdoor Amenity Space. The higher percentage between the AM and PM peak hours will be used to determine the contribution percentage. From the trip distribution assumptions, there will be 4 site trips entering the intersection in the AM, and 15 trips entering the intersection in the PM. This accounts for 0.17% of the total entering trips in the AM, and 0.62% of the total entering trips in the PM, meaning that the percent contribution for Steamboat Basecamp is 0.62%.

5. Alternate Modes of Transportation

The City of Steamboat Springs has several multimodal options, including bus lines, bike lanes, and bike/walking paths. The Red Line and Blue Line both stop at the Elk River Crossing bus stop, just east of Steamboat Basecamp on Elk River Rd. Each of these bus lines have routes that go into downtown Steamboat Ski Resort. The Red Line and Blue Line stop at Elk River Crossing every 20 minutes from 6:35 AM to 11:45 PM.

The Yampa River Core Trail passes just south of the Steamboat Basecamp, intersecting with Shield Dr, and extending through downtown Steamboat. Cyclists looking to ride from the Steamboat Basecamp into downtown Steamboat will most likely take this trail. Many of the roads in downtown Steamboat have bike lanes making it easy for cyclists to exit the Yampa River Core Trail and use the roadway network to reach their destination.

Findings and Recommendations

The traffic impact study conducted for the Steamboat Basecamp Residential and Outdoor Amenity Space in Steamboat Springs has concluded that the traffic volumes generated by the facility can be accommodated by the surrounding roadway system. The following is a summary of the study's findings:

1. The Steamboat Basecamp contributes 0.62% of the traffic volume at the intersection of US 40 & Downhill Dr/Riverside Dr in the AM peak hour.
2. No access permit is needed at the intersections of US 40 & Elk River Rd and US 40 & Sunlight Dr/Curve CT, as the increase in volumes due to the Steamboat Basecamp Residential and Outdoor Amenity Space is below 20%.

The recommendations made in the Steamboat Basecamp study, included in the Appendix, apply to this study as well. The recommendations in the Steamboat Basecamp study were made to accommodate the trips from the Steamboat Basecamp Apartments and the background growth. The trips generated by the Steamboat Basecamp Residential and Outdoor Amenity Space do not impact traffic operations enough to require additional recommendations. Below is a summary of the recommendations from the Steamboat Basecamp Study.

1. The Steamboat Basecamp is not responsible for failing traffic operations at the intersection of US 40 & Elk River Rd. For this intersection to operate well during peak hours in year 2040, and consistent with current long-range plans, a second westbound thru lane will need to be constructed.
2. Signage warning drivers not to block the intersection should be installed at the intersection of Curve Plaza & Elk River Rd if queues become problematic in the future.
3. A state highway access permit is required for the access at the intersection of US 40 & Sunlight Dr/Curve CT. The Steamboat Basecamp is not responsible for failing traffic operations at the intersection of US 40 & Sunlight Dr/Curve CT. In order to operate acceptably in the long term, the intersection could be made a ¾ movement (left-in, right-in, right-out).

Appendix A

Approved Scope Approval Form

Attachment A
TRAFFIC IMPACT STUDY – SCOPE APPROVAL FORM

Prior to starting a traffic impact study, a Scope Approval Form must be submitted for review and signed by the City Public Works Director. It shall be included in every traffic study submittal as Attachment A. This Scope Approval Form is for City requirements only. Consultants must contact CDOT to determine requirements related to access permits and work in CDOT right-of-way.

Project Information

Project Name:	Steamboat Basecamp (Phase 2)
Project Location:	East of Shield Drive between Elk River Road and Curve Court (Former site of the Steamboat Pilot)
Developer Name/ Contact Number:	Kevin Riegler May Riegler Properties (202) 369-5820
Traffic Engineer Name/ Contact Number:	Max Rusch, PE Stolfus & Associates, Inc. (303) 221-2330; max@stolfusandassociates.com

Study Parameters

Type of Study Required: ☐ Trip Generation Letter ☒ Long-term Traffic Study
☐ Short-term Traffic Study ☐ Trip Evaluation Letter

Trip generation using ITE for Phases 1 & 2 combined is over 1,000 ADT for the site.

Traffic Counts

☐ Winter Zone ☒ Summer Zone

☒ Counts w/in last 2 years are available

☐ New counts will be collected on _____

☐ Existing counts will be estimated based on:

☒ Future counts will be estimated based on a _____% growth rate. A 1.16 20-year factor (0.75% per year) from OTIS Count Station #101838

Peak Hours Analyzed

☒ AM Peak Hour ☒ PM peak hour ☐ Other _____

Trip Generation Rates

☒ From ITE ☐ Other (cite)_____

☐ No passby or mode split (typical)

☒ Passby or mode split (describe)_____ The suitability of these adjustments will be consistent with the Trip Generation, 10th Edition Supplement and potentially other sources, subject to City and CDOT approval.

Trip Distribution – Attach sketch A-1

Study Parameters

List of Study Area Intersections

1.	Lincoln Avenue &	Elk River Road
2.	Lincoln Avenue &	Curve Court
3.	Elk River Road &	Curve Plaza / Site Access #1
4.	Elk River Road &	Shield Drive
5.	Shield Drive &	Site Access #2
6.	Curve Court &	Site Access #3
7.		

Key Analysis items

- [X] Existing + site traffic at study intersections
- [X] Peak Hour LOS at study intersections
- [X] % Site contribution to signal at Lincoln Ave & Downhill Drive
- [X] Auxiliary lane evaluation at Lincoln Ave & Curve Court, Shield Drive & Site Access #2
- [ ] Traffic signal warrants at _____
- [ ] Four-way stop sign warrants at _____
- [X] Queuing Analysis at Lincoln Ave & Elk River Road
- [X] Other Evaluate need for CDOT permitting

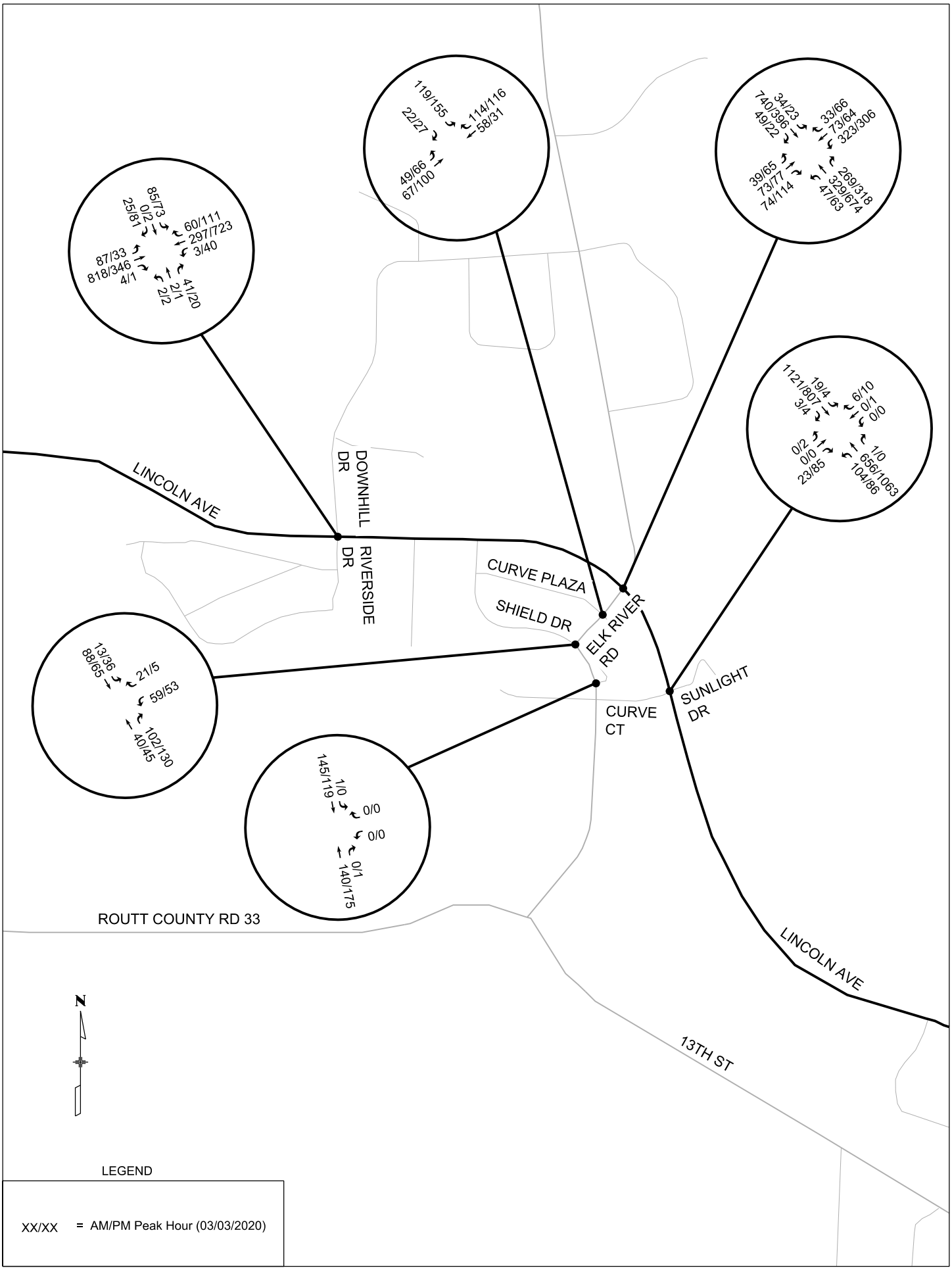
Approvals

Max Rusch	1/14/2021	303-221-2330
Prepared By:	Date	Phone
Ben Beall	1/15/21	970-871-8293
Ben Beall City Engineer	Date	Phone

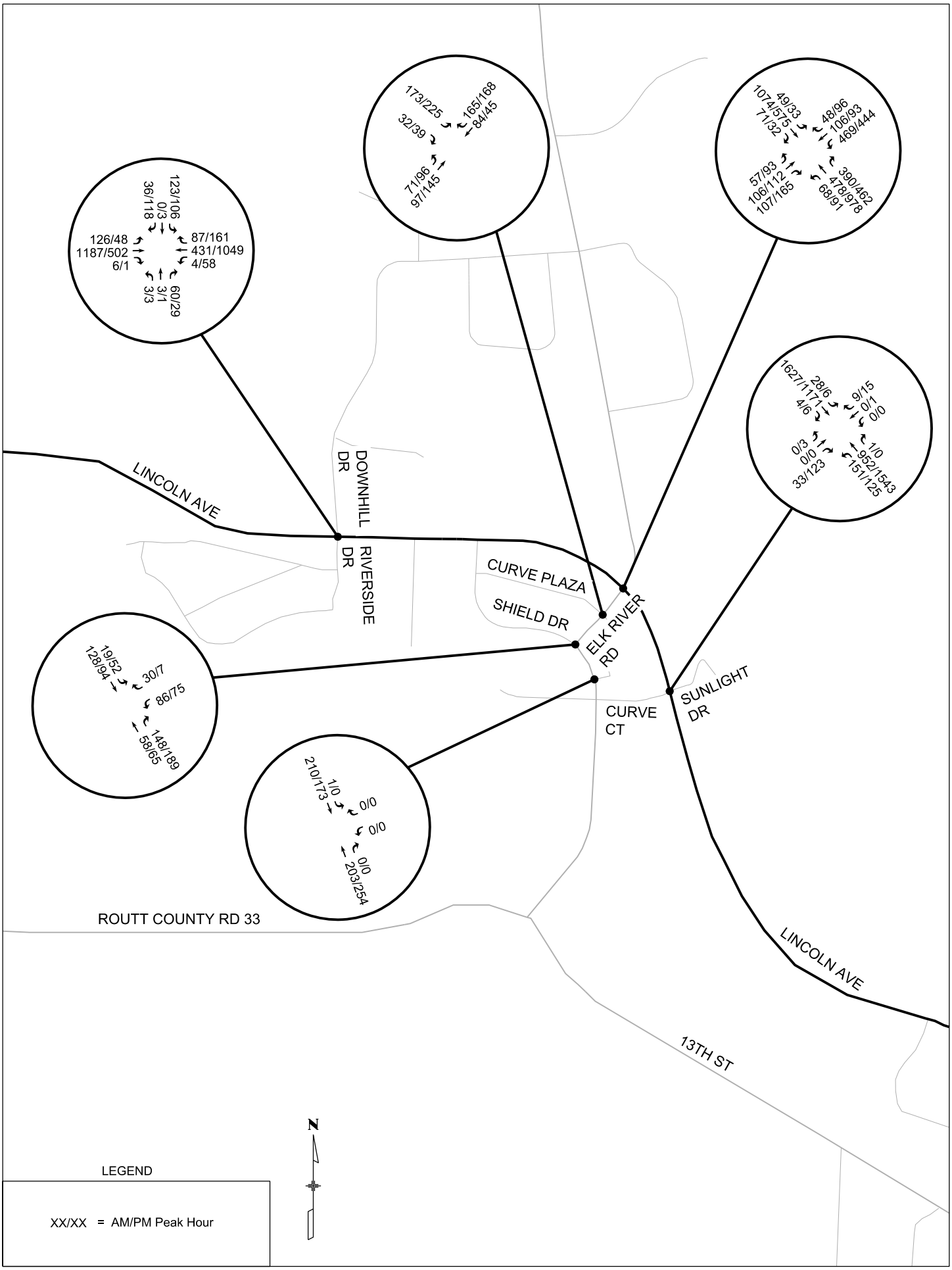
Please note that the approval of this scope approval form shall not be construed as an approval of the proposed use, but rather a methodology for evaluation of the proposed use. During the city development review process, the proposed use will be reviewed by city staff for compliance with code, standards, and community planning documents.

Appendix B

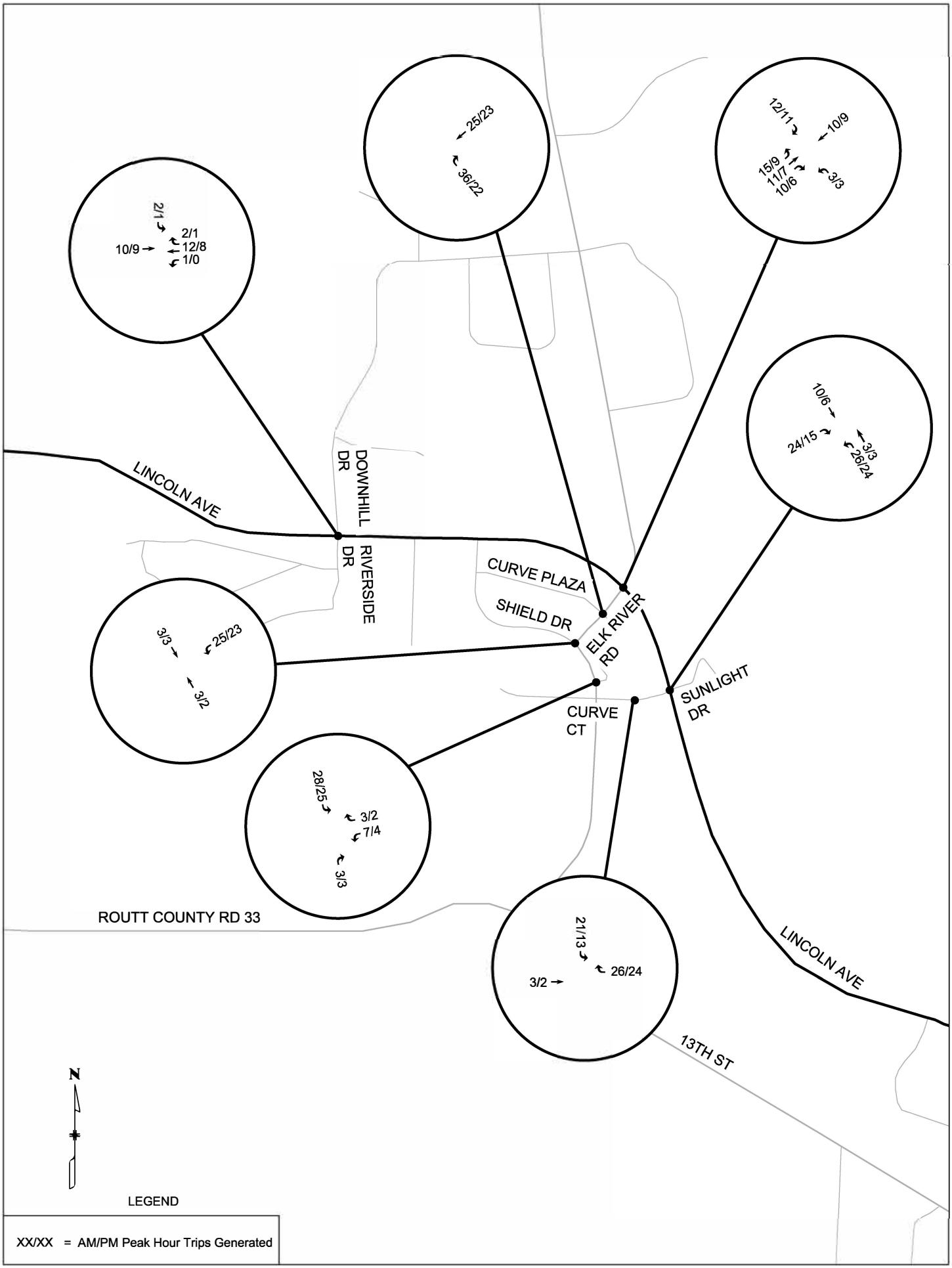
Volume Sheets
Traffic Count Data



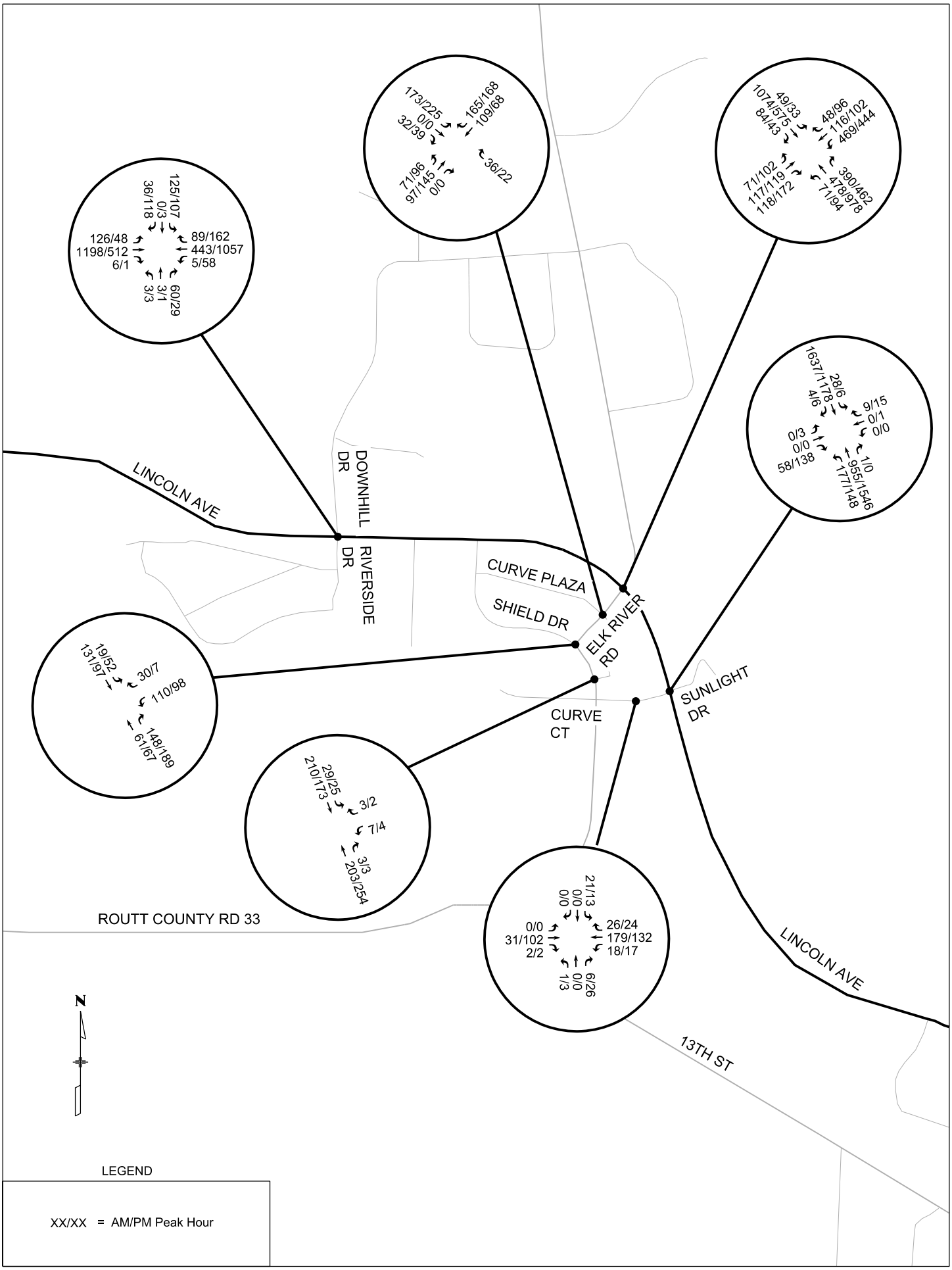
Existing Traffic Volumes



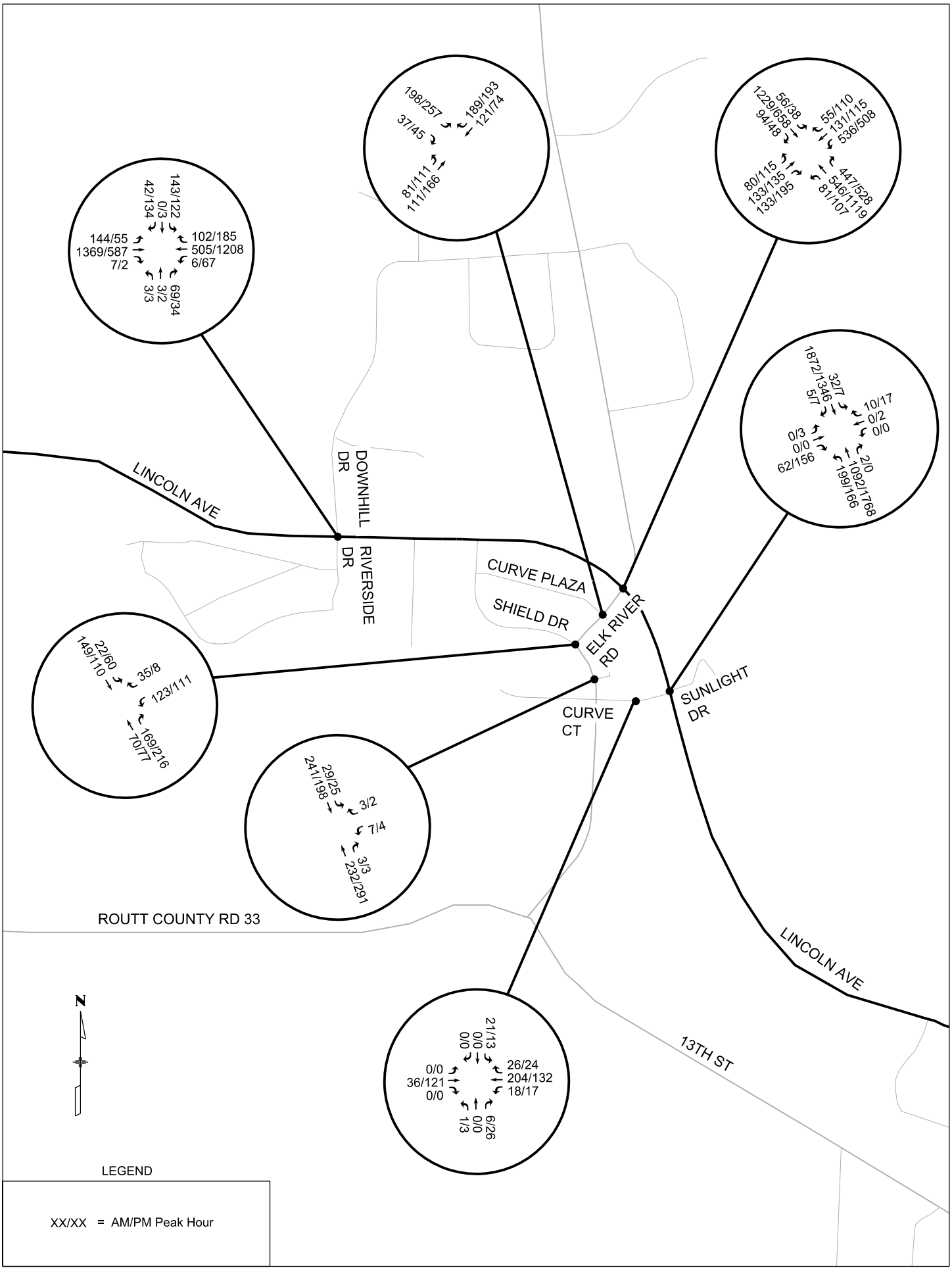
SHORT TERM BACKGROUND CONDITIONS (JULY 2022)



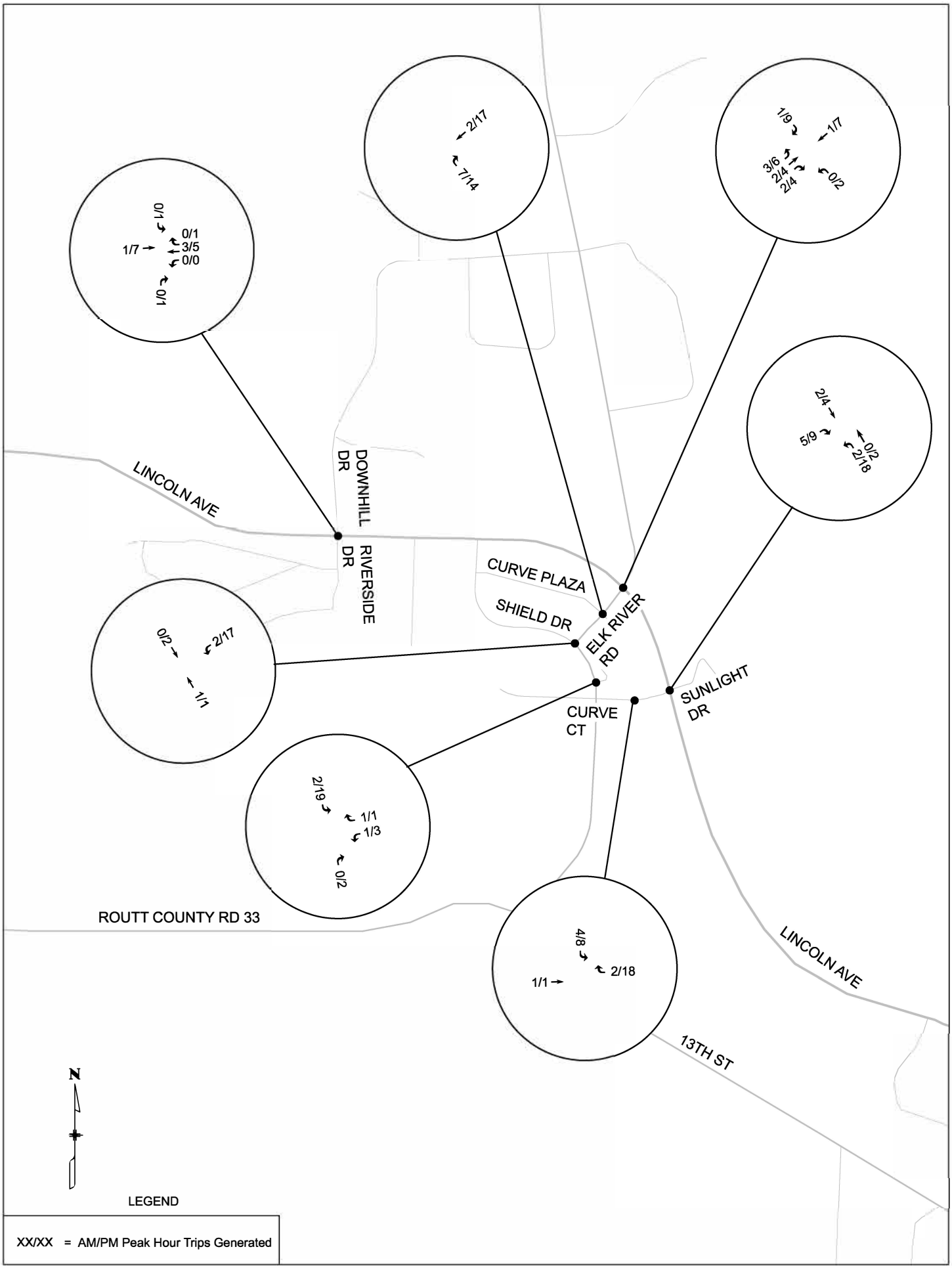
TRIPS GENERATED FROM STEAMBOAT BASECAMP APARTMENTS



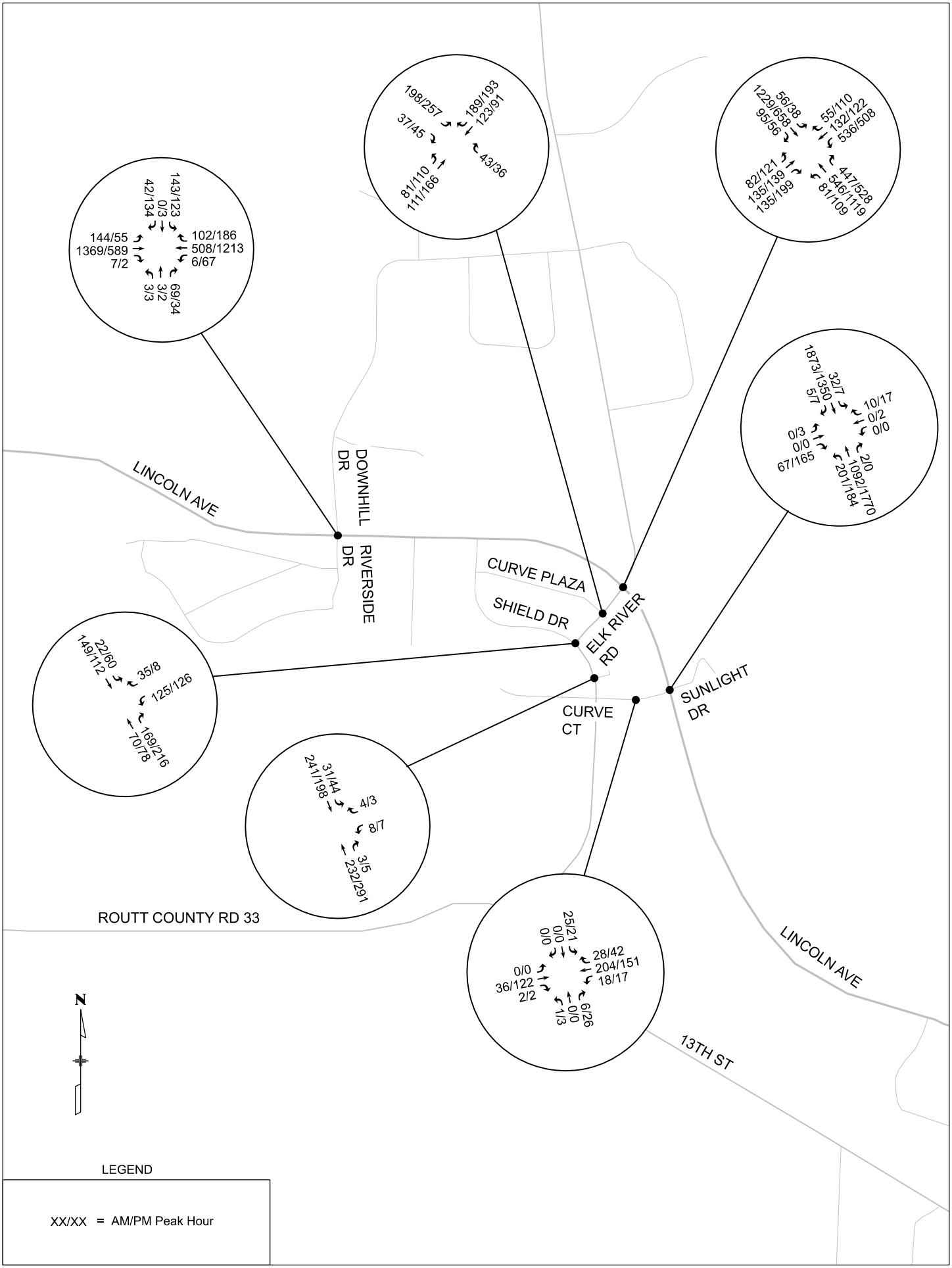
SHORT TERM TOTAL CONDITIONS (JULY 2022)



LONG TERM BACKGROUND CONDITIONS (JULY 2040)



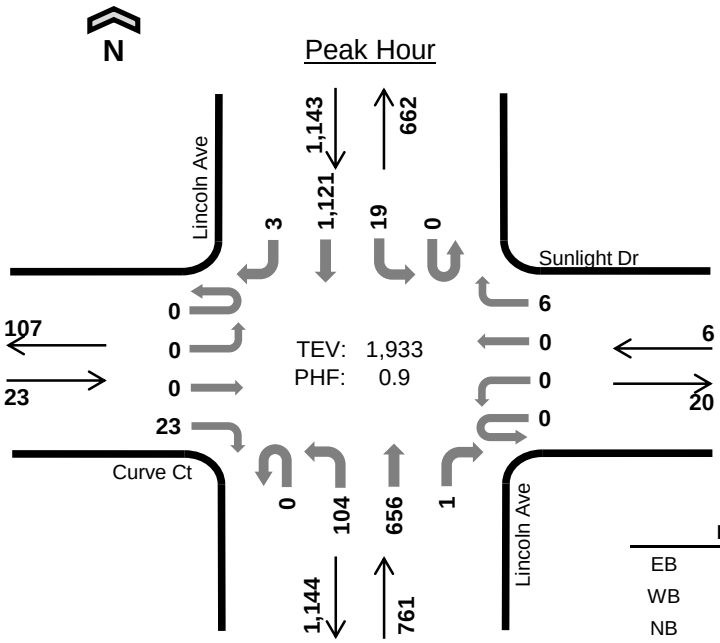
TRIPS GENERATED FROM STEAMBOAT BASECAMP RESIDENTIAL AND OUTDOOR AMENITY SPACE

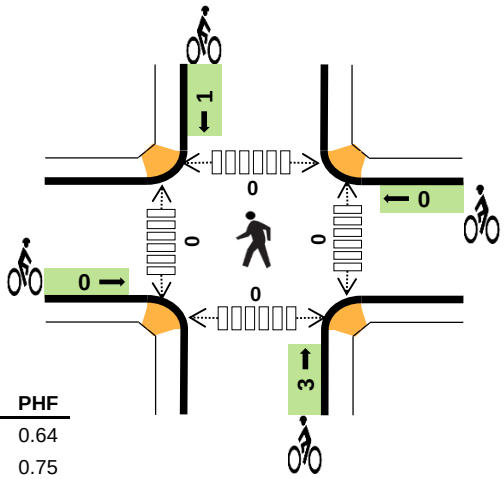


LONG TERM TOTAL CONDITIONS (JULY 2040)

Lincoln Ave
Curve Ct

Date: Tue, Mar 03, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM





	HV %:	PHF
EB	0.0%	0.64
WB	0.0%	0.75
NB	4.3%	0.80
SB	3.3%	0.91
TOTAL	3.7%	0.90

Two-Hour Count Summaries

Interval Start	Curve Ct Eastbound				Sunlight Dr Westbound				Lincoln Ave Northbound				Lincoln Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	8	0	0	0	0	0	11	59	0	0	2	188	0	268	0
7:15 AM	0	0	0	5	0	0	0	0	0	13	110	0	0	4	188	1	321	0
7:30 AM	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**2**	**0**	**16**	**103**	**0**	**0**	**3**	**300**	**0**	**429**	0
7:45 AM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**22**	**180**	**1**	**0**	**7**	**304**	**2**	**518**	1,536
8:00 AM	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**2**	**0**	**35**	**204**	**0**	**0**	**5**	**283**	**0**	**538**	1,806
8:15 AM	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**2**	**0**	**31**	**169**	**0**	**0**	**4**	**234**	**1**	**448**	**1,933**
8:30 AM	0	0	0	10	0	1	0	1	0	24	125	0	0	1	191	2	355	1,859
8:45 AM	0	1	0	10	0	0	0	0	0	26	127	2	0	4	230	1	401	1,742
Count Total	0	1	0	56	0	1	0	7	0	178	1,077	3	0	30	1,918	7	3,278	0
Peak Hour	**0**	**0**	**0**	**23**	**0**	**0**	**0**	**6**	**0**	**104**	**656**	**1**	**0**	**19**	**1,121**	**3**	**1,933**	**0**

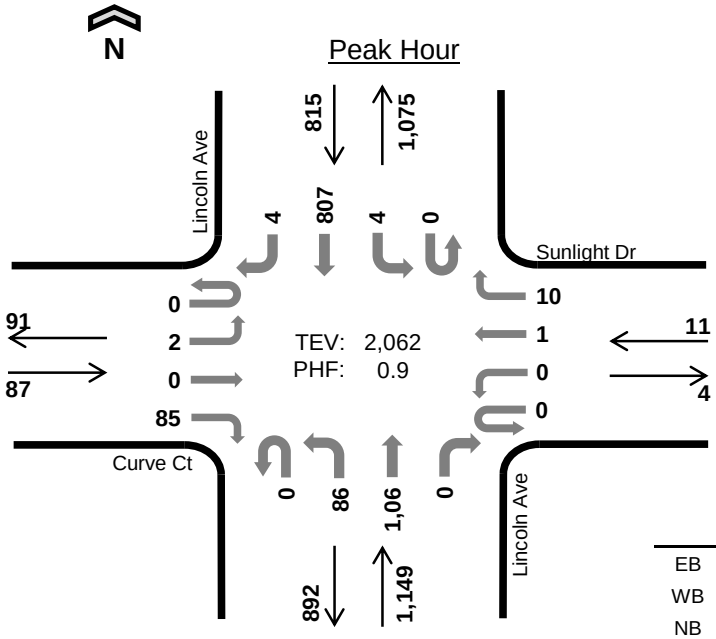
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

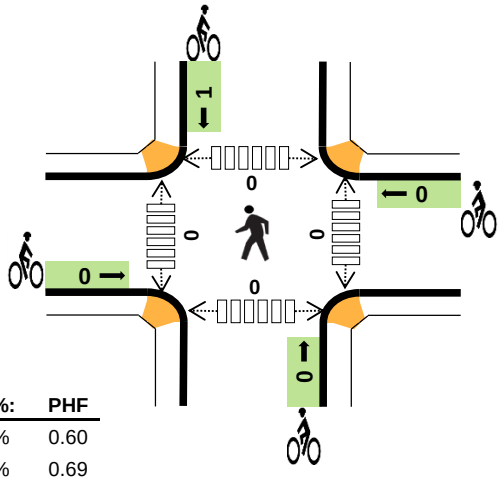
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	3	0	3	2	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	4	0	6	7	*17*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	**0**	**0**	**3**	**13**	***16***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**1**	**11**	***12***	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**0**	**14**	**8**	***22***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**0**	**15**	**6**	***21***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	7	10	*17*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	1	0	4	10	*15*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	8	0	53	67	*128*	0	0	3	1	*4*	0	0	0	0	*0*
Peak Hour	**0**	**0**	**33**	**38**	***71***	**0**	**0**	**3**	**1**	***4***	**0**	**0**	**0**	**0**	***0***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Lincoln Ave
Curve Ct

Date: Tue, Mar 03, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	0.0%	0.60
WB	0.0%	0.69
NB	3.6%	0.94
SB	3.2%	0.88
TOTAL	3.2%	0.90

Two-Hour Count Summaries

Interval Start	Curve Ct Eastbound				Sunlight Dr Westbound				Lincoln Ave Northbound				Lincoln Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	0	32	0	0	1	4	1	42	240	1	0	1	213	2	538	0
4:15 PM	0	0	1	20	0	0	0	2	0	24	237	0	0	2	206	0	492	0
4:30 PM	0	1	0	12	0	0	0	3	0	22	205	1	0	0	166	1	411	0
4:45 PM	**0**	**0**	**0**	**15**	**0**	**0**	**0**	**3**	**0**	**32**	**247**	**0**	**0**	**1**	**193**	**1**	**492**	1,933
5:00 PM	**0**	**0**	**0**	**36**	**0**	**0**	**0**	**2**	**0**	**25**	**279**	**0**	**0**	**2**	**229**	**1**	**574**	1,969
5:15 PM	**0**	**1**	**0**	**14**	**0**	**0**	**1**	**3**	**0**	**15**	**270**	**0**	**0**	**1**	**204**	**1**	**510**	1,987
5:30 PM	**0**	**1**	**0**	**20**	**0**	**0**	**0**	**2**	**0**	**14**	**267**	**0**	**0**	**0**	**181**	**1**	**486**	**2,062**
5:45 PM	0	0	1	11	0	0	1	2	0	14	212	0	0	2	192	0	435	2,005
Count Total	0	4	2	160	0	0	3	21	1	188	1,957	2	0	9	1,584	7	3,938	0
Peak Hour	**0**	**2**	**0**	**85**	**0**	**0**	**1**	**10**	**0**	**86**	**1,063**	**0**	**0**	**4**	**807**	**4**	**2,062**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	14	5	*19*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	0	8	9	*17*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	8	6	*14*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**0**	**0**	**13**	**8**	***21***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**9**	**4**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**14**	**8**	***22***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
5:30 PM	**0**	**0**	**5**	**6**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	0	0	4	5	*9*	0	0	0	1	*1*	0	2	0	0	*2*
Count Total	0	0	75	51	*126*	0	0	0	2	*2*	0	2	0	0	*2*
Peak Hour	**0**	**0**	**41**	**26**	***67***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***

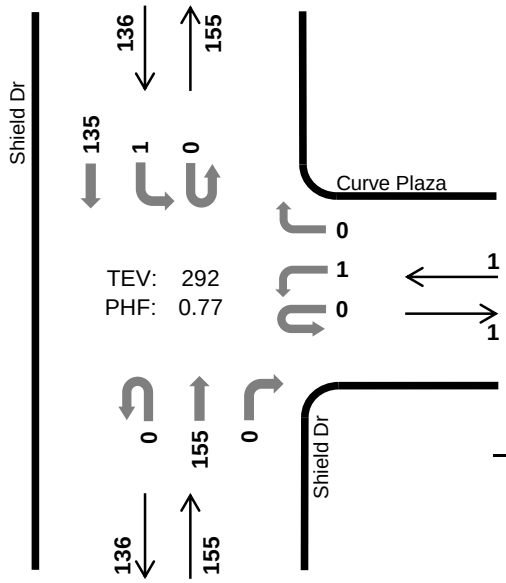
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

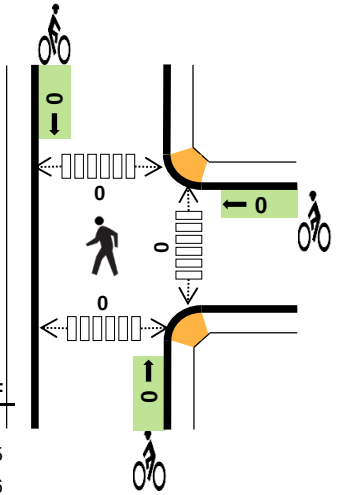
Shield Dr
Curve Plaza

Date: Tue, Mar 03, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

N

Peak Hour





	HV %:	PHF
EB	-	-
WB	0.0%	0.25
NB	11.0%	0.86
SB	1.5%	0.58
TOTAL	6.5%	0.77

Two-Hour Count Summaries

Interval Start	0				Curve Plaza				Shield Dr				Shield Dr				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	24	0	0	0	16	0	40	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	21	0	0	0	17	0	38	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	30	0	0	0	35	0	65	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**36**	**0**	**0**	**0**	**59**	**0**	**95**	238
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**37**	**0**	**0**	**1**	**30**	**0**	**68**	266
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**37**	**0**	**0**	**0**	**21**	**0**	**58**	286
8:30 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**45**	**0**	**0**	**0**	**25**	**0**	**71**	**292**
8:45 AM	0	0	0	0	0	0	0	0	0	0	33	0	0	0	29	0	62	259
Count Total	0	0	0	0	0	1	0	0	0	0	263	0	0	1	232	0	497	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**155**	**0**	**0**	**1**	**135**	**0**	**292**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	3	3	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	0	4	2	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	0	6	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	**0**	**0**	**6**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**0**	**5**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**0**	**0**	**4**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	0	0	4	1	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	34	9	*43*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**17**	**2**	***19***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

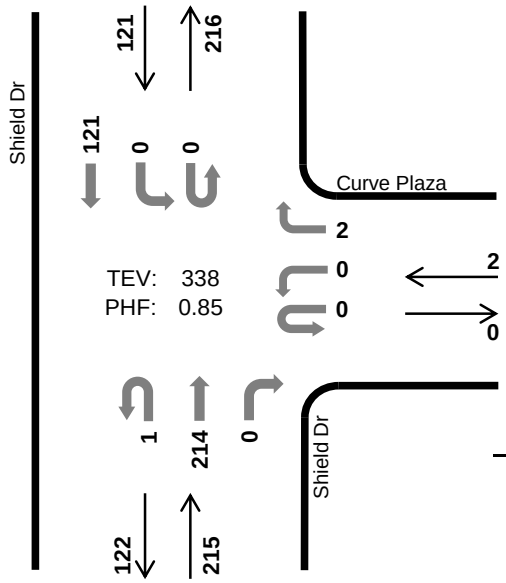
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

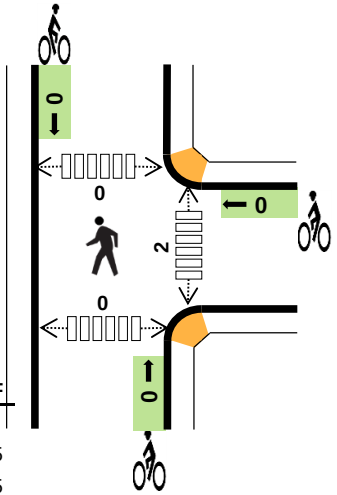
Shield Dr
Curve Plaza

Date: Tue, Mar 03, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

N

Peak Hour





	HV %:	PHF
EB	-	-
WB	0.0%	0.25
NB	4.7%	0.85
SB	5.8%	0.82
TOTAL	5.0%	0.85

Two-Hour Count Summaries

Interval Start	0				Curve Plaza				Shield Dr				Shield Dr				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**63**	**0**	**0**	**0**	**35**	**0**	**100**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**52**	**0**	**0**	**0**	**37**	**0**	**89**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**0**	**0**	**0**	**21**	**0**	**71**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**49**	**0**	**0**	**0**	**28**	**0**	**78**	**338**
5:00 PM	0	0	0	0	0	0	0	0	0	0	56	0	0	0	40	0	96	334
5:15 PM	0	0	0	0	0	0	0	0	0	0	40	0	0	0	30	0	70	315
5:30 PM	0	0	0	0	0	0	0	0	0	0	30	0	0	0	21	0	51	295
5:45 PM	0	0	0	0	0	0	0	0	0	0	24	0	0	0	16	0	40	257
Count Total	0	0	0	0	0	0	0	2	1	0	364	0	0	0	228	0	595	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**214**	**0**	**0**	**0**	**121**	**0**	**338**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
4:15 PM	**0**	**0**	**4**	**5**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
4:30 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
4:45 PM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**0**	***2***
5:00 PM	0	0	1	1	*2*	0	0	0	1	*1*	1	0	0	1	*2*
5:15 PM	0	0	3	0	*3*	0	0	0	0	*0*	2	0	0	2	*4*
5:30 PM	0	0	1	0	*1*	0	0	0	0	*0*	1	0	0	0	*1*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	2	0	0	0	*2*
Count Total	0	0	15	8	*23*	0	0	0	1	*1*	8	3	0	3	*14*
Peak Hr	**0**	**0**	**10**	**7**	***17***	**0**	**0**	**0**	**0**	***0***	**2**	**3**	**0**	**0**	***5***

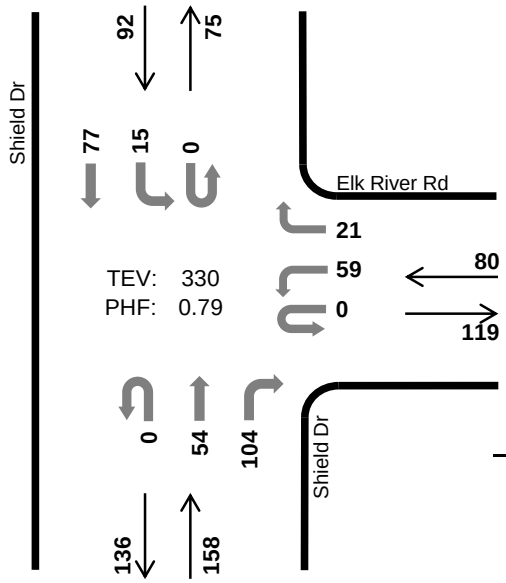
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

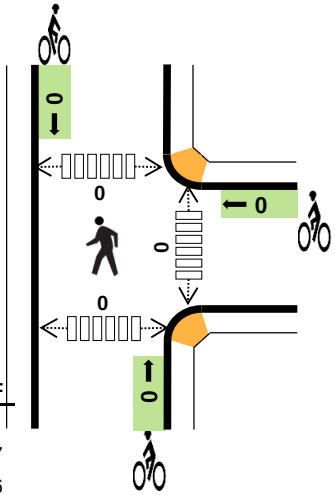
Shield Dr
Elk River Rd

Date: Tue, Mar 03, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

N

Peak Hour





	HV %:	PHF
EB	-	-
WB	2.5%	0.77
NB	10.8%	0.86
SB	0.0%	0.49
TOTAL	5.8%	0.79

Two-Hour Count Summaries

Interval Start	0 Eastbound				Elk River Rd Westbound				Shield Dr Northbound				Shield Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	6	0	3	0	0	8	16	0	0	10	0	43	0
7:15 AM	0	0	0	0	0	12	0	4	0	0	5	17	0	3	5	0	46	0
7:30 AM	0	0	0	0	0	15	0	3	0	0	4	26	0	4	20	0	72	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**4**	**0**	**0**	**10**	**27**	**0**	**4**	**43**	**0**	**105**	266
8:00 AM	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**9**	**0**	**0**	**11**	**25**	**0**	**2**	**13**	**0**	**77**	300
8:15 AM	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**5**	**0**	**0**	**15**	**24**	**0**	**3**	**12**	**0**	**69**	323
8:30 AM	**0**	**0**	**0**	**0**	**0**	**15**	**0**	**3**	**0**	**0**	**18**	**28**	**0**	**6**	**9**	**0**	**79**	**330**
8:45 AM	0	0	0	0	1	13	0	4	0	0	10	23	0	4	15	0	70	295
Count Total	0	0	0	0	1	105	0	35	0	0	81	186	0	26	127	0	561	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**59**	**0**	**21**	**0**	**0**	**54**	**104**	**0**	**15**	**77**	**0**	**330**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	3	4	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	1	4	2	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	1	6	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	**0**	**0**	**6**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**1**	**2**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**0**	**5**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**0**	**1**	**4**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	0	0	4	1	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	7	35	3	*45*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**2**	**17**	**0**	***19***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

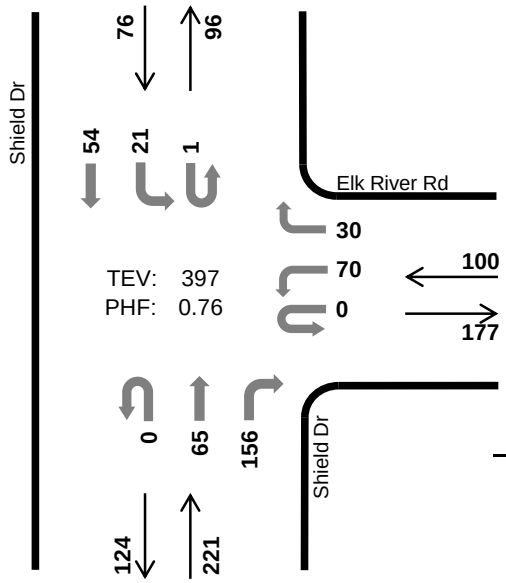
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Shield Dr
Elk River Rd

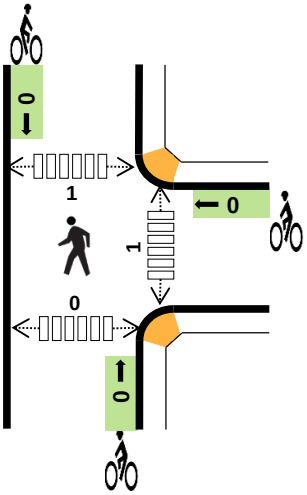
Date: Tue, Mar 03, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	3.0%	0.63
NB	4.5%	0.84
SB	5.3%	0.79
TOTAL	4.3%	0.76



Two-Hour Count Summaries

Interval Start	0				Elk River Rd				Shield Dr				Shield Dr				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**0**	**0**	**0**	**0**	**19**	**0**	**21**	**0**	**0**	**21**	**45**	**0**	**8**	**16**	**0**	**130**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**25**	**0**	**4**	**0**	**0**	**14**	**39**	**1**	**6**	**15**	**0**	**104**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**3**	**0**	**0**	**13**	**42**	**0**	**3**	**9**	**0**	**82**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**2**	**0**	**0**	**17**	**30**	**0**	**4**	**14**	**0**	**81**	**397**
5:00 PM	0	0	0	0	1	11	0	3	0	0	10	49	0	21	27	0	122	389
5:15 PM	0	0	0	0	0	18	0	0	0	0	10	30	0	6	12	0	76	361
5:30 PM	0	0	0	0	0	9	0	0	0	0	8	21	0	5	12	0	55	334
5:45 PM	0	0	0	0	0	8	0	0	0	0	8	16	0	4	7	0	43	296
Count Total	0	0	0	0	1	116	0	33	0	0	101	272	1	57	112	0	693	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**70**	**0**	**30**	**0**	**0**	**65**	**156**	**1**	**21**	**54**	**0**	**397**	**0**

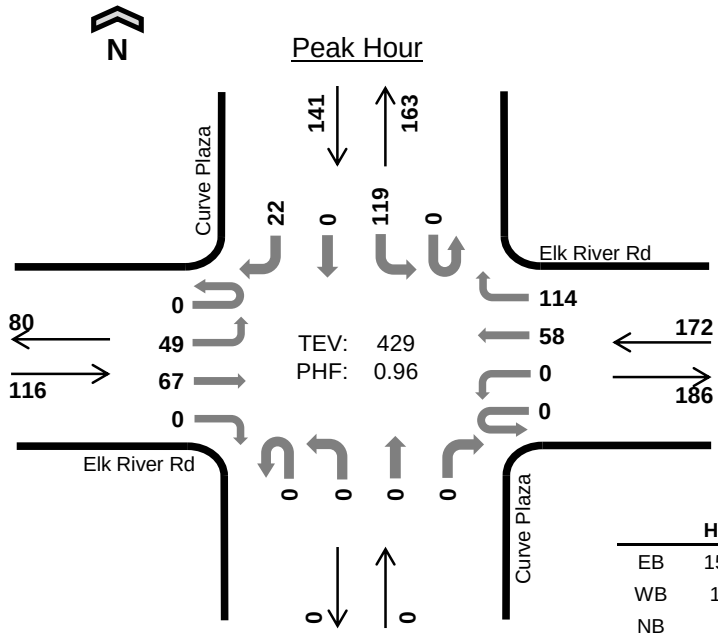
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

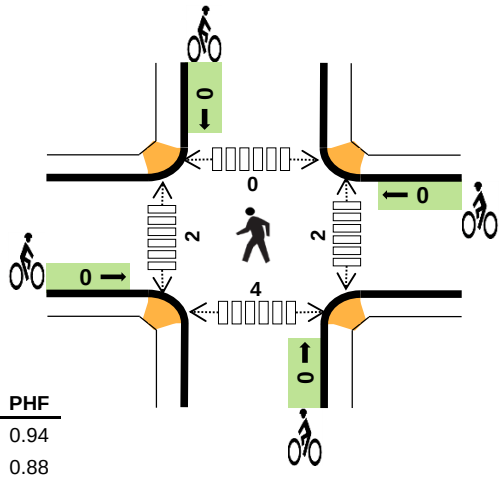
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**0**	**2**	**4**	**3**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**0**	*2*
4:30 PM	**0**	**1**	**1**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
4:45 PM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	1	1	0	*2*	0	1	0	0	*1*	1	0	0	0	*1*
5:15 PM	0	0	3	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	1	0	*1*
5:45 PM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	4	15	6	*25*	0	1	0	0	*1*	2	1	2	0	*5*
Peak Hr	**0**	**3**	**10**	**4**	***17***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**1**	**0**	***3***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Curve Plaza
Elk River Rd

Date: Tue, Mar 03, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM





	HV %:	PHF
EB	15.5%	0.94
WB	1.2%	0.88
NB	-	-
SB	2.1%	0.86
TOTAL	5.4%	0.96

Two-Hour Count Summaries

Interval Start	Elk River Rd Eastbound				Elk River Rd Westbound				Curve Plaza Northbound				Curve Plaza Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	5	11	0	0	0	9	9	0	0	0	0	0	12	0	0	46	0
7:15 AM	0	8	11	0	0	0	13	17	0	0	0	0	0	17	0	3	69	0
7:30 AM	**0**	**13**	**17**	**0**	**0**	**0**	**14**	**29**	**0**	**0**	**0**	**0**	**0**	**25**	**0**	**3**	**101**	0
7:45 AM	**0**	**15**	**16**	**0**	**0**	**0**	**17**	**26**	**0**	**0**	**0**	**0**	**0**	**32**	**0**	**6**	**112**	328
8:00 AM	**0**	**10**	**17**	**0**	**0**	**0**	**19**	**30**	**0**	**0**	**0**	**0**	**0**	**26**	**0**	**8**	**110**	392
8:15 AM	**0**	**11**	**17**	**0**	**0**	**0**	**8**	**29**	**0**	**0**	**0**	**0**	**0**	**36**	**0**	**5**	**106**	**429**
8:30 AM	0	10	24	0	0	0	13	17	0	0	0	0	0	29	0	6	99	427
8:45 AM	0	12	16	0	0	0	13	20	0	0	0	0	0	27	0	6	94	409
Count Total	0	84	129	0	0	0	106	177	0	0	0	0	0	204	0	37	737	0
Peak Hour	**0**	**49**	**67**	**0**	**0**	**0**	**58**	**114**	**0**	**0**	**0**	**0**	**0**	**119**	**0**	**22**	**429**	**0**

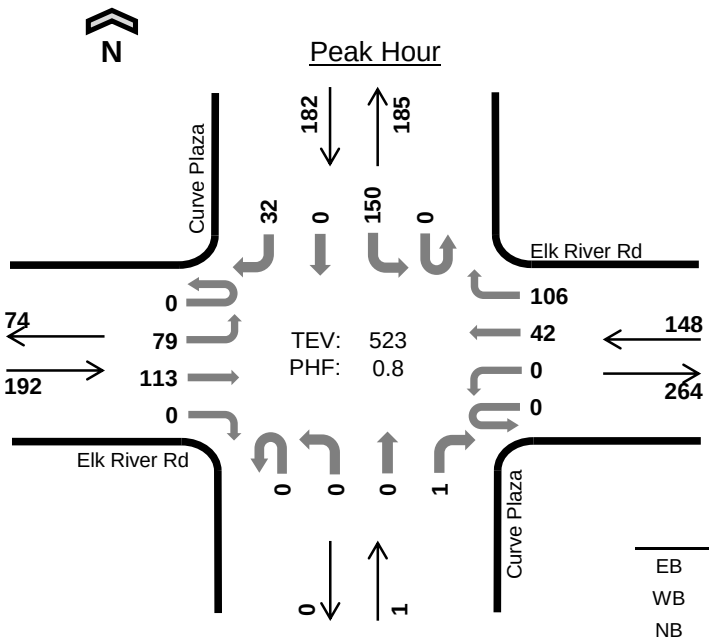
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

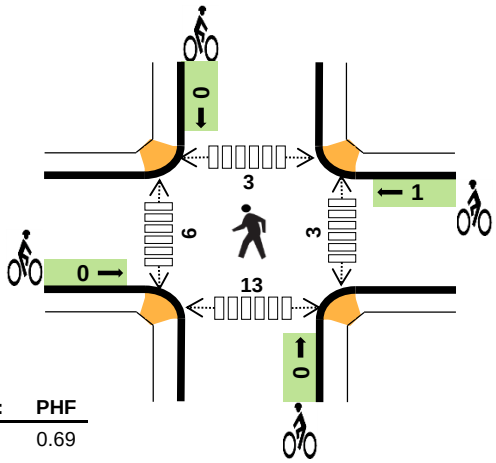
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	3	0	1	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	5	1	0	0	*6*	0	0	0	0	*0*	0	2	0	0	*2*
7:30 AM	**6**	**2**	**0**	**0**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**1**	*2*
7:45 AM	**5**	**0**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
8:00 AM	**2**	**0**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**1**	*3*
8:15 AM	**5**	**0**	**0**	**2**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**2**	***2***
8:30 AM	3	1	0	2	*6*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	4	0	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	34	7	0	6	*47*	0	0	0	0	*0*	2	4	0	4	*10*
Peak Hour	**18**	**2**	**0**	**3**	***23***	**0**	**0**	**0**	**0**	***0***	**2**	**2**	**0**	**4**	***8***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Curve Plaza
Elk River Rd

Date: Tue, Mar 03, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM





	HV %:	PHF
EB	4.2%	0.69
WB	3.4%	0.86
NB	0.0%	0.25
SB	1.6%	0.91
TOTAL	3.1%	0.80

Two-Hour Count Summaries

Interval Start	Elk River Rd Eastbound				Elk River Rd Westbound				Curve Plaza Northbound				Curve Plaza Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	23	29	1	0	1	35	6	0	0	1	0	0	30	1	7	134	0
4:15 PM	**0**	**20**	**24**	**0**	**0**	**0**	**15**	**25**	**0**	**0**	**0**	**1**	**0**	**38**	**0**	**12**	**135**	0
4:30 PM	**0**	**20**	**25**	**0**	**0**	**0**	**8**	**19**	**0**	**0**	**0**	**0**	**0**	**31**	**0**	**7**	**110**	0
4:45 PM	**0**	**14**	**19**	**0**	**0**	**0**	**9**	**29**	**0**	**0**	**0**	**0**	**0**	**37**	**0**	**7**	**115**	494
5:00 PM	**0**	**25**	**45**	**0**	**0**	**0**	**10**	**33**	**0**	**0**	**0**	**0**	**0**	**44**	**0**	**6**	**163**	**523**
5:15 PM	0	14	23	0	0	0	8	29	0	0	0	0	0	43	0	9	126	514
5:30 PM	0	13	13	0	0	0	4	25	0	0	0	0	0	31	0	5	91	495
5:45 PM	0	8	12	0	0	0	2	27	0	0	0	0	0	41	0	7	97	477
Count Total	0	137	190	1	0	1	91	193	0	0	1	1	0	295	1	60	971	0
Peak Hour	**0**	**79**	**113**	**0**	**0**	**0**	**42**	**106**	**0**	**0**	**0**	**1**	**0**	**150**	**0**	**32**	**523**	**0**

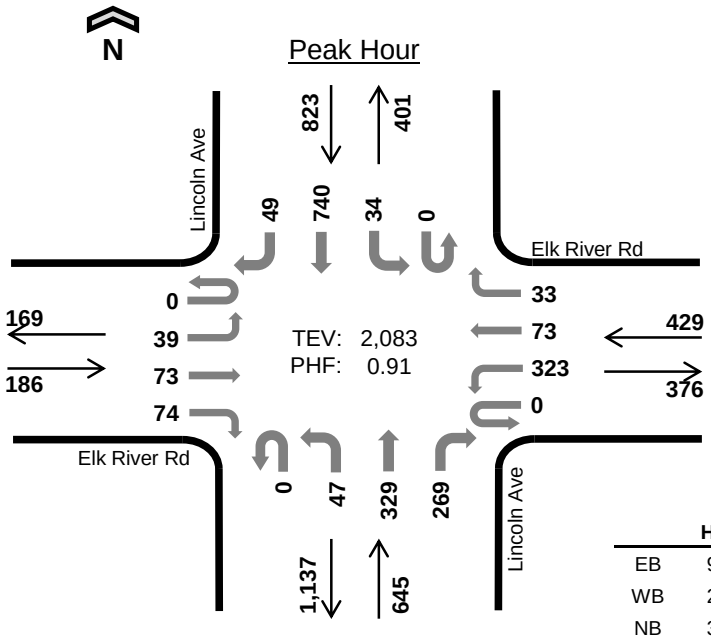
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

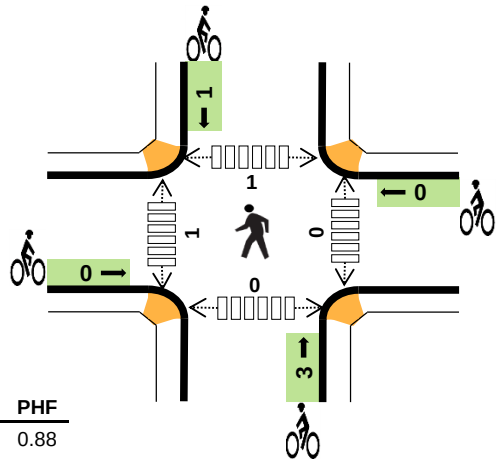
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	0	0	0	*3*	0	0	0	0	*0*	1	6	0	7	*14*
4:15 PM	**4**	**3**	**0**	**2**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**3**	**0**	*3*
4:30 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**0**	**4**	*7*
4:45 PM	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**0**	**3**	*7*
5:00 PM	**1**	**1**	**0**	**1**	***3***	**0**	**1**	**0**	**0**	***1***	**0**	**2**	**0**	**6**	***8***
5:15 PM	3	0	0	0	*3*	0	0	0	0	*0*	0	3	0	1	*4*
5:30 PM	1	0	0	1	*2*	0	0	0	0	*0*	0	7	0	5	*12*
5:45 PM	2	0	0	0	*2*	0	0	0	0	*0*	0	2	0	0	*2*
Count Total	17	5	0	4	*26*	0	1	0	0	*1*	4	24	3	26	*57*
Peak Hour	**8**	**5**	**0**	**3**	***16***	**0**	**1**	**0**	**0**	***1***	**3**	**6**	**3**	**13**	***25***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Lincoln Ave
Elk River Rd

Date: Tue, Mar 03, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM





	HV %:	PHF
EB	9.7%	0.88
WB	2.3%	0.84
NB	3.1%	0.81
SB	3.0%	0.88
TOTAL	3.5%	0.91

Two-Hour Count Summaries

Interval Start	Elk River Rd Eastbound				Elk River Rd Westbound				Lincoln Ave Northbound				Lincoln Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	8	8	3	0	42	8	5	0	2	35	19	0	6	135	8	279	0
7:15 AM	0	4	11	15	0	41	18	3	0	4	69	36	0	4	143	8	356	0
7:30 AM	**0**	**7**	**20**	**13**	**0**	**91**	**19**	**6**	**0**	**5**	**54**	**44**	**0**	**9**	**209**	**16**	**493**	0
7:45 AM	**0**	**10**	**15**	**22**	**0**	**98**	**20**	**9**	**0**	**12**	**93**	**76**	**0**	**10**	**180**	**11**	**556**	1,684
8:00 AM	**0**	**11**	**17**	**18**	**0**	**75**	**25**	**7**	**0**	**14**	**104**	**81**	**0**	**10**	**202**	**10**	**574**	1,979
8:15 AM	**0**	**11**	**21**	**21**	**0**	**59**	**9**	**11**	**0**	**16**	**78**	**68**	**0**	**5**	**149**	**12**	**460**	**2,083**
8:30 AM	0	10	19	21	0	64	20	6	0	4	66	54	0	4	108	6	382	1,972
8:45 AM	0	4	21	21	0	65	19	4	0	7	64	54	0	5	149	7	420	1,836
Count Total	0	65	132	134	0	535	138	51	0	64	563	432	0	53	1,275	78	3,520	0
Peak Hour	**0**	**39**	**73**	**74**	**0**	**323**	**73**	**33**	**0**	**47**	**329**	**269**	**0**	**34**	**740**	**49**	**2,083**	**0**

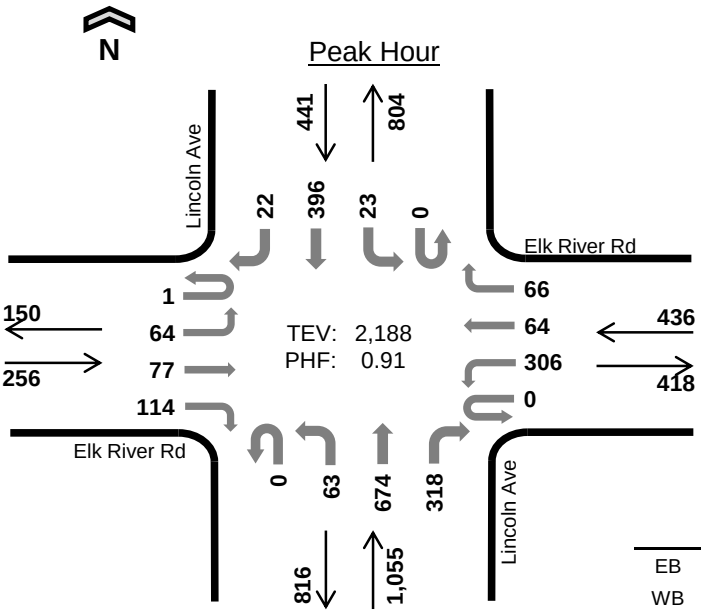
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

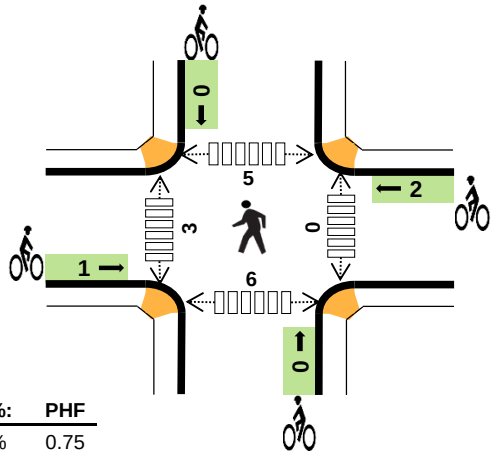
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	3	3	2	*12*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	5	2	6	3	*16*	0	0	0	0	*0*	1	0	0	1	*2*
7:30 AM	**6**	**3**	**3**	**12**	***24***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**4**	**4**	**1**	**6**	***15***	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**1**	**0**	**8**	**7**	***16***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**7**	**3**	**8**	**0**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**0**	***2***
8:30 AM	5	4	5	6	*20*	0	0	0	0	*0*	0	0	0	1	*1*
8:45 AM	4	2	3	8	*17*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	36	21	37	44	*138*	0	0	3	1	*4*	1	1	1	3	*6*
Peak Hour	**18**	**10**	**20**	**25**	***73***	**0**	**0**	**3**	**1**	***4***	**0**	**1**	**1**	**0**	***2***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Lincoln Ave
Elk River Rd

Date: Tue, Mar 03, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	3.5%	0.75
WB	1.8%	0.83
NB	3.7%	0.94
SB	2.9%	0.95
TOTAL	3.2%	0.91

Two-Hour Count Summaries

Interval Start	Elk River Rd Eastbound				Elk River Rd Westbound				Lincoln Ave Northbound				Lincoln Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	1	14	24	21	0	80	19	20	0	16	148	73	0	3	110	6	535	0
4:15 PM	0	12	20	28	0	67	20	13	0	14	149	75	0	7	115	6	526	0
4:30 PM	0	23	20	17	0	59	14	11	0	12	132	56	0	6	85	1	436	0
4:45 PM	**1**	**12**	**16**	**28**	**0**	**75**	**15**	**16**	**0**	**17**	**152**	**79**	**0**	**3**	**96**	**7**	**517**	2,014
5:00 PM	**0**	**24**	**26**	**35**	**0**	**93**	**22**	**17**	**0**	**17**	**165**	**90**	**0**	**9**	**97**	**6**	**601**	2,080
5:15 PM	**0**	**14**	**23**	**32**	**0**	**80**	**16**	**23**	**0**	**13**	**184**	**83**	**0**	**9**	**102**	**5**	**584**	2,138
5:30 PM	**0**	**14**	**12**	**19**	**0**	**58**	**11**	**10**	**0**	**16**	**173**	**66**	**0**	**2**	**101**	**4**	**486**	**2,188**
5:45 PM	0	17	8	27	0	54	11	8	0	11	154	49	0	4	109	6	458	2,129
Count Total	2	130	149	207	0	566	128	118	0	116	1,257	571	0	43	815	41	4,143	0
Peak Hour	**1**	**64**	**77**	**114**	**0**	**306**	**64**	**66**	**0**	**63**	**674**	**318**	**0**	**23**	**396**	**22**	**2,188**	**0**

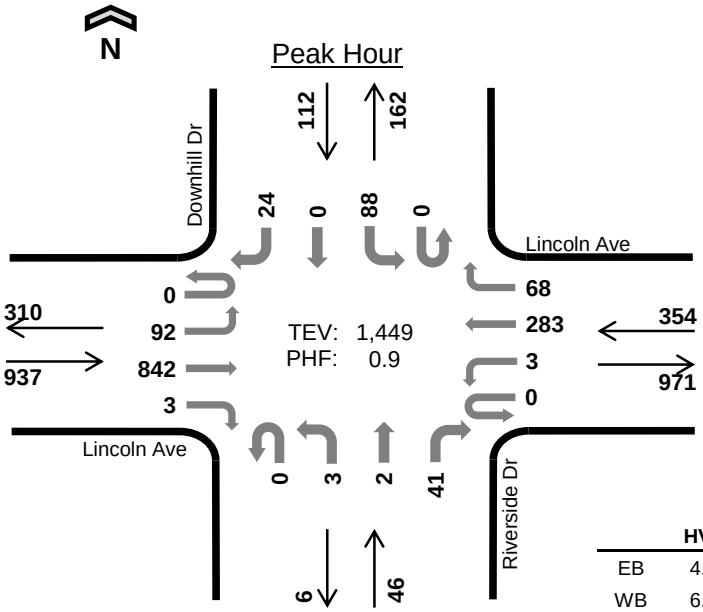
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

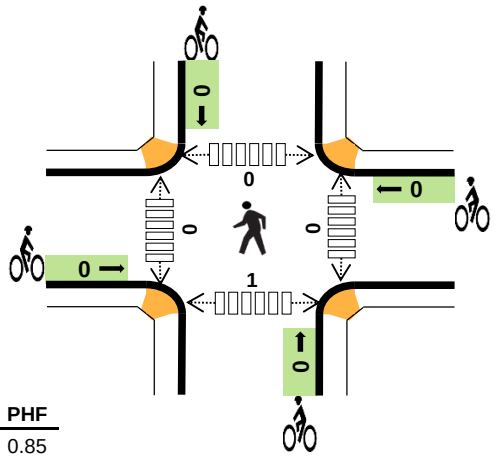
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	1	8	4	*16*	0	0	0	0	*0*	0	2	0	0	*2*
4:15 PM	5	3	6	9	*23*	0	0	0	0	*0*	1	0	2	0	*3*
4:30 PM	1	0	5	2	*8*	0	0	0	0	*0*	0	0	1	2	*3*
4:45 PM	**3**	**1**	**12**	**4**	***20***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	*2*
5:00 PM	**2**	**3**	**9**	**1**	***15***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**1**	**1**	*2*
5:15 PM	**1**	**4**	**12**	**4**	***21***	**1**	**1**	**0**	**0**	***2***	**0**	**1**	**3**	**1**	*5*
5:30 PM	**3**	**0**	**6**	**4**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**3**	***5***
5:45 PM	1	2	4	2	*9*	0	1	0	0	*1*	0	0	0	0	*0*
Count Total	19	14	62	30	*125*	1	3	0	0	*4*	1	5	8	8	*22*
Peak Hour	**9**	**8**	**39**	**13**	***69***	**1**	**2**	**0**	**0**	***3***	**0**	**3**	**5**	**6**	***14***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Riverside Dr
Lincoln Ave

Date: Tue, Mar 03, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	4.1%	0.85
WB	6.8%	0.74
NB	2.2%	0.82
SB	0.9%	0.74
TOTAL	4.4%	0.90

Two-Hour Count Summaries

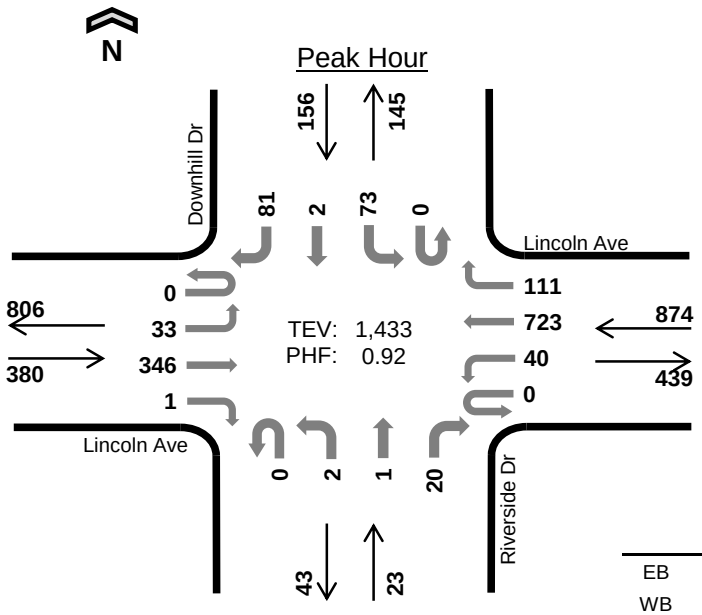
Interval Start	Lincoln Ave Eastbound				Lincoln Ave Westbound				Riverside Dr Northbound				Downhill Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	12	127	1	0	2	37	2	0	0	0	9	0	20	1	6	217	0
7:15 AM	**0**	**20**	**159**	**0**	**0**	**0**	**52**	**19**	**0**	**1**	**0**	**7**	**0**	**16**	**0**	**4**	**278**	0
7:30 AM	**0**	**26**	**249**	**1**	**0**	**1**	**54**	**7**	**0**	**0**	**0**	**11**	**0**	**22**	**0**	**5**	**376**	0
7:45 AM	**0**	**30**	**218**	**1**	**0**	**1**	**80**	**21**	**0**	**0**	**1**	**13**	**0**	**24**	**0**	**3**	**392**	1,263
8:00 AM	**0**	**16**	**216**	**1**	**0**	**1**	**97**	**21**	**0**	**2**	**1**	**10**	**0**	**26**	**0**	**12**	**403**	**1,449**
8:15 AM	0	15	135	1	0	0	66	11	0	0	0	7	0	13	0	5	253	1,424
8:30 AM	0	11	118	0	0	6	51	18	0	0	1	5	0	15	0	4	229	1,277
8:45 AM	0	19	153	1	0	2	57	10	0	0	1	6	0	21	0	4	274	1,159
Count Total	0	149	1,375	6	0	13	494	109	0	3	4	68	0	157	1	43	2,422	0
Peak Hour	**0**	**92**	**842**	**3**	**0**	**3**	**283**	**68**	**0**	**3**	**2**	**41**	**0**	**88**	**0**	**24**	**1,449**	**0**

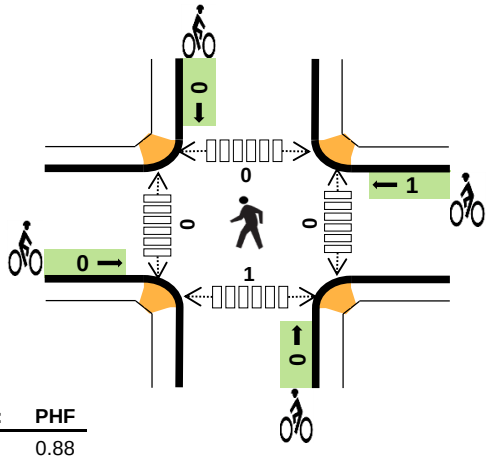
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	3	5	0	0	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**6**	**7**	**0**	**0**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**15**	**8**	**1**	**1**	***25***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**7**	**4**	**0**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**10**	**5**	**0**	**0**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	***1***
8:15 AM	3	6	0	0	*9*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	9	6	0	0	*15*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	12	4	0	2	*18*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	65	45	1	3	*114*	0	0	0	0	*0*	0	0	0	1	*1*
Peak Hour	**38**	**24**	**1**	**1**	***64***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	***1***

Riverside Dr
Lincoln Ave

Date: Tue, Mar 03, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	4.5%	0.88
WB	3.7%	0.91
NB	0.0%	0.72
SB	1.9%	0.91
TOTAL	3.6%	0.92

Two-Hour Count Summaries

Interval Start	Lincoln Ave Eastbound				Lincoln Ave Westbound				Riverside Dr Northbound				Downhill Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	9	98	2	0	6	143	31	0	0	1	6	0	18	0	14	328	0
4:15 PM	0	9	102	0	0	7	136	30	0	0	0	3	0	23	1	22	333	0
4:30 PM	0	11	67	0	0	10	166	21	0	1	0	8	0	17	0	11	312	0
4:45 PM	**0**	**7**	**89**	**1**	**0**	**8**	**149**	**30**	**0**	**0**	**0**	**3**	**0**	**24**	**1**	**15**	**327**	1,300
5:00 PM	**0**	**11**	**83**	**0**	**0**	**11**	**204**	**24**	**0**	**0**	**1**	**5**	**0**	**10**	**0**	**33**	**382**	1,354
5:15 PM	**0**	**9**	**99**	**0**	**0**	**16**	**193**	**25**	**0**	**1**	**0**	**7**	**0**	**19**	**0**	**21**	**390**	1,411
5:30 PM	**0**	**6**	**75**	**0**	**0**	**5**	**177**	**32**	**0**	**1**	**0**	**5**	**0**	**20**	**1**	**12**	**334**	**1,433**
5:45 PM	0	4	90	0	0	11	136	32	0	0	0	7	0	13	0	13	306	1,412
Count Total	0	66	703	3	0	74	1,304	225	0	3	2	44	0	144	3	141	2,712	0
Peak Hour	**0**	**33**	**346**	**1**	**0**	**40**	**723**	**111**	**0**	**2**	**1**	**20**	**0**	**73**	**2**	**81**	**1,433**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	6	4	0	2	*12*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	13	2	0	1	*16*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	2	4	0	0	*6*	0	0	0	0	*0*	0	0	1	1	*2*
4:45 PM	**4**	**10**	**0**	**1**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**3**	**7**	**0**	**1**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**5**	**9**	**0**	**0**	***14***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**1**	*1*
5:30 PM	**5**	**6**	**0**	**1**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	1	3	0	0	*4*	0	0	0	0	*0*	0	1	0	1	*2*
Count Total	39	45	0	6	*90*	0	1	0	0	*1*	0	1	1	3	*5*
Peak Hour	**17**	**32**	**0**	**3**	***52***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**1**	***1***

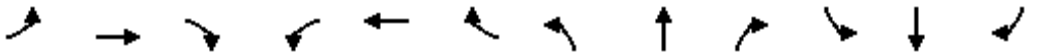
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

Appendix C

Synchro Printouts

Existing (Year 2020)
Short Term Background (Year 2022)
Short Term Total (Year 2022)
Long Term Background (Year 2040)
Long Term Total (Year 2040)

Existing AM
6: Elk River Rd & US-40



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	740	49	47	329	269	39	73	74	323	73	33
Future Volume (veh/h)	34	740	49	47	329	269	39	73	74	323	73	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1752	1752	1752	1870	1870	1870
Adj Flow Rate, veh/h	39	841	0	58	406	0	44	83	0	385	87	0
Peak Hour Factor	0.88	0.88	0.88	0.81	0.81	0.81	0.88	0.88	0.88	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	10	10	10	2	2	2
Cap, veh/h	63	1272		79	686		64	418		470	628	
Arrive On Green	0.04	0.36	0.00	0.04	0.37	0.00	0.04	0.24	0.00	0.14	0.34	0.00
Sat Flow, veh/h	1767	3526	1572	1767	1856	1572	1668	1752	1485	3456	1870	1585
Grp Volume(v), veh/h	39	841	0	58	406	0	44	83	0	385	87	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1856	1572	1668	1752	1485	1728	1870	1585
Q Serve(g_s), s	1.8	16.4	0.0	2.7	14.4	0.0	2.1	3.1	0.0	8.9	2.6	0.0
Cycle Q Clear(g_c), s	1.8	16.4	0.0	2.7	14.4	0.0	2.1	3.1	0.0	8.9	2.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	63	1272		79	686		64	418		470	628	
V/C Ratio(X)	0.61	0.66		0.73	0.59		0.68	0.20		0.82	0.14	
Avail Cap(c_a), veh/h	119	1272		119	686		102	418		528	628	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.9	21.9	0.0	38.6	20.8	0.0	38.8	24.9	0.0	34.4	18.9	0.0
Incr Delay (d2), s/veh	9.3	2.7	0.0	12.3	3.7	0.0	12.0	1.1	0.0	9.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	6.7	0.0	1.4	6.4	0.0	1.1	1.3	0.0	4.1	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.1	24.7	0.0	50.8	24.5	0.0	50.8	26.0	0.0	43.4	19.4	0.0
LnGrp LOS	D	C		D	C		D	C		D	B	
Approach Vol, veh/h		880	A		464	A		127	A		472	A
Approach Delay, s/veh		25.7			27.8			34.6			39.0	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	34.0	15.6	24.0	7.4	34.7	7.7	32.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	29.5	12.5	19.5	5.5	29.5	5.0	27.0
Max Q Clear Time (g_c+I1), s	4.7	18.4	10.9	5.1	3.8	16.4	4.1	4.6
Green Ext Time (p_c), s	0.0	4.1	0.3	0.2	0.0	1.9	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

Notes

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

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Existing AM
7: Shield Dr & Elk River Rd

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	88	40	102	59	21
Future Vol, veh/h	13	88	40	102	59	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	54	54	91	91	77	77
Heavy Vehicles, %	0	0	13	13	3	3
Mvmt Flow	24	163	44	112	77	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	156	0	-	0	311	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	211	-
Critical Hdwy	4.1	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1436	-	-	-	679	953
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1436	-	-	-	667	953
Mov Cap-2 Maneuver	-	-	-	-	667	-
Stage 1	-	-	-	-	904	-
Stage 2	-	-	-	-	822	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1436	-	-	-	724
HCM Lane V/C Ratio	0.017	-	-	-	0.144
HCM Control Delay (s)	7.5	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Existing AM
9: US-40 & Curve Ct/Sunlight Dr

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	23	0	0	6	104	656	1	19	1121	3
Future Vol, veh/h	0	0	23	0	0	6	104	656	1	19	1121	3
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	-	-	-	-	-	-	50	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	64	64	64	75	75	75	80	80	80	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	0	0	36	0	0	8	130	820	1	21	1232	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2359	2355	616	1739	2358	821	1235	0	0	821	0	0
Stage 1	1274	1274	-	1081	1081	-	-	-	-	-	-	-
Stage 2	1085	1081	-	658	1277	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	22	36	438	63	36	378	553	-	-	801	-	-
Stage 1	180	240	-	266	296	-	-	-	-	-	-	-
Stage 2	265	296	-	424	239	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	17	25	438	44	25	378	553	-	-	801	-	-
Mov Cap-2 Maneuver	17	25	-	44	25	-	-	-	-	-	-	-
Stage 1	138	220	-	203	226	-	-	-	-	-	-	-
Stage 2	198	226	-	357	219	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	14.7	1.8	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	553	-	-	438	378	801	-	-
HCM Lane V/C Ratio	0.235	-	-	0.082	0.021	0.026	-	-
HCM Control Delay (s)	13.5	-	-	14	14.7	9.6	0.4	-
HCM Lane LOS	B	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.9	-	-	0.3	0.1	0.1	-	-

Existing AM
16: Elk River Rd & Curve Plaza

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↑	↱
Traffic Vol, veh/h	119	0	22	0	0	0	49	67	0	0	58	114
Future Vol, veh/h	119	0	22	0	0	0	49	67	0	0	58	114
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	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	92	92	92	94	94	94	88	88	88
Heavy Vehicles, %	2	2	2	0	0	0	16	16	16	1	1	1
Mvmt Flow	138	0	26	0	0	0	52	71	0	0	66	130

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	241	241	66	319	371	71	196	0	0	-	-	0
Stage 1	66	66	-	175	175	-	-	-	-	-	-	-
Stage 2	175	175	-	144	196	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.26	-	-	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.344	-	-	-	-	-
Pot Cap-1 Maneuver	713	660	998	638	562	997	1297	-	-	0	-	-
Stage 1	945	840	-	832	758	-	-	-	-	0	-	-
Stage 2	827	754	-	864	742	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	690	632	998	602	538	997	1297	-	-	-	-	-
Mov Cap-2 Maneuver	690	632	-	602	538	-	-	-	-	-	-	-
Stage 1	905	840	-	797	726	-	-	-	-	-	-	-
Stage 2	792	722	-	842	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	0	3.3	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1297	-	-	725	-	-	-
HCM Lane V/C Ratio	0.04	-	-	0.226	-	-	-
HCM Control Delay (s)	7.9	0	-	11.4	0	-	-
HCM Lane LOS	A	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	-	-	-

Existing AM
20: Shield Dr & Curve Plaza

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	140	0	1	145
Future Vol, veh/h	0	0	140	0	1	145
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	95	95	62	62
Heavy Vehicles, %	2	2	14	14	1	1
Mvmt Flow	0	0	147	0	2	234

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	385	147	0	0	147	0
Stage 1	147	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	618	900	-	-	1441	-
Stage 1	880	-	-	-	-	-
Stage 2	802	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	617	900	-	-	1441	-
Mov Cap-2 Maneuver	617	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1441	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	-	-	0	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Existing PM
6: Elk River Rd & US-40

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	396	22	63	674	318	65	77	114	306	64	66
Future Volume (veh/h)	23	396	22	63	674	318	65	77	114	306	64	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	24	417	0	67	717	0	87	103	0	369	77	0
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.75	0.75	0.75	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	2	2	2
Cap, veh/h	44	1309		86	728		111	499		393	601	
Arrive On Green	0.02	0.37	0.00	0.05	0.40	0.00	0.06	0.27	0.00	0.11	0.32	0.00
Sat Flow, veh/h	1767	3526	1572	1753	1841	1560	1753	1841	1560	3456	1870	1585
Grp Volume(v), veh/h	24	417	0	67	717	0	87	103	0	369	77	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1753	1841	1560	1753	1841	1560	1728	1870	1585
Q Serve(g_s), s	1.2	7.8	0.0	3.5	35.6	0.0	4.5	4.0	0.0	9.8	2.7	0.0
Cycle Q Clear(g_c), s	1.2	7.8	0.0	3.5	35.6	0.0	4.5	4.0	0.0	9.8	2.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	1309		86	728		111	499		393	601	
V/C Ratio(X)	0.55	0.32		0.78	0.98		0.79	0.21		0.94	0.13	
Avail Cap(c_a), veh/h	96	1309		177	728		142	499		393	601	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.5	20.7	0.0	43.4	27.6	0.0	42.6	26.0	0.0	40.6	22.2	0.0
Incr Delay (d2), s/veh	10.1	0.6	0.0	13.9	29.9	0.0	19.4	0.9	0.0	30.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.1	0.0	1.8	20.3	0.0	2.5	1.8	0.0	5.7	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	21.3	0.0	57.3	57.5	0.0	62.0	26.9	0.0	70.8	22.6	0.0
LnGrp LOS	D	C		E	E		E	C		E	C	
Approach Vol, veh/h		441	A		784	A		190	A		446	A
Approach Delay, s/veh		23.1			57.5			43.0			62.5	
Approach LOS		C			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	38.8	15.0	29.5	6.8	41.0	10.3	34.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.3	32.2	10.5	25.0	5.0	36.5	7.5	28.0
Max Q Clear Time (g_c+I1), s	5.5	9.8	11.8	6.0	3.2	37.6	6.5	4.7
Green Ext Time (p_c), s	0.0	2.5	0.0	0.4	0.0	0.0	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	49.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Existing PM
7: Shield Dr & Elk River Rd

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	65	45	130	53	5
Future Vol, veh/h	36	65	45	130	53	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	74	74	81	81
Heavy Vehicles, %	0	0	4	4	2	2
Mvmt Flow	68	123	61	176	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	237	0	-	0	408	149
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1342	-	-	-	599	898
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	784	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1342	-	-	-	567	898
Mov Cap-2 Maneuver	-	-	-	-	567	-
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	784	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1342	-	-	-	586
HCM Lane V/C Ratio	0.051	-	-	-	0.122
HCM Control Delay (s)	7.8	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Existing PM
9: US-40 & Curve Ct/Sunlight Dr

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	2	0	85	0	1	10	86	1063	0	4	807	4
Future Vol, veh/h	2	0	85	0	1	10	86	1063	0	4	807	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	-	-	-	-	-	-	50	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	69	69	69	94	94	94	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	3	0	142	0	1	14	91	1131	0	5	917	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2248	2240	459	1782	2245	1131	922	0	0	1131	0	0
Stage 1	927	927	-	1313	1313	-	-	-	-	-	-	-
Stage 2	1321	1313	-	469	932	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	27	43	554	58	42	250	728	-	-	611	-	-
Stage 1	293	350	-	197	230	-	-	-	-	-	-	-
Stage 2	195	230	-	549	348	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	22	37	554	39	36	250	728	-	-	611	-	-
Mov Cap-2 Maneuver	22	37	-	39	36	-	-	-	-	-	-	-
Stage 1	256	344	-	172	201	-	-	-	-	-	-	-
Stage 2	160	201	-	402	342	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.9	29.6	0.8	0.2
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	728	-	-	356	162	611	-	-
HCM Lane V/C Ratio	0.126	-	-	0.407	0.098	0.007	-	-
HCM Control Delay (s)	10.7	-	-	21.9	29.6	10.9	0.1	-
HCM Lane LOS	B	-	-	C	D	B	A	-
HCM 95th %tile Q(veh)	0.4	-	-	1.9	0.3	0	-	-

Existing PM
16: Elk River Rd & Curve Plaza

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↑	↱
Traffic Vol, veh/h	155	0	27	0	0	0	66	100	0	0	31	116
Future Vol, veh/h	155	0	27	0	0	0	66	100	0	0	31	116
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	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	59	59	59	85	85	85
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	176	0	31	0	0	0	112	169	0	0	36	136

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	429	429	36	513	565	169	172	0	0	-	-	0
Stage 1	36	36	-	393	393	-	-	-	-	-	-	-
Stage 2	393	393	-	120	172	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.1	6.5	6.2	4.14	-	-	-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.5	4	3.3	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	538	520	1039	475	437	880	1393	-	-	0	-	-
Stage 1	982	867	-	636	609	-	-	-	-	0	-	-
Stage 2	634	608	-	889	760	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	474	1039	429	398	880	1393	-	-	-	-	-
Mov Cap-2 Maneuver	501	474	-	429	398	-	-	-	-	-	-	-
Stage 1	895	867	-	579	555	-	-	-	-	-	-	-
Stage 2	578	554	-	863	760	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	0	3.1	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1393	-	-	543	-	-	-
HCM Lane V/C Ratio	0.08	-	-	0.381	-	-	-
HCM Control Delay (s)	7.8	0	-	15.7	0	-	-
HCM Lane LOS	A	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.8	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	175	0	0	119
Future Vol, veh/h	0	0	175	0	0	119
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	79	79	74	74
Heavy Vehicles, %	2	2	4	4	1	1
Mvmt Flow	0	0	222	0	0	161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	383	222	0	0	222	0
Stage 1	222	-	-	-	-	-
Stage 2	161	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	620	818	-	-	1353	-
Stage 1	815	-	-	-	-	-
Stage 2	868	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	620	818	-	-	1353	-
Mov Cap-2 Maneuver	620	-	-	-	-	-
Stage 1	815	-	-	-	-	-
Stage 2	868	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1353	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Short Term Background Conditions AM
6: Elk River Rd & US-40

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1074	71	68	478	390	57	106	107	469	106	48
Future Volume (veh/h)	49	1074	71	68	478	390	57	106	107	469	106	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1752	1752	1752	1870	1870	1870
Adj Flow Rate, veh/h	56	1220	0	84	590	0	65	120	0	558	126	0
Peak Hour Factor	0.88	0.88	0.88	0.81	0.81	0.81	0.88	0.88	0.88	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	10	10	10	2	2	2
Cap, veh/h	72	1279		101	704		82	417		589	672	
Arrive On Green	0.04	0.36	0.00	0.06	0.38	0.00	0.05	0.24	0.00	0.17	0.36	0.00
Sat Flow, veh/h	1767	3526	1572	1767	1856	1572	1668	1752	1485	3456	1870	1585
Grp Volume(v), veh/h	56	1220	0	84	590	0	65	120	0	558	126	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1856	1572	1668	1752	1485	1728	1870	1585
Q Serve(g_s), s	3.3	35.4	0.0	4.9	30.4	0.0	4.0	5.9	0.0	16.8	4.9	0.0
Cycle Q Clear(g_c), s	3.3	35.4	0.0	4.9	30.4	0.0	4.0	5.9	0.0	16.8	4.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	72	1279		101	704		82	417		589	672	
V/C Ratio(X)	0.78	0.95		0.83	0.84		0.79	0.29		0.95	0.19	
Avail Cap(c_a), veh/h	84	1279		101	704		162	417		589	672	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.9	32.6	0.0	49.0	29.6	0.0	49.4	32.7	0.0	43.1	23.1	0.0
Incr Delay (d2), s/veh	32.0	16.3	0.0	41.8	11.4	0.0	15.4	1.7	0.0	24.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	17.1	0.0	3.3	15.0	0.0	2.0	2.6	0.0	9.0	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.0	48.9	0.0	90.8	41.1	0.0	64.8	34.5	0.0	67.7	23.7	0.0
LnGrp LOS	F	D		F	D		E	C		E	C	
Approach Vol, veh/h		1276	A		674	A		185	A		684	A
Approach Delay, s/veh		50.3			47.3			45.1			59.6	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	42.6	22.4	29.5	8.8	44.3	9.7	42.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.0	38.1	17.9	25.0	5.0	39.1	10.2	32.7
Max Q Clear Time (g_c+I1), s	6.9	37.4	18.8	7.9	5.3	32.4	6.0	6.9
Green Ext Time (p_c), s	0.0	0.5	0.0	0.5	0.0	2.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	51.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Short Term Background Conditions AM
7: Shield Dr & Elk River Rd

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	128	58	148	86	30
Future Vol, veh/h	19	128	58	148	86	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	54	54	91	91	77	77
Heavy Vehicles, %	0	0	13	13	3	3
Mvmt Flow	35	237	64	163	112	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	227	0	-	0	453	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	307	-
Critical Hdwy	4.1	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1353	-	-	-	563	898
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	744	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1353	-	-	-	546	898
Mov Cap-2 Maneuver	-	-	-	-	546	-
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	744	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1353	-	-	-	608
HCM Lane V/C Ratio	0.026	-	-	-	0.248
HCM Control Delay (s)	7.7	0	-	-	12.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

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	0	0	33	0	0	9	151	952	1	28	1627	4
Future Vol, veh/h	0	0	33	0	0	9	151	952	1	28	1627	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	-	-	-	-	-	-	50	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	64	64	64	75	75	75	80	80	80	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	0	0	52	0	0	12	189	1190	1	31	1788	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3425	3419	894	2525	3423	1191	1792	0	0	1191	0	0
Stage 1	1850	1850	-	1569	1569	-	-	-	-	-	-	-
Stage 2	1575	1569	-	956	1854	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	3	7	288	17	7	231	336	-	-	579	-	-
Stage 1	79	126	-	140	173	-	-	-	-	-	-	-
Stage 2	139	173	-	281	125	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	288	-	0	231	336	-	-	579	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	35	0	-	61	76	-	-	-	-	-	-	-
Stage 2	58	76	-	-	0	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			3.9	5.7
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	336	-	-	-	-	579	-	-
HCM Lane V/C Ratio	0.562	-	-	-	-	0.053	-	-
HCM Control Delay (s)	28.6	-	-	-	-	11.6	5.6	-
HCM Lane LOS	D	-	-	-	-	B	A	-
HCM 95th %tile Q(veh)	3.3	-	-	-	-	0.2	-	-

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	173	0	32	0	0	0	71	97	0	0	84	165
Future Vol, veh/h	173	0	32	0	0	0	71	97	0	0	84	165
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	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	92	92	92	94	94	94	88	88	88
Heavy Vehicles, %	2	2	2	0	0	0	16	16	16	1	1	1
Mvmt Flow	201	0	37	0	0	0	76	103	0	0	95	188

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	350	350	95	463	538	103	283	0	0	-	-	0
Stage 1	95	95	-	255	255	-	-	-	-	-	-	-
Stage 2	255	255	-	208	283	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.26	-	-	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.344	-	-	-	-	-
Pot Cap-1 Maneuver	605	574	962	513	453	957	1203	-	-	0	-	-
Stage 1	912	816	-	754	700	-	-	-	-	0	-	-
Stage 2	749	696	-	799	681	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	574	536	962	468	423	957	1203	-	-	-	-	-
Mov Cap-2 Maneuver	574	536	-	468	423	-	-	-	-	-	-	-
Stage 1	851	816	-	703	653	-	-	-	-	-	-	-
Stage 2	699	649	-	768	681	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.6	0	3.5	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1203	-	-	613	-	-	-
HCM Lane V/C Ratio	0.063	-	-	0.389	-	-	-
HCM Control Delay (s)	8.2	0	-	14.6	0	-	-
HCM Lane LOS	A	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.8	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	203	0	1	210
Future Vol, veh/h	0	0	203	0	1	210
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	95	95	62	62
Heavy Vehicles, %	2	2	14	14	1	1
Mvmt Flow	0	0	214	0	2	339

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	557	214	0	0	214	0
Stage 1	214	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	491	826	-	-	1362	-
Stage 1	822	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	490	826	-	-	1362	-
Mov Cap-2 Maneuver	490	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	718	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1362	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	-	-	0	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Short Term Background Traffic PM
6: Elk River Rd & US-40

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	575	32	91	978	462	93	112	165	444	93	96
Future Volume (veh/h)	33	575	32	91	978	462	93	112	165	444	93	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	35	605	0	97	1040	0	124	149	0	535	112	0
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.75	0.75	0.75	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	2	2	2
Cap, veh/h	46	1730		119	979		146	320		493	436	
Arrive On Green	0.03	0.49	0.00	0.07	0.53	0.00	0.08	0.17	0.00	0.14	0.23	0.00
Sat Flow, veh/h	1767	3526	1572	1753	1841	1560	1753	1841	1560	3456	1870	1585
Grp Volume(v), veh/h	35	605	0	97	1040	0	124	149	0	535	112	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1753	1841	1560	1753	1841	1560	1728	1870	1585
Q Serve(g_s), s	2.8	15.2	0.0	7.9	76.5	0.0	10.0	10.5	0.0	20.5	7.0	0.0
Cycle Q Clear(g_c), s	2.8	15.2	0.0	7.9	76.5	0.0	10.0	10.5	0.0	20.5	7.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	46	1730		119	979		146	320		493	436	
V/C Ratio(X)	0.76	0.35		0.82	1.06		0.85	0.47		1.09	0.26	
Avail Cap(c_a), veh/h	61	1730		195	979		180	320		493	436	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	69.5	22.5	0.0	66.1	33.6	0.0	65.0	53.4	0.0	61.6	45.0	0.0
Incr Delay (d2), s/veh	30.7	0.6	0.0	12.7	46.6	0.0	25.3	4.8	0.0	65.7	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	6.3	0.0	3.9	44.8	0.0	5.5	5.2	0.0	13.4	3.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.2	23.1	0.0	78.8	80.3	0.0	90.3	58.2	0.0	127.4	46.4	0.0
LnGrp LOS	F	C		E	F		F	E		F	D	
Approach Vol, veh/h		640	A		1137	A		273	A		647	A
Approach Delay, s/veh		27.3			80.1			72.7			113.3	
Approach LOS		C			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	75.0	25.0	29.5	8.3	81.0	16.5	38.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.0	65.5	20.5	25.0	5.0	76.5	14.8	30.7
Max Q Clear Time (g_c+I1), s	9.9	17.2	22.5	12.5	4.8	78.5	12.0	9.0
Green Ext Time (p_c), s	0.1	4.4	0.0	0.5	0.0	0.0	0.1	0.5

Intersection Summary		
HCM 6th Ctrl Delay		74.8
HCM 6th LOS		E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Short Term Background Traffic PM
7: Shield Dr & Elk River Rd

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	52	94	65	189	75	7
Future Vol, veh/h	52	94	65	189	75	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	74	74	81	81
Heavy Vehicles, %	0	0	4	4	2	2
Mvmt Flow	98	177	88	255	93	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	343	0	-	0	589	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	373	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1227	-	-	-	471	824
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1227	-	-	-	429	824
Mov Cap-2 Maneuver	-	-	-	-	429	-
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1227	-	-	-	447
HCM Lane V/C Ratio	0.08	-	-	-	0.226
HCM Control Delay (s)	8.2	0	-	-	15.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9

Intersection	
Int Delay, s/veh	40.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	123	0	1	15	125	1543	0	6	1171	6
Future Vol, veh/h	3	0	123	0	1	15	125	1543	0	6	1171	6
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	-	-	-	-	-	-	50	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	69	69	69	94	94	94	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	5	0	205	0	1	22	133	1641	0	7	1331	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3264	3252	666	2587	3259	1641	1338	0	0	1641	0	0
Stage 1	1345	1345	-	1907	1907	-	-	-	-	-	-	-
Stage 2	1919	1907	-	680	1352	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	5	9	407	15	9	125	505	-	-	389	-	-
Stage 1	163	222	-	89	118	-	-	-	-	-	-	-
Stage 2	88	118	-	412	220	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 3	6	407	6	6	125	505	-	-	389	-	-
Mov Cap-2 Maneuver	~ 3	6	-	6	6	-	-	-	-	-	-	-
Stage 1	120	206	-	66	87	-	-	-	-	-	-	-
Stage 2	53	87	-	190	205	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 628	108.8	1.1	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	505	-	-	97	56	389	-	-
HCM Lane V/C Ratio	0.263	-	-	2.165	0.414	0.018	-	-
HCM Control Delay (s)	14.7	-	-	$ 628	108.8	14.4	0.5	-
HCM Lane LOS	B	-	-	F	F	B	A	-
HCM 95th %tile Q(veh)	1	-	-	18.4	1.5	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Short Term Background Traffic PM
16: Elk River Rd & Curve Plaza

Intersection	
Int Delay, s/veh	13.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↑	↱
Traffic Vol, veh/h	225	0	39	0	0	0	96	145	0	0	45	168
Future Vol, veh/h	225	0	39	0	0	0	96	145	0	0	45	168
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	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	59	59	59	85	85	85
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	256	0	44	0	0	0	163	246	0	0	53	198

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	625	625	53	746	823	246	251	0	0	-	-	0
Stage 1	53	53	-	572	572	-	-	-	-	-	-	-
Stage 2	572	572	-	174	251	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.1	6.5	6.2	4.14	-	-	-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.5	4	3.3	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	399	403	1017	332	311	798	1303	-	-	0	-	-
Stage 1	962	853	-	509	508	-	-	-	-	0	-	-
Stage 2	507	506	-	833	703	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	355	345	1017	282	266	798	1303	-	-	-	-	-
Mov Cap-2 Maneuver	355	345	-	282	266	-	-	-	-	-	-	-
Stage 1	823	853	-	435	434	-	-	-	-	-	-	-
Stage 2	433	433	-	797	703	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.3	0	3.2	0
HCM LOS	E	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1303	-	-	393	-	-	-
HCM Lane V/C Ratio	0.125	-	-	0.763	-	-	-
HCM Control Delay (s)	8.2	0	-	38.3	0	-	-
HCM Lane LOS	A	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	6.3	-	-	-

Short Term Background Traffic PM
20: Shield Dr & Curve Plaza

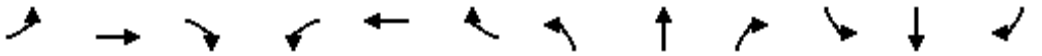
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	254	0	0	173
Future Vol, veh/h	0	0	254	0	0	173
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	79	79	74	74
Heavy Vehicles, %	2	2	4	4	1	1
Mvmt Flow	0	0	322	0	0	234

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	556	322	0	0	322	0
Stage 1	322	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	492	719	-	-	1244	-
Stage 1	735	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	492	719	-	-	1244	-
Mov Cap-2 Maneuver	492	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	805	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1244	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1074	84	71	478	390	71	117	118	469	116	48
Future Volume (veh/h)	49	1074	84	71	478	390	71	117	118	469	116	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1752	1752	1752	1870	1870	1870
Adj Flow Rate, veh/h	56	1220	0	88	590	0	81	133	0	558	138	0
Peak Hour Factor	0.88	0.88	0.88	0.81	0.81	0.81	0.88	0.88	0.88	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	10	10	10	2	2	2
Cap, veh/h	72	1279		101	704		102	417		589	650	
Arrive On Green	0.04	0.36	0.00	0.06	0.38	0.00	0.06	0.24	0.00	0.17	0.35	0.00
Sat Flow, veh/h	1767	3526	1572	1767	1856	1572	1668	1752	1485	3456	1870	1585
Grp Volume(v), veh/h	56	1220	0	88	590	0	81	133	0	558	138	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1856	1572	1668	1752	1485	1728	1870	1585
Q Serve(g_s), s	3.3	35.4	0.0	5.2	30.4	0.0	5.0	6.6	0.0	16.8	5.5	0.0
Cycle Q Clear(g_c), s	3.3	35.4	0.0	5.2	30.4	0.0	5.0	6.6	0.0	16.8	5.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	72	1279		101	704		102	417		589	650	
V/C Ratio(X)	0.78	0.95		0.87	0.84		0.80	0.32		0.95	0.21	
Avail Cap(c_a), veh/h	84	1279		101	704		168	417		589	650	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.9	32.6	0.0	49.1	29.6	0.0	48.6	33.0	0.0	43.1	24.1	0.0
Incr Delay (d2), s/veh	32.0	16.3	0.0	51.2	11.4	0.0	13.0	2.0	0.0	24.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	17.1	0.0	3.7	15.0	0.0	2.4	2.9	0.0	9.0	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.0	48.9	0.0	100.3	41.1	0.0	61.7	35.0	0.0	67.7	24.9	0.0
LnGrp LOS	F	D		F	D		E	C		E	C	
Approach Vol, veh/h		1276	A		678	A		214	A		696	A
Approach Delay, s/veh		50.3			48.8			45.1			59.2	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	42.6	22.4	29.5	8.8	44.3	10.9	41.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.0	38.1	17.9	25.0	5.0	39.1	10.6	32.3
Max Q Clear Time (g_c+I1), s	7.2	37.4	18.8	8.6	5.3	32.4	7.0	7.5
Green Ext Time (p_c), s	0.0	0.5	0.0	0.5	0.0	2.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	51.7
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	131	61	148	110	30
Future Vol, veh/h	19	131	61	148	110	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	54	54	91	91	77	77
Heavy Vehicles, %	0	0	13	13	3	3
Mvmt Flow	35	243	67	163	143	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	230	0	-	0	462	149
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	313	-
Critical Hdwy	4.1	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1350	-	-	-	556	895
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	739	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1350	-	-	-	539	895
Mov Cap-2 Maneuver	-	-	-	-	539	-
Stage 1	-	-	-	-	850	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1350	-	-	-	589
HCM Lane V/C Ratio	0.026	-	-	-	0.309
HCM Control Delay (s)	7.7	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.3

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	58	0	0	9	177	955	1	28	1637	4
Future Vol, veh/h	0	0	58	0	0	9	177	955	1	28	1637	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	-	-	-	-	-	-	50	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	64	64	64	75	75	75	80	80	80	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	0	0	91	0	0	12	221	1194	1	31	1799	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3504	3498	900	2599	3502	1195	1803	0	0	1195	0	0
Stage 1	1861	1861	-	1637	1637	-	-	-	-	-	-	-
Stage 2	1643	1637	-	962	1865	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	3	6	285	15	6	229	333	-	-	577	-	-
Stage 1	77	124	-	128	160	-	-	-	-	-	-	-
Stage 2	127	160	-	279	124	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	1	2	285	5	2	229	333	-	-	577	-	-
Mov Cap-2 Maneuver	1	2	-	5	2	-	-	-	-	-	-	-
Stage 1	26	124	-	43	54	-	-	-	-	-	-	-
Stage 2	40	54	-	190	124	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.4	21.6	5.4	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	333	-	-	285	229	577	-	-
HCM Lane V/C Ratio	0.664	-	-	0.318	0.052	0.053	-	-
HCM Control Delay (s)	34.8	-	-	23.4	21.6	11.6	0	-
HCM Lane LOS	D	-	-	C	C	B	A	-
HCM 95th %tile Q(veh)	4.5	-	-	1.3	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱		↕			↑	↱
Traffic Vol, veh/h	173	0	32	0	0	36	71	97	0	0	109	165
Future Vol, veh/h	173	0	32	0	0	36	71	97	0	0	109	165
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	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	92	92	92	94	94	94	88	88	88
Heavy Vehicles, %	2	2	2	0	0	0	16	16	16	1	1	1
Mvmt Flow	201	0	37	0	0	39	76	103	0	0	124	188

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	399	379	124	-	-	103	312	0	0	-	-	0
Stage 1	124	124	-	-	-	-	-	-	-	-	-	-
Stage 2	275	255	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	-	-	6.2	4.26	-	-	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	3.3	2.344	-	-	-	-	-
Pot Cap-1 Maneuver	561	553	927	0	0	957	1173	-	-	0	-	-
Stage 1	880	793	-	0	0	-	-	-	-	0	-	-
Stage 2	731	696	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	510	515	927	-	-	957	1173	-	-	-	-	-
Mov Cap-2 Maneuver	510	515	-	-	-	-	-	-	-	-	-	-
Stage 1	819	793	-	-	-	-	-	-	-	-	-	-
Stage 2	653	648	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	8.9	3.5	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1173	-	-	549	957	-	-
HCM Lane V/C Ratio	0.064	-	-	0.434	0.041	-	-
HCM Control Delay (s)	8.3	0	-	16.5	8.9	-	-
HCM Lane LOS	A	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	3	203	3	29	210
Future Vol, veh/h	7	3	203	3	29	210
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	95	95	62	62
Heavy Vehicles, %	2	2	14	14	1	1
Mvmt Flow	8	3	214	3	47	339

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	649	216	0	0	217	0
Stage 1	216	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	434	824	-	-	1359	-
Stage 1	820	-	-	-	-	-
Stage 2	654	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	415	824	-	-	1359	-
Mov Cap-2 Maneuver	415	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	626	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	488	1359	-
HCM Lane V/C Ratio	-	-	0.022	0.034	-
HCM Control Delay (s)	-	-	12.5	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	1.5

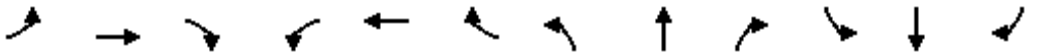
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	31	2	18	179	26	1	0	6	21	0	0
Future Vol, veh/h	0	31	2	18	179	26	1	0	6	21	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	34	2	20	195	28	1	0	7	23	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	223	0	0	36	0	0	284	298	35	288	285	209
Stage 1	-	-	-	-	-	-	35	35	-	249	249	-
Stage 2	-	-	-	-	-	-	249	263	-	39	36	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1346	-	-	1575	-	-	668	614	1038	664	624	831
Stage 1	-	-	-	-	-	-	981	866	-	755	701	-
Stage 2	-	-	-	-	-	-	755	691	-	976	865	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1346	-	-	1575	-	-	661	605	1038	652	615	831
Mov Cap-2 Maneuver	-	-	-	-	-	-	661	605	-	652	615	-
Stage 1	-	-	-	-	-	-	981	866	-	755	690	-
Stage 2	-	-	-	-	-	-	744	681	-	970	865	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	8.8	10.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	960	1346	-	-	1575	-	-	652
HCM Lane V/C Ratio	0.008	-	-	-	0.012	-	-	0.035
HCM Control Delay (s)	8.8	0	-	-	7.3	0	-	10.7
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Short Term Build PM
6: Elk River Rd & US-40



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	575	43	94	978	462	102	119	172	444	102	96
Future Volume (veh/h)	33	575	43	94	978	462	102	119	172	444	102	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	35	605	0	100	1040	0	136	159	0	535	123	0
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.75	0.75	0.75	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	2	2	2
Cap, veh/h	46	1723		122	979		158	320		493	423	
Arrive On Green	0.03	0.49	0.00	0.07	0.53	0.00	0.09	0.17	0.00	0.14	0.23	0.00
Sat Flow, veh/h	1767	3526	1572	1753	1841	1560	1753	1841	1560	3456	1870	1585
Grp Volume(v), veh/h	35	605	0	100	1040	0	136	159	0	535	123	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1753	1841	1560	1753	1841	1560	1728	1870	1585
Q Serve(g_s), s	2.8	15.2	0.0	8.1	76.5	0.0	11.0	11.2	0.0	20.5	7.8	0.0
Cycle Q Clear(g_c), s	2.8	15.2	0.0	8.1	76.5	0.0	11.0	11.2	0.0	20.5	7.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	46	1723		122	979		158	320		493	423	
V/C Ratio(X)	0.76	0.35		0.82	1.06		0.86	0.50		1.09	0.29	
Avail Cap(c_a), veh/h	61	1723		195	979		182	320		493	423	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	69.5	22.7	0.0	66.0	33.6	0.0	64.5	53.7	0.0	61.6	46.1	0.0
Incr Delay (d2), s/veh	30.7	0.6	0.0	13.6	46.6	0.0	28.7	5.4	0.0	65.7	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	6.4	0.0	4.0	44.8	0.0	6.1	5.6	0.0	13.4	3.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.2	23.2	0.0	79.6	80.3	0.0	93.2	59.1	0.0	127.4	47.8	0.0
LnGrp LOS	F	C		E	F		F	E		F	D	
Approach Vol, veh/h		640	A		1140	A		295	A		658	A
Approach Delay, s/veh		27.5			80.2			74.8			112.5	
Approach LOS		C			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	74.8	25.0	29.5	8.3	81.0	17.5	37.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.0	65.5	20.5	25.0	5.0	76.5	14.9	30.6
Max Q Clear Time (g_c+I1), s	10.1	17.2	22.5	13.2	4.8	78.5	13.0	9.8
Green Ext Time (p_c), s	0.1	4.4	0.0	0.5	0.0	0.0	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	75.0
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	61.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	512	1	58	1057	162	3	1	29	107	3	118
Future Vol, veh/h	48	512	1	58	1057	162	3	1	29	107	3	118
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	-	-	Free	-	-	None
Storage Length	100	-	0	50	-	250	-	-	25	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	91	91	91	72	72	72	91	91	91
Heavy Vehicles, %	4	4	4	4	4	4	0	0	0	2	2	2
Mvmt Flow	55	582	1	64	1162	178	4	1	40	118	3	130

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1340	0	0	583	0	0	2138	2160	-	1983	1983	1162
Stage 1	-	-	-	-	-	-	692	692	-	1290	1290	-
Stage 2	-	-	-	-	-	-	1446	1468	-	693	693	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.1	6.5	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.5	4	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	508	-	-	982	-	-	36	48	0	~ 46	61	237
Stage 1	-	-	-	-	-	-	437	448	0	201	234	-
Stage 2	-	-	-	-	-	-	165	194	0	434	445	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	508	-	-	982	-	-	14	40	-	~ 39	51	237
Mov Cap-2 Maneuver	-	-	-	-	-	-	14	40	-	~ 39	51	-
Stage 1	-	-	-	-	-	-	390	400	-	179	219	-
Stage 2	-	-	-	-	-	-	69	181	-	386	397	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.4	297.9	$ 552.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	17	-	508	-	-	982	-	-	39	217
HCM Lane V/C Ratio	0.327	-	0.107	-	-	0.065	-	-	3.015	0.613
HCM Control Delay (s)	297.9	0	12.9	-	-	8.9	-	-	$ 1125.8	44.8
HCM Lane LOS	F	A	B	-	-	A	-	-	F	E
HCM 95th %tile Q(veh)	0.9	-	0.4	-	-	0.2	-	-	13.2	3.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	52	97	67	189	98	7
Future Vol, veh/h	52	97	67	189	98	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	74	74	81	81
Heavy Vehicles, %	0	0	4	4	2	2
Mvmt Flow	98	183	91	255	121	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	346	0	-	0	598	219
Stage 1	-	-	-	-	219	-
Stage 2	-	-	-	-	379	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1224	-	-	-	465	821
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	692	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1224	-	-	-	424	821
Mov Cap-2 Maneuver	-	-	-	-	424	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	692	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1224	-	-	-	438
HCM Lane V/C Ratio	0.08	-	-	-	0.296
HCM Control Delay (s)	8.2	0	-	-	16.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	1.2

Intersection	
Int Delay, s/veh	73.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	138	0	1	15	148	1546	0	6	1178	6
Future Vol, veh/h	3	0	138	0	1	15	148	1546	0	6	1178	6
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	-	-	-	-	-	-	50	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	69	69	69	94	94	94	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	5	0	230	0	1	22	157	1645	0	7	1339	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3324	3312	670	2643	3319	1645	1346	0	0	1645	0	0
Stage 1	1353	1353	-	1959	1959	-	-	-	-	-	-	-
Stage 2	1971	1959	-	684	1360	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	~ 4	9	404	13	9	124	501	-	-	387	-	-
Stage 1	161	220	-	83	111	-	-	-	-	-	-	-
Stage 2	82	111	-	410	218	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 2	6	404	4	6	124	501	-	-	387	-	-
Mov Cap-2 Maneuver	~ 2	6	-	4	6	-	-	-	-	-	-	-
Stage 1	111	204	-	57	76	-	-	-	-	-	-	-
Stage 2	46	76	-	164	202	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	1040.1	108.8	1.3	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	501	-	-	77	56	387	-	-
HCM Lane V/C Ratio	0.314	-	-	3.052	0.414	0.018	-	-
HCM Control Delay (s)	15.4	-	-	$ 1040.1	108.8	14.5	0.5	-
HCM Lane LOS	C	-	-	F	F	B	A	-
HCM 95th %tile Q(veh)	1.3	-	-	23.5	1.5	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	16.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱		↕			↑	↱
Traffic Vol, veh/h	225	0	39	0	0	22	96	145	0	0	68	168
Future Vol, veh/h	225	0	39	0	0	22	96	145	0	0	68	168
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	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	59	59	59	85	85	85
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	256	0	44	0	0	24	163	246	0	0	80	198

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	664	652	80	-	-	246	278	0	0	-	-	0
Stage 1	80	80	-	-	-	-	-	-	-	-	-	-
Stage 2	584	572	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	-	-	6.2	4.14	-	-	-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	-	-	3.3	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	375	388	983	0	0	798	1273	-	-	0	-	-
Stage 1	931	830	-	0	0	-	-	-	-	0	-	-
Stage 2	499	506	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	323	331	983	-	-	798	1273	-	-	-	-	-
Mov Cap-2 Maneuver	323	331	-	-	-	-	-	-	-	-	-	-
Stage 1	793	830	-	-	-	-	-	-	-	-	-	-
Stage 2	412	431	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	49.7	9.7	3.3	0
HCM LOS	E	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1273	-	-	359	798	-	-
HCM Lane V/C Ratio	0.128	-	-	0.836	0.03	-	-
HCM Control Delay (s)	8.2	0	-	49.7	9.7	-	-
HCM Lane LOS	A	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	7.5	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	2	254	3	25	173
Future Vol, veh/h	4	2	254	3	25	173
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	79	79	74	74
Heavy Vehicles, %	2	2	4	4	1	1
Mvmt Flow	4	2	322	4	34	234

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	626	324	0	0	326	0
Stage 1	324	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	448	717	-	-	1239	-
Stage 1	733	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	434	717	-	-	1239	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	726	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	500	1239	-
HCM Lane V/C Ratio	-	-	0.013	0.027	-
HCM Control Delay (s)	-	-	12.3	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	102	2	17	132	24	3	0	26	13	0	0
Future Vol, veh/h	0	102	2	17	132	24	3	0	26	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	-	-	-	-	-	-	-	-	-	-	-	-
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	111	2	18	143	26	3	0	28	14	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	169	0	0	113	0	0	304	317	112	318	305	156
Stage 1	-	-	-	-	-	-	112	112	-	192	192	-
Stage 2	-	-	-	-	-	-	192	205	-	126	113	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1409	-	-	1476	-	-	648	599	941	635	608	890
Stage 1	-	-	-	-	-	-	893	803	-	810	742	-
Stage 2	-	-	-	-	-	-	810	732	-	878	802	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1409	-	-	1476	-	-	641	591	941	610	599	890
Mov Cap-2 Maneuver	-	-	-	-	-	-	641	591	-	610	599	-
Stage 1	-	-	-	-	-	-	893	803	-	810	732	-
Stage 2	-	-	-	-	-	-	799	722	-	852	802	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	9.2	11
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	898	1409	-	-	1476	-	-	610
HCM Lane V/C Ratio	0.035	-	-	-	0.013	-	-	0.023
HCM Control Delay (s)	9.2	0	-	-	7.5	0	-	11
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	149	70	169	123	35
Future Vol, veh/h	22	149	70	169	123	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	54	54	91	91	77	77
Heavy Vehicles, %	0	0	13	13	3	3
Mvmt Flow	41	276	77	186	160	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	263	0	-	0	528	170
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	4.1	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1313	-	-	-	509	871
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1313	-	-	-	490	871
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1313	-	-	-	543
HCM Lane V/C Ratio	0.031	-	-	-	0.378
HCM Control Delay (s)	7.8	0	-	-	15.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.8

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	62	0	0	10	199	1092	2	32	1872	5
Future Vol, veh/h	0	0	62	0	0	10	199	1092	2	32	1872	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	-	-	-	-	-	-	50	-	-	50	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	64	64	64	75	75	75	80	80	80	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	0	0	97	0	0	13	249	1365	3	35	2057	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3998	3993	1029	2964	3997	1367	2062	0	0	1368	0	0
Stage 1	2127	2127	-	1865	1865	-	-	-	-	-	-	-
Stage 2	1871	1866	-	1099	2132	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	1	3	234	8	3	182	263	-	-	496	-	-
Stage 1	52	91	-	95	124	-	-	-	-	-	-	-
Stage 2	94	123	-	230	91	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	0	0	234	1	0	182	263	-	-	496	-	-
Mov Cap-2 Maneuver	0	0	-	1	0	-	-	-	-	-	-	-
Stage 1	3	85	-	5	7	-	-	-	-	-	-	-
Stage 2	5	7	-	125	85	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.8	26.3	12.9	0.2
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	263	-	-	234	182	496	-	-
HCM Lane V/C Ratio	0.946	-	-	0.414	0.073	0.071	-	-
HCM Control Delay (s)	83.8	-	-	30.8	26.3	12.8	-	-
HCM Lane LOS	F	-	-	D	D	B	-	-
HCM 95th %tile Q(veh)	8.8	-	-	1.9	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱		↕			↑	↱
Traffic Vol, veh/h	198	0	37	0	0	36	81	111	0	0	121	189
Future Vol, veh/h	198	0	37	0	0	36	81	111	0	0	121	189
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	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	92	92	92	94	94	94	88	88	88
Heavy Vehicles, %	2	2	2	0	0	0	16	16	16	1	1	1
Mvmt Flow	230	0	43	0	0	39	86	118	0	0	138	215

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	448	428	138	-	-	118	353	0	0	-	-	0
Stage 1	138	138	-	-	-	-	-	-	-	-	-	-
Stage 2	310	290	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	-	-	6.2	4.26	-	-	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	3.3	2.344	-	-	-	-	-
Pot Cap-1 Maneuver	521	519	910	0	0	939	1132	-	-	0	-	-
Stage 1	865	782	-	0	0	-	-	-	-	0	-	-
Stage 2	700	672	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	468	477	910	-	-	939	1132	-	-	-	-	-
Mov Cap-2 Maneuver	468	477	-	-	-	-	-	-	-	-	-	-
Stage 1	795	782	-	-	-	-	-	-	-	-	-	-
Stage 2	616	618	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.1	9	3.6	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1132	-	-	507	939	-	-
HCM Lane V/C Ratio	0.076	-	-	0.539	0.042	-	-
HCM Control Delay (s)	8.4	0	-	20.1	9	-	-
HCM Lane LOS	A	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	3	232	3	29	241
Future Vol, veh/h	7	3	232	3	29	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	95	95	62	62
Heavy Vehicles, %	2	2	14	14	1	1
Mvmt Flow	8	3	244	3	47	389

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	729	246	0	0	247	0
Stage 1	246	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	390	793	-	-	1325	-
Stage 1	795	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	372	793	-	-	1325	-
Mov Cap-2 Maneuver	372	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	442	1325	-
HCM Lane V/C Ratio	-	-	0.025	0.035	-
HCM Control Delay (s)	-	-	13.4	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	36	2	18	204	26	1	0	6	21	0	0
Future Vol, veh/h	0	36	2	18	204	26	1	0	6	21	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	4	4	2	2	2	2	2	2
Mvmt Flow	0	39	2	20	222	28	1	0	7	23	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	250	0	0	41	0	0	316	330	40	320	317	236
Stage 1	-	-	-	-	-	-	40	40	-	276	276	-
Stage 2	-	-	-	-	-	-	276	290	-	44	41	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.2	-	-	2.236	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1327	-	-	1556	-	-	637	589	1031	633	599	803
Stage 1	-	-	-	-	-	-	975	862	-	730	682	-
Stage 2	-	-	-	-	-	-	730	672	-	970	861	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1327	-	-	1556	-	-	630	580	1031	622	590	803
Mov Cap-2 Maneuver	-	-	-	-	-	-	630	580	-	622	590	-
Stage 1	-	-	-	-	-	-	975	862	-	730	672	-
Stage 2	-	-	-	-	-	-	719	662	-	964	861	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	8.8	11
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	945	1327	-	-	1556	-	-	622
HCM Lane V/C Ratio	0.008	-	-	-	0.013	-	-	0.037
HCM Control Delay (s)	8.8	0	-	-	7.3	0	-	11
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	1229	94	81	546	447	80	133	133	536	131	55
Future Volume (veh/h)	56	1229	94	81	546	447	80	133	133	536	131	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1752	1752	1752	1870	1870	1870
Adj Flow Rate, veh/h	64	1397	0	100	674	0	91	151	0	638	156	0
Peak Hour Factor	0.88	0.88	0.88	0.81	0.81	0.81	0.88	0.88	0.88	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	10	10	10	2	2	2
Cap, veh/h	79	1430		110	785		112	350		650	600	
Arrive On Green	0.04	0.41	0.00	0.06	0.42	0.00	0.07	0.20	0.00	0.19	0.32	0.00
Sat Flow, veh/h	1767	3526	1572	1767	1856	1572	1668	1752	1485	3456	1870	1585
Grp Volume(v), veh/h	64	1397	0	100	674	0	91	151	0	638	156	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1856	1572	1668	1752	1485	1728	1870	1585
Q Serve(g_s), s	4.5	48.8	0.0	7.0	41.1	0.0	6.7	9.4	0.0	23.0	7.7	0.0
Cycle Q Clear(g_c), s	4.5	48.8	0.0	7.0	41.1	0.0	6.7	9.4	0.0	23.0	7.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	79	1430		110	785		112	350		650	600	
V/C Ratio(X)	0.81	0.98		0.91	0.86		0.81	0.43		0.98	0.26	
Avail Cap(c_a), veh/h	79	1430		110	785		184	350		650	600	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	59.2	36.6	0.0	58.2	32.7	0.0	57.5	43.8	0.0	50.5	31.5	0.0
Incr Delay (d2), s/veh	44.3	18.9	0.0	57.3	11.7	0.0	12.8	3.8	0.0	30.7	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	23.8	0.0	4.9	20.2	0.0	3.2	4.4	0.0	12.5	3.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.5	55.5	0.0	115.6	44.4	0.0	70.3	47.6	0.0	81.2	32.5	0.0
LnGrp LOS	F	E		F	D		E	D		F	C	
Approach Vol, veh/h		1461	A		774	A		242	A		794	A
Approach Delay, s/veh		57.6			53.6			56.1			71.7	
Approach LOS		E			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	55.2	28.0	29.5	10.1	57.4	12.9	44.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.8	50.7	23.5	25.0	5.6	52.9	13.8	34.7
Max Q Clear Time (g_c+I1), s	9.0	50.8	25.0	11.4	6.5	43.1	8.7	9.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	3.0	0.1	0.7

Intersection Summary	
HCM 6th Ctrl Delay	59.9
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	110	77	216	109	8
Future Vol, veh/h	60	110	77	216	109	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	74	74	81	81
Heavy Vehicles, %	0	0	4	4	2	2
Mvmt Flow	113	208	104	292	135	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	396	0	-	0	684	250
Stage 1	-	-	-	-	250	-
Stage 2	-	-	-	-	434	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1174	-	-	-	414	789
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1174	-	-	-	369	789
Mov Cap-2 Maneuver	-	-	-	-	369	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	653	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	20
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1174	-	-	-	383
HCM Lane V/C Ratio	0.096	-	-	-	0.377
HCM Control Delay (s)	8.4	0	-	-	20
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	1.7

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	156	0	2	17	166	1768	0	7	1346	7
Future Vol, veh/h	3	0	156	0	2	17	166	1768	0	7	1346	7
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	-	-	-	-	-	-	50	-	-	50	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	69	69	69	94	94	94	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	5	0	260	0	3	25	177	1881	0	8	1530	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3795	3781	765	3016	3789	1881	1538	0	0	1881	0	0
Stage 1	1546	1546	-	2235	2235	-	-	-	-	-	-	-
Stage 2	2249	2235	-	781	1554	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	~ 2	4	350	7	4	90	422	-	-	314	-	-
Stage 1	122	178	-	57	80	-	-	-	-	-	-	-
Stage 2	56	80	-	358	176	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	2	350	1	~ 2	90	422	-	-	314	-	-
Mov Cap-2 Maneuver	-	2	-	1	~ 2	-	-	-	-	-	-	-
Stage 1	71	174	-	33	46	-	-	-	-	-	-	-
Stage 2	22	46	-	90	172	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 840.1	1.7	0.1
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	422	-	-	-	16	314	-	-
HCM Lane V/C Ratio	0.418	-	-	-	1.721	0.025	-	-
HCM Control Delay (s)	19.5	-	-	-	$ 840.1	16.8	-	-
HCM Lane LOS	C	-	-	-	F	C	-	-
HCM 95th %tile Q(veh)	2	-	-	-	4	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	38.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱		↕			↑	↱
Traffic Vol, veh/h	257	0	45	0	0	22	110	166	0	0	74	193
Future Vol, veh/h	257	0	45	0	0	22	110	166	0	0	74	193
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	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	59	59	59	85	85	85
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	292	0	51	0	0	24	186	281	0	0	87	227

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	752	740	87	-	-	281	314	0	0	-	-	0
Stage 1	87	87	-	-	-	-	-	-	-	-	-	-
Stage 2	665	653	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	-	-	6.2	4.14	-	-	-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	-	-	3.3	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	328	346	974	0	0	763	1235	-	-	0	-	-
Stage 1	923	825	-	0	0	-	-	-	-	0	-	-
Stage 2	451	465	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 274	284	974	-	-	763	1235	-	-	-	-	-
Mov Cap-2 Maneuver	~ 274	284	-	-	-	-	-	-	-	-	-	-
Stage 1	758	825	-	-	-	-	-	-	-	-	-	-
Stage 2	359	382	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	124.5	9.9	3.4	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1235	-	-	307	763	-	-
HCM Lane V/C Ratio	0.151	-	-	1.118	0.031	-	-
HCM Control Delay (s)	8.4	0	-	124.5	9.9	-	-
HCM Lane LOS	A	A	-	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	13.8	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	2	291	3	25	198
Future Vol, veh/h	4	2	291	3	25	198
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	79	79	74	74
Heavy Vehicles, %	2	2	4	4	1	1
Mvmt Flow	4	2	368	4	34	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	706	370	0	0	372	0
Stage 1	370	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	402	676	-	-	1192	-
Stage 1	699	-	-	-	-	-
Stage 2	724	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	388	676	-	-	1192	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	699	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	452	1192	-
HCM Lane V/C Ratio	-	-	0.014	0.028	-
HCM Control Delay (s)	-	-	13.1	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	121	2	17	151	24	3	0	26	13	0	0
Future Vol, veh/h	0	121	2	17	151	24	3	0	26	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	4	4	2	2	2	2	2	2
Mvmt Flow	0	132	2	18	164	26	3	0	28	14	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	190	0	0	134	0	0	346	359	133	360	347	177
Stage 1	-	-	-	-	-	-	133	133	-	213	213	-
Stage 2	-	-	-	-	-	-	213	226	-	147	134	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.2	-	-	2.236	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1396	-	-	1438	-	-	608	568	916	596	576	866
Stage 1	-	-	-	-	-	-	870	786	-	789	726	-
Stage 2	-	-	-	-	-	-	789	717	-	856	785	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1396	-	-	1438	-	-	601	560	916	572	568	866
Mov Cap-2 Maneuver	-	-	-	-	-	-	601	560	-	572	568	-
Stage 1	-	-	-	-	-	-	870	786	-	789	716	-
Stage 2	-	-	-	-	-	-	778	707	-	830	785	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	9.3	11.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	869	1396	-	-	1438	-	-	572
HCM Lane V/C Ratio	0.036	-	-	-	0.013	-	-	0.025
HCM Control Delay (s)	9.3	0	-	-	7.5	0	-	11.5
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	658	48	107	1119	528	115	135	195	508	115	110
Future Volume (veh/h)	38	658	48	107	1119	528	115	135	195	508	115	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	40	693	0	114	1190	0	153	180	0	612	139	0
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.75	0.75	0.75	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	2	2	2
Cap, veh/h	53	1578		139	915		178	372		433	422	
Arrive On Green	0.03	0.45	0.00	0.08	0.50	0.00	0.10	0.20	0.00	0.13	0.23	0.00
Sat Flow, veh/h	1767	3526	1572	1753	1841	1560	1753	1841	1560	3456	1870	1585
Grp Volume(v), veh/h	40	693	0	114	1190	0	153	180	0	612	139	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1753	1841	1560	1753	1841	1560	1728	1870	1585
Q Serve(g_s), s	2.8	16.7	0.0	7.9	61.5	0.0	10.6	10.7	0.0	15.5	7.7	0.0
Cycle Q Clear(g_c), s	2.8	16.7	0.0	7.9	61.5	0.0	10.6	10.7	0.0	15.5	7.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	53	1578		139	915		178	372		433	422	
V/C Ratio(X)	0.75	0.44		0.82	1.30		0.86	0.48		1.41	0.33	
Avail Cap(c_a), veh/h	71	1578		227	915		180	372		433	422	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	59.5	23.5	0.0	56.1	31.1	0.0	54.7	43.7	0.0	54.1	40.1	0.0
Incr Delay (d2), s/veh	25.6	0.9	0.0	11.2	143.4	0.0	31.5	4.5	0.0	199.5	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	6.9	0.0	3.9	61.8	0.0	6.2	5.3	0.0	18.6	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.1	24.4	0.0	67.3	174.5	0.0	86.3	48.1	0.0	253.6	42.1	0.0
LnGrp LOS	F	C		E	F		F	D		F	D	
Approach Vol, veh/h		733	A		1304	A		333	A		751	A
Approach Delay, s/veh		27.7			165.1			65.6			214.4	
Approach LOS		C			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	59.9	20.0	29.5	8.2	66.0	17.1	32.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.0	50.5	15.5	25.0	5.0	61.5	12.7	27.8
Max Q Clear Time (g_c+I1), s	9.9	18.7	17.5	12.7	4.8	63.5	12.6	9.7
Green Ext Time (p_c), s	0.1	4.9	0.0	0.6	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	134.1
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Long Term Total AM
6: Elk River Rd & US-40

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	1229	95	81	546	447	82	135	135	536	132	55
Future Volume (veh/h)	56	1229	95	81	546	447	82	135	135	536	132	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1752	1752	1752	1870	1870	1870
Adj Flow Rate, veh/h	64	1397	0	100	674	0	93	153	0	638	157	0
Peak Hour Factor	0.88	0.88	0.88	0.81	0.81	0.81	0.88	0.88	0.88	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	10	10	10	2	2	2
Cap, veh/h	79	1430		110	785		115	350		650	597	
Arrive On Green	0.04	0.41	0.00	0.06	0.42	0.00	0.07	0.20	0.00	0.19	0.32	0.00
Sat Flow, veh/h	1767	3526	1572	1767	1856	1572	1668	1752	1485	3456	1870	1585
Grp Volume(v), veh/h	64	1397	0	100	674	0	93	153	0	638	157	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1856	1572	1668	1752	1485	1728	1870	1585
Q Serve(g_s), s	4.5	48.8	0.0	7.0	41.1	0.0	6.9	9.6	0.0	23.0	7.8	0.0
Cycle Q Clear(g_c), s	4.5	48.8	0.0	7.0	41.1	0.0	6.9	9.6	0.0	23.0	7.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	79	1430		110	785		115	350		650	597	
V/C Ratio(X)	0.81	0.98		0.91	0.86		0.81	0.44		0.98	0.26	
Avail Cap(c_a), veh/h	79	1430		110	785		184	350		650	597	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	59.2	36.6	0.0	58.2	32.7	0.0	57.4	43.8	0.0	50.5	31.6	0.0
Incr Delay (d2), s/veh	44.3	18.9	0.0	57.3	11.7	0.0	13.1	3.9	0.0	30.7	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	23.8	0.0	4.9	20.2	0.0	3.3	4.5	0.0	12.5	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.5	55.5	0.0	115.6	44.4	0.0	70.5	47.7	0.0	81.2	32.7	0.0
LnGrp LOS	F	E		F	D		E	D		F	C	
Approach Vol, veh/h		1461	A		774	A		246	A		795	A
Approach Delay, s/veh		57.6			53.6			56.3			71.6	
Approach LOS		E			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	55.2	28.0	29.5	10.1	57.4	13.1	44.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.8	50.7	23.5	25.0	5.6	52.9	13.8	34.7
Max Q Clear Time (g_c+I1), s	9.0	50.8	25.0	11.6	6.5	43.1	8.9	9.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.6	0.0	3.0	0.1	0.8

Intersection Summary	
HCM 6th Ctrl Delay	60.0
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	149	70	169	125	35
Future Vol, veh/h	22	149	70	169	125	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	54	54	91	91	77	77
Heavy Vehicles, %	0	0	13	13	3	3
Mvmt Flow	41	276	77	186	162	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	263	0	-	0	528	170
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	4.1	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1313	-	-	-	509	871
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1313	-	-	-	490	871
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1313	-	-	-	542
HCM Lane V/C Ratio	0.031	-	-	-	0.383
HCM Control Delay (s)	7.8	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.8

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	67	0	0	10	201	1092	2	32	1873	5
Future Vol, veh/h	0	0	67	0	0	10	201	1092	2	32	1873	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	-	-	-	-	-	-	50	-	-	50	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	64	64	64	75	75	75	80	80	80	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	0	0	105	0	0	13	251	1365	3	35	2058	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	4003	3998	1029	2968	4002	1367	2063	0	0	1368	0	0
Stage 1	2128	2128	-	1869	1869	-	-	-	-	-	-	-
Stage 2	1875	1870	-	1099	2133	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	1	3	234	8	3	182	263	-	-	496	-	-
Stage 1	52	91	-	94	123	-	-	-	-	-	-	-
Stage 2	93	123	-	230	90	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	0	0	234	1	0	182	263	-	-	496	-	-
Mov Cap-2 Maneuver	0	0	-	1	0	-	-	-	-	-	-	-
Stage 1	2	85	-	4	6	-	-	-	-	-	-	-
Stage 2	4	6	-	118	84	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.3	26.3	13.3	0.2
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	263	-	-	234	182	496	-	-
HCM Lane V/C Ratio	0.955	-	-	0.447	0.073	0.071	-	-
HCM Control Delay (s)	86	-	-	32.3	26.3	12.8	-	-
HCM Lane LOS	F	-	-	D	D	B	-	-
HCM 95th %tile Q(veh)	9	-	-	2.1	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱		↕			↑	↱
Traffic Vol, veh/h	198	0	37	0	0	43	81	111	0	0	123	189
Future Vol, veh/h	198	0	37	0	0	43	81	111	0	0	123	189
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	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	92	92	92	94	94	94	88	88	88
Heavy Vehicles, %	2	2	2	0	0	0	16	16	16	1	1	1
Mvmt Flow	230	0	43	0	0	47	86	118	0	0	140	215

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	454	430	140	-	-	118	355	0	0	-	-	0
Stage 1	140	140	-	-	-	-	-	-	-	-	-	-
Stage 2	314	290	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	-	-	6.2	4.26	-	-	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	3.3	2.344	-	-	-	-	-
Pot Cap-1 Maneuver	516	518	908	0	0	939	1130	-	-	0	-	-
Stage 1	863	781	-	0	0	-	-	-	-	0	-	-
Stage 2	697	672	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	460	476	908	-	-	939	1130	-	-	-	-	-
Mov Cap-2 Maneuver	460	476	-	-	-	-	-	-	-	-	-	-
Stage 1	793	781	-	-	-	-	-	-	-	-	-	-
Stage 2	609	618	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.6	9	3.6	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1130	-	-	499	939	-	-
HCM Lane V/C Ratio	0.076	-	-	0.548	0.05	-	-
HCM Control Delay (s)	8.4	0	-	20.6	9	-	-
HCM Lane LOS	A	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3.3	0.2	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	4	232	3	31	241
Future Vol, veh/h	8	4	232	3	31	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	95	95	62	62
Heavy Vehicles, %	2	2	14	14	1	1
Mvmt Flow	9	4	244	3	50	389

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	735	246	0	0	247	0
Stage 1	246	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	387	793	-	-	1325	-
Stage 1	795	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	368	793	-	-	1325	-
Mov Cap-2 Maneuver	368	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	586	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	448	1325	-
HCM Lane V/C Ratio	-	-	0.029	0.038	-
HCM Control Delay (s)	-	-	13.3	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	36	2	18	204	28	1	0	6	25	0	0
Future Vol, veh/h	0	36	2	18	204	28	1	0	6	25	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	4	4	2	2	2	2	2	2
Mvmt Flow	0	39	2	20	222	30	1	0	7	27	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	252	0	0	41	0	0	317	332	40	321	318	237
Stage 1	-	-	-	-	-	-	40	40	-	277	277	-
Stage 2	-	-	-	-	-	-	277	292	-	44	41	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.2	-	-	2.236	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1325	-	-	1556	-	-	636	588	1031	632	598	802
Stage 1	-	-	-	-	-	-	975	862	-	729	681	-
Stage 2	-	-	-	-	-	-	729	671	-	970	861	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1325	-	-	1556	-	-	629	579	1031	621	589	802
Mov Cap-2 Maneuver	-	-	-	-	-	-	629	579	-	621	589	-
Stage 1	-	-	-	-	-	-	975	862	-	729	671	-
Stage 2	-	-	-	-	-	-	718	661	-	964	861	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	8.8	11.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	945	1325	-	-	1556	-	-	621
HCM Lane V/C Ratio	0.008	-	-	-	0.013	-	-	0.044
HCM Control Delay (s)	8.8	0	-	-	7.3	0	-	11.1
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	658	56	109	1119	528	121	139	199	508	122	110
Future Volume (veh/h)	38	658	56	109	1119	528	121	139	199	508	122	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	40	693	0	116	1190	0	161	185	0	612	147	0
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.75	0.75	0.75	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	2	2	2
Cap, veh/h	53	1574		142	915		180	372		433	420	
Arrive On Green	0.03	0.45	0.00	0.08	0.50	0.00	0.10	0.20	0.00	0.13	0.22	0.00
Sat Flow, veh/h	1767	3526	1572	1753	1841	1560	1753	1841	1560	3456	1870	1585
Grp Volume(v), veh/h	40	693	0	116	1190	0	161	185	0	612	147	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1753	1841	1560	1753	1841	1560	1728	1870	1585
Q Serve(g_s), s	2.8	16.8	0.0	8.1	61.5	0.0	11.2	11.0	0.0	15.5	8.2	0.0
Cycle Q Clear(g_c), s	2.8	16.8	0.0	8.1	61.5	0.0	11.2	11.0	0.0	15.5	8.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	53	1574		142	915		180	372		433	420	
V/C Ratio(X)	0.75	0.44		0.82	1.30		0.89	0.50		1.41	0.35	
Avail Cap(c_a), veh/h	71	1574		227	915		180	372		433	420	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	59.5	23.6	0.0	56.0	31.1	0.0	54.9	43.8	0.0	54.1	40.4	0.0
Incr Delay (d2), s/veh	25.6	0.9	0.0	11.8	143.4	0.0	39.0	4.7	0.0	199.5	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	7.0	0.0	4.0	61.8	0.0	6.8	5.4	0.0	18.6	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.1	24.5	0.0	67.8	174.5	0.0	93.8	48.5	0.0	253.6	42.6	0.0
LnGrp LOS	F	C		E	F		F	D		F	D	
Approach Vol, veh/h		733	A		1306	A		346	A		759	A
Approach Delay, s/veh		27.8			165.0			69.6			212.7	
Approach LOS		C			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	59.7	20.0	29.5	8.2	66.0	17.2	32.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.0	50.5	15.5	25.0	5.0	61.5	12.7	27.8
Max Q Clear Time (g_c+I1), s	10.1	18.8	17.5	13.0	4.8	63.5	13.2	10.2
Green Ext Time (p_c), s	0.1	4.9	0.0	0.7	0.0	0.0	0.0	0.6

Intersection Summary			
HCM 6th Ctrl Delay		134.0	
HCM 6th LOS		F	

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	112	78	216	126	8
Future Vol, veh/h	60	112	78	216	126	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	74	74	81	81
Heavy Vehicles, %	0	0	4	4	2	2
Mvmt Flow	113	211	105	292	156	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	397	0	-	0	688	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1173	-	-	-	412	788
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1173	-	-	-	367	788
Mov Cap-2 Maneuver	-	-	-	-	367	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	21.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1173	-	-	-	379
HCM Lane V/C Ratio	0.097	-	-	-	0.436
HCM Control Delay (s)	8.4	0	-	-	21.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	2.2

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	165	0	2	17	184	1770	0	7	1350	7
Future Vol, veh/h	3	0	165	0	2	17	184	1770	0	7	1350	7
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	-	-	-	-	-	-	50	-	-	50	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	69	69	69	94	94	94	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	3	3	3
Mvmt Flow	5	0	275	0	3	25	196	1883	0	8	1534	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3839	3825	767	3058	3833	1883	1542	0	0	1883	0	0
Stage 1	1550	1550	-	2275	2275	-	-	-	-	-	-	-
Stage 2	2289	2275	-	783	1558	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.9	7.3	6.5	6.2	4.16	-	-	4.145	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.238	-	-	2.2285	-	-
Pot Cap-1 Maneuver	~ 2	4	349	7	4	89	421	-	-	313	-	-
Stage 1	121	177	-	54	76	-	-	-	-	-	-	-
Stage 2	53	76	-	357	175	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	2	349	1	~ 2	89	421	-	-	313	-	-
Mov Cap-2 Maneuver	-	2	-	1	~ 2	-	-	-	-	-	-	-
Stage 1	65	172	-	29	41	-	-	-	-	-	-	-
Stage 2	19	41	-	74	170	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 840.1	2	0.1
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	421	-	-	-	16	313	-	-
HCM Lane V/C Ratio	0.465	-	-	-	1.721	0.025	-	-
HCM Control Delay (s)	20.8	-	-	-	$ 840.1	16.8	-	-
HCM Lane LOS	C	-	-	-	F	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	-	4	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	46.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕				↱		↕			↑	↱
Traffic Vol, veh/h	257	0	45	0	0	36	110	166	0	0	91	193
Future Vol, veh/h	257	0	45	0	0	36	110	166	0	0	91	193
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	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	59	59	59	85	85	85
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	292	0	51	0	0	39	186	281	0	0	107	227

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	780	760	107	-	-	281	334	0	0	-	-	0
Stage 1	107	107	-	-	-	-	-	-	-	-	-	-
Stage 2	673	653	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	-	-	6.2	4.14	-	-	-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	-	-	3.3	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	314	337	950	0	0	763	1214	-	-	0	-	-
Stage 1	901	809	-	0	0	-	-	-	-	0	-	-
Stage 2	446	465	-	0	0	-	-	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 256	276	950	-	-	763	1214	-	-	-	-	-
Mov Cap-2 Maneuver	~ 256	276	-	-	-	-	-	-	-	-	-	-
Stage 1	737	809	-	-	-	-	-	-	-	-	-	-
Stage 2	346	380	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	154.8	10	3.4	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	1214	-	-	287	763	-	-
HCM Lane V/C Ratio	0.154	-	-	1.196	0.051	-	-
HCM Control Delay (s)	8.5	0	-	154.8	10	-	-
HCM Lane LOS	A	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	15.4	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	3	291	5	44	198
Future Vol, veh/h	7	3	291	5	44	198
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	79	79	74	74
Heavy Vehicles, %	2	2	4	4	1	1
Mvmt Flow	8	3	368	6	59	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	757	371	0	0	374	0
Stage 1	371	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	375	675	-	-	1190	-
Stage 1	698	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	353	675	-	-	1190	-
Mov Cap-2 Maneuver	353	-	-	-	-	-
Stage 1	698	-	-	-	-	-
Stage 2	647	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	1.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	412	1190	-
HCM Lane V/C Ratio	-	-	0.026	0.05	-
HCM Control Delay (s)	-	-	14	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	122	2	17	151	42	3	0	26	25	0	0
Future Vol, veh/h	0	122	2	17	151	42	3	0	26	25	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	4	4	2	2	2	2	2	2
Mvmt Flow	0	133	2	18	164	46	3	0	28	27	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	210	0	0	135	0	0	357	380	134	371	358	187
Stage 1	-	-	-	-	-	-	134	134	-	223	223	-
Stage 2	-	-	-	-	-	-	223	246	-	148	135	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.2	-	-	2.236	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1373	-	-	1437	-	-	598	552	915	586	568	855
Stage 1	-	-	-	-	-	-	869	785	-	780	719	-
Stage 2	-	-	-	-	-	-	780	703	-	855	785	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1373	-	-	1437	-	-	591	544	915	562	560	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	591	544	-	562	560	-
Stage 1	-	-	-	-	-	-	869	785	-	780	709	-
Stage 2	-	-	-	-	-	-	769	693	-	829	785	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	9.3	11.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	866	1373	-	-	1437	-	-	562
HCM Lane V/C Ratio	0.036	-	-	-	0.013	-	-	0.048
HCM Control Delay (s)	9.3	0	-	-	7.5	0	-	11.7
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Table 1: Steamboat Springs Monthly ADT Data Conversion Table

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	1	1.02	1.06	0.94	1.1	1.47	1.69	1.56	1.35	1.19	0.99	1.04
Feb	0.98	1	1.04	0.92	1.08	1.44	1.66	1.53	1.32	1.16	0.97	1.02
Mar	0.94	0.96	1	0.89	1.04	1.38	1.59	1.47	1.27	1.12	0.93	0.98
Apr	1.06	1.08	1.12	1	1.17	1.56	1.79	1.66	1.43	1.26	1.05	1.11
May	0.91	0.92	0.96	0.85	1	1.33	1.53	1.42	1.22	1.07	0.89	0.94
Jun	0.68	0.69	0.72	0.64	0.75	1	1.15	1.06	0.92	0.81	0.67	0.71
Jul	0.59	0.6	0.63	0.56	0.65	0.87	1	0.92	0.8	0.7	0.58	0.62
Aug	0.64	0.65	0.68	0.6	0.71	0.94	1.08	1	0.86	0.76	0.63	0.67
Sep	0.74	0.76	0.79	0.7	0.82	1.09	1.26	1.16	1	0.88	0.73	0.77
Oct	0.84	0.86	0.89	0.8	0.93	1.24	1.43	1.32	1.14	1	0.83	0.88
Nov	1.01	1.03	1.07	0.96	1.12	1.49	1.71	1.58	1.36	1.2	1	1.06
Dec	0.96	0.98	1.02	0.9	1.06	1.41	1.62	1.5	1.29	1.14	0.95	1

Appendix D

Steamboat Basecamp Apartments Traffic Impact Study

TRAFFIC IMPACT STUDY

FOR

Steamboat Basecamp

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V5.0

Contents

Figures and Tables

Project Description

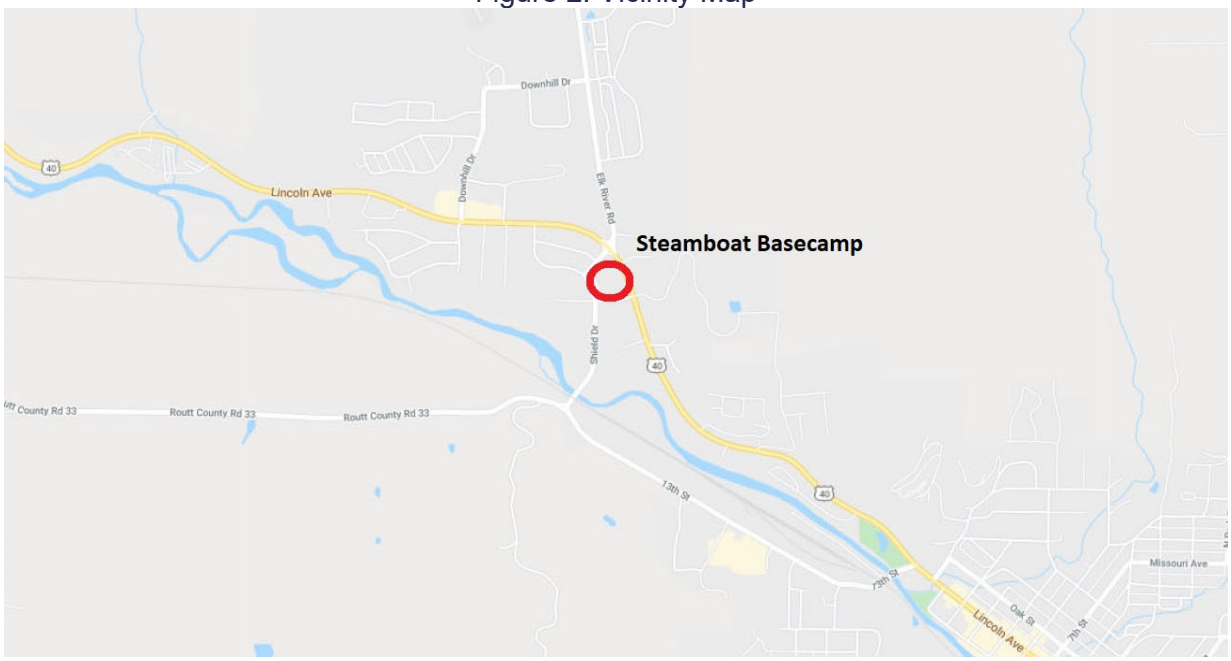
This long-term traffic impact study analyzes the effects that the Pilot Building of the Steamboat Basecamp development will have on traffic operations in the years of 2022 and 2040. The Steamboat Basecamp is a redevelopment of the old Steamboat Pilot Building. Once completed, the new building will include a variety of apartment types and other amenities, such as a fitness center and restaurant. Figure 1 shows a rendering of the proposed development.

Figure 1: Steamboat Basecamp Rendering

The City of Steamboat Springs has requested that a traffic impact study be prepared for the Steamboat Basecamp. A scope approval form was submitted to the City of Steamboat prior to beginning the study, and approval is pending at this time. It is included in Appendix A, and outlines the key items to be analyzed in this study. The traffic impact study has been prepared in accordance with City of Steamboat Springs requirements, assuming an opening year of 2022.

The Steamboat Basecamp is located on the northeast corner of Elk River Rd & Shield Dr, with site access on each of these roads. A vicinity map is provided in Figure 2.

Figure 2: Vicinity Map



The Steamboat Pilot Building will include several amenities that are expected to generate external trips, shown in Table 1, while others amenities will likely only be used by the residents.

Table 1: Basecamp Amenities Generating External Trips

Amenity	Size
Multifamily Housing	75 Units
Health/Fitness Club*	4,090 SQ FT
Restaurant	3,659 SQ FT

**Class-based fitness center. No Open Gym Hours.*

The site plan is shown in Figure *3*.

Figure 3: Site Plan

Roadways in the vicinity of the site are described below:

Lincoln Avenue (US 40) is an east/west roadway providing access to Elk River Rd, Curve Ct, and Downhill Dr, as well as serving as the main travel corridor and gateway into Steamboat Springs. Through the study area, US 40 alternates between a two and four lane arterial roadway with intermittent auxiliary lanes at intersections and access points. This segment of roadway is classified as NR-A by the Colorado Department of Transportation (CDOT). The posted speed limit is 40mph through the study area.

Elk River Rd is a two-lane north/south roadway providing direct access to Steamboat Basecamp. Elk Road intersects US 40 in a signalized intersection to the northwest of the development.

Curve CT is a two-lane east/west roadway between US 40 and Shield Dr. Many of the site trips from the south will use Curve Ct to access the site.

Shield Dr is a two-lane north/south roadway between Elk River Rd and Curve Ct, and provides direct access to Steamboat Basecamp.

Downhill Drive is a two lane, north/south roadway that intersects US 40 to the west of the site. While the intersection with US 40 is currently stop-controlled, the City has committed to studying the intersection to determine the most appropriate traffic control (roundabout or signal) and to design and construct an improvement in the next few years. The posted speed limit on Downhill Drive is 25mph.

1. Existing Conditions

1.1. Volumes

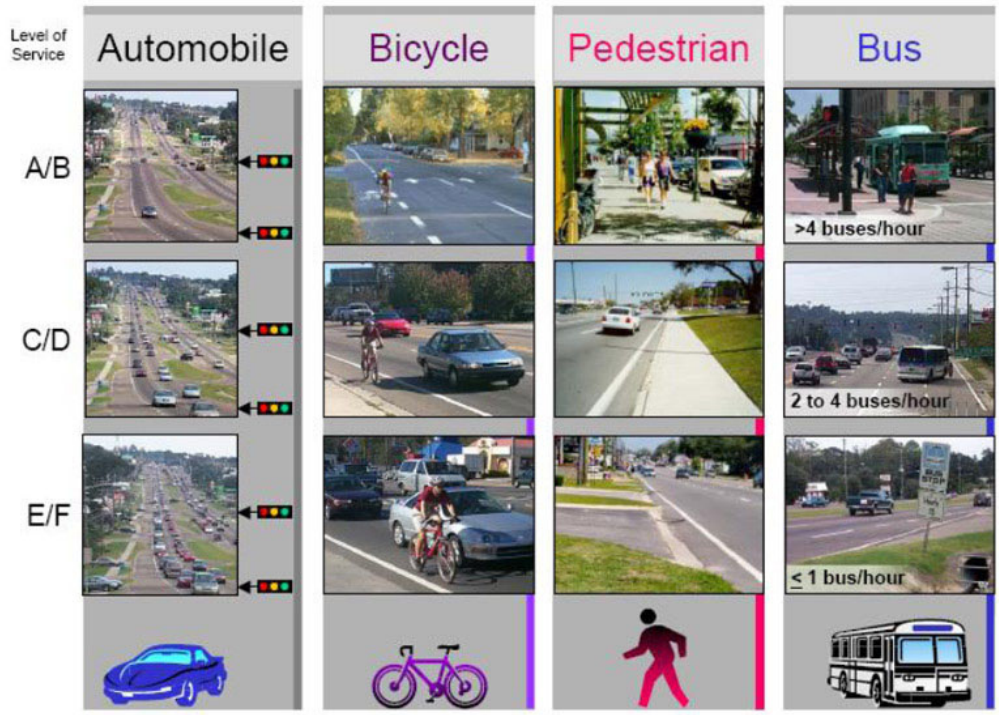
To provide a baseline condition for the traffic study, turning movement counts were taken at the following intersections.

- US 40 & Sunlight Dr/Curve CT
- US 40 & Elk River Rd
- US 40 & Downhill Dr/Riverside Dr
- Curve Plaza & Shield Dr
- Shield Dr & Elk River Rd
- Curve Plaza & Elk River Rd

The counts were collected on Tuesday, March 3, 2020 from 7:00-9:00 AM and 4:00-6:00 PM, and include pedestrian, bicycle, and heavy vehicle data. From these counts, it was determined that the AM peak hour was from 7:45-8:45 AM and the PM peak hour was from 4:45-5:45 PM. The intersection of US 40 & Downhill Dr/Riverside Dr was not included in the traffic models, since the City of Steamboat is planning on constructing intersection improvements in the next several years. The specific nature of the improvements are unknown at this time, making it difficult to accurately model the future scenario at US 40 & Downhill Dr/Riverside Dr. Counts were taken at this intersection in order to be able to assess the percent contribution that that the Steamboat Basecamp will have in regards to the intersection improvements. The traffic counts can be found in Appendix B.

1.2. LOS Criteria

Traffic analyses were conducted in accordance with procedures outlined in the Highway Capacity Manual, and included intersection Level-of-Service (LOS). LOS is a measure of the quality of traffic flow and ranges from LOS A (nearly ideal traffic conditions with very little delay for motorists) to LOS F (poor traffic conditions with long motorist delays). LOS C is typically considered a “good” traffic condition. LOS D or better conditions are typically desirable during peak traffic periods; however, LOS E conditions are not uncommon. LOS F, although undesirable, is also not uncommon for side street traffic movements at full movement, unsignalized intersections with high volume arterial roadways. Figure 4 illustrates examples of LOS for various modes of travel.



Source: FDOT Quality/Level of Service Handbook

Figure 4: LOS Conditions

When reporting delay and LOS, the HCM specifies that at a signalized intersection, the average intersection delay be used to derive the LOS. At a stop-controlled intersection, the worst movement is used. Table 2 provides a summary of the Highway Capacity Manual's LOS Criteria. This study area contains both signalized and unsignalized intersections.

Table 2: LOS Criteria

Level of Service (LOS)	Signalized Intersection	Unsignalized Intersection	Traffic Characteristics
	Average Intersection Delay (sec/veh)	Worst Movement (sec/veh)	
A	<= 10	<= 10	Free Flow / Insignificant Delays
B	> 10-20	> 10-15	Stable Flow / Minimal Delays
C	> 20-35	>15-25	Stable Flow / Acceptable Delays
D	> 35-55	>25-35	Nearing Unstable / Tolerable Delays
E	> 55-80	>35-50	Unstable Flow / Significant Delays
F	> 80	> 50	Forced Flow / Excessive Delays

Where an unsignalized intersection operates at LOS E or F, a volume-to-capacity ratio (V/C) has been reported for the worst-case movement. Where V/C exceeds 1.00, traffic demand during peak periods exceeds the capacity for the movement. This condition will cause queues to

grow, potentially filling auxiliary lanes and blocking adjacent traffic lanes until demand decreases.

1.3. Existing Traffic Operations

Existing traffic operations were evaluated using Synchro 10th Edition. The existing traffic models use the March 2020 volumes and the existing roadway geometry. In this scenario, the Steamboat Basecamp has not yet been constructed. The traffic signal splits and cycle lengths were optimized in Synchro. Table 3 shows the existing traffic operations.

Table 3: Existing Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh	LOS (V/C)
US 40/Elk River Rd (Signal)	-	30.0	C	-	49.1	D
US 40/Sunlight Dr/Curve CT	WB	14.7	B	WB	29.6	D
Shield Dr/Elk River Rd	SB	10.8	B	SB	12.0	B
Curve Plaza/Elk River Rd/Access #1	EB	11.4	B	EB	15.7	C
Shield Dr/Access #2	SB	7.5	A	-	0.0	A

All of the intersections operate acceptably for the March 2020 conditions. The intersections of US 40 & Elk River Rd and US 40 & Sunlight Dr/Curve CT operate at LOS D in the PM peak, while the remaining intersections operate at LOS C or better. The Synchro result printouts can be found in Appendix C.

2. Short Term Background Conditions

2.1. Background Volumes

The Short-Term Background Conditions analyzes the existing roadway network, with 2022 traffic volume projections. This scenario assumes that the Steamboat Basecamp has not been built. Traffic volumes in Steamboat Springs are highly seasonal. Traffic counts were collected in March, which is one of the lower volume months. In accordance with City of Steamboat requirements, the existing traffic counts were factored up to reflect conditions typical to the month of July. Using the City's ADT conversion table, the March volumes were factored by 1.59 to convert to the traffic volumes typically experienced in July. The ADT conversion table has been included in the Appendix.

The background growth rate was taken from the CDOT count station #101838 at MP 130.57. The projected 20-year factor is 1.16, yielding an annual growth of 0.75%. The existing counts, after being seasonally adjusted, were then inflated by the 0.75% annual growth in order to generate the 2022 volumes. These volumes can be found in the Appendix.

2.2. Short Term Background Traffic Operations

Traffic operations were evaluated using Synchro 10th Edition. Table 4 shows the traffic operations.

Table 4: Short Term Background Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh	LOS (V/C)
US 40/Elk River Rd (Signal)	-	51.5	D	-	74.8	E
US 40/Sunlight Dr/Curve CT	NBL	28.6	D	EB	628	F (2.17)
Shield Dr/Elk River Rd	SB	12.9	B	SB	15.4	C
Curve Plaza/Elk River Rd/Access #1	EB	14.6	B	EB	38.3	E (0.76)
Shield Dr/Access #2	SB	7.6	A	-	0.0	A

Delays have increased at most intersections due to the volume growth. The intersection of US 40 & Sunlight Dr/Curve Ct is expected to operate at LOS F in the PM. This is due to the side street left turn movements having difficulty turning because of the high thru movements along US 40. The West Steamboat Springs US Highway 40 Access Study, conducted by Stolfus and Associates, Inc. states that the intersection of US 40 & Sunlight Dr/Curve CT is to be made right-in, right-out if traffic operations deteriorate. As the projected 2022 volumes are far too low to warrant a signal, movement restrictions at the intersection will likely be the solution should traffic conditions become unacceptable or unsafe.

3. Short Term Total Conditions

3.1. Trip Generation

The ITE Trip Generation Manual 10th Edition was used to calculate the number of trips generated by the Steamboat Basecamp upon opening year. Only land uses expected to generate external trips were included in the calculations. Amenities intended solely for the residents, such as the hot tub and lobby space, will not attract external visitors, and were not part of the trip generation calculations. Table 5 shows the trip generation calculations for the Steamboat Basecamp.

Table 5: ITE Trip Generation Calculations

Multifamily														
ITE Code	Units	ITE Land Use	Weekday Rate	Weekday Trips	AM Peak Rate	AM Peak Entering %	AM Peak Exiting %	PM Peak Rate	PM Peak Entering %	PM Peak Exiting %	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
221	75	Multifamily Housing (Mid-Rise) (General Urban/Suburban)	5.43	407	0.34	26%	74%	0.45	61%	39%	7	19	21	13

Fitness Center														
ITE Code	Sq. Ft (1000 Ft)	ITE Land Use	Weekday Rate	Weekday Trips	AM Number of People	AM Peak Entering %	AM Peak Exiting %	PM Number of People	PM Peak Entering %	PM Peak Exiting %	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
492	4.09	Health/Fitness Club	-	-	16	51%	49%	16	57%	43%	8	8	9	7

Market														
ITE Code	Sq. Ft (1000 Ft)	ITE Land Use	Weekday Rate	Weekday Trips	AM Peak Rate	AM Peak Entering %	AM Peak Exiting %	PM Peak Rate	PM Peak Entering %	PM Peak Exiting %	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
851	1.00	Convenience Market	381.855	382	31.27	50%	50%	24.56	51%	49%	16	16	13	12
936	1.00	Coffee/Donut Show without Drive-Through	377.275	377	50.57	51%	49%	18.16	50%	50%	26	25	9	9
-	0.5	Kitchen/Storage Space	Not Expected to Generate Trips											
-	1.16	Lounge/Lobby Space	Not Expected to Generate Trips											

Phase 1 Total				
Weekday Trips	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
1342	56	67	51	41

The fitness center is unlikely to follow the rates prescribed by the Trip Generation Manual. The fitness center is class-based and has a limit on the number of people using it at any given time, making it unlikely to generate trips at the rate of a typical fitness center. From the information provided about the Steamboat Basecamp amenities, it was assumed that 8 people would enter and exit the fitness center each hour.

The restaurant was broken down into several land uses when calculating the generated trips. The land uses expected to generate external trips were modeled as a 1,000 SF café and a 1,000 SF market. The areas of the restaurant not expected to generate trips are 500 SF of kitchen/storage space and 1,159 SF of lounge/lobby space. The restaurant is expected to serve both residents of the Basecamp, as well as external customers. For the trip generation calculations, it was assumed that 50% of the customers were external trips. The trip rates and the generated trips shown in the trip generation table for the market and café reflect the 50% of trips that are external to the site.

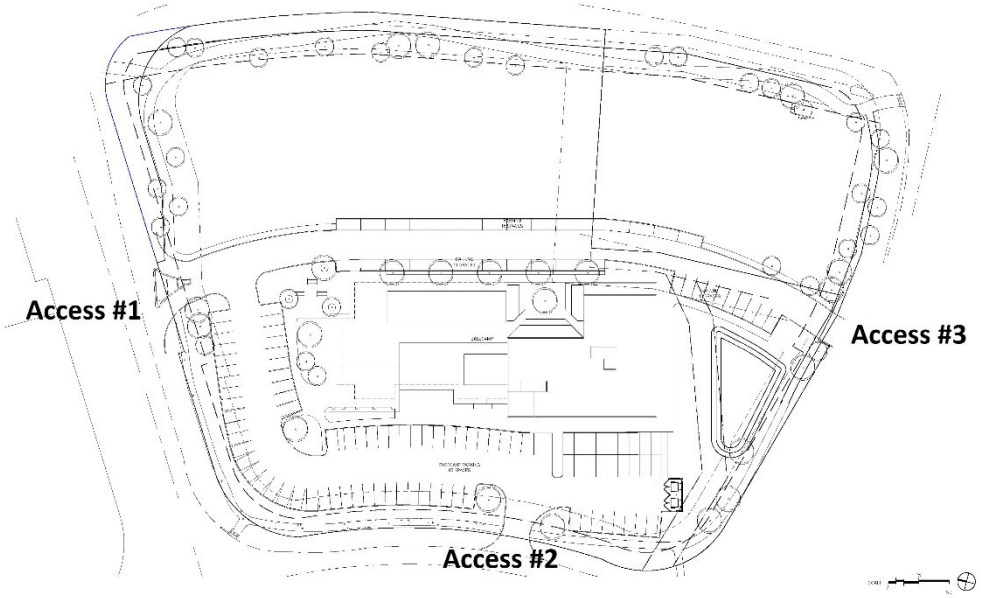
For housing in a general urban/suburban it is assumed that 7% of people will enter/exit the apartments via some form of multimodal transportation, while 8% will do so in the PM. The number of vehicle trips in Table *5* have already been reduced by these percentages, so no further alteration to the vehicle trip numbers was necessary.

3.2. Site Access and Circulation Evaluation

Upon completion of the Pilot Building, there will be three access points to the Steamboat Basecamp.

Figure *5* shows the location of the three access points to the Basecamp.

Figure 5: Steamboat Basecamp Access Points



The trips generated by Phase 1 will use the access point which results in the shortest trip. Once out of the Basecamp parking lot, the proportion of trips from the east was determined by the existing turning movements. The distribution of trips to the north and west was determined by traffic counts taken for a study conducted for the West End Plaza, just west of Downhill Dr. The West End Plaza is a good indicator of the Basecamp's trip distribution as they are in similar locations relative to the center of Steamboat. In addition, it was estimated that 5% of the generated vehicles would go to/from the shopping center on Curve Plaza, just west of the Steamboat Basecamp. Another 5% were estimated to travel south on Shield Dr. Figure 6 shows the estimated trip distribution.

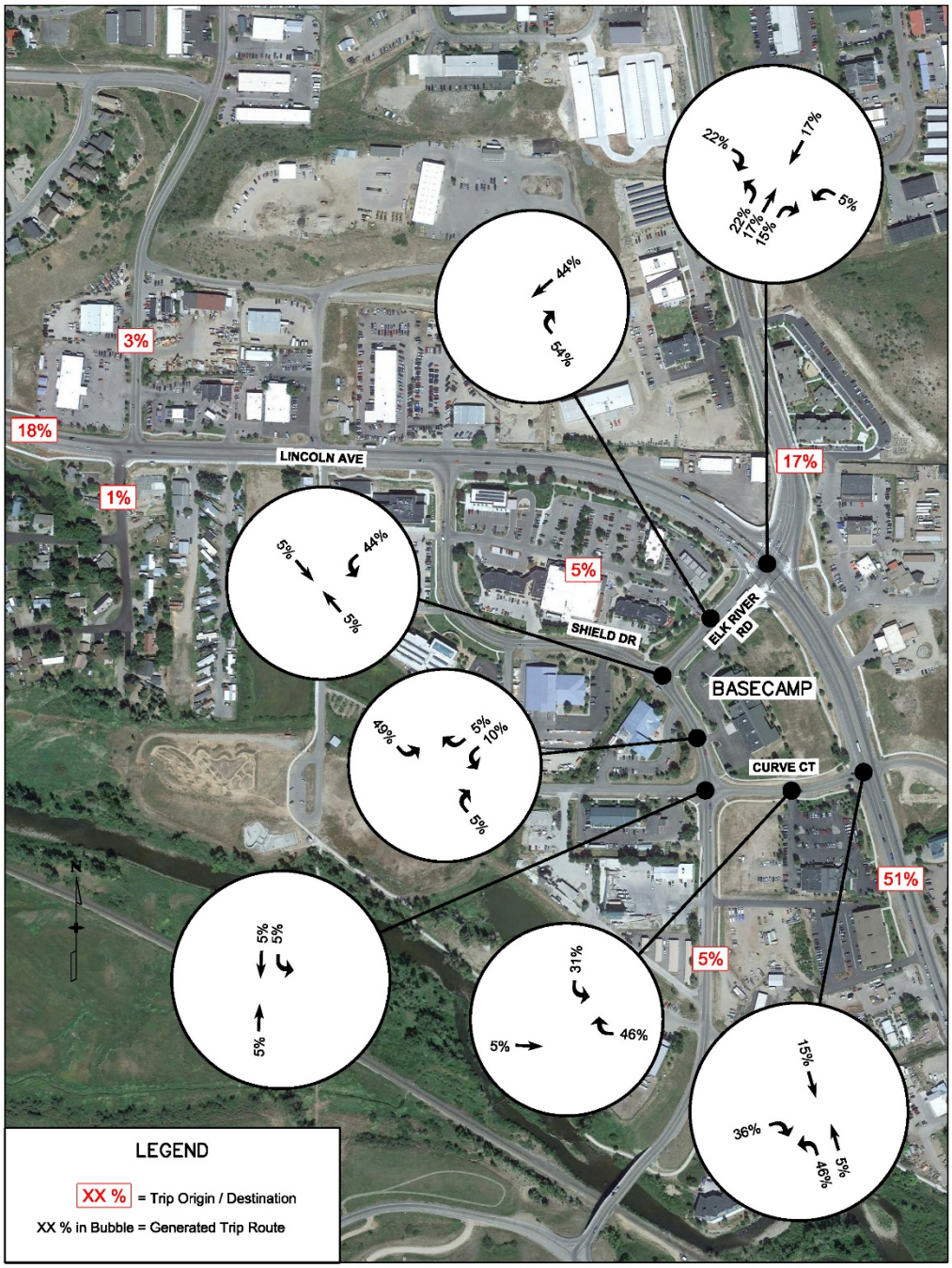


Figure 6:Trip Distribution

3.3. Auxiliary Lanes

Each turning movement on US 40 was assessed to see if SHAC auxiliary lane requirements are met. Since this portion of US 40 is classified as a Non-Rural Regional Highway (NR-A), a volume greater than 10 vehicles per hour (VPH) warrants a left turn deceleration lane, and a volume greater than 25 VPH warrants a right turn deceleration lane. A right turning movement of 50 VPH from the side street warrants an acceleration lane. Table 6 shows the warranted auxiliary lanes.

Table 6: Warranted Auxiliary Lanes

Intersection	Movement	2022 Total Conditions Volume
US 40 & Downhill Dr/Riverside Dr	WBR	162 VPH
US 40 & Sunlight Dr/Curve CT	SBL	28 VPH

As noted previously, the US 40 & Downhill Dr/Riverside Dr intersection is the subject of current study by the City of Steamboat Springs. With respect to the US 40 & Sunlight Dr/Curve Ct intersection, the Steamboat Basecamp project does not contribute any traffic volume to southbound left turn movement.

3.4. Short Term Conditions Traffic Operations

Traffic operations were evaluated for the Short-Term Total Conditions scenario using Synchro 10th Edition. This scenario assumes that Phase 1 of the Steamboat Basecamp has been completed. The roadway geometry remains the same as in the previous scenarios. Table 7 shows the delay and LOS for the Total Conditions scenario. The Synchro printouts can be found in Appendix C.

Table 7: Short Term Total Conditions Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh)	LOS (V/C)
US 40/Elk River Rd (Signal)	-	51.7	D	-	75.0	E
US 40/Sunlight Dr/Curve CT	NBL	34.8	D	EB	1040.1	F (3.05)
Shield Dr/Elk River Rd	SB	13.8	B	SB	16.6	C
Curve Plaza/Elk River Rd/Access #1	EB	16.5	C	EB	49.7	E (0.84)
	WB	8.9	A	WB	9.7	A
Shield Dr/Access #2	WB	12.5	B	WB	12.3	B
Curve Ct/Access #3	SB	10.7	B	SB	11.0	B

The intersection of Curve Plaza & Elk River Rd was modeled with a RIRO access to the Steamboat Basecamp, and a full movement access for the shopping plaza. The RIRO access provides better traffic operations at the intersection than if both accesses were full movement. As shown in the table, the eastbound movements are the cause of poor LOS at the intersection while the westbound movements from the basecamp are expected to operate at LOS A during both time periods. The entering and exiting movements to the Basecamp are expected to experience little to no delay, with the significant delay coming from the left turns exiting the shopping plaza. Traffic operations at the intersection of US 40 & Elk River Rd are expected to be LOS E in the PM due to the westbound thru movement being over capacity. As in the Background scenario, the eastbound movement from Curve CT onto US 40 has significant delays, and is far over capacity.

4. Long Term Background Conditions

4.1 Traffic Volumes

The Long-Term Background Conditions analyzes the existing roadway network, with 2040 traffic volume projections. This scenario assumes that the Steamboat Basecamp has not occurred.

Traffic volumes in Steamboat Springs are highly seasonal. Traffic counts were collected in March which is one of the lower volume months. In accordance with City of Steamboat requirements, the existing traffic counts were factored up to reflect conditions typical to the month of July. Using the City's ADT conversion table, the March volumes were factored by 1.59 to convert to the traffic volumes typically experienced in July. The ADT conversion table has been included in the Appendix.

The background growth rate was taken from the CDOT count station #101838 at MP 130.57. The projected 20-year factor is 1.16, yielding an annual growth of 0.75%. The existing counts, after being seasonally adjusted, were then inflated by the 0.75% annual growth in order to generate the 2040 volumes. These volumes can be found in the Appendix.

4.2 Long-Term Background Traffic Operations

Traffic operations were evaluated using Synchro 10. Table 8 shows the delay and LOS for the study intersections.

Table 8: Long-Term Background Delay and LOS

Intersection	AM Peak Hour			PM Peak Hour		
	Movement	Delay (sec/veh)	LOS (V/C)	Movement	Delay (sec/veh)	LOS (V/C)
US 40/Elk River Rd (Signal)	-	59.3	E	-	135.2	F
US 40/Sunlight Dr/Curve CT	NBL	58.4	F (0.81)	WB	534.1	F (1.25)
Shield Dr/Elk River Rd	SB	14.2	B	SB	18.0	C
Curve Plaza/Elk River Rd/Access #1	EB	16.0	C	EB	66.1	F (0.94)
Shield Dr/Access #2	SB	7.7	A	-	0	A

When compared to the year 2022 background conditions, the delays have increased due to the background volume growth. The intersection of US 40 & Sunlight Dr/Curve CT is expected to operate at LOS F, with both the left turns onto and off of Curve CT failing. The signalized intersection of US 40 & Elk River Rd is expected to operate at LOS E in the AM and LOS F in the PM. With the increased volumes along Elk River Rd, the intersection of Curve Plaza & Elk River Rd operates at LOS F in the PM, with the eastbound approach nearing capacity.

5. Long-Term Total Conditions

5.1 Trip Generation

The Long-Term Total Conditions scenario analyzes the study area assuming that Phase 1 of the Steamboat Basecamp has been completed, and the background traffic volumes have grown to the projected year 2040 levels. The number of trips generated by Phase 1 of the Basecamp remains unchanged from the Short-Term Total Conditions scenario, with the assumed trip generation shown in Table 9.

Table 9: ITE Trip Generation Calculations

Multifamily														
ITE Code	Units	ITE Land Use	Weekday Rate	Weekday Trips	AM Peak Rate	AM Peak Entering %	AM Peak Exiting %	PM Peak Rate	PM Peak Entering %	PM Peak Exiting %	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
221	75	Multifamily Housing (Mid-Rise) (General Urban/Suburban)	5.43	407	0.34	26%	74%	0.45	61%	39%	7	19	21	13

Fitness Center														
ITE Code	Sq. Ft (1000 Ft)	ITE Land Use	Weekday Rate	Weekday Trips	AM Number of People	AM Peak Entering %	AM Peak Exiting %	PM Number of People	PM Peak Entering %	PM Peak Exiting %	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
492	4.09	Health/Fitness Club	-	-	16	51%	49%	16	57%	43%	8	8	9	7

Market														
ITE Code	Sq. Ft (1000 Ft)	ITE Land Use	Weekday Rate	Weekday Trips	AM Peak Rate	AM Peak Entering %	AM Peak Exiting %	PM Peak Rate	PM Peak Entering %	PM Peak Exiting %	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
851	1.00	Convenience Market	381.855	382	31.27	50%	50%	24.56	51%	49%	16	16	13	12
936	1.00	Coffee/Donut Show without Drive-Through	377.275	377	50.57	51%	49%	18.16	50%	50%	26	25	9	9
-	0.5	Kitchen/Storage Space	Not Expected to Generate Trips											
-	1.16	Lounge/Lobby Space	Not Expected to Generate Trips											

Phase 1 Total				
Weekday Trips	AM Peak Trips Entering	AM Peak Trips Exiting	PM Peak Trips Entering	PM Peak Trips Exiting
1342	56	67	51	41

The trip distribution of the Phase 1 trips will also remain consistent with the Short-Term Total Conditions scenario.

5.2 Auxiliary Lanes

Each turning movement on US 40 was assessed to see if SHAC auxiliary lane requirements are met. Since this portion of US 40 is classified as a Non-Rural Regional Highway (NR-A), a volume greater than 10 vehicles per hour (VPH) warrants a left turn deceleration lane, and a volume greater than 25 VPH warrants a right turn deceleration lane. A right turning movement of 50 VPH from the side street warrants an acceleration lane. Table 6 shows the warranted auxiliary lanes which are not already in place.

Table 10: Warranted Auxiliary Lanes

Intersection	Movement	2040 Total Conditions Volume
US 40 & Downhill Dr/Riverside Dr	WBR	185 VPH
US 40 & Sunlight Dr/Curve CT	NBL	199 VPH
	SBL	32 VPH

As noted previously, the US 40 & Downhill Dr/Riverside Dr intersection is the subject of current study by the City of Steamboat Springs. With respect to the US 40 & Sunlight Dr/Curve CT intersection, the Steamboat Basecamp project does not contribute any traffic volume to southbound left turn movement. The intersections at the Basecamp access #2 and access #3 do not require auxiliary lanes.

5.3 Long-Term Total Conditions Traffic Operations

Traffic operations were evaluated for the Long-Term Total Conditions using Synchro 10. The warranted auxiliary lanes have been included in the Synchro models. Table 11 shows the delay and LOS. The Synchro printouts can be found in the Appendix.

Table 11: Long-Term Total Conditions Delay and LOS

Intersection	AM			PM		
	Movement	Delay (sec)	LOS (v/c)	Movement	Delay (sec)	LOS (v/c)
US 40/Elk River Rd (Signal)	-	59.9	E	-	134.1	F
US 40/Sunlight Dr/Curve CT	NBL	83.8	F (0.95)	EB	1039.7	F (3.04)
US 40/Downhill Dr/Riverside Dr	-	93.8	C	-	34.6	C
Shield Dr/Elk River Rd	SB	15.6	C	SB	20.0	C
Curve Plaza/Elk River Rd/Access #1	EB	20.1	C	EB	124.5	F (1.12)
	WB	9.0	A	WB	9.8	A
Shield Dr/Access #2	WB	13.4	B	WB	13.1	B
Curve Ct/Access #3	SB	11.0	B	SB	11.5	B

As in the Short-Term Conditions, the intersection of Curve Plaza/Access #1 & Elk River Rd was modeled with a RIRO access to the Steamboat Basecamp. A splitter island could be used to make Access #1 a RIRO access, and would provide better traffic operations at the intersection than if both accesses were full movement. The right-in and right-out movements for the Basecamp are expected to experience little to no delay, with the significant delay coming from the left turns exiting the shopping plaza on the other side of Elk River Rd. Since the eastbound approach will be over capacity by the year 2040, alternative designs should be considered. One solution is to make the shopping plaza access a RIRO, however, this will result in out of direction travel. Another possibility is a roundabout, allowing full access to both the Steamboat Basecamp and the shopping plaza.

The intersection of US 40 & Elk River Rd fails in the PM, with a comparable delay to the 2040 Baseline Conditions. Much of this problem stems from the westbound direction on US 40 only having one thru lane, putting it over capacity, and is unrelated to the development. Until an additional westbound thru lane is built, it is unlikely that the intersection of US 40 & Elk River Rd will operate effectively during the peak hours of demand. The City of Steamboat has identified capacity issues along US-40 in the “US-40 Highway NEPA Study”, and has proposed that US-40 be made a four-lane highway through the western side of town, which includes the study area. The intersection of US 40 & Elk River Rd will operate acceptably if US-40 is a four-lane highway through the intersection.

5.4 US 40 & Sunlight Dr/Curve CT

Traffic operations at US 40 & Sunlight Dr/Curve CT remain problematic for the left turns from Sunlight Dr and Curve Ct to US 40. It should be noted that the trips generated by this project do not contribute to the poor traffic conditions for these movements. The left turns out of Sunlight Dr are expected to experience delays exceeding the acceptable limit with or without the construction of Steamboat Basecamp.

The Synchro results also show the northbound left turn from US 40 onto Curve CT failing in the AM, due to an inability to find sufficient gaps in the southbound thru traffic along US 40. Synchro models a mostly uniform rate of arrival for the southbound movement, resulting in few gaps in traffic for the northbound lefts to make their turn. Since the signal of US 40 & Elk River Rd is only 700 feet upstream, the southbound movement will actually be passing Curve CT in platoons, rather than in a more uniform arrival pattern. The platooning effect will provide larger gaps, allowing a longer opportunity of time for the northbound lefts to turn onto Curve CT. The microsimulation extension of Synchro, SimTraffic, was used to analyze this intersection, as it has the ability to more accurately analyze the platooning effects along US 40. The simulation runs from SimTraffic show the northbound left turn movement having a delay of 37.9 seconds (LOS E). LOS D or better conditions are typically desirable during peak traffic periods; however, LOS E conditions are not uncommon, particularly for unsignalized movements onto and off of side streets.

The West Steamboat Springs US Highway 40 Access Study specifies that the intersection of US 40 & Sunlight Dr/Curve CT may be converted to a RIRO if safety or traffic operational problems occur, or if the intersection of US 40 & Loggers Lane, just to the east, is extended to connect US 40 to Shield Dr. The section of the access control plan in the vicinity of US 40 & Sunlight Dr/Curve CT is shown in Figure 7. Converting the intersection of US 40 & Sunlight Dr/Curve CT to a RIRO would divert all of the northbound lefts to the intersection of US 40 & Elk River Rd, which is expected to already be operating at capacity by year 2040. An alternative long-term strategy may be to make the US 40 & Sunlight Dr/Curve CT intersection a 3/4 movement (left-in, right-in, right-out) in order to minimize impacts to the Elk River Rd intersection.

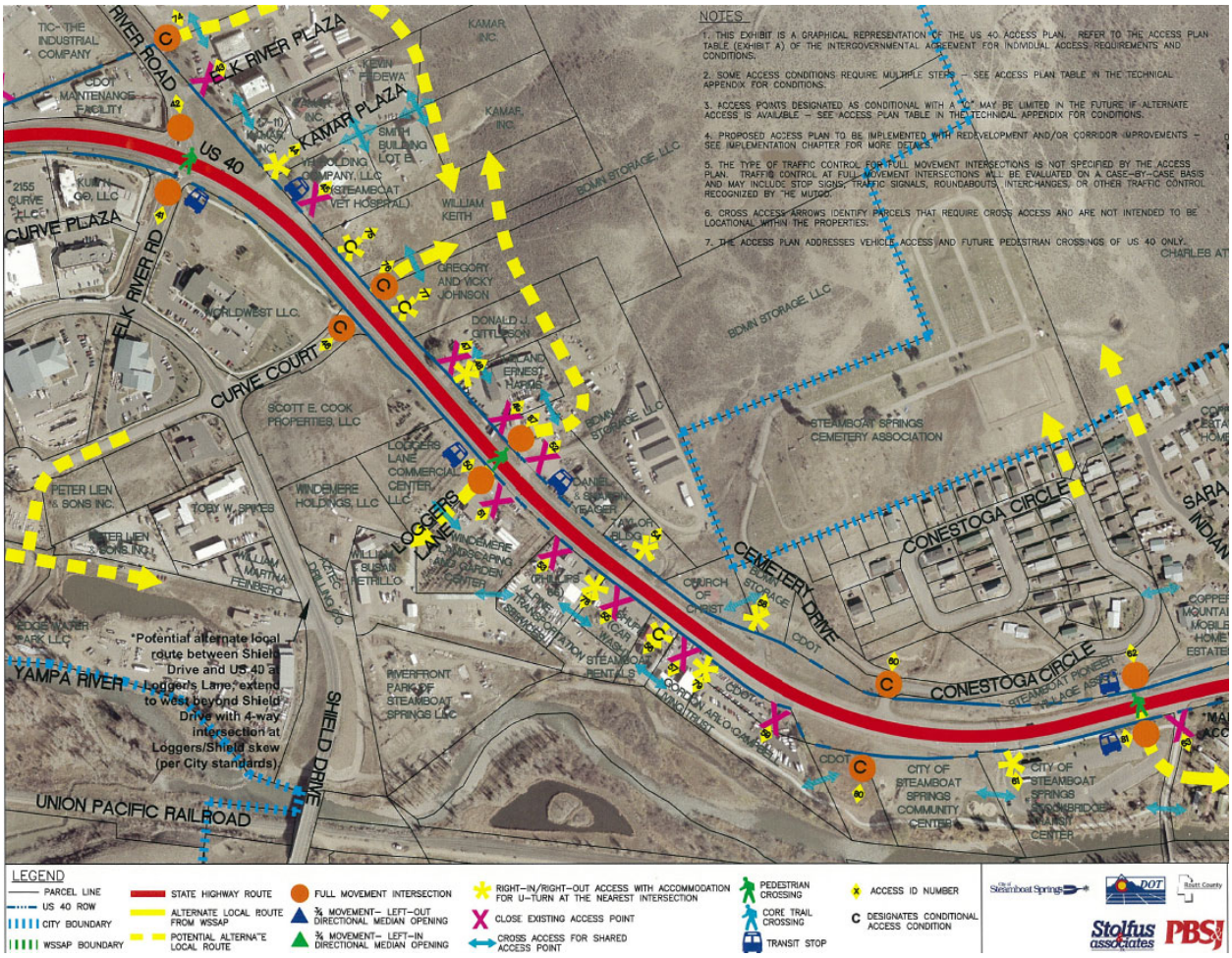


Figure 7: US Highway 40 Access Control Plan

5.5 Queuing

Since the intersections of US 40 & Elk River Rd and Curve Plaza & Elk River Rd are spaced only 210 feet apart, the queueing between the two intersections was analyzed to ensure that neither intersection would be blocked. The northbound left turn moment at the signal of US 40 & Elk River Rd has a projected 95% queue of 183 feet. This puts the back of the queue only 27 feet away from extending into the intersection of Curve Plaza & Elk River Rd. Signage warning drivers not to block the intersection should be installed at the intersection of Curve Plaza & Elk River Rd if queues become problematic in the future. This will reduce the chances of the northbound queue from US 40 & Elk River Rd blocking drivers turning onto and off of Elk River Rd.

6. Site Contribution

In Colorado, all accesses to the state highway are regulated by the Colorado Department of Transportation (CDOT). Colorado's state highway system constitutes a valuable resource and a major public and private investment. It is the purpose of the SHAC to provide procedures and standards to aid in the management of that investment, to protect the public health, safety, and welfare, to maintain smooth traffic flow, and to protect the functional level of state highways while considering state, regional, and local transportation needs and interests. CDOT requires an access permit to be submitted if the traffic of a facility or operation exceeds 20% of the existing permitted traffic volumes at the access onto a state highway. The year 2022 volumes were used to determine the site contribution. The Steamboat Basecamp is expected to increase the existing traffic volumes by 27% at the access of US 40 & Sunlight Dr/Curve CT, and by 12% at the intersection of US 40 & Elk River Rd. Since the volumes accessing Curve CT are expected to increase by over 20%, an access permit will be required for that intersection.

There are future plans to improve the intersection of US 40 & Downhill Dr/Riverside Dr. Since the development of Steamboat Basecamp will contribute trips to this intersection, the developer will be required to contribute a determined percentage to the cost of intersection improvements. The percent contribution for intersection improvements at US 40 & Downhill Dr/Riverside Dr is determined by the percent of the total traffic volumes entering the intersection that is made up of trips going to or from the Steamboat Basecamp. The higher percentage between the AM and PM peak hours will be used to determine the contribution percentage. From the trip distribution assumptions, there will be 27 site trips entering the intersection in the AM, and 19 trips entering in the PM. The 27 site trips entering the intersection during the AM peak hour account for 1.29% of the total 2,094 entering trips, meaning that the Steamboat Basecamp is responsible for 1.29% of the intersection improvement costs.

7. Alternate Modes of Transportation

The City of Steamboat Springs has several multimodal options, including bus lines, bike lanes, and bike/walking paths. The Red Line and Blue Line both stop at the Elk River Crossing bus stop, just east of Steamboat Basecamp on Elk River Rd. Each of these bus lines have routes that go into downtown Steamboat Ski Resort. The Red Line and Blue Line stop at Elk River Crossing every 20 minutes from 6:35 AM to 11:45 PM.

The Yampa River Core Trail passes just south of the Steamboat Basecamp, intersecting with Shield Dr, and extending through downtown Steamboat. Cyclists looking to ride from the Steamboat Basecamp into downtown Steamboat will most likely take this trail. Many of the roads in downtown Steamboat have bike lanes making it easy for cyclists to exit the Yampa River Core Trail and use the roadway network to reach their destination.

Findings and Recommendations

The traffic impact study conducted for the Steamboat Basecamp in Steamboat Springs has concluded that the traffic volumes generated by the facility can be accommodated by the surrounding roadway system. The following is a summary of the study's findings:

1. A state highway access permit is required for the access at the intersection of US 40 & Sunlight Dr/Curve CT. In addition, both a southbound and northbound left turn lane should be added. Both of these turn lanes can be added by restriping the two-way left-turn median.

2. The Steamboat Basecamp is not responsible for failing traffic operations at the intersection of US 40 & Elk River Rd. For this intersection to operate well during peak hours in year 2040, and consistent with current long-range plans, a second westbound thru lane will need to be constructed.

3. The Steamboat Basecamp is not responsible for failing traffic operations at the intersection of Sunlight Dr/Curve CT. In order to operate acceptably in the long term, the intersection could be made a ¾ movement (left-in, right-in, right-out).

4. The Steamboat Basecamp contributes 1.29% of the traffic volume at the intersection of US 40 & Downhill Dr/Riverside Dr in the AM peak hour.

5. Signage warning drivers not to block the intersection should be installed at the intersection of Access #1 & Elk River Rd if queues become problematic in the future.

6. Access #1 to the Basecamp should be made right-in, right-out to help accommodate increased future traffic volumes. A splitter island and accompanying signage could be used to restrict the movements.