

Kelly Creek Road Interchange APPLE Study

Moody, St. Clair County, Alabama

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Admonition

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Executive Summary

Study Initiation and Study Area

This study was initiated by St. Clair County and the City of Moody through the Advanced Planning, Programming, and Logical Engineering (APPLE) program developed by the Regional Planning Commission of Greater Birmingham (RPCGB). The study area includes the I-20 interchange with Kelly Creek Road, extending along Kelly Creek Road from US-78 (SR-4) to Park Avenue (CR-10).

Purpose of the Study

This study was undertaken to evaluate the feasibility of improving the Interstate 20 (I-20) interchange with Kelly Creek Road. The purpose of the study was to identify potential improvement alternatives and to analyze improvements to traffic operations, identify right-of-way acquisition needs, and develop construction cost estimates for each alternative.

If improvements to the interchange are deemed necessary, this report may serve as the first step toward a potential Interchange Modification Report (IMR).

This report summarizes the following tasks from the study:

- An evaluation of existing traffic conditions
- Future traffic forecasting and analysis of future conditions (20-year horizon)
- Development of conceptual alternatives for improving the interchange
- Opinions of probable cost and potential funding sources

Stakeholder Input

Prior to initiation of the APPLE study, several meetings were held to discuss a potential project at the Kelly Creek Road interchange. Attendees at meetings prior to the study included ALDOT, St. Clair County, City of Moody, and Sain Associates. The most recent meeting prior to the initiation of this study was held on December 5, 2022. ALDOT Director John Cooper was in attendance alongside ALDOT East Central Region staff. The consensus from ALDOT at this time was that further study of traffic operations at the interchange was needed to advance a project.

A project kickoff meeting for the study was held on September 13, 2023, at Moody City Hall. The meeting was attended by representatives of the City of Moody, St. Clair County, RPCGB, and Sain Associates. Stakeholders discussed the project background, identified priorities, and outlined expectations for the scope of the study. Short-term strategies to mitigate queuing on the interstate ramps were discussed, as well as the long-term goal of progressing towards a potential IMR.

Due diligence for a potential IMR was coordinated with ALDOT East Central Region staff and ALDOT Traffic Design Bureau staff. Determination of whether or not an IMR is required would be determined by the Alabama Division of Federal Highway Administration (FHWA).

Improvement Alternatives

In addition to the No Build Alternative, which assumes no improvements to the study area, the following two improvement scenarios were identified and analyzed:

- Alternative A – Improved Diamond Interchange with Bridge Replacement
- Alternative B – Diverging Diamond Interchange (DDI)

Higher resolution concept drawings of both alternatives are provided in **Appendix A**.

The following evaluation matrix shows the anticipated benefits and challenges of each alternative. This table can also be found in Section 2.8 of this report.

Interchange Improvement Alternatives Evaluation Matrix

Category	No Build Alternative	Alternative A - Improved Diamond	Alternative B - DDI
Addresses Existing Capacity Deficiencies of the Two-Lane Bridge	No	Yes – Adds exclusive left turn lanes at ramp terminals	Yes – Reduces delay by allowing turning movements to flow freely
Mitigates Queueing on the I-20 Exit Ramps	No	Yes – Signalized intersections able to process queues more efficiently	Yes – Signalized intersections able to process queues more efficiently
Expands Capacity of the Interchange	No	Yes – Increases from 2 lanes to 4 lanes	Yes – Increases from 2 lanes to 4 lanes
Future LOS at I-20 Eastbound Ramps Intersection	AM Peak: LOS F PM Peak: LOS F	AM Peak: LOS B PM Peak: LOS C	AM Peak: LOS B PM Peak: LOS A
Future LOS at I-20 Westbound Ramps Intersection	AM Peak: LOS F PM Peak: LOS F	AM Peak: LOS D PM Peak: LOS C	AM Peak: LOS B PM Peak: LOS D
Opinion of Probable Cost	Maintenance costs only	\$19.2 million	\$13.8 million
Right-of-Way Acquisition & Utility Relocation Required	No	Yes, both required	Yes, both required
Method of Addressing Bridge Structure	No change	Full replacement; construct new bridge in 2 phases	Construct additional structure to the west of existing bridge; retain existing bridge
Interchange Alignment Matches Local Driver Expectation	Yes	Yes	No

FHWA's Capacity Analysis for Planning of Junctions (CAP-X) Tool was utilized to explore interchange alternatives to be evaluated in addition to an improved diamond interchange. Two feasible interchange configurations scored well in the CAP-X Tool's Overall V/C Ratio metric: single point urban interchange (SPUI) and diverging diamond interchange (DDI). The expected cost of bridge structure with a SPUI configuration is much higher than an improved diamond interchange and DDI configurations. Therefore, a SPUI configuration was ruled out from further detailed study. One interchange configuration not directly included in the CAP-X Tool is the double roundabout configuration, which is a diamond interchange with roundabout at each ramp terminal. Available space and high heavy volumes are concerns with this alternative, but a double roundabout would also be expected to function well at this location from a traffic operations perspective.

Next Steps

The immediate next step following the study is for ALDOT to seek the opinion of the Alabama Division of FHWA regarding the proposed alternatives. FHWA will determine whether or not an IMR is required to implement either of the proposed alternatives. Once this is officially determined and any required IMR is complete, the next step would be to seek funding for an environmental document, design, and construction of the resulting improvements.

Several IJJA-initiated competitive grant programs could be pursued once an IMR is complete or determined not to be necessary. The next chance to apply for appropriate competitive grant programs is likely Spring 2024 when a Notice of Funding Opportunity (NOFO) is released for the Infra, Rural, and Mega competitive grant programs.

Both the City and County currently have ATRIP-II projects underway which have not been let for construction at the time of this report. Therefore, funding for the Fiscal Year 2024 would not be eligible if either project is not let for construction by the application deadline, and the next opportunity for that program would be in Fall 2024 for Fiscal Year 2025 ATRIP-II cycle.

It is possible that a combination of local and state funding (i.e., ATRIP-II) could be used to reach the 20% match for various federal funding sources. This, along with combining the project with another large project in the area, should be explored throughout the process of seeking funding for the project.

Table of Contents

1	Existing Conditions	1
1.1	Description of the Study Area.....	1
1.2	Traffic Volumes.....	4
1.3	Field Review	6
1.4	Utilities and Right-of-Way	7
1.5	Crash Data Analysis.....	8
1.6	Existing Conditions Capacity Analysis.....	10
1.7	Existing Conditions Signal Warrant Evaluation.....	11
1.8	Bicycle and Pedestrian Accommodations	12
1.9	Existing Documents and Adjacent Projects	12
2	Concept Plan Development and Recommendations.....	15
2.1	Purpose and Need for Improvements	15
2.2	Future Traffic Volumes and Forecasting	15
2.3	Interim Recommendations	19
2.4	Build Alternatives	20
2.5	Future Conditions Capacity Analysis	22
2.6	Planning-Level Opinions of Probable Cost	24
2.7	Alternatives Evaluation Matrix	25
2.7	Funding Sources.....	26
2.8	Stakeholder Involvement.....	29
2.9	Next Steps.....	29

Appendices

Appendix A – Improvement Alternatives Concept Drawings

Appendix B – Raw Traffic Data Reports

Appendix C – Field Review Observations & Photos

Appendix D – Utility Plan Sheets

Appendix E – Descriptions of Levels of Service

Appendix F – Existing Conditions Capacity Analysis Reports

Appendix G – Existing Conditions Signal Warrant Evaluation Reports

Appendix H – Future Conditions Capacity Analysis Reports

Appendix I – Opinions of Probable Cost

Figures

Figure 1: Site Vicinity Map	2
Figure 2: Identification Map of Driveways Near the Interchange	3
Figure 3: Existing Peak Hour Traffic Volumes	5
Figure 4: ALDOT Right-of-Way Map of Study Area.....	7
Figure 5: Utility Plans Showing Existing Force Main Across I-20.....	8
Figure 6: Crash Data Breakdown by Collision Type	9
Figure 7: Crash Data Breakdown by Severity	9
Figure 8: Background Peak Hour Traffic Volumes (2043)	16
Figure 9: Future Peak Hour Added Trips	17
Figure 10: Combined Future Peak Hour Traffic Volumes (2043).....	18
Figure 11: Alternative A – Improved Diamond Interchange Concept	20
Figure 12: Alternative B – Diverging Diamond Interchange Concept	21

Tables

Table 1: Study Area Roadway Characteristics.....	1
Table 2: Bi-directional Counts Summary	6
Table 3: Existing Levels of Service	10
Table 4: Existing Conditions Signal Warrant Results – With Right-Turn Reduction.....	12
Table 5: Existing Conditions Signal Warrant Results – Without Right-Turn Reduction	12
Table 6: Future No Build Alternative Intersection LOS (2043).....	22
Table 7: Improvement Alternatives Intersection LOS (2043).....	23
Table 8: Opinions of Probable Cost for Improvement Alternatives	24
Table 9: Interchange Improvement Alternatives Evaluation Matrix	25
Table 10: Funding Source Options.....	26

Photos

Photo 1: Queueing on I-20 eastbound exit ramp at Kelly Creek Road.....	6
Photo 2: I-20 eastbound exit ramp queueing to gore point of I-20	7
Photo 3: Kelly Creek Road improvements just south of I-20 eastbound ramps	13
Photo 4: AWSC Condition at I-20 EB Exit Ramp Approach to Kelly Creek Road.....	19

1 Existing Conditions

1.1 Description of the Study Area

The study area is in the City of Moody within St. Clair County. The study area includes Kelly Creek Road near its interchange with Interstate 20, from US-78 south of the interchange to Park Avenue north of the interchange. **Figure 1** illustrates the location of the study area.

The land uses adjacent to the study area are commercial and industrial. There are several truck stop and gas station facilities near the interchange. To the north of the interchange, there is a Vulcan Industries facility just north of the I-20 westbound ramps, which is accessed by Display Drive; a Red Diamond facility along Park Avenue west of its intersection with Kelly Creek Road; and an industrial park along Kelly Creek Road north of its intersection with Park Avenue. To the south of the interchange, Kelly Creek Road transitions into US-78 and provides access to Moody Commerce Park, another multi-facility industrial park.

Table 1 summarizes the functional classifications and roadway geometry in the study area. All the study intersections are two-way stop controlled except for Kelly Creek Road at the I-20 eastbound ramps, which is all-way stop controlled.


Table 1: Study Area Roadway Characteristics

Road Name	Speed Limit (MPH)	Functional Classification	Typical Section
Kelly Creek Road	30-35	Major Collector	2-lane north of I-20 EB ramps 3-lane south of I-20 EB ramps
Interstate 20	70	Interstate	6-lane divided
US-78	35-55	Minor Arterial	2-lane undivided
Park Avenue	40	Minor Arterial/ Local Road	2-lane undivided
Display Drive	None Posted	Private Drive	2-lane divided

Figure 2 shows a map identifying each access point near the interchange.

In addition to the turning movement counts (TMCs), 24-hour bi-directional tube counts were collected at several of the truck stop driveways within the study area.

Legend

 Study Intersections

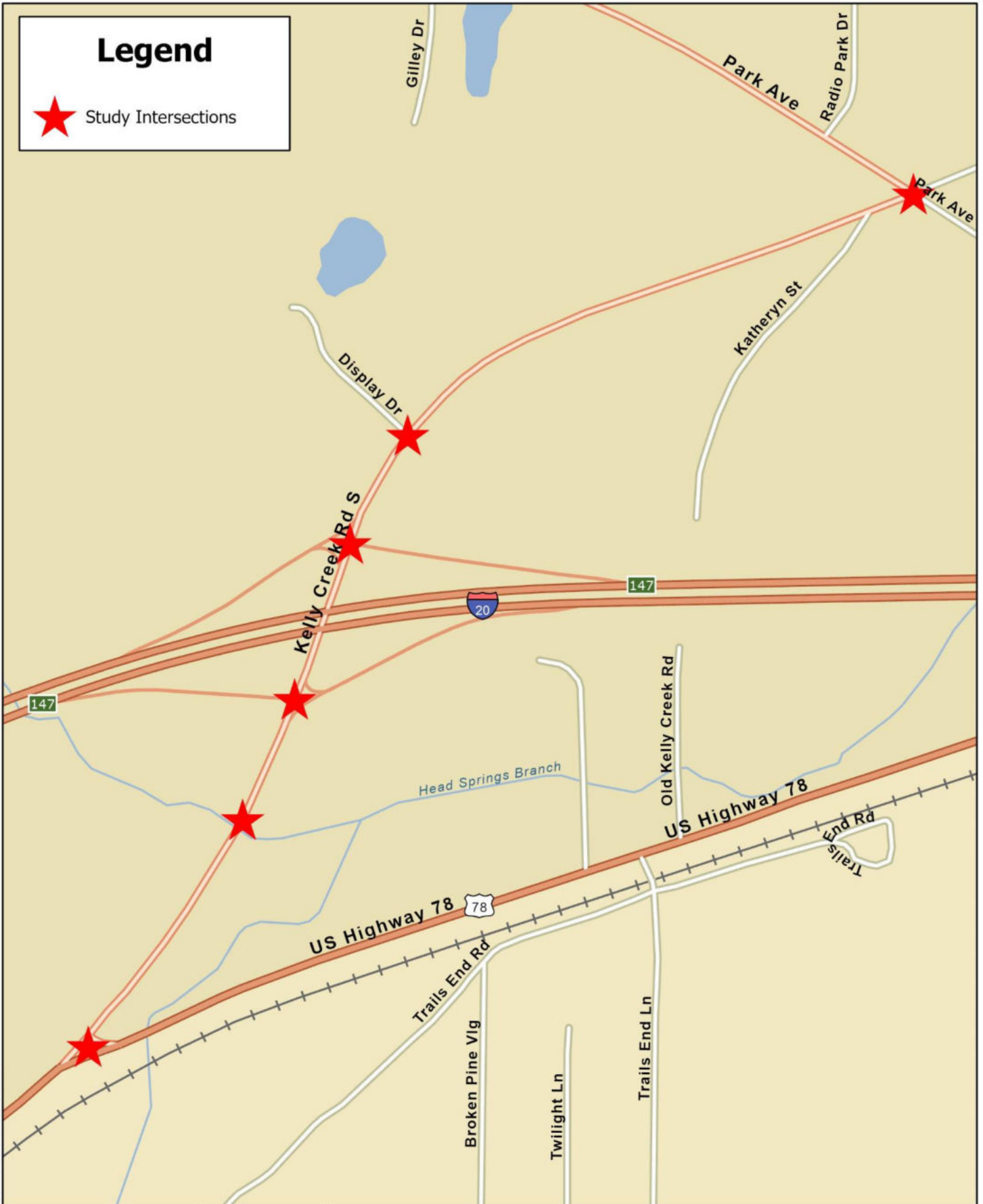


Figure 1 - Study Area Location Map

Kelly Creek Road APPLE Study
Moody, AL



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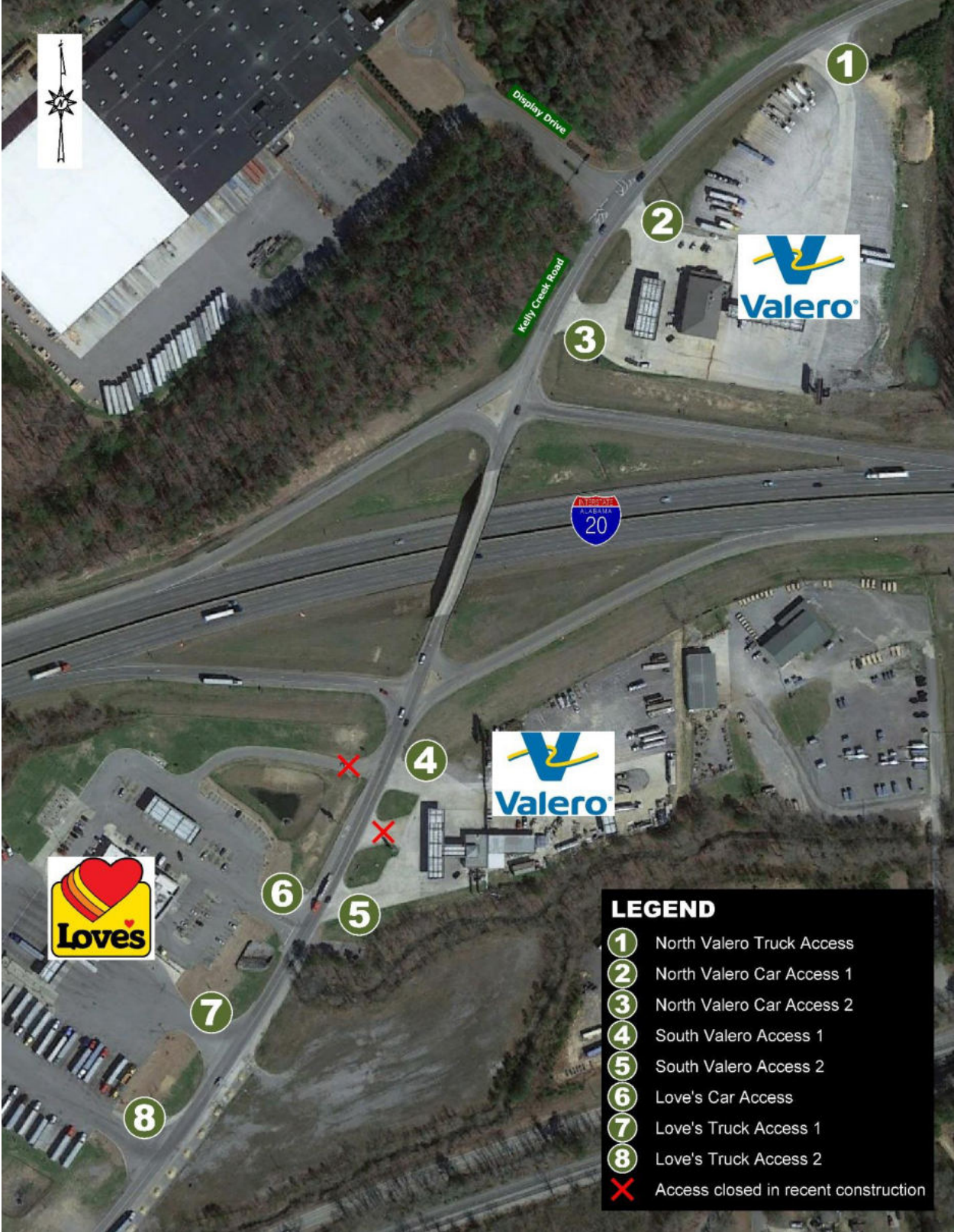


Figure 2: Identification Map of Driveways Near the Interchange

1.2 Traffic Volumes

Sain Associates collected traffic count data through subconsultant Marr Traffic, Inc on Tuesday, May 23, 2023.

24-hour turning movement count data was collected at the following intersections:

- Kelly Creek Road @ I-20 Eastbound Ramps
- Kelly Creek Road @ I-20 Westbound Ramps

14-hour turning movement count data was collected from 6:00 AM to 8:00 PM at the following intersections:

- Kelly Creek Road @ US-78
- Kelly Creek Road @ Park Avenue
- Kelly Creek Road @ South Valero Access 2/Love's Car Access
- Kelly Creek Road @ Display Drive /North Valero Car Access 1

The peak hours of traffic flow at the interchange were determined to be 7:00 – 8:00 AM and 4:30 – 5:30 PM. **Figure 3** illustrates the existing traffic volumes from the collected turning movement counts during the peak hours.

Additionally, 24-hour bi-directional counts were collected at the following driveways within the study area:

- North Valero Truck Access
- North Valero Car Access 2
- South Valero Access 2
- Love's Truck Access 1
- Love's Truck Access 2

Classification of vehicle types was included in data collection efforts. Heavy vehicles percentages at the following locations are listed as follows:

- Kelly Creek Road, North of I-20:
 - 3.8% in AM peak hour
 - 4.0% in PM peak hour
- Kelly Creek Road, at I-20:
 - 9.0% in AM peak hour
 - 7.0% in PM peak hour
- Kelly Creek Road, South of I-20:
 - 15.1% in AM peak hour
 - 11.9% in PM peak hour

Entering and exiting volumes for each driveway in the study area are summarized in **Table 2**. All raw traffic data reports are provided in **Appendix B**.

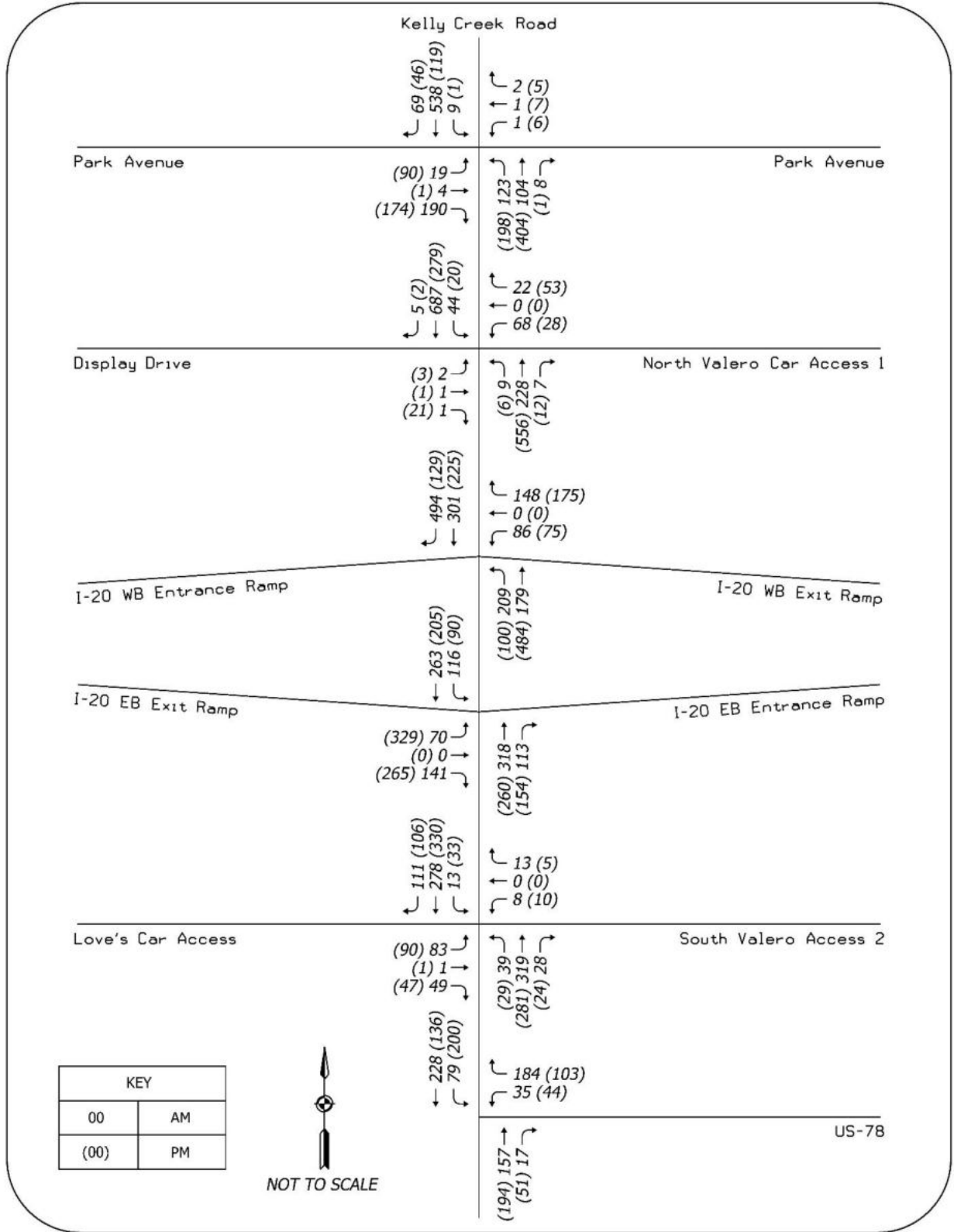


Figure 3: Existing Peak Hour Traffic Volumes

Table 2: Bi-directional Counts Summary

Driveway	AM Peak Hour		PM Peak Hour	
	Entering	Exiting	Entering	Exiting
North Valero Truck Access	13	17	11	14
North Valero Car Access 1	52	90	33	81
North Valero Car Access 2	88	39	99	37
South Valero Access 1	1	19	1	33
South Valero Access 2	42	21	58	15
Love's Car Access	150	133	135	138
Love's Truck Access 1	37	1	42	1
Love's Truck Access 2	3	50	13	33

1.3 Field Review

Sain Associates performed field reviews on Wednesday, August 16, 2023 from 3:00 to 6:00 PM and Thursday, August 17, 2023 from 7:00 to 8:00 AM. Observations were chiefly focused on the I-20 interchange ramps and the surrounding sections of Kelly Creek Road.

During the AM peak period, intermittent queuing occurred along Kelly Creek Road southbound from the I-20 westbound ramps to Park Avenue and Kelly Creek Road northbound from the I-20 eastbound ramps to Love's Truck Access 2.

During the PM peak period, sustained queuing occurred from 5:15 PM to 6:00 PM on the I-20 eastbound exit ramp and Kelly Creek Road northbound from the I-20 eastbound ramps to US-78. **Photos 1 and 2** show the I-20 eastbound exit ramp queue at Kelly Creek Road during the PM peak period. The queue reached the I-20 gore point several times between 5:15 PM and 6:00 PM.

Detailed notes containing observations and photos from the field review are included in **Appendix C**.



Photo 1: Queueing on I-20 eastbound exit ramp at Kelly Creek Road



Photo 2: I-20 eastbound exit ramp queueing to gore point of I-20

1.4 Utilities and Right-of-Way

There are various utilities in the study area, including water, sanitary sewer, gas, fiber, and overhead power. These utilities mainly serve the gas stations on the north and south sides of the interchange. Utility plan sheets from the recently completed improvements to Kelly Creek Road are provided in **Appendix D**.

Kelly Creek Road has a right-of-way width of 150' throughout the study area, as shown in **Figure 4**.

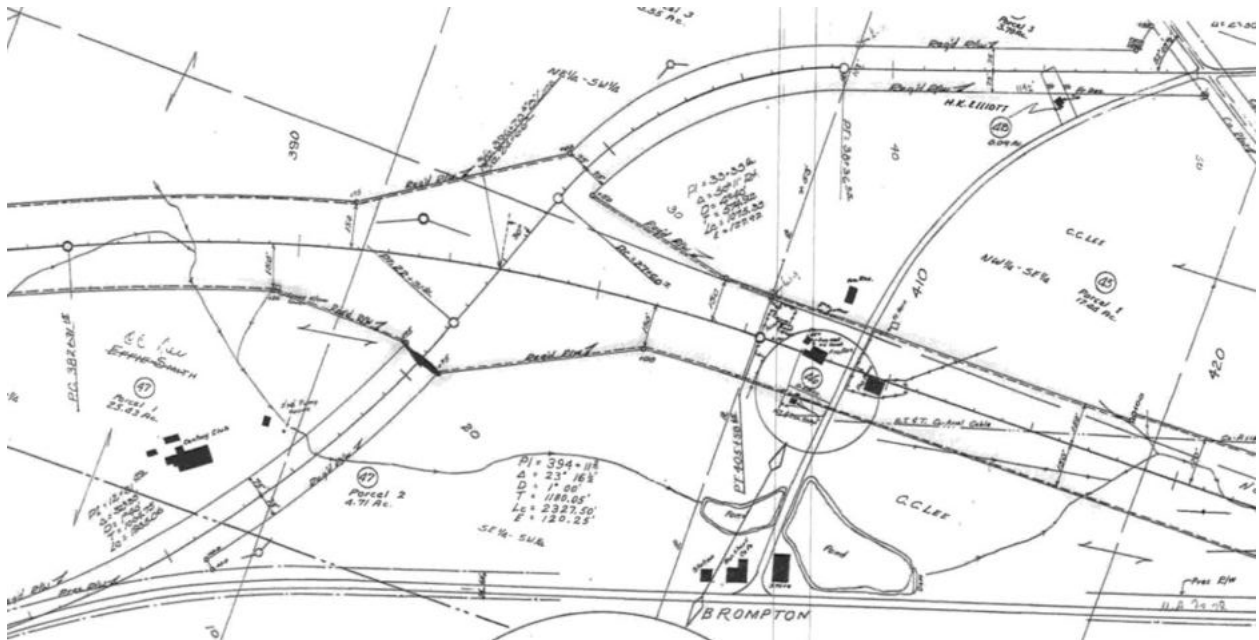


Figure 4: ALDOT Right-of-Way Map of Study Area

An existing force main crosses both sides of the interstate approximately 120' to the west of the gore point of the I-20 eastbound exit ramp, as shown in **Figure 5**. Any potential improvements to the interchange that involve lengthening the eastbound exit ramp or the westbound entrance ramp may require relocation of the force main.

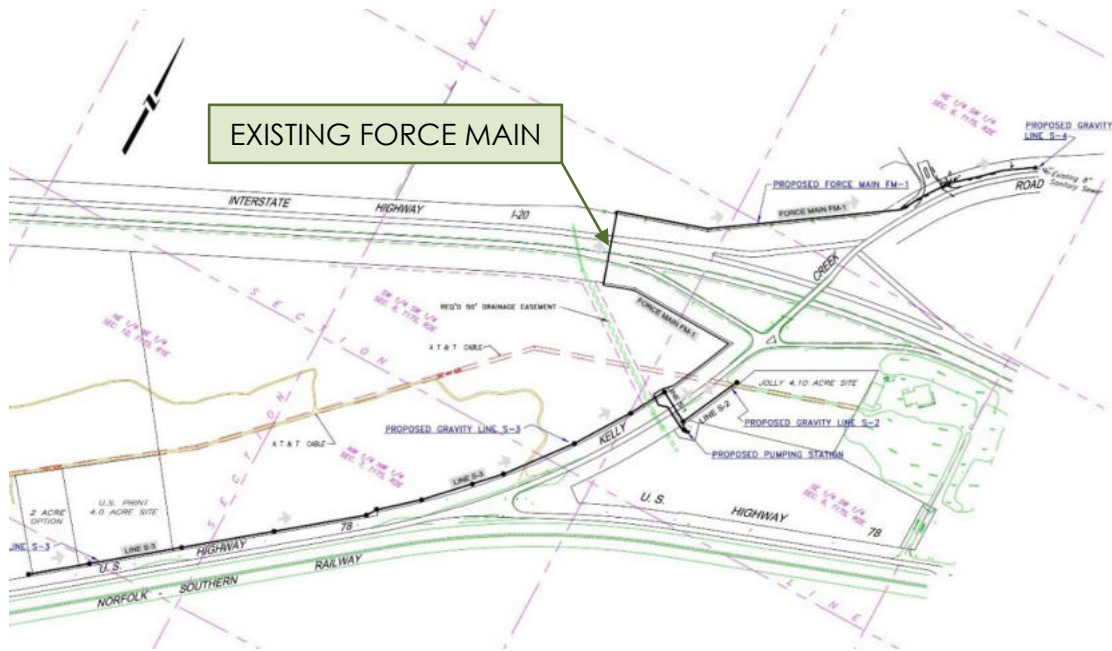


Figure 5: Utility Plans Showing Existing Force Main Across I-20

1.5 Crash Data Analysis

The information presented in this section is exempt from open records, discovery or admission under Alabama Law and 23 U.S.C. §§ 148(h)(4) and 409). The collection of safety data is encouraged to actively address safety issues on regional, local, and site-specific levels. Congress has laws, 23 U.S.C. § 148(h)(4) and 23 U.S.C. § 409 which prohibit the production under open records and the discovery or admission of crash and safety data from being admitted into evidence in a Federal or state court proceeding. This document contains text, charts, tables, graphs, lists, and diagrams for the purpose of identifying and evaluating safety enhancements in the project area. These materials are protected under 23 U.S.C. §409 and 23 U.S.C. § 148(h)(4). In addition, the Supreme Court in *Ex parte Alabama Dept. of Trans.*, 757 So. 2d 371 (Ala. 1999) found that these are sensitive materials exempt from the Alabama Open Records Act.

Crashes are to some degree random events; therefore, crash frequencies naturally fluctuate over time at a given site. This randomness indicates that short-term crash frequencies alone are not a reliable estimator of long-term crash frequency. The crash fluctuation over time makes it difficult to determine whether changes in the observed crash frequency are due to changes in site conditions or are due to natural fluctuations. When a period with high crash frequency is observed, it is statistically probable that the following period will have low crash frequency. This tendency is known as regression-to-the-mean (RTM). Not accounting for the effects of RTM introduces the potential for "RTM bias" (Refer to the Highway Safety Manual for more information).

Crash data for this analysis was provided by the Regional Planning Commission of Greater Birmingham (RPCGB). Data included crash information from January 2018 to December

2022 from the Critical Analysis Reporting Environment (CARE) database maintained by the Center for Advanced Public Safety (CAPS) at The University of Alabama. The data is summarized as follows:

- One hundred seven (107) total crashes reported,
- Zero (0) fatal, incapacitating injury, or non-incapacitating injury crashes,
- Sixteen (16) possible injury crashes, and
- Eighty-nine (89) property damage only crashes.
- Two (2) crashes reported no crash severity.

Figures 6 and 7 illustrate the breakdown of the crash data by collision type and severity, respectively.

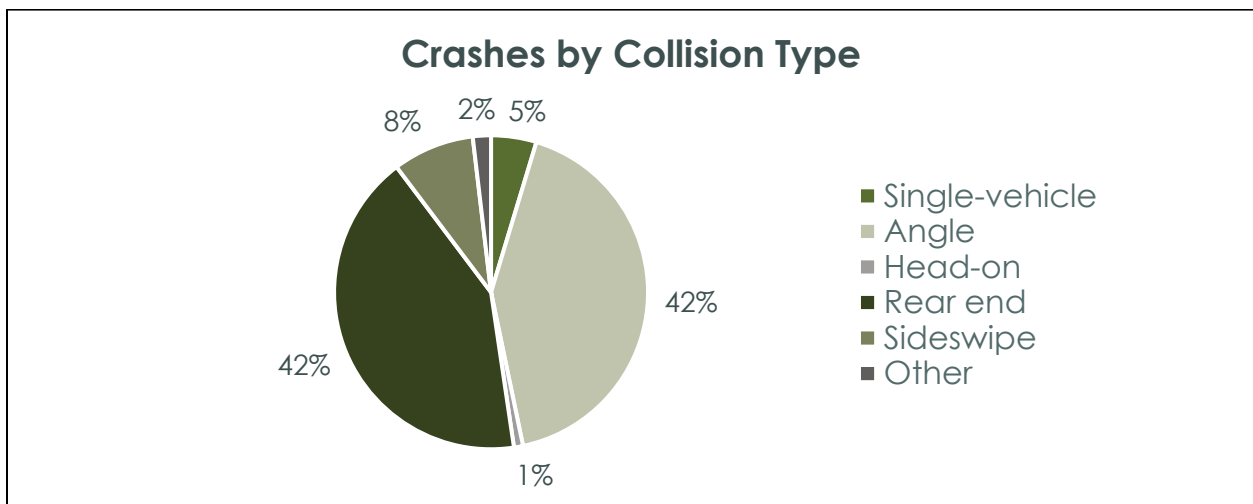


Figure 6: Crash Data Breakdown by Collision Type

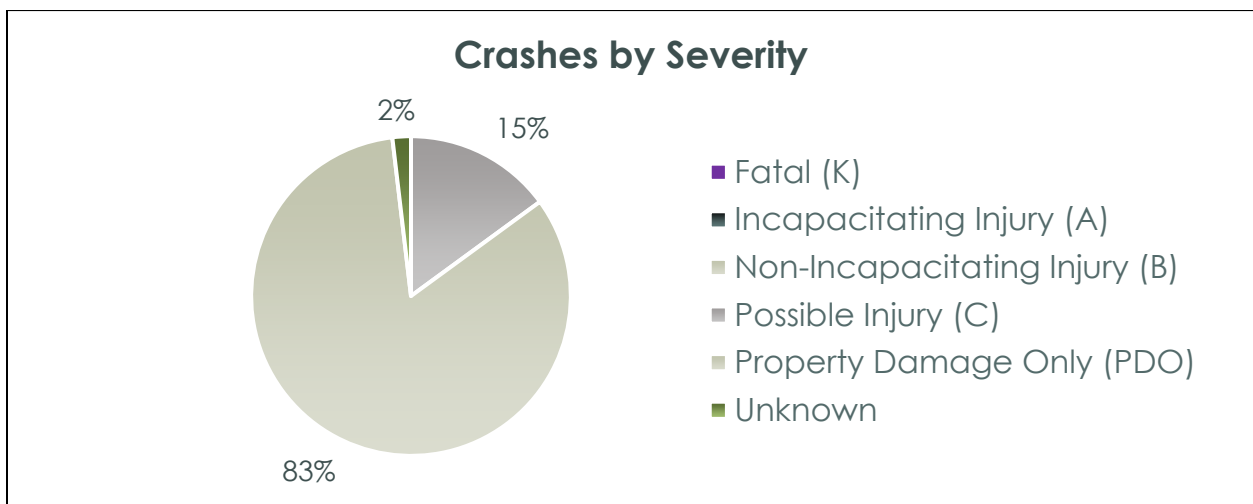


Figure 7: Crash Data Breakdown by Severity

Rear-end and angled collisions each represented the most crashes among the reported crashes in the dataset. Rear-end collisions are typically low-severity crashes, while angled collisions tend to have higher severities.

1.6 Existing Conditions Capacity Analysis

Using the methods described in the Highway Capacity Manual, published by the Transportation Research Board, Sain analyzed the existing traffic conditions within the study area. According to this method of analysis, traffic capacities are expressed as levels of service (LOS) ranging from “A” to “F.” A detailed description of each LOS designation is included in **Appendix E**. Generally, LOS “C” or better is considered desirable, while LOS “D” is considered acceptable during peak hours of traffic flow. Trafficware’s Synchro 11 modeling software was used to complete this analysis.

Full printouts of the existing conditions capacity analysis are provided in **Appendix F**, with the results summarized in **Table 3**.

Table 3: Existing Levels of Service

Intersection	Approach		Level of Service	
			AM Peak	PM Peak
Kelly Creek Road @ I-20 EB Ramps	EB	EB Exit Ramp	B	C
	NB	Kelly Creek Rd	B	C
	SB	Kelly Creek Rd	C	C
Kelly Creek Road @ I-20 WB Ramps	WB	WB Exit Ramp	F	D
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ US-78	WB	US-78	B	B
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ Park Avenue	EB	Park Ave	C	C
	WB	Park Ave	C	C
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ Love's Car Access/ South Valero Access 1	EB	Love's Car Access	C	C
	WB	S Valero Access 1	B	C
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ Display Drive/ North Valero Car Access 1	EB	Display Dr	C	A
	WB	N Valero Car Access 1	E	C
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A

It is not uncommon for field conditions to differ from modeled conditions, which is the case for the I-20 westbound exit ramp and the I-20 eastbound exit ramp. Modeled conditions for the I-20 eastbound exit ramp appeared better than what was observed in the field, while modeled conditions for the I-20 westbound ramp appeared worse than what was observed in the field. The all-way stop controlled intersection at the I-20 eastbound ramps is not operating as efficiently as the model projects. At the I-20 westbound ramps intersection, queued motorists along Kelly Creek Road are stopping to allow vehicles to enter from the I-20 westbound ramp. This cannot be accurately represented in the Synchro model. Both instances of the modeled conditions failing to match the existing conditions should be considered in future conditions models.

According to the existing conditions capacity analysis, all study intersection approaches are currently operating with LOS D or better during both peak periods, except for the I-20 Westbound Exit Ramp at Kelly Creek Road during the AM peak period and the Westbound Display Drive at Kelly Creek Road during the AM peak period.

1.7 Existing Conditions Signal Warrant Evaluation

Sain Associates performed a traffic signal warrant evaluation for the intersections of Kelly Creek Road and the eastbound & westbound I-20 ramps according to the guidelines contained in the *Manual of Uniform Traffic Control Devices (MUTCD), 2009 Edition*. These guidelines establish nine different conditions that could warrant the installation of a traffic signal. The following warrants are most commonly used to justify a traffic signal:

- Warrant #1 – Eight-Hour Vehicular Volume
- Warrant #2 – Four-Hour Vehicular Volume

In evaluating Warrants #1 and #2, the existing traffic volumes were compared to the minimum thresholds required by the MUTCD to satisfy the need for a traffic signal. ALDOT's *Traffic Signal Design Guide & Timing Manual (2015)* provides guidelines for reducing projected right-turning volumes from the minor road to account for a certain percentage of vehicles being able to turn right without the installation of a traffic signal.

However, a sight distance issue looking north from the I-20 eastbound exit ramp prevents the right-turning vehicles from taking full advantage of the exclusive right turn lane. For this reason, it may not be appropriate to apply the right-turn reduction specified for the lane geometry. Without the right-turn reduction applied to traffic volumes, the signal warrant results are different.

Also, previous remedial measures were attempted in the form of converting from side-street stop control to all-way stop control to mitigate unsatisfactory intersection sight distance on the I-20 eastbound ramp approach to Kelly Creek Road. Based on field observations, this remedial measure does mitigate sight distance issues but fails to mitigate queueing onto the mainline interstate. Exclusive right turn lanes were also installed on both I-20 exit ramps at Kelly Creek Road as previous remedial measures.

The results of this analysis with the right-turn reduction applied are summarized in **Table 4**, while the results of this analysis without the right-turn reduction applied are summarized in **Table 5**. Full reports of the signal warrant evaluation are given in **Appendix G**.

Table 4: Existing Conditions Signal Warrant Evaluation Results – With Right-Turn Reduction

Intersection	Signal Warrant Result			
	#1 – Eight Hour Volume		#2 – Four Hour Volume	
	Hours Met	Satisfied?	Hours Met	Satisfied?
Kelly Creek Road @ I-20 Eastbound Ramps	4/8 hours	No	3/4 hours	No
Kelly Creek Road @ I-20 Westbound Ramps	0/8 hours	No	2/4 hours	No

Table 5: Existing Conditions Signal Warrant Evaluation Results – Without Right-Turn Reduction

Intersection	Signal Warrant Result			
	#1 – Eight Hour Volume		#2 – Four Hour Volume	
	Hours Met	Satisfied?	Hours Met	Satisfied?
Kelly Creek Road @ I-20 Eastbound Ramps	8/8 hours	Yes	4/4 hours	Yes
Kelly Creek Road @ I-20 Westbound Ramps	8/8 hours	Yes	4/4 hours	Yes

1.8 Bicycle and Pedestrian Accommodations

There are no pedestrian accommodations within the study area. By state law, cyclists may ride within the traveled way, but there are no exclusive bicycle facilities within the study area. No bicycle or pedestrian activity was observed during the field review.

1.9 Existing Documents and Adjacent Projects

Kelly Creek Road Phase 1 Improvements Memorandum

Sain Associates completed this technical memo on August 4, 2016 for St. Clair County. The purpose of the memo was to evaluate potential improvements to Kelly Creek Road.

The following recommendations were listed as a result of the analysis:

- Widening of the I-20 westbound off ramp to include a right turn lane with an increased right turn radius
- Widening of the I-20 eastbound off ramp to include a right turn lane with an increased right turn radius
- Widening of Kelly Creek Road to provide a northbound right turn lane plus an acceleration lane onto the I-20 eastbound on ramp

- Relocating the stop line for northbound Kelly Creek Road at the I-20 eastbound ramps closer to the intersection
- Closing the northern Love's right-in only driveway
- Closing the middle Valero driveway
- Widening Kelly Creek Road to three lanes from just south of I-20 to US-78
 - Raised median from I-20 through the northern Valero driveway
 - Southbound left turn lane for the southern Valero driveway
 - Two-way-left-turn-lane from the southern Valero driveway to US-78

Additionally, signal warrant analyses were conducted at the intersections of Kelly Creek Road and the eastbound & westbound I-20 ramps. Neither location was found to warrant the installation of a traffic signal, but it was recommended to periodically monitor the traffic conditions for a potential need for a traffic signal in the future.

Kelly Creek Road & I-20 Ramps Widening & Intersection Improvements

Sain Associates designed improvements for Kelly Creek Road that included all the listed recommendations from the previously described Kelly Creek Road Phase 1 Improvements Memorandum. Construction began in January 2022 and was completed in July 2023. **Photo 3** contains a view of Kelly Creek Road just south of I-20.



Photo 3: Kelly Creek Road improvements just south of I-20 eastbound ramps

Kelly Creek Commerce Park Traffic Impact Analysis

Sain Associates performed a traffic impact analysis (TIA) for a proposed industrial park located on the west side of Kelly Creek Road to the north of its intersection with Park Avenue. This TIA was submitted in March 2020 and construction of the industrial park has since been completed.

The study analyzed the intersections of Kelly Creek Road with I-20 eastbound ramps, I-20 westbound ramps, and Park Avenue. According to the future conditions capacity

analysis, the Park Avenue approaches at Kelly Creek Road were projected to operate with level of service (LOS) E or F; the report notes that it is not uncommon for side streets at stop-controlled intersections to experience low LOS during peak hours. The intersections of Kelly Creek Road and the I-20 ramps were projected to operate with LOS D or better.

No improvements to the existing study intersections were recommended by this TIA.

Speedway Traffic Impact Analysis (Not Constructed)

Sain Associates performed a TIA for a proposed Speedway truck stop located in the northeast quadrant of Kelly Creek Road and US-78. This TIA was submitted in April 2020. At the time this APPLE study was prepared, construction of the Speedway facility had not occurred.

The study analyzed the intersections of Kelly Creek Road with I-20 eastbound ramps, I-20 westbound ramps, and US-78. According to the future conditions capacity analysis, each study intersection approach was projected to operate with LOS D or better.

No improvements to the existing study intersections were recommended by this TIA.

Although this development has not yet been constructed, the estimated added trips were incorporated into the capacity analysis for this APPLE study to account for potential future developments in the area.

2 Concept Plan Development and Recommendations

2.1 Purpose and Need for Improvements

At the Kelly Creek Road interchange with I-20, the purpose and need for improvement is to address existing capacity deficiencies of the two-lane bridge over I-20, mitigate queueing on the I-20 exit ramps, address sight distance issue at the I-20 eastbound exit ramp approach to Kelly Creek Road, and expand the capacity of the interchange to accommodate additional development north of the interchange.

2.2 Future Traffic Volumes and Forecasting

A background growth rate was applied to existing traffic volumes to forecast a 20-year horizon (year 2043). Using historical annual average daily traffic (AADT) volumes from ALDOT's *Alabama Traffic Data* website, a 1% linear growth rate was determined to be appropriate. **Figure 8** illustrates the 2043 background traffic volumes.

Additionally, generated traffic volumes from the Kelly Creek Commerce Park and Speedway traffic impact analyses (see Section 1.9) were added to the background volumes to calculate the combined future traffic volumes. Although the Speedway development was not constructed, those volumes were used as a placeholder for any future development in that parcel. **Figure 9** illustrates the generated trips estimated by the two traffic impact analyses, and the combined future traffic volumes are shown in **Figure 10**.

The full traffic impact analysis report documents are available upon request.

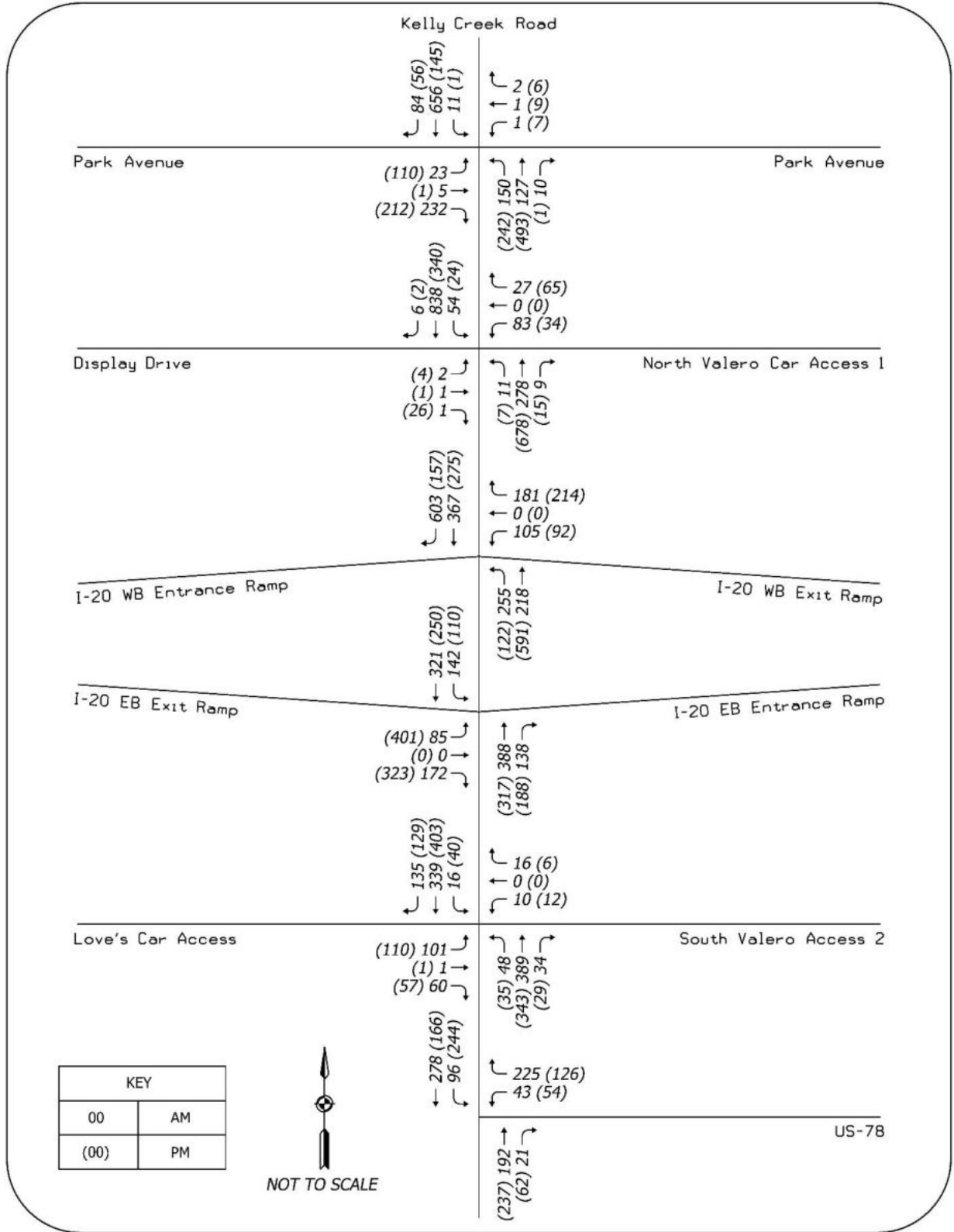


Figure 8: Background Peak Hour Traffic Volumes (2043)

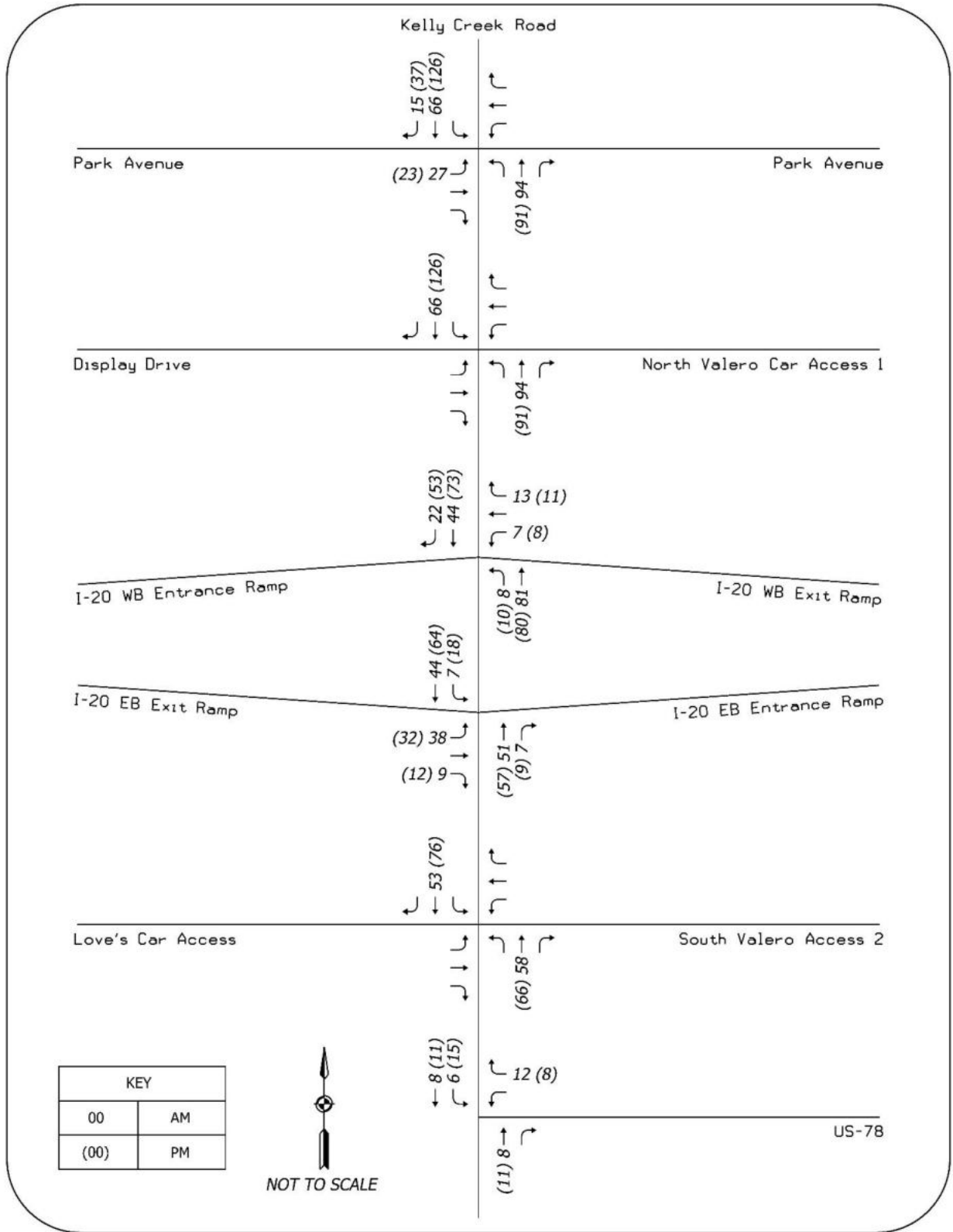


Figure 9: Future Peak Hour Added Trips

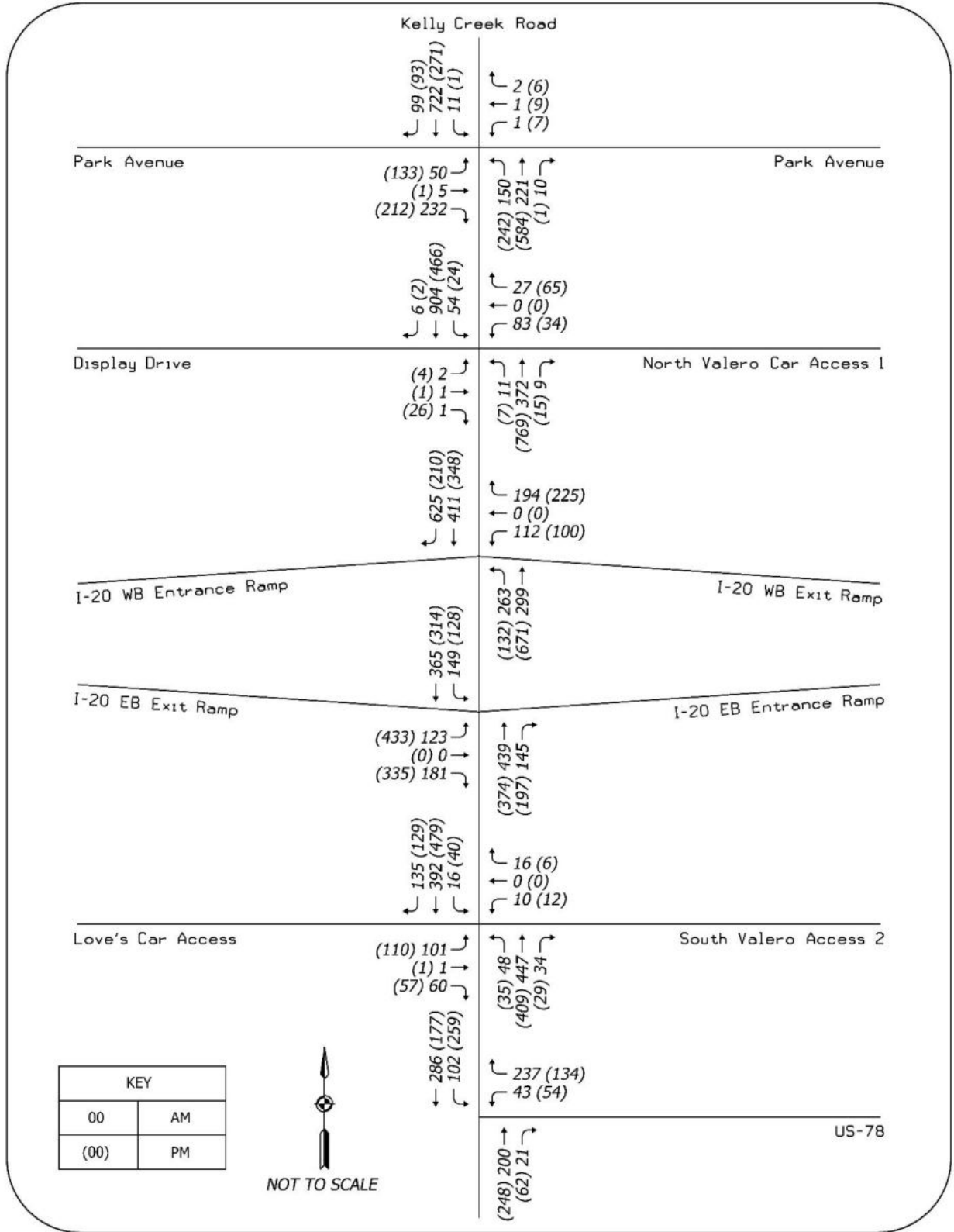


Figure 10: Combined Future Peak Hour Traffic Volumes (2043)

2.3 Interim Recommendations

Queueing on the I-20 eastbound exit ramp was observed reaching the gore point of the ramp and extended into the interstate mainline. This should be addressed independently from any larger-scale interchange improvements. Previously, the intersection's two-way stop control was updated to an all-way stop control configuration to address sight distance issues for eastbound drivers looking left (north) along Kelly Creek Road; however, it is clear from field observations that this configuration is not able to adequately process the traffic on the I-20 eastbound exit ramp during the PM peak hour. A traffic signal would allow queues on the ramp to clear more efficiently, while also serving the traffic on Kelly Creek Road.

A traffic signal warrant evaluation was conducted (see Section 1.7) and it was determined that the results of the signal warrant evaluation are dependent on application of right-turn reductions at both intersections. The application of the right-turn reductions, which are based on lane geometry, may not be appropriate in this case due to sight distance issues and queueing on the I-20 eastbound exit ramp.

With right-turn reductions applied, both intersections failed to satisfy either warrant that was considered. However, without right-turn reductions applied, both intersections did satisfy Warrant #1 and Warrant #2 for installation a traffic signal. Based on the analysis performed in the study, Sain Associates recommends the following items in the interim:

1. Install a temporary traffic signal at the intersection of Kelly Creek Road and I-20 Eastbound Ramps. Once a build alternative is constructed, consider removal of or modification of this traffic signal as needed.
2. Do not install a temporary traffic signal at the intersection of Kelly Creek Road and I-20 Westbound Ramps. Ability to coordinate the signals in the interim period could prove challenging and ultimately make traffic conditions worse.

The interim recommendations are not representative of a long-term solution to the issues at the Kelly Creek Road interchange. The goal of the interim recommendations are to mitigate existing queueing onto the I-20 eastbound mainline. The long-term solutions evaluated in this study are found in Section 2.4.

Photo 4 displays the all-way stop-control condition at the I-20 eastbound exit ramp approach to Kelly Creek Road.



Photo 4: All-Way Stop-Control Condition at I-20 Eastbound Exit Ramp Approach to Kelly Creek Road

2.4 Build Alternatives

In addition to the No Build Alternative, which assumes no improvement to the existing interchange, two improvement scenarios were evaluated for the interchange. Higher resolution concept drawings of both alternatives are provided in **Appendix A**.

Alternative A – Improved Diamond Interchange with Bridge Replacement

The main improvement in this scenario is the widening of the bridge from two lanes to four lanes. The new geometry would feature a through lane and exclusive left turn lane on northbound and southbound Kelly Creek Road.

This scenario was analyzed with coordinated traffic signals at the two ramp terminals because the existing stop-controlled intersections resulted in failing LOS for both exit ramps during both peak periods. Traffic volumes should be monitored periodically to determine whether traffic signals are warranted. Additionally, this scenario was modeled with an exclusive southbound right turn lane from Kelly Creek Road onto the I-20 westbound entrance ramp.

Figure 11 shows a conceptual layout of Alternative A.



Figure 11: Alternative A – Improved Diamond Interchange Concept

Alternative B – Diverging Diamond Interchange

A diverging diamond interchange (DDI) is an alternative design in which traffic crosses over – or diverges – from the right side of the road to the left, and then back to the right side again beyond the interchange. A DDI is typically appropriate for interchanges with relatively low through volumes and relatively high turning volumes, as the left turn movements can be made without crossing opposing traffic lanes. Because the DDI is not a common configuration in Alabama, it may take time for drivers to become acclimated to the DDI configuration.

Figure 12 shows a conceptual layout of Alternative B.

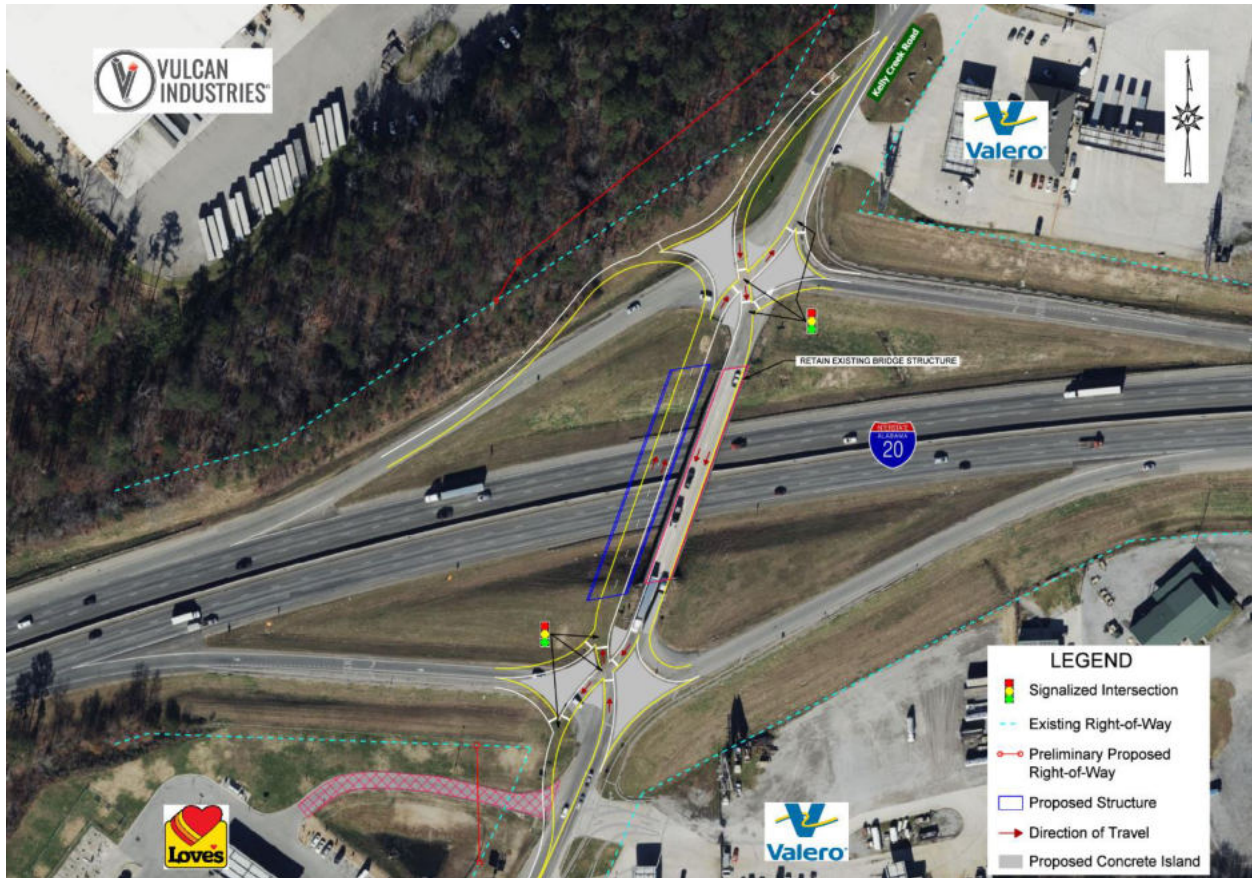


Figure 12: Alternative B – Diverging Diamond Interchange Concept

Additional Alternatives Considered

FHWA's Capacity Analysis for Planning of Junctions (CAP-X) Tool was utilized to explore interchange alternatives to be evaluated in addition to an improved diamond interchange. Two feasible interchange configurations scored well in the CAP-X Tool's Overall V/C Ratio metric: single point urban interchange (SPUI) and diverging diamond interchange (DDI). The expected cost of bridge structure with a SPUI configuration is much higher than an improved diamond interchange and DDI configurations. Therefore, a SPUI configuration was ruled out from further detailed study. One interchange configuration not directly included in the CAP-X Tool is the double roundabout

configuration, which is a diamond interchange with roundabout at each ramp terminal. Available space and high heavy volumes are concerns with this alternative, but a double roundabout would also be expected to function well at this location from a traffic operations perspective.

2.5 Future Conditions Capacity Analysis

Each alternative was analyzed under future conditions using the HCM methodology previously described for the existing conditions capacity analysis. **Table 6** summarizes the LOS results for the future No Build Alternative, which assumes no improvements to the existing interchange. **Table 7** provides a comparison of the LOS at the two ramp intersections in each improvement scenario.

Full reports of the future conditions capacity analysis are provided in **Appendix H**.

Table 6: Future No Build Alternative Intersection LOS (2043)

Intersection	Approach		Level of Service	
			AM Peak	PM Peak
Kelly Creek Road @ I-20 EB Ramps	EB	EB Exit Ramp	B	E
	NB	Kelly Creek Rd	D	D
	SB	Kelly Creek Rd	F	F
Kelly Creek Road @ I-20 WB Ramps	WB	WB Exit Ramp	F	F
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ US-78	WB	US-78	B	D
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ Park Avenue	EB	Park Ave	F	F
	WB	Park Ave	F	F
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ Love's Car Access/ South Valero Access 1	EB	Love's Car Access	D	E
	WB	S Valero Access 1	C	D
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Road @ Display Drive/North Valero Car Access 1	EB	Display Dr	E	B
	WB	N Valero Car Access 1	F	E
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A

According to the future conditions capacity analysis for the Future “No Build” scenario, many of the study intersection approaches are projected to operate with LOS E or F during each peak hour. The only approaches that are projected to experience LOS A are the uncontrolled northbound and southbound approaches of Kelly Creek Road at the various two-way stop-controlled intersections.

Table 7: Improvement Alternatives Intersection LOS (2043)

Scenario	Intersection	Approach		Level of Service	
				AM Peak	PM Peak
Alternative A - Improved Diamond Interchange	Kelly Creek Road @ I-20 EB Ramps	EB	EB Exit Ramp	D	D
		NB	Kelly Creek Rd	B	C
		SB	Kelly Creek Rd	A	C
		Total Intersection LOS		B	C
	Kelly Creek Road @ I-20 WB Ramps	WB	WB Exit Ramp	D	D
		NB	Kelly Creek Rd	B	B
		SB	Kelly Creek Rd	C	B
		Total Intersection LOS		C	C
Alternative B - Diverging Diamond Interchange	Kelly Creek Road @ I-20 EB Ramps	EB	EB Exit Ramp	A	A
		NB	Kelly Creek Rd	C	B
		SB	Kelly Creek Rd	B	B
		Total Intersection LOS		B	A
	Kelly Creek Road @ I-20 WB Ramps	WB	WB Exit Ramp	A	A
		NB	Kelly Creek Rd	A	C
		SB	Kelly Creek Rd	C	D
		Total Intersection LOS		B	C

According to the future conditions capacity analysis for the improvement alternatives, each study intersection approach is projected to operate with LOS D or better under both improvement alternatives during each peak hour.

2.6 Planning-Level Opinions of Probable Cost

Planning-level opinions of probable cost were prepared for each alternative. The estimates are based on the engineer's experiences and qualifications and represent the engineer's best judgment within the industry. The engineer does not guarantee that proposals, bids, or actual costs will not vary from the engineer's opinions of probable cost. The opinions of probable cost were estimated in 2023 dollars. For budgeting future year projects, these costs will need to be escalated to future year dollars.

The totals include opinions of probable cost of construction, preliminary engineering (15%), utility relocation, right-of-way, construction engineering and inspection (15%), ALDOT indirect costs (10%), and a 20% contingency. **Table 8** shows the opinions of probable cost, estimated in 2023 dollars, for the recommended improvements at each of the priority intersections. Detailed breakdowns of each alternative's opinion of probable cost can be found in **Appendix I**.

Opinions of probable cost for bridge structures were estimated at a conservative \$275 per square foot of bridge surface area.

Table 8: Opinions of Probable Cost for Improvement Alternatives

Category	Alternative A Improved Diamond	Alternative B Diverging Diamond
Construction, Contingency, and CE&I	\$14.8 million	\$10.4 million
Preliminary Engineering (15%)	\$1.9 million	\$1.3 million
Utility Relocation	\$150,000	\$300,000
Right-of-Way Acquisition	\$50,000	\$100,000
ALDOT Indirect Costs (13.7%)	\$2.3 million	\$1.7 million
Project Total	\$19.2 million	\$13.8 million

2.7 Alternatives Evaluation Matrix

An evaluation matrix was compiled to compare the benefits and challenges of each improvement alternative. The matrix is summarized in **Table 9**.

Table 9: Interchange Improvement Alternatives Evaluation Matrix

Category	No Build Alternative	Alternative A - Improved Diamond	Alternative B - DDI
Addresses Existing Capacity Deficiencies of the Two-Lane Bridge	No	Yes – Adds exclusive left turn lanes at ramp terminals	Yes – Reduces delay by allowing turning movements to flow freely
Mitigates Queueing on the I-20 Exit Ramps	No	Yes – Signalized intersections able to process queues more efficiently	Yes – Signalized intersections able to process queues more efficiently
Expands Capacity of the Interchange	No	Yes – Increases from 2 lanes to 4 lanes	Yes – Increases from 2 lanes to 4 lanes
Future LOS at I-20 Eastbound Ramps Intersection	AM Peak: LOS F PM Peak: LOS F	AM Peak: LOS B PM Peak: LOS C	AM Peak: LOS B PM Peak: LOS A
Future LOS at I-20 Westbound Ramps Intersection	AM Peak: LOS F PM Peak: LOS F	AM Peak: LOS D PM Peak: LOS C	AM Peak: LOS B PM Peak: LOS D
Opinion of Probable Cost	Maintenance costs only	\$19.2 million	\$13.8 million
Right-of-Way Acquisition & Utility Relocation Required	No	Yes, both required	Yes, both required
Method of Addressing Bridge Structure	No change	Full replacement; construct new bridge in 2 phases	Construct additional structure to the west of existing bridge; retain existing bridge
Interchange Alignment Matches Local Driver Expectation	Yes	Yes	No

2.7 Funding Sources

Costs associated with the design and construction of alternatives are expected to exceed current available resources. Federal, state, and local funding sources are available to pursue. Federal programs are administered by ALDOT.

Table 10 details funding sources, the category of the source, and the cost sharing percentage between state, local, and federal levels. Funding sources are complex and constantly evolving. The Bipartisan Infrastructure Law (BIL) passed in 2022 authorized many new competitive grant programs and re-authorized many of the formula funding from the previous transportation bill, the Fixing America's Surface Transportation (FAST) Act, from FY 2016 – FY 2020 and further extended in FY 2021.

Table 10: Funding Source Options

Funding Source	Category	Match Type
Surface Transportation Block Grant (STBG)	Federal	80% Federal / 20% Local
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Federal	80% Federal* / 20% Local
Infrastructure for Rebuilding America (INFRA)**	Federal	80% Federal* / 20% Local
Mega Grant Program (Mega)**	Federal	80% Federal* / 20% Local
Rural Surface Transportation Grant (Rural)**	Federal	80% Federal* / 20% Local
Alabama Transportation Infrastructure Bank (ATIB)	State	Loan
Alabama Transportation Rehabilitation and Improvement Program – II (ATRIP-II)	State	Up to 100% State

*Federal match can increase above 80% if a project is located in a Historically Disadvantaged Community or Area of Persistent Poverty, as defined by USDOT.

**Part of the three-program Multimodal Project Discretionary Grant Opportunity (MPDG) in FY 2022.

Federal Funding

Federal funding is ideal for large transportation projects which require more detailed engineering design, right-of-way acquisition, and utility relocation. To move forward with implementing a federally funded project, the next step is to request inclusion of a project in the Alabama Statewide Transportation Improvement Plan (STIP). Once funds are in place, an environmental document will need to be prepared. The environmental document must include technical studies and public involvement outreach necessary to

comply with procedures of NEPA. Once the environmental study has been completed, design will be finalized, followed by construction. If additional right-of-way is required, acquisition would be conducted prior to construction.

Federal funding programs have varying funding amounts, and each program has specific requirements and stipulations associated with project eligibility. Since the BIL was passed, the USDOT releases a Notice of Funding Opportunity (NOFO) whenever the application acceptance period begins for each program's fiscal year.

The **Surface Transportation Block Grant (STBG)** is a federal aid program included in BIL and administered by ALDOT. STGB provides "flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway." As a formula-based federal aid program, the STBG differs from the competitive grant programs such as RAISE, INFRA, Mega, and Rural. STBG funds may be used to match federal funds in certain competitive grant programs such as PROTECT, but this is not permitted in most competitive grant programs (RAISE, INFRA, Mega, Rural).

The **Rebuilding American Infrastructure with Sustainability and Equity (RAISE)** competitive grant program provides funding through the USDOT and replaced the BUILD and Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants. One benefit of RAISE grant funds is that they allow project sponsors to obtain funding for multi-modal and multi-jurisdictional projects that are typically difficult to fund using traditional programs. Construction and pre-construction activities are RAISE eligible. Applications for RAISE funding should include a benefit-cost analysis for the proposed project. \$1.5 billion was the total funding amount authorized by the BIL for FY2023, not including the additional \$800 million for the program from the FY 2023 Appropriations Act. The minimum award size in FY 2023 for rural areas was \$1 million, while the maximum award was \$25 million. Any FY 2023 funding is required to be expended by September 2032. The FY 2024 NOFO is expected to be released in early 2024. If the project is located in an area of persistent poverty (APP) or historically disadvantaged community (HDC), the cost share can be up to 100% federally funded.

The **Infrastructure for Rebuilding America (INFRA)** competitive grant program which "awards project of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas." The primary focus of the program is to fund projects which eliminate freight bottlenecks and improve critical freight movements. INFRA is known statutorily as the Nationally Significant Multimodal Freight and Highway Projects program. \$8 billion is the total funding amount for FY 2022 – 2026 nationwide.

The **Mega Grant Program (Mega)** is a competitive grant program which funds "large, complex projects that are difficult to fund by other means and likely to generate national or regional economic, mobility, or safety benefits." Mega is known statutorily as the National Infrastructure Project Assistance program. Eligible projects must be located

along the National Multimodal Freight Network, the National Highway Freight Network, or the National Highway System. Applications should include a benefit-cost analysis for the proposed project. \$5 billion is the total funding amount for FY 2022 – 2026 nationwide.

The **Rural Surface Transportation Grant Program (Rural)** is a competitive grant program supporting “projects to improve and expand the surface transportation infrastructure in rural areas to increase connectivity, improve the safety and reliability of the movement of people and freight, and generate regional economic growth and improve quality of life.” Applications should include a benefit-cost analysis for the proposed project. The total funding amount for FY 2022 – FY 2026 is \$2 billion nationwide.

For FY 2022, the INFRA, Mega, and Rural grant programs were part of a three-program NOFO entitled **Multimodal Project Discretionary Grant Opportunity (MPDG)**. Provides Federal financial assistance to highway and bridge, intercity passenger rail, railway-highway grade and separation, wildlife crossing, public transportation, marine highway, and freight and multimodal projects, or groups of such projects, of national or regional significance, as well as to projects to improve and expand the surface transportation infrastructure in rural areas. Applications should include a benefit-cost analysis for the proposed project. For FY 2022, MPDG authorized up to \$1 billion in Mega funding, up to \$1.55 billion in INFRA funding, and up to \$300 million in Rural funding.

For additional details on all BIL competitive grant programs, the following USDOT link provides resources for applicants:

https://www.fhwa.dot.gov/bipartisan-infrastructure-law/grant_programs.cfm

State Funding

The **Alabama Transportation Infrastructure Bank (ATIB)** was created in 2021 by ALDOT with a primary focus on assisting in financing major qualified projects which improve transportation facilities for public purposes. The minimum loan amount is \$5,000,000, and the loan term is not to exceed the useful life of the project. Any government entity or joint group of government entities are eligible to apply. Applications are accepted throughout the year.

The **Alabama Transportation Rehabilitation and Improvement Program-II (ATRIP II)** was created in 2019 by the Rebuild Alabama Act and is administered by ALDOT. Eligible projects include transportation projects that improve any state-maintained highway system. Projects with a primary focus on local roads are not eligible. For ATRIP II projects, ALDOT will perform the preliminary engineering as an eligible cost to the project if it has the capacity to do so. A project sponsor can request to perform the preliminary engineering; however, preliminary engineering performed by any entity other than ALDOT is not eligible for ATRIP II funding. Right-of-way acquisition is an ATRIP II eligible activity, but utility relocation is not. For FY 2023, the maximum funding amount per project was set at \$2 Million.

2.8 Stakeholder Involvement

Prior to initiation of the APPLE study, several meetings were held to discuss a potential project at the Kelly Creek Road interchange. Attendees at meetings prior to the study included ALDOT, St. Clair County, City of Moody, and Sain Associates. The most recent meeting prior to the initiation of this study was held on December 5, 2022. ALDOT Director John Cooper was in attendance alongside ALDOT East Central Region staff. The consensus from ALDOT at this time was that further study of traffic operations at the interchange was needed to advance a project.

A project kickoff meeting was held on September 13, 2023, at Moody City Hall. The meeting was attended by representatives of the City of Moody, St. Clair County, RPCGB, and Sain Associates. Stakeholders discussed the project background, identified priorities, and outlined expectations for the scope of the study. Short-term strategies to mitigate queuing on the interstate ramps were discussed, as well as the long-term goal of progressing towards a potential IMR.

Due diligence for a potential IMR was coordinated with ALDOT East Central Region staff and ALDOT Traffic Design Bureau staff. Determination of whether or not an IMR is required would be determined by the Alabama Division of FHWA.

2.9 Next Steps

This report documents the study undertaken to further evaluate the traffic operations at the Kelly Creek Road interchange with I-20. In previous sections of this report, transportation analysis and improvement recommendations have been provided.

The immediate next step following the study is for ALDOT to seek the opinion of the Federal Highway Administration's (FHWA) Alabama Division regarding the proposed alternatives. FHWA will determine whether or not an IMR is required to implement either of the proposed alternatives. Once this is officially determined and any required IMR is complete, the next step would be to seek funding for an environmental document, design, and construction of the resulting improvements.

Several IJA-initiated competitive grant programs could be pursued once an IMR is complete or determined not to be necessary. The next chance to apply for appropriate competitive grant programs is likely Spring 2024 when a Notice of Funding Opportunity (NOFO) is released for the Infra, Rural, and Mega competitive grant programs.

Both the City and County currently have ATRIP-II projects underway which have not been let for construction at the time of this report. Therefore, funding for the Fiscal Year 2024 would not be eligible if either project is not let for construction by the application deadline, and the next opportunity for that program would be in Fall 2024 for Fiscal Year 2025 ATRIP-II cycle.

It is possible that a combination of local and state funding (i.e., ATRIP-II) could be used to reach the 20% match for various federal funding sources. This, along with combining the project with another large project in the area, should be explored throughout the process of seeking funding for the project.

Appendix A – Build Alternative Concept Drawings & FHWA CAP-X Tool



Kelly Creek Road



LEGEND

- Signalized Intersection
- Existing Right-of-Way
- Preliminary Proposed Right-of-Way
- Proposed Structure

NO.	REVISIONS	BY	DATE

Two Piedmont Park South
Suite 500 East
Birmingham, Alabama 35243
Phone: (205) 940-6420
Website: www.sain.com

SAIN ASSOCIATES

ALTERNATIVE A - IMPROVED DIAMOND
KELLY CREEK ROAD AT I-20
MOODY, ALABAMA

DRN. BY	JOB NO.
DJC	23-0105
CKD. BY	SCALE
DEC	N.T.S.
PROJ. MGR.	DATE
DEC	12-08-23

SHEET NO.
Alt. A



Kelly Creek Road

RETAIN EXISTING BRIDGE STRUCTURE



LEGEND

- Signalized Intersection
- Existing Right-of-Way
- Preliminary Proposed Right-of-Way
- Proposed Structure
- Direction of Travel
- Proposed Concrete Island

NO	REVISIONS DESCRIPTION	BY	DATE

Two Piedmont Park South
Suite 500 East
Birmingham, Alabama 35243
Phone: (205) 940-6420
Webster: www.sain.com

SAIN
ASSOCIATES

ALTERNATIVE B - DDI

KELLY CREEK ROAD AT I-20
MOODY, ALABAMA





DRN. BY DJC	JOB NO. 23-0105
CKD. BY DEC	SCALE N.T.S.
PROJ. MGR. DEC	DATE 12-08-23

SHEET NO.
Alt. B

Capacity Analysis for Planning of Junctions

Summary Report

Project Name:	Kelly Creek Rd Interchange APPLE
Project Number:	SA#23-0105
Location:	Moody, St. Clair County, Alabama
Date:	2043 AM
Number of Intersection Legs:	
Major Street Direction	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	123	2500	181	2.00%	0.00%
Westbound	0	112	3500	194	2.00%	0.00%
Southbound	0	149	262	625	10.00%	0.00%
Northbound	0	263	176	145	10.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	0.80	0.95		0.85		
Truck to PCE Factor				Suggested = 2.00	2.00	
Multimodal Activity Level			Low			
Critical Lane Volume Threshold	2-phase signal	Suggested = 1800 (Urban), 1650 (Rural)			1650	
	3-phase signal	Suggested = 1750 (Urban), 1600 (Rural)			1600	
	4-phase signal	Suggested = 1700 (Urban), 1550 (Rural)			1550	

Capacity Analysis for Planning of Junctions





Summary Report

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Pedestrian Accommodations	Bicycle Accommodations
Single Point N-S	0.47	1	Good	Excellent
Diverging Diamond Interchange N-S	0.54	2	Good	Excellent
Contraflow Left Interchange N-S	0.84	3	Good	Excellent
Diamond N-S	1.20	4	Good	Fair
Displaced Left Turn (Interchange) E-W	1.22	5	Good	Excellent
Single Point E-W	1.27	6	Good	Excellent
Contraflow Left Interchange E-W	1.31	7	Good	Excellent
Diverging Diamond Interchange E-W	1.32	8	Good	Excellent
Diamond E-W	1.33	9	Good	Fair
Displaced Left Turn (Interchange) N-S	2.54	10	Good	Excellent

Capacity Analysis for Planning of Junctions

Summary Report

Project Name:	Kelly Creek Rd Interchange APPLE
Project Number:	SA#23-0105
Location:	Moody, St. Clair County, Alabama
Date:	2043 PM
Number of Intersection Legs:	
Major Street Direction	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	433	3500	335	2.00%	0.00%
Westbound	0	100	2500	225	2.00%	0.00%
Southbound	0	128	220	210	10.00%	0.00%
Northbound	0	132	242	197	10.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	0.80	0.95		0.85		
Truck to PCE Factor				Suggested = 2.00	2.00	
Multimodal Activity Level			Low			
Critical Lane Volume Threshold	2-phase signal	Suggested = 1800 (Urban), 1650 (Rural)			1650	
	3-phase signal	Suggested = 1750 (Urban), 1600 (Rural)			1600	
	4-phase signal	Suggested = 1700 (Urban), 1550 (Rural)			1550	

Capacity Analysis for Planning of Junctions

Summary Report

#####

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Pedestrian Accommodations	Bicycle Accommodations
Single Point N-S	0.59	1	Good	Excellent
Contraflow Left Interchange N-S	0.61	2	Good	Excellent
Diverging Diamond Interchange N-S	0.66	3	Good	Excellent
Contraflow Left Interchange E-W	0.98	4	Good	Excellent
Displaced Left Turn (Interchange) E-W	1.00	5	Good	Excellent
Diamond E-W	1.06	6	Good	Fair
Diamond N-S	1.13	7	Good	Fair
Single Point E-W	1.17	8	Good	Excellent
Diverging Diamond Interchange E-W	1.35	9	Good	Excellent
Displaced Left Turn (Interchange) N-S	2.75	10	Good	Excellent

Appendix B – Raw Traffic Data Reports

 [Click here for Map](#)

Peak Hour Turning Movement Count

Moody, AL



www.marrtraffic.com

Tuesday, May 23, 2023	
Period	0000 - 2400
Peak Hour	1630 - 1730

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)



I-20 E/Bound Off-Ramp

I-20 E/Bound On-Ramp

Time	Kelly Creek Rd (South) Northbound			Kelly Creek Rd (North) Southbound			I-20 E/Bound Off-Ramp Eastbound			I-20 E/Bound On-Ramp Westbound			Total
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
15 Minute Totals													
12:00 AM - 12:15 AM	0	20	8	0	7	0	2	0	10	0	0	0	47
12:15 AM - 12:30 AM	0	8	8	1	7	0	2	0	11	0	0	0	37
12:30 AM - 12:45 AM	0	4	5	2	11	0	1	0	7	0	0	0	30
12:45 AM - 01:00 AM	0	8	18	0	8	0	1	0	8	0	0	0	43
01:00 AM - 01:15 AM	0	6	3	1	6	0	3	0	4	0	0	0	23
01:15 AM - 01:30 AM	0	7	6	0	4	0	1	0	12	0	0	0	30
01:30 AM - 01:45 AM	0	8	9	4	12	0	4	0	4	0	0	0	41
01:45 AM - 02:00 AM	0	10	4	1	8	0	3	0	7	0	0	0	33
02:00 AM - 02:15 AM	0	9	4	8	10	0	2	0	8	0	0	0	41
02:15 AM - 02:30 AM	0	6	5	1	3	0	2	0	4	0	0	0	21
02:30 AM - 02:45 AM	0	10	5	0	5	0	1	0	9	0	0	0	30
02:45 AM - 03:00 AM	0	5	12	0	10	0	1	0	9	0	0	0	37
03:00 AM - 03:15 AM	0	11	11	2	7	0	3	0	10	0	0	0	44
03:15 AM - 03:30 AM	0	6	4	2	7	0	2	0	10	0	0	0	31
03:30 AM - 03:45 AM	0	13	10	2	11	0	4	0	9	0	0	0	49
03:45 AM - 04:00 AM	0	7	13	2	9	0	10	0	10	0	0	0	51
04:00 AM - 04:15 AM	0	12	14	6	11	0	6	0	9	0	0	0	58
04:15 AM - 04:30 AM	0	18	11	5	16	0	16	0	10	0	0	0	76
04:30 AM - 04:45 AM	0	18	14	9	20	0	7	0	16	0	0	0	84
04:45 AM - 05:00 AM	0	21	16	12	19	0	11	0	14	0	0	0	93
05:00 AM - 05:15 AM	0	23	12	15	24	0	4	0	11	0	0	0	89
05:15 AM - 05:30 AM	0	31	20	16	24	0	4	0	16	0	0	0	111
05:30 AM - 05:45 AM	0	40	21	17	33	0	3	0	15	0	0	0	129
05:45 AM - 06:00 AM	0	51	16	14	52	0	6	0	19	0	0	0	158
06:00 AM - 06:15 AM	0	54	17	11	33	0	4	0	23	0	0	0	142
06:15 AM - 06:30 AM	0	62	21	19	42	0	11	0	28	0	0	0	183
06:30 AM - 06:45 AM	0	76	24	27	50	0	7	0	31	0	0	0	215
06:45 AM - 07:00 AM	0	89	25	25	60	0	12	0	37	0	0	0	248
07:00 AM - 07:15 AM	0	81	32	27	52	0	12	0	45	0	0	0	249
07:15 AM - 07:30 AM	0	81	28	25	65	0	18	0	34	0	0	0	251
07:30 AM - 07:45 AM	0	87	28	32	70	0	22	0	27	0	0	0	266
07:45 AM - 08:00 AM	0	69	25	32	76	0	18	0	35	0	0	0	255
08:00 AM - 08:15 AM	0	68	19	9	52	0	15	0	25	0	0	0	188
08:15 AM - 08:30 AM	0	50	25	14	43	0	13	0	29	0	0	0	174
08:30 AM - 08:45 AM	0	45	31	20	46	0	14	0	35	0	0	0	191
08:45 AM - 09:00 AM	0	35	25	21	37	0	18	0	37	0	0	0	173
09:00 AM - 09:15 AM	0	47	20	11	34	0	14	0	29	0	0	0	155
09:15 AM - 09:30 AM	0	45	26	18	41	0	10	0	25	0	0	0	165
09:30 AM - 09:45 AM	0	51	23	18	33	0	18	0	36	0	0	0	179
09:45 AM - 10:00 AM	0	52	25	12	28	0	9	0	26	0	0	0	152
10:00 AM - 10:15 AM	0	37	23	9	38	0	11	0	31	0	0	0	149
10:15 AM - 10:30 AM	0	53	18	10	26	0	15	0	37	0	0	0	159
10:30 AM - 10:45 AM	0	41	21	13	39	0	9	0	26	0	0	0	149
10:45 AM - 11:00 AM	0	43	28	18	26	0	17	0	36	0	0	0	168
11:00 AM - 11:15 AM	0	44	26	24	49	0	17	0	34	0	0	0	194
11:15 AM - 11:30 AM	0	56	24	15	40	0	16	0	34	0	0	0	185
11:30 AM - 11:45 AM	0	57	23	20	53	0	21	0	47	0	0	0	221
11:45 AM - 12:00 PM	0	60	31	10	38	0	15	0	44	0	0	0	198
12:00 PM - 12:15 PM	0	64	31	17	48	0	29	0	40	0	0	0	229
12:15 PM - 12:30 PM	0	54	40	18	41	0	21	0	51	0	0	0	225
12:30 PM - 12:45 PM	0	51	29	18	33	0	21	0	55	0	0	0	207
12:45 PM - 01:00 PM	0	60	26	16	46	0	29	0	42	0	0	0	219
01:00 PM - 01:15 PM	0	58	31	21	52	0	30	0	43	0	0	0	235
01:15 PM - 01:30 PM	0	61	36	13	43	0	22	0	52	0	0	0	227
01:30 PM - 01:45 PM	0	64	37	17	37	0	33	0	51	0	0	0	239
01:45 PM - 02:00 PM	0	40	21	17	36	0	22	0	39	0	0	0	175
02:00 PM - 02:15 PM	0	50	26	16	43	0	31	0	57	0	0	0	223
02:15 PM - 02:30 PM	0	56	35	22	40	0	45	0	52	0	0	0	250
02:30 PM - 02:45 PM	0	76	41	24	43	0	34	0	60	0	0	0	278
02:45 PM - 03:00 PM	0	54	40	21	57	0	39	0	53	0	0	0	264
03:00 PM - 03:15 PM	0	70	54	29	55	0	54	0	59	0	0	0	321
03:15 PM - 03:30 PM	0	44	39	29	46	0	49	0	49	0	0	0	256
03:30 PM - 03:45 PM	0	78	42	31	50	0	52	0	74	0	0	0	327
03:45 PM - 04:00 PM	0	79	26	23	45	0	57	0	64	0	0	0	294
04:00 PM - 04:15 PM	0	88	50	30	49	0	56	0	60	0	0	0	333
04:15 PM - 04:30 PM	0	67	36	28	47	0	60	0	72	0	0	0	310
04:30 PM - 04:45 PM	0	68	43	28	45	0	81	0	60	0	0	0	325
04:45 PM - 05:00 PM	0	66	35	18	62	0	78	0	74	0	0	0	333
05:00 PM - 05:15 PM	0	56	35	21	55	0	91	0	69	0	0	0	327
05:15 PM - 05:30 PM	0	70	41	23	43	0	79	0	62	0	0	0	318
05:30 PM - 05:45 PM	0	70	34	32	42	0	73	0	57	0	0	0	308
05:45 PM - 06:00 PM	0	65	35	11	35	0	76	0	58	0	0	0	280
06:00 PM - 06:15 PM	0	58	27	15	52	0	52	0	54	0	0	0	258
06:15 PM - 06:30 PM	0	51	31	24	41	0	32	0	50	0	0	0	229
06:30 PM - 06:45 PM	0	45	33	13	35	0	33	0	57	0	0	0	216
06:45 PM - 07:00 PM	0	39	20	14	29	0	26	0	39	0	0	0	167
07:00 PM - 07:15 PM	0	34	23	9	23	0	24	0	41	0	0	0	154
07:15 PM - 07:30 PM	0	32	17	8	34	0	21	0	36	0	0	0	148
07:30 PM - 07:45 PM	0	34	28	9	17	0	16	0	26	0	0	0	130
07:45 PM - 08:00 PM	0	26	19	6	29	0	30	0	42	0	0	0	152
08:00 PM - 08:15 PM	0	21	19	9	28	0	20	0	35	0	0	0	132
08:15 PM - 08:30 PM	0	27	9	8	21	0	22	0	33	0	0	0	120
08:30 PM - 08:45 PM	0	35	22	7	18	0	20	0	26	0	0	0	128
08:45 PM - 09:00 PM	0	19	20	10	23	0	22	0	33	0	0	0	127
09:00 PM - 09:15 PM	0	21	10	11	17	0	9	0	23	0	0	0	91
09:15 PM - 09:30 PM	0	27	12	4	19	0	7	0	26	0	0	0	95
09:30 PM - 09:45 PM	0	21	14	5	18	0	17	0	28	0	0	0	103
09:45 PM - 10:00 PM	0	18	15	6	21	0	16	0	13	0	0	0	89
10:00 PM - 10:15 PM	0	22	17	4	14	0	14	0	21	0	0	0	92
10:15 PM - 10:30 PM	0	15	16	7	16	0	13	0	25	0	0	0	92
10:30 PM - 10:45 PM	0	14	18	3	19	0	7	0	18	0	0	0	79
10:45 PM - 11:00 PM	0	16	11	3	7	0	7	0	10	0	0	0	54
11:00 PM - 11:15 PM	0	10	5	1	11	0	6	0	11	0	0	0	44
11:15 PM - 11:30 PM	0	12	10	3	13	0	11	0	19	0	0	0	68
11:30 PM - 11:45 PM	0	15	15	1	13	0	4	0	10	0	0	0	58
11:45 PM - 12:00 AM	0	14	10	2	11	0	4	0	17	0	0	0	58



[Click here for Map](#)

Peak Hour Turning Movement Count

Moody, AL



www.marrtraffic.com

Tuesday, May 23, 2023	
Period	0000 - 2400
Peak Hour	0700 - 0800

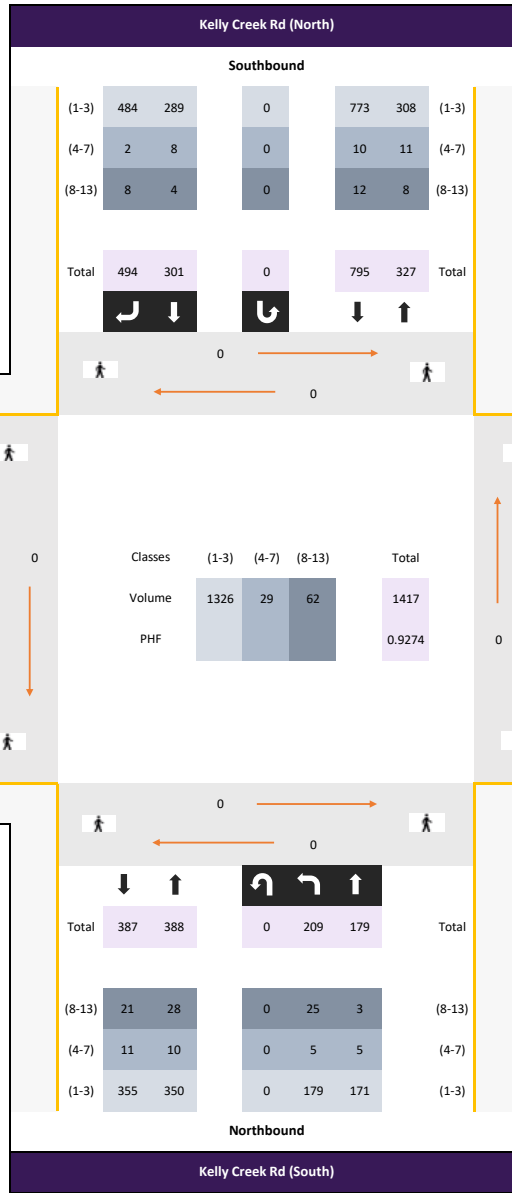
* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



I-20 W/Bound On-Ramp

I-20 W/Bound Off-Ramp

Start Date: 5/23/2023	Kelly Creek Rd (South) Northbound			Kelly Creek Rd (North) Southbound			I-20 W/ Bound On-Ramp Eastbound			I-20 W/ Bound Off-Ramp Westbound			Total
Time	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
15 Minute Totals													
12:00 AM - 12:15 AM	16	6	0	0	2	3	0	0	0	5	0	2	34
12:15 AM - 12:30 AM	6	5	0	0	2	2	0	0	0	3	0	0	18
12:30 AM - 12:45 AM	3	2	0	0	6	3	0	0	0	6	0	7	27
12:45 AM - 01:00 AM	5	4	0	0	1	5	0	0	0	7	0	3	25
01:00 AM - 01:15 AM	5	3	0	0	1	7	0	0	0	6	0	12	34
01:15 AM - 01:30 AM	4	4	0	0	2	4	0	0	0	1	0	5	20
01:30 AM - 01:45 AM	5	7	0	0	5	8	0	0	0	9	0	3	37
01:45 AM - 02:00 AM	9	5	0	0	5	3	0	0	0	3	0	9	34
02:00 AM - 02:15 AM	5	5	0	0	14	36	0	0	0	4	0	5	69
02:15 AM - 02:30 AM	3	6	0	0	3	6	0	0	0	1	0	4	23
02:30 AM - 02:45 AM	8	4	0	0	1	4	0	0	0	4	0	2	23
02:45 AM - 03:00 AM	3	3	0	0	0	5	0	0	0	10	0	5	26
03:00 AM - 03:15 AM	9	4	0	0	5	3	0	0	0	4	0	4	29
03:15 AM - 03:30 AM	6	3	0	0	4	4	0	0	0	6	0	3	26
03:30 AM - 03:45 AM	9	7	0	0	3	5	0	0	0	10	0	6	40
03:45 AM - 04:00 AM	7	11	0	0	3	4	0	0	0	8	0	6	39
04:00 AM - 04:15 AM	8	8	0	0	9	8	0	0	0	9	0	5	47
04:15 AM - 04:30 AM	15	19	0	0	7	4	0	0	0	12	0	4	61
04:30 AM - 04:45 AM	15	11	0	0	13	11	0	0	0	11	0	11	72
04:45 AM - 05:00 AM	16	16	0	0	17	14	0	0	0	12	0	10	85
05:00 AM - 05:15 AM	15	12	0	0	27	28	0	0	0	11	0	8	101
05:15 AM - 05:30 AM	24	11	0	0	26	29	0	0	0	12	0	17	119
05:30 AM - 05:45 AM	30	14	0	0	31	39	0	0	0	21	0	17	152
05:45 AM - 06:00 AM	35	19	0	0	37	34	0	0	0	30	0	17	172
06:00 AM - 06:15 AM	36	23	0	0	30	39	0	0	0	13	0	15	156
06:15 AM - 06:30 AM	48	25	0	0	40	72	0	0	0	19	0	23	227
06:30 AM - 06:45 AM	53	28	0	0	57	77	0	0	0	22	0	39	276
06:45 AM - 07:00 AM	60	42	0	0	59	91	0	0	0	22	0	43	317
07:00 AM - 07:15 AM	57	33	0	0	62	119	0	0	0	19	0	38	328
07:15 AM - 07:30 AM	57	47	0	0	83	145	0	0	0	17	0	33	382
07:30 AM - 07:45 AM	48	61	0	0	81	129	0	0	0	20	0	32	371
07:45 AM - 08:00 AM	47	38	0	0	75	101	0	0	0	30	0	45	336
08:00 AM - 08:15 AM	38	46	0	0	37	57	0	0	0	26	0	20	224
08:15 AM - 08:30 AM	29	34	0	0	42	60	0	0	0	12	0	24	201
08:30 AM - 08:45 AM	37	27	0	0	55	43	0	0	0	13	0	23	198
08:45 AM - 09:00 AM	19	32	0	0	39	31	0	0	0	19	0	12	152
09:00 AM - 09:15 AM	26	34	0	0	27	34	0	0	0	17	0	18	156
09:15 AM - 09:30 AM	28	27	0	0	43	31	0	0	0	16	0	24	169
09:30 AM - 09:45 AM	32	35	0	0	37	31	0	0	0	14	0	13	162
09:45 AM - 10:00 AM	33	30	0	0	23	32	0	0	0	16	0	34	168
10:00 AM - 10:15 AM	15	31	0	0	29	33	0	0	0	17	0	23	148
10:15 AM - 10:30 AM	30	36	0	0	24	22	0	0	0	13	0	26	151
10:30 AM - 10:45 AM	20	29	0	0	39	34	0	0	0	13	0	13	148
10:45 AM - 11:00 AM	27	32	0	0	31	21	0	0	0	11	0	25	147
11:00 AM - 11:15 AM	25	38	0	0	44	25	0	0	0	27	0	17	176
11:15 AM - 11:30 AM	31	41	0	0	45	45	0	0	0	14	0	31	207
11:30 AM - 11:45 AM	35	44	0	0	50	39	0	0	0	22	0	29	219
11:45 AM - 12:00 PM	32	44	0	0	36	28	0	0	0	14	0	15	169
12:00 PM - 12:15 PM	37	57	0	0	49	24	0	0	0	19	0	15	201
12:15 PM - 12:30 PM	31	42	0	0	36	26	0	0	0	20	0	20	175
12:30 PM - 12:45 PM	31	38	0	0	40	42	0	0	0	12	0	20	183
12:45 PM - 01:00 PM	38	50	0	0	46	20	0	0	0	16	0	24	194
01:00 PM - 01:15 PM	32	55	0	0	55	23	0	0	0	18	0	41	224
01:15 PM - 01:30 PM	32	52	0	0	36	31	0	0	0	19	0	25	195
01:30 PM - 01:45 PM	37	61	0	0	39	26	0	0	0	16	0	23	202
01:45 PM - 02:00 PM	22	41	0	0	42	23	0	0	0	14	0	22	164
02:00 PM - 02:15 PM	27	55	0	0	36	26	0	0	0	19	0	22	185
02:15 PM - 02:30 PM	27	71	0	0	45	21	0	0	0	19	0	23	206
02:30 PM - 02:45 PM	39	70	0	0	49	25	0	0	0	20	0	30	233
02:45 PM - 03:00 PM	25	68	0	0	50	26	0	0	0	28	0	40	237
03:00 PM - 03:15 PM	39	86	0	0	73	48	0	0	0	10	0	35	291
03:15 PM - 03:30 PM	25	70	0	0	47	46	0	0	0	20	0	41	249
03:30 PM - 03:45 PM	39	83	0	0	70	53	0	0	0	20	0	39	304
03:45 PM - 04:00 PM	38	106	0	0	56	36	0	0	0	11	0	39	286
04:00 PM - 04:15 PM	33	114	0	0	66	33	0	0	0	15	0	58	319
04:15 PM - 04:30 PM	34	89	0	0	55	34	0	0	0	24	0	36	272
04:30 PM - 04:45 PM	31	111	0	0	59	27	0	0	0	16	0	39	283
04:45 PM - 05:00 PM	29	118	0	0	61	31	0	0	0	17	0	45	301
05:00 PM - 05:15 PM	14	135	0	0	61	40	0	0	0	20	0	41	311
05:15 PM - 05:30 PM	26	120	0	0	44	31	0	0	0	22	0	50	293
05:30 PM - 05:45 PM	23	121	0	0	60	29	0	0	0	13	0	28	274
05:45 PM - 06:00 PM	33	108	0	0	30	18	0	0	0	12	0	23	224
06:00 PM - 06:15 PM	39	69	0	0	53	29	0	0	0	16	0	25	231
06:15 PM - 06:30 PM	23	62	0	0	53	28	0	0	0	15	0	22	203
06:30 PM - 06:45 PM	24	56	0	0	37	22	0	0	0	10	0	23	172
06:45 PM - 07:00 PM	15	47	0	0	33	18	0	0	0	7	0	11	131
07:00 PM - 07:15 PM	21	40	0	0	23	13	0	0	0	9	0	21	127
07:15 PM - 07:30 PM	18	36	0	0	25	14	0	0	0	16	0	14	123
07:30 PM - 07:45 PM	15	37	0	0	18	13	0	0	0	8	0	20	111
07:45 PM - 08:00 PM	17	37	0	0	25	11	0	0	0	11	0	14	115
08:00 PM - 08:15 PM	9	36	0	0	26	11	0	0	0	10	0	16	108
08:15 PM - 08:30 PM	14	37	0	0	19	13	0	0	0	11	0	7	101
08:30 PM - 08:45 PM	11	44	0	0	17	10	0	0	0	9	0	11	102
08:45 PM - 09:00 PM	9	31	0	0	24	8	0	0	0	9	0	13	94
09:00 PM - 09:15 PM	10	22	0	0	19	9	0	0	0	11	0	9	80
09:15 PM - 09:30 PM	9	25	0	0	14	9	0	0	0	9	0	10	76
09:30 PM - 09:45 PM	12	27	0	0	18	4	0	0	0	5	0	7	74
09:45 PM - 10:00 PM	5	29	0	0	15	4	0	0	0	12	0	8	73
10:00 PM - 10:15 PM	10	23	0	0	12	7	0	0	0	7	0	14	73
10:15 PM - 10:30 PM	8	18	0	0	19	7	0	0	0	3	0	6	61
10:30 PM - 10:45 PM	5	17	0	0	14	5	0	0	0	8	0	5	54
10:45 PM - 11:00 PM	12	14	0	0	7	5	0	0	0	3	0	5	46
11:00 PM - 11:15 PM	3	12	0	0	4	3	0	0	0	8	0	6	36
11:15 PM - 11:30 PM	5	17	0	0	6	3	0	0	0	10	0	7	48
11:30 PM - 11:45 PM	8	9	0	0	6	4	0	0	0	8	0	5	40
11:45 PM - 12:00 AM	9	10	0	0	6	4	0	0	0	8	0	10	47

 [Click here for Map](#)

Peak Hour Turning Movement Count

Moody, AL



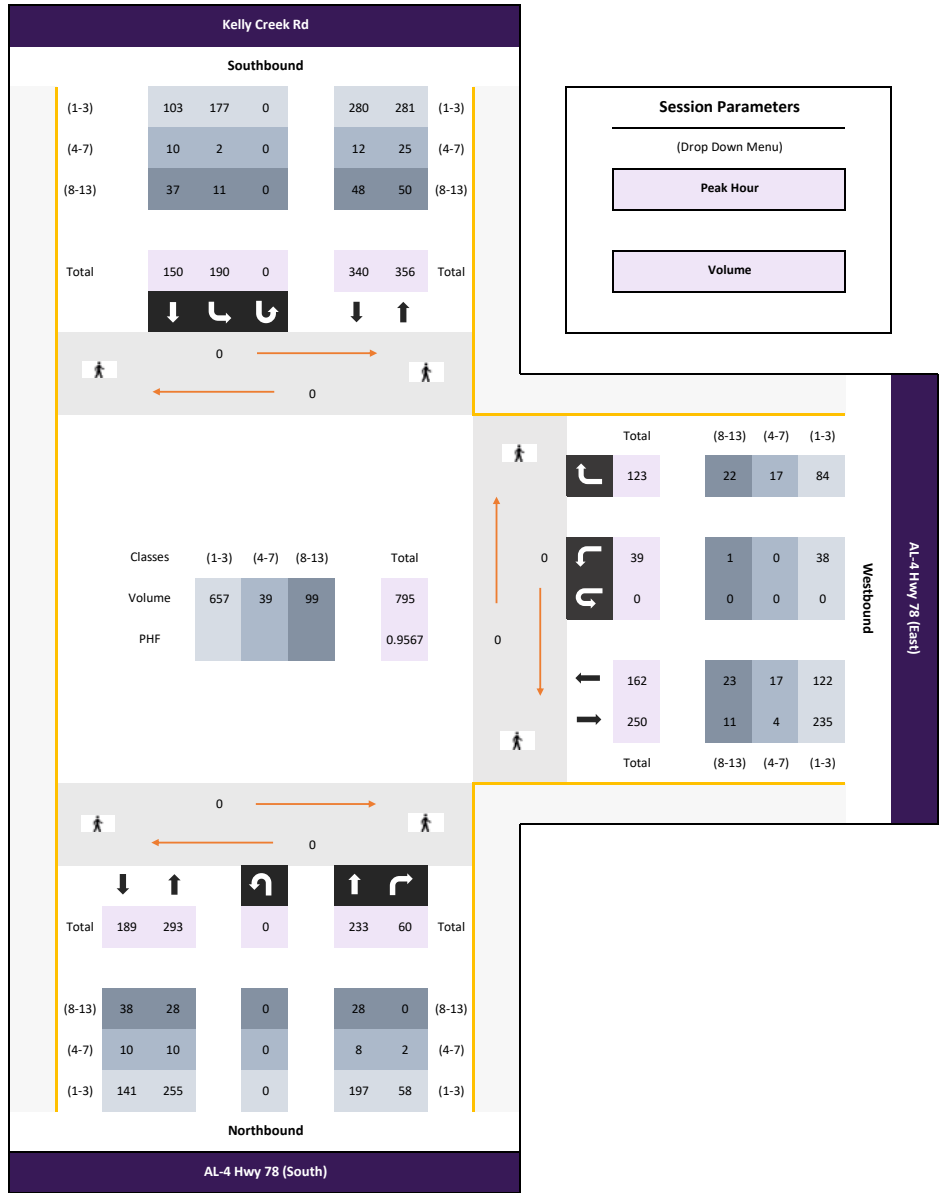
www.marrtraffic.com

Tuesday, May 23, 2023	
Period	0600 - 2000
Peak Hour	1530 - 1630

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)





[Click here for Map](#)

Peak Hour Turning Movement Count

Moody, AL



www.marrtraffic.com

Tuesday, May 23, 2023	
Period	0600 - 2000
Peak Hour	0700 - 0800

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



Eastbound

(1-3)	(4-7)	(8-13)	Total
176	9	8	193
205	6	2	213
0	0	0	0
19	0	0	19
4	0	0	4
182	6	2	190
(1-3)	(4-7)	(8-13)	Total

Classes

(1-3)	(4-7)	(8-13)	Total
1031	18	19	1068
PHF			0.8641

Westbound

(8-13)	(4-7)	(1-3)	Total
0	0	2	2
0	0	1	1
0	0	1	1
0	0	0	0
0	0	4	4
0	1	20	21
(8-13)	(4-7)	(1-3)	Total

Northbound

(8-13)	(4-7)	(1-3)	Total
11	8	0	19
8	10	0	18
710	217	0	927
(8-13)	(4-7)	(1-3)	Total

 [Click here for Map](#)

Peak Hour Turning Movement Count

Moody, AL



www.marrtraffic.com

Tuesday, May 23, 2023	
Period	0600 - 2000
Peak Hour	1530 - 1630

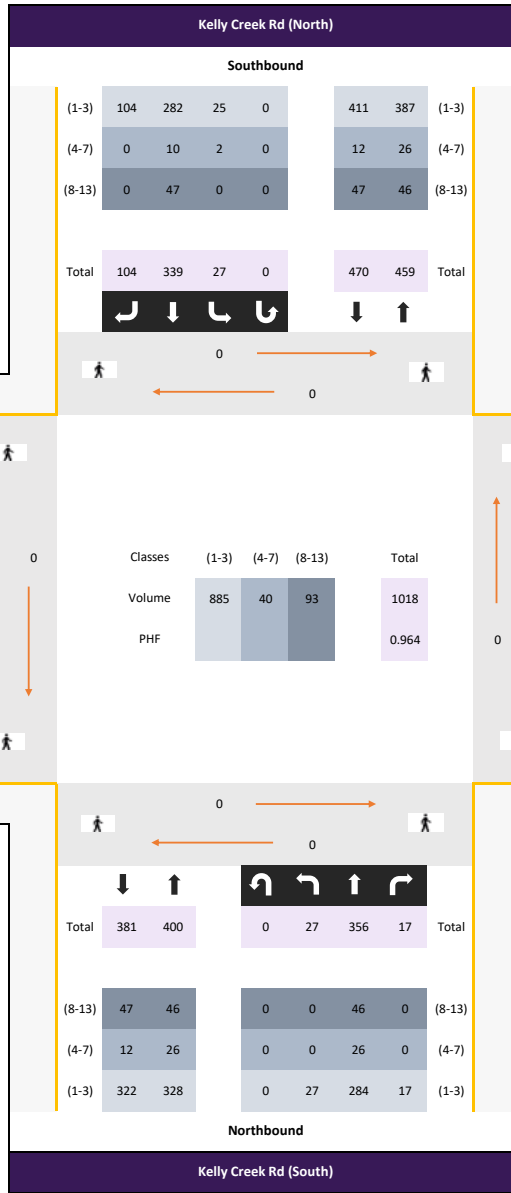
* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



Eastbound

(1-3)	(4-7)	(8-13)	Total
132	0	0	132
131	1	0	132
0	0	0	0
97	0	0	97
2	0	0	2
32	1	0	33
(1-3)	(4-7)	(8-13)	Total

Classes

(1-3)	(4-7)	(8-13)	Total
885	40	93	1018
PHF			0.964

Westbound

Total	(8-13)	(4-7)	(1-3)
6	0	0	6
1	0	0	1
9	0	1	8
0	0	0	0
16	0	1	15
46	0	2	44
Total	(8-13)	(4-7)	(1-3)

Northbound

Total	(8-13)	(4-7)	(1-3)
381	47	12	322
400	46	26	328
0	0	0	0
27	0	0	27
356	46	0	284
17	0	0	17
Total	(8-13)	(4-7)	(1-3)

Love's Travel Stop Driveway

Valero Access

 [Click here for Map](#)

Peak Hour Turning Movement Count

Moody, AL



www.marrtraffic.com

Tuesday, May 23, 2023	
Period	0600 - 2000
Peak Hour	0700 - 0800

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)


Peak Hour

Volume


Kelly Creek Rd (North)

Southbound

	(1-3)	5	668	44	0		717	234	(1-3)
	(4-7)	0	8	0	0		8	10	(4-7)
	(8-13)	0	11	0	0		11	8	(8-13)
Total		5	687	44	0		736	252	Total








0







0





Classes

(1-3)	(4-7)	(8-13)	Total
1035	19	20	1074

Volume




PHF



(1-3)	(4-7)	(8-13)	Total
0.892			


Display Dr (West)

Eastbound


	(1-3)	(4-7)	(8-13)			
	14	0	0		Total	14
	3	1	0			4
	0	0	0		0	0
	1	1	0		2	2
	1	0	0		1	1
	1	0	0		1	1
Total						








0











Display Dr (East)

Westbound

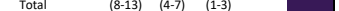
	(8-13)	(4-7)	(1-3)			
	0	0	22		Total	22
	0	0	0			0
	1	1	66		68	68
	0	0	0		0	0
	1	1	88		90	90
	0	0	52		52	52
Total						








0











Kelly Creek Rd (South)

Northbound

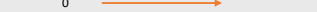
	(8-13)	12	8				0	9	228	7	
	(4-7)	9	9				0	0	9	0	(4-7)
	(1-3)	735	227				0	9	211	7	(1-3)
Total		756	244				0	9	228	7	Total








0





Bi-Directional Class Count || Volume Summary 15min



www.marrtraffic.com

Moody, AL

Site 7

North Valero Access 1,
south of Kelly Creek Rd

Date

Tuesday, May 23, 2023

Weather

Cloudy
66°F

Lat/Long

33.580543°, -86.473777°

0000 - 2400 (24h Session) (05-23-2023)

Volume Summary 15min

TIME	Volume Summary 15min		15min Total	60min Total
	NB	SB		
0000 - 0015	0	1	1	
0015 - 0030	0	0	0	
0030 - 0045	1	3	4	
0045 - 0100	2	3	5	10
0100 - 0115	0	0	0	
0115 - 0130	0	0	0	
0130 - 0145	1	2	3	
0145 - 0200	1	0	1	4
0200 - 0215	1	0	1	
0215 - 0230	0	2	2	
0230 - 0245	1	0	1	
0245 - 0300	1	2	3	7
0300 - 0315	2	1	3	
0315 - 0330	0	1	1	
0330 - 0345	2	1	3	
0345 - 0400	1	0	1	8
0400 - 0415	2	2	4	
0415 - 0430	1	0	1	
0430 - 0445	0	1	1	
0445 - 0500	3	1	4	10
0500 - 0515	2	0	2	
0515 - 0530	4	3	7	
0530 - 0545	4	2	6	
0545 - 0600	3	2	5	20
0600 - 0615	2	1	3	
0615 - 0630	6	1	7	
0630 - 0645	7	0	7	
0645 - 0700	4	5	9	26
0700 - 0715	6	3	9	
0715 - 0730	5	1	6	
0730 - 0745	3	4	7	
0745 - 0800	3	5	8	30
0800 - 0815	4	0	4	
0815 - 0830	7	3	10	
0830 - 0845	2	1	3	
0845 - 0900	2	1	3	20
0900 - 0915	2	3	5	
0915 - 0930	4	1	5	
0930 - 0945	2	3	5	
0945 - 1000	3	4	7	22
1000 - 1015	0	3	3	
1015 - 1030	3	1	4	
1030 - 1045	3	0	3	
1045 - 1100	3	2	5	15
1100 - 1115	3	5	8	
1115 - 1130	5	3	8	
1130 - 1145	3	8	11	
1145 - 1200	4	4	8	35

Time	Volume Summary 15min		15min Total	60min Total
	NB	SB		
1200 - 1215	7	2	9	
1215 - 1230	3	4	7	
1230 - 1245	5	2	7	
1245 - 1300	1	1	2	25
1300 - 1315	2	3	5	
1315 - 1330	5	2	7	
1330 - 1345	1	1	2	
1345 - 1400	0	1	1	15
1400 - 1415	3	2	5	
1415 - 1430	2	1	3	
1430 - 1445	1	1	2	
1445 - 1500	1	1	2	12
1500 - 1515	1	2	3	
1515 - 1530	5	5	10	
1530 - 1545	1	2	3	
1545 - 1600	1	1	2	18
1600 - 1615	4	7	11	
1615 - 1630	6	4	10	
1630 - 1645	6	5	11	
1645 - 1700	1	0	1	33
1700 - 1715	4	3	7	
1715 - 1730	3	3	6	
1730 - 1745	1	3	4	
1745 - 1800	1	0	1	18
1800 - 1815	4	4	8	
1815 - 1830	1	3	4	
1830 - 1845	2	0	2	
1845 - 1900	0	2	2	16
1900 - 1915	1	2	3	
1915 - 1930	3	6	9	
1930 - 1945	1	3	4	
1945 - 2000	3	1	4	20
2000 - 2015	2	2	4	
2015 - 2030	3	1	4	
2030 - 2045	1	2	3	
2045 - 2100	0	1	1	12
2100 - 2115	1	1	2	
2115 - 2130	1	2	3	
2130 - 2145	1	2	3	
2145 - 2200	0	4	4	12
2200 - 2215	1	3	4	
2215 - 2230	0	3	3	
2230 - 2245	0	1	1	
2245 - 2300	0	2	2	10
2300 - 2315	2	0	2	
2315 - 2330	2	2	4	
2330 - 2345	0	2	2	
2345 - 0000	0	3	3	11

Session Total	212	197	409
Session Average	2.21	2.05	4.26
Session Percentage	51.83	48.17	

Bi-Directional Class Count || Volume Summary 15min



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Moody, AL

Site 8

North Valero Access 2,
east of Kelly Creek Rd

Date

Tuesday, May 23, 2023

Weather

Cloudy
66°F

Lat/Long

33.579283°, -86.475231°

0000 - 2400 (24h Session) (05-23-2023)

Volume Summary 15min

TIME	Volume Summary 15min		15min Total	60min Total
	EB	WB		
0000 - 0015	1	0	1	
0015 - 0030	1	1	2	
0030 - 0045	2	0	2	
0045 - 0100	1	3	4	9
0100 - 0115	8	5	13	
0115 - 0130	1	1	2	
0130 - 0145	0	2	2	
0145 - 0200	5	1	6	23
0200 - 0215	1	9	10	
0215 - 0230	2	2	4	
0230 - 0245	1	1	2	
0245 - 0300	3	0	3	19
0300 - 0315	2	3	5	
0315 - 0330	3	2	5	
0330 - 0345	3	1	4	
0345 - 0400	2	1	3	17
0400 - 0415	4	3	7	
0415 - 0430	1	0	1	
0430 - 0445	4	3	7	
0445 - 0500	4	2	6	21
0500 - 0515	6	5	11	
0515 - 0530	10	4	14	
0530 - 0545	8	6	14	
0545 - 0600	6	4	10	49
0600 - 0615	11	7	18	
0615 - 0630	14	7	21	
0630 - 0645	23	9	32	
0645 - 0700	17	17	34	105
0700 - 0715	23	9	32	
0715 - 0730	20	11	31	
0730 - 0745	20	10	30	
0745 - 0800	25	9	34	127
0800 - 0815	12	8	20	
0815 - 0830	14	7	21	
0830 - 0845	15	13	28	
0845 - 0900	11	9	20	89
0900 - 0915	5	9	14	
0915 - 0930	8	5	13	
0930 - 0945	9	3	12	
0945 - 1000	16	7	23	62
1000 - 1015	13	7	20	
1015 - 1030	16	8	24	
1030 - 1045	7	12	19	
1045 - 1100	18	7	25	88
1100 - 1115	15	7	22	
1115 - 1130	16	14	30	
1130 - 1145	15	6	21	
1145 - 1200	9	5	14	87

Time	Volume Summary 15min		15min Total	60min Total
	EB	WB		
1200 - 1215	18	5	23	
1215 - 1230	9	11	20	
1230 - 1245	9	10	19	
1245 - 1300	12	6	18	80
1300 - 1315	19	6	25	
1315 - 1330	18	10	28	
1330 - 1345	18	11	29	
1345 - 1400	10	6	16	98
1400 - 1415	16	7	23	
1415 - 1430	14	9	23	
1430 - 1445	16	7	23	
1445 - 1500	15	8	23	92
1500 - 1515	20	11	31	
1515 - 1530	24	8	32	
1530 - 1545	24	9	33	
1545 - 1600	23	14	37	133
1600 - 1615	26	10	36	
1615 - 1630	14	12	26	
1630 - 1645	12	9	21	
1645 - 1700	28	4	32	115
1700 - 1715	25	10	35	
1715 - 1730	34	14	48	
1730 - 1745	13	11	24	
1745 - 1800	13	5	18	125
1800 - 1815	16	7	23	
1815 - 1830	16	10	26	
1830 - 1845	21	9	30	
1845 - 1900	5	8	13	92
1900 - 1915	8	4	12	
1915 - 1930	12	10	22	
1930 - 1945	10	7	17	
1945 - 2000	4	1	5	56
2000 - 2015	8	1	9	
2015 - 2030	4	6	10	
2030 - 2045	13	8	21	
2045 - 2100	11	8	19	59
2100 - 2115	8	6	14	
2115 - 2130	5	4	9	
2130 - 2145	4	2	6	
2145 - 2200	2	0	2	31
2200 - 2215	3	1	4	
2215 - 2230	2	4	6	
2230 - 2245	6	6	12	
2245 - 2300	1	2	3	25
2300 - 2315	4	0	4	
2315 - 2330	7	3	10	
2330 - 2345	2	2	4	
2345 - 0000	6	4	10	28

Session Total	1039	591	1630
Session Average	10.82	6.16	16.98
Session Percentage	63.74	36.26	

Bi-Directional Class Count || Volume Summary 15min



www.marrtraffic.com

Moody, AL

Site 9

South Valero Access 1,
east of Kelly Creek Rd

Date

Tuesday, May 23, 2023

Weather

Cloudy
66°F

Lat/Long

33.576983°, -86.476320°

0000 - 2400 (24h Session) (05-23-2023)

Volume Summary 15min

TIME	Volume Summary 15min		15min Total	60min Total
	EB	WB		
0000 - 0015	0	0	0	
0015 - 0030	0	0	0	
0030 - 0045	0	1	1	
0045 - 0100	0	0	0	1
0100 - 0115	0	0	0	
0115 - 0130	0	1	1	
0130 - 0145	0	1	1	
0145 - 0200	0	0	0	2
0200 - 0215	0	0	0	
0215 - 0230	0	1	1	
0230 - 0245	0	1	1	
0245 - 0300	0	0	0	2
0300 - 0315	0	2	2	
0315 - 0330	0	0	0	
0330 - 0345	0	0	0	
0345 - 0400	0	3	3	5
0400 - 0415	0	1	1	
0415 - 0430	0	1	1	
0430 - 0445	0	2	2	
0445 - 0500	0	3	3	7
0500 - 0515	0	2	2	
0515 - 0530	0	5	5	
0530 - 0545	1	4	5	
0545 - 0600	2	6	8	20
0600 - 0615	0	3	3	
0615 - 0630	0	4	4	
0630 - 0645	0	9	9	
0645 - 0700	0	3	3	19
0700 - 0715	0	4	4	
0715 - 0730	1	5	6	
0730 - 0745	0	4	4	
0745 - 0800	0	6	6	20
0800 - 0815	0	3	3	
0815 - 0830	0	2	2	
0830 - 0845	0	2	2	
0845 - 0900	1	2	3	10
0900 - 0915	0	2	2	
0915 - 0930	0	4	4	
0930 - 0945	0	2	2	
0945 - 1000	0	2	2	10
1000 - 1015	0	3	3	
1015 - 1030	0	7	7	
1030 - 1045	0	4	4	
1045 - 1100	0	6	6	20
1100 - 1115	0	6	6	
1115 - 1130	0	5	5	
1130 - 1145	0	2	2	
1145 - 1200	0	5	5	18

Time	Volume Summary 15min		15min Total	60min Total
	EB	WB		
1200 - 1215	0	6	6	
1215 - 1230	0	6	6	
1230 - 1245	0	3	3	
1245 - 1300	0	6	6	21
1300 - 1315	0	6	6	
1315 - 1330	0	9	9	
1330 - 1345	0	10	10	
1345 - 1400	0	5	5	30
1400 - 1415	0	7	7	
1415 - 1430	0	6	6	
1430 - 1445	0	6	6	
1445 - 1500	0	6	6	25
1500 - 1515	0	6	6	
1515 - 1530	0	3	3	
1530 - 1545	0	9	9	
1545 - 1600	0	6	6	24
1600 - 1615	0	4	4	
1615 - 1630	3	10	13	
1630 - 1645	0	13	13	
1645 - 1700	1	5	6	36
1700 - 1715	0	8	8	
1715 - 1730	0	7	7	
1730 - 1745	1	8	9	
1745 - 1800	0	5	5	29
1800 - 1815	0	5	5	
1815 - 1830	0	6	6	
1830 - 1845	0	9	9	
1845 - 1900	0	6	6	26
1900 - 1915	2	7	9	
1915 - 1930	0	3	3	
1930 - 1945	0	7	7	
1945 - 2000	0	3	3	22
2000 - 2015	0	3	3	
2015 - 2030	0	1	1	
2030 - 2045	0	3	3	
2045 - 2100	0	3	3	10
2100 - 2115	0	2	2	
2115 - 2130	0	6	6	
2130 - 2145	0	2	2	
2145 - 2200	3	2	5	15
2200 - 2215	0	2	2	
2215 - 2230	0	5	5	
2230 - 2245	0	1	1	
2245 - 2300	0	2	2	10
2300 - 2315	0	0	0	
2315 - 2330	0	1	1	
2330 - 2345	2	1	3	
2345 - 0000	2	0	2	6

Session Total	19	369	388
Session Average	0.20	3.84	4.04
Session Percentage	4.90	95.10	

Bi-Directional Class Count || Volume Summary 15min



www.marrtraffic.com

Moody, AL

Site 10

Love's North Truck Access,
east of Kelly Creek Rd

Date

Tuesday, May 23, 2023

Weather

Cloudy
66°F

Lat/Long

33.575736°, -86.477604°

0000 - 2400 (24h Session) (05-23-2023)

Volume Summary 15min

TIME	Volume Summary 15min		15min Total	60min Total
	EB	WB		
0000 - 0015	1	7	8	
0015 - 0030	1	9	10	
0030 - 0045	0	6	6	
0045 - 0100	0	9	9	33
0100 - 0115	0	7	7	
0115 - 0130	0	7	7	
0130 - 0145	1	8	9	
0145 - 0200	0	3	3	26
0200 - 0215	0	8	8	
0215 - 0230	2	7	9	
0230 - 0245	0	6	6	
0245 - 0300	1	7	8	31
0300 - 0315	0	6	6	
0315 - 0330	0	10	10	
0330 - 0345	1	8	9	
0345 - 0400	0	7	7	32
0400 - 0415	1	6	7	
0415 - 0430	0	12	12	
0430 - 0445	0	9	9	
0445 - 0500	1	7	8	36
0500 - 0515	0	7	7	
0515 - 0530	1	6	7	
0530 - 0545	3	8	11	
0545 - 0600	0	10	10	35
0600 - 0615	1	6	7	
0615 - 0630	0	11	11	
0630 - 0645	0	9	9	
0645 - 0700	1	10	11	38
0700 - 0715	0	8	8	
0715 - 0730	0	10	10	
0730 - 0745	0	10	10	
0745 - 0800	1	9	10	38
0800 - 0815	0	10	10	
0815 - 0830	0	7	7	
0830 - 0845	0	14	14	
0845 - 0900	0	4	4	35
0900 - 0915	3	15	18	
0915 - 0930	0	8	8	
0930 - 0945	1	8	9	
0945 - 1000	1	10	11	46
1000 - 1015	0	15	15	
1015 - 1030	2	13	15	
1030 - 1045	2	12	14	
1045 - 1100	1	10	11	55
1100 - 1115	2	13	15	
1115 - 1130	1	15	16	
1130 - 1145	2	14	16	
1145 - 1200	4	14	18	65

Time	Volume Summary 15min		15min Total	60min Total
	EB	WB		
1200 - 1215	1	16	17	
1215 - 1230	2	21	23	
1230 - 1245	0	12	12	
1245 - 1300	0	7	7	59
1300 - 1315	0	9	9	
1315 - 1330	1	12	13	
1330 - 1345	0	6	6	
1345 - 1400	0	9	9	37
1400 - 1415	0	16	16	
1415 - 1430	0	15	15	
1430 - 1445	1	16	17	
1445 - 1500	0	11	11	59
1500 - 1515	1	8	9	
1515 - 1530	0	11	11	
1530 - 1545	0	10	10	
1545 - 1600	1	10	11	41
1600 - 1615	0	9	9	
1615 - 1630	1	7	8	
1630 - 1645	0	11	11	
1645 - 1700	0	12	12	40
1700 - 1715	0	14	14	
1715 - 1730	1	5	6	
1730 - 1745	0	11	11	
1745 - 1800	2	4	6	37
1800 - 1815	0	11	11	
1815 - 1830	0	11	11	
1830 - 1845	1	9	10	
1845 - 1900	3	6	9	41
1900 - 1915	1	9	10	
1915 - 1930	0	10	10	
1930 - 1945	0	7	7	
1945 - 2000	0	7	7	34
2000 - 2015	0	9	9	
2015 - 2030	2	8	10	
2030 - 2045	0	11	11	
2045 - 2100	0	13	13	43
2100 - 2115	0	6	6	
2115 - 2130	2	8	10	
2130 - 2145	0	4	4	
2145 - 2200	0	6	6	26
2200 - 2215	1	9	10	
2215 - 2230	0	6	6	
2230 - 2245	0	4	4	
2245 - 2300	0	2	2	22
2300 - 2315	0	6	6	
2315 - 2330	1	12	13	
2330 - 2345	0	4	4	
2345 - 0000	0	9	9	32

Session Total	57	884	941
Session Average	0.59	9.21	9.80
Session Percentage	6.06	93.94	

Bi-Directional Class Count || Volume Summary 15min



www.marrtraffic.com

Moody, AL

Site 11

Love's South Truck Access,
west of Kelly Creek Rd

Date

Tuesday, May 23, 2023

Weather

Cloudy
66°F

Lat/Long

33.575150°, -86.478018°

0000 - 2400 (24h Session) (05-23-2023)

Volume Summary 15min

TIME	Volume Summary 15min		15min Total	60min Total
	EB	WB		
0000 - 0015	12	0	12	
0015 - 0030	7	0	7	
0030 - 0045	3	0	3	
0045 - 0100	17	0	17	39
0100 - 0115	6	0	6	
0115 - 0130	7	1	8	
0130 - 0145	4	0	4	
0145 - 0200	7	1	8	26
0200 - 0215	5	0	5	
0215 - 0230	9	0	9	
0230 - 0245	6	1	7	
0245 - 0300	12	1	13	34
0300 - 0315	16	0	16	
0315 - 0330	5	0	5	
0330 - 0345	10	0	10	
0345 - 0400	11	0	11	42
0400 - 0415	9	3	12	
0415 - 0430	8	1	9	
0430 - 0445	11	4	15	
0445 - 0500	7	0	7	43
0500 - 0515	9	0	9	
0515 - 0530	15	1	16	
0530 - 0545	8	2	10	
0545 - 0600	10	0	10	45
0600 - 0615	8	1	9	
0615 - 0630	16	2	18	
0630 - 0645	14	0	14	
0645 - 0700	16	2	18	59
0700 - 0715	18	1	19	
0715 - 0730	7	0	7	
0730 - 0745	15	0	15	
0745 - 0800	10	2	12	53
0800 - 0815	14	3	17	
0815 - 0830	14	1	15	
0830 - 0845	14	1	15	
0845 - 0900	12	3	15	62
0900 - 0915	10	1	11	
0915 - 0930	10	2	12	
0930 - 0945	10	2	12	
0945 - 1000	11	2	13	48
1000 - 1015	11	2	13	
1015 - 1030	11	4	15	
1030 - 1045	6	3	9	
1045 - 1100	18	3	21	58
1100 - 1115	6	2	8	
1115 - 1130	17	1	18	
1130 - 1145	15	0	15	
1145 - 1200	8	5	13	54

Time	Volume Summary 15min		15min Total	60min Total
	EB	WB		
1200 - 1215	18	1	19	
1215 - 1230	22	4	26	
1230 - 1245	19	0	19	
1245 - 1300	11	2	13	77
1300 - 1315	17	1	18	
1315 - 1330	11	3	14	
1330 - 1345	11	0	11	
1345 - 1400	12	4	16	59
1400 - 1415	9	2	11	
1415 - 1430	13	2	15	
1430 - 1445	13	6	19	
1445 - 1500	14	4	18	63
1500 - 1515	12	2	14	
1515 - 1530	11	3	14	
1530 - 1545	12	1	13	
1545 - 1600	15	4	19	60
1600 - 1615	12	2	14	
1615 - 1630	6	3	9	
1630 - 1645	8	6	14	
1645 - 1700	11	2	13	50
1700 - 1715	5	3	8	
1715 - 1730	9	2	11	
1730 - 1745	12	2	14	
1745 - 1800	16	3	19	52
1800 - 1815	10	3	13	
1815 - 1830	12	3	15	
1830 - 1845	12	5	17	
1845 - 1900	11	2	13	58
1900 - 1915	9	3	12	
1915 - 1930	7	2	9	
1930 - 1945	13	1	14	
1945 - 2000	14	1	15	50
2000 - 2015	8	0	8	
2015 - 2030	7	1	8	
2030 - 2045	9	3	12	
2045 - 2100	13	0	13	41
2100 - 2115	8	0	8	
2115 - 2130	6	1	7	
2130 - 2145	5	2	7	
2145 - 2200	6	0	6	28
2200 - 2215	9	4	13	
2215 - 2230	6	0	6	
2230 - 2245	8	0	8	
2245 - 2300	5	0	5	32
2300 - 2315	4	1	5	
2315 - 2330	7	0	7	
2330 - 2345	7	0	7	
2345 - 0000	8	0	8	27

Session Total	1008	152	1160
Session Average	10.50	1.58	12.08
Session Percentage	86.90	13.10	

Appendix C – Field Review Observations & Photos

Field Review Observations & Photos

Wednesday, 8/16/2023 – PM Observations

- Kelly Creek Road @ I-20 Eastbound Ramps
 - From 3:00 – 4:00, the queue on the eastbound exit ramp did not exceed approximately 5 cars.
 - Southbound Kelly Creek Road queued beyond the I-20 westbound ramps to the North Valero Truck Access during the 3:00 hour.
 - Kelly Creek Road southbound queue rarely exceeded the length of the bridge throughout the PM peak hour (4:30 – 5:30).
 - Kelly Creek Road northbound queue fluctuated between 0 cars and 10 cars until approximately 5:15. From 5:25 to 6:00, the Kelly Creek Road northbound queue extended back to the area between Love's Truck Driveways and US-78. The queue began to dissipate around 6:00 to 6:05.
 - Kelly Creek Road northbound queueing from 5:25 to 6:00 resulted in multi-minute delays for vehicles (heavy and passenger) exiting from all three Love's driveways onto Kelly Creek Road northbound.
 - The I-20 eastbound exit ramp queue contained approximately 0 to 5 cars at a time until approximately 5:10. From 5:10 to 6:00, the queue contained 10-20 vehicles, which resulted in the queue reaching the gore area of the exit ramp. The queue briefly extended onto the interstate mainline on a few occasions during this period.
 - At times, the I-20 eastbound exit ramp queue was 10-20 vehicles in length while 0-2 vehicles queued on Kelly Creek Road, suggesting that the traffic control of AWSC is unable to process the vehicle arrivals at the ramp terminal, even when Kelly Creek Road volumes are lower from 5:10-5:20.
 - The right turning movement from I-20 eastbound exit ramp rarely queued while the left turning movement queue extended to approximately 20 vehicles. Drivers preparing to turn right from the I-20 eastbound exit ramp were observed passing the queue on the ramp shoulder prior to the right turn lane taper beginning.
 - Most truck traffic exiting I-20 eastbound was observed turning right onto Kelly Creek Road southbound, presumably to access Moody Commerce Park or Love's. When sites develop and tenants operate at Kelly Creek Commerce Park, there will be additional heavy vehicle traffic turning left onto Kelly Creek Road northbound from the ramp. This is likely to exacerbate PM peak hour queueing and result in queued vehicles further onto the interstate.
 - In summary, the AWSC at the intersection of Kelly Creek Road and I-20 eastbound ramps could not process westbound or northbound volume demands from approximately 5:15 to 6:00.



Photo 1: Queueing on I-20 eastbound exit ramp at Kelly Creek Road



Photo 2: I-20 eastbound exit ramp queueing to gore point of I-20

- Kelly Creek Road @ I-20 Westbound Ramps
 - Acceptable gaps in southbound Kelly Creek Road traffic occurred infrequently. This is problematic for northbound heavy truck traffic attempting to turn left onto I-20 westbound. Theoretically, the channelized section of left turn lane could help with this issue, but its storage capacity is insufficient for most heavy trucks.
 - From approximately 3:00 to 3:45, the queue along Kelly Creek Road southbound prevented vehicles entering Kelly Creek Road southbound from the I-20 westbound exit ramp. This results in multi-minute delays for motorists queued on the I-20 westbound exit ramp.
 - Several instances of failure to yield occurred at the conflict point between the northbound left and southbound right turning movements. Drivers completing the northbound left turn are instructed by signage to yield to drivers completing southbound right turns.
 - The queue on northbound Kelly Creek Road contained approximately 6-10 cars from 4:30 to 5:15; this was typically caused by vehicles having to wait for an appropriate gap to turn left onto I-20 westbound.
 - A maximum queue of 5-10 vehicles was observed on the I-20 westbound exit ramp; however, vehicles still experienced multi-minute delays waiting for a truck to make a left turn onto Kelly Creek Road southbound.



Photo 3: Southbound Kelly Creek Road at I-20 westbound ramps

Thursday, 8/17/2023 – AM Observations

- Kelly Creek Road @ I-20 Eastbound Ramps
 - Northbound Kelly Creek Road queued to Love's Truck Access 2 throughout the AM peak hour. At 7:30 the queue reached US-78.
 - At a minimum, the queue on southbound Kelly Creek Road extended the length of the bridge for the entire AM peak hour. At 7:45 the queue was observed extending all the way to the Park Avenue intersection.
 - The I-20 eastbound exit ramp queue consisted of 5 or fewer vehicles the entire AM peak hour.



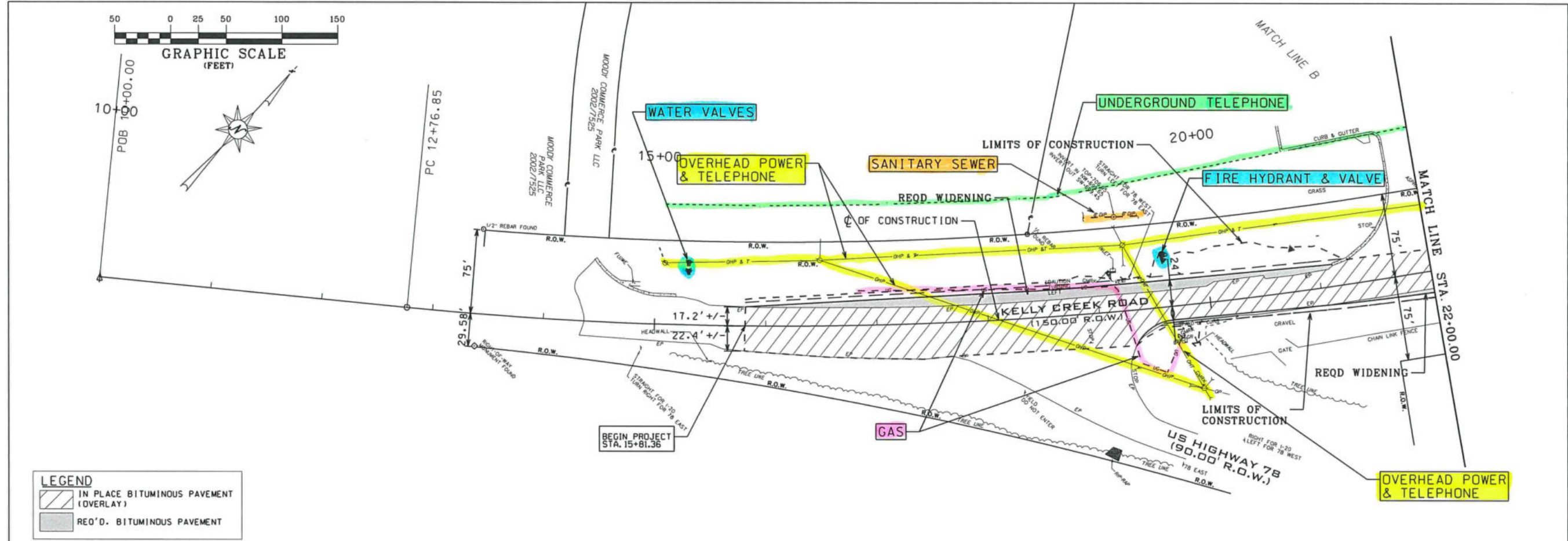
Photo 4: Queuing on northbound Kelly Creek Road south of I-20 eastbound ramps



Photo 5: Queueing on southbound Kelly Creek Road just south of Park Avenue

- Kelly Creek Road @ I-20 Westbound Ramps
 - At various points during the AM peak hour, the northbound left-turning vehicles from Kelly Creek Road onto I-20 westbound queued in the channelized left turn lane area because of high southbound right-turning volumes.
 - Vehicles exiting I-20 westbound were observed driving through the hatched area when turning right. This especially occurred when a heavy truck was turning left, creating a sight distance issue looking south along Kelly Creek Road.
 - During the AM peak hour, the queue on the I-20 westbound exit ramp did not exceed 5 vehicles.

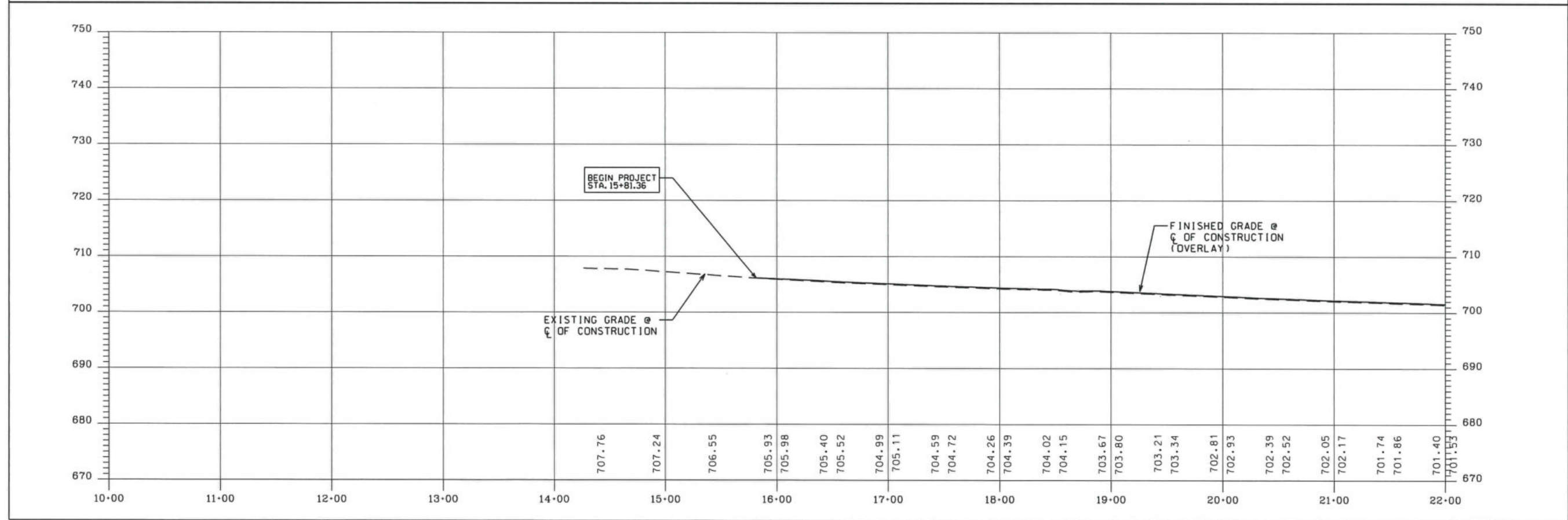
Appendix D – Utility Plan Sheets



LEGEND

IN PLACE BITUMINOUS PAVEMENT (OVERLAY)

REQ'D. BITUMINOUS PAVEMENT



NO.	REVISIONS	DESCRIPTION	BY	CHK	DATE

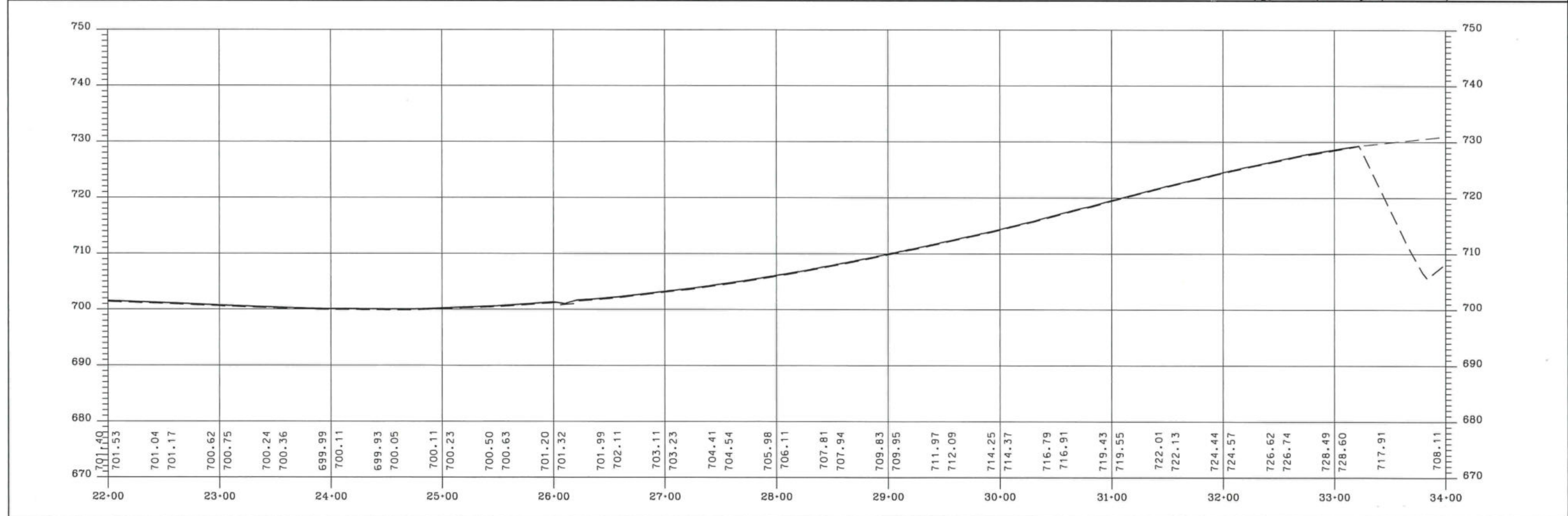
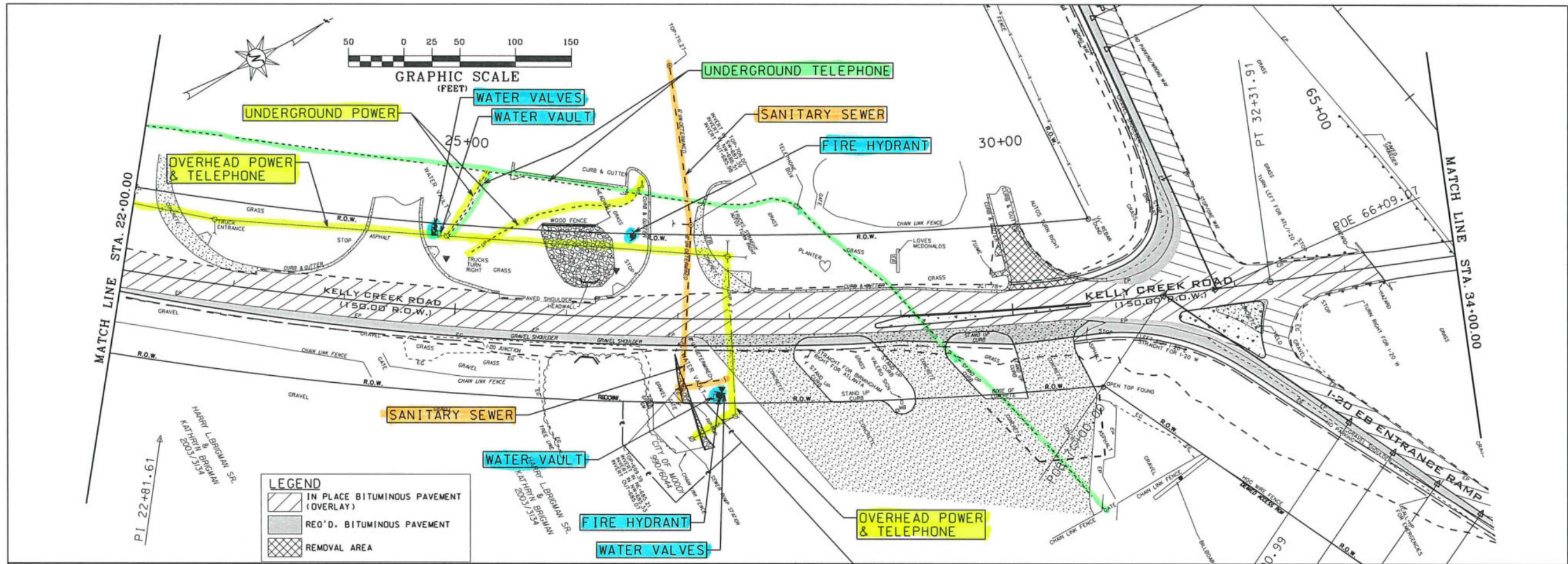
Two Perimeter Park South
 Suite 500 East
 Birmingham, Alabama 35243
 Phone: (205) 940-6420
 Website: www.sain.com

SAIN
 associates
 ENGINEERING BETTER PARTNERSHIPS

DRAWING NAME: UTILITY SHEET
 KELLY CREEK ROAD & I-20 RAMP
 MOODY, ALABAMA
 FOR
 ST. CLAIR COUNTY

DRN. BY	SRH	JOB NO.	15-0262
CHK. BY	NC	SCALE	
PROJ. MGR.	NC	DATE	12-20-16

SHEET NO.
13-R0



NO.	REVISIONS DESCRIPTION	BY	CHK	DATE

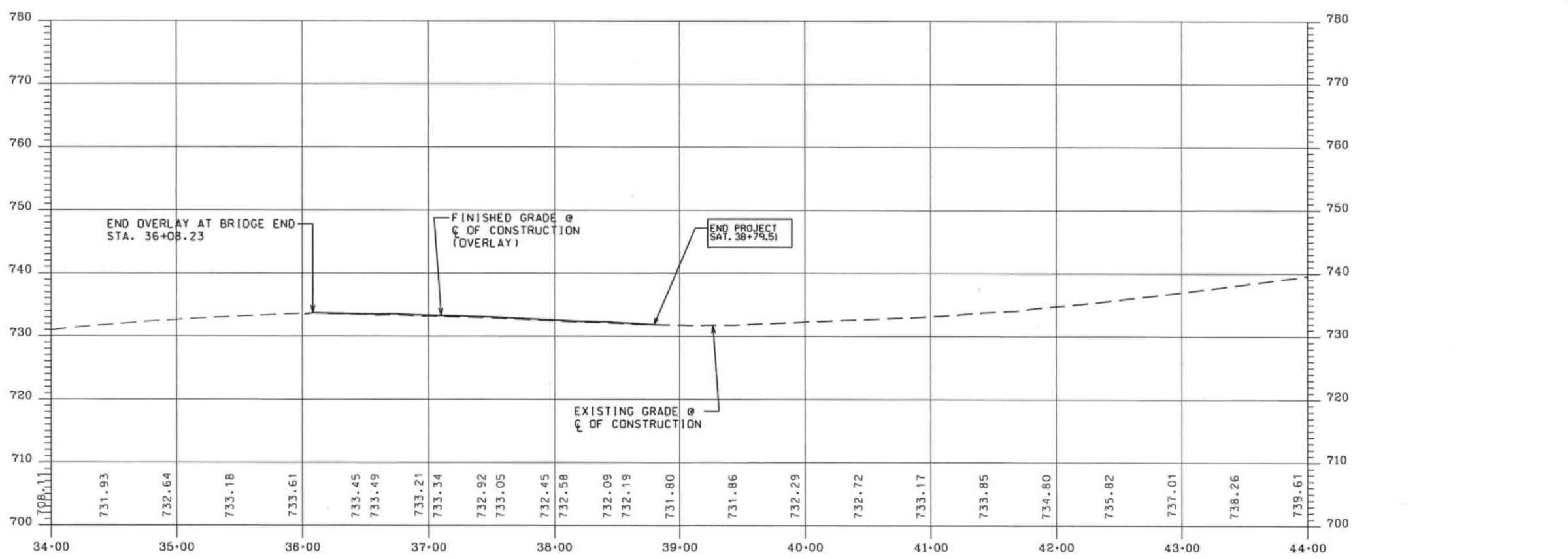
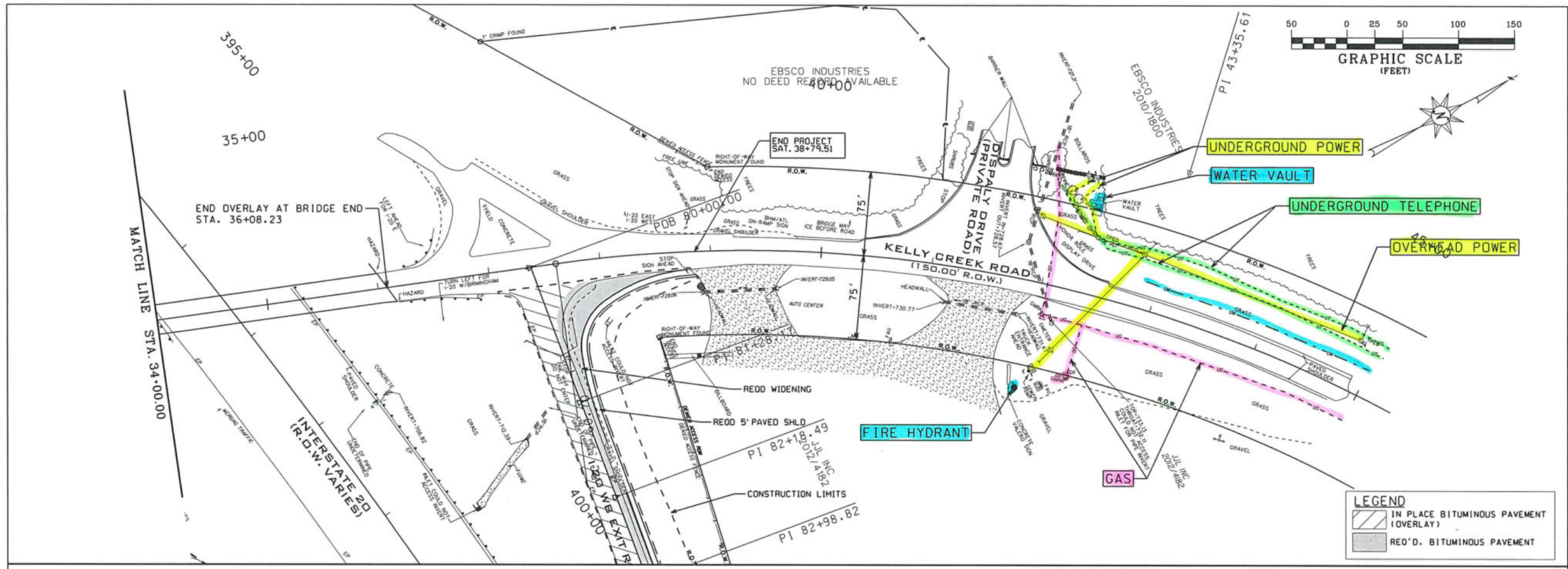
SAIN associates
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Two Perimeter Park South
Suite 500 East
Birmingham, Alabama 35243
Phone: (205) 940-6420
Website: www.sain.com

UTILITY SHEET
KELLY CREEK ROAD & I-20 RAMPS
MOODY, ALABAMA
FOR
ST. CLAIR COUNTY

DRN. BY	SRH	JOB NO.	15-0262
CHK. BY	NC	SCALE	
PROJ. MGR.	NC	DATE	12-20-16

SHEET NO.
14-R0



NO.	REVISIONS	DESCRIPTION	BY	CHK	DATE

Two Perimeter Park South
 Suite 500 East
 Birmingham, Alabama 35243
 Phone: (205) 940-6420
 Website: www.sain.com

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 associates
 ENGINEERING BETTER PARTNERSHIPS

DRAWING NAME
UTILITY SHEET

KELLY CREEK ROAD & I-20 RAMPS
 MOODY, ALABAMA
 FOR
 ST. CLAIR COUNTY

DRN. BY SRH	JOB NO. 15-0262
CKD. BY NC	SCALE
PROJ. MGR. NC	DATE 12-20-16

SHEET NO.
15-R0

Appendix E – Descriptions of Levels of Service

Signalized Intersections

Level of service criteria for signalized intersections is defined in terms of *delay*. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Specifically, level of service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period.

Level of Service	Average Delay (seconds/vehicle)
A	0 - 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Unsignalized Intersections

Level of service criteria for unsignalized intersections is stated in terms of average control delay. Control delay is defined as the total elapsed time from a vehicle joining the queue until its departure from the stopped position at the head of the queue. The criteria for each level of service are cited in the table below.

Level of Service	Average Control Delay (seconds/vehicle)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Appendix F – Existing Conditions Capacity Analysis Reports

HCM 6th AWSC
1: Kelly Creek Rd & I-20 EB Ramps

08/29/2023

Intersection	
Intersection Delay, s/veh	15.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕					↑	↕		↕	
Traffic Vol, veh/h	70	0	141	0	0	0	0	318	113	116	263	0
Future Vol, veh/h	70	0	141	0	0	0	0	318	113	116	263	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	4	0	20	0	0	0	0	11	30	3	11	0
Mvmt Flow	73	0	147	0	0	0	0	331	118	121	274	0
Number of Lanes	0	1	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	10.9	13.9	19.2
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	31%
Vol Thru, %	100%	0%	0%	0%	69%
Vol Right, %	0%	100%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	318	113	70	141	379
LT Vol	0	0	70	0	116
Through Vol	318	0	0	0	263
RT Vol	0	113	0	141	0
Lane Flow Rate	331	118	73	147	395
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.543	0.18	0.148	0.245	0.648
Departure Headway (Hd)	5.896	5.515	7.286	5.995	5.907
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	613	651	492	599	612
Service Time	3.626	3.244	5.028	3.737	3.937
HCM Lane V/C Ratio	0.54	0.181	0.148	0.245	0.645
HCM Control Delay	15.4	9.5	11.3	10.7	19.2
HCM Lane LOS	C	A	B	B	C
HCM 95th-tile Q	3.3	0.7	0.5	1	4.7

HCM 6th TWSC
 2: Kelly Creek Rd & I-20 WB Ramps

08/29/2023

Intersection												
Int Delay, s/veh	16.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↗			↖			↗	
Traffic Vol, veh/h	0	0	0	86	0	148	209	179	0	0	301	494
Future Vol, veh/h	0	0	0	86	0	148	209	179	0	0	301	494
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	-	320	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	5	-	-	3	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	23	0	7	14	4	0	0	4	2
Mvmt Flow	0	0	0	92	0	159	225	192	0	0	324	531

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	1232	1497	192	855	0	-	-
Stage 1	642	642	-	-	-	-	-
Stage 2	590	855	-	-	-	-	-
Critical Hdwy	7.63	7.5	6.77	4.24	-	-	-
Critical Hdwy Stg 1	6.63	6.5	-	-	-	-	-
Critical Hdwy Stg 2	6.63	6.5	-	-	-	-	-
Follow-up Hdwy	3.707	4	3.363	2.326	-	-	-
Pot Cap-1 Maneuver	126	82	815	736	-	0	0
Stage 1	407	395	-	-	-	0	0
Stage 2	437	298	-	-	-	0	0
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	~ 83	0	815	736	-	-	-
Mov Cap-2 Maneuver	~ 83	0	-	-	-	-	-
Stage 1	268	0	-	-	-	-	-
Stage 2	437	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	88.9	6.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	736	-	83	815	-
HCM Lane V/C Ratio	0.305	-	1.114	0.195	-
HCM Control Delay (s)	12	0	223.7	10.5	-
HCM Lane LOS	B	A	F	B	-
HCM 95th %tile Q(veh)	1.3	-	6.5	0.7	-

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

HCM 6th TWSC
3: Kelly Creek Rd & US-78

08/29/2023

Intersection						
Int Delay, s/veh	4.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	35	184	157	17	79	228
Future Vol, veh/h	35	184	157	17	79	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	-	-	-	155	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	26	12	24	19	10
Mvmt Flow	36	192	164	18	82	238

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	575	173	0	0	164
Stage 1	173	-	-	-	-
Stage 2	402	-	-	-	-
Critical Hdwy	6.4	6.46	-	-	4.29
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.534	-	-	2.371
Pot Cap-1 Maneuver	483	812	-	-	1317
Stage 1	862	-	-	-	-
Stage 2	680	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	453	812	-	-	1317
Mov Cap-2 Maneuver	453	-	-	-	-
Stage 1	862	-	-	-	-
Stage 2	638	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	721	1317
HCM Lane V/C Ratio	-	-	0.316	0.062
HCM Control Delay (s)	-	-	12.3	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.4	0.2

HCM 6th TWSC
4: Kelly Creek Rd & Park Ave

08/29/2023

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	19	4	190	1	1	2	123	104	8	9	538	69
Future Vol, veh/h	19	4	190	1	1	2	123	104	8	9	538	69
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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	0	0	0	14	0	12	0	2	0
Mvmt Flow	22	5	221	1	1	2	143	121	9	10	626	80

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1059	1062	626	1061	1058	126	626	0	0	130	0	0
Stage 1	646	646	-	412	412	-	-	-	-	-	-	-
Stage 2	413	416	-	649	646	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.24	7.1	6.5	6.2	4.24	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.336	3.5	4	3.3	2.326	-	-	2.2	-	-
Pot Cap-1 Maneuver	204	225	481	203	227	930	900	-	-	1468	-	-
Stage 1	464	470	-	621	598	-	-	-	-	-	-	-
Stage 2	620	595	-	462	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	174	185	481	93	186	930	900	-	-	1468	-	-
Mov Cap-2 Maneuver	174	185	-	93	186	-	-	-	-	-	-	-
Stage 1	385	465	-	515	496	-	-	-	-	-	-	-
Stage 2	511	493	-	245	465	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.2		21.8		5.1		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	900	-	-	539	219	1468	-
HCM Lane V/C Ratio	0.159	-	-	0.46	0.021	0.007	-
HCM Control Delay (s)	9.8	0	-	17.2	21.8	7.5	0
HCM Lane LOS	A	A	-	C	C	A	A
HCM 95th %tile Q(veh)	0.6	-	-	2.4	0.1	0	-

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕		↖	↗		↖	↗	↖
Traffic Vol, veh/h	83	1	49	8	0	13	39	319	28	13	278	111
Future Vol, veh/h	83	1	49	8	0	13	39	319	28	13	278	111
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	-	-	-	-	-	100	-	-	50	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	4	-	-	-4	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	0	0	0	0	8	3	21	0	8	19	4
Mvmt Flow	86	1	51	8	0	13	40	329	29	13	287	114

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	743	751	287	820	851	344	401	0	0	358	0	0
Stage 1	313	313	-	424	424	-	-	-	-	-	-	-
Stage 2	430	438	-	396	427	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.5	6.2	7.1	6.5	6.28	4.13	-	-	4.18	-	-
Critical Hdwy Stg 1	6.12	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	3.5	4	3.372	2.227	-	-	2.272	-	-
Pot Cap-1 Maneuver	331	342	757	296	299	685	1152	-	-	1168	-	-
Stage 1	698	661	-	612	590	-	-	-	-	-	-	-
Stage 2	603	582	-	633	589	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	313	326	757	266	285	685	1152	-	-	1168	-	-
Mov Cap-2 Maneuver	313	326	-	266	285	-	-	-	-	-	-	-
Stage 1	674	654	-	591	569	-	-	-	-	-	-	-
Stage 2	571	562	-	583	583	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	16.9		13.9		0.8			0.3		
HCM LOS	C		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1152	-	-	313	737	428	1168	-	-
HCM Lane V/C Ratio	0.035	-	-	0.273	0.07	0.051	0.011	-	-
HCM Control Delay (s)	8.2	-	-	20.8	10.3	13.9	8.1	-	-
HCM Lane LOS	A	-	-	C	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.2	0.2	0	-	-

HCM 6th TWSC
6: Kelly Creek Rd & Display Dr/N Valero PC Access 1

08/29/2023

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	1	1	68	0	22	9	228	7	44	687	5
Future Vol, veh/h	2	1	1	68	0	22	9	228	7	44	687	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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	50	0	0	3	0	0	0	7	0	0	3	0
Mvmt Flow	2	1	1	76	0	25	10	256	8	49	772	6

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1166	1157	775	1151	1150	260	772	0	0	264	0	0
Stage 1	873	873	-	280	280	-	-	-	-	-	-	-
Stage 2	293	284	-	871	870	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.6	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	138	198	401	174	200	784	852	-	-	1312	-	-
Stage 1	286	370	-	725	683	-	-	-	-	-	-	-
Stage 2	623	680	-	344	372	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	126	182	401	162	184	784	852	-	-	1312	-	-
Mov Cap-2 Maneuver	126	182	-	162	184	-	-	-	-	-	-	-
Stage 1	282	346	-	715	673	-	-	-	-	-	-	-
Stage 2	595	670	-	319	347	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	24.7		39.8		0.3		0.5	
HCM LOS	C		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	852	-	-	187	201	1312	-
HCM Lane V/C Ratio	0.012	-	-	0.024	0.503	0.038	-
HCM Control Delay (s)	9.3	0	-	24.7	39.8	7.9	0
HCM Lane LOS	A	A	-	C	E	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	2.5	0.1	-

HCM 6th AWSC
 1: Kelly Creek Rd & I-20 EB Ramps

08/29/2023

Intersection	
Intersection Delay, s/veh	17.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕					↑	↕		↕	
Traffic Vol, veh/h	329	0	265	0	0	0	0	260	154	90	205	0
Future Vol, veh/h	329	0	265	0	0	0	0	260	154	90	205	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	0	14	0	0	0	0	9	14	7	12	0
Mvmt Flow	336	0	270	0	0	0	0	265	157	92	209	0
Number of Lanes	0	1	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	19	15.1	19.7
HCM LOS	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	31%
Vol Thru, %	100%	0%	0%	0%	69%
Vol Right, %	0%	100%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	260	154	329	265	295
LT Vol	0	0	329	0	90
Through Vol	260	0	0	0	205
RT Vol	0	154	0	265	0
Lane Flow Rate	265	157	336	270	301
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.516	0.278	0.671	0.446	0.587
Departure Headway (Hd)	6.997	6.369	7.198	5.943	7.018
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	512	561	500	603	512
Service Time	4.77	4.141	4.963	3.707	5.083
HCM Lane V/C Ratio	0.518	0.28	0.672	0.448	0.588
HCM Control Delay	17.1	11.6	23.5	13.5	19.7
HCM Lane LOS	C	B	C	B	C
HCM 95th-tile Q	2.9	1.1	4.9	2.3	3.7

HCM 6th TWSC
2: Kelly Creek Rd & I-20 WB Ramps

08/29/2023

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶	↷			↶			↷	
Traffic Vol, veh/h	0	0	0	75	0	175	100	484	0	0	225	129
Future Vol, veh/h	0	0	0	75	0	175	100	484	0	0	225	129
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	-	320	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	5	-	-	3	-	-	-2	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	21	0	3	13	3	0	0	5	7
Mvmt Flow	0	0	0	79	0	184	105	509	0	0	237	136

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	1024	1092	509	373	0	-	-
Stage 1	719	719	-	-	-	-	-
Stage 2	305	373	-	-	-	-	-
Critical Hdwy	7.61	7.5	6.73	4.23	-	-	-
Critical Hdwy Stg 1	6.61	6.5	-	-	-	-	-
Critical Hdwy Stg 2	6.61	6.5	-	-	-	-	-
Follow-up Hdwy	3.689	4	3.327	2.317	-	-	-
Pot Cap-1 Maneuver	181	160	524	1128	-	0	0
Stage 1	368	357	-	-	-	0	0
Stage 2	649	561	-	-	-	0	0
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	157	0	524	1128	-	-	-
Mov Cap-2 Maneuver	157	0	-	-	-	-	-
Stage 1	320	0	-	-	-	-	-
Stage 2	649	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.6	1.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1128	-	157	524	-
HCM Lane V/C Ratio	0.093	-	0.503	0.352	-
HCM Control Delay (s)	8.5	0	49.1	15.5	-
HCM Lane LOS	A	A	E	C	-
HCM 95th %tile Q(veh)	0.3	-	2.4	1.6	-

HCM 6th TWSC
3: Kelly Creek Rd & US-78

08/29/2023

Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	44	103	194	51	200	136
Future Vol, veh/h	44	103	194	51	200	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	-	-	-	155	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	20	15	0	19	8
Mvmt Flow	50	117	220	58	227	155

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	858	249	0	0	220
Stage 1	249	-	-	-	-
Stage 2	609	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	4.29
Critical Hdwy Stg 1	5.45	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	2.371
Pot Cap-1 Maneuver	323	748	-	-	1255
Stage 1	785	-	-	-	-
Stage 2	537	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	265	748	-	-	1255
Mov Cap-2 Maneuver	265	-	-	-	-
Stage 1	785	-	-	-	-
Stage 2	440	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	5.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	484	1255
HCM Lane V/C Ratio	-	-	0.345	0.181
HCM Control Delay (s)	-	-	16.3	8.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.5	0.7

HCM 6th TWSC
4: Kelly Creek Rd & Park Ave

08/29/2023

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Traffic Vol, veh/h	90	1	174	6	7	5	198	404	1	1	119	46
Future Vol, veh/h	90	1	174	6	7	5	198	404	1	1	119	46
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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	100	7	7	0	0	3	5	0	0	2	0
Mvmt Flow	100	1	193	7	8	6	220	449	1	1	132	51

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1031	1024	132	1025	1024	450	132	0	0	450	0	0
Stage 1	134	134	-	890	890	-	-	-	-	-	-	-
Stage 2	897	890	-	135	134	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.27	7.17	6.5	6.2	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.363	3.563	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	213	161	904	209	237	613	1447	-	-	1121	-	-
Stage 1	874	631	-	331	364	-	-	-	-	-	-	-
Stage 2	337	254	-	856	789	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	173	128	904	138	189	613	1447	-	-	1121	-	-
Mov Cap-2 Maneuver	173	128	-	138	189	-	-	-	-	-	-	-
Stage 1	697	630	-	264	290	-	-	-	-	-	-	-
Stage 2	259	202	-	671	788	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	21.8		24.7		2.6		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1447	-	-	502	203	1121	-
HCM Lane V/C Ratio	0.152	-	-	0.587	0.099	0.001	-
HCM Control Delay (s)	7.9	0	-	21.8	24.7	8.2	0
HCM Lane LOS	A	A	-	C	C	A	A
HCM 95th %tile Q(veh)	0.5	-	-	3.7	0.3	0	-

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕		↖	↗		↖	↗	↖
Traffic Vol, veh/h	90	1	47	10	0	5	29	281	24	33	330	106
Future Vol, veh/h	90	1	47	10	0	5	29	281	24	33	330	106
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	-	-	-	-	-	100	-	-	50	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	4	-	-	-4	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	3	11	0	0	0	20	0	7	17	0
Mvmt Flow	96	1	50	11	0	5	31	299	26	35	351	113

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	798	808	351	877	908	312	464	0	0	325	0	0
Stage 1	421	421	-	374	374	-	-	-	-	-	-	-
Stage 2	377	387	-	503	534	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.23	7.21	6.5	6.2	4.1	-	-	4.17	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.327	3.599	4	3.3	2.2	-	-	2.263	-	-
Pot Cap-1 Maneuver	306	317	690	259	277	733	1108	-	-	1207	-	-
Stage 1	614	592	-	629	621	-	-	-	-	-	-	-
Stage 2	649	613	-	534	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	291	299	690	229	261	733	1108	-	-	1207	-	-
Mov Cap-2 Maneuver	291	299	-	229	261	-	-	-	-	-	-	-
Stage 1	597	575	-	611	604	-	-	-	-	-	-	-
Stage 2	626	596	-	480	513	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19	17.8	0.7	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1108	-	-	291	672	297	1207	-	-
HCM Lane V/C Ratio	0.028	-	-	0.329	0.076	0.054	0.029	-	-
HCM Control Delay (s)	8.3	-	-	23.3	10.8	17.8	8.1	-	-
HCM Lane LOS	A	-	-	C	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.4	0.2	0.2	0.1	-	-

HCM 6th TWSC
6: Kelly Creek Rd & Display Dr/N Valero PC Access 1

08/29/2023

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	3	1	21	28	0	53	6	556	12	20	279	2
Future Vol, veh/h	3	1	21	28	0	53	6	556	12	20	279	2
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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	29	0	0	0	50	5	0	0	6	0
Mvmt Flow	3	1	23	30	0	58	7	604	13	22	303	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1002	979	304	973	972	611	303	0	0	617	0	0
Stage 1	348	348	-	625	625	-	-	-	-	-	-	-
Stage 2	654	631	-	348	347	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.49	7.1	6.5	6.2	4.6	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.561	3.5	4	3.3	2.65	-	-	2.2	-	-
Pot Cap-1 Maneuver	223	252	677	233	254	497	1029	-	-	973	-	-
Stage 1	672	638	-	476	480	-	-	-	-	-	-	-
Stage 2	459	477	-	672	638	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	192	243	677	218	245	497	1029	-	-	973	-	-
Mov Cap-2 Maneuver	192	243	-	218	245	-	-	-	-	-	-	-
Stage 1	665	621	-	471	475	-	-	-	-	-	-	-
Stage 2	402	472	-	631	621	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.6		19		0.1		0.6	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1029	-	-	806	345	973	-	-
HCM Lane V/C Ratio	0.006	-	-	0.034	0.255	0.022	-	-
HCM Control Delay (s)	8.5	0	-	9.6	19	8.8	0	-
HCM Lane LOS	A	A	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0.1	-	-

Appendix G – Existing Conditions Signal Warrant Evaluation Reports

1. Kelly Creek Road at I-20 Eastbound Ramps – No Right Turn Reduction
2. Kelly Creek Road at I-20 Eastbound Ramps – Right Turn Reduction Applied
3. Kelly Creek Road at I-20 Westbound Ramps – No Right Turn Reduction
4. Kelly Creek Road at I-20 Westbound Ramps – Right Turn Reduction Applied

TRAFFIC SIGNAL WARRANTS

City/Town: **Moody**
 County: **St. Clair**
 Division:
 Data Date: **5/23/2023**
 Major Route: **Kelly Creek Road**
 Minor Route: **I-20 EB Ramps**

Analysis Performed By: **DJC**
 Date Analysis Performed: **8/8/2023**
 Project Number if Applicable: **230105**
 Weather Conditions: **Fair**
 Apr. Lanes: **1** Critical Approach Speed (mph): **30**
 Apr. Lanes: **2**

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area or isolated community of <10,000 population? Yes No
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied. Satisfied: Yes No

Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied, given adequate trials of other remedial measures have been tried.

Adequate trial(s) of other remedial measures tried: Yes No

List Remedial Measures Tried (Required for 80% Combination of A & B)

**Converted from TWSC to AWSC to mitigate sight distance issue
 Installed exclusive right turn lane**

Condition A - Minimum Vehicular Volume & Condition B - Interruption of Continuous Traffic

100% Satisfied: Yes No

(Used if neither Condition A or B is satisfied) 80% Satisfied: Yes No

		(volumes in veh/hr)		Minimum Requirements				Eight Highest Hours							
								4 PM	5 PM	3 PM	7 AM	2 PM	12 PM	1 PM	6 PM
		Approach Lanes		1		2 or more									
		Volume Level		100%	70%	100%	70%								
W - 1A	100%	Both Approaches on Major Street		500	350	600	420	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		150	105	200	140	541	565	458	211	371	288	292	343
W - 1B	100%	Both Approaches on Major Street		750	525	900	630	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		75	53	100	70	541	565	458	211	371	288	292	343
W - 1A	80%	Both Approaches on Major Street		400	280	480	336	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		120	84	160	112	541	565	458	211	371	288	292	343
W - 1B	80%	Both Approaches on Major Street		600	420	720	504	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		60	42	80	56	541	565	458	211	371	288	292	343

TRAFFIC SIGNAL WARRANTS

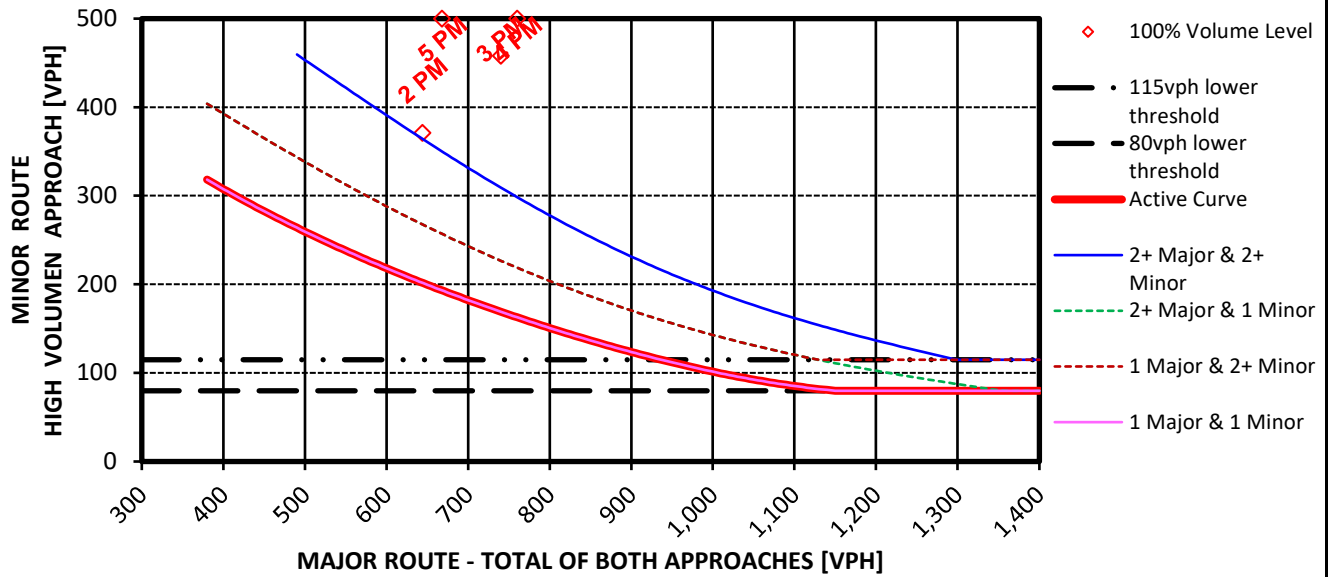
WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Satisfied: Yes No

If all four points lie above the appropriate line, then this warrant is satisfied.

	Four Highest Hours			
	4 PM	5 PM	3 PM	2 PM
(Volumes in veh/hr)				
SUM of Both Approaches on Major Street	760	668	740	644
Highest Minor Street Approach	541	565	458	371

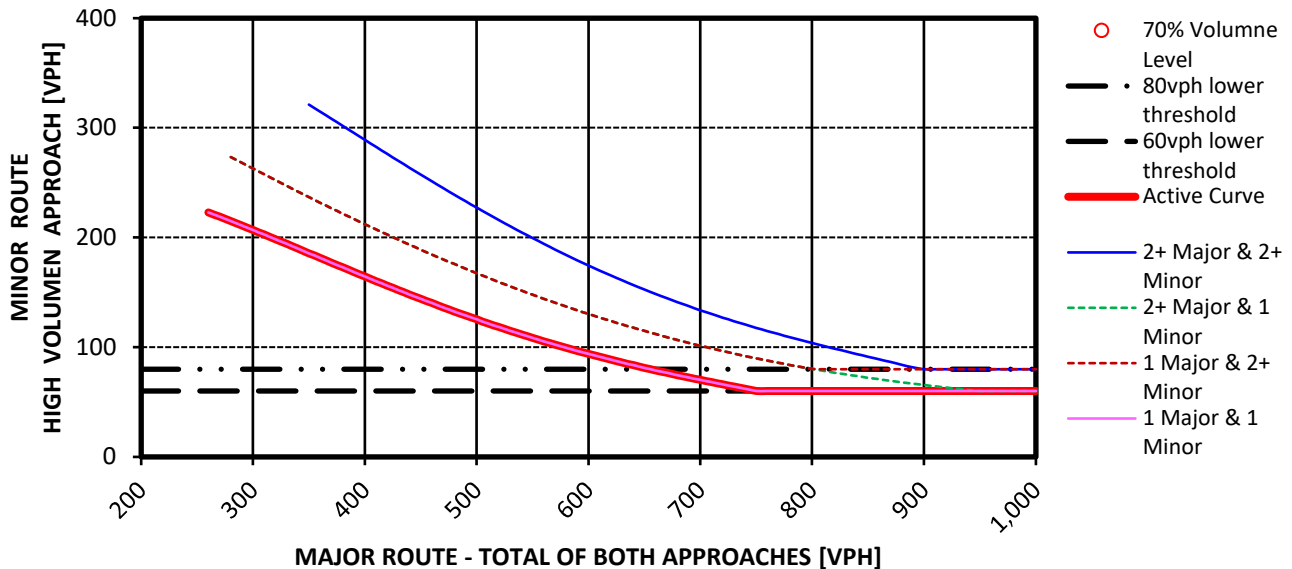
FIGURE W-2: Criteria for "100%" Volume Level



** Note: 115 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

FIGURE W-2: Criteria for "70%" Volume Level

(Community less-than 10,000 population or speeds greater-than 70 km/hr [40 mph] on Major Street)



** Note: 80 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

TRAFFIC SIGNAL WARRANTS

City/Town: **Moody**
 County: **St. Clair**
 Division:
 Data Date: **5/23/2023**
 Major Route: **Kelly Creek Road**
 Minor Route: **I-20 EB Ramps**

Analysis Performed By: **DJC**
 Date Analysis Performed: **8/8/2023**
 Project Number if Applicable: **230105**
 Weather Conditions: **Fair**
 Apr. Lanes: **1** Critical Approach Speed (mph): **30**
 Apr. Lanes: **2**

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area or isolated community of <10,000 population? Yes No
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied. Satisfied: Yes No

Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied, given adequate trials of other remedial measures have been tried.

Adequate trial(s) of other remedial measures tried: Yes No

List Remedial Measures Tried (Required for 80% Combination of A & B)

**Converted from TWSC to AWSC to mitigate sight distance issue
 Installed exclusive right turn lane**

Condition A - Minimum Vehicular Volume & Condition B - Interruption of Continuous Traffic

100% Satisfied: Yes No

(Used if neither Condition A or B is satisfied) 80% Satisfied: Yes No

		(volumes in veh/hr)		Minimum Requirements				Eight Highest Hours							
								4 PM	5 PM	3 PM	7 AM	2 PM	12 PM	1 PM	6 PM
		Approach Lanes		1		2 or more									
		Volume Level		100%	70%	100%	70%								
W - 1A	100%	Both Approaches on Major Street		500	350	600	420	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		150	105	200	140	342	381	274	112	205	147	153	193
W - 1B	100%	Both Approaches on Major Street		750	525	900	630	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		75	53	100	70	342	381	274	112	205	147	153	193
W - 1A	80%	Both Approaches on Major Street		400	280	480	336	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		120	84	160	112	342	381	274	112	205	147	153	193
W - 1B	80%	Both Approaches on Major Street		600	420	720	504	760	668	740	810	644	592	584	527
		Highest Approach on Minor Street		60	42	80	56	342	381	274	112	205	147	153	193

TRAFFIC SIGNAL WARRANTS

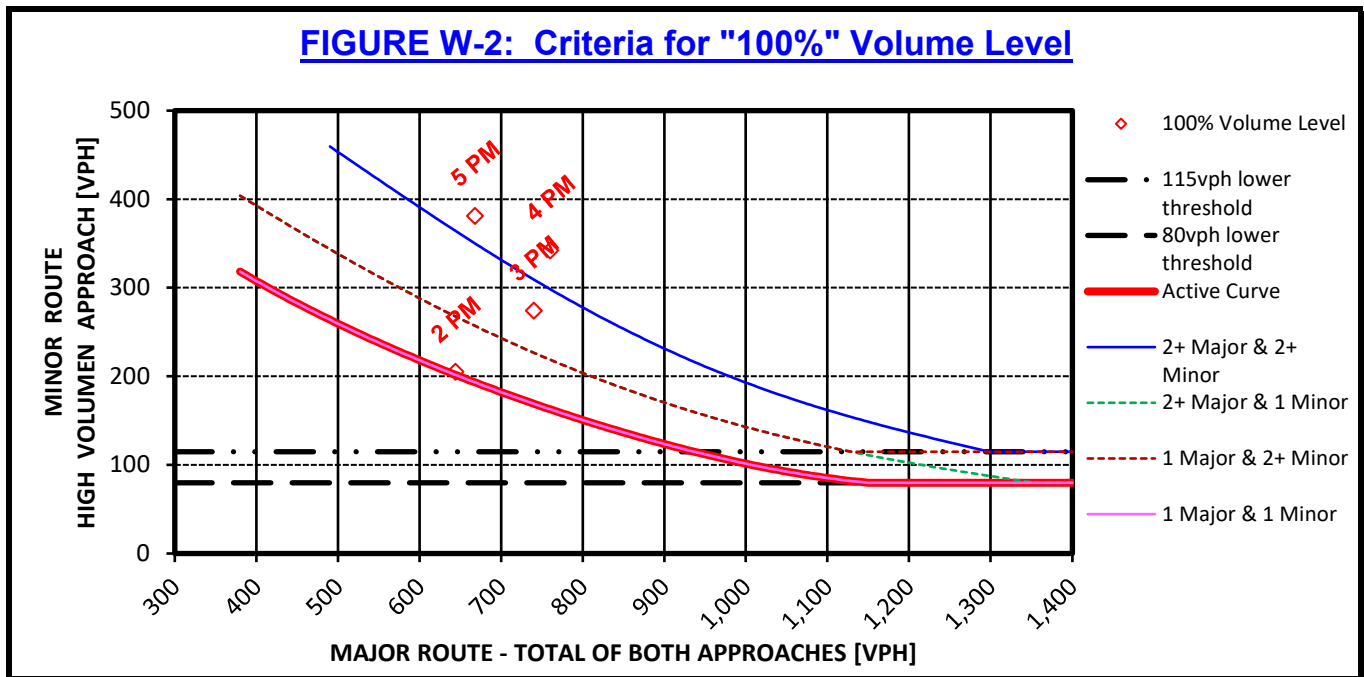
WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Satisfied: Yes No

If all four points lie above the appropriate line, then this warrant is satisfied.

	Four Highest Hours			
	4 PM	5 PM	3 PM	2 PM
(Volumes in veh/hr)				
SUM of Both Approaches on Major Street	760	668	740	644
Highest Minor Street Approach	342	381	274	205

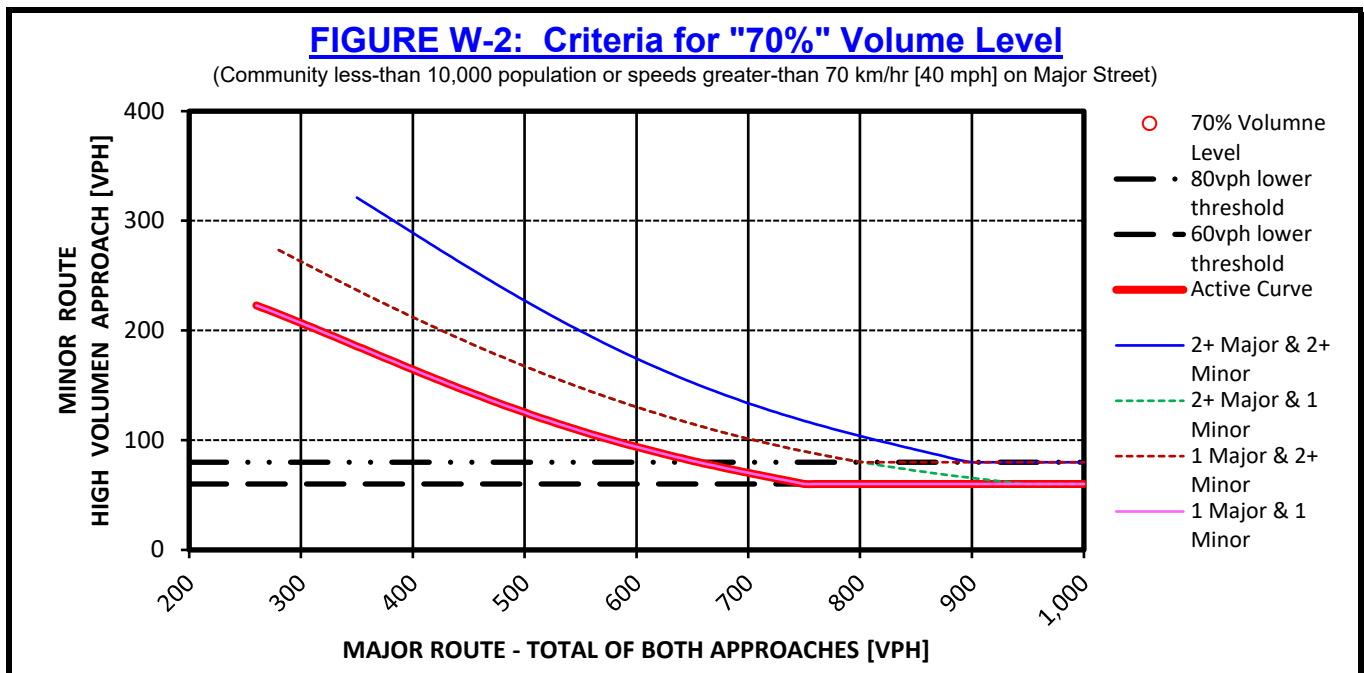
FIGURE W-2: Criteria for "100%" Volume Level



** Note: 115 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

FIGURE W-2: Criteria for "70%" Volume Level

(Community less-than 10,000 population or speeds greater-than 70 km/hr [40 mph] on Major Street)



** Note: 80 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

TRAFFIC SIGNAL WARRANTS

City/Town: **Moody**
 County: **St. Clair**
 Division:
 Data Date: **5/23/2023**
 Major Route: **Kelly Creek Road**
 Minor Route: **I-20 WB Ramps**

Analysis Performed By: **DJC**
 Date Analysis Performed: **8/8/2023**
 Project Number if Applicable: **230105**
 Weather Conditions: **Fair**
 Apr. Lanes: **1** Critical Approach Speed (mph): **30**
 Apr. Lanes: **2**

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area or isolated community of <10,000 population? Yes No
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied. Satisfied: Yes No

Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied, given adequate trials of other remedial measures have been tried.

Adequate trial(s) of other remedial measures tried: Yes No

List Remedial Measures Tried (Required for 80% Combination of A & B)

Installed exclusive right turn lane

Condition A - Minimum Vehicular Volume & Condition B - Interruption of Continuous Traffic

100% Satisfied: Yes No

(Used if neither Condition A or B is satisfied) 80% Satisfied: Yes No

		(volumes in veh/hr)		Minimum Requirements				Eight Highest Hours							
								7 AM	4 PM	3 PM	5 PM	6 AM	2 PM	1 PM	11 AM
		Approach Lanes		1	2 or more										
		Volume Level		100%	70%	100%	70%								
W - 1A	100%	Both Approaches on Major Street		500	350	600	420	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		150	105	200	140	234	250	215	209	196	201	178	169
W - 1B	100%	Both Approaches on Major Street		750	525	900	630	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		75	53	100	70	234	250	215	209	196	201	178	169
W - 1A	80%	Both Approaches on Major Street		400	280	480	336	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		120	84	160	112	234	250	215	209	196	201	178	169
W - 1B	80%	Both Approaches on Major Street		600	420	720	504	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		60	42	80	56	234	250	215	209	196	201	178	169

TRAFFIC SIGNAL WARRANTS

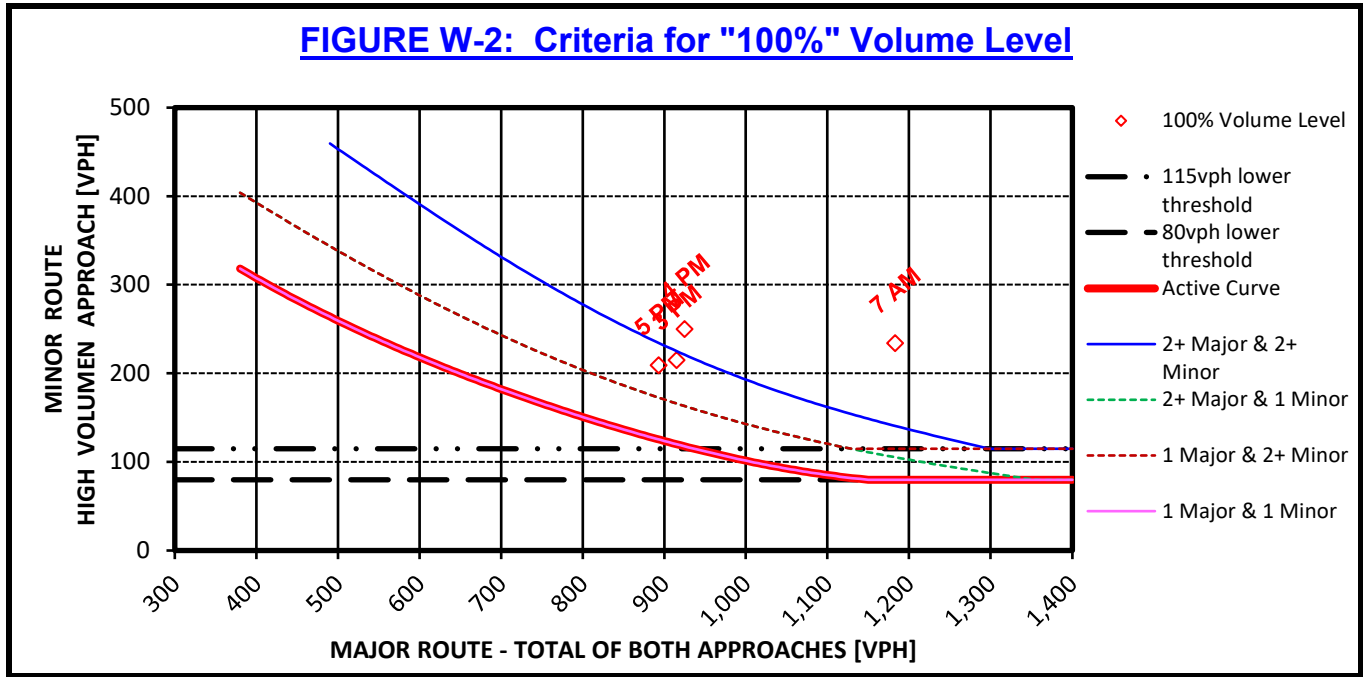
WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Satisfied: Yes No

If all four points lie above the appropriate line, then this warrant is satisfied.

Four Highest Hours				
	7 AM	4 PM	3 PM	5 PM
(Volumes in veh/hr)				
SUM of Both Approaches on Major Street	1,183	925	915	893
Highest Minor Street Approach	234	250	215	209

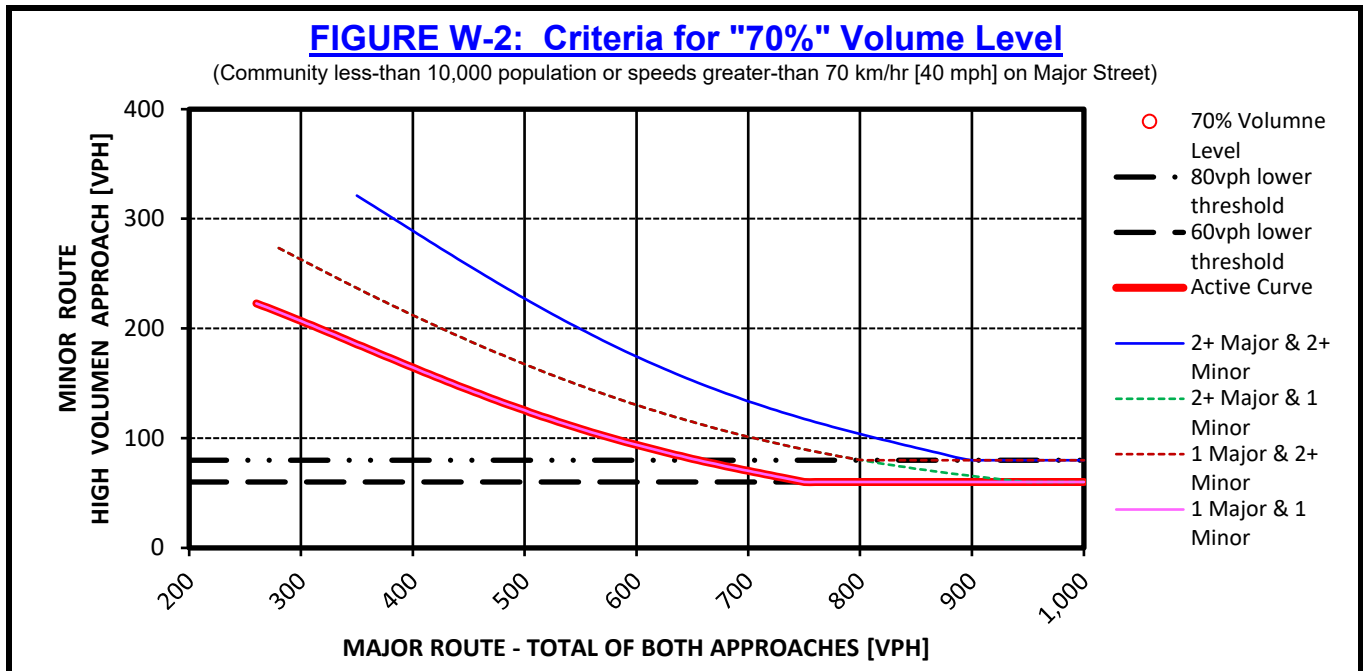
FIGURE W-2: Criteria for "100%" Volume Level



** Note: 115 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

FIGURE W-2: Criteria for "70%" Volume Level

(Community less-than 10,000 population or speeds greater-than 70 km/hr [40 mph] on Major Street)



** Note: 80 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

TRAFFIC SIGNAL WARRANTS

City/Town: **Moody**
 County: **St. Clair**
 Division:
 Data Date: **5/23/2023**
 Major Route: **Kelly Creek Road**
 Minor Route: **I-20 WB Ramps**

Analysis Performed By: **DJC**
 Date Analysis Performed: **8/8/2023**
 Project Number if Applicable: **230105**
 Weather Conditions: **Fair**
 Apr. Lanes: **1** Critical Approach Speed (mph): **30**
 Apr. Lanes: **2**

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area or isolated community of <10,000 population? Yes No
 If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied. Satisfied: Yes No

Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied, given adequate trials of other remedial measures have been tried.

Adequate trial(s) of other remedial measures tried: Yes No

List Remedial Measures Tried (Required for 80% Combination of A & B)

Install Exclusive Right Turn Lane

Condition A - Minimum Vehicular Volume & Condition B - Interruption of Continuous Traffic

100% Satisfied: Yes No

(Used if neither Condition A or B is satisfied) 80% Satisfied: Yes No

		(volumes in veh/hr)		Minimum Requirements				Eight Highest Hours							
								7 AM	4 PM	3 PM	5 PM	6 AM	2 PM	1 PM	11 AM
		Approach Lanes		1	2 or more										
		Volume Level		100%	70%	100%	70%								
W - 1A	100%	Both Approaches on Major Street		500	350	600	420	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		150	105	200	140	138	125	107	110	106	115	95	100
W - 1B	100%	Both Approaches on Major Street		750	525	900	630	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		75	53	100	70	138	125	107	110	106	115	95	100
W - 1A	80%	Both Approaches on Major Street		400	280	480	336	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		120	84	160	112	138	125	107	110	106	115	95	100
W - 1B	80%	Both Approaches on Major Street		600	420	720	504	1,183	925	915	893	780	660	607	602
		Highest Approach on Minor Street		60	42	80	56	138	125	107	110	106	115	95	100

TRAFFIC SIGNAL WARRANTS

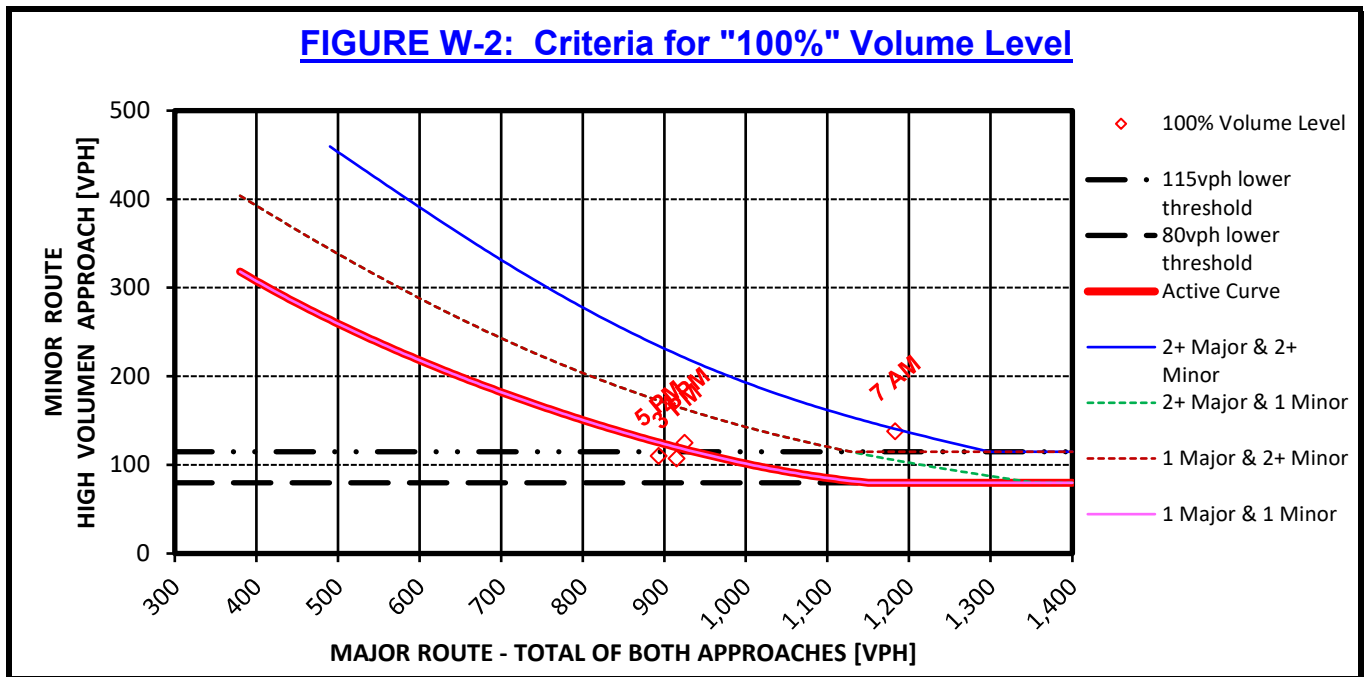
WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Satisfied: Yes No

If all four points lie above the appropriate line, then this warrant is satisfied.

	Four Highest Hours			
	7 AM	4 PM	3 PM	5 PM
(Volumes in veh/hr)				
SUM of Both Approaches on Major Street	1,183	925	915	893
Highest Minor Street Approach	138	125	107	110

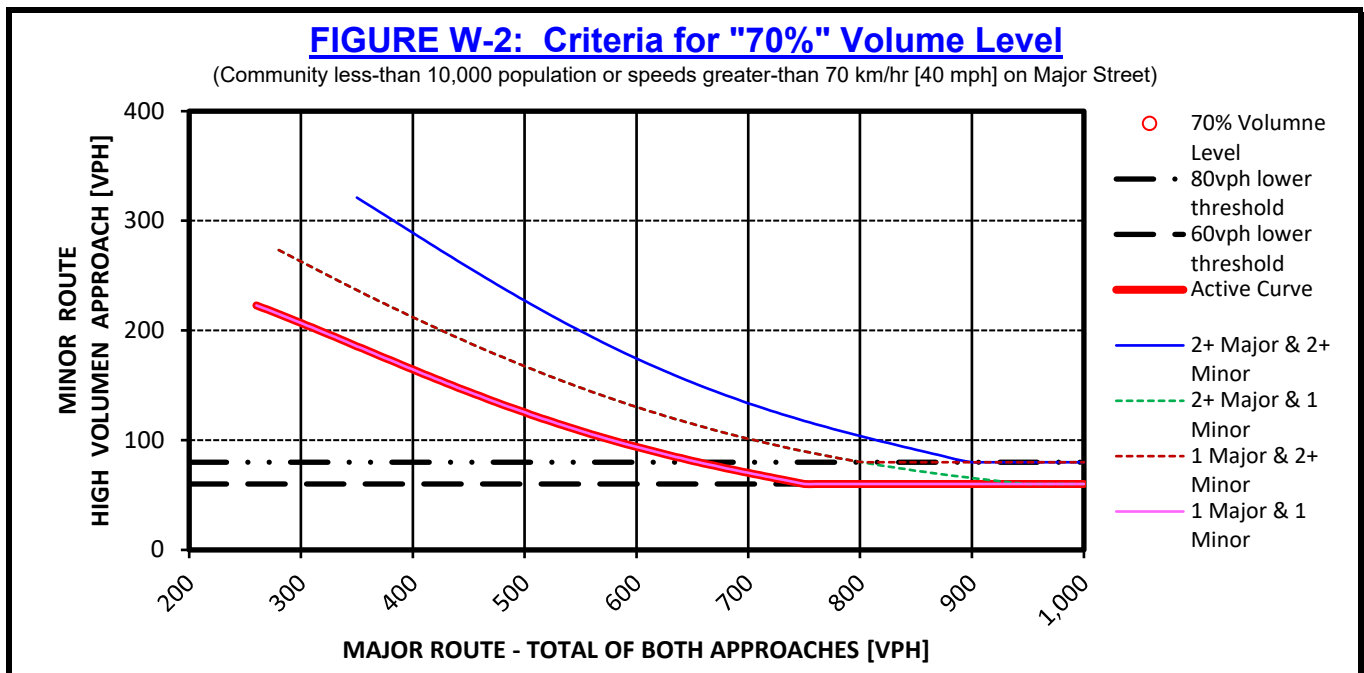
FIGURE W-2: Criteria for "100%" Volume Level



** Note: 115 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

FIGURE W-2: Criteria for "70%" Volume Level

(Community less-than 10,000 population or speeds greater-than 70 km/hr [40 mph] on Major Street)





















** Note: 80 vph applies as the lower threshold volume for a minor route approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor route approach with one lane.*

Appendix H – Future Conditions Capacity Analysis Reports

HCM 6th Signalized Intersection Summary

1: Kelly Creek Rd & I-20 EB Ramps

10/25/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	0	181	0	0	0	0	439	145	149	365	0
Future Volume (veh/h)	123	0	181	0	0	0	0	439	145	149	365	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1788	1847	1551				0	1643	1361	1973	1853	0
Adj Flow Rate, veh/h	128	0	189				0	457	0	155	380	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	0	20				0	11	30	3	11	0
Cap, veh/h	294	0	220				0	934		580	1298	0
Arrive On Green	0.17	0.00	0.17				0.00	0.57	0.00	0.11	1.00	0.00
Sat Flow, veh/h	1759	0	1314				0	1643	1154	1879	1853	0
Grp Volume(v), veh/h	128	0	189				0	457	0	155	380	0
Grp Sat Flow(s),veh/h/ln	1759	0	1314				0	1643	1154	1879	1853	0
Q Serve(g_s), s	5.9	0.0	12.6				0.0	15.0	0.0	3.0	0.0	0.0
Cycle Q Clear(g_c), s	5.9	0.0	12.6				0.0	15.0	0.0	3.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	294	0	220				0	934		580	1298	0
V/C Ratio(X)	0.43	0.00	0.86				0.00	0.49		0.27	0.29	0.00
Avail Cap(c_a), veh/h	360	0	269				0	934		646	1298	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.70	0.70	0.00
Uniform Delay (d), s/veh	33.6	0.0	36.4				0.0	11.6	0.0	7.6	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	20.3				0.0	1.8	0.0	0.2	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
%ile BackOfQ(50%),veh/ln	2.5	0.0	5.1				0.0	5.3	0.0	0.9	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	0.0	56.7				0.0	13.4	0.0	7.7	0.4	0.0
LnGrp LOS	C	A	E				A	B		A	A	A
Approach Vol, veh/h		317						457			535	
Approach Delay, s/veh		47.8						13.4			2.5	
Approach LOS		D						B			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	11.9	57.5		20.7				69.3				
Change Period (Y+Rc), s	* 6.9	* 6.3		* 5.6				* 6.3				
Max Green Setting (Gmax), s	* 8.1	* 45		* 18				* 61				
Max Q Clear Time (g_c+I1), s	5.0	17.0		14.6				2.0				
Green Ext Time (p_c), s	0.1	3.0		0.5				2.5				

Intersection Summary

HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

2: Kelly Creek Rd & I-20 WB Ramps

10/25/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶	↷		↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	112	0	194	263	299	0	0	411	625
Future Volume (veh/h)	0	0	0	112	0	194	263	299	0	0	411	625
Initial Q (Qb), veh				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
Parking Bus, Adj				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				1412	1753	1649	1640	1788	0	0	1919	1949
Adj Flow Rate, veh/h				120	0	209	283	322	0	0	614	0
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				23	0	7	14	4	0	0	4	2
Cap, veh/h				217	0	240	509	1261	0	0	925	
Arrive On Green				0.16	0.00	0.16	0.05	0.23	0.00	0.00	0.48	0.00
Sat Flow, veh/h				1345	0	1485	1561	1788	0	0	1919	1651
Grp Volume(v), veh/h				120	0	209	283	322	0	0	614	0
Grp Sat Flow(s),veh/h/ln				1345	0	1485	1561	1788	0	0	1919	1651
Q Serve(g_s), s				7.4	0.0	12.4	6.5	13.2	0.0	0.0	21.9	0.0
Cycle Q Clear(g_c), s				7.4	0.0	12.4	6.5	13.2	0.0	0.0	21.9	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				217	0	240	509	1261	0	0	925	
V/C Ratio(X)				0.55	0.00	0.87	0.56	0.26	0.00	0.00	0.66	
Avail Cap(c_a), veh/h				229	0	253	542	1261	0	0	925	
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.85	0.85	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				34.8	0.0	36.8	13.3	15.2	0.0	0.0	17.7	0.0
Incr Delay (d2), s/veh				2.6	0.0	25.8	0.9	0.4	0.0	0.0	3.7	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
%ile BackOfQ(50%),veh/ln				2.5	0.0	6.1	2.2	6.4	0.0	0.0	9.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				37.3	0.0	62.7	14.3	15.7	0.0	0.0	21.5	0.0
LnGrp LOS				D	A	E	B	B	A	A	C	
Approach Vol, veh/h					329			605			614	
Approach Delay, s/veh					53.4			15.0			21.5	
Approach LOS					D			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		69.8			20.1	49.7		20.2				
Change Period (Y+Rc), s		* 6.3			* 5.1	* 6.3		5.7				
Max Green Setting (Gmax), s		* 63			* 17	* 41		15.3				
Max Q Clear Time (g_c+I1), s		15.2			8.5	23.9		14.4				
Green Ext Time (p_c), s		2.0			0.5	3.7		0.2				

Intersection Summary

HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary

1: Kelly Creek Rd & I-20 EB Ramps

10/25/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↑	↗	↘	↑	
Traffic Volume (veh/h)	433	0	335	0	0	0	0	374	197	128	314	0
Future Volume (veh/h)	433	0	335	0	0	0	0	374	197	128	314	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1817	1847	1640				0	1672	1598	1913	1838	0
Adj Flow Rate, veh/h	442	0	342				0	382	0	131	320	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	14				0	9	14	7	12	0
Cap, veh/h	512	0	404				0	622		481	1048	0
Arrive On Green	0.29	0.00	0.29				0.00	0.37	0.00	0.04	0.19	0.00
Sat Flow, veh/h	1759	0	1389				0	1672	1354	1822	1838	0
Grp Volume(v), veh/h	442	0	342				0	382	0	131	320	0
Grp Sat Flow(s),veh/h/ln	1759	0	1389				0	1672	1354	1822	1838	0
Q Serve(g_s), s	21.4	0.0	20.8				0.0	16.7	0.0	0.0	13.5	0.0
Cycle Q Clear(g_c), s	21.4	0.0	20.8				0.0	16.7	0.0	0.0	13.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	512	0	404				0	622		481	1048	0
V/C Ratio(X)	0.86	0.00	0.85				0.00	0.61		0.27	0.31	0.00
Avail Cap(c_a), veh/h	633	0	500				0	622		481	1048	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.89	0.89	0.00
Uniform Delay (d), s/veh	30.2	0.0	30.0				0.0	23.0	0.0	28.8	21.2	0.0
Incr Delay (d2), s/veh	10.1	0.0	10.7				0.0	4.5	0.0	0.3	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
%ile BackOfQ(50%),veh/ln	10.1	0.0	7.8				0.0	7.0	0.0	2.5	6.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	0.0	40.7				0.0	27.5	0.0	29.1	21.9	0.0
LnGrp LOS	D	A	D				A	C		C	C	A
Approach Vol, veh/h		784						382			451	
Approach Delay, s/veh		40.5						27.5			24.0	
Approach LOS		D						C			C	
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	18.4	39.8	31.8	58.2								
Change Period (Y+Rc), s	* 6.9	* 6.3	* 5.6	* 6.9								
Max Green Setting (Gmax), s	* 5.3	* 34	* 32	* 47								
Max Q Clear Time (g_c+I1), s	2.0	18.7	23.4	15.5								
Green Ext Time (p_c), s	0.1	1.9	2.8	2.0								

Intersection Summary

HCM 6th Ctrl Delay			32.8									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

HCM 6th Signalized Intersection Summary
 2: Kelly Creek Rd & I-20 WB Ramps

10/25/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↗		↖	↗			↗	↖
Traffic Volume (veh/h)	0	0	0	100	0	225	132	671	0	0	348	210
Future Volume (veh/h)	0	0	0	100	0	225	132	671	0	0	348	210
Initial Q (Qb), veh				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
Parking Bus, Adj				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				1442	1753	1708	1654	1803	0	0	1904	1874
Adj Flow Rate, veh/h				105	0	237	139	706	0	0	366	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				21	0	3	13	3	0	0	5	7
Cap, veh/h				248	0	268	641	1237	0	0	891	
Arrive On Green				0.18	0.00	0.18	0.11	0.46	0.00	0.00	0.47	0.00
Sat Flow, veh/h				1373	0	1485	1576	1803	0	0	1904	1588
Grp Volume(v), veh/h				105	0	237	139	706	0	0	366	0
Grp Sat Flow(s),veh/h/ln				1373	0	1485	1576	1803	0	0	1904	1588
Q Serve(g_s), s				6.1	0.0	14.0	3.1	25.8	0.0	0.0	11.4	0.0
Cycle Q Clear(g_c), s				6.1	0.0	14.0	3.1	25.8	0.0	0.0	11.4	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				248	0	268	641	1237	0	0	891	
V/C Ratio(X)				0.42	0.00	0.88	0.22	0.57	0.00	0.00	0.41	
Avail Cap(c_a), veh/h				264	0	286	683	1237	0	0	891	
HCM Platoon Ratio				1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.83	0.83	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				32.7	0.0	36.0	7.7	14.6	0.0	0.0	15.8	0.0
Incr Delay (d2), s/veh				1.2	0.0	25.3	0.1	1.6	0.0	0.0	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
%ile BackOfQ(50%),veh/ln				2.1	0.0	6.8	0.9	11.5	0.0	0.0	5.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.9	0.0	61.3	7.8	16.2	0.0	0.0	17.2	0.0
LnGrp LOS				C	A	E	A	B	A	A	B	
Approach Vol, veh/h					342			845			366	
Approach Delay, s/veh					52.9			14.8			17.2	
Approach LOS					D			B			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		68.1			19.6	48.4		21.9				
Change Period (Y+Rc), s		* 6.3			* 5.1	* 6.3		5.7				
Max Green Setting (Gmax), s		* 61			* 17	* 39		17.3				
Max Q Clear Time (g_c+I1), s		27.8			5.1	13.4		16.0				
Green Ext Time (p_c), s		5.5			0.3	2.2		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				23.8								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings
 1: Kelly Creek Rd & I-20 EB Ramps

10/25/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø6	Ø8
Lane Configurations								
Traffic Volume (vph)	123	0	0	439	0	0		
Future Volume (vph)	123	0	0	439	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt								
Flt Protected	0.950							
Satd. Flow (prot)	1736	0	0	1712	0	0		
Flt Permitted	0.950							
Satd. Flow (perm)	1736	0	0	1712	0	0		
Right Turn on Red	Yes	Yes				Yes		
Satd. Flow (RTOR)	284							
Link Speed (mph)	35			35	35			
Link Distance (ft)	185			139	274			
Travel Time (s)	3.6			2.7	5.3			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.92	0.92		
Heavy Vehicles (%)	4%	0%	0%	11%	2%	2%		
Adj. Flow (vph)	128	0	0	457	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	128	0	0	457	0	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	12			0	0			
Link Offset(ft)	0			0	0			
Crosswalk Width(ft)	16			16	16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15	9	15			9		
Number of Detectors	0			0				
Detector Template								
Leading Detector (ft)	0			0				
Trailing Detector (ft)	0			0				
Turn Type	Prot			NA				
Protected Phases	4			2			6	8
Permitted Phases								
Detector Phase	4			2				
Switch Phase								
Minimum Initial (s)	5.0			5.0			5.0	5.0
Minimum Split (s)	22.5			22.5			22.5	22.5
Total Split (s)	29.0			31.0			31.0	29.0
Total Split (%)	48.3%			51.7%			52%	48%
Maximum Green (s)	24.5			26.5			26.5	24.5
Yellow Time (s)	3.5			3.5			3.5	3.5
All-Red Time (s)	1.0			1.0			1.0	1.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.5			4.5				
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0			3.0			3.0	3.0

Lanes, Volumes, Timings
 1: Kelly Creek Rd & I-20 EB Ramps

10/25/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø6	Ø8
Recall Mode	None			Max		Max C-Max		
Act Effct Green (s)	24.5			26.5				
Actuated g/C Ratio	0.41			0.44				
v/c Ratio	0.15			0.60				
Control Delay	0.3			4.4				
Queue Delay	0.0			0.0				
Total Delay	0.3			4.4				
LOS	A			A				
Approach Delay	0.3			4.4				
Approach LOS	A			A				

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	3.5
Intersection LOS:	A
Intersection Capacity Utilization	52.0%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 1: Kelly Creek Rd & I-20 EB Ramps



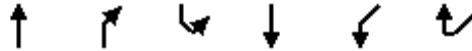
Lanes, Volumes, Timings
2: Kelly Creek Rd & I-20 WB Ramps

10/25/2023

	↑	↗	↘	↓	↙	↖		
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2	Ø4
Lane Configurations				↑	↘			
Traffic Volume (vph)	0	0	0	411	112	0		
Future Volume (vph)	0	0	0	411	112	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	0	0	1827	1467	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	0	0	1827	1467	0		
Right Turn on Red		Yes			Yes	Yes		
Satd. Flow (RTOR)					267			
Link Speed (mph)	35			35	35			
Link Distance (ft)	251			132	293			
Travel Time (s)	4.9			2.6	5.7			
Peak Hour Factor	0.92	0.92	0.93	0.93	0.93	0.93		
Heavy Vehicles (%)	2%	2%	0%	4%	23%	0%		
Adj. Flow (vph)	0	0	0	442	120	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	442	120	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	0			0	12			
Link Offset(ft)	0			0	0			
Crosswalk Width(ft)	16			16	16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)		9	15		15	9		
Number of Detectors				0	0			
Detector Template								
Leading Detector (ft)				0	0			
Trailing Detector (ft)				0	0			
Turn Type				NA	Prot			
Protected Phases				8	6		2	4
Permitted Phases								
Detector Phase				8	6			
Switch Phase								
Minimum Initial (s)				5.0	5.0		5.0	5.0
Minimum Split (s)				22.5	22.5		22.5	22.5
Total Split (s)				29.0	31.0		31.0	29.0
Total Split (%)				48.3%	51.7%		52%	48%
Maximum Green (s)				24.5	26.5		26.5	24.5
Yellow Time (s)				3.5	3.5		3.5	3.5
All-Red Time (s)				1.0	1.0		1.0	1.0
Lost Time Adjust (s)				0.0	0.0			
Total Lost Time (s)				4.5	4.5			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)				3.0	3.0		3.0	3.0

Lanes, Volumes, Timings
 2: Kelly Creek Rd & I-20 WB Ramps

10/25/2023

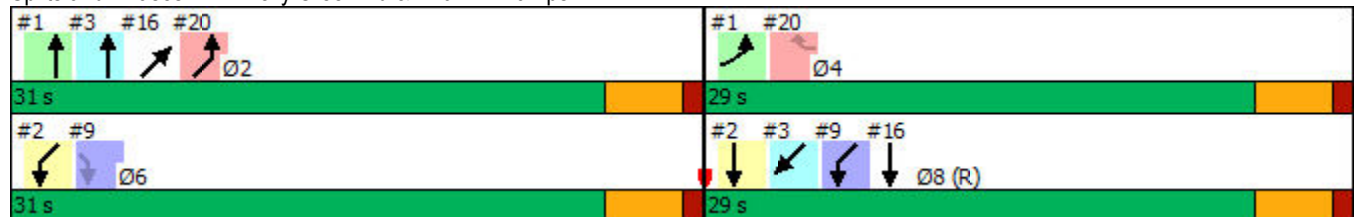


Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2	Ø4
Recall Mode				C-Max	Max		Max	None
Act Effct Green (s)				24.5	26.5			
Actuated g/C Ratio				0.41	0.44			
v/c Ratio				0.59	0.15			
Control Delay				4.3	0.4			
Queue Delay				0.0	0.0			
Total Delay				4.3	0.4			
LOS				A	A			
Approach Delay				4.3	0.4			
Approach LOS				A	A			

Intersection Summary















Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	3.5
Intersection LOS:	A
Intersection Capacity Utilization	38.9%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 2: Kelly Creek Rd & I-20 WB Ramps



Lanes, Volumes, Timings
3: Kelly Creek Rd

10/25/2023

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	439	0	0	0	0	0	0	0	0	365	0
Future Volume (vph)	0	439	0	0	0	0	0	0	0	0	365	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	1712	0	0	0	0	0	0	0	0	1712	0
Flt Permitted												
Satd. Flow (perm)	0	1712	0	0	0	0	0	0	0	0	1712	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		96			139			91			156	
Travel Time (s)		1.9			2.7			1.8			3.0	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	0%	11%	0%	2%	2%	2%	2%	2%	2%	0%	11%	0%
Adj. Flow (vph)	0	457	0	0	0	0	0	0	0	0	380	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	457	0	0	0	0	0	0	0	0	380	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		0									0	
Detector Template												
Leading Detector (ft)		0									0	
Trailing Detector (ft)		0									0	
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Detector Phase		2									8	
Switch Phase												
Minimum Initial (s)		5.0									5.0	
Minimum Split (s)		22.5									22.5	
Total Split (s)		31.0									29.0	
Total Split (%)		51.7%									48.3%	
Maximum Green (s)		26.5									24.5	
Yellow Time (s)		3.5									3.5	
All-Red Time (s)		1.0									1.0	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		4.5									4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0									3.0	

Lanes, Volumes, Timings
 3: Kelly Creek Rd

10/25/2023

Lane Group	Ø4	Ø6
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Turn Type		
Protected Phases	4	6
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	22.5	22.5
Total Split (s)	29.0	31.0
Total Split (%)	48%	52%
Maximum Green (s)	24.5	26.5
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0

Lanes, Volumes, Timings
3: Kelly Creek Rd

10/25/2023

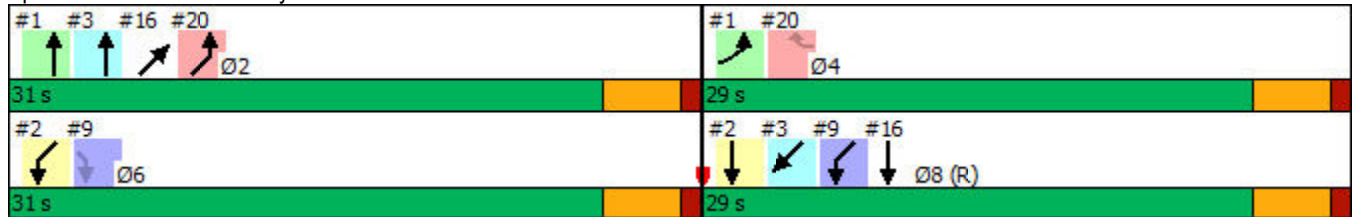


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Recall Mode		Max									C-Max	
Act Effct Green (s)		26.5									24.5	
Actuated g/C Ratio		0.44									0.41	
v/c Ratio		0.60									0.54	
Control Delay		17.0									10.3	
Queue Delay		0.0									0.0	
Total Delay		17.0									10.3	
LOS		B									B	
Approach Delay		17.0									10.3	
Approach LOS		B									B	

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	13.9
Intersection LOS:	B
Intersection Capacity Utilization	49.8%
ICU Level of Service	A
Analysis Period (min)	15









Splits and Phases: 3: Kelly Creek Rd



Lane Group	Ø4	Ø6
Recall Mode	None	Max
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

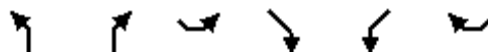
Lanes, Volumes, Timings
 9: Kelly Creek Rd & I-20 EB Ramps

10/25/2023

								
Lane Group	NBL	NBR	SEL	SER	SWL	SWR	Ø2	Ø4
Lane Configurations								
Traffic Volume (vph)	0	0	0	181	365	0		
Future Volume (vph)	0	0	0	181	365	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Fr't				0.865				
Flt Protected					0.950			
Satd. Flow (prot)	0	0	0	1370	1626	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	0	0	1370	1626	0		
Right Turn on Red		Yes		Yes	Yes	Yes		
Satd. Flow (RTOR)				326	631			
Link Speed (mph)	35		35		35			
Link Distance (ft)	125		151		91			
Travel Time (s)	2.4		2.9		1.8			
Peak Hour Factor	0.92	0.92	0.96	0.96	0.96	0.96		
Heavy Vehicles (%)	2%	2%	0%	20%	11%	0%		
Adj. Flow (vph)	0	0	0	189	380	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	189	380	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Right	Left	Right		
Median Width(ft)	0		0		12			
Link Offset(ft)	0		0		0			
Crosswalk Width(ft)	16		16		16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15	9	15	9	15	9		
Number of Detectors				0	0			
Detector Template								
Leading Detector (ft)				0	0			
Trailing Detector (ft)				0	0			
Turn Type				Perm	Prot			
Protected Phases					8		2	4
Permitted Phases				6				
Detector Phase				6	8			
Switch Phase								
Minimum Initial (s)				5.0	5.0		5.0	5.0
Minimum Split (s)				22.5	22.5		22.5	22.5
Total Split (s)				31.0	29.0		31.0	29.0
Total Split (%)				51.7%	48.3%		52%	48%
Maximum Green (s)				26.5	24.5		26.5	24.5
Yellow Time (s)				3.5	3.5		3.5	3.5
All-Red Time (s)				1.0	1.0		1.0	1.0
Lost Time Adjust (s)				0.0	0.0			
Total Lost Time (s)				4.5	4.5			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)				3.0	3.0		3.0	3.0

Lanes, Volumes, Timings
 9: Kelly Creek Rd & I-20 EB Ramps

10/25/2023

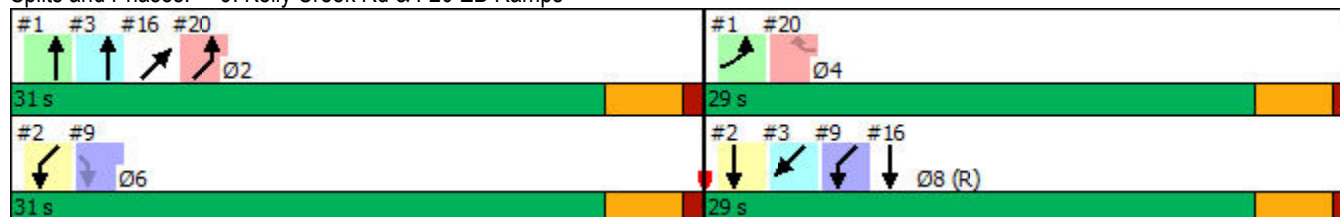


Lane Group	NBL	NBR	SEL	SER	SWL	SWR	Ø2	Ø4
Recall Mode				Max	C-Max		Max	None
Act Effct Green (s)				26.5	24.5			
Actuated g/C Ratio				0.44	0.41			
v/c Ratio				0.24	0.37			
Control Delay				0.7	0.9			
Queue Delay				0.0	0.0			
Total Delay				0.7	0.9			
LOS				A	A			
Approach Delay			0.7		0.9			
Approach LOS			A		A			

Intersection Summary













Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	0.9
Intersection LOS:	A
Intersection Capacity Utilization	49.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 9: Kelly Creek Rd & I-20 EB Ramps



Lanes, Volumes, Timings
16: Kelly Creek Rd

10/25/2023

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations					↑			↑				
Traffic Volume (vph)	0	0	0	0	411	0	0	299	0	0	0	0
Future Volume (vph)	0	0	0	0	411	0	0	299	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	1827	0	0	1827	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	1827	0	0	1827	0	0	0	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35				35
Link Distance (ft)		132			136			125				149
Travel Time (s)		2.6			2.6			2.4				2.9
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	4%	0%	0%	4%	0%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	442	0	0	322	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	442	0	0	322	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors					0			0				
Detector Template												
Leading Detector (ft)					0			0				
Trailing Detector (ft)					0			0				
Turn Type					NA			NA				
Protected Phases					8			2				
Permitted Phases												
Detector Phase					8			2				
Switch Phase												
Minimum Initial (s)					5.0			5.0				
Minimum Split (s)					22.5			22.5				
Total Split (s)					29.0			31.0				
Total Split (%)					48.3%			51.7%				
Maximum Green (s)					24.5			26.5				
Yellow Time (s)					3.5			3.5				
All-Red Time (s)					1.0			1.0				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					4.5			4.5				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0			3.0				

Lanes, Volumes, Timings
 16: Kelly Creek Rd

10/25/2023

Lane Group	Ø4	Ø6
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Turn Type		
Protected Phases	4	6
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	22.5	22.5
Total Split (s)	29.0	31.0
Total Split (%)	48%	52%
Maximum Green (s)	24.5	26.5
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0

Lanes, Volumes, Timings
16: Kelly Creek Rd

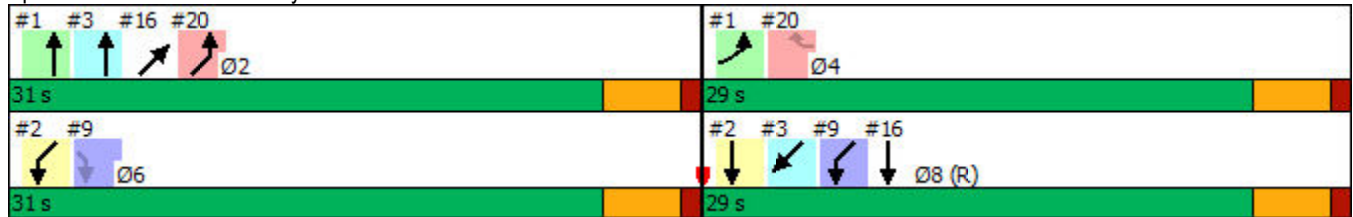
10/25/2023

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Recall Mode					C-Max			Max				
Act Effct Green (s)					24.5			26.5				
Actuated g/C Ratio					0.41			0.44				
v/c Ratio					0.59			0.40				
Control Delay					17.9			8.0				
Queue Delay					0.0			0.0				
Total Delay					17.9			8.0				
LOS					B			A				
Approach Delay					17.9			8.0				
Approach LOS					B			A				

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	13.7
Intersection LOS:	B
Intersection Capacity Utilization	44.9%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 16: Kelly Creek Rd



Lane Group	Ø4	Ø6
Recall Mode	None	Max
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Lanes, Volumes, Timings
 20: Kelly Creek Rd & I-20 WB Ramps

10/25/2023



Lane Group	WBL	WBR	SBL	SBR	NEL	NER	Ø6	Ø8
Lane Configurations								
Traffic Volume (vph)	0	194	0	0	299	0		
Future Volume (vph)	0	194	0	0	299	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Fr t		0.865						
Flt Protected					0.950			
Satd. Flow (prot)	0	1536	0	0	1736	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	1536	0	0	1736	0		
Right Turn on Red		Yes		Yes	Yes	Yes		
Satd. Flow (RTOR)		426			566			
Link Speed (mph)	35		35		35			
Link Distance (ft)	145		189		149			
Travel Time (s)	2.8		3.7		2.9			
Peak Hour Factor	0.93	0.93	0.92	0.92	0.93	0.93		
Heavy Vehicles (%)	0%	7%	2%	2%	4%	0%		
Adj. Flow (vph)	0	209	0	0	322	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	209	0	0	322	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Right	Left	Right		
Median Width(ft)	0		0		12			
Link Offset(ft)	0		0		0			
Crosswalk Width(ft)	16		16		16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15	9	15	9	15	9		
Number of Detectors		0			0			
Detector Template								
Leading Detector (ft)		0			0			
Trailing Detector (ft)		0			0			
Turn Type		Perm			Prot			
Protected Phases					2		6	8
Permitted Phases		4						
Detector Phase		4			2			
Switch Phase								
Minimum Initial (s)		5.0			5.0		5.0	5.0
Minimum Split (s)		22.5			22.5		22.5	22.5
Total Split (s)		29.0			31.0		31.0	29.0
Total Split (%)		48.3%			51.7%		52%	48%
Maximum Green (s)		24.5			26.5		26.5	24.5
Yellow Time (s)		3.5			3.5		3.5	3.5
All-Red Time (s)		1.0			1.0		1.0	1.0
Lost Time Adjust (s)		0.0			0.0			
Total Lost Time (s)		4.5			4.5			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)		3.0			3.0		3.0	3.0

Lanes, Volumes, Timings
 20: Kelly Creek Rd & I-20 WB Ramps

10/25/2023

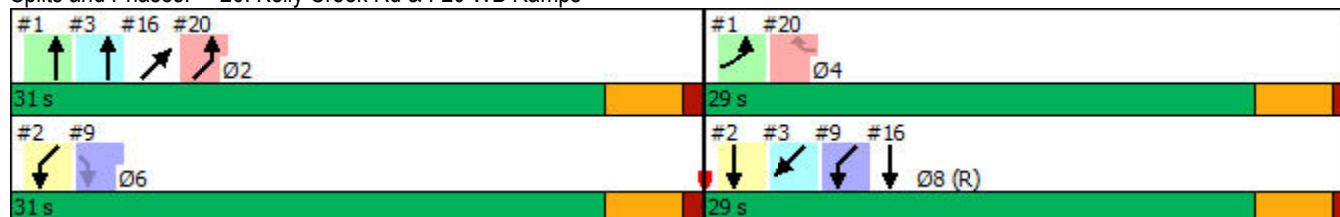


Lane Group	WBL	WBR	SBL	SBR	NEL	NER	Ø6	Ø8
Recall Mode		None			Max		Max	C-Max
Act Effct Green (s)		24.5			26.5			
Actuated g/C Ratio		0.41			0.44			
v/c Ratio		0.24			0.30			
Control Delay		0.6			0.8			
Queue Delay		0.0			0.5			
Total Delay		0.6			1.2			
LOS		A			A			
Approach Delay	0.6				1.2			
Approach LOS	A				A			

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	1.0
Intersection LOS:	A
Intersection Capacity Utilization	44.9%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 20: Kelly Creek Rd & I-20 WB Ramps



Lanes, Volumes, Timings
1: Kelly Creek Rd & I-20 EB Ramps

10/25/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø6	Ø8
Lane Configurations	↶			↷				
Traffic Volume (vph)	433	0	0	374	0	0		
Future Volume (vph)	433	0	0	374	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frnt								
Flt Protected	0.950							
Satd. Flow (prot)	1770	0	0	1743	0	0		
Flt Permitted	0.950							
Satd. Flow (perm)	1770	0	0	1743	0	0		
Right Turn on Red	Yes	Yes				Yes		
Satd. Flow (RTOR)	427							
Link Speed (mph)	35			35	35			
Link Distance (ft)	185			139	274			
Travel Time (s)	3.6			2.7	5.3			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.92	0.92		
Heavy Vehicles (%)	2%	0%	0%	9%	2%	2%		
Adj. Flow (vph)	442	0	0	382	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	442	0	0	382	0	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	12			0	0			
Link Offset(ft)	0			0	0			
Crosswalk Width(ft)	16			16	16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15	9	15			9		
Number of Detectors	0			0				
Detector Template								
Leading Detector (ft)	0			0				
Trailing Detector (ft)	0			0				
Turn Type	Prot			NA				
Protected Phases	4			2			6	8
Permitted Phases								
Detector Phase	4			2				
Switch Phase								
Minimum Initial (s)	5.0			5.0			5.0	5.0
Minimum Split (s)	22.5			22.5			22.5	22.5
Total Split (s)	24.0			36.0			36.0	24.0
Total Split (%)	40.0%			60.0%			60%	40%
Maximum Green (s)	19.5			31.5			31.5	19.5
Yellow Time (s)	3.5			3.5			3.5	3.5
All-Red Time (s)	1.0			1.0			1.0	1.0
Lost Time Adjust (s)	0.0			0.0				
Total Lost Time (s)	4.5			4.5				
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0			3.0			3.0	3.0

Lanes, Volumes, Timings
 1: Kelly Creek Rd & I-20 EB Ramps

10/25/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø6	Ø8
Recall Mode	None			Max		Max C-Max		
Act Effct Green (s)	19.5			31.5				
Actuated g/C Ratio	0.32			0.52				
v/c Ratio	0.51			0.42				
Control Delay	4.6			2.6				
Queue Delay	0.0			0.2				
Total Delay	4.6			2.8				
LOS	A			A				
Approach Delay	4.6			2.8				
Approach LOS	A			A				

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	3.8
Intersection LOS:	A
Intersection Capacity Utilization	77.3%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 1: Kelly Creek Rd & I-20 EB Ramps



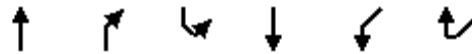
Lanes, Volumes, Timings
2: Kelly Creek Rd & I-20 WB Ramps

10/25/2023

	↑	↗	↘	↓	↙	↖		
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2	Ø4
Lane Configurations				↑	↖			
Traffic Volume (vph)	0	0	0	348	100	0		
Future Volume (vph)	0	0	0	348	100	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	0	0	1810	1492	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	0	0	1810	1492	0		
Right Turn on Red		Yes			Yes	Yes		
Satd. Flow (RTOR)					251			
Link Speed (mph)	35			35	35			
Link Distance (ft)	251			132	293			
Travel Time (s)	4.9			2.6	5.7			
Peak Hour Factor	0.92	0.92	0.95	0.95	0.95	0.95		
Heavy Vehicles (%)	2%	2%	0%	5%	21%	0%		
Adj. Flow (vph)	0	0	0	366	105	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	366	105	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Left	Left	Right		
Median Width(ft)	0			0	12			
Link Offset(ft)	0			0	0			
Crosswalk Width(ft)	16			16	16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)		9	15		15	9		
Number of Detectors				0	0			
Detector Template								
Leading Detector (ft)				0	0			
Trailing Detector (ft)				0	0			
Turn Type				NA	Prot			
Protected Phases				8	6		2	4
Permitted Phases								
Detector Phase				8	6			
Switch Phase								
Minimum Initial (s)				5.0	5.0		5.0	5.0
Minimum Split (s)				22.5	22.5		22.5	22.5
Total Split (s)				24.0	36.0		36.0	24.0
Total Split (%)				40.0%	60.0%		60%	40%
Maximum Green (s)				19.5	31.5		31.5	19.5
Yellow Time (s)				3.5	3.5		3.5	3.5
All-Red Time (s)				1.0	1.0		1.0	1.0
Lost Time Adjust (s)				0.0	0.0			
Total Lost Time (s)				4.5	4.5			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)				3.0	3.0		3.0	3.0

Lanes, Volumes, Timings
 2: Kelly Creek Rd & I-20 WB Ramps

10/25/2023

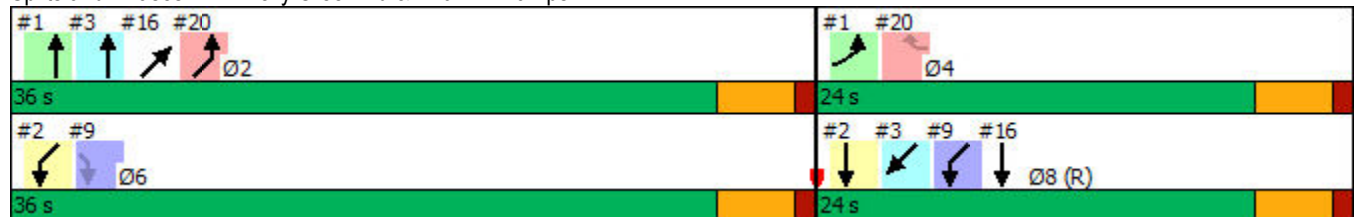


Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2	Ø4
Recall Mode				C-Max	Max		Max	None
Act Effct Green (s)				19.5	31.5			
Actuated g/C Ratio				0.32	0.52			
v/c Ratio				0.62	0.12			
Control Delay				6.1	0.3			
Queue Delay				0.0	0.0			
Total Delay				6.1	0.3			
LOS				A	A			
Approach Delay				6.1	0.3			
Approach LOS				A	A			

Intersection Summary















Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	4.8
Intersection LOS:	A
Intersection Capacity Utilization	37.2%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 2: Kelly Creek Rd & I-20 WB Ramps



Lanes, Volumes, Timings
3: Kelly Creek Rd

10/25/2023

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	374	0	0	0	0	0	0	0	0	314	0
Future Volume (vph)	0	374	0	0	0	0	0	0	0	0	314	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	1743	0	0	0	0	0	0	0	0	1776	0
Flt Permitted												
Satd. Flow (perm)	0	1743	0	0	0	0	0	0	0	0	1776	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		96			139			91			156	
Travel Time (s)		1.9			2.7			1.8			3.0	
Peak Hour Factor	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.98	0.98	0.98
Heavy Vehicles (%)	0%	9%	0%	2%	2%	2%	2%	2%	2%	0%	7%	0%
Adj. Flow (vph)	0	382	0	0	0	0	0	0	0	0	320	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	382	0	0	0	0	0	0	0	0	320	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		0									0	
Detector Template												
Leading Detector (ft)		0									0	
Trailing Detector (ft)		0									0	
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Detector Phase		2									8	
Switch Phase												
Minimum Initial (s)		5.0									5.0	
Minimum Split (s)		22.5									22.5	
Total Split (s)		36.0									24.0	
Total Split (%)		60.0%									40.0%	
Maximum Green (s)		31.5									19.5	
Yellow Time (s)		3.5									3.5	
All-Red Time (s)		1.0									1.0	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		4.5									4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0									3.0	

Lanes, Volumes, Timings
3: Kelly Creek Rd

10/25/2023

Lane Group	Ø4	Ø6
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Fr1		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Turn Type		
Protected Phases	4	6
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	22.5	22.5
Total Split (s)	24.0	36.0
Total Split (%)	40%	60%
Maximum Green (s)	19.5	31.5
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0

Lanes, Volumes, Timings
3: Kelly Creek Rd

10/25/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Recall Mode		Max									C-Max	
Act Effct Green (s)		31.5									19.5	
Actuated g/C Ratio		0.52									0.32	
v/c Ratio		0.42									0.55	
Control Delay		10.4									16.0	
Queue Delay		0.0									0.0	
Total Delay		10.4									16.0	
LOS		B									B	
Approach Delay		10.4									16.0	
Approach LOS		B									B	

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	13.0
Intersection LOS:	B
Intersection Capacity Utilization	43.7%
ICU Level of Service	A
Analysis Period (min)	15

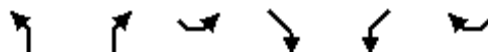
Splits and Phases: 3: Kelly Creek Rd



Lane Group	Ø4	Ø6
Recall Mode	None	Max
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Lanes, Volumes, Timings
9: Kelly Creek Rd & I-20 EB Ramps

10/25/2023



Lane Group	NBL	NBR	SEL	SER	SWL	SWR	Ø2	Ø4
Lane Configurations								
Traffic Volume (vph)	0	0	0	335	314	0		
Future Volume (vph)	0	0	0	335	314	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Fr't				0.865				
Flt Protected					0.950			
Satd. Flow (prot)	0	0	0	1442	1687	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	0	0	1442	1687	0		
Right Turn on Red		Yes		Yes	Yes	Yes		
Satd. Flow (RTOR)				304	472			
Link Speed (mph)	35		35		35			
Link Distance (ft)	125		151		91			
Travel Time (s)	2.4		2.9		1.8			
Peak Hour Factor	0.92	0.92	0.98	0.98	0.98	0.98		
Heavy Vehicles (%)	2%	2%	0%	14%	7%	0%		
Adj. Flow (vph)	0	0	0	342	320	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	342	320	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Right	Left	Right		
Median Width(ft)	0		0		12			
Link Offset(ft)	0		0		0			
Crosswalk Width(ft)	16		16		16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15	9	15	9	15	9		
Number of Detectors				0	0			
Detector Template								
Leading Detector (ft)				0	0			
Trailing Detector (ft)				0	0			
Turn Type				Perm	Prot			
Protected Phases					8		2	4
Permitted Phases				6				
Detector Phase				6	8			
Switch Phase								
Minimum Initial (s)				5.0	5.0		5.0	5.0
Minimum Split (s)				22.5	22.5		22.5	22.5
Total Split (s)				36.0	24.0		36.0	24.0
Total Split (%)				60.0%	40.0%		60%	40%
Maximum Green (s)				31.5	19.5		31.5	19.5
Yellow Time (s)				3.5	3.5		3.5	3.5
All-Red Time (s)				1.0	1.0		1.0	1.0
Lost Time Adjust (s)				0.0	0.0			
Total Lost Time (s)				4.5	4.5			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)				3.0	3.0		3.0	3.0

Lanes, Volumes, Timings
 9: Kelly Creek Rd & I-20 EB Ramps

10/25/2023



Lane Group	NBL	NBR	SEL	SER	SWL	SWR	Ø2	Ø4
Recall Mode				Max	C-Max		Max	None
Act Effct Green (s)				31.5	19.5			
Actuated g/C Ratio				0.52	0.32			
v/c Ratio				0.38	0.37			
Control Delay				3.0	1.2			
Queue Delay				0.0	0.0			
Total Delay				3.0	1.2			
LOS				A	A			
Approach Delay			3.0		1.2			
Approach LOS			A		A			

Intersection Summary













Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	2.1
Intersection LOS:	A
Intersection Capacity Utilization	43.7%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 9: Kelly Creek Rd & I-20 EB Ramps



Lanes, Volumes, Timings
16: Kelly Creek Rd

10/25/2023

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations					↑			↑				
Traffic Volume (vph)	0	0	0	0	348	0	0	671	0	0	0	0
Future Volume (vph)	0	0	0	0	348	0	0	671	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	1810	0	0	1845	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	1810	0	0	1845	0	0	0	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35				35
Link Distance (ft)		132			136			125				149
Travel Time (s)		2.6			2.6			2.4				2.9
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	5%	0%	0%	3%	0%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	366	0	0	706	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	366	0	0	706	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors					0			0				
Detector Template												
Leading Detector (ft)					0			0				
Trailing Detector (ft)					0			0				
Turn Type					NA			NA				
Protected Phases					8			2				
Permitted Phases												
Detector Phase					8			2				
Switch Phase												
Minimum Initial (s)					5.0			5.0				
Minimum Split (s)					22.5			22.5				
Total Split (s)					24.0			36.0				
Total Split (%)					40.0%			60.0%				
Maximum Green (s)					19.5			31.5				
Yellow Time (s)					3.5			3.5				
All-Red Time (s)					1.0			1.0				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					4.5			4.5				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0			3.0				

Lanes, Volumes, Timings
 16: Kelly Creek Rd

10/25/2023

Lane Group	Ø4	Ø6
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Turn Type		
Protected Phases	4	6
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	22.5	22.5
Total Split (s)	24.0	36.0
Total Split (%)	40%	60%
Maximum Green (s)	19.5	31.5
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0

Lanes, Volumes, Timings
 16: Kelly Creek Rd

10/25/2023



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Recall Mode					C-Max			Max				
Act Effct Green (s)					19.5			31.5				
Actuated g/C Ratio					0.32			0.52				
v/c Ratio					0.62			0.73				
Control Delay					22.7			12.7				
Queue Delay					0.0			0.0				
Total Delay					22.7			12.8				
LOS					C			B				
Approach Delay					22.7			12.8				
Approach LOS					C			B				

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	16.2
Intersection LOS:	B
Intersection Capacity Utilization	61.1%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 16: Kelly Creek Rd



Lane Group	Ø4	Ø6
Recall Mode	None	Max
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Intersection Summary		

Lanes, Volumes, Timings
 20: Kelly Creek Rd & I-20 WB Ramps

10/25/2023



Lane Group	WBL	WBR	SBL	SBR	NEL	NER	Ø6	Ø8
Lane Configurations								
Traffic Volume (vph)	0	225	0	0	671	0		
Future Volume (vph)	0	225	0	0	671	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Fr _t		0.865						
Flt Protected					0.950			
Satd. Flow (prot)	0	1596	0	0	1752	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	1596	0	0	1752	0		
Right Turn on Red		Yes		Yes	Yes	Yes		
Satd. Flow (RTOR)		187			426			
Link Speed (mph)	35		35		35			
Link Distance (ft)	145		189		149			
Travel Time (s)	2.8		3.7		2.9			
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95		
Heavy Vehicles (%)	0%	3%	2%	2%	3%	0%		
Adj. Flow (vph)	0	237	0	0	706	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	237	0	0	706	0		
Enter Blocked Intersection	No	No	No	No	No	No		
Lane Alignment	Left	Right	Left	Right	Left	Right		
Median Width(ft)	0		0		12			
Link Offset(ft)	0		0		0			
Crosswalk Width(ft)	16		16		16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15	9	15	9	15	9		
Number of Detectors		0			0			
Detector Template								
Leading Detector (ft)		0			0			
Trailing Detector (ft)		0			0			
Turn Type		Perm			Prot			
Protected Phases					2		6	8
Permitted Phases		4						
Detector Phase		4			2			
Switch Phase								
Minimum Initial (s)		5.0			5.0		5.0	5.0
Minimum Split (s)		22.5			22.5		22.5	22.5
Total Split (s)		24.0			36.0		36.0	24.0
Total Split (%)		40.0%			60.0%		60%	40%
Maximum Green (s)		19.5			31.5		31.5	19.5
Yellow Time (s)		3.5			3.5		3.5	3.5
All-Red Time (s)		1.0			1.0		1.0	1.0
Lost Time Adjust (s)		0.0			0.0			
Total Lost Time (s)		4.5			4.5			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)		3.0			3.0		3.0	3.0

Lanes, Volumes, Timings
 20: Kelly Creek Rd & I-20 WB Ramps

10/25/2023

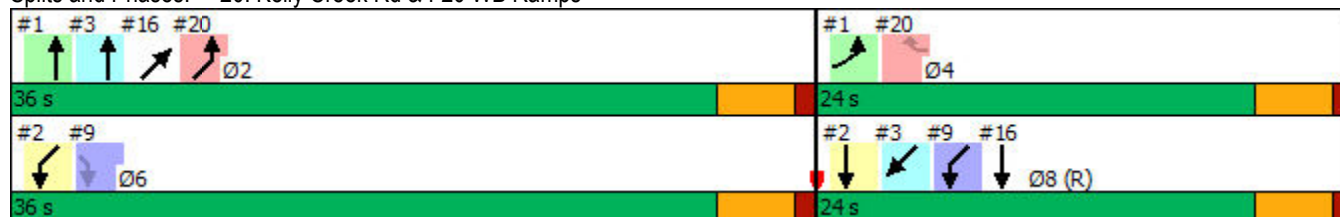


Lane Group	WBL	WBR	SBL	SBR	NEL	NER	Ø6	Ø8
Recall Mode		None			Max		Max	C-Max
Act Effct Green (s)		19.5			31.5			
Actuated g/C Ratio		0.32			0.52			
v/c Ratio		0.37			0.63			
Control Delay		6.4			2.6			
Queue Delay		0.0			0.9			
Total Delay		6.4			3.5			
LOS		A			A			
Approach Delay	6.4				3.5			
Approach LOS	A				A			

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 8:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	4.2
Intersection LOS:	A
Intersection Capacity Utilization	61.1%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 20: Kelly Creek Rd & I-20 WB Ramps



HCM 6th AWSC
1: Kelly Creek Rd & I-20 EB Ramps

08/29/2023

Intersection	
Intersection Delay, s/veh	36.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔					↑	↔		↔	
Traffic Vol, veh/h	123	0	181	0	0	0	0	439	145	149	365	0
Future Vol, veh/h	123	0	181	0	0	0	0	439	145	149	365	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	4	0	20	0	0	0	0	11	30	3	11	0
Mvmt Flow	128	0	189	0	0	0	0	457	151	155	380	0
Number of Lanes	0	1	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	13.7	29.4	58.5
HCM LOS	B	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	29%
Vol Thru, %	100%	0%	0%	0%	71%
Vol Right, %	0%	100%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	439	145	123	181	514
LT Vol	0	0	123	0	149
Through Vol	439	0	0	0	365
RT Vol	0	145	0	181	0
Lane Flow Rate	457	151	128	189	535
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.841	0.262	0.288	0.356	0.976
Departure Headway (Hd)	6.624	6.239	8.104	6.801	6.563
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	544	572	442	526	551
Service Time	4.399	4.014	5.889	4.584	4.63
HCM Lane V/C Ratio	0.84	0.264	0.29	0.359	0.971
HCM Control Delay	35.4	11.2	14.2	13.3	58.5
HCM Lane LOS	E	B	B	B	F
HCM 95th-tile Q	8.7	1	1.2	1.6	13.3

HCM 6th TWSC
 2: Kelly Creek Rd & I-20 WB Ramps

08/29/2023

Intersection												
Int Delay, s/veh	129.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↗			↖			↗	
Traffic Vol, veh/h	0	0	0	112	0	194	263	299	0	0	411	625
Future Vol, veh/h	0	0	0	112	0	194	263	299	0	0	411	625
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	-	320	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	5	-	-	3	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	23	0	7	14	4	0	0	4	2
Mvmt Flow	0	0	0	120	0	209	283	322	0	0	442	672

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	1666	2002	322	1114	0	-	0
Stage 1	888	888	-	-	-	-	-
Stage 2	778	1114	-	-	-	-	-
Critical Hdwy	7.63	7.5	6.77	4.24	-	-	-
Critical Hdwy Stg 1	6.63	6.5	-	-	-	-	-
Critical Hdwy Stg 2	6.63	6.5	-	-	-	-	-
Follow-up Hdwy	3.707	4	3.363	2.326	-	-	-
Pot Cap-1 Maneuver	~ 59	35	677	585	-	0	0
Stage 1	289	285	-	-	-	0	0
Stage 2	337	210	-	-	-	0	0
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	~ 24	0	677	585	-	-	-
Mov Cap-2 Maneuver	~ 24	0	-	-	-	-	-
Stage 1	~ 119	0	-	-	-	-	-
Stage 2	337	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 789.2	7.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1WBLn2	SBT	SBR
Capacity (veh/h)	585	- 24	677	-
HCM Lane V/C Ratio	0.483	- 5.018	0.308	-
HCM Control Delay (s)	16.8	\$ 2134.2	12.7	-
HCM Lane LOS	C	A	F	B
HCM 95th %tile Q(veh)	2.6	- 15.1	1.3	-

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

HCM 6th TWSC
3: Kelly Creek Rd & US-78

08/29/2023

Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	237	200	21	102	286
Future Vol, veh/h	43	237	200	21	102	286
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	-	-	-	155	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	26	12	24	19	10
Mvmt Flow	45	247	208	22	106	298

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	729	219	0	0	208
Stage 1	219	-	-	-	-
Stage 2	510	-	-	-	-
Critical Hdwy	6.4	6.46	-	-	4.29
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.534	-	-	2.371
Pot Cap-1 Maneuver	393	764	-	-	1268
Stage 1	822	-	-	-	-
Stage 2	607	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	360	764	-	-	1268
Mov Cap-2 Maneuver	360	-	-	-	-
Stage 1	822	-	-	-	-
Stage 2	556	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	652	1268
HCM Lane V/C Ratio	-	-	0.447	0.084
HCM Control Delay (s)	-	-	14.9	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	2.3	0.3

HCM 6th TWSC
4: Kelly Creek Rd & Park Ave

08/29/2023

Intersection												
Int Delay, s/veh	20.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↗
Traffic Vol, veh/h	50	5	232	1	1	2	150	221	10	11	722	99
Future Vol, veh/h	50	5	232	1	1	2	150	221	10	11	722	99
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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	0	0	0	14	0	12	0	2	0
Mvmt Flow	58	6	270	1	1	2	174	257	12	13	840	115

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1479	1483	840	1480	1477	263	840	0	0	269	0	0
Stage 1	866	866	-	611	611	-	-	-	-	-	-	-
Stage 2	613	617	-	869	866	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.24	7.1	6.5	6.2	4.24	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.336	3.5	4	3.3	2.326	-	-	2.2	-	-
Pot Cap-1 Maneuver	105	126	362	105	127	781	746	-	-	1306	-	-
Stage 1	351	373	-	484	487	-	-	-	-	-	-	-
Stage 2	483	484	-	349	373	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	80	89	362	20	90	781	746	-	-	1306	-	-
Mov Cap-2 Maneuver	80	89	-	20	90	-	-	-	-	-	-	-
Stage 1	254	365	-	351	353	-	-	-	-	-	-	-
Stage 2	348	351	-	86	365	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	100.3		66.6		4.4		0.1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	746	-	-	319	63	1306	-
HCM Lane V/C Ratio	0.234	-	-	1.046	0.074	0.01	-
HCM Control Delay (s)	11.3	0	-	100.3	66.6	7.8	0
HCM Lane LOS	B	A	-	F	F	A	A
HCM 95th %tile Q(veh)	0.9	-	-	12.1	0.2	0	-

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	101	1	60	10	0	16	48	447	34	16	392	135
Future Vol, veh/h	101	1	60	10	0	16	48	447	34	16	392	135
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	-	-	-	-	-	100	-	-	50	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	4	-	-	-4	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	0	0	0	0	8	3	21	0	8	19	4
Mvmt Flow	104	1	62	10	0	16	49	461	35	16	404	139

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1021	1030	404	1114	1152	479	543	0	0	496	0	0
Stage 1	436	436	-	577	577	-	-	-	-	-	-	-
Stage 2	585	594	-	537	575	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.5	6.2	7.1	6.5	6.28	4.13	-	-	4.18	-	-
Critical Hdwy Stg 1	6.12	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	3.5	4	3.372	2.227	-	-	2.272	-	-
Pot Cap-1 Maneuver	215	235	651	187	199	575	1021	-	-	1037	-	-
Stage 1	599	583	-	506	505	-	-	-	-	-	-	-
Stage 2	497	496	-	532	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	199	220	651	161	187	575	1021	-	-	1037	-	-
Mov Cap-2 Maneuver	199	220	-	161	187	-	-	-	-	-	-	-
Stage 1	570	574	-	482	481	-	-	-	-	-	-	-
Stage 2	460	472	-	473	498	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	30.1		18.7		0.8		0.3	
HCM LOS	D		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1021	-	-	199	631	289	1037	-	-
HCM Lane V/C Ratio	0.048	-	-	0.523	0.1	0.093	0.016	-	-
HCM Control Delay (s)	8.7	-	-	41.4	11.3	18.7	8.5	-	-
HCM Lane LOS	A	-	-	E	B	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.7	0.3	0.3	0	-	-

HCM 6th TWSC
6: Kelly Creek Rd & Display Dr/N Valero PC Access 1

08/29/2023

Intersection												
Int Delay, s/veh	20.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	1	1	83	0	27	11	372	9	54	904	6
Future Vol, veh/h	2	1	1	83	0	27	11	372	9	54	904	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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	50	0	0	3	0	0	0	7	0	0	3	0
Mvmt Flow	2	1	1	93	0	30	12	418	10	61	1016	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1604	1594	1020	1586	1585	423	1016	0	0	428	0	0
Stage 1	1142	1142	-	447	447	-	-	-	-	-	-	-
Stage 2	462	452	-	1139	1138	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.6	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	66	108	290	~ 87	109	635	691	-	-	1142	-	-
Stage 1	197	278	-	589	577	-	-	-	-	-	-	-
Stage 2	498	574	-	244	279	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	56	92	290	~ 76	93	635	691	-	-	1142	-	-
Mov Cap-2 Maneuver	56	92	-	~ 76	93	-	-	-	-	-	-	-
Stage 1	192	244	-	575	564	-	-	-	-	-	-	-
Stage 2	463	561	-	212	244	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	49.2		262.2		0.3		0.5	
HCM LOS	E		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	691	-	-	86	97	1142	-	-
HCM Lane V/C Ratio	0.018	-	-	0.052	1.274	0.053	-	-
HCM Control Delay (s)	10.3	0	-	49.2	262.2	8.3	0	-
HCM Lane LOS	B	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	8.7	0.2	-	-

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

HCM 6th AWSC
1: Kelly Creek Rd & I-20 EB Ramps

09/13/2023

Intersection	
Intersection Delay, s/veh	46.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗					↑	↗		↖	
Traffic Vol, veh/h	433	0	335	0	0	0	0	374	197	128	314	0
Future Vol, veh/h	433	0	335	0	0	0	0	374	197	128	314	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	0	14	0	0	0	0	9	14	7	12	0
Mvmt Flow	442	0	342	0	0	0	0	382	201	131	320	0
Number of Lanes	0	1	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	49.1	31.6	62.9
HCM LOS	E	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	29%
Vol Thru, %	100%	0%	0%	0%	71%
Vol Right, %	0%	100%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	374	197	433	335	442
LT Vol	0	0	433	0	128
Through Vol	374	0	0	0	314
RT Vol	0	197	0	335	0
Lane Flow Rate	382	201	442	342	451
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.839	0.406	0.995	0.65	0.97
Departure Headway (Hd)	7.914	7.279	8.11	6.842	7.745
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	454	490	446	523	469
Service Time	5.71	5.074	5.902	4.632	5.821
HCM Lane V/C Ratio	0.841	0.41	0.991	0.654	0.962
HCM Control Delay	40.3	15	70.4	21.6	62.9
HCM Lane LOS	E	B	F	C	F
HCM 95th-tile Q	8.2	1.9	12.7	4.6	12.1

HCM 6th TWSC
2: Kelly Creek Rd & I-20 WB Ramps

09/13/2023

Intersection												
Int Delay, s/veh	30.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↗			↖			↗	
Traffic Vol, veh/h	0	0	0	100	0	225	132	671	0	0	348	210
Future Vol, veh/h	0	0	0	100	0	225	132	671	0	0	348	210
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	-	320	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	5	-	-	3	-	-	-2	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	21	0	3	13	3	0	0	5	7
Mvmt Flow	0	0	0	105	0	237	139	706	0	0	366	221

Major/Minor	Minor1	Major1	Major2						
Conflicting Flow All	1461	1571	706	587	0	-	-	-	0
Stage 1	984	984	-	-	-	-	-	-	-
Stage 2	477	587	-	-	-	-	-	-	-
Critical Hdwy	7.61	7.5	6.73	4.23	-	-	-	-	-
Critical Hdwy Stg 1	6.61	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.61	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.689	4	3.327	2.317	-	-	-	-	-
Pot Cap-1 Maneuver	~ 86	72	394	936	-	0	0	-	-
Stage 1	254	250	-	-	-	0	0	-	-
Stage 2	514	425	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 65	0	394	936	-	-	-	-	-
Mov Cap-2 Maneuver	~ 65	0	-	-	-	-	-	-	-
Stage 1	192	0	-	-	-	-	-	-	-
Stage 2	514	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	155.4	1.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	936	-	65	394	-
HCM Lane V/C Ratio	0.148	-	1.619	0.601	-
HCM Control Delay (s)	9.5	0	444.3	27	-
HCM Lane LOS	A	A	F	D	-
HCM 95th %tile Q(veh)	0.5	-	9.3	3.8	-

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

HCM 6th TWSC
3: Kelly Creek Rd & US-78

09/13/2023

Intersection						
Int Delay, s/veh	8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	134	248	62	259	177
Future Vol, veh/h	54	134	248	62	259	177
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	-	-	-	155	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	20	15	0	19	8
Mvmt Flow	61	152	282	70	294	201

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1106	317	0	0	282
Stage 1	317	-	-	-	-
Stage 2	789	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	4.29
Critical Hdwy Stg 1	5.45	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	2.371
Pot Cap-1 Maneuver	230	684	-	-	1189
Stage 1	732	-	-	-	-
Stage 2	442	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	173	684	-	-	1189
Mov Cap-2 Maneuver	173	-	-	-	-
Stage 1	732	-	-	-	-
Stage 2	333	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.2	0	5.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	370	1189
HCM Lane V/C Ratio	-	-	0.577	0.248
HCM Control Delay (s)	-	-	27.2	9
HCM Lane LOS	-	-	D	A
HCM 95th %tile Q(veh)	-	-	3.5	1

HCM 6th TWSC
4: Kelly Creek Rd & Park Ave

09/13/2023

Intersection												
Int Delay, s/veh	164.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Traffic Vol, veh/h	133	1	212	7	9	6	242	584	1	1	271	93
Future Vol, veh/h	133	1	212	7	9	6	242	584	1	1	271	93
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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	100	7	7	0	0	3	5	0	0	2	0
Mvmt Flow	148	1	236	8	10	7	269	649	1	1	301	103

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1499	1491	301	1492	1491	650	301	0	0	650	0	0
Stage 1	303	303	-	1188	1188	-	-	-	-	-	-	-
Stage 2	1196	1188	-	304	303	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.27	7.17	6.5	6.2	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.363	3.563	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 102	77	727	99	125	473	1254	-	-	946	-	-
Stage 1	711	519	-	224	264	-	-	-	-	-	-	-
Stage 2	229	174	-	695	667	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 68	51	727	49	83	473	1254	-	-	946	-	-
Mov Cap-2 Maneuver	~ 68	51	-	49	83	-	-	-	-	-	-	-
Stage 1	472	518	-	149	175	-	-	-	-	-	-	-
Stage 2	~ 141	116	-	468	666	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	731.2	65.6	2.5	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1254	-	-	155	83	946	-	-
HCM Lane V/C Ratio	0.214	-	-	2.48	0.295	0.001	-	-
HCM Control Delay (s)	8.7	0	-	731.2	65.6	8.8	0	-
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	33	1.1	0	-	-

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

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	110	1	57	12	0	6	35	409	29	40	479	129
Future Vol, veh/h	110	1	57	12	0	6	35	409	29	40	479	129
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	-	-	-	-	-	100	-	-	50	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	4	-	-	-4	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	3	11	0	0	0	20	0	7	17	0
Mvmt Flow	117	1	61	13	0	6	37	435	31	43	510	137

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1124	1136	510	1221	1258	451	647	0	0	466	0	0
Stage 1	596	596	-	525	525	-	-	-	-	-	-	-
Stage 2	528	540	-	696	733	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.23	7.21	6.5	6.2	4.1	-	-	4.17	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.327	3.599	4	3.3	2.2	-	-	2.263	-	-
Pot Cap-1 Maneuver	184	204	561	150	172	613	948	-	-	1070	-	-
Stage 1	494	495	-	520	533	-	-	-	-	-	-	-
Stage 2	538	524	-	418	429	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	171	188	561	125	159	613	948	-	-	1070	-	-
Mov Cap-2 Maneuver	171	188	-	125	159	-	-	-	-	-	-	-
Stage 1	475	475	-	500	512	-	-	-	-	-	-	-
Stage 2	512	504	-	357	412	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.2	28.8	0.7	0.5
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	948	-	-	171	542	170	1070	-	-
HCM Lane V/C Ratio	0.039	-	-	0.684	0.114	0.113	0.04	-	-
HCM Control Delay (s)	9	-	-	62.4	12.5	28.8	8.5	-	-
HCM Lane LOS	A	-	-	F	B	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	4.1	0.4	0.4	0.1	-	-

HCM 6th TWSC
6: Kelly Creek Rd & Display Dr/N Valero PC Access 1

09/13/2023

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	1	26	34	0	65	7	769	15	24	466	2
Future Vol, veh/h	4	1	26	34	0	65	7	769	15	24	466	2
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	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	29	0	0	0	50	5	0	0	6	0
Mvmt Flow	4	1	28	37	0	71	8	836	16	26	507	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1456	1428	508	1420	1419	844	507	0	0	852	0	0
Stage 1	560	560	-	860	860	-	-	-	-	-	-	-
Stage 2	896	868	-	560	559	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.49	7.1	6.5	6.2	4.6	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.561	3.5	4	3.3	2.65	-	-	2.2	-	-
Pot Cap-1 Maneuver	109	136	515	115	138	366	852	-	-	795	-	-
Stage 1	516	514	-	353	376	-	-	-	-	-	-	-
Stage 2	338	372	-	516	514	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	84	127	515	103	129	366	852	-	-	795	-	-
Mov Cap-2 Maneuver	84	127	-	103	129	-	-	-	-	-	-	-
Stage 1	507	490	-	347	369	-	-	-	-	-	-	-
Stage 2	268	365	-	464	490	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.9		44.1		0.1		0.5	
HCM LOS	B		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	852	-	-	559	195	795	-
HCM Lane V/C Ratio	0.009	-	-	0.06	0.552	0.033	-
HCM Control Delay (s)	9.3	0	-	11.9	44.1	9.7	0
HCM Lane LOS	A	A	-	B	E	A	A
HCM 95th %tile Q(veh)	0	-	-	0.2	2.9	0.1	-

Appendix I – Opinions of Probable Cost

Kelly Creek at I-20 Interchange				
Alternative A				
Item Description	Unit	Quantity	Unit Price	Amount
Clearing & Grubbing (Max ALDOT Bid = \$8,000/Acre)	LS	1	\$ 8,000.00	\$ 8,000.00
Concrete Removal (Curb & Gutter, Slope Paving, etc.)	LS	1	\$ 11,600.00	\$ 11,600.00
Unclassified Excavation	CY	5000	\$ 25.00	\$ 125,000.00
Borrow Excavation	CY	10000	\$ 30.00	\$ 300,000.00
Planing Existing Pavement	SY	2970	\$ 5.00	\$ 14,850.00
Wearing Surface (1.5")	TN	1045	\$ 140.00	\$ 146,300.00
Upper Binder Layer (2")	TN	1070	\$ 140.00	\$ 149,800.00
Lower Binder Layer (5")	TN	2765	\$ 140.00	\$ 387,100.00
Leveling	TN	4000	\$ 70.00	\$ 280,000.00
Aggregate Base (6")	SY	9705	\$ 15.00	\$ 145,575.00
Roadbed Processing	STA	25	\$ 800.00	\$ 20,000.00
Patching	TN	250	\$ 250.00	\$ 62,500.00
Tack Coat	GAL	2570	\$ 6.00	\$ 15,420.00
Bituminous Treatment	SY	9705	\$ 4.00	\$ 38,820.00
Guardrail	LF	400	\$ 160.00	\$ 64,000.00
Slope Paving	CY	200	\$ 700.00	\$ 140,000.00
Topsoil	CY	5000	\$ 20.00	\$ 100,000.00
Concrete Driveway, 6" Thick	SY	75	\$ 90.00	\$ 6,750.00
Curb & Gutter	LF	310	\$ 40.00	\$ 12,400.00
Storm Drainage	LS	1	\$ 85,800.00	\$ 85,800.00
Striping & Signage	LS	1	\$ 60,000.00	\$ 60,000.00
Erosion Control	LS	1	\$ 75,000.00	\$ 75,000.00
Traffic Control	LS	1	\$ 220,000.00	\$ 220,000.00
Traffic Signal	EA	2	\$ 250,000.00	\$ 500,000.00
Proposed Bridge	SF	22490	\$ 275.00	\$ 6,184,750.00
Removal of Existing Bridge	SF	9120	\$ 15.00	\$ 136,800.00
Lighting	LS	1	\$ 400,000.00	\$ 400,000.00
Mobilization (9.7% of Overall Cost)	LS	1	\$ 901,175.11	\$ 901,175.11
Engineering Controls (1.3% of Overall Cost)	LS	1	\$ 137,691.32	\$ 137,691.32

Construction Subtotal	\$ 10,730,000.00
Contingency (20%)	\$ 2,146,000.00
CE&I (15%)	\$ 1,931,400.00
Construction Total	\$ 14,808,000.00
Preliminary Engineering (15%)	\$ 1,931,400.00
Utility Relocation Allowance:	\$ 150,000.00
Right-of-Way Cost:	\$ 50,000.00
ALDOT Indirect Costs (13.7%)	\$ 2,320,697.80
Total Estimated Project Cost	\$ 19,261,000.00

NOTES:

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST PROVIDED IS MADE ON THE BASIS OF ENGINEER'S EXPERIENCES AND QUALIFICATION AND REPRESENTS ENGINEER'S BEST JUDGMENT WITH THE INDUSTRY. ENGINEER DOES NOT GUARANTEE THAT PROPOSALS, BIDS, OR ACTUAL COST WILL NOT VARY FROM ENGINEER'S OPINION OF PROBABLE COST.

THE TOTAL ESTIMATED PROJECT COST WAS PREPARED FOR THE 2023 PLANNING YEAR. THIS NUMBER SHOULD BE INCREASED TO ACCOUNT FOR RISING COSTS DUE TO INFLATION SHOULD THE IMPROVEMENTS NOT BE IMPLEMENTED IN 2023.

UTILITY RELOCATION AND RIGHT-OF-WAY COSTS ARE INCLUDED IN THIS ESTIMATE. HOWEVER, THESE COSTS ARE HIGHLY VARIABLE AND DEPENDENT ON SEVERAL FACTORS. DUE TO LIMITED INFORMATION AT THE TIME OF THIS ESTIMATE, THE COST PROVIDED SHOULD BE CONSIDERED AS BUDGETARY ONLY.

CONTINGENCY INCLUDES MISCELLANEOUS AND/OR UNKNOWN ITEMS THAT CANNOT BE QUANTIFIED AT THE TIME THIS STUDY WAS CONDUCTED.

Kelly Creek at I-20 Interchange

Alternative B - DDI

Item Description	Unit	Quantity	Unit Price	Amount
Clearing & Grubbing (Max ALDOT Bid = \$8,000/Acre)	LS	1	\$ 8,000.00	\$ 8,000.00
Concrete Removal (Curb & Gutter, Slope Paving, etc.)	LS	1	\$ 10,000.00	\$ 10,000.00
Unclassified Excavation	CY	10000	\$ 25.00	\$ 250,000.00
Borrow Excavation	CY	15000	\$ 30.00	\$ 450,000.00
Wearing Surface (1.5")	TN	560	\$ 140.00	\$ 78,400.00
Upper Binder Layer (2")	TN	740	\$ 140.00	\$ 103,600.00
Lower Binder Layer (5")	TN	1910	\$ 140.00	\$ 267,400.00
Leveling	TN	5000	\$ 70.00	\$ 350,000.00
Aggregate Base (6")	SY	6700	\$ 15.00	\$ 100,500.00
Roadbed Processing	STA	32	\$ 800.00	\$ 25,600.00
Patching	TN	250	\$ 250.00	\$ 62,500.00
Tack Coat	GAL	1610	\$ 6.00	\$ 9,660.00
Bituminous Treatment	SY	6700	\$ 4.00	\$ 26,800.00
Guardrail	LF	400	\$ 160.00	\$ 64,000.00
Slope Paving	CY	130	\$ 700.00	\$ 91,000.00
Topsoil	CY	7500	\$ 20.00	\$ 150,000.00
Type N Curb	LF	1930	\$ 50.00	\$ 96,500.00
Curb & Gutter	LF	160	\$ 40.00	\$ 6,400.00
Storm Drainage	LS	1	\$ 139,300.00	\$ 139,300.00
Striping & Signage	LS	1	\$ 70,000.00	\$ 70,000.00
Erosion Control	LS	1	\$ 110,000.00	\$ 110,000.00
Traffic Control	LS	1	\$ 230,000.00	\$ 230,000.00
Traffic Signal	EA	2	\$ 300,000.00	\$ 600,000.00
Proposed Bridge	SF	13410	\$ 225.00	\$ 3,017,250.00
Lighting	LS	1	\$ 500,000.00	\$ 500,000.00
Mobilization (9.7% of Overall Cost)	LS	1	\$ 612,740.27	\$ 612,740.27
Engineering Controls (1.3% of Overall Cost)	LS	1	\$ 96,585.45	\$ 96,585.45

Construction Subtotal	\$ 7,527,000.00
Contingency (20%)	\$ 1,505,400.00
CE&I (15%)	\$ 1,354,860.00
Construction Total	\$ 10,388,000.00
Preliminary Engineering (15%)	\$ 1,354,860.00
Utility Relocation Allowance:	\$ 300,000.00
Right-of-Way Cost:	\$ 100,000.00
ALDOT Indirect Costs (13.7%)	\$ 1,663,571.82
Total Estimated Project Cost	\$ 13,807,000.00

NOTES:

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST PROVIDED IS MADE ON THE BASIS OF ENGINEER'S EXPERIENCES AND QUALIFICATION AND REPRESENTS ENGINEER'S BEST JUDGMENT WITH THE INDUSTRY. ENGINEER DOES NOT GUARANTEE THAT PROPOSALS, BIDS, OR ACTUAL COST WILL NOT VARY FROM ENGINEER'S OPINION OF PROBABLE COST.

THE TOTAL ESTIMATED PROJECT COST WAS PREPARED FOR THE 2023 PLANNING YEAR. THIS NUMBER SHOULD BE INCREASED TO ACCOUNT FOR RISING COSTS DUE TO INFLATION SHOULD THE IMPROVEMENTS NOT BE IMPLEMENTED IN 2023.

UTILITY RELOCATION AND RIGHT-OF-WAY COSTS ARE INCLUDED IN THIS ESTIMATE. HOWEVER, THESE COSTS ARE HIGHLY VARIABLE AND DEPENDENT ON SEVERAL FACTORS. DUE TO LIMITED INFORMATION AT THE TIME OF THIS ESTIMATE, THE COST PROVIDED SHOULD BE CONSIDERED AS BUDGETARY ONLY.

CONTINGENCY INCLUDES MISCELLANEOUS AND/OR UNKNOWN ITEMS THAT CANNOT BE QUANTIFIED AT THE TIME THIS STUDY WAS CONDUCTED.