

*Route MM from I-44 to James River Freeway
J8S0836B
Access Management Study*

Final Access Management Report

September 2024

Prepared for:



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1 Introduction

The purpose of this project, J8S0836B, is to address the safety, operations, and access management improvements along State Route MM between the interchanges of Interstate 44 and James River Freeway in Republic, Greene County, Missouri. This report will identify existing access management conditions, analyze both the existing and future operations, and make recommendations to improve operations and access management along the corridor. The primary goal is to establish recommendations for the future Route MM cross-section, provide access management recommendations, and determine anticipated intersection traffic control and turn lane needs to promote safety and operations to support future development growth patterns along the corridor.

1.1 Project Background

State Route MM carries north-south traffic from US Route 60/State Route 413 on the south, through State Route 360 (James River Freeway), to Interstate 44 (I-44) on the north. Route MM provides access to these major east-west routes between Republic, Springfield, and the surrounding areas. Route MM is currently classified as a minor arterial. The section of the corridor addressed in this study primarily serves as a major access route for industrial development but also acts as a north-south connection for commuters between Republic and Springfield.

Keeping Missouri's roads and bridges in a state of good repair contributes to a robust economy and increased quality of life. Being that this project runs through a developing industrial portion of the City of Republic, it is important to consider improvements that promote safety and operations and allow this important connection to serve the surrounding area into the future. A focus for this project will be to establish preferred access management conditions that maintain acceptable levels of service with the expected increase in future development traffic.

1.2 Study Area

This report reviews Route MM from I-44 to James River Freeway. **Figure 1** displays the extents of the project.

Overall traffic operations were reviewed at a total of eight existing and future intersections within the study area. All major roadways, including their characteristics within the study area, are shown in **Table 1**.

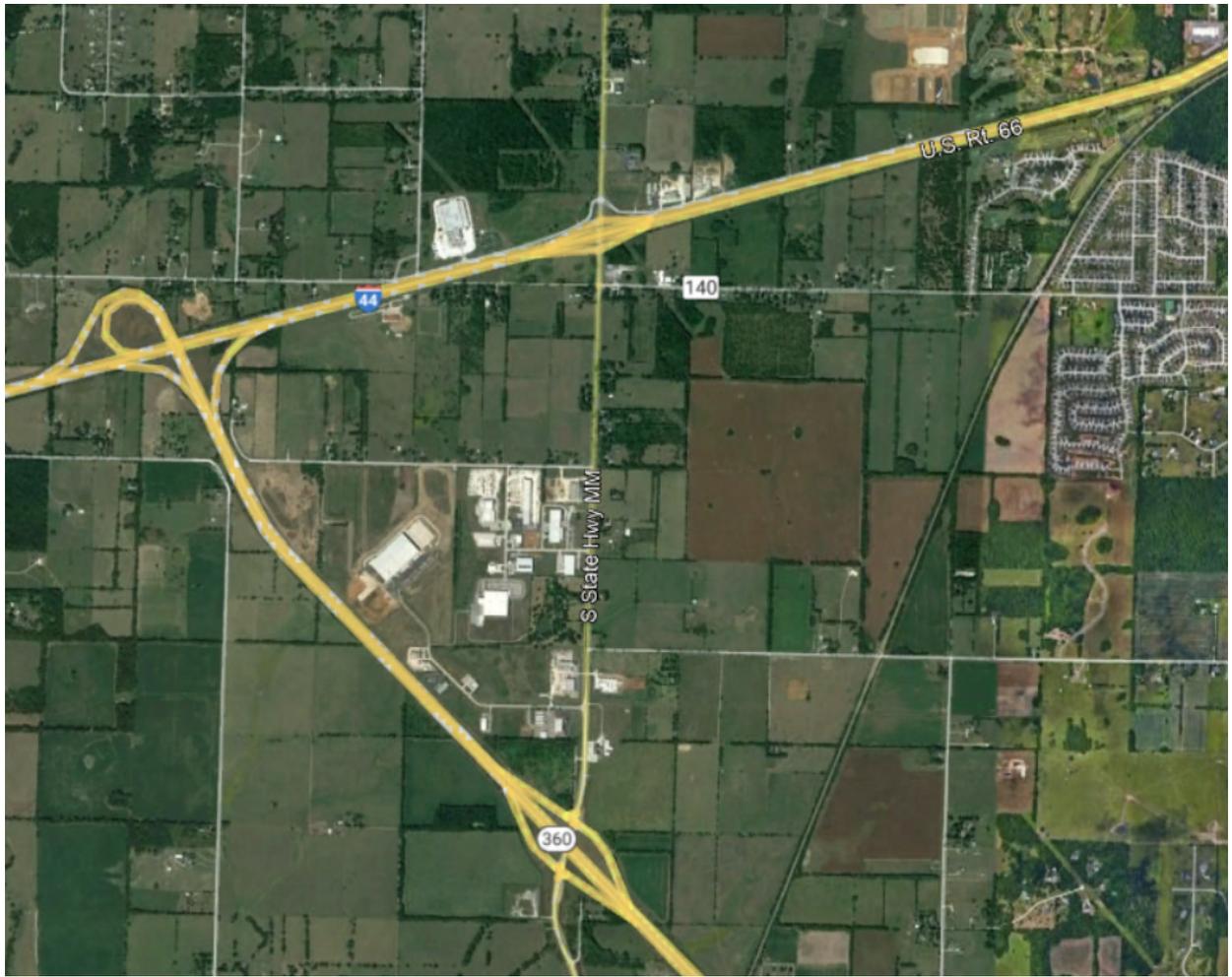


Figure 1: Study Area

Table 1: Existing Network Summary

Roadway	Functional Classification	Section	Median Type	Posted Speed Limit
Route MM	Minor Arterial	2-lane (N of Carnahan) 3-lane (S of Carnahan)	Undivided	55 mph
I-44 EB Ramps	Interstate	2-lane	Undivided	40 mph
Farm Road 140	Major Collector / Local Road	2-lane	Undivided	45 mph
Farm Road 144	Local Road	2-lane	Undivided	45 mph
Kings Street	Local Road	2-lane	Undivided	30 mph
Farm Road 148	Local Road	2-lane	Undivided	45 mph
Carnahan Street	Local Road	2-lane	Undivided	40 mph
James River Freeway WB Ramps	Other Freeway and Expressway	2-lane	Undivided	40 mph

1.3 Problem Definition

Nearly 350 acres of future development is anticipated to occur within the study area that will utilize Route MM as the main corridor for access. To support this expected growth, the City of Republic has planned Route MM to be widened from the existing two-lane section to a proposed five lane section with two through lanes and a continuous two-way left-turn lane, though a median divided four-lane road is also being considered. To balance the needs of transportation users with the needs of development, access management practices are anticipated to be needed along Route MM in the future. Access management practices considered for the study area include:

- Installing non-traversable medians where appropriate,
- Minimizing the number of driveways and promoting service road usage in high density locations,
- Installation of dedicated left and/or right-turn lanes,
- Limiting driveways to 3/4 or right-in/right-out access, and
- Review traffic control/signalization.

1.4 Design Alternatives

The primary alternative that was evaluated for this study is outlined below:

- Four-lane roadway (two northbound lanes, two southbound lanes) either with raised center median and main line left-turn lanes, or undivided with center two-way left-turn lane).
- Traffic signal at Route MM and Farm Road 144

- Traffic signalization in addition to Farm Road 144 is *not* proposed for construction at this time. Additional traffic signals along Route MM are planned to be installed by future, separate developer-driven projects when warranted.

This is the cross-section currently planned by the City of Republic. Future improvements in addition to the proposed widening were also considered and are described below.

Access Management

Planned developments are expected to generate a lot of traffic along Route MM. In general, considerations for improvements to access management as they relate to vehicle traffic along the corridor are summarized in **Table 2**.

Table 2: Access Management General Trends

Access Solution	Operations	Safety
Installation of Non-Traversable Median	Typical free-flow and travel speeds can be expected to decrease depending on the proportion of the roadway with raised medians.	Motor vehicle crash rates decrease and greatly reduce for head-on collisions as the number of vehicle conflict points decrease.
Consolidation of Proposed Driveway Locations / Promotion of Service Roads	Can result in higher free-flow and travel speeds between intersections, though delay may increase at major intersections along the corridor as more traffic is funneled to these locations.	Typically vehicle crash rates decrease while turning movements to and from properties occur in a lower volume/speed environment.
Installation of Turn Lanes	Results in increased free-flow and travel speeds through the corridor, particularly when turning movements are high.	Motor vehicle crash rates typically decrease.
Limiting driveways to ¼ or right-in/right-out access	May result in reduced free-flow and travel speeds at limited-access driveways, delay may increase for side street movements.	Channelizing islands help direct traffic flows entering and exiting driveways and reduce conflict points. Should be paired with median to ensure compliance.
Traffic Control & Signalization	Increases intersection capacity, promotes orderly movement of vehicles at intersections, and improves side street operations.	Reduces frequency and speed of left-turn and angle crashes.

Roadway Reconfiguration

The existing typical section along Route MM consists of either a two-lane (undivided) or three-lane (two-way-left-turn lane undivided) section. A 5-lane with a two-way left-turn lane was initially reviewed for the study area as well as the potential need for 4-lane divided with select median breaks for left-turn lanes.

Signal & Intersection Improvements

Reviewing the level of service at the unsignalized intersections, several potential signal locations are recommended to provide benefits to operations and facilitate safer turning movements from the side streets at select locations.

Overall signalized and unsignalized intersection geometrics were reviewed including:

- Left and right-turn lane improvements including addition of auxiliary lanes and increased turn bay storage length,
- Limiting access at some drives to $\frac{3}{4}$ or right-in/right-out conditions, and
- Signalization.

2 Future Baseline Traffic Operations

From coordination with City staff, the horizon year of 2045 was considered for the Future scenario. The City's planned widening of Route MM is anticipated to be constructed prior to 2045 and is included in this scenario. Key roadway characteristics of this scenarios include the following:

- Five travel lanes (two northbound lanes, two southbound lanes, and a center two-way left-turn lane)
- Center two-way left-turn lane to be constructed wide enough to install raised median if needed in the future.
- Traffic signal at Route MM and Farm Road 144
 - Due to high north-south through volumes and significant anticipated development, all intersections along Route MM, except Farm Road 140, were evaluated as signalized in the capacity analysis. It should be noted that traffic signalization in addition to Farm Road 144 is *not* proposed for construction at this time but are likely to warrant with future development. These additional signals along Route MM are planned to be installed by future, separate developer-driven projects when warranted.
- Background volume development estimates.

The Future Baseline exhibit is shown in **Appendix B**.

2.1 Background Forecasting

Per guidance from City staff, approximately 422 acres are available to develop in the Route MM study area bounded by Interstate 44 to the north, James River Freeway to the southwest, and the BNSF railroad tracks to the southeast. From this acreage, a floor area ratio (FAR) of 0.4 was applied to determine the potential developable area. This FAR factor was determined in coordination with City staff and is consistent with other previous planning level studies in the area. To estimate the trip generation of this developable area, calculations were conducted assuming the ITE land use of Industrial Park (LUC 150). Trip generation calculations are summarized in **Table 3** below.

Table 3: Future Trip Generation

ITE Code	Land Use	Setting/Location	Density (s.f.)	Daily	AM Peak Hour	PM Peak Hour
130	Industrial Park	General Urban/Suburban	5,607,415	7,620	1,907	1,907

Historical traffic data from MoDOT count stations, 2021 traffic data, and input from City staff was utilized to determine an appropriate growth rate for the study area. Based on this information, a growth rate of 3% was applied to 2021 traffic volumes.

Multiple planned/approved developments are not fully constructed at the time of this report. However, the traffic associated with each of these developments has been incorporated. These developments include:

- Seitz – MM Industrial Park
- Morelock Warehouse
- Convoy of Hope
- Eoff – Industrial Park

A horizon year of 2045 was utilized to review future traffic impacts along the corridor. MoDOT Datasone and historical traffic count maps were used to develop the appropriate growth rates along the corridor. A background growth rate of 3% was used for analysis. Full build volumes for approved developments (Convoy of Hope, MM Industrial Park, Morelock Warehousing, and the Eoff Development) were also factored into the production of background volumes. The full build future trip generation from additional development as described above was added to these background volumes to determine the anticipated horizon year 2045 traffic characteristics.

The planned and approved developments in the study area are shown in **Figure 2**.

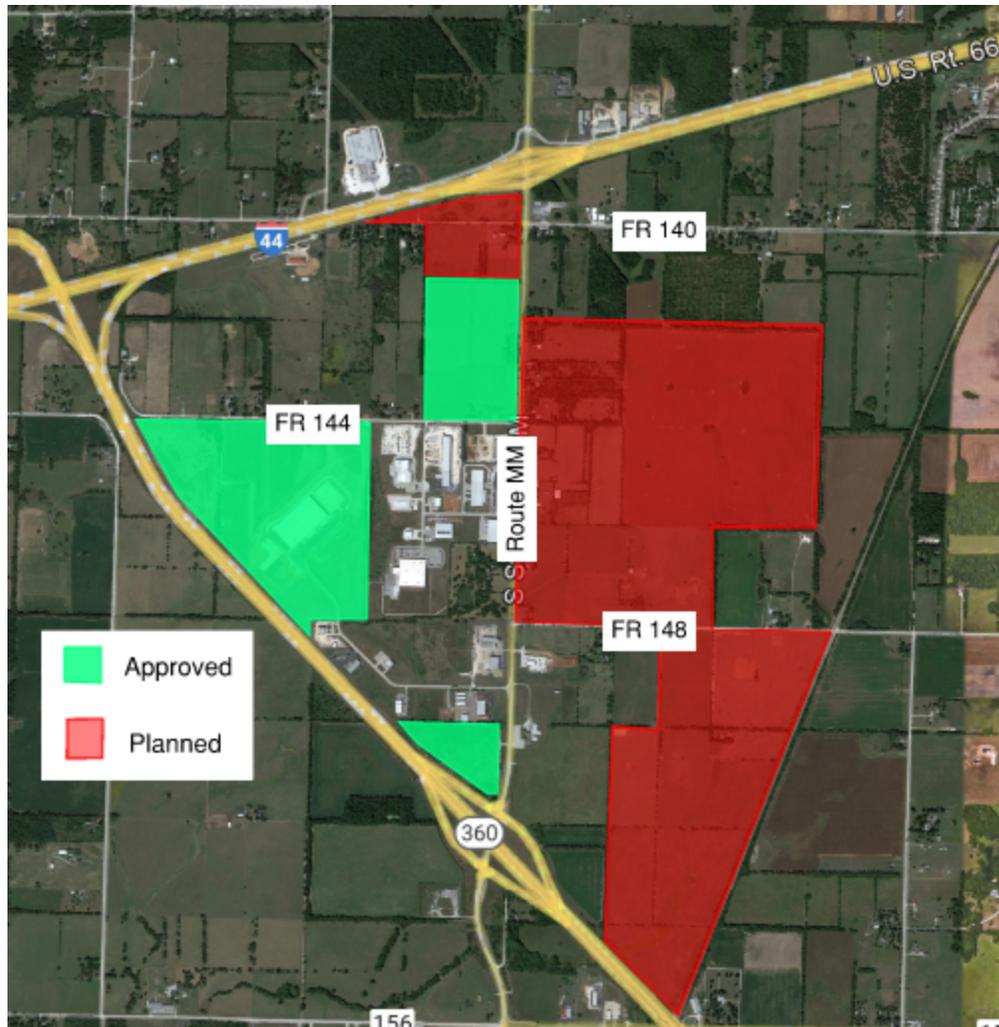


Figure 2: Development Map

2.2 Traffic Operations

The growth rate was applied to existing through traffic volumes along Route MM to develop 2045 traffic volumes. The future (2045) conditions volumes are shown in the **Appendix B**.

2.2.1 Turn Lane Warrants

MoDOT Access Management Guidelines, located in Section 940.9 of MoDOT's Engineering Policy Guide (EPG), were used to determine whether auxiliary turn lanes are currently warranted at the study intersections based on traffic volumes. Following the procedures outlined in the EPG, it was determined that the criteria for a turn lane was met at four locations within the study area during the AM and PM peak periods. The northbound and southbound right-turn movement at Farm Road 144, and the northbound and southbound right-turn lane at Kings Road both met the warrant criteria in both peak periods.

Operations and safety were reviewed to determine if these additional considerations support construction of a turn lane. Turn lane warrant analysis sheets can be found in the **Appendix B**.

2.2.2 Segment AADT

Roadway segment average annual daily traffic estimates for Route MM considering 2021 MoDOT traffic data, background volume growth through future year 2045, and estimated traffic volumes from approved and planned developments were developed. In addition, these segment volumes are compared against the MoDOT EPG recommended AADT threshold of 28,000 vehicles/day for five-lane road with continuous two-way left-turn lane (TWLTL). The estimated segment daily volumes and volume to capacity ratios are summarized in **Table 4** below.

Table 4: Route MM Segment AADT

Segment	Future 2045 AADT	EPG 5-Lane AADT Threshold	V/C
I-44 Westbound to FR 140	31,244	28,000	1.12
FR 140 to Industrial Drive	31,329	28,000	1.12
Industrial Drive to FR 144	31,132	28,000	1.11
FR 144 to Kings Street	31,001	28,000	1.11
Kings Street to FR 148	30,667	28,000	1.10
FR 148 to Carnahan Street	30,879	28,000	1.10
Carnahan Street to James River Freeway Westbound Ramp	31,113	28,000	1.11

The estimated volumes indicate the TWLTL threshold is exceeded for the Future 2045 AADT scenario at all roadway segments and raised medians should be considered along Route MM. Although not proposed as part of the Baseline roadway improvements, raised medians shall be considered along the roadway as the area develops.

2.2.3 Capacity Analysis

Capacity analysis was performed for the Future 2045 conditions using the 5-lane section described in Section 2.0 and making all intersections signalized except Farm Road 140. Signalized intersection analysis was conducted using Synchro, Version 11. The analysis for the intersections was based on the Highway Capacity Manual (HCM) delay methodologies. For simplicity, the amount of control delay is equated to a grade of Level of Service (LOS) based on thresholds of driver acceptance. The amount of delay is assigned a letter grade A through F, LOS A representing little or no delay and LOS F representing very high delay. **Table 5** shows the delays associated with each LOS grade for signalized and unsignalized intersections. Queuing is evaluated considering the 95th percentile queue length. The 95th percentile queue represents the queue length that has a 5 percent probability of being exceeded during the peak hour. Detailed queue results are shown in the **Appendix B**.

Table 5: Intersection LOS Criteria

Level-of-Service	Average Control Delay (sec/veh)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Highway Capacity Manual (6th Edition)

Per EPG section 905.3.5.1, peak hour factors were set to 0.92 for the 2045 analysis. No adjustments to existing signal timings were made for this scenario. **Table 6** represents the future year Level of Service (LOS) for signalized intersections with the study area.

Table 6: Future Conditions - LOS along Route MM

Intersection	Eastbound	Westbound	Northbound	Southbound	Overall
I-44 EB Ramps	F[F]	N/A	A[D]	A[A]	D[C]
Farm Road 140	F[C]	F[F]	A[A]	A[A]	N/A
Industrial Drive	C[D]	C[F]	A[D]	A[C]	A[D]
Farm Road 144	B[D]	C[E]	A[E]	A[A]	A[D]
Kings Street	B[D]	C[E]	A[F]	A[F]	A[F]
Farm Road 148	N/A	C[D]	A[A]	A[A]	A[A]
Carnahan Street	C[D]	C[E]	A[A]	A[C]	A[B]
James River Freeway WB	N/A	D[E]	A[A]	B[F]	A[F]

Note: AM [PM]

Capacity analysis results show most intersections operate at acceptable levels of service during the AM peak hour. Mainline operations are acceptable at most intersections during both the AM and PM peaks. However, 95th percentile queues were shown to extend to upstream intersections with the potential to significantly impact neighboring intersections. Although not reflected in delay calculations, these high queues impact intersection influence areas. Based on capacity results, northbound and southbound right-turn and left-turn lanes are recommended at every signalized intersection. Eastbound and westbound left-turn lanes, including dual left-turn lanes at certain locations, are recommended at all full-access intersections.

In addition, due to high volumes and limited gaps on Route MM, unsignalized full access private driveways along Route MM are not recommended. Private driveways are recommended to function as right-in/right-out and restrict left-turns into or out of the driveways.

2.2.4 Traffic Signal Warrant

Peak hour (Warrant 3) traffic signal warrant analysis was performed using the methodology provided in Chapter 4C of the *Manual on Uniform Traffic Control Devices (MUTCD)*, 2009 Edition published by the Federal Highway Administration (FHWA). Warrant 3 is intended for use at locations where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street; a common application of Warrant 3 is at industrial sites such as what is included in the study area.

Warrant 3 was evaluated at the intersection of Route MM and Farm Road 144 for the AM and PM peak hours under the design year 2045. As part of the proposed interim roadway improvements, it will remain as a three-leg intersection (western leg re-constructed) for the approved Seitz Industrial Park and Convoy of Hope developments. Thus, traffic signal warrant calculations were performed only considering the eastbound (minor street) and Route MM (mainline) traffic volumes and are summarized in **Table 7** below.

Table 7: Traffic Signal Warrant Analysis (Warrant 3)

Intersection	Future 2045	
	AM Peak Hour	PM Peak Hour
Route MM at FR 144	Not Warranted	Warranted

Based on these results, Warrant 3 is expected to be satisfied in the interim condition as a three-leg intersection. If the area develops as anticipated, the future eastern leg of this intersection is likely to generate more traffic than the west leg and result in more strongly satisfied signal warrants in the future.

2.2.5 Safety

A general review of potential safety characteristics of the proposed widening and traffic control improvements was conducted for this access management report. The widening of Route MM, implementing access management practices, and improvements to intersection traffic control would be expected to enhance the safety of the corridor. These improvements are expected to provide dedicated deceleration and stacking lanes for turning vehicles, reduce congestion along the mainline, allow for controlled turning movements to/from the side streets. As development occurs along Route MM and traffic increases, these improvements are expected to improve safety and vehicle operations compared to the existing two-lane conditions.

3 Future Improved Design Alternative

The preferred design alternative for this corridor consists of the proposed roadway discussed in Section 2.0, as well as additional traffic control and roadway geometry recommendations that should be considered as the area builds out. This includes the allocation of right-of-way for the ultimate condition. These recommendations are based on capacity analysis, intersection influence area considering anticipated queues, and safety evaluations of the Future 2045 scenario.

3.1.1 Intersection Spacing

Intersection spacing guidelines for MoDOT are provided in the Engineering Policy Guide (EPG). Per the EPG, minimum signalized intersection spacing along Route MM (classified by MoDOT as a minor arterial or a minor/non-freeway facility) is 1,320 feet (0.25 mile). In the interim condition, a traffic signal is planned to be constructed at Farm Road 144, which would provide adequate spacing in the interim condition. Future signals are also planned as development occurs at the intersections of Industrial Drive, Kings Street, and Farm Road 148. If constructed, all planned signals would satisfy minimum signal spacing criteria (1,320 feet) except between Kings Street and Farm Road 144 (potentially spaced at 1,220 feet). The spacing between Kings Street and Farm Road 144 is approximately 100 feet below the desired spacing criteria if a signal is installed at the existing Kings Street alignment. When a traffic signal is being considered at this location in the future, it is recommended to provide signal coordination and ensure that a proposed spacing of 1,220 feet is acceptable with future studies.

The intersections of Carnahan Street and Farm Road 140 along Route MM are less than 1,000 feet away from their neighboring planned signalized intersections (Farm Road 148 and I-44, respectively). Thus, to reduce the impact from intersection influence areas and improve operations along Route MM, these intersections are proposed to be a 3/4 access when warranted (restricted side-street left turns accomplished via raised median).

3.1.2 Future Segment AADT

Roadway segment average annual daily traffic estimates for Route MM considering 2021 MoDOT traffic data, background volume growth through future year 2045, and estimated traffic volumes from all approved and planned developments at the time of this study were developed. These segment volumes were compared against the MoDOT EPG recommended AADT threshold of 28,000 vehicles/day for five-lane road with continuous two-way left-turn lane (TWLTL). The estimated segment daily volumes and volume to capacity ratios are summarized in **Table 8** below.

Table 8: Route MM Segment AADT

Segment	Future 2045 AADT	EPG 5-Lane AADT Threshold	V/C
I-44 Westbound to FR 140	31,244	28,000	1.12
FR 140 to Industrial Drive	31,329	28,000	1.12
Industrial Drive to FR 144	31,132	28,000	1.11
FR 144 to Kings Street	31,001	28,000	1.11
Kings Street to FR 148	30,667	28,000	1.10
FR 148 to Carnahan Street	30,879	28,000	1.10
Carnahan Street to James River Freeway Westbound Ramp	31,113	28,000	1.11

If all the planned development occurs as anticipated, the estimated volumes are expected to exceed the typical TWLTL capacity for the Future 2045 AADT scenario at all roadway segments. Thus, the potential need for raised medians must be considered along Route MM. In the interim, raised medians are planned to be constructed along Route MM. In addition, further access limitations shall be considered at FR 140 and Carnahan Street as the area develops.

3.1.3 Future Improvements

Specific geometric recommendations (turn lane lengths, curb radii, among other improvements) can be visualized in the Strip Map Plan in **Appendix C** and are outlined below:

I-44 EB Ramps

- Add dedicated northbound right-turn lane.

Farm Road 140

- Raised median restricted 3/4 side-street access: right-in, right-out, left-in.
- Stop-controlled side-street approaches.
- Add dedicated northbound and southbound right-turn lanes.

Industrial Drive

- New signalized intersection when warranted.
 - As of the date of this report, the exact location of this intersection could not be confirmed with the City, but it is anticipated that a future intersection on Route MM between Farm Road 140 and Farm Road 144 will be constructed as development occurs in the surrounding area.
- Dedicated westbound right-turn lane and dual left-turn lanes.
- Dedicated northbound right-turn lane.
- Dedicated southbound right-turn lane.
- Dedicated eastbound right-turn lane and left-turn lane.
- Dedicated single northbound left-turn lane.
- Dedicated single southbound left-turn lane.
- Raised median provided adjacent to signalized left-turn bay along Route MM and adjacent to dual westbound left-turn lanes to protect the intersection influence area.

Farm Road 144

- Signalized intersection.
- New east leg with dedicated westbound right-turn lane and dual left-turn lanes.
- Dedicated northbound right-turn lane.
- Dedicated southbound right-turn lane.
- Dedicated eastbound right-turn lane and left-turn lane.
- Raised median provided adjacent to signalized left-turn bay along Route MM and adjacent to dual left-turn lanes to protect the intersection influence area.

Kings Street

- Signalized intersection when warranted.
- New east leg with dedicated westbound right-turn lane and dual left-turn lanes.
- Dedicated northbound right-turn lane.
- Dedicated southbound right-turn lane.
- Dedicated eastbound right-turn lane and left-turn lane.
- Raised median provided adjacent to signalized left-turn bay along Route MM and adjacent to dual left-turn lanes to protect the intersection influence area.

Farm Road 148

- Signalized intersection when warranted.
- New west leg with eastbound left-turn lane.
- Dedicated northbound right-turn lane.
- Dedicated westbound right-turn lane and dual left-turn lanes.
- Dedicated southbound right-turn lane and dual left-turn lanes.
- Dual eastbound receiving lanes to accommodate dual southbound left-turn lanes.
- Raised median provided adjacent to signalized left-turn bay along Route MM and adjacent to dual left-turn lanes to protect the intersection influence area.

Carnahan Street

- New eastern leg
- Raised median restricted 3/4 side-street access: right-in, right-out, left-in.
- Stop-controlled minor approaches.
- Add dedicated northbound and southbound right-turn lanes.

James River Freeway WB Ramps

- Add dedicated southbound right-turn lane.

Route MM

- Install raised median at signalized intersections adjacent to Route MM left-turn bays and adjacent to any dual left-turn lanes.

At all future signalized intersections, a raised median shall be constructed within the influence area of the intersections (at a minimum adjacent to signalized turn bays along Route MM). The “Baseline” improvements of Route MM would be expected to support traffic volumes for the interim conditions, but the full raised median between signals is likely to be needed in the future and should be installed when warranted by safety and capacity operations. The planned improvements to be installed with this project are outlined in Section 4. Additional improvements outlined above should be built as warranted when development occurs within the study area.

Intersection geometrics which reflect the improved design alternative are illustrated in **Appendix C**.

3.2 Traffic Operations

Capacity analysis was performed for the Future 2045 with the recommendations identified in **Section 3.1** using the methodologies described in **Section 2.2.2**. A peak hour factor of 0.92 was used in this scenario. Signal timings were optimized for north-south throughput. **Table 9** represents the future year Level of Service (LOS) for intersections and movements within the study area and **Table 10** shows a comparison of the Future Baseline and Future Improved scenarios intersection LOS.

Table 9: Future Conditions - LOS along Route MM

Intersection	Eastbound	Westbound	Northbound	Southbound	Overall
I-44 EB Ramps	E[F]	N/A	A[D]	A[A]	A[C]
Farm Road 140	D[D]	C[E]	A[A]	A[A]	N/A
Industrial Drive	E[D]	E[E]	A[F]	A[C]	B[E]
Farm Road 144	E[E]	E[E]	A[C]	A[A]	A[C]
Kings Street	E[E]	E[F]	A[B]	A[C]	A[C]
Farm Road 148	E[E]	E[F]	C[D]	B[C]	C[D]
Carnahan Street	C[F]	D[C]	A[A]	A[A]	N/A
James River Freeway WB	N/A	F[F]	A[A]	B[F]	A[F]

Note: AM [PM]

Table 10: Comparison of Intersection LOS by Scenario

Intersection	Future Baseline	Future Improved
I-44 EB Ramps	D[C]	A[C]
Farm Road 140	D[D]	A[A]
Industrial Drive	A[E]	B[E]
Farm Road 144	A[D]	A[C]
Kings Street	A[F]	A[C]
Farm Road 148	A[A]	C[D]
Carnahan Street	A[B]	A[A]
James River Freeway WB	B[F]	A[F]

Note: AM [PM]

Based on capacity analysis results, intersection delays and 95th percentile queues improve for both the AM and PM peak hours. Although high-side street delays were observed during the AM and PM peak hours, they were generally found acceptable in order maintain optimized mainline operations and progression.

The westbound ramp intersection at James River Freeway showed a LOS F for the AM and PM peak hours. Improvements at this intersection were not included in this report as any improvements should consider overall interchange improvements and/or reconfiguration that is beyond the scope of this report.

4 Conclusions

For this project, funds have been allocated to address safety and operational improvements along Route MM within Republic, Missouri to perform the planned widening and the construction of a traffic signal at Farm Road 144. The proposed interim improvements for which funding has been allocated are described below.

Interim Improvements

- Median divided four-lane roadway (two northbound lanes, two southbound lanes, and center median) with main line left-turn lanes installed at public intersections.
- Traffic signal at Route MM and Farm Road 144.

Through the findings of this access management report, the proposed interim improvements and widening of Route MM is expected to improve operations. However, the additional recommendations listed under Section 3.2 must be considered in the future as the area develops. The “Future Improved Design Alternative” improvements are expected to promote safe and efficient travel to the public and provide additional capacity in anticipation of future development. The need for these improvements should be monitored in future developer traffic impact studies (when land uses and intensity have been confirmed) and be constructed when warranted. In addition, as the area develops, right-of-way should be allocated should these additional improvements be needed in the future.

APPENDIX A

Data Collection

Count Data

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021

Full Length (12 AM-12 AM (+1))

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858959, Location: 37.174065, -93.421986



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East		App	Int
	Westbound			
Time	Lane 1	Lane 2		
2021-07-29 12:00AM	6	12	18	18
12:15AM	3	12	15	15
12:30AM	5	13	18	18
12:45AM	4	7	11	11
Hourly Total	18	44	62	62
1:00AM	2	7	9	9
1:15AM	3	13	16	16
1:30AM	2	15	17	17
1:45AM	4	10	14	14
Hourly Total	11	45	56	56
2:00AM	4	7	11	11
2:15AM	2	5	7	7
2:30AM	3	9	12	12
2:45AM	5	7	12	12
Hourly Total	14	28	42	42
3:00AM	6	16	22	22
3:15AM	10	13	23	23
3:30AM	11	12	23	23
3:45AM	15	12	27	27
Hourly Total	42	53	95	95
4:00AM	6	10	16	16
4:15AM	9	13	22	22
4:30AM	21	15	36	36
4:45AM	27	25	52	52
Hourly Total	63	63	126	126
5:00AM	19	19	38	38
5:15AM	33	26	59	59
5:30AM	44	35	79	79
5:45AM	59	37	96	96
Hourly Total	155	117	272	272
6:00AM	41	54	95	95
6:15AM	88	57	145	145
6:30AM	65	79	144	144
6:45AM	84	82	166	166
Hourly Total	278	272	550	550
7:00AM	63	89	152	152
7:15AM	75	110	185	185
7:30AM	71	95	166	166
7:45AM	79	97	176	176
Hourly Total	288	391	679	679
8:00AM	48	69	117	117
8:15AM	45	83	128	128
8:30AM	35	103	138	138
8:45AM	46	106	152	152
Hourly Total	174	361	535	535
9:00AM	44	124	168	168
9:15AM	45	110	155	155
9:30AM	46	104	150	150
9:45AM	47	98	145	145
Hourly Total	182	436	618	618
10:00AM	44	113	157	157
10:15AM	62	105	167	167
10:30AM	55	137	192	192
10:45AM	54	114	168	168

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	App	Int
Hourly Total	215	469	684	684
11:00AM	40	121	161	161
11:15AM	55	131	186	186
11:30AM	52	116	168	168
11:45AM	42	131	173	173
Hourly Total	189	499	688	688
12:00PM	54	115	169	169
12:15PM	58	110	168	168
12:30PM	41	118	159	159
12:45PM	65	114	179	179
Hourly Total	218	457	675	675
1:00PM	44	128	172	172
1:15PM	52	103	155	155
1:30PM	48	137	185	185
1:45PM	56	127	183	183
Hourly Total	200	495	695	695
2:00PM	48	142	190	190
2:15PM	58	106	164	164
2:30PM	58	128	186	186
2:45PM	74	140	214	214
Hourly Total	238	516	754	754
3:00PM	65	125	190	190
3:15PM	75	150	225	225
3:30PM	73	142	215	215
3:45PM	65	139	204	204
Hourly Total	278	556	834	834
4:00PM	76	188	264	264
4:15PM	81	190	271	271
4:30PM	79	167	246	246
4:45PM	85	187	272	272
Hourly Total	321	732	1053	1053
5:00PM	81	178	259	259
5:15PM	101	213	314	314
5:30PM	83	146	229	229
5:45PM	66	138	204	204
Hourly Total	331	675	1006	1006
6:00PM	65	124	189	189
6:15PM	51	118	169	169
6:30PM	49	102	151	151
6:45PM	35	94	129	129
Hourly Total	200	438	638	638
7:00PM	36	87	123	123
7:15PM	39	85	124	124
7:30PM	44	91	135	135
7:45PM	35	70	105	105
Hourly Total	154	333	487	487
8:00PM	40	64	104	104
8:15PM	33	75	108	108
8:30PM	27	64	91	91
8:45PM	35	59	94	94
Hourly Total	135	262	397	397
9:00PM	23	53	76	76
9:15PM	30	45	75	75
9:30PM	28	41	69	69
9:45PM	29	43	72	72
Hourly Total	110	182	292	292
10:00PM	24	25	49	49
10:15PM	18	36	54	54
10:30PM	11	32	43	43
10:45PM	15	32	47	47

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	App	Int
Hourly Total	68	125	193	193
11:00PM	18	15	33	33
11:15PM	9	29	38	38
11:30PM	10	16	26	26
11:45PM	7	13	20	20
Hourly Total	44	73	117	117
Total	3926	7622	11548	11548
% Approach	34.0%	66.0%	-	-
% Total	34.0%	66.0%	100%	-
Lights	3559	6771	10330	10330
% Lights	90.7%	88.8%	89.5%	89.5%
Articulated Trucks	139	681	820	820
% Articulated Trucks	3.5%	8.9%	7.1%	7.1%
Buses and Single-Unit Trucks	228	170	398	398
% Buses and Single-Unit Trucks	5.8%	2.2%	3.4%	3.4%

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021

Full Length (12 AM-12 AM (+1))

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858959, Location: 37.174065, -93.421986



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



MM / US-360 WB Ramps Off - ATR
 Thu Jul 29, 2021
 AM Peak (Jul 29 2021 10AM - 11 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Channels
 ID: 858959, Location: 37.174065, -93.421986



Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East		App	Int
	Westbound			
Time	Lane 1	Lane 2		
2021-07-29 10:00AM	44	113	157	157
10:15AM	62	105	167	167
10:30AM	55	137	192	192
10:45AM	54	114	168	168
Total	215	469	684	684
% Approach	31.4%	68.6%	-	-
% Total	31.4%	68.6%	100%	-
PHF	0.867	0.856	0.891	0.891
Lights	186	410	596	596
% Lights	86.5%	87.4%	87.1%	87.1%
Articulated Trucks	8	47	55	55
% Articulated Trucks	3.7%	10.0%	8.0%	8.0%
Buses and Single-Unit Trucks	21	12	33	33
% Buses and Single-Unit Trucks	9.8%	2.6%	4.8%	4.8%

MM / US-360 WB Ramps Off - ATR
Thu Jul 29, 2021
AM Peak (Jul 29 2021 10AM - 11 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986



MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021

Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858959, Location: 37.174065, -93.421986



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East		App	Int
	Westbound			
Time	Lane 1	Lane 2		
2021-07-29 11:15AM	55	131	186	186
11:30AM	52	116	168	168
11:45AM	42	131	173	173
12:00PM	54	115	169	169
Total	203	493	696	696
% Approach	29.2%	70.8%	-	-
% Total	29.2%	70.8%	100%	-
PHF	0.923	0.941	0.935	0.935
Lights	170	427	597	597
% Lights	83.7%	86.6%	85.8%	85.8%
Articulated Trucks	9	50	59	59
% Articulated Trucks	4.4%	10.1%	8.5%	8.5%
Buses and Single-Unit Trucks	24	16	40	40
% Buses and Single-Unit Trucks	11.8%	3.2%	5.7%	5.7%

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021

Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858959, Location: 37.174065, -93.421986



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021

PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858959, Location: 37.174065, -93.421986



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound				
	Lane 1	Lane 2	App	Int	
Time					
	2021-07-29 4:30PM	79	167	246	246
	4:45PM	85	187	272	272
	5:00PM	81	178	259	259
	5:15PM	101	213	314	314
	Total	346	745	1091	1091
	% Approach	31.7%	68.3%	-	-
	% Total	31.7%	68.3%	100%	-
	PHF	0.856	0.874	0.869	0.869
	Lights	329	702	1031	1031
	% Lights	95.1%	94.2%	94.5%	94.5%
	Articulated Trucks	8	33	41	41
	% Articulated Trucks	2.3%	4.4%	3.8%	3.8%
	Buses and Single-Unit Trucks	9	10	19	19
	% Buses and Single-Unit Trucks	2.6%	1.3%	1.7%	1.7%

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021

PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858959, Location: 37.174065, -93.421986



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021

Full Length (12 AM-12 AM (+1))

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858962, Location: 37.177611, -93.425452



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	App	Int
2021-07-29 12:00AM	1	1	1
12:15AM	2	2	2
12:30AM	1	1	1
12:45AM	1	1	1
Hourly Total	5	5	5
1:00AM	0	0	0
1:15AM	0	0	0
1:30AM	0	0	0
1:45AM	0	0	0
Hourly Total	0	0	0
2:00AM	1	1	1
2:15AM	3	3	3
2:30AM	0	0	0
2:45AM	0	0	0
Hourly Total	4	4	4
3:00AM	0	0	0
3:15AM	0	0	0
3:30AM	1	1	1
3:45AM	1	1	1
Hourly Total	2	2	2
4:00AM	0	0	0
4:15AM	1	1	1
4:30AM	2	2	2
4:45AM	2	2	2
Hourly Total	5	5	5
5:00AM	1	1	1
5:15AM	1	1	1
5:30AM	3	3	3
5:45AM	0	0	0
Hourly Total	5	5	5
6:00AM	3	3	3
6:15AM	1	1	1
6:30AM	3	3	3
6:45AM	5	5	5
Hourly Total	12	12	12
7:00AM	1	1	1
7:15AM	3	3	3
7:30AM	7	7	7
7:45AM	4	4	4
Hourly Total	15	15	15
8:00AM	4	4	4
8:15AM	3	3	3
8:30AM	2	2	2
8:45AM	3	3	3
Hourly Total	12	12	12
9:00AM	3	3	3
9:15AM	4	4	4
9:30AM	5	5	5
9:45AM	6	6	6
Hourly Total	18	18	18
10:00AM	5	5	5
10:15AM	4	4	4
10:30AM	2	2	2
10:45AM	5	5	5

Leg Direction	East Westbound		
Time		T	App Int
Hourly Total		16	16
11:00AM		4	4
11:15AM		3	3
11:30AM		5	5
11:45AM		6	6
Hourly Total		18	18
12:00PM		5	5
12:15PM		3	3
12:30PM		2	2
12:45PM		6	6
Hourly Total		16	16
1:00PM		6	6
1:15PM		7	7
1:30PM		6	6
1:45PM		7	7
Hourly Total		26	26
2:00PM		5	5
2:15PM		4	4
2:30PM		5	5
2:45PM		4	4
Hourly Total		18	18
3:00PM		6	6
3:15PM		3	3
3:30PM		7	7
3:45PM		5	5
Hourly Total		21	21
4:00PM		4	4
4:15PM		3	3
4:30PM		7	7
4:45PM		8	8
Hourly Total		22	22
5:00PM		7	7
5:15PM		5	5
5:30PM		7	7
5:45PM		2	2
Hourly Total		21	21
6:00PM		13	13
6:15PM		1	1
6:30PM		9	9
6:45PM		3	3
Hourly Total		26	26
7:00PM		3	3
7:15PM		2	2
7:30PM		3	3
7:45PM		3	3
Hourly Total		11	11
8:00PM		2	2
8:15PM		3	3
8:30PM		2	2
8:45PM		1	1
Hourly Total		8	8
9:00PM		4	4
9:15PM		4	4
9:30PM		0	0
9:45PM		1	1
Hourly Total		9	9
10:00PM		0	0
10:15PM		1	1
10:30PM		3	3
10:45PM		2	2

Leg Direction	East Westbound		
Time	T	App	Int
Hourly Total	6	6	6
11:00PM	3	3	3
11:15PM	1	1	1
11:30PM	3	3	3
11:45PM	2	2	2
Hourly Total	9	9	9
Total	305	305	305
% Approach	100%	-	-
% Total	100%	100%	-
Lights	196	196	196
% Lights	64.3%	64.3%	64.3%
Articulated Trucks	91	91	91
% Articulated Trucks	29.8%	29.8%	29.8%
Buses and Single-Unit Trucks	18	18	18
% Buses and Single-Unit Trucks	5.9%	5.9%	5.9%

*T: Thru

MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021

Full Length (12 AM-12 AM (+1))

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858962, Location: 37.177611, -93.425452



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021

AM Peak (Jul 29 2021 9:15AM - 10:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858962, Location: 37.177611, -93.425452



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	App	Int
2021-07-29 9:15AM	4	4	4
9:30AM	5	5	5
9:45AM	6	6	6
10:00AM	5	5	5
Total	20	20	20
% Approach	100%	-	-
% Total	100%	100%	-
PHF	0.833	0.833	0.833
Lights	15	15	15
% Lights	75.0%	75.0%	75.0%
Articulated Trucks	2	2	2
% Articulated Trucks	10.0%	10.0%	10.0%
Buses and Single-Unit Trucks	3	3	3
% Buses and Single-Unit Trucks	15.0%	15.0%	15.0%

*T: Thru

MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021

AM Peak (Jul 29 2021 9:15AM - 10:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858962, Location: 37.177611, -93.425452



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021

Midday Peak (Jul 29 2021 1PM - 2 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858962, Location: 37.177611, -93.425452



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	App	Int
2021-07-29 1:00PM	6	6	6
1:15PM	7	7	7
1:30PM	6	6	6
1:45PM	7	7	7
Total	26	26	26
% Approach	100%	-	-
% Total	100%	100%	-
PHF	0.929	0.929	0.929
Lights	19	19	19
% Lights	73.1%	73.1%	73.1%
Articulated Trucks	6	6	6
% Articulated Trucks	23.1%	23.1%	23.1%
Buses and Single-Unit Trucks	1	1	1
% Buses and Single-Unit Trucks	3.8%	3.8%	3.8%

*T: Thru

MM / US-360 WB Ramps On - ATR
Thu Jul 29, 2021
Midday Peak (Jul 29 2021 1PM - 2 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452



MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021

PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858962, Location: 37.177611, -93.425452



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	App	Int
2021-07-29 4:30PM	7	7	7
4:45PM	8	8	8
5:00PM	7	7	7
5:15PM	5	5	5
Total	27	27	27
% Approach	100%	-	-
% Total	100%	100%	-
PHF	0.844	0.844	0.844
Lights	17	17	17
% Lights	63.0%	63.0%	63.0%
Articulated Trucks	8	8	8
% Articulated Trucks	29.6%	29.6%	29.6%
Buses and Single-Unit Trucks	2	2	2
% Buses and Single-Unit Trucks	7.4%	7.4%	7.4%

*T: Thru

MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021

PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Channels

ID: 858962, Location: 37.177611, -93.425452



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



1 - South State Highway MM & West Carnahan S... - TMC

Thu Jul 29, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010599, Location: 37.181519, -93.423796



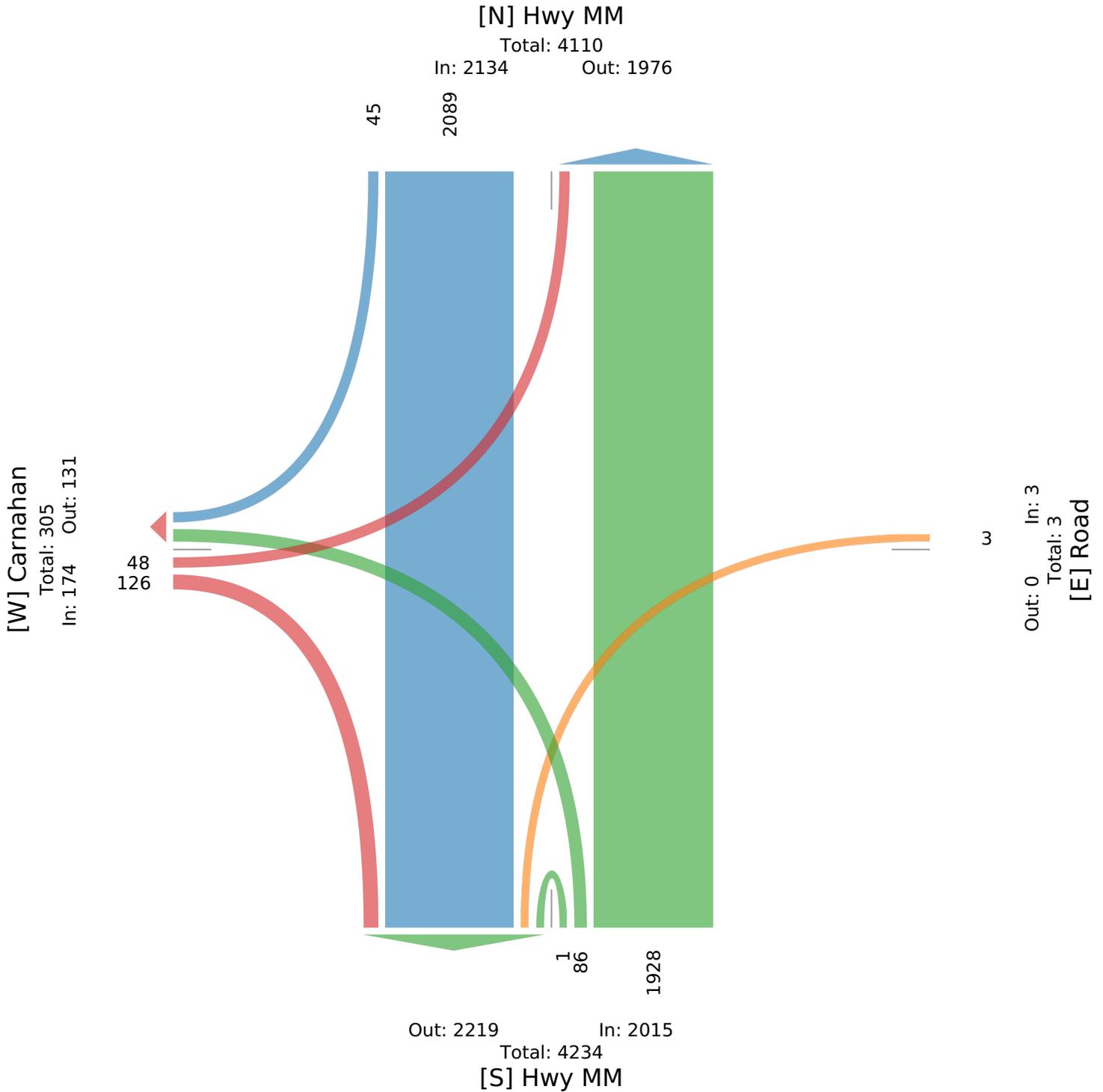
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy MM Southbound					Road Westbound					Hwy MM Northbound					Carnahan Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 7:00AM	5	111	0	0	116	0	0	0	0	0	0	117	9	0	126	5	0	1	0	6	248
7:15AM	9	109	0	0	118	0	0	0	0	0	0	145	8	0	153	6	0	1	0	7	278
7:30AM	4	144	0	0	148	0	0	0	0	0	0	151	10	0	161	4	0	2	0	6	315
7:45AM	6	124	0	0	130	0	0	0	0	0	0	124	8	0	132	10	0	3	0	13	275
Hourly Total	24	488	0	0	512	0	0	0	0	0	0	537	35	0	572	25	0	7	0	32	1116
8:00AM	8	94	0	0	102	0	0	0	0	0	0	118	11	0	129	9	0	1	0	10	241
8:15AM	3	114	0	0	117	0	0	0	0	0	0	94	13	0	107	7	0	3	0	10	234
8:30AM	2	95	0	0	97	0	0	1	0	1	0	79	4	0	83	5	0	2	0	7	188
8:45AM	1	82	0	0	83	0	0	0	0	0	0	84	3	0	87	9	0	4	0	13	183
Hourly Total	14	385	0	0	399	0	0	1	0	1	0	375	31	0	406	30	0	10	0	40	846
4:00PM	0	138	0	0	138	0	0	0	0	0	0	120	3	0	123	11	0	5	0	16	277
4:15PM	1	150	0	0	151	0	0	1	0	1	0	102	4	0	106	7	0	4	0	11	269
4:30PM	1	150	0	0	151	0	0	0	0	0	0	146	4	0	150	13	0	3	0	16	317
4:45PM	0	178	0	0	178	0	0	1	0	1	0	127	2	1	130	9	0	5	0	14	323
Hourly Total	2	616	0	0	618	0	0	2	0	2	0	495	13	1	509	40	0	17	0	57	1186
5:00PM	0	181	0	0	181	0	0	0	0	0	0	142	2	0	144	18	0	1	0	19	344
5:15PM	0	159	0	0	159	0	0	0	0	0	0	157	0	0	157	3	0	2	0	5	321
5:30PM	3	137	0	0	140	0	0	0	0	0	0	115	3	0	118	5	0	9	0	14	272
5:45PM	2	123	0	0	125	0	0	0	0	0	0	107	2	0	109	5	0	2	0	7	241
Hourly Total	5	600	0	0	605	0	0	0	0	0	0	521	7	0	528	31	0	14	0	45	1178
Total	45	2089	0	0	2134	0	0	3	0	3	0	1928	86	1	2015	126	0	48	0	174	4326
% Approach	2.1%	97.9%	0%	0%	-	0%	0%	100%	0%	-	0%	95.7%	4.3%	0%	-	72.4%	0%	27.6%	0%	-	-
% Total	1.0%	48.3%	0%	0%	49.3%	0%	0%	0.1%	0%	0.1%	0%	44.6%	2.0%	0%	46.6%	2.9%	0%	1.1%	0%	4.0%	-
Lights	36	1900	0	0	1936	0	0	3	0	3	0	1729	53	1	1783	98	0	40	0	138	3860
% Lights	80.0%	91.0%	0%	0%	90.7%	0%	0%	100%	0%	100%	0%	89.7%	61.6%	100%	88.5%	77.8%	0%	83.3%	0%	79.3%	89.2%
Articulated Trucks	2	65	0	0	67	0	0	0	0	0	0	64	5	0	69	4	0	1	0	5	141
% Articulated Trucks	4.4%	3.1%	0%	0%	3.1%	0%	0%	0%	0%	0%	0%	3.3%	5.8%	0%	3.4%	3.2%	0%	2.1%	0%	2.9%	3.3%
Buses and Single-Unit Trucks	7	124	0	0	131	0	0	0	0	0	0	135	28	0	163	24	0	7	0	31	325
% Buses and Single-Unit Trucks	15.6%	5.9%	0%	0%	6.1%	0%	0%	0%	0%	0%	0%	7.0%	32.6%	0%	8.1%	19.0%	0%	14.6%	0%	17.8%	7.5%

*L: Left, R: Right, T: Thru, U: U-Turn

1 - South State Highway MM & West Carnahan S... - TMC
 Thu Jul 29, 2021
 Full Length ()
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010599, Location: 37.181519, -93.423796



1 - South State Highway MM & West Carnahan S... - TMC

Thu Jul 29, 2021

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010599, Location: 37.181519, -93.423796



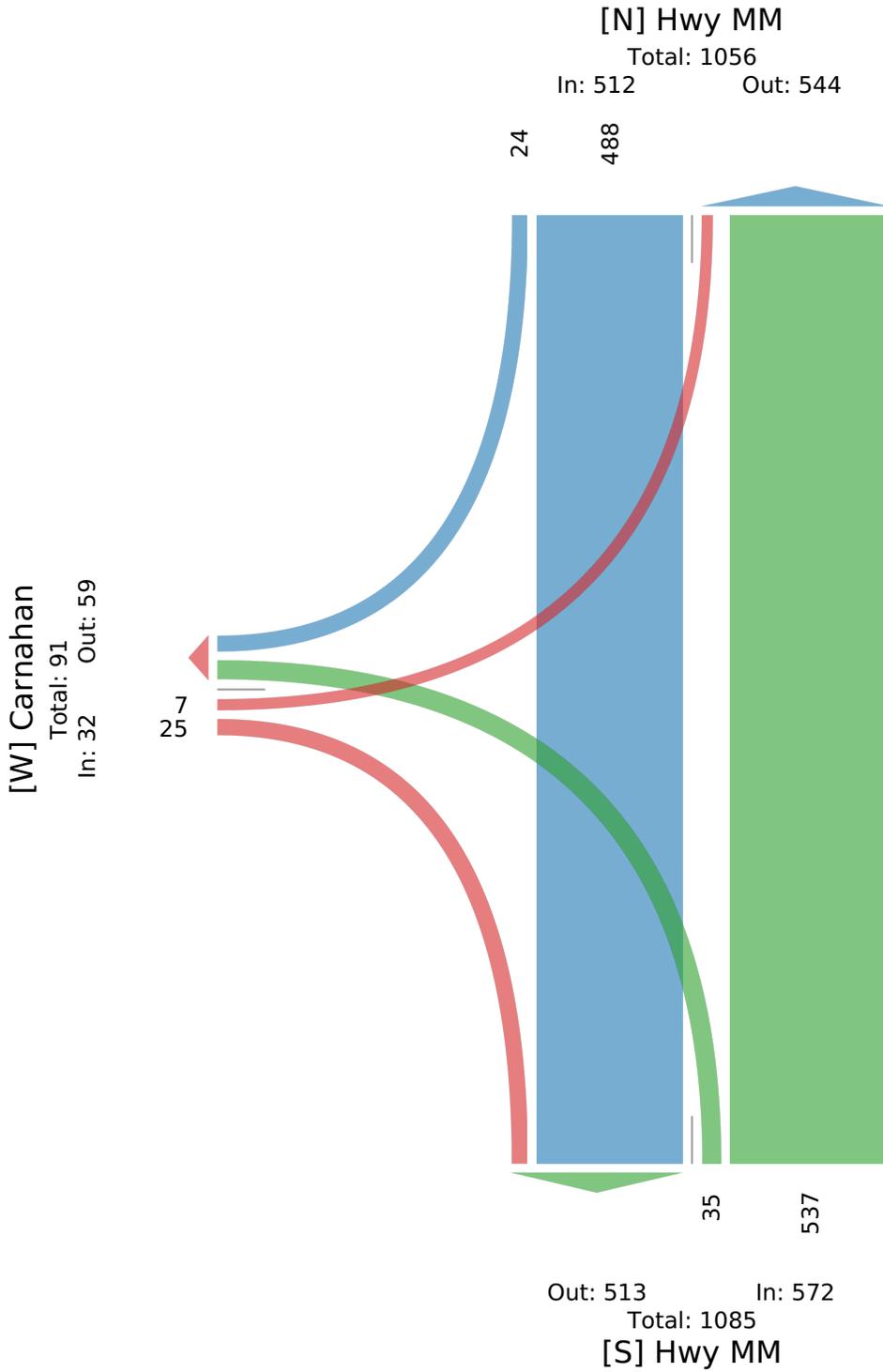
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy MM Southbound					Road Westbound					Hwy MM Northbound					Carnahan Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 7:00AM	5	111	0	0	116	0	0	0	0	0	0	117	9	0	126	5	0	1	0	6	248
7:15AM	9	109	0	0	118	0	0	0	0	0	0	145	8	0	153	6	0	1	0	7	278
7:30AM	4	144	0	0	148	0	0	0	0	0	0	151	10	0	161	4	0	2	0	6	315
7:45AM	6	124	0	0	130	0	0	0	0	0	0	124	8	0	132	10	0	3	0	13	275
Total	24	488	0	0	512	0	0	0	0	0	0	537	35	0	572	25	0	7	0	32	1116
% Approach	4.7%	95.3%	0%	0%	-	0%	0%	0%	0%	-	0%	93.9%	6.1%	0%	-	78.1%	0%	21.9%	0%	-	-
% Total	2.2%	43.7%	0%	0%	45.9%	0%	0%	0%	0%	0%	0%	48.1%	3.1%	0%	51.3%	2.2%	0%	0.6%	0%	2.9%	-
PHF	0.667	0.847	-	-	0.865	-	-	-	-	-	-	0.889	0.875	-	0.888	0.625	-	0.583	-	0.615	0.886
Lights	20	424	0	0	444	0	0	0	0	0	0	478	29	0	507	18	0	4	0	22	973
% Lights	83.3%	86.9%	0%	0%	86.7%	0%	0%	0%	0%	-	0%	89.0%	82.9%	0%	88.6%	72.0%	0%	57.1%	0%	68.8%	87.2%
Articulated Trucks	2	24	0	0	26	0	0	0	0	0	0	23	1	0	24	2	0	1	0	3	53
% Articulated Trucks	8.3%	4.9%	0%	0%	5.1%	0%	0%	0%	0%	-	0%	4.3%	2.9%	0%	4.2%	8.0%	0%	14.3%	0%	9.4%	4.7%
Buses and Single-Unit Trucks	2	40	0	0	42	0	0	0	0	0	0	36	5	0	41	5	0	2	0	7	90
% Buses and Single-Unit Trucks	8.3%	8.2%	0%	0%	8.2%	0%	0%	0%	0%	-	0%	6.7%	14.3%	0%	7.2%	20.0%	0%	28.6%	0%	21.9%	8.1%

* L: Left, R: Right, T: Thru, U: U-Turn

1 - South State Highway MM & West Carnahan S... - TMC
 Thu Jul 29, 2021
 AM Peak (7 AM - 8 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010599, Location: 37.181519, -93.423796



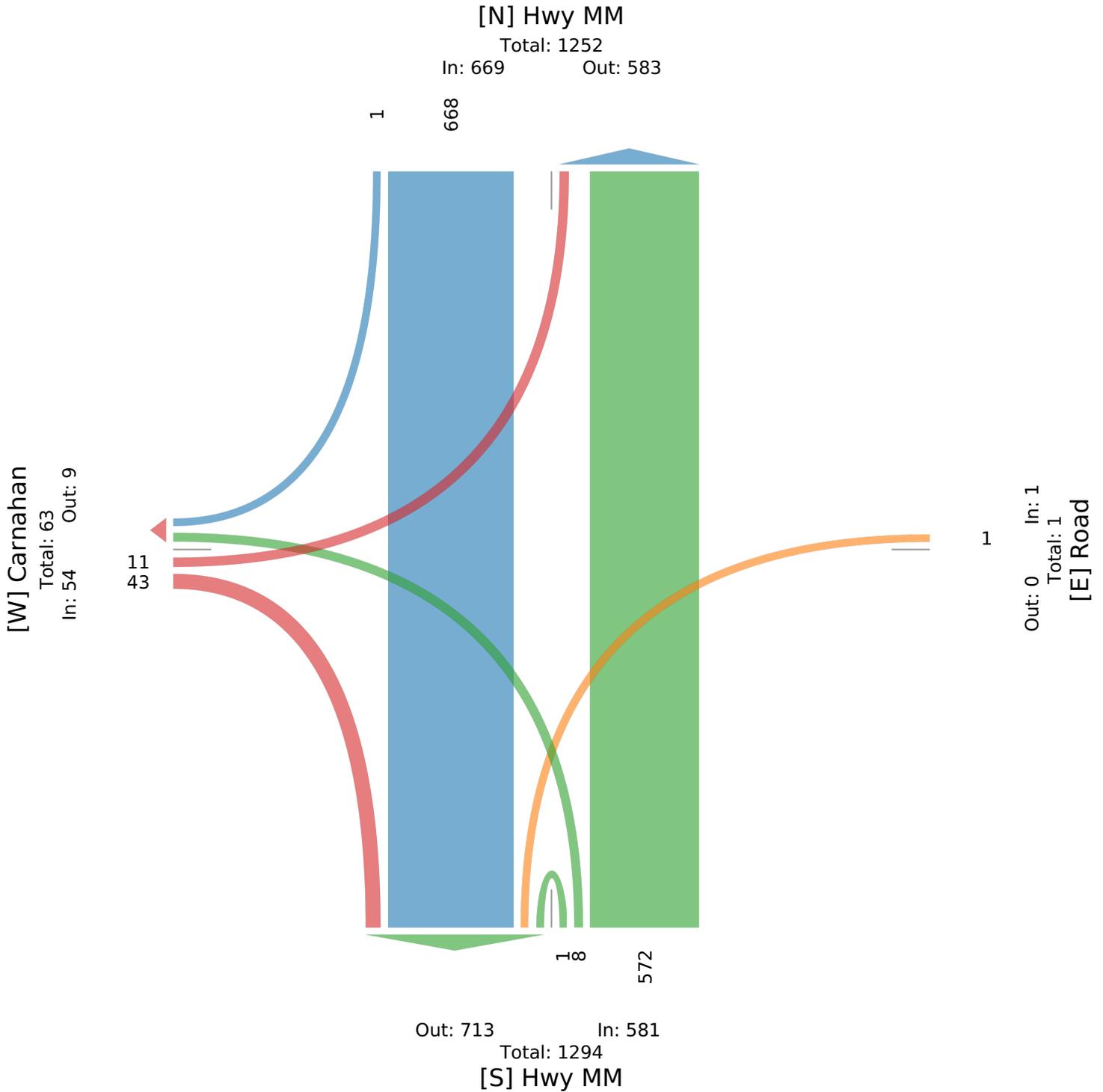
1 - South State Highway MM & West Carnahan S... - TMC
 Thu Jul 29, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010599, Location: 37.181519, -93.423796



Leg Direction	Hwy MM Southbound					Road Westbound					Hwy MM Northbound					Carnahan Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 4:30PM	1	150	0	0	151	0	0	0	0	0	0	146	4	0	150	13	0	3	0	16	317
4:45PM	0	178	0	0	178	0	0	1	0	1	0	127	2	1	130	9	0	5	0	14	323
5:00PM	0	181	0	0	181	0	0	0	0	0	0	142	2	0	144	18	0	1	0	19	344
5:15PM	0	159	0	0	159	0	0	0	0	0	0	157	0	0	157	3	0	2	0	5	321
Total	1	668	0	0	669	0	0	1	0	1	0	572	8	1	581	43	0	11	0	54	1305
% Approach	0.1%	99.9%	0%	0%	-	0%	0%	100%	0%	-	0%	98.5%	1.4%	0.2%	-	79.6%	0%	20.4%	0%	-	-
% Total	0.1%	51.2%	0%	0%	51.3%	0%	0%	0.1%	0%	0.1%	0%	43.8%	0.6%	0.1%	44.5%	3.3%	0%	0.8%	0%	4.1%	-
PHF	0.250	0.923	-	-	0.924	-	-	0.250	-	0.250	-	0.911	0.500	0.250	0.925	0.597	-	0.550	-	0.711	0.948
Lights	1	634	0	0	635	0	0	1	0	1	0	529	3	1	533	35	0	11	0	46	1215
% Lights	100%	94.9%	0%	0%	94.9%	0%	0%	100%	0%	100%	0%	92.5%	37.5%	100%	91.7%	81.4%	0%	100%	0%	85.2%	93.1%
Articulated Trucks	0	10	0	0	10	0	0	0	0	0	0	11	2	0	13	1	0	0	0	1	24
% Articulated Trucks	0%	1.5%	0%	0%	1.5%	0%	0%	0%	0%	0%	0%	1.9%	25.0%	0%	2.2%	2.3%	0%	0%	0%	1.9%	1.8%
Buses and Single-Unit Trucks	0	24	0	0	24	0	0	0	0	0	0	32	3	0	35	7	0	0	0	7	66
% Buses and Single-Unit Trucks	0%	3.6%	0%	0%	3.6%	0%	0%	0%	0%	0%	0%	5.6%	37.5%	0%	6.0%	16.3%	0%	0%	0%	13.0%	5.1%

* L: Left, R: Right, T: Thru, U: U-Turn

1 - South State Highway MM & West Carnahan S... - TMC
 Thu Jul 29, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010599, Location: 37.181519, -93.423796



2 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010600, Location: 37.18389, -93.423639



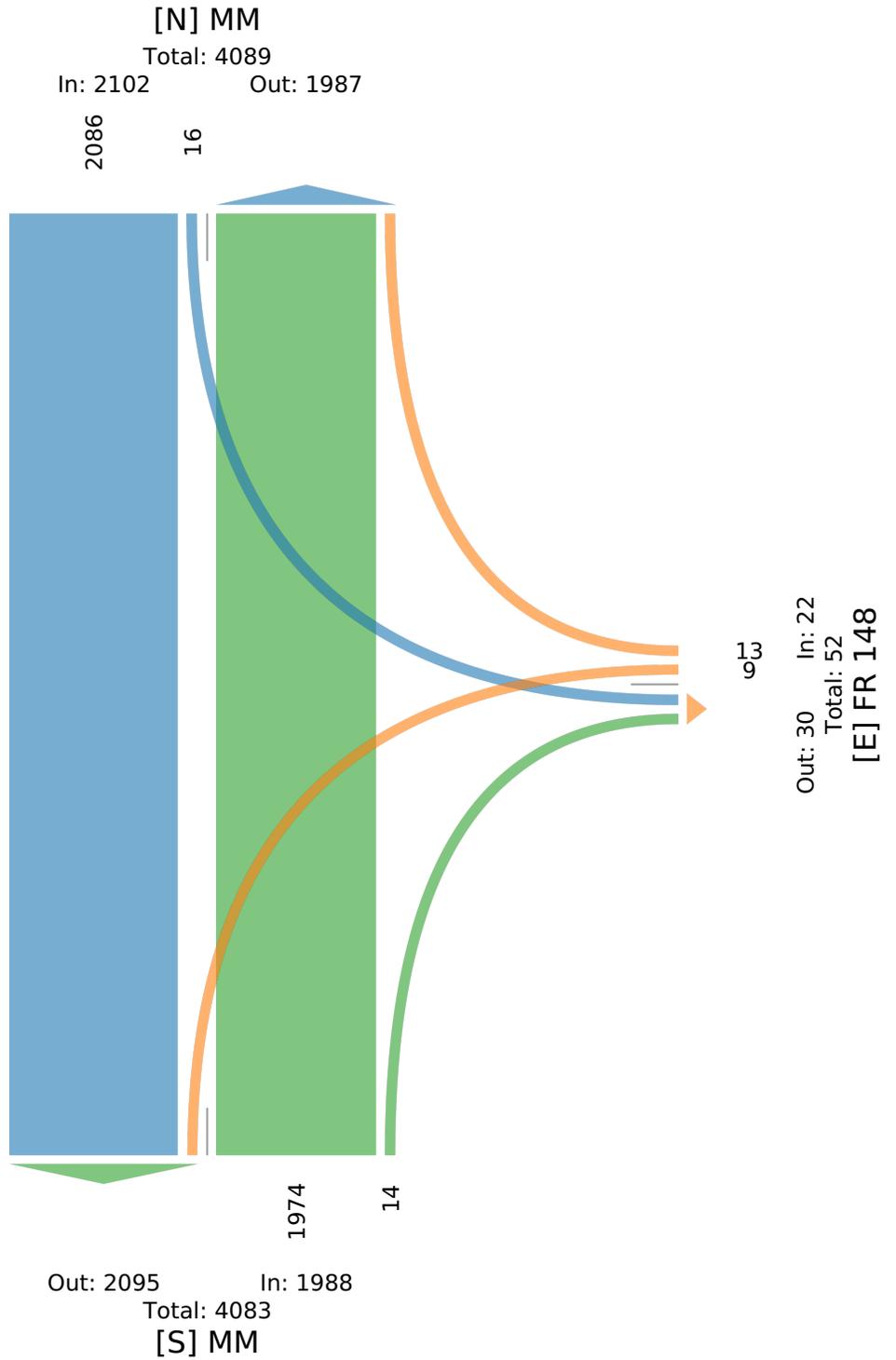
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				FR 148 Westbound				MM Northbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2021-07-29 7:00AM	109	1	0	110	1	0	0	1	2	117	0	119	230
7:15AM	118	0	0	118	0	0	0	0	1	153	0	154	272
7:30AM	139	0	0	139	2	0	0	2	0	157	0	157	298
7:45AM	132	1	0	133	2	1	0	3	0	125	0	125	261
Hourly Total	498	2	0	500	5	1	0	6	3	552	0	555	1061
8:00AM	100	0	0	100	1	0	0	1	0	118	0	118	219
8:15AM	116	1	0	117	1	0	0	1	2	93	0	95	213
8:30AM	92	0	0	92	0	0	0	0	0	75	0	75	167
8:45AM	77	0	0	77	2	1	0	3	1	84	0	85	165
Hourly Total	385	1	0	386	4	1	0	5	3	370	0	373	764
4:00PM	128	1	0	129	0	1	0	1	1	123	0	124	254
4:15PM	151	1	0	152	1	0	0	1	3	107	0	110	263
4:30PM	151	4	0	155	1	0	0	1	0	150	0	150	306
4:45PM	173	1	0	174	0	3	0	3	0	140	0	140	317
Hourly Total	603	7	0	610	2	4	0	6	4	520	0	524	1140
5:00PM	181	2	0	183	1	0	0	1	1	144	0	145	329
5:15PM	155	2	0	157	0	1	0	1	1	156	0	157	315
5:30PM	141	2	0	143	0	1	0	1	2	119	0	121	265
5:45PM	123	0	0	123	1	1	0	2	0	113	0	113	238
Hourly Total	600	6	0	606	2	3	0	5	4	532	0	536	1147
Total	2086	16	0	2102	13	9	0	22	14	1974	0	1988	4112
% Approach	99.2%	0.8%	0%	-	59.1%	40.9%	0%	-	0.7%	99.3%	0%	-	-
% Total	50.7%	0.4%	0%	51.1%	0.3%	0.2%	0%	0.5%	0.3%	48.0%	0%	48.3%	-
Lights	1903	16	0	1919	13	9	0	22	10	1780	0	1790	3731
% Lights	91.2%	100%	0%	91.3%	100%	100%	0%	100%	71.4%	90.2%	0%	90.0%	90.7%
Articulated Trucks	64	0	0	64	0	0	0	0	1	64	0	65	129
% Articulated Trucks	3.1%	0%	0%	3.0%	0%	0%	0%	0%	7.1%	3.2%	0%	3.3%	3.1%
Buses and Single-Unit Trucks	119	0	0	119	0	0	0	0	3	130	0	133	252
% Buses and Single-Unit Trucks	5.7%	0%	0%	5.7%	0%	0%	0%	0%	21.4%	6.6%	0%	6.7%	6.1%

*L: Left, R: Right, T: Thru, U: U-Turn

2 - South State Highway MM & West Farm Road ... - TMC
 Thu Jul 29, 2021
 Full Length ()
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010600, Location: 37.18389, -93.423639



2 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010600, Location: 37.18389, -93.423639



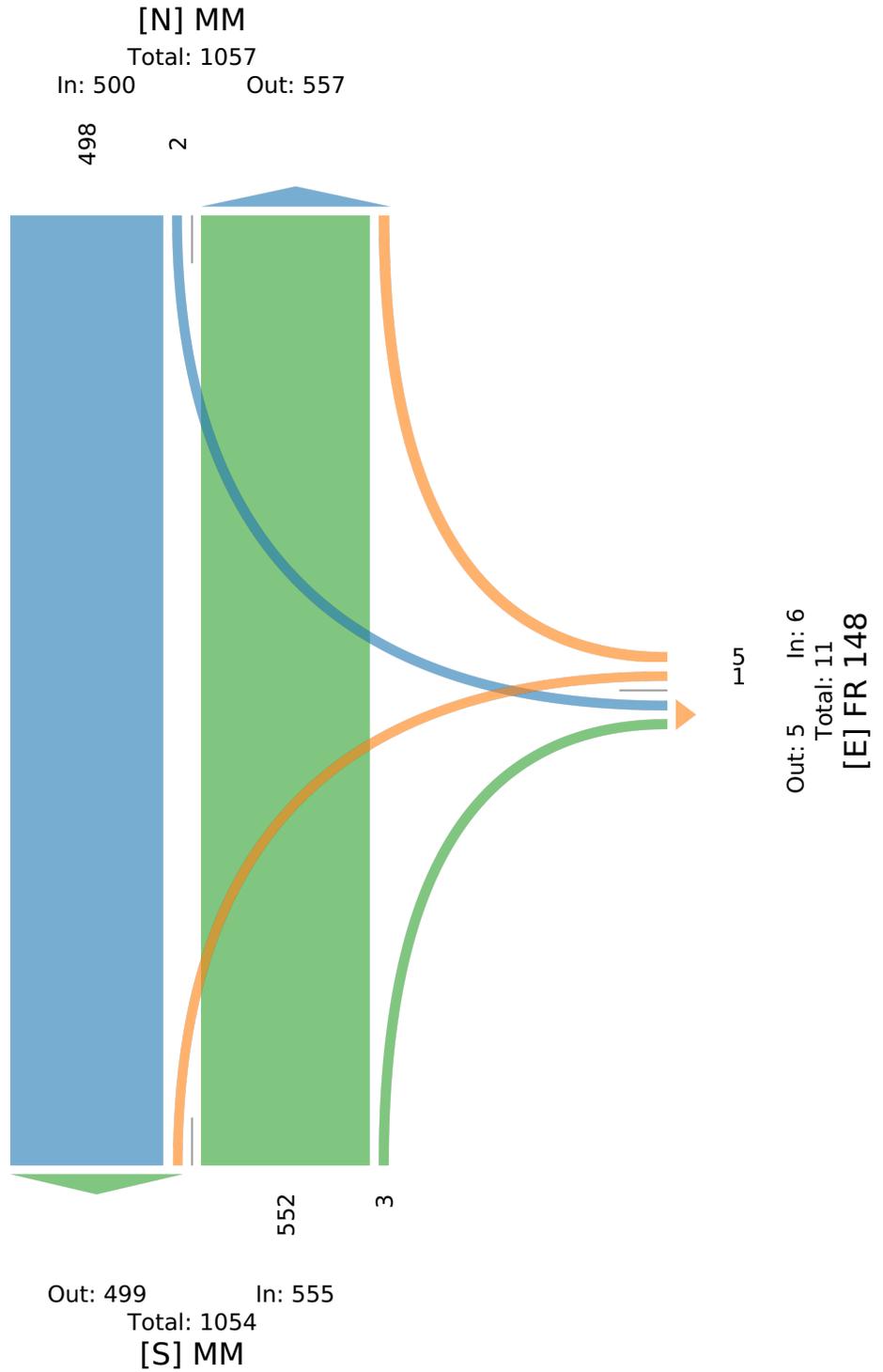
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				FR 148 Westbound				MM Northbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2021-07-29 7:00AM	109	1	0	110	1	0	0	1	2	117	0	119	230
7:15AM	118	0	0	118	0	0	0	0	1	153	0	154	272
7:30AM	139	0	0	139	2	0	0	2	0	157	0	157	298
7:45AM	132	1	0	133	2	1	0	3	0	125	0	125	261
Total	498	2	0	500	5	1	0	6	3	552	0	555	1061
% Approach	99.6%	0.4%	0%	-	83.3%	16.7%	0%	-	0.5%	99.5%	0%	-	-
% Total	46.9%	0.2%	0%	47.1%	0.5%	0.1%	0%	0.6%	0.3%	52.0%	0%	52.3%	-
PHF	0.896	0.500	-	0.899	0.625	0.250	-	0.500	0.375	0.879	-	0.884	0.890
Lights	430	2	0	432	5	1	0	6	2	492	0	494	932
% Lights	86.3%	100%	0%	86.4%	100%	100%	0%	100%	66.7%	89.1%	0%	89.0%	87.8%
Articulated Trucks	26	0	0	26	0	0	0	0	1	24	0	25	51
% Articulated Trucks	5.2%	0%	0%	5.2%	0%	0%	0%	0%	33.3%	4.3%	0%	4.5%	4.8%
Buses and Single-Unit Trucks	42	0	0	42	0	0	0	0	0	36	0	36	78
% Buses and Single-Unit Trucks	8.4%	0%	0%	8.4%	0%	0%	0%	0%	0%	6.5%	0%	6.5%	7.4%

* L: Left, R: Right, T: Thru, U: U-Turn

2 - South State Highway MM & West Farm Road ... - TMC
 Thu Jul 29, 2021
 AM Peak (7 AM - 8 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010600, Location: 37.18389, -93.423639



2 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010600, Location: 37.18389, -93.423639



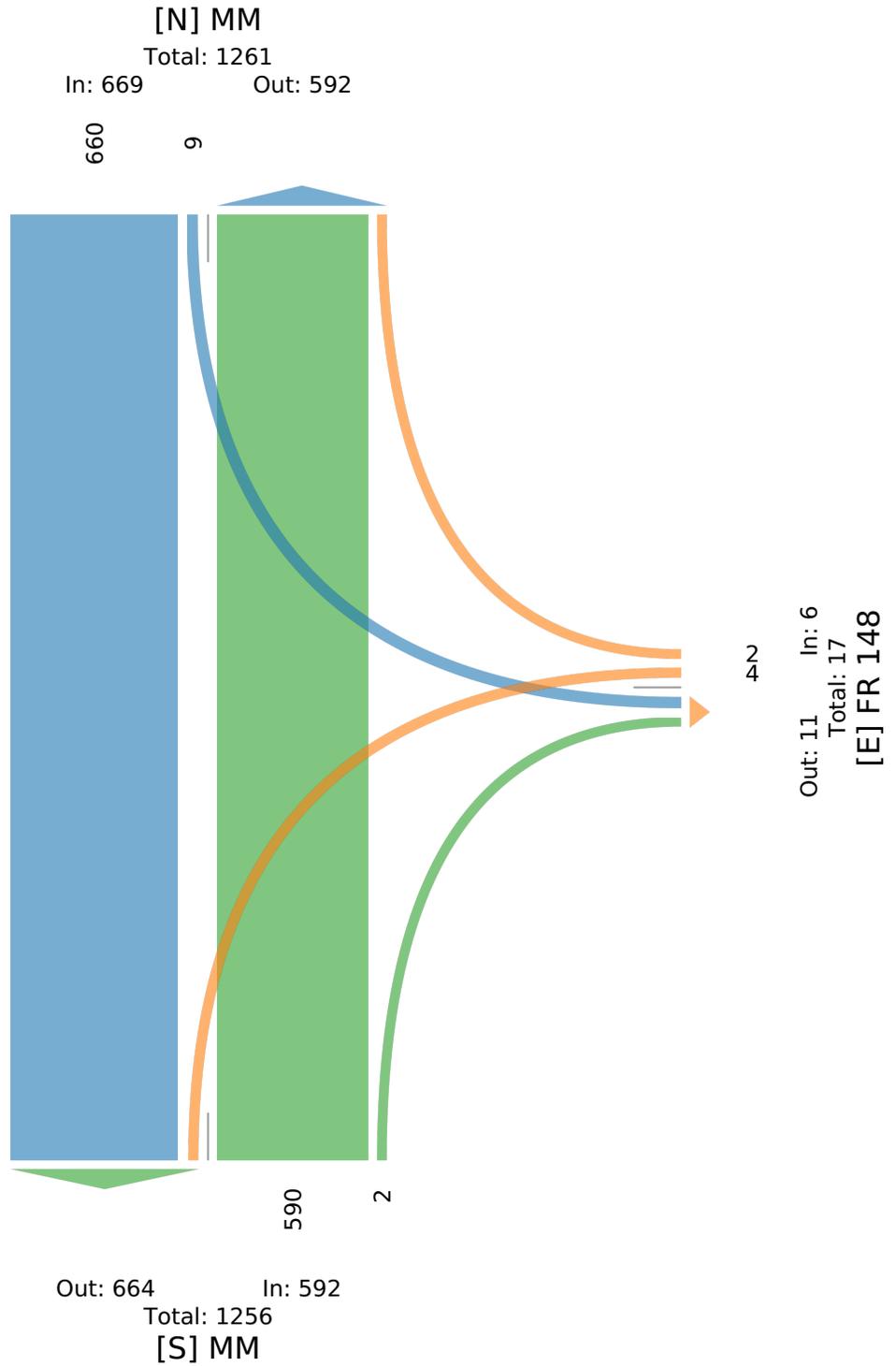
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				FR 148 Westbound				MM Northbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2021-07-29 4:30PM	151	4	0	155	1	0	0	1	0	150	0	150	306
4:45PM	173	1	0	174	0	3	0	3	0	140	0	140	317
5:00PM	181	2	0	183	1	0	0	1	1	144	0	145	329
5:15PM	155	2	0	157	0	1	0	1	1	156	0	157	315
Total	660	9	0	669	2	4	0	6	2	590	0	592	1267
% Approach	98.7%	1.3%	0%	-	33.3%	66.7%	0%	-	0.3%	99.7%	0%	-	-
% Total	52.1%	0.7%	0%	52.8%	0.2%	0.3%	0%	0.5%	0.2%	46.6%	0%	46.7%	-
PHF	0.912	0.563	-	0.914	0.500	0.333	-	0.500	0.500	0.946	-	0.943	0.963
Lights	628	9	0	637	2	4	0	6	2	543	0	545	1188
% Lights	95.2%	100%	0%	95.2%	100%	100%	0%	100%	100%	92.0%	0%	92.1%	93.8%
Articulated Trucks	10	0	0	10	0	0	0	0	0	14	0	14	24
% Articulated Trucks	1.5%	0%	0%	1.5%	0%	0%	0%	0%	0%	2.4%	0%	2.4%	1.9%
Buses and Single-Unit Trucks	22	0	0	22	0	0	0	0	0	33	0	33	55
% Buses and Single-Unit Trucks	3.3%	0%	0%	3.3%	0%	0%	0%	0%	0%	5.6%	0%	5.6%	4.3%

* L: Left, R: Right, T: Thru, U: U-Turn

2 - South State Highway MM & West Farm Road ... - TMC
 Thu Jul 29, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010600, Location: 37.18389, -93.423639



3 - South State Highway MM & West Kings Stre... - TMC

Thu Jul 29, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010601, Location: 37.187851, -93.423539

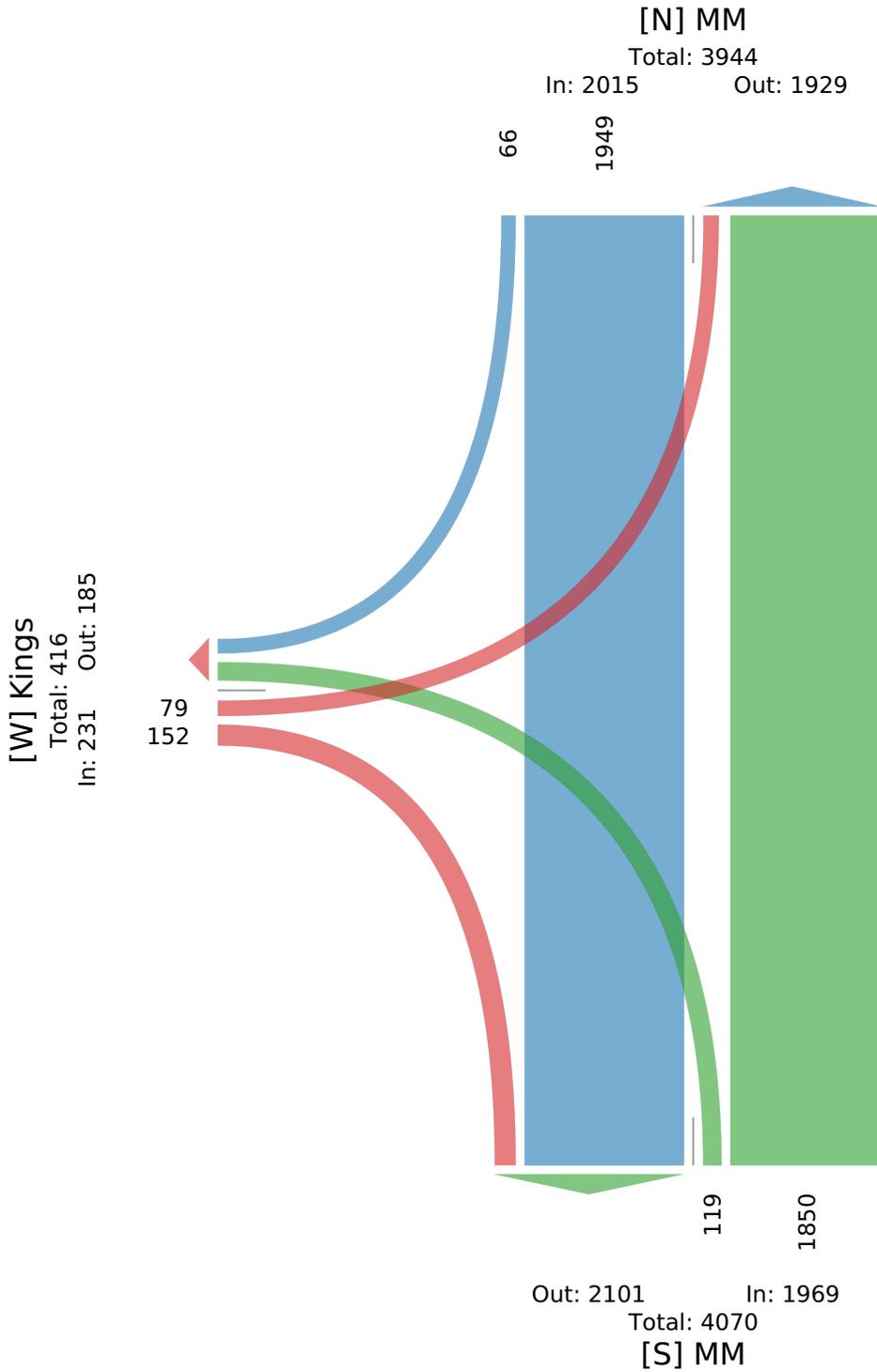


Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				MM Northbound				Kings Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2021-07-29 7:00AM	7	109	0	116	99	9	0	108	6	2	0	8	232
7:15AM	7	114	0	121	134	12	0	146	8	6	0	14	281
7:30AM	8	134	0	142	135	11	0	146	6	1	0	7	295
7:45AM	7	129	0	136	109	23	0	132	6	5	0	11	279
Hourly Total	29	486	0	515	477	55	0	532	26	14	0	40	1087
8:00AM	12	93	0	105	104	13	0	117	5	4	0	9	231
8:15AM	3	108	0	111	85	10	0	95	6	2	0	8	214
8:30AM	5	83	0	88	67	8	0	75	8	4	0	12	175
8:45AM	3	78	0	81	80	4	0	84	4	3	0	7	172
Hourly Total	23	362	0	385	336	35	0	371	23	13	0	36	792
4:00PM	1	113	0	114	118	5	0	123	15	7	0	22	259
4:15PM	3	136	0	139	104	4	0	108	11	3	0	14	261
4:30PM	4	143	0	147	143	5	0	148	15	9	0	24	319
4:45PM	2	155	0	157	147	0	0	147	15	6	0	21	325
Hourly Total	10	547	0	557	512	14	0	526	56	25	0	81	1164
5:00PM	1	161	0	162	142	3	0	145	26	11	0	37	344
5:15PM	2	150	0	152	156	2	0	158	5	4	0	9	319
5:30PM	0	127	0	127	119	6	0	125	11	9	0	20	272
5:45PM	1	116	0	117	108	4	0	112	5	3	0	8	237
Hourly Total	4	554	0	558	525	15	0	540	47	27	0	74	1172
Total	66	1949	0	2015	1850	119	0	1969	152	79	0	231	4215
% Approach	3.3%	96.7%	0%	-	94.0%	6.0%	0%	-	65.8%	34.2%	0%	-	-
% Total	1.6%	46.2%	0%	47.8%	43.9%	2.8%	0%	46.7%	3.6%	1.9%	0%	5.5%	-
Lights	58	1793	0	1851	1682	98	0	1780	126	65	0	191	3822
% Lights	87.9%	92.0%	0%	91.9%	90.9%	82.4%	0%	90.4%	82.9%	82.3%	0%	82.7%	90.7%
Articulated Trucks	3	62	0	65	56	5	0	61	4	6	0	10	136
% Articulated Trucks	4.5%	3.2%	0%	3.2%	3.0%	4.2%	0%	3.1%	2.6%	7.6%	0%	4.3%	3.2%
Buses and Single-Unit Trucks	5	94	0	99	112	16	0	128	22	8	0	30	257
% Buses and Single-Unit Trucks	7.6%	4.8%	0%	4.9%	6.1%	13.4%	0%	6.5%	14.5%	10.1%	0%	13.0%	6.1%

*L: Left, R: Right, T: Thru, U: U-Turn

3 - South State Highway MM & West Kings Stre... - TMC
 Thu Jul 29, 2021
 Full Length ()
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010601, Location: 37.187851, -93.423539



3 - South State Highway MM & West Kings Stre... - TMC

Thu Jul 29, 2021

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010601, Location: 37.187851, -93.423539



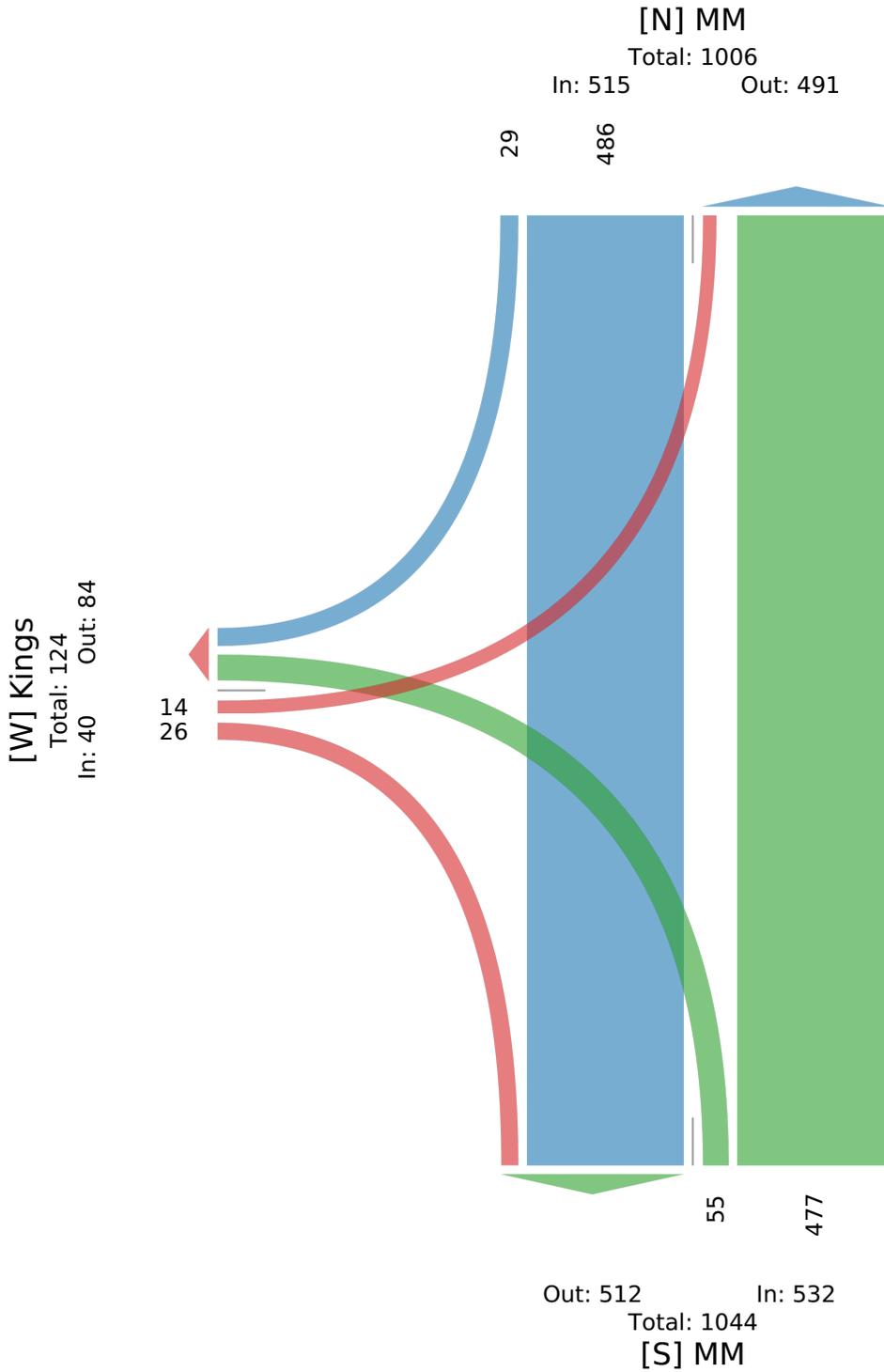
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				MM Northbound				Kings Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2021-07-29 7:00AM	7	109	0	116	99	9	0	108	6	2	0	8	232
7:15AM	7	114	0	121	134	12	0	146	8	6	0	14	281
7:30AM	8	134	0	142	135	11	0	146	6	1	0	7	295
7:45AM	7	129	0	136	109	23	0	132	6	5	0	11	279
Total	29	486	0	515	477	55	0	532	26	14	0	40	1087
% Approach	5.6%	94.4%	0%	-	89.7%	10.3%	0%	-	65.0%	35.0%	0%	-	-
% Total	2.7%	44.7%	0%	47.4%	43.9%	5.1%	0%	48.9%	2.4%	1.3%	0%	3.7%	-
PHF	0.906	0.907	-	0.907	0.883	0.598	-	0.911	0.813	0.583	-	0.714	0.921
Lights	27	431	0	458	422	51	0	473	15	10	0	25	956
% Lights	93.1%	88.7%	0%	88.9%	88.5%	92.7%	0%	88.9%	57.7%	71.4%	0%	62.5%	87.9%
Articulated Trucks	1	24	0	25	22	0	0	22	3	2	0	5	52
% Articulated Trucks	3.4%	4.9%	0%	4.9%	4.6%	0%	0%	4.1%	11.5%	14.3%	0%	12.5%	4.8%
Buses and Single-Unit Trucks	1	31	0	32	33	4	0	37	8	2	0	10	79
% Buses and Single-Unit Trucks	3.4%	6.4%	0%	6.2%	6.9%	7.3%	0%	7.0%	30.8%	14.3%	0%	25.0%	7.3%

* L: Left, R: Right, T: Thru, U: U-Turn

3 - South State Highway MM & West Kings Stre... - TMC
 Thu Jul 29, 2021
 AM Peak (7 AM - 8 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010601, Location: 37.187851, -93.423539



3 - South State Highway MM & West Kings Stre... - TMC

Thu Jul 29, 2021

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010601, Location: 37.187851, -93.423539



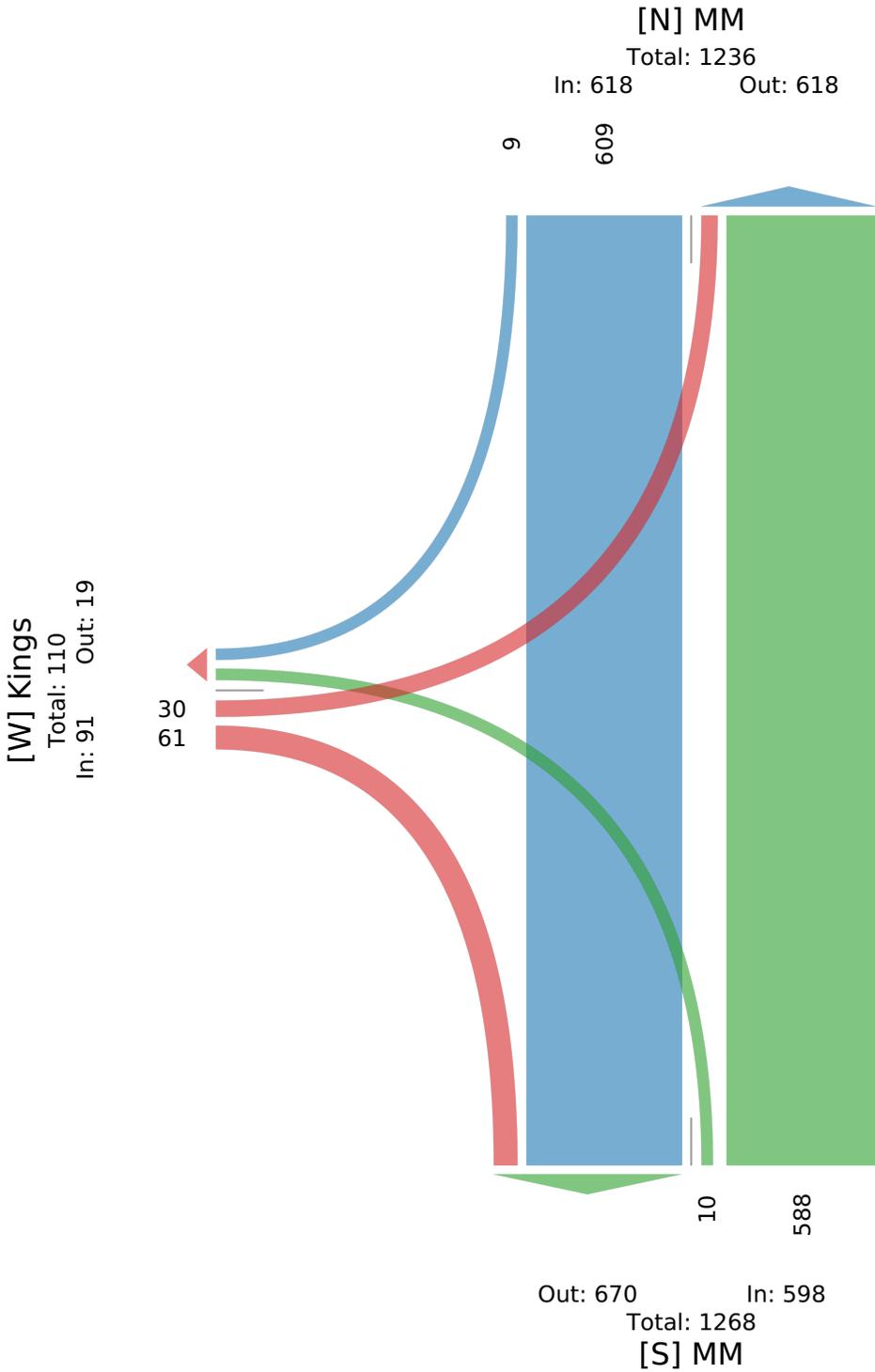
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				MM Northbound				Kings Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2021-07-29 4:30PM	4	143	0	147	143	5	0	148	15	9	0	24	319
4:45PM	2	155	0	157	147	0	0	147	15	6	0	21	325
5:00PM	1	161	0	162	142	3	0	145	26	11	0	37	344
5:15PM	2	150	0	152	156	2	0	158	5	4	0	9	319
Total	9	609	0	618	588	10	0	598	61	30	0	91	1307
% Approach	1.5%	98.5%	0%	-	98.3%	1.7%	0%	-	67.0%	33.0%	0%	-	-
% Total	0.7%	46.6%	0%	47.3%	45.0%	0.8%	0%	45.8%	4.7%	2.3%	0%	7.0%	-
PHF	0.563	0.946	-	0.954	0.942	0.500	-	0.946	0.587	0.682	-	0.615	0.950
Lights	6	579	0	585	547	4	0	551	58	26	0	84	1220
% Lights	66.7%	95.1%	0%	94.7%	93.0%	40.0%	0%	92.1%	95.1%	86.7%	0%	92.3%	93.3%
Articulated Trucks	0	10	0	10	11	2	0	13	0	2	0	2	25
% Articulated Trucks	0%	1.6%	0%	1.6%	1.9%	20.0%	0%	2.2%	0%	6.7%	0%	2.2%	1.9%
Buses and Single-Unit Trucks	3	20	0	23	30	4	0	34	3	2	0	5	62
% Buses and Single-Unit Trucks	33.3%	3.3%	0%	3.7%	5.1%	40.0%	0%	5.7%	4.9%	6.7%	0%	5.5%	4.7%

* L: Left, R: Right, T: Thru, U: U-Turn

3 - South State Highway MM & West Kings Stre... - TMC
 Thu Jul 29, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010601, Location: 37.187851, -93.423539



4 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010602, Location: 37.191205, -93.423394



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				MM Northbound				FR 144 Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2021-07-29 7:00AM	0	111	0	111	108	0	0	108	1	0	0	1	220
7:15AM	1	118	0	119	131	0	0	131	0	2	0	2	252
7:30AM	1	132	0	133	139	0	0	139	0	1	0	1	273
7:45AM	1	139	0	140	107	0	0	107	0	2	0	2	249
Hourly Total	3	500	0	503	485	0	0	485	1	5	0	6	994
8:00AM	0	101	0	101	109	1	0	110	1	0	0	1	212
8:15AM	2	108	0	110	81	0	0	81	0	1	0	1	192
8:30AM	3	85	0	88	73	0	0	73	2	2	0	4	165
8:45AM	1	81	0	82	82	0	0	82	2	0	0	2	166
Hourly Total	6	375	0	381	345	1	0	346	5	3	0	8	735
4:00PM	0	114	0	114	126	0	0	126	2	0	0	2	242
4:15PM	2	136	0	138	111	0	0	111	0	1	0	1	250
4:30PM	1	148	0	149	144	0	0	144	1	1	0	2	295
4:45PM	1	152	0	153	153	0	0	153	0	0	0	0	306
Hourly Total	4	550	0	554	534	0	0	534	3	2	0	5	1093
5:00PM	4	160	0	164	158	0	0	158	1	1	0	2	324
5:15PM	1	147	0	148	159	1	0	160	2	0	0	2	310
5:30PM	2	124	0	126	127	5	0	132	1	0	0	1	259
5:45PM	3	113	0	116	109	2	0	111	0	1	0	1	228
Hourly Total	10	544	0	554	553	8	0	561	4	2	0	6	1121
Total	23	1969	0	1992	1917	9	0	1926	13	12	0	25	3943
% Approach	1.2%	98.8%	0%	-	99.5%	0.5%	0%	-	52.0%	48.0%	0%	-	-
% Total	0.6%	49.9%	0%	50.5%	48.6%	0.2%	0%	48.8%	0.3%	0.3%	0%	0.6%	-
Lights	18	1802	0	1820	1727	9	0	1736	13	11	0	24	3580
% Lights	78.3%	91.5%	0%	91.4%	90.1%	100%	0%	90.1%	100%	91.7%	0%	96.0%	90.8%
Articulated Trucks	5	61	0	66	68	0	0	68	0	1	0	1	135
% Articulated Trucks	21.7%	3.1%	0%	3.3%	3.5%	0%	0%	3.5%	0%	8.3%	0%	4.0%	3.4%
Buses and Single-Unit Trucks	0	106	0	106	122	0	0	122	0	0	0	0	228
% Buses and Single-Unit Trucks	0%	5.4%	0%	5.3%	6.4%	0%	0%	6.3%	0%	0%	0%	0%	5.8%

*L: Left, R: Right, T: Thru, U: U-Turn

4 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

Full Length ()

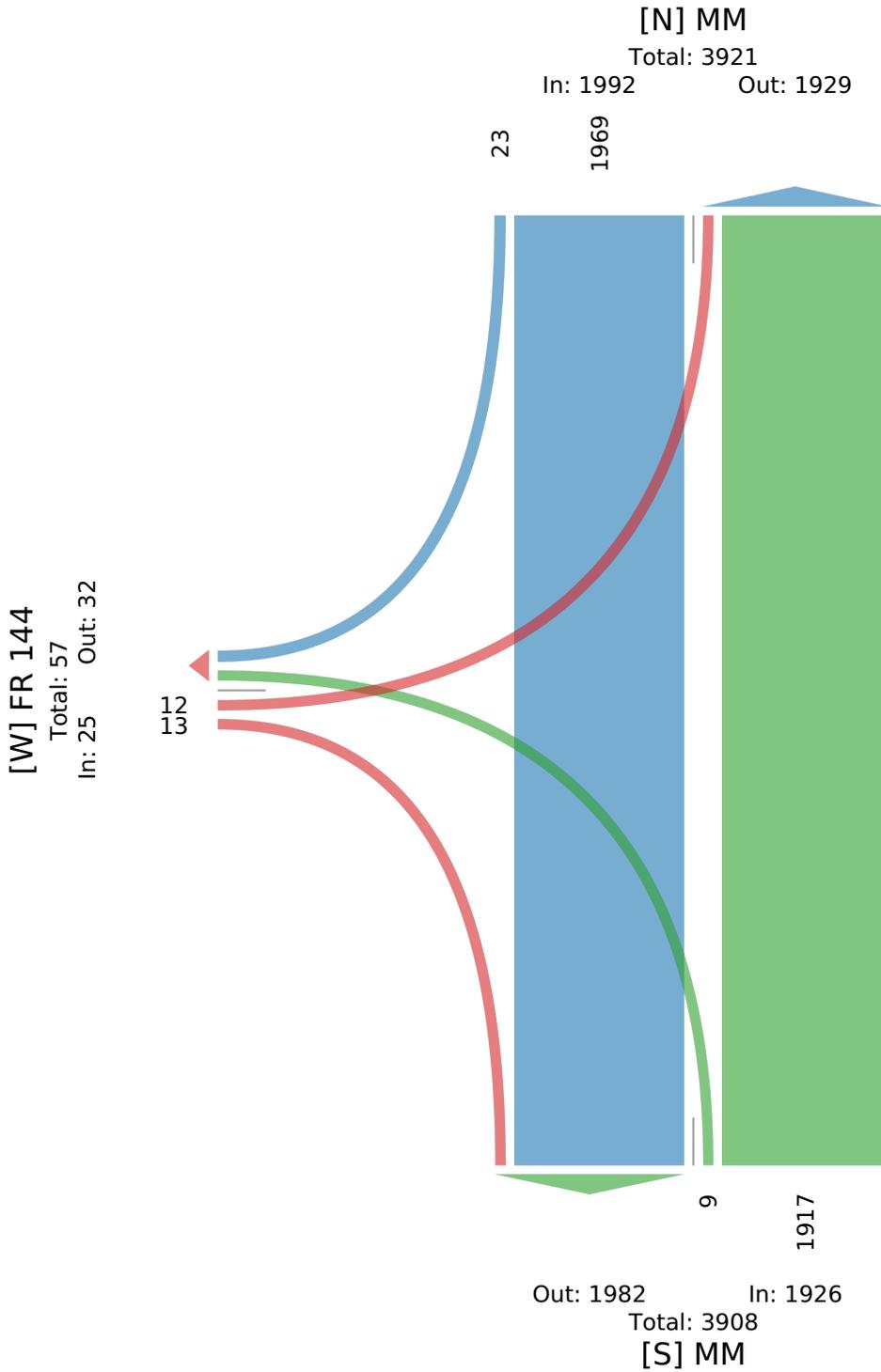
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010602, Location: 37.191205, -93.423394



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



4 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010602, Location: 37.191205, -93.423394



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				MM Northbound				FR 144 Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2021-07-29 7:00AM	0	111	0	111	108	0	0	108	1	0	0	1	220
7:15AM	1	118	0	119	131	0	0	131	0	2	0	2	252
7:30AM	1	132	0	133	139	0	0	139	0	1	0	1	273
7:45AM	1	139	0	140	107	0	0	107	0	2	0	2	249
Total	3	500	0	503	485	0	0	485	1	5	0	6	994
% Approach	0.6%	99.4%	0%	-	100%	0%	0%	-	16.7%	83.3%	0%	-	-
% Total	0.3%	50.3%	0%	50.6%	48.8%	0%	0%	48.8%	0.1%	0.5%	0%	0.6%	-
PHF	0.750	0.899	-	0.898	0.872	-	-	0.872	0.250	0.625	-	0.750	0.910
Lights	0	438	0	438	423	0	0	423	1	5	0	6	867
% Lights	0%	87.6%	0%	87.1%	87.2%	0%	0%	87.2%	100%	100%	0%	100%	87.2%
Articulated Trucks	3	25	0	28	26	0	0	26	0	0	0	0	54
% Articulated Trucks	100%	5.0%	0%	5.6%	5.4%	0%	0%	5.4%	0%	0%	0%	0%	5.4%
Buses and Single-Unit Trucks	0	37	0	37	36	0	0	36	0	0	0	0	73
% Buses and Single-Unit Trucks	0%	7.4%	0%	7.4%	7.4%	0%	0%	7.4%	0%	0%	0%	0%	7.3%

* L: Left, R: Right, T: Thru, U: U-Turn

4 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

AM Peak (7 AM - 8 AM)

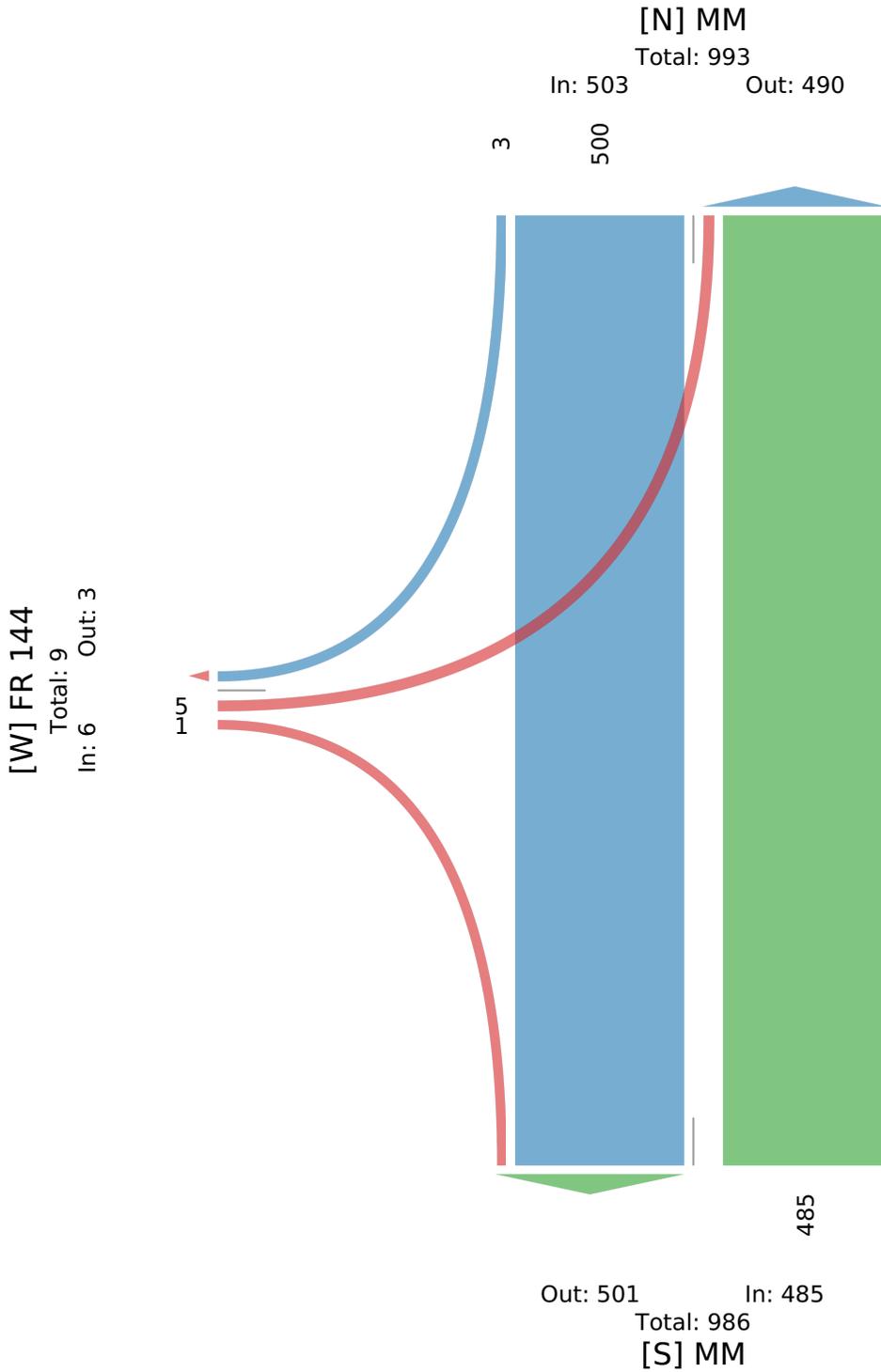
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010602, Location: 37.191205, -93.423394



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



4 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010602, Location: 37.191205, -93.423394



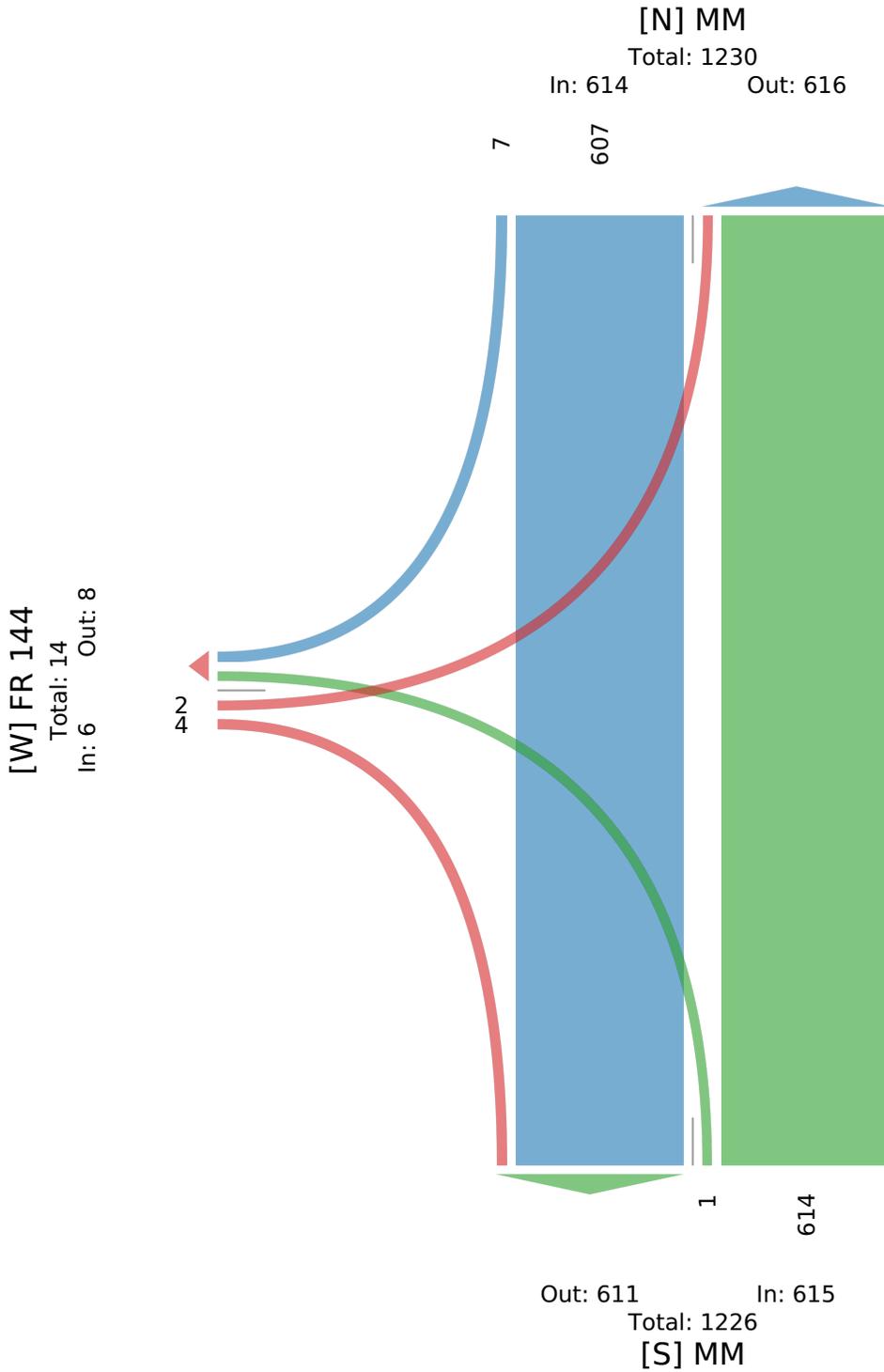
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound				MM Northbound				FR 144 Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2021-07-29 4:30PM	1	148	0	149	144	0	0	144	1	1	0	2	295
4:45PM	1	152	0	153	153	0	0	153	0	0	0	0	306
5:00PM	4	160	0	164	158	0	0	158	1	1	0	2	324
5:15PM	1	147	0	148	159	1	0	160	2	0	0	2	310
Total	7	607	0	614	614	1	0	615	4	2	0	6	1235
% Approach	1.1%	98.9%	0%	-	99.8%	0.2%	0%	-	66.7%	33.3%	0%	-	-
% Total	0.6%	49.1%	0%	49.7%	49.7%	0.1%	0%	49.8%	0.3%	0.2%	0%	0.5%	-
PHF	0.438	0.948	-	0.936	0.965	0.250	-	0.961	0.500	0.500	-	0.750	0.953
Lights	6	576	0	582	568	1	0	569	4	2	0	6	1157
% Lights	85.7%	94.9%	0%	94.8%	92.5%	100%	0%	92.5%	100%	100%	0%	100%	93.7%
Articulated Trucks	1	9	0	10	14	0	0	14	0	0	0	0	24
% Articulated Trucks	14.3%	1.5%	0%	1.6%	2.3%	0%	0%	2.3%	0%	0%	0%	0%	1.9%
Buses and Single-Unit Trucks	0	22	0	22	32	0	0	32	0	0	0	0	54
% Buses and Single-Unit Trucks	0%	3.6%	0%	3.6%	5.2%	0%	0%	5.2%	0%	0%	0%	0%	4.4%

* L: Left, R: Right, T: Thru, U: U-Turn

4 - South State Highway MM & West Farm Road ... - TMC
 Thu Jul 29, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010602, Location: 37.191205, -93.423394



5 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010603, Location: 37.198538, -93.423094



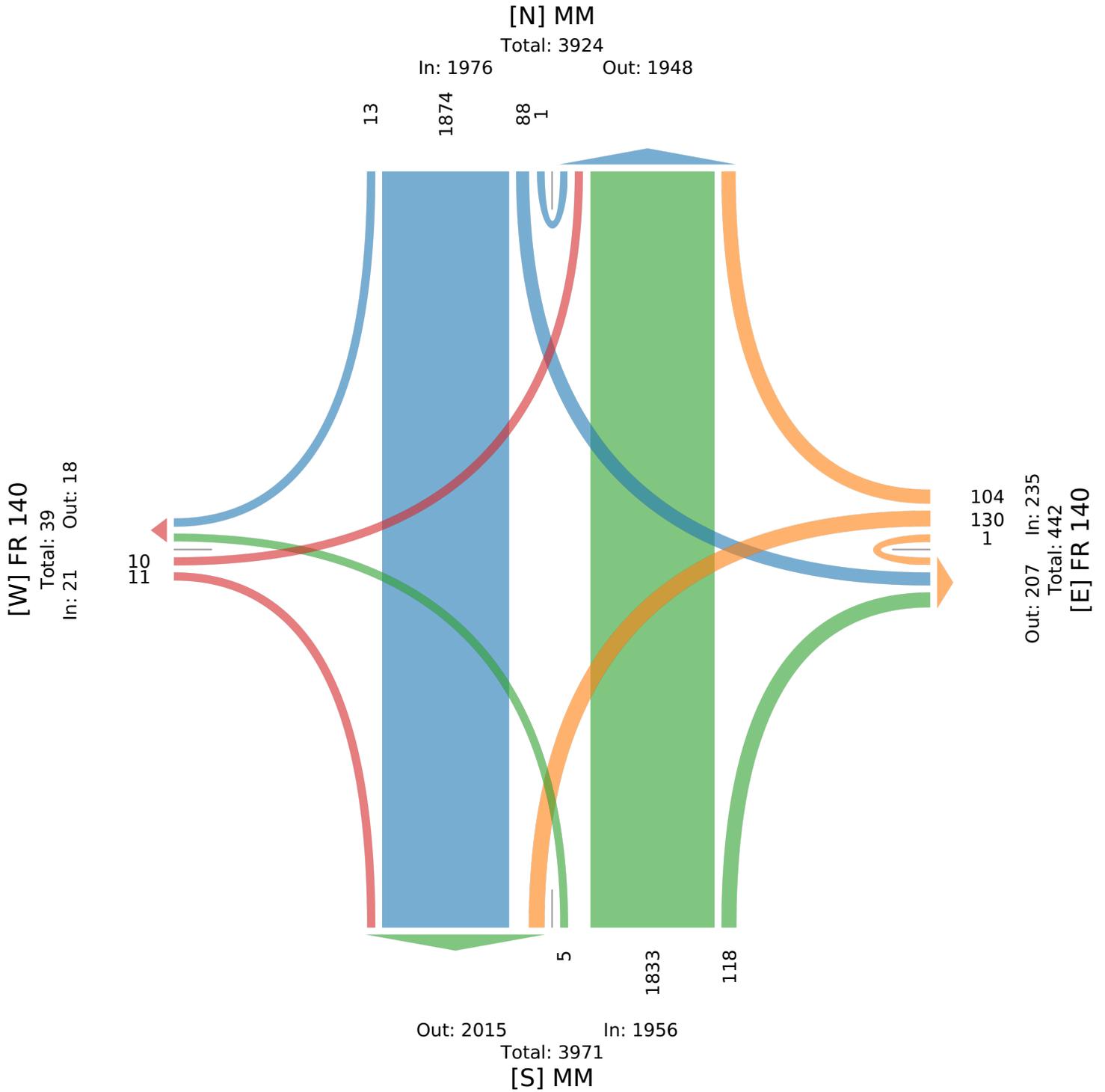
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound					FR 140 Westbound					MM Northbound					FR 140 Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 7:00AM	0	111	2	0	113	3	0	7	0	10	3	100	2	0	105	0	0	0	0	0	228
7:15AM	0	120	2	0	122	5	0	5	0	10	3	138	0	0	141	1	0	0	0	1	274
7:30AM	0	127	1	0	128	5	0	14	0	19	1	137	1	0	139	0	0	0	0	0	286
7:45AM	3	125	2	0	130	12	0	11	0	23	2	106	0	0	108	0	0	2	0	2	263
Hourly Total	3	483	7	0	493	25	0	37	0	62	9	481	3	0	493	1	0	2	0	3	1051
8:00AM	2	102	4	0	108	6	0	5	0	11	2	108	0	0	110	0	0	0	0	0	229
8:15AM	1	102	3	0	106	8	0	11	0	19	1	83	0	0	84	0	0	0	0	0	209
8:30AM	1	79	2	0	82	6	0	9	0	15	4	74	0	0	78	1	0	0	0	1	176
8:45AM	0	79	5	0	84	5	0	5	0	10	3	77	0	0	80	0	0	0	0	0	174
Hourly Total	4	362	14	0	380	25	0	30	0	55	10	342	0	0	352	1	0	0	0	1	788
4:00PM	1	96	9	0	106	7	0	10	0	17	6	123	0	0	129	2	0	2	0	4	256
4:15PM	3	126	11	0	140	7	0	11	1	19	7	107	0	0	114	2	0	1	0	3	276
4:30PM	0	142	5	0	147	3	0	10	0	13	17	132	0	0	149	0	0	0	0	0	309
4:45PM	1	147	10	0	158	6	0	4	0	10	15	134	1	0	150	1	0	1	0	2	320
Hourly Total	5	511	35	0	551	23	0	35	1	59	45	496	1	0	542	5	0	4	0	9	1161
5:00PM	1	152	8	1	162	4	0	10	0	14	16	140	1	0	157	0	0	1	0	1	334
5:15PM	0	137	8	0	145	6	0	5	0	11	16	154	0	0	170	1	0	0	0	1	327
5:30PM	0	121	6	0	127	10	0	9	0	19	10	116	0	0	126	2	0	2	0	4	276
5:45PM	0	108	10	0	118	11	0	4	0	15	12	104	0	0	116	1	0	1	0	2	251
Hourly Total	1	518	32	1	552	31	0	28	0	59	54	514	1	0	569	4	0	4	0	8	1188
Total	13	1874	88	1	1976	104	0	130	1	235	118	1833	5	0	1956	11	0	10	0	21	4188
% Approach	0.7%	94.8%	4.5%	0.1%	-	44.3%	0%	55.3%	0.4%	-	6.0%	93.7%	0.3%	0%	-	52.4%	0%	47.6%	0%	-	-
% Total	0.3%	44.7%	2.1%	0%	47.2%	2.5%	0%	3.1%	0%	5.6%	2.8%	43.8%	0.1%	0%	46.7%	0.3%	0%	0.2%	0%	0.5%	-
Lights	11	1705	84	1	1801	98	0	126	1	225	116	1645	4	0	1765	10	0	8	0	18	3809
% Lights	84.6%	91.0%	95.5%	100%	91.1%	94.2%	0%	96.9%	100%	95.7%	98.3%	89.7%	80.0%	0%	90.2%	90.9%	0%	80.0%	0%	85.7%	91.0%
Articulated Trucks	1	67	1	0	69	2	0	3	0	5	1	64	0	0	65	1	0	1	0	2	141
% Articulated Trucks	7.7%	3.6%	1.1%	0%	3.5%	1.9%	0%	2.3%	0%	2.1%	0.8%	3.5%	0%	0%	3.3%	9.1%	0%	10.0%	0%	9.5%	3.4%
Buses and Single-Unit Trucks	1	102	3	0	106	4	0	1	0	5	1	124	1	0	126	0	0	1	0	1	238
% Buses and Single-Unit Trucks	7.7%	5.4%	3.4%	0%	5.4%	3.8%	0%	0.8%	0%	2.1%	0.8%	6.8%	20.0%	0%	6.4%	0%	0%	10.0%	0%	4.8%	5.7%

*L: Left, R: Right, T: Thru, U: U-Turn

5 - South State Highway MM & West Farm Road ... - TMC
 Thu Jul 29, 2021
 Full Length ()
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010603, Location: 37.198538, -93.423094



5 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010603, Location: 37.198538, -93.423094



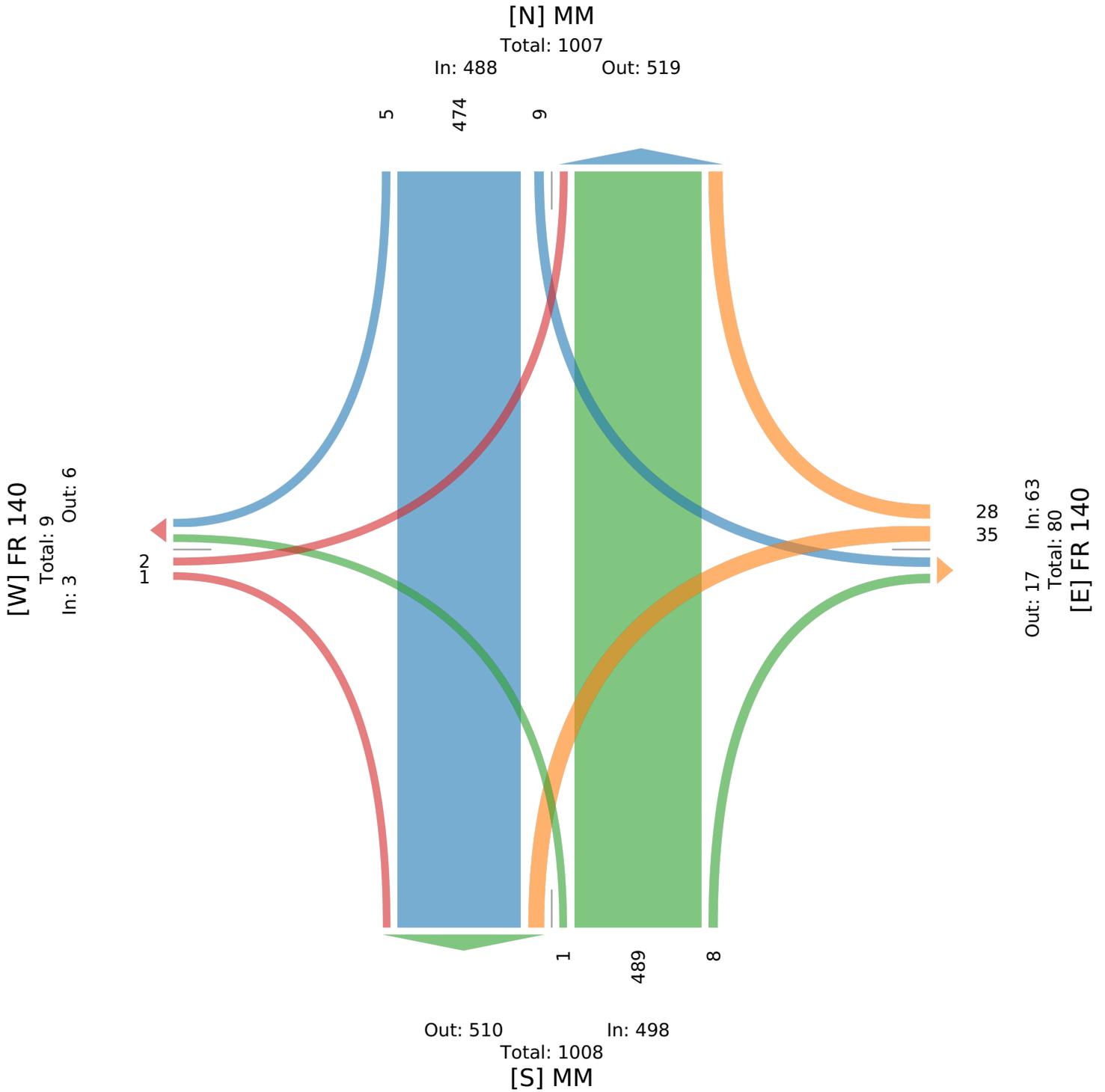
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound					FR 140 Westbound					MM Northbound					FR 140 Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 7:15AM	0	120	2	0	122	5	0	5	0	10	3	138	0	0	141	1	0	0	0	1	274
7:30AM	0	127	1	0	128	5	0	14	0	19	1	137	1	0	139	0	0	0	0	0	286
7:45AM	3	125	2	0	130	12	0	11	0	23	2	106	0	0	108	0	0	2	0	2	263
8:00AM	2	102	4	0	108	6	0	5	0	11	2	108	0	0	110	0	0	0	0	0	229
Total	5	474	9	0	488	28	0	35	0	63	8	489	1	0	498	1	0	2	0	3	1052
% Approach	1.0%	97.1%	1.8%	0%	-	44.4%	0%	55.6%	0%	-	1.6%	98.2%	0.2%	0%	-	33.3%	0%	66.7%	0%	-	-
% Total	0.5%	45.1%	0.9%	0%	46.4%	2.7%	0%	3.3%	0%	6.0%	0.8%	46.5%	0.1%	0%	47.3%	0.1%	0%	0.2%	0%	0.3%	-
PHF	0.417	0.933	0.563	-	0.938	0.583	-	0.625	-	0.685	0.667	0.886	0.250	-	0.883	0.250	-	0.250	-	0.375	0.920
Lights	4	417	9	0	430	25	0	34	0	59	7	422	1	0	430	1	0	2	0	3	922
% Lights	80.0%	88.0%	100%	0%	88.1%	89.3%	0%	97.1%	0%	93.7%	87.5%	86.3%	100%	0%	86.3%	100%	0%	100%	0%	100%	87.6%
Articulated Trucks	0	22	0	0	22	1	0	0	0	1	1	26	0	0	27	0	0	0	0	0	50
% Articulated Trucks	0%	4.6%	0%	0%	4.5%	3.6%	0%	0%	0%	1.6%	12.5%	5.3%	0%	0%	5.4%	0%	0%	0%	0%	0%	4.8%
Buses and Single-Unit Trucks	1	35	0	0	36	2	0	1	0	3	0	41	0	0	41	0	0	0	0	0	80
% Buses and Single-Unit Trucks	20.0%	7.4%	0%	0%	7.4%	7.1%	0%	2.9%	0%	4.8%	0%	8.4%	0%	0%	8.2%	0%	0%	0%	0%	0%	7.6%

* L: Left, R: Right, T: Thru, U: U-Turn

5 - South State Highway MM & West Farm Road ... - TMC
 Thu Jul 29, 2021
 AM Peak (7:15 AM - 8:15 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010603, Location: 37.198538, -93.423094



5 - South State Highway MM & West Farm Road ... - TMC

Thu Jul 29, 2021

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010603, Location: 37.198538, -93.423094



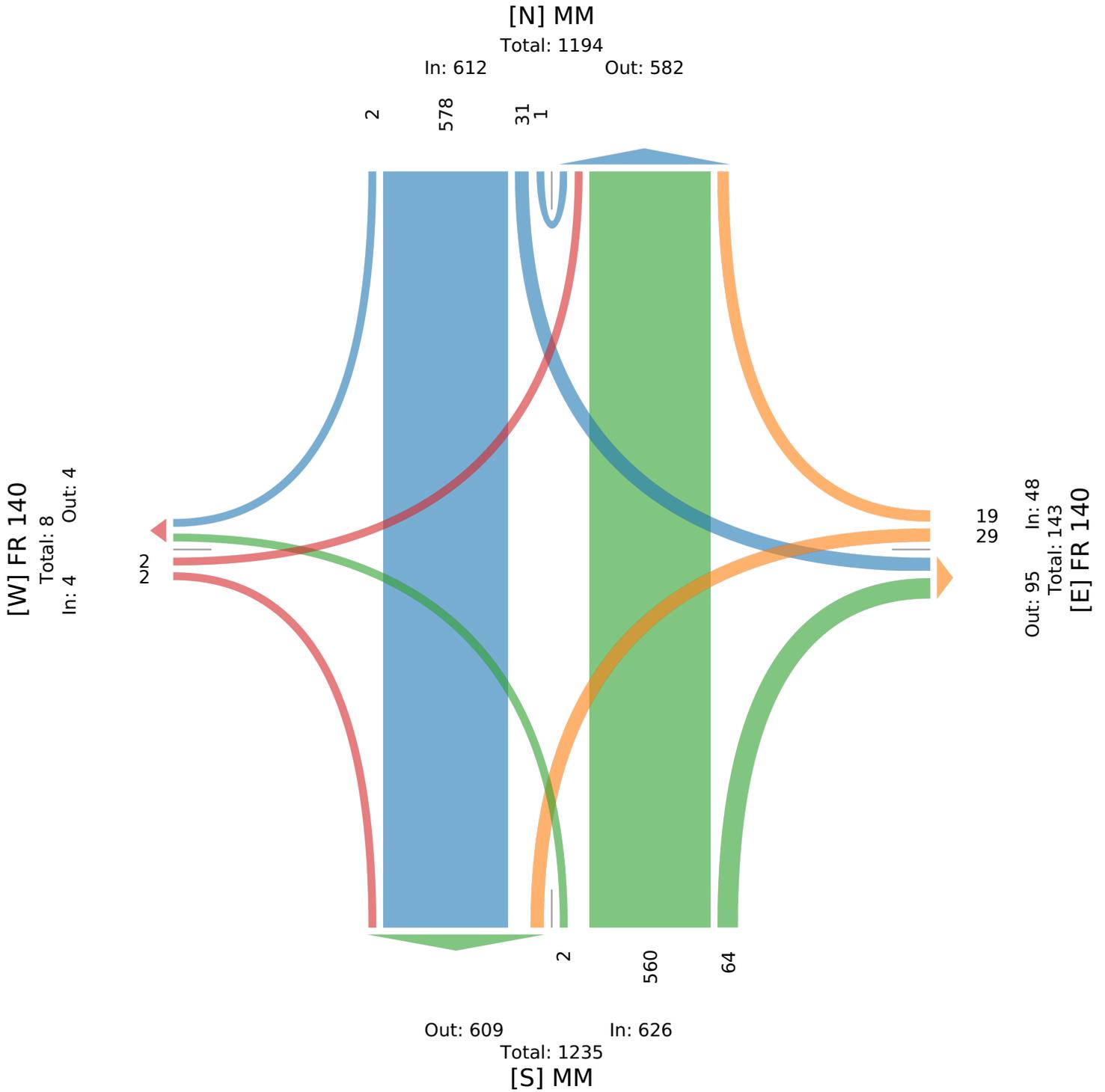
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound					FR 140 Westbound					MM Northbound					FR 140 Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 4:30PM	0	142	5	0	147	3	0	10	0	13	17	132	0	0	149	0	0	0	0	0	309
4:45PM	1	147	10	0	158	6	0	4	0	10	15	134	1	0	150	1	0	1	0	2	320
5:00PM	1	152	8	1	162	4	0	10	0	14	16	140	1	0	157	0	0	1	0	1	334
5:15PM	0	137	8	0	145	6	0	5	0	11	16	154	0	0	170	1	0	0	0	1	327
Total	2	578	31	1	612	19	0	29	0	48	64	560	2	0	626	2	0	2	0	4	1290
% Approach	0.3%	94.4%	5.1%	0.2%	-	39.6%	0%	60.4%	0%	-	10.2%	89.5%	0.3%	0%	-	50.0%	0%	50.0%	0%	-	-
% Total	0.2%	44.8%	2.4%	0.1%	47.4%	1.5%	0%	2.2%	0%	3.7%	5.0%	43.4%	0.2%	0%	48.5%	0.2%	0%	0.2%	0%	0.3%	-
PHF	0.500	0.951	0.775	0.250	0.944	0.792	-	0.725	-	0.857	0.941	0.909	0.500	-	0.921	0.500	-	0.500	-	0.500	0.966
Lights	2	548	30	1	581	19	0	28	0	47	63	515	1	0	579	1	0	0	0	1	1208
% Lights	100%	94.8%	96.8%	100%	94.9%	100%	0%	96.6%	0%	97.9%	98.4%	92.0%	50.0%	0%	92.5%	50.0%	0%	0%	0%	25.0%	93.6%
Articulated Trucks	0	9	0	0	9	0	0	1	0	1	0	12	0	0	12	1	0	1	0	2	24
% Articulated Trucks	0%	1.6%	0%	0%	1.5%	0%	0%	3.4%	0%	2.1%	0%	2.1%	0%	0%	1.9%	50.0%	0%	50.0%	0%	50.0%	1.9%
Buses and Single-Unit Trucks	0	21	1	0	22	0	0	0	0	0	1	33	1	0	35	0	0	1	0	1	58
% Buses and Single-Unit Trucks	0%	3.6%	3.2%	0%	3.6%	0%	0%	0%	0%	0%	1.6%	5.9%	50.0%	0%	5.6%	0%	0%	50.0%	0%	25.0%	4.5%

* L: Left, R: Right, T: Thru, U: U-Turn

5 - South State Highway MM & West Farm Road ... - TMC
 Thu Jul 29, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010603, Location: 37.198538, -93.423094



6 - South State Highway MM & I-44 EB - MERGED - TMC

Thu Jul 29, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010605, Location: 37.200012, -93.423024



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound					ramp eb Westbound					MM Northbound					ramp eb Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 7:00AM	0	109	1	0	110	0	0	0	0	0	56	46	0	0	102	4	0	4	0	8	220
7:15AM	0	118	6	0	124	0	0	0	0	0	94	51	0	0	145	3	0	5	0	8	277
7:30AM	0	122	2	0	124	0	0	0	0	0	78	61	0	0	139	6	0	4	0	10	273
7:45AM	0	128	5	0	133	0	0	0	0	0	57	67	0	0	124	6	0	7	0	13	270
Hourly Total	0	477	14	0	491	0	0	0	0	0	285	225	0	0	510	19	0	20	0	39	1040
8:00AM	0	101	1	0	102	0	0	0	0	0	62	47	0	0	109	6	0	9	0	15	226
8:15AM	0	103	3	0	106	0	0	0	0	0	51	43	0	0	94	4	2	3	0	9	209
8:30AM	0	77	1	0	78	0	0	0	0	0	49	31	0	0	80	3	0	7	0	10	168
8:45AM	0	83	2	0	85	0	0	0	0	0	50	34	0	0	84	1	0	6	0	7	176
Hourly Total	0	364	7	0	371	0	0	0	0	0	212	155	0	0	367	14	2	25	0	41	779
4:00PM	0	104	3	0	107	0	0	0	0	0	48	77	0	0	125	3	0	14	0	17	249
4:15PM	0	134	2	0	136	0	0	0	0	0	42	78	0	0	120	7	1	10	0	18	274
4:30PM	0	143	3	0	146	0	0	0	0	0	56	81	0	0	137	4	0	9	0	13	296
4:45PM	0	157	3	0	160	0	0	0	0	0	52	92	0	0	144	3	0	7	0	10	314
Hourly Total	0	538	11	0	549	0	0	0	0	0	198	328	0	0	526	17	1	40	0	58	1133
5:00PM	0	156	4	0	160	0	0	0	0	0	67	77	0	0	144	5	0	6	0	11	315
5:15PM	0	141	2	0	143	0	0	0	0	0	54	102	0	0	156	5	0	4	0	9	308
5:30PM	0	125	2	0	127	0	0	0	0	0	38	90	0	0	128	3	0	2	0	5	260
5:45PM	0	114	1	0	115	0	0	0	0	0	57	57	0	0	114	5	0	4	0	9	238
Hourly Total	0	536	9	0	545	0	0	0	0	0	216	326	0	0	542	18	0	16	0	34	1121
Total	0	1915	41	0	1956	0	0	0	0	0	911	1034	0	0	1945	68	3	101	0	172	4073
% Approach	0%	97.9%	2.1%	0%	-	0%	0%	0%	0%	-	46.8%	53.2%	0%	0%	-	39.5%	1.7%	58.7%	0%	-	-
% Total	0%	47.0%	1.0%	0%	48.0%	0%	0%	0%	0%	0%	22.4%	25.4%	0%	0%	47.8%	1.7%	0.1%	2.5%	0%	4.2%	-
Lights	0	1750	38	0	1788	0	0	0	0	0	815	933	0	0	1748	59	3	92	0	154	3690
% Lights	0%	91.4%	92.7%	0%	91.4%	0%	0%	0%	0%	-	89.5%	90.2%	0%	0%	89.9%	86.8%	100%	91.1%	0%	89.5%	90.6%
Articulated Trucks	0	62	1	0	63	0	0	0	0	0	55	18	0	0	73	7	0	6	0	13	149
% Articulated Trucks	0%	3.2%	2.4%	0%	3.2%	0%	0%	0%	0%	-	6.0%	1.7%	0%	0%	3.8%	10.3%	0%	5.9%	0%	7.6%	3.7%
Buses and Single-Unit Trucks	0	103	2	0	105	0	0	0	0	0	41	83	0	0	124	2	0	3	0	5	234
% Buses and Single-Unit Trucks	0%	5.4%	4.9%	0%	5.4%	0%	0%	0%	0%	-	4.5%	8.0%	0%	0%	6.4%	2.9%	0%	3.0%	0%	2.9%	5.7%

*L: Left, R: Right, T: Thru, U: U-Turn

6 - South State Highway MM & I-44 EB - MERGED - TMC

Thu Jul 29, 2021

Full Length ()

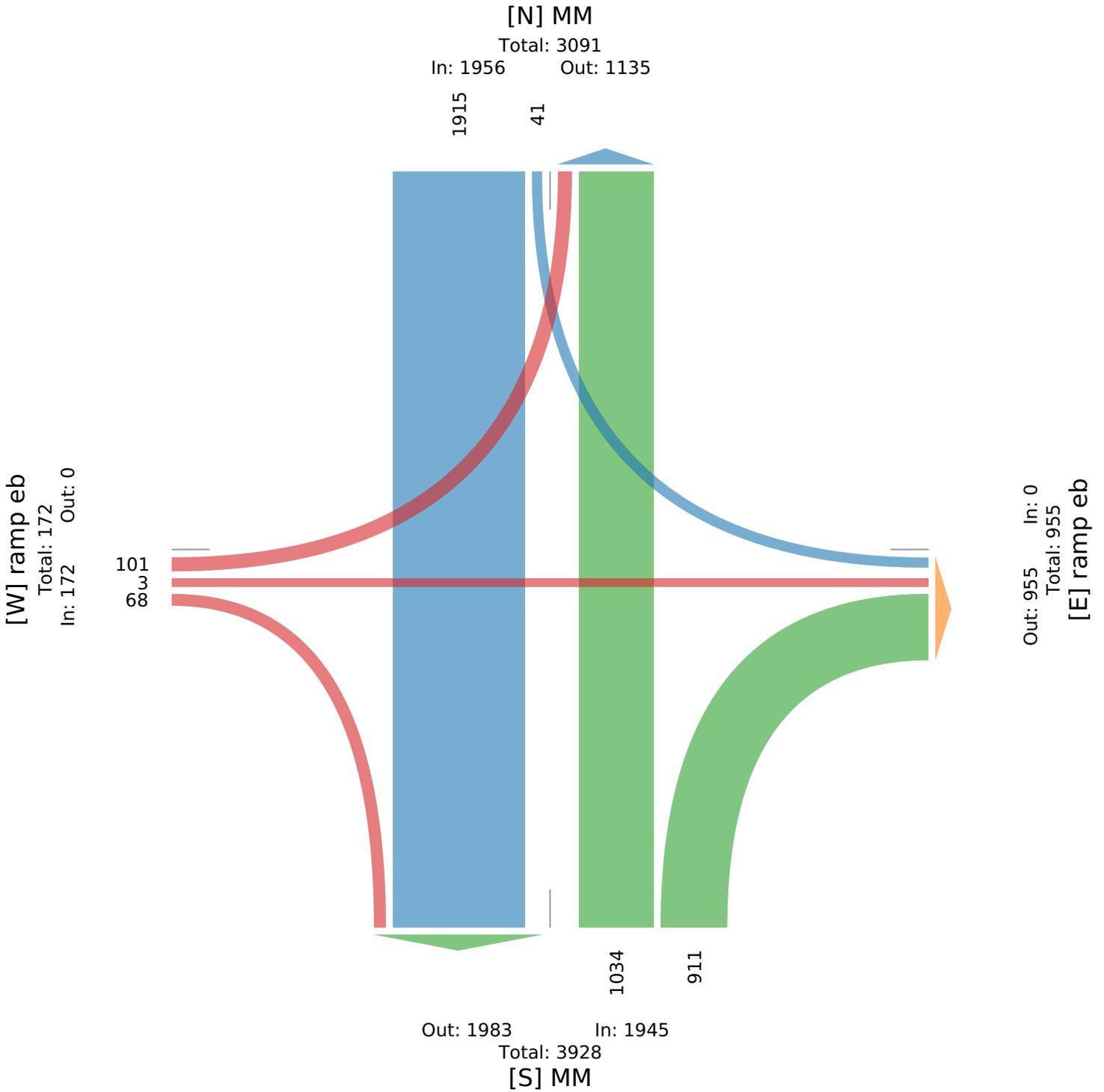
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010605, Location: 37.200012, -93.423024



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



6 - South State Highway MM & I-44 EB - MERGED - TMC

Thu Jul 29, 2021

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010605, Location: 37.200012, -93.423024



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound					ramp eb Westbound					MM Northbound					ramp eb Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 7:15AM	0	118	6	0	124	0	0	0	0	0	94	51	0	0	145	3	0	5	0	8	277
7:30AM	0	122	2	0	124	0	0	0	0	0	78	61	0	0	139	6	0	4	0	10	273
7:45AM	0	128	5	0	133	0	0	0	0	0	57	67	0	0	124	6	0	7	0	13	270
8:00AM	0	101	1	0	102	0	0	0	0	0	62	47	0	0	109	6	0	9	0	15	226
Total	0	469	14	0	483	0	0	0	0	0	291	226	0	0	517	21	0	25	0	46	1046
% Approach	0%	97.1%	2.9%	0%	-	0%	0%	0%	0%	-	56.3%	43.7%	0%	0%	-	45.7%	0%	54.3%	0%	-	-
% Total	0%	44.8%	1.3%	0%	46.2%	0%	0%	0%	0%	0%	27.8%	21.6%	0%	0%	49.4%	2.0%	0%	2.4%	0%	4.4%	-
PHF	-	0.916	0.583	-	0.908	-	-	-	-	-	0.774	0.843	-	-	0.891	0.875	-	0.694	-	0.767	0.944
Lights	0	413	12	0	425	0	0	0	0	0	254	192	0	0	446	19	0	21	0	40	911
% Lights	0%	88.1%	85.7%	0%	88.0%	0%	0%	0%	0%	-	87.3%	85.0%	0%	0%	86.3%	90.5%	0%	84.0%	0%	87.0%	87.1%
Articulated Trucks	0	21	1	0	22	0	0	0	0	0	23	7	0	0	30	1	0	3	0	4	56
% Articulated Trucks	0%	4.5%	7.1%	0%	4.6%	0%	0%	0%	0%	-	7.9%	3.1%	0%	0%	5.8%	4.8%	0%	12.0%	0%	8.7%	5.4%
Buses and Single-Unit Trucks	0	35	1	0	36	0	0	0	0	0	14	27	0	0	41	1	0	1	0	2	79
% Buses and Single-Unit Trucks	0%	7.5%	7.1%	0%	7.5%	0%	0%	0%	0%	-	4.8%	11.9%	0%	0%	7.9%	4.8%	0%	4.0%	0%	4.3%	7.6%

* L: Left, R: Right, T: Thru, U: U-Turn

6 - South State Highway MM & I-44 EB - MERGED - TMC

Thu Jul 29, 2021

AM Peak (7:15 AM - 8:15 AM)

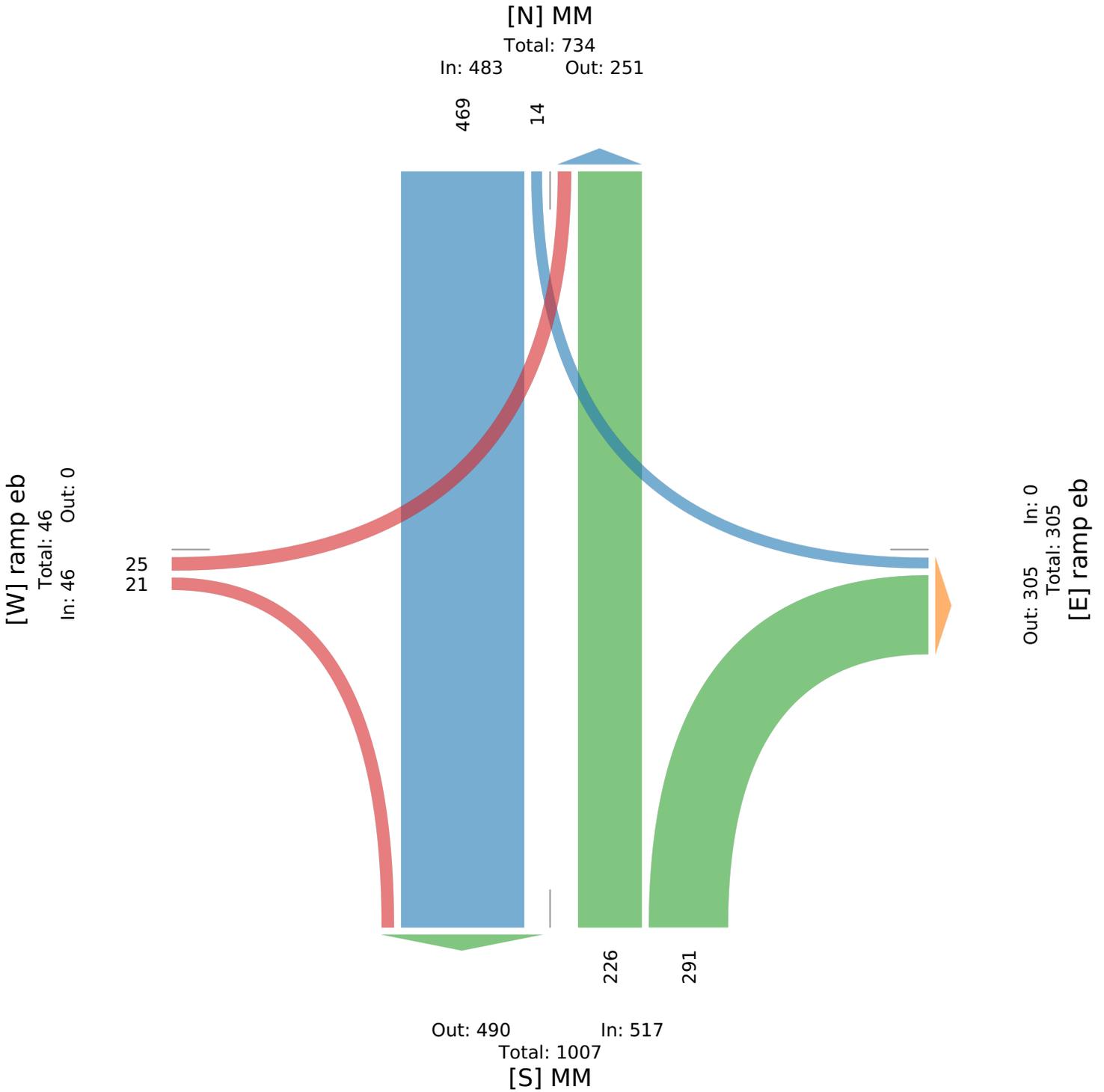
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010605, Location: 37.200012, -93.423024



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



6 - South State Highway MM & I-44 EB - MERGED - TMC

Thu Jul 29, 2021

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1010605, Location: 37.200012, -93.423024

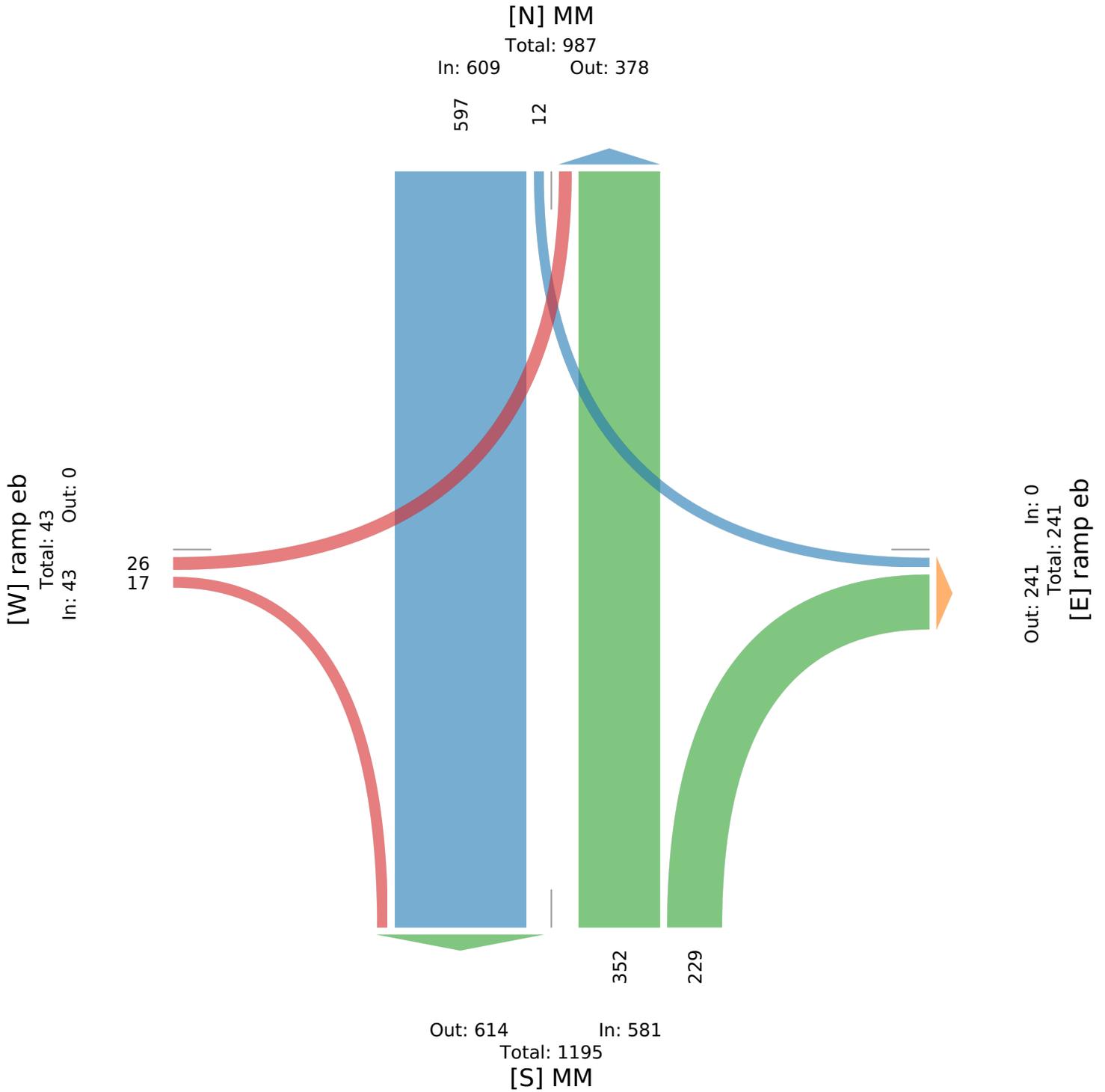


Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MM Southbound					ramp eb Westbound					MM Northbound					ramp eb Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-07-29 4:30PM	0	143	3	0	146	0	0	0	0	0	56	81	0	0	137	4	0	9	0	13	296
4:45PM	0	157	3	0	160	0	0	0	0	0	52	92	0	0	144	3	0	7	0	10	314
5:00PM	0	156	4	0	160	0	0	0	0	0	67	77	0	0	144	5	0	6	0	11	315
5:15PM	0	141	2	0	143	0	0	0	0	0	54	102	0	0	156	5	0	4	0	9	308
Total	0	597	12	0	609	0	0	0	0	0	229	352	0	0	581	17	0	26	0	43	1233
% Approach	0%	98.0%	2.0%	0%	-	0%	0%	0%	0%	-	39.4%	60.6%	0%	0%	-	39.5%	0%	60.5%	0%	-	-
% Total	0%	48.4%	1.0%	0%	49.4%	0%	0%	0%	0%	0%	18.6%	28.5%	0%	0%	47.1%	1.4%	0%	2.1%	0%	3.5%	-
PHF	-	0.951	0.750	-	0.952	-	-	-	-	-	0.854	0.863	-	-	0.931	0.850	-	0.722	-	0.827	0.979
Lights	0	569	12	0	581	0	0	0	0	0	204	332	0	0	536	14	0	25	0	39	1156
% Lights	0%	95.3%	100%	0%	95.4%	0%	0%	0%	0%	-	89.1%	94.3%	0%	0%	92.3%	82.4%	0%	96.2%	0%	90.7%	93.8%
Articulated Trucks	0	7	0	0	7	0	0	0	0	0	10	3	0	0	13	2	0	1	0	3	23
% Articulated Trucks	0%	1.2%	0%	0%	1.1%	0%	0%	0%	0%	-	4.4%	0.9%	0%	0%	2.2%	11.8%	0%	3.8%	0%	7.0%	1.9%
Buses and Single-Unit Trucks	0	21	0	0	21	0	0	0	0	0	15	17	0	0	32	1	0	0	0	1	54
% Buses and Single-Unit Trucks	0%	3.5%	0%	0%	3.4%	0%	0%	0%	0%	-	6.6%	4.8%	0%	0%	5.5%	5.9%	0%	0%	0%	2.3%	4.4%

* L: Left, R: Right, T: Thru, U: U-Turn

6 - South State Highway MM & I-44 EB - MERGED - TMC
 Thu Jul 29, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1010605, Location: 37.200012, -93.423024



APPENDIX B

Future Baseline Conditions

Future Baseline Exhibit

BEGINS AT A POINT APPROX. 19.20' EAST & 567.31' NORTH OF THE 1/4 CORNER OF SECTIONS 26 & 27, T29N R23W.
 1/4 CORNER OF SECTIONS 26 & 27, T29N R8E 567.63', N01°56'16"E TO BEGINNING OF PROJECT.

STA. 544+07.60 CL (RTE1-44) = STA. 46+86.90 CL (RTEMM)

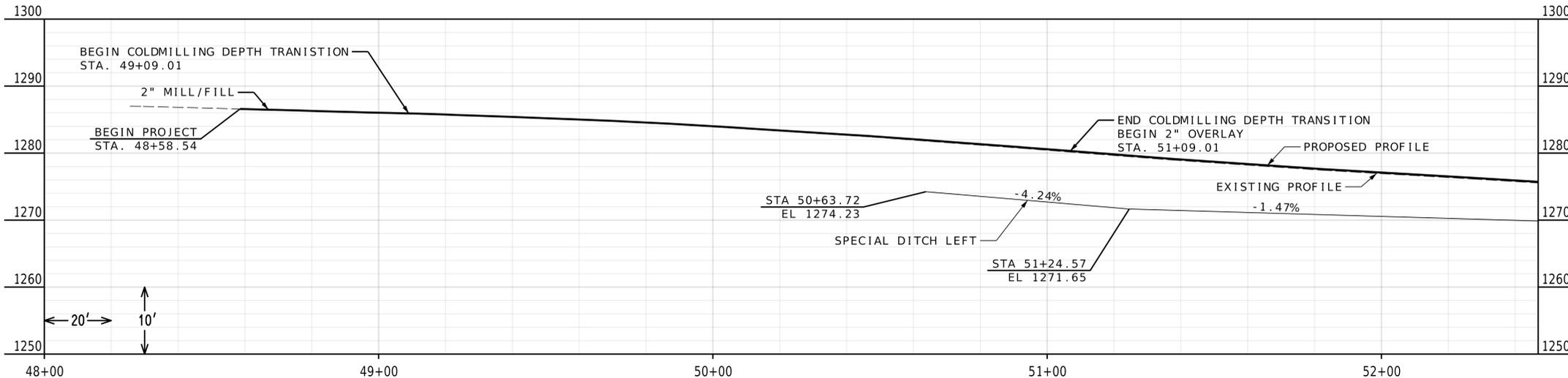
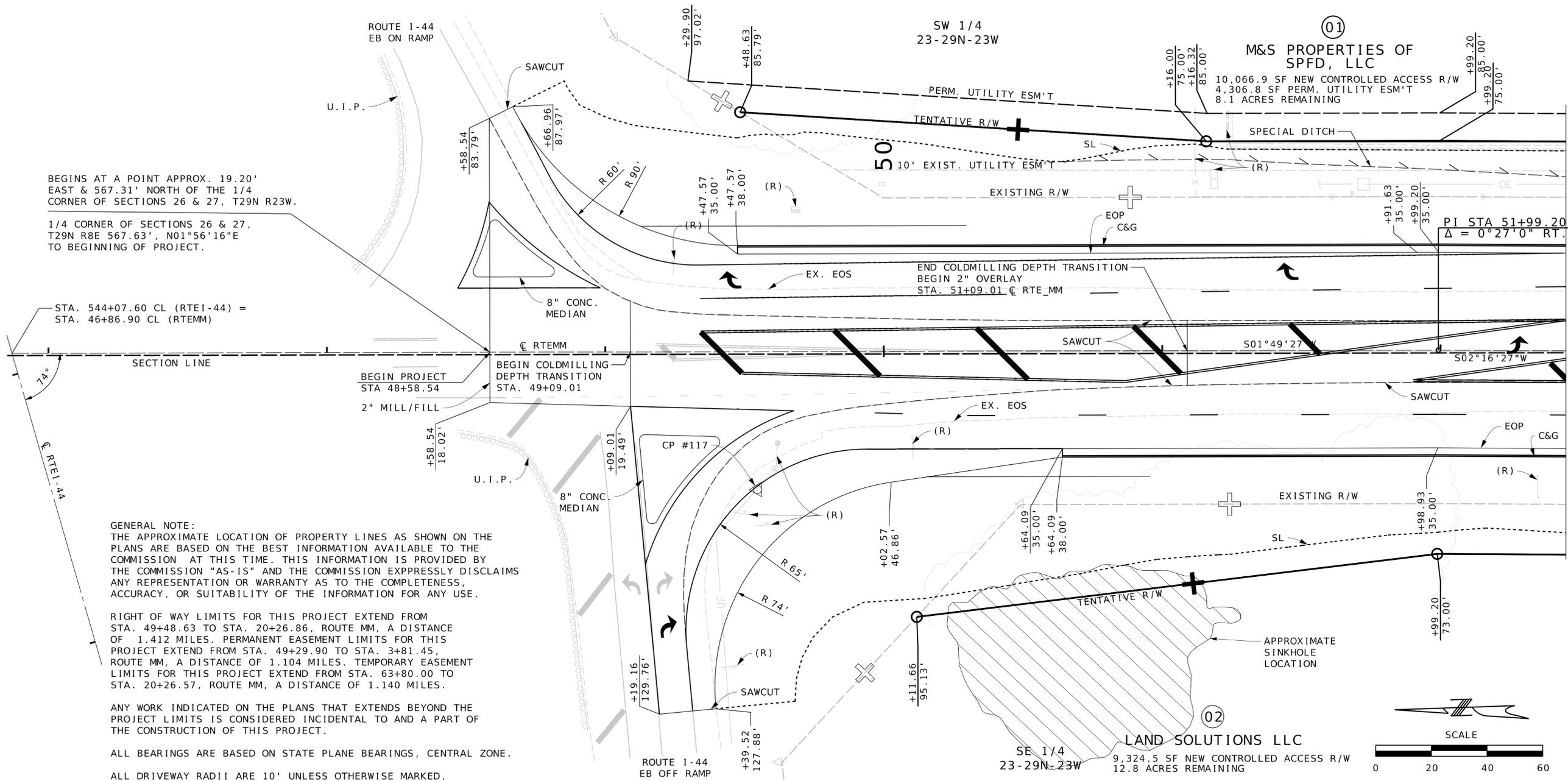
GENERAL NOTE:
 THE APPROXIMATE LOCATION OF PROPERTY LINES AS SHOWN ON THE PLANS ARE BASED ON THE BEST INFORMATION AVAILABLE TO THE COMMISSION AT THIS TIME. THIS INFORMATION IS PROVIDED BY THE COMMISSION "AS-IS" AND THE COMMISSION EXPRESSLY DISCLAIMS ANY REPRESENTATION OR WARRANTY AS TO THE COMPLETENESS, ACCURACY, OR SUITABILITY OF THE INFORMATION FOR ANY USE.

RIGHT OF WAY LIMITS FOR THIS PROJECT EXTEND FROM STA. 49+48.63 TO STA. 20+26.86, ROUTE MM, A DISTANCE OF 1.412 MILES. PERMANENT EASEMENT LIMITS FOR THIS PROJECT EXTEND FROM STA. 49+29.90 TO STA. 3+81.45, ROUTE MM, A DISTANCE OF 1.104 MILES. TEMPORARY EASEMENT LIMITS FOR THIS PROJECT EXTEND FROM STA. 63+80.00 TO STA. 20+26.57, ROUTE MM, A DISTANCE OF 1.140 MILES.

ANY WORK INDICATED ON THE PLANS THAT EXTENDS BEYOND THE PROJECT LIMITS IS CONSIDERED INCIDENTAL TO AND A PART OF THE CONSTRUCTION OF THIS PROJECT.

ALL BEARINGS ARE BASED ON STATE PLANE BEARINGS, CENTRAL ZONE.

ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE MARKED.



PLAN PROFILE SHEET SHEET 1 OF 20

PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 4
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

550 ST. LOUIS STREET
 SPRINGFIELD, MO 65806
 CERTIFICATE OF AUTHORITY NO. 001592

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

01
M&S PROPERTIES OF
SPFD, LLC
SEE SHEET 4

SW 1/4
23-29N-23W
20' EXIST. SAN.
SEWER ESM'T

STA. 5+57.25 FR140E
131' X 18" GROUP A PIPE (18")
2-18" GROUP A FES

NW1/4 NW1/4
26-29N-23W

03
AUSTIN, KENNETH W TR
53,911.3 SF NEW R/W
1,690.2 SF TEMP. CONST. ESM'T.
32.7 ACRES REMAINING

PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED
4/4/2023

ROUTE STATE
MM MO
DISTRICT SHEET NO.
SW 5

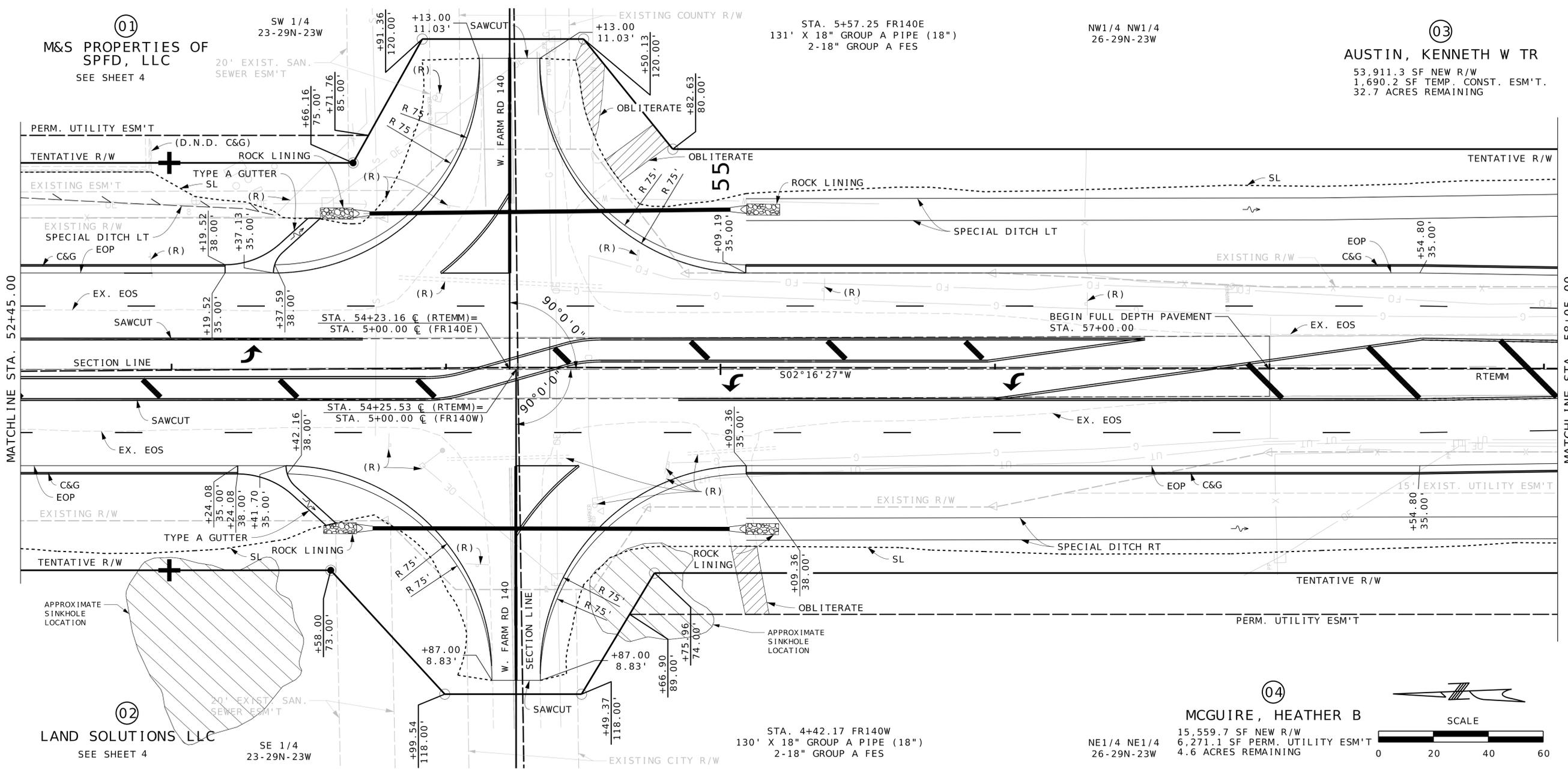
COUNTY
GREENE
JOB NO.
J8S0836B
CONTRACT ID.

PROJECT NO.

BRIDGE NO.

MATCHLINE STA. 52+45.00

MATCHLINE STA. 58+05.00



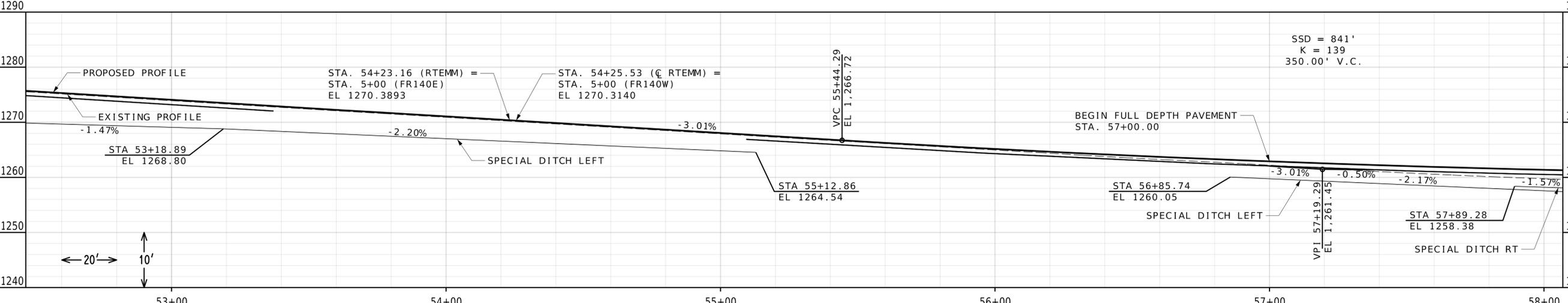
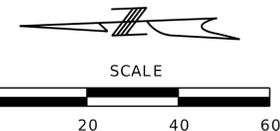
02
LAND SOLUTIONS LLC
SEE SHEET 4

SE 1/4
23-29N-23W

STA. 4+42.17 FR140W
130' X 18" GROUP A PIPE (18")
2-18" GROUP A FES

NE1/4 NE1/4
26-29N-23W

04
MCGUIRE, HEATHER B
15,559.7 SF NEW R/W
6,271.1 SF PERM. UTILITY ESM'T
4.6 ACRES REMAINING



PLAN PROFILE SHEET
SHEET 2 OF 20

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

DATE DESCRIPTION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



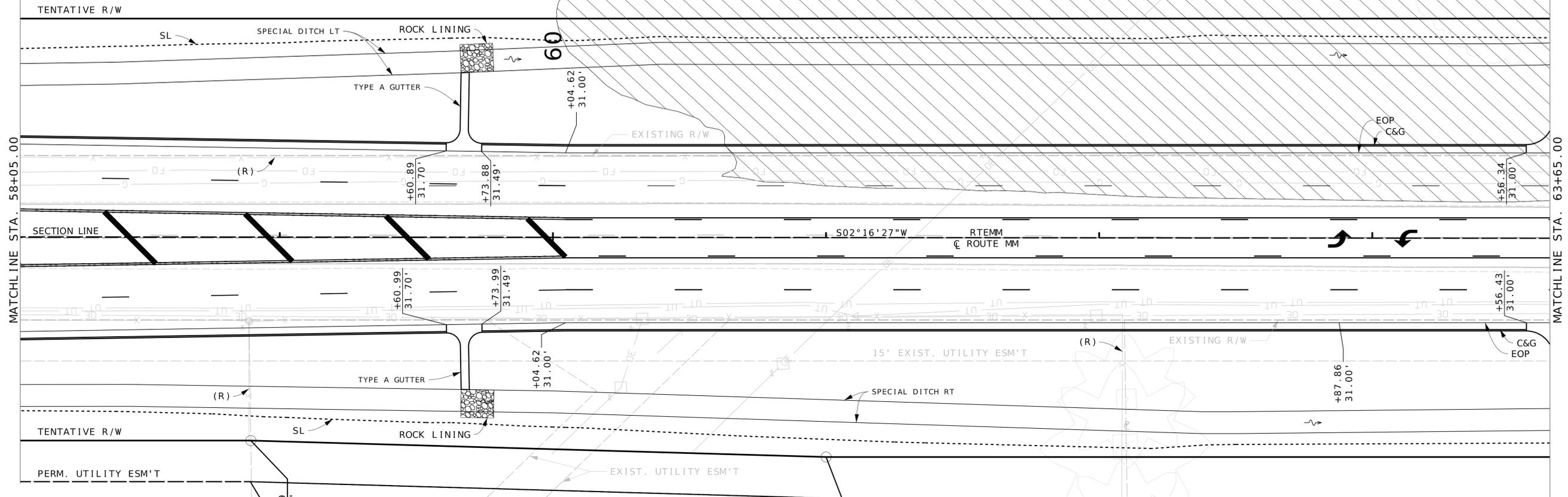
Olsson
550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

03
AUSTIN, KENNETH W TR
SEE SHEET 5

APPROXIMATE
SINKHOLE
LOCATION

NW1/4, NW1/4
26-29N-23W

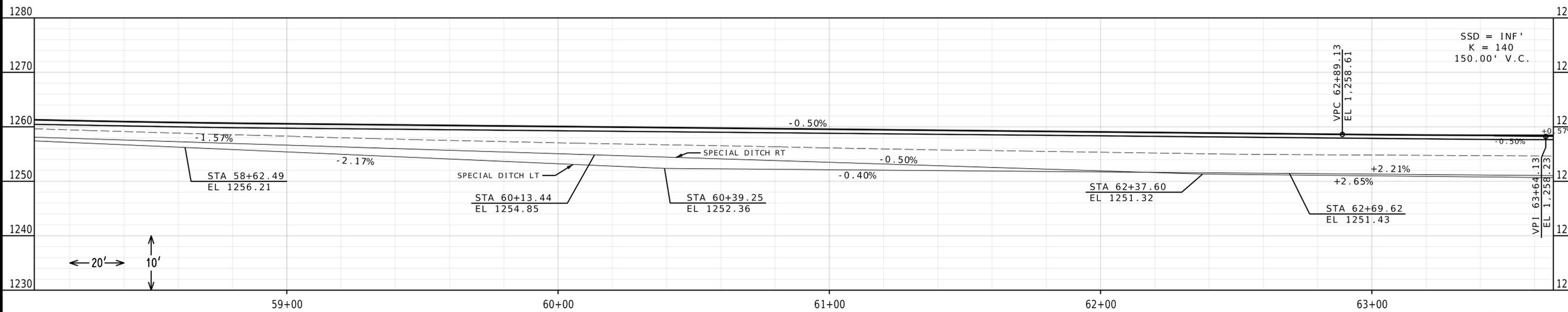
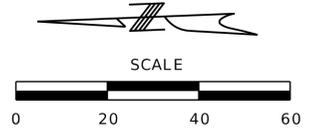


04
MCGUIRE, HEATHER B
SEE SHEET 5

NE1/4 NE1/4
27-29N-23W

05
MM FARM LLC
15,394.1 SF NEW R/W
4,810.5 SF PERM. UTILITY ESM'T
18.2 ACRES REMAINING

06
PLAZA SOUTHWEST LLC
27,475.2 SF NEW R/W
8,241.4 SF PERM. UTILITY ESM'T
300.0 SF PERM. DRAINAGE ESM'T
15.8 ACRES REMAINING



PLAN PROFILE SHEET
SHEET 3 OF 20

PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

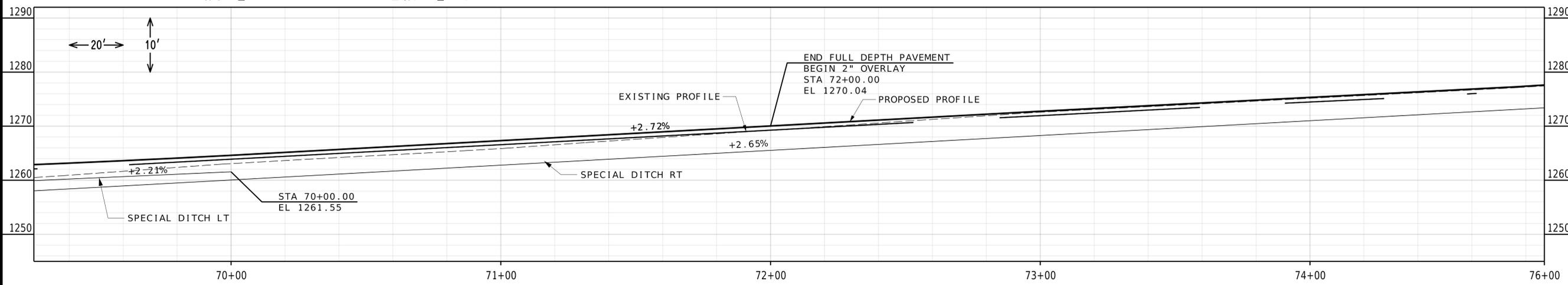
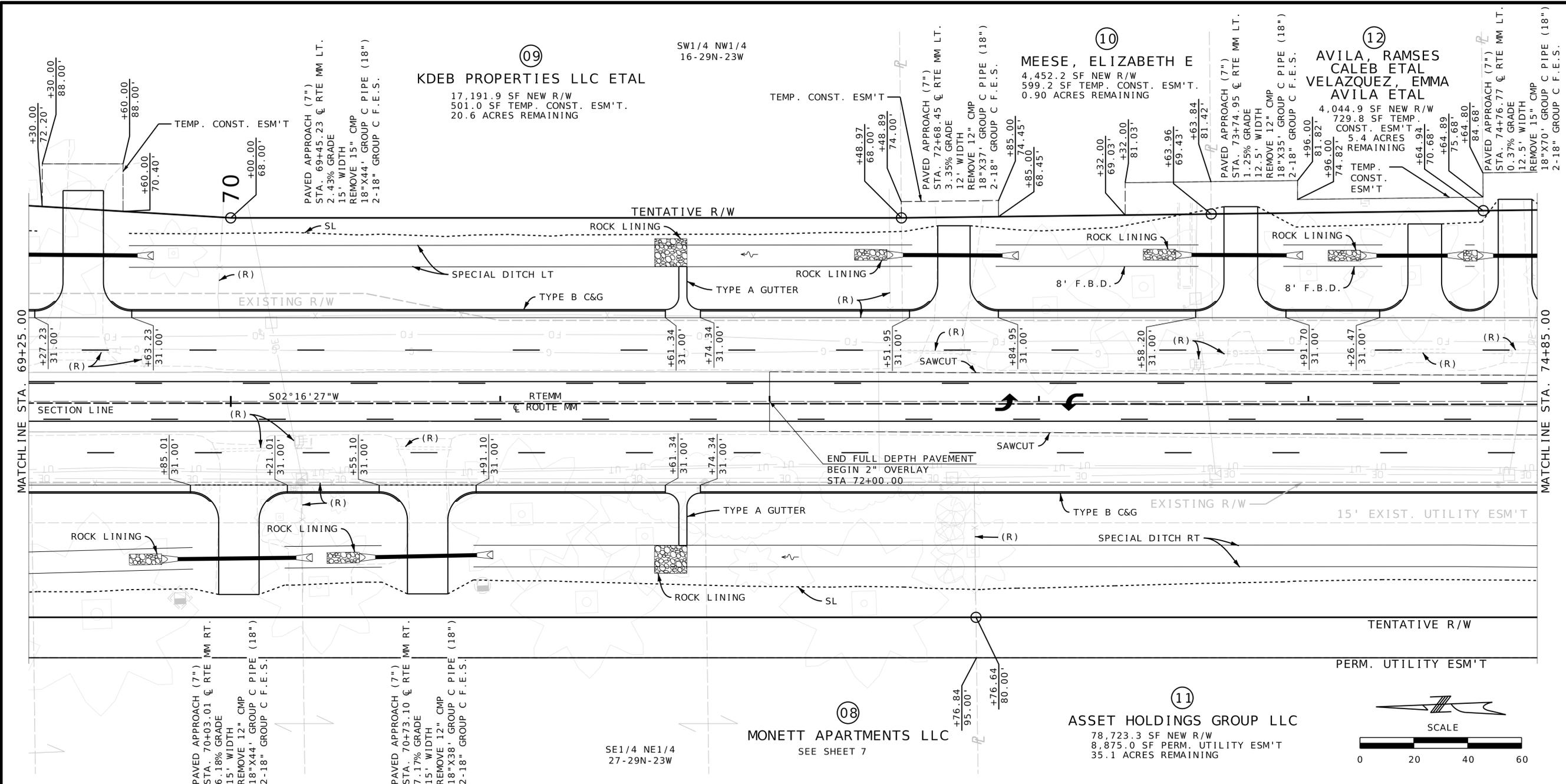
DATE PREPARED
4/4/2023
ROUTE STATE
MM MO
DISTRICT SHEET NO.
SW 6
COUNTY
GREENE
JOB NO.
J8S0836B
CONTRACT ID.
PROJECT NO.
BRIDGE NO.

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION
MoDOT
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

olsson
550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PLAN PROFILE SHEET
SHEET 5 OF 20

PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 8
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

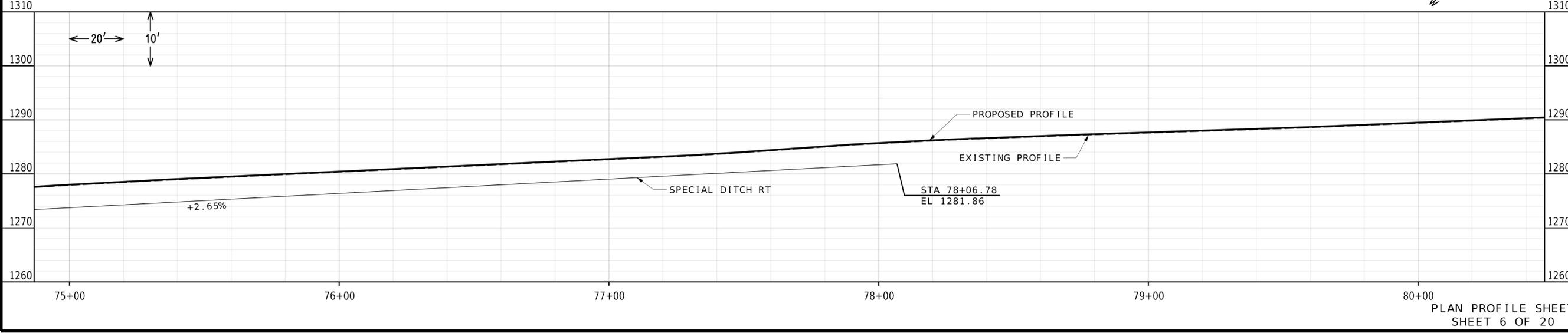
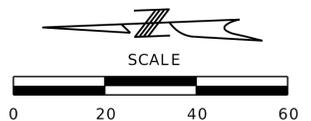
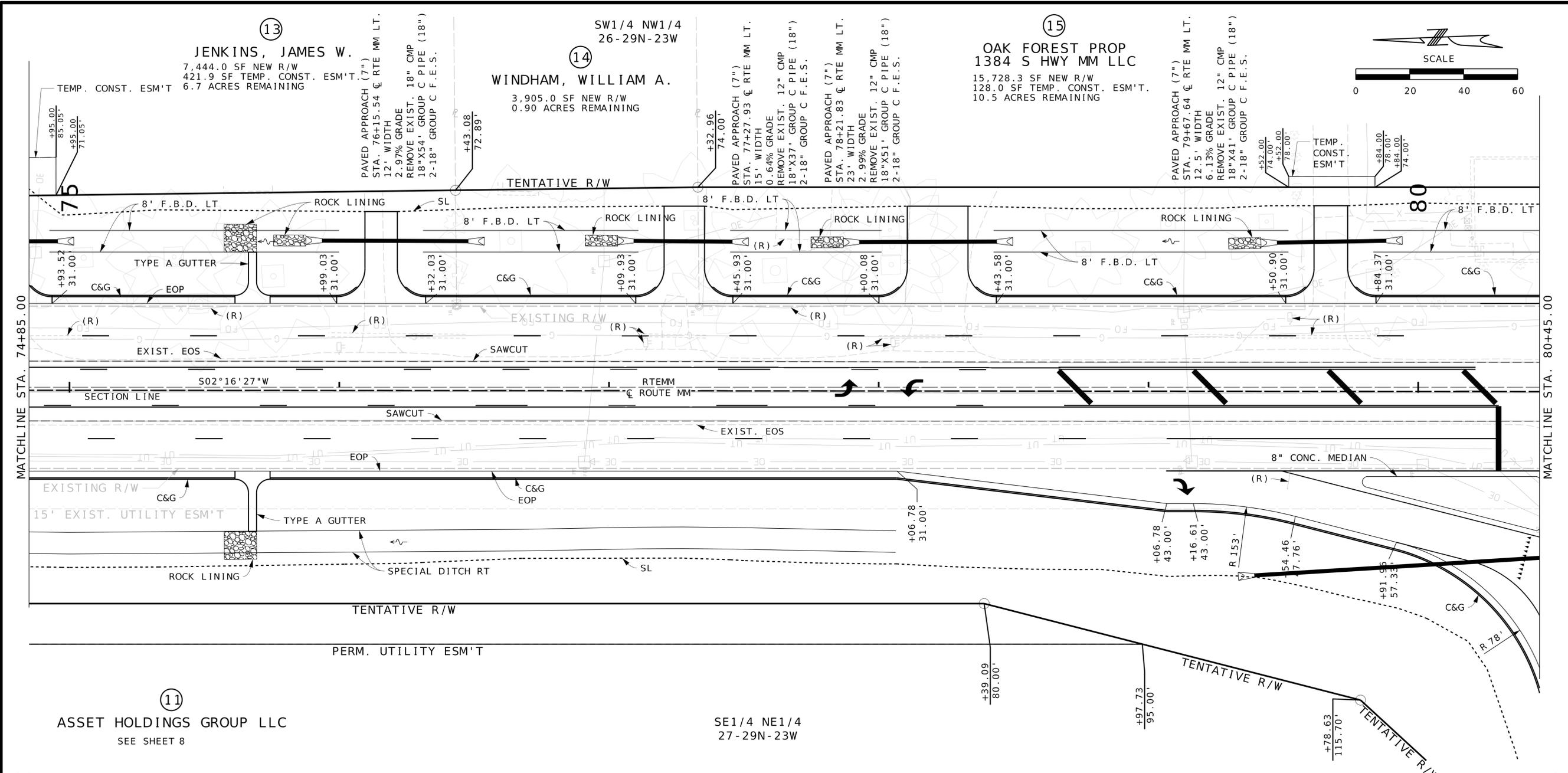
DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

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PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

DATE PREPARED
 4/4/2023

ROUTE MM STATE MO
 DISTRICT SW SHEET NO. 9

COUNTY GREENE
 JOB NO. J8S0836B
 CONTRACT ID.

PROJECT NO.
 BRIDGE NO.

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MoDOT
 105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

olsson
 550 ST. LOUIS STREET
 SPRINGFIELD, MO 65806
 CERTIFICATE OF AUTHORITY NO. 001592

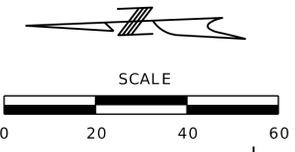
PLAN PROFILE SHEET
 SHEET 6 OF 20

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

SW1/4 NW1/4
26-29N-23W

NW1/4 SW1/4
26-29N-23W

16
GARRETT, LEE TR ETAL
32,097.9 SF NEW R/W
22.0 ACRES REMAINING



15
OAK FOREST
PROP-1384 S
HWY MM LLC
SEE SHEET 9

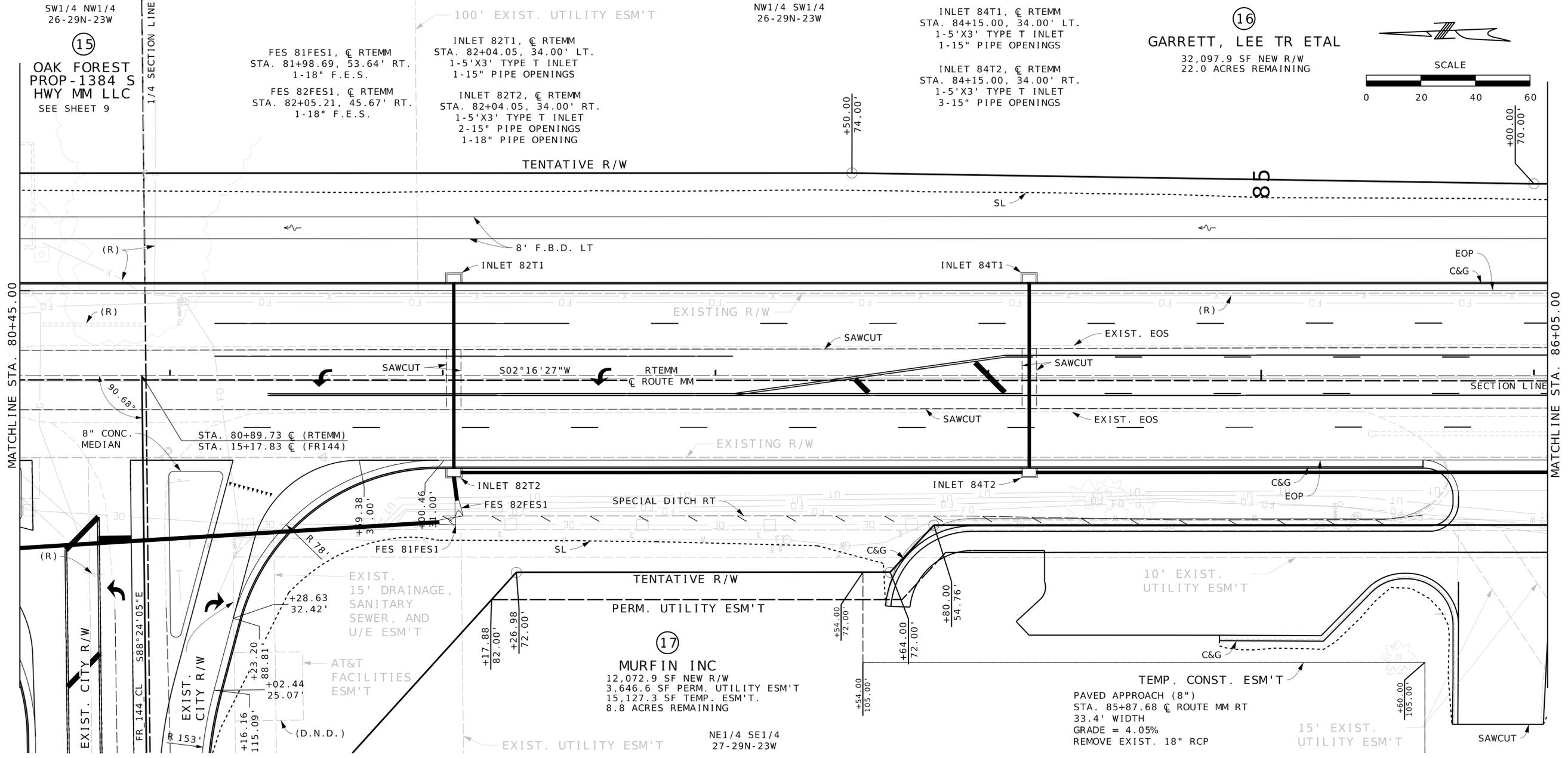
FES 81FES1, C RTEMM
STA. 81+98.69, 53.64' RT.
1-18" F.E.S.
FES 82FES1, C RTEMM
STA. 82+05.21, 45.67' RT.
1-18" F.E.S.

100' EXIST. UTILITY ESM'T
INLET 82T1, C RTEMM
STA. 82+04.05, 34.00' LT.
1-5'X3' TYPE T INLET
1-15" PIPE OPENINGS
INLET 82T2, C RTEMM
STA. 82+04.05, 34.00' RT.
1-5'X3' TYPE T INLET
2-15" PIPE OPENINGS
1-18" PIPE OPENING

INLET 84T1, C RTEMM
STA. 84+15.00, 34.00' LT.
1-5'X3' TYPE T INLET
1-15" PIPE OPENINGS
INLET 84T2, C RTEMM
STA. 84+15.00, 34.00' RT.
1-5'X3' TYPE T INLET
3-15" PIPE OPENINGS

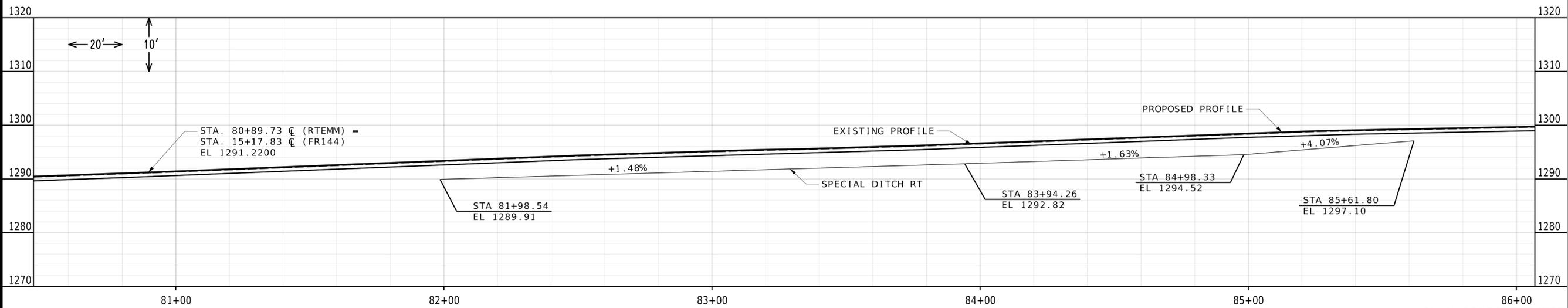
MATCHLINE STA. 80+45.00

MATCHLINE STA. 86+05.00



17
MURFIN INC
12,072.9 SF NEW R/W
3,646.6 SF PERM. UTILITY ESM'T
15,127.3 SF TEMP. ESM'T.
8.8 ACRES REMAINING

TEMP. CONST. ESM'T
PAVED APPROACH (8")
STA. 85+87.68 C ROUTE MM RT
33.4' WIDTH
GRADE = 4.05%
REMOVE EXIST. 18" RCP



PLAN PROFILE SHEET
SHEET 7 OF 20

PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 10
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION
MoDOT
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

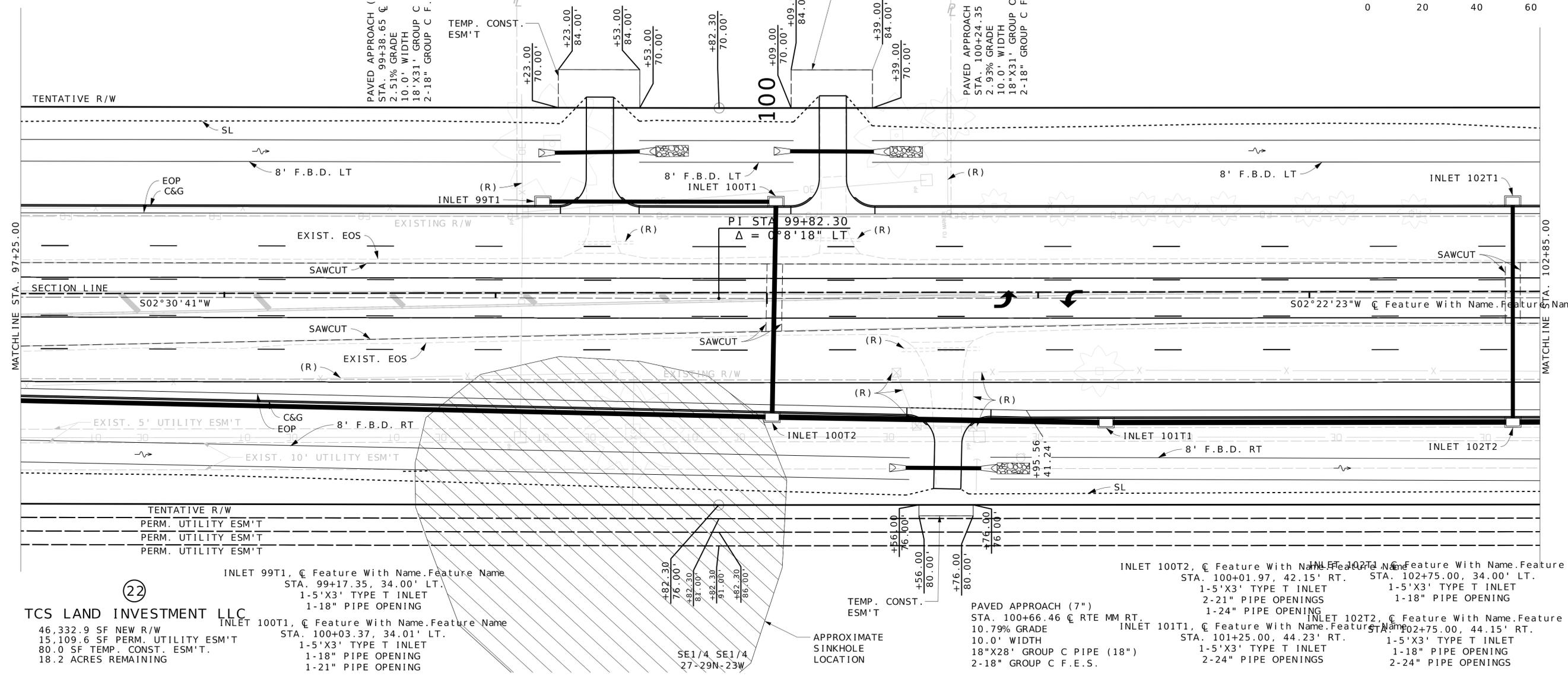
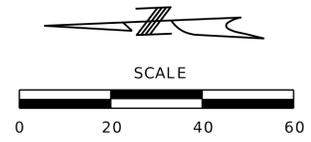
olsson
550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

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21
MCCALL, VIRGINIA TR ETAL
SEE SHEET 12

23
ERWIN, GREGORY
SW1/4 SW1/4
26-29N-23W
6,400.0 SF NEW R/W
840.0 SF TEMP. CONST. ESM'T.
0.80 ACRES REMAINING

21
MCCALL, VIRGINIA TR ETAL
SEE SHEET 12



22
TCS LAND INVESTMENT LLC
46,332.9 SF NEW R/W
15,109.6 SF PERM. UTILITY ESM'T
80.0 SF TEMP. CONST. ESM'T.
18.2 ACRES REMAINING

INLET 99T1, C Feature With Name.Feature Name
STA. 99+17.35, 34.00' LT.
1-5'X3' TYPE T INLET
1-18" PIPE OPENING

INLET 100T1, C Feature With Name.Feature Name
STA. 100+03.37, 34.01' LT.
1-5'X3' TYPE T INLET
1-18" PIPE OPENING
1-21" PIPE OPENING

SE1/4 SE1/4
27-29N-23W

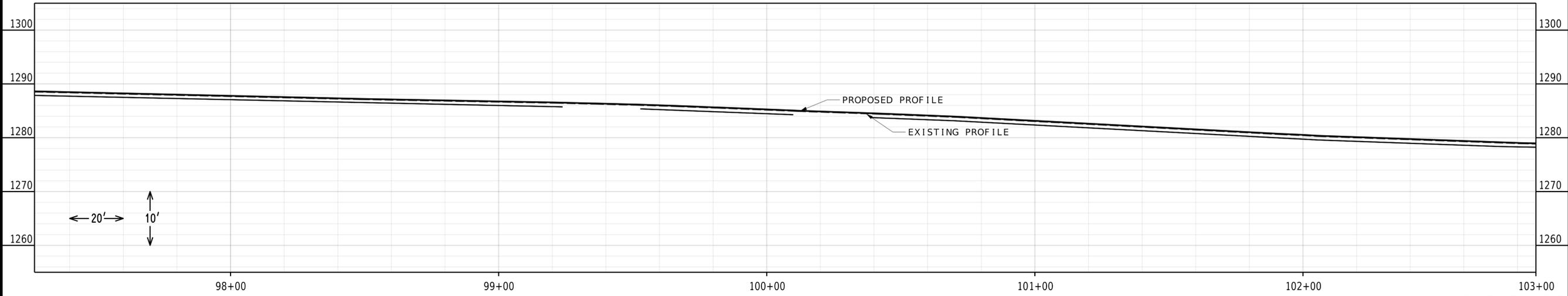
PAVED APPROACH (7")
STA. 100+66.46 C RTE MM RT.
10.79% GRADE
10.0' WIDTH
18"X28" GROUP C PIPE (18")
2-18" GROUP C F.E.S.

INLET 100T2, C Feature With Name.Feature Name
STA. 100+01.97, 42.15' RT.
1-5'X3' TYPE T INLET
2-21" PIPE OPENINGS
1-24" PIPE OPENING

INLET 101T1, C Feature With Name.Feature Name
STA. 101+25.00, 44.23' RT.
1-5'X3' TYPE T INLET
2-24" PIPE OPENINGS

INLET 102T1, C Feature With Name.Feature Name
STA. 102+75.00, 34.00' LT.
1-5'X3' TYPE T INLET
1-18" PIPE OPENING

INLET 102T2, C Feature With Name.Feature Name
STA. 102+75.00, 44.15' RT.
1-5'X3' TYPE T INLET
1-18" PIPE OPENING
2-24" PIPE OPENINGS



PLAN PROFILE SHEET
SHEET 10 OF 20

PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 13
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

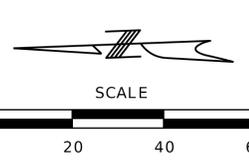
MoDOT

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Olsson

550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

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21
MCCALL, VIRGINIA TR ETAL
 SEE SHEET12

SW1/4 SW1/4
 26-29N-23W

INLET 106T1, @ RTEMM
 STA. 106+00.00, 34.00' LT.
 1-5'X3' TYPE T INLET
 1-18" PIPE OPENINGS

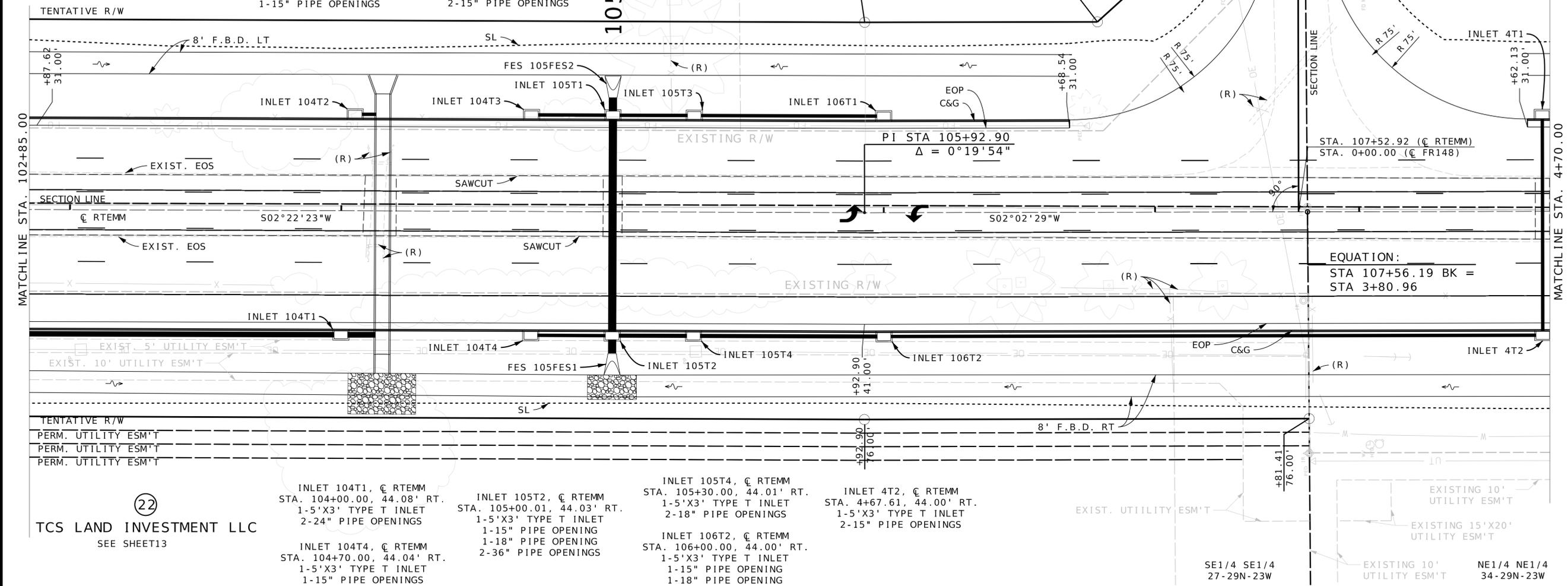
INLET 4T1, @ RTEMM
 STA. 4+67.60, 34.00' LT.
 1-5'X3' TYPE T INLET
 1-15" PIPE OPENING

INLET 104T2, @ RTEMM
 STA. 104+05.00, 34.00' LT.
 1-5'X3' TYPE T INLET
 1-15" PIPE OPENINGS

INLET 105T1, @ RTEMM
 STA. 105+00.00, 34.00' LT.
 1-5'X3' TYPE T INLET
 2-15" PIPE OPENINGS
 2-36" PIPE OPENINGS

INLET 104T3, @ RTEMM
 STA. 104+70.00, 34.00' LT.
 1-5'X3' TYPE T INLET
 1-15" PIPE OPENINGS

INLET 105T3, @ RTEMM
 STA. 105+30.00, 34.00' LT.
 1-5'X3' TYPE T INLET
 2-15" PIPE OPENINGS



EQUATION:
 STA 107+56.19 BK =
 STA 3+80.96

TENTATIVE R/W
 PERM. UTILITY ESM'T
 PERM. UTILITY ESM'T
 PERM. UTILITY ESM'T

22
TCS LAND INVESTMENT LLC
 SEE SHEET13

INLET 104T1, @ RTEMM
 STA. 104+00.00, 44.08' RT.
 1-5'X3' TYPE T INLET
 2-24" PIPE OPENINGS

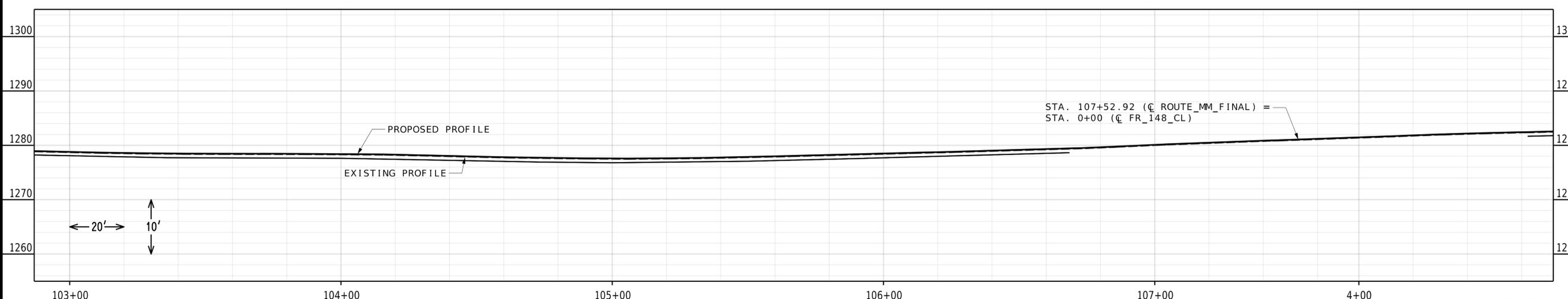
INLET 105T2, @ RTEMM
 STA. 105+00.01, 44.03' RT.
 1-5'X3' TYPE T INLET
 1-15" PIPE OPENING
 1-18" PIPE OPENING
 2-36" PIPE OPENINGS

INLET 105T4, @ RTEMM
 STA. 105+30.00, 44.01' RT.
 1-5'X3' TYPE T INLET
 2-18" PIPE OPENINGS

INLET 4T2, @ RTEMM
 STA. 4+67.61, 44.00' RT.
 1-5'X3' TYPE T INLET
 2-15" PIPE OPENINGS

INLET 106T2, @ RTEMM
 STA. 106+00.00, 44.00' RT.
 1-5'X3' TYPE T INLET
 1-15" PIPE OPENING
 1-18" PIPE OPENING

INLET 104T4, @ RTEMM
 STA. 104+70.00, 44.04' RT.
 1-5'X3' TYPE T INLET
 1-15" PIPE OPENINGS



PRELIMINARY
 PLANS
 NOT FOR
 CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 14
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
 COMMISSION

105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

olsson
 550 ST. LOUIS STREET
 SPRINGFIELD, MO 65806
 CERTIFICATE OF
 AUTHORITY NO. 001592

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24
PSQUAREDSTORAGE LLC
 XXX.XX NEW R/W
 XXX.XX PERM. ESM'T
 XXX.XX TEMP. ESM'T
 XXX.XX REMAINING

INLET 10T1, @ RTEMM
 STA. 10+25.00, 38.00' LT.
 1-5'X3' TYPE T INLET
 1-15" PIPE OPENINGS

 FES 9FES1, @ RTEMM
 STA. 9+70.22, 64.64' LT.
 1-18" GROUP C F.E.S.
 REMOVE 25' EXISTING PIPE

26
S2J HOLDINGS LLC
 XXX.XX NEW R/W
 XXX.XX PERM. ESM'T
 XXX.XX TEMP. ESM'T
 XXX.XX REMAINING

PAVED APPROACH (8")
 STA. 7+31.33 LT
 GRADE = X.X%
 30' WIDTH
 18"X73' GROUP C PIPE
 2-18" GROUP C F.E.S.
 18"

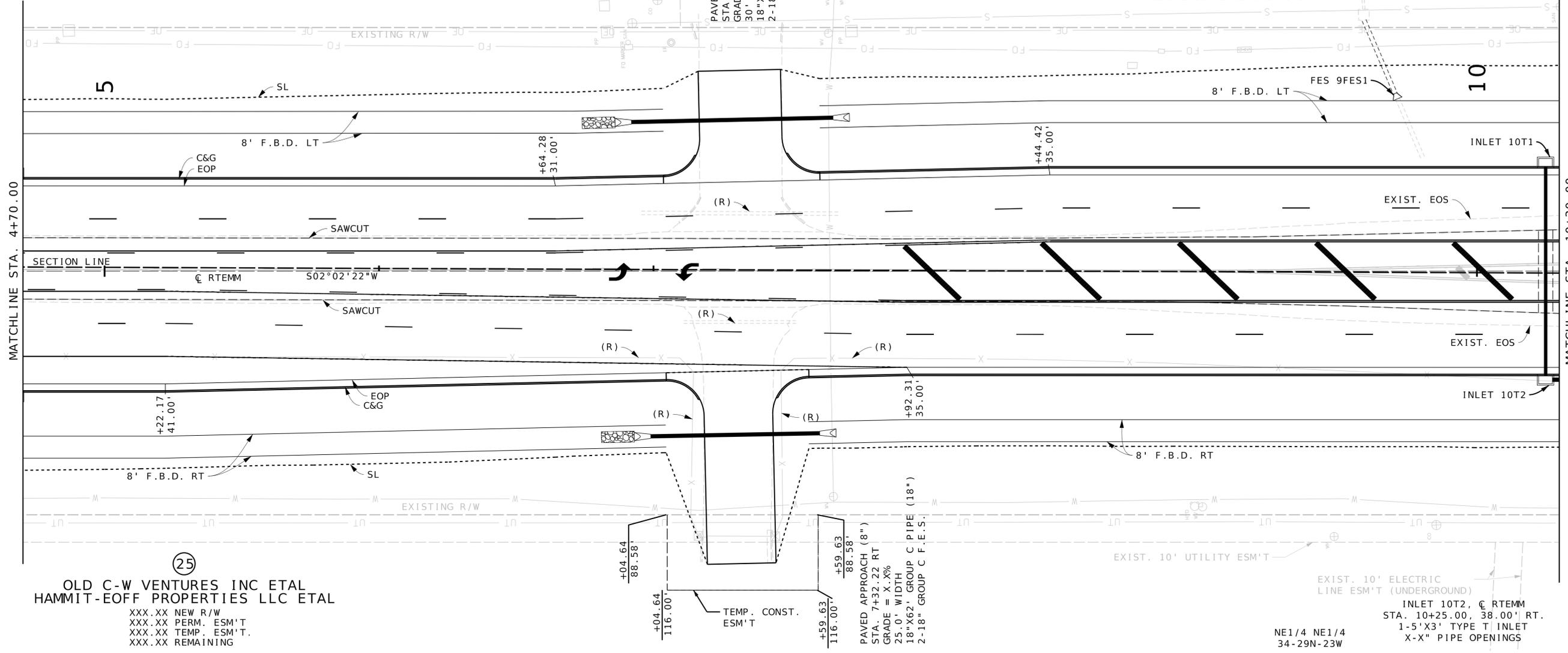
NW1/4 NW1/4
 35-29N-23W

PAVED APPROACH (8")
 STA. 7+32.22 RT
 GRADE = X.X%
 25.0' WIDTH
 18"X62' GROUP C PIPE (18")
 2-18" GROUP C F.E.S.
 18"

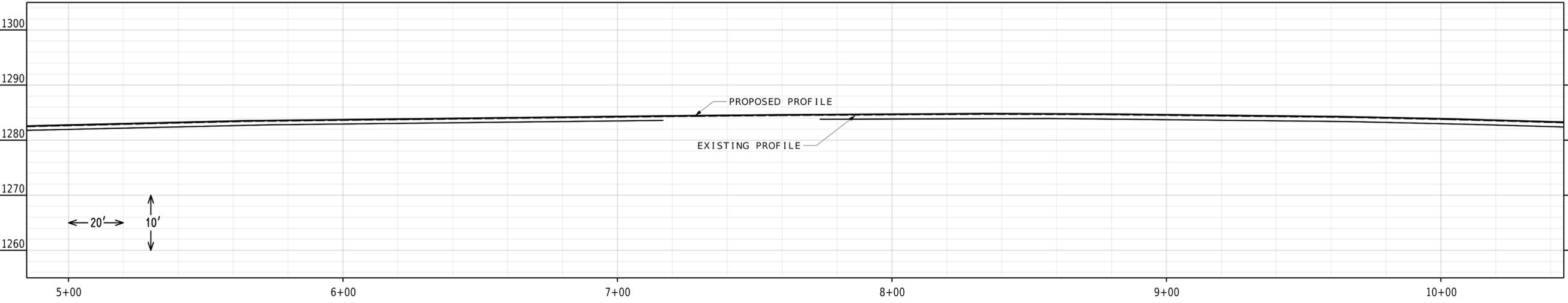
NE1/4 NE1/4
 34-29N-23W

PRELIMINARY
 PLANS
 NOT FOR
 CONSTRUCTION

DATE PREPARED
 4/4/2023
 ROUTE STATE
 MM MO
 DISTRICT SHEET NO.
 SW 15
 COUNTY
 GREENE
 JOB NO.
 J8S0836B
 CONTRACT ID.
 PROJECT NO.
 BRIDGE NO.



25
**OLD C-W VENTURES INC ETAL
 HAMMIT-EOFF PROPERTIES LLC ETAL**
 XXX.XX NEW R/W
 XXX.XX PERM. ESM'T
 XXX.XX TEMP. ESM'T
 XXX.XX REMAINING



PLAN PROFILE SHEET
 SHEET 12 OF 20

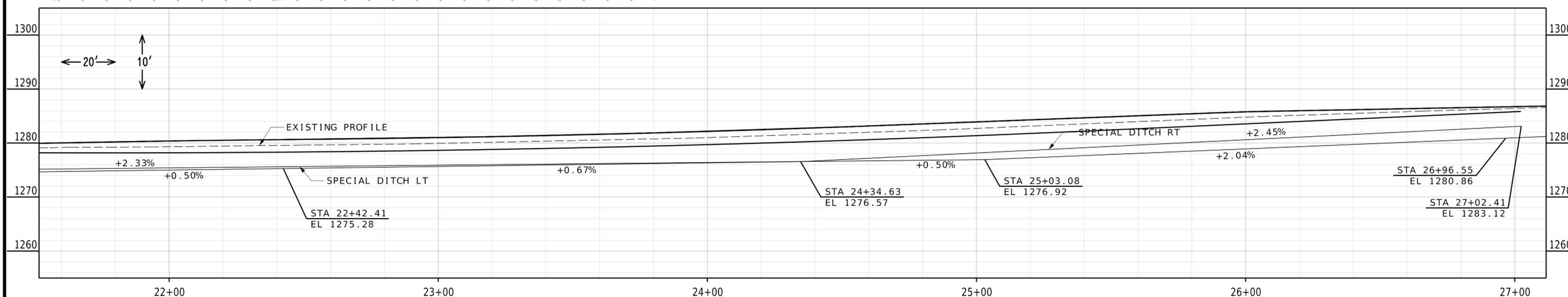
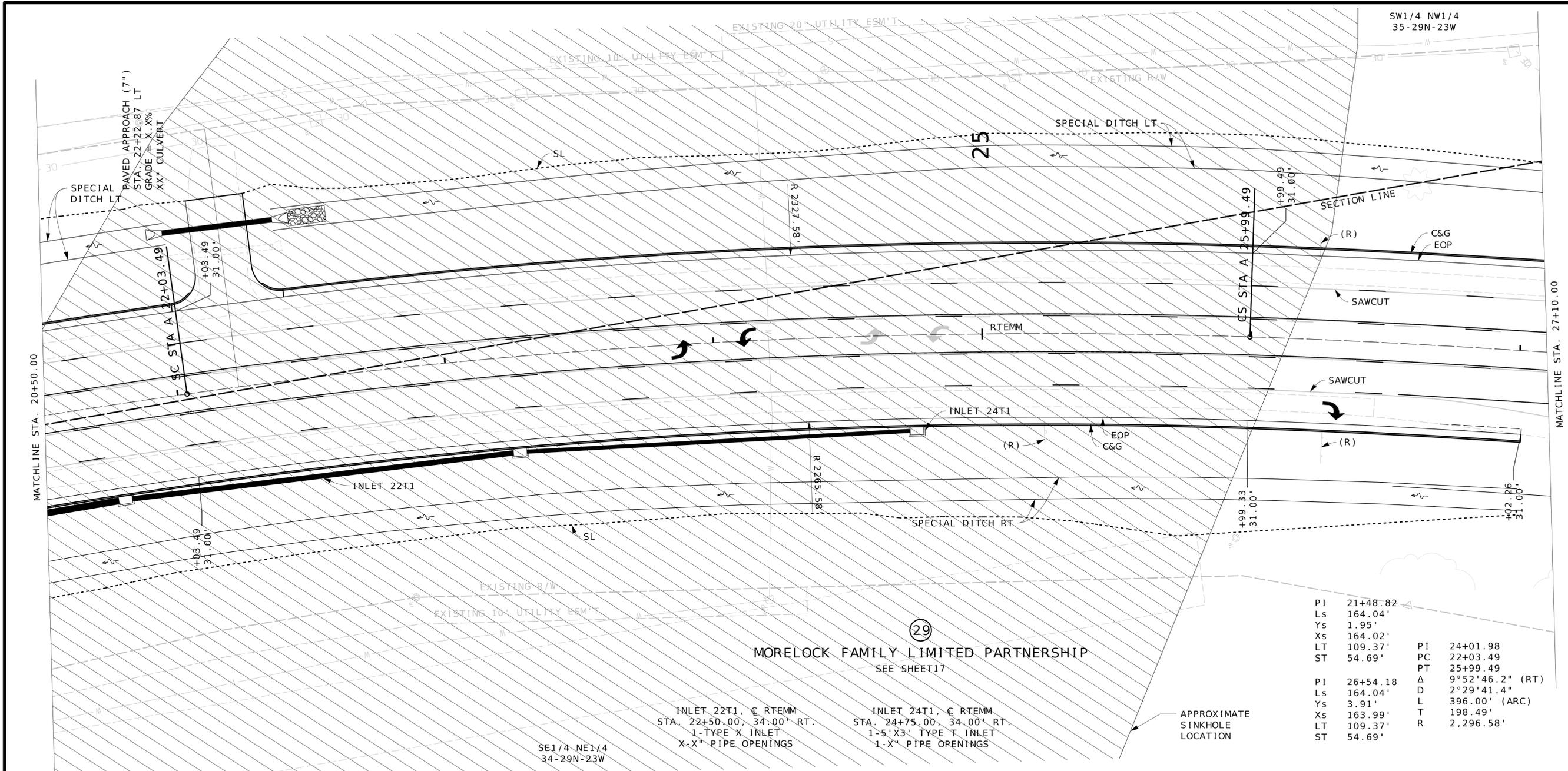
DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
 COMMISSION

 105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

Olsson
 550 ST. LOUIS STREET
 SPRINGFIELD, MO 65806
 CERTIFICATE OF
 AUTHORITY NO. 001592

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PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 18
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION

MoDOT

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Olsson

550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
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29
MORELOCK FAMILY LIMITED PARTNERSHIP
SEE SHEET 17

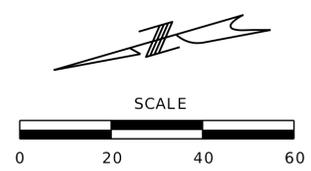
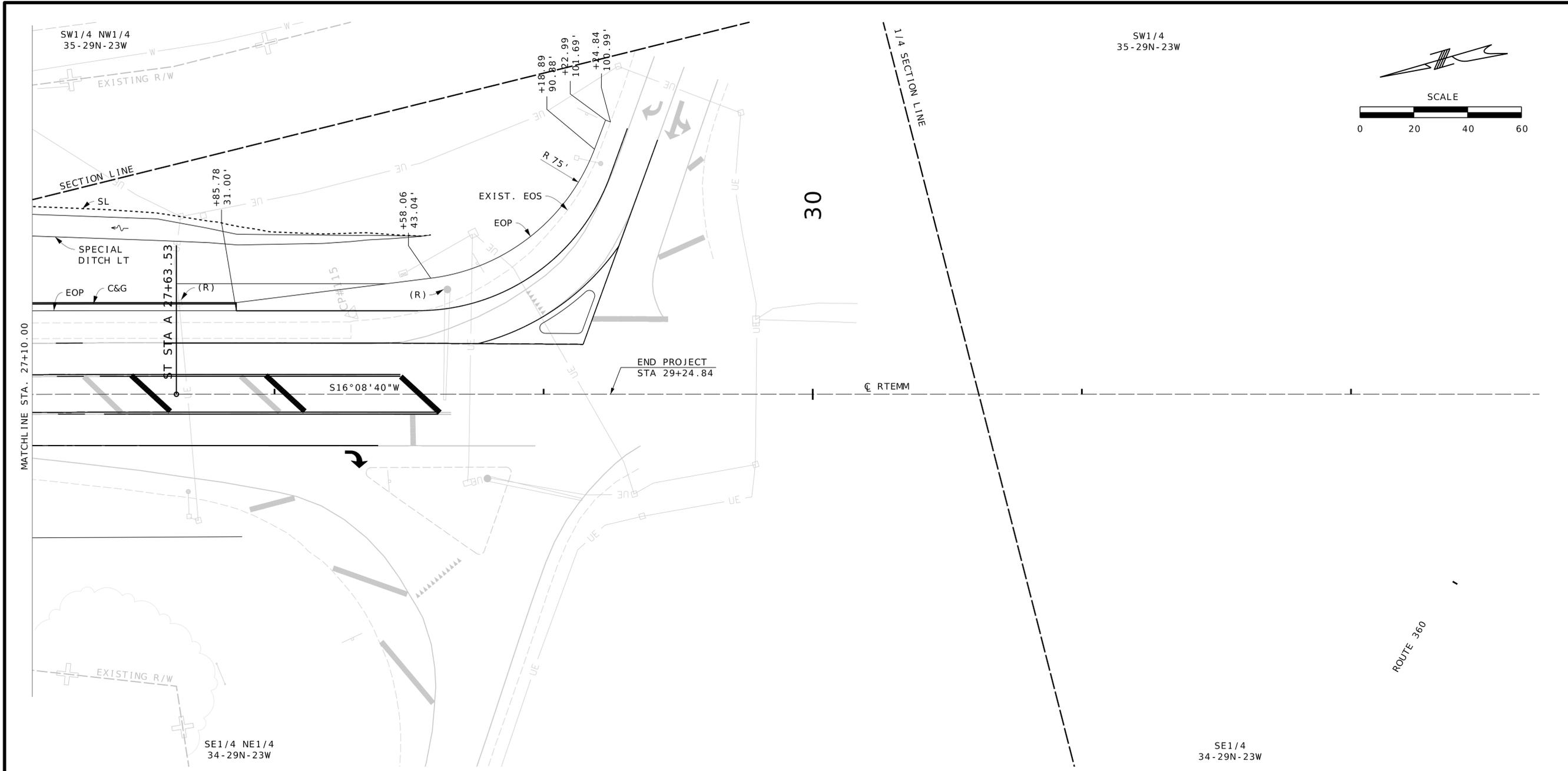
INLET 22T1, C RTEMM
STA. 22+50.00, 34.00 RT.
1-TYPE X INLET
X-X" PIPE OPENINGS

INLET 24T1, C RTEMM
STA. 24+75.00, 34.00 RT.
1-5'X3' TYPE T INLET
1-X" PIPE OPENINGS

PI	21+48.82	PI	24+01.98
Ls	164.04'	PC	22+03.49
Ys	1.95'	PT	25+99.49
Xs	164.02'	Δ	9°52'46.2" (RT)
LT	109.37'	D	2°29'41.4"
ST	54.69'	L	396.00' (ARC)
		T	198.49'
		R	2,296.58'
PI	26+54.18		
Ls	164.04'		
Ys	3.91'		
Xs	163.99'		
LT	109.37'		
ST	54.69'		

SE1/4 NE1/4
34-29N-23W

APPROXIMATE
SINKHOLE
LOCATION



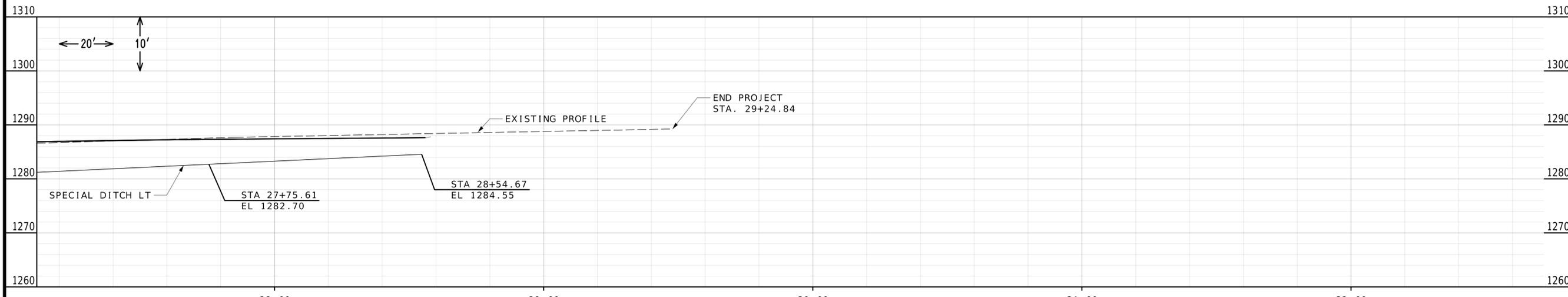
PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 19
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



PLAN PROFILE SHEET
SHEET 16 OF 20

550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

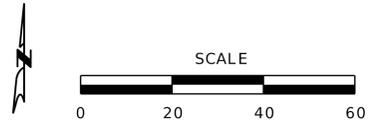
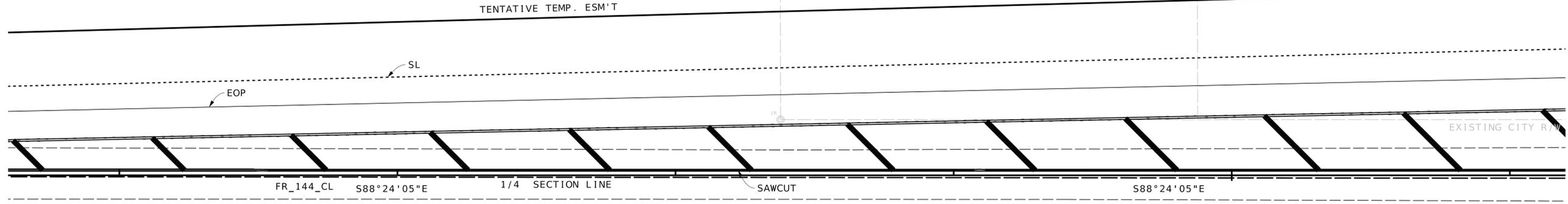
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

①
ASSET HOLDINGS GROUP
SEE SHEET

SE1/4 NE1/4
27-29N-23W

③④
JOHN Q PROP OWNER
XXX.XX NEW R/W
XXX.XX PERM. ESM'T
XXX.XX TEMP. ESM'T
XXX.XX REMAINING

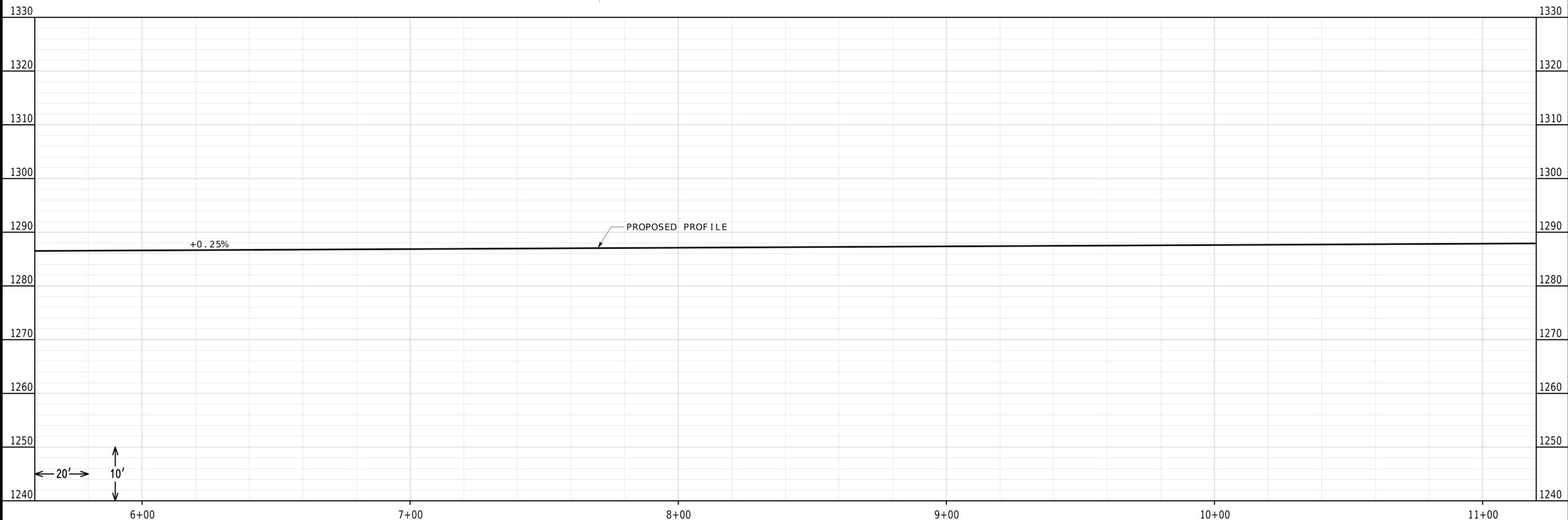
①
ASSET HOLDINGS GROUP
SEE SHEET



③③
JOHN Q PROP OWNER
SEE SHEET

NE1/4 SE1/4
27-29N-23W

③⑤
MURFIN INC
XXX.XX NEW R/W
XXX.XX PERM. ESM'T
XXX.XX TEMP. ESM'T
XXX.XX REMAINING



PLAN PROFILE SHEET
SHEET 18 OF 20

PRELIMINARY
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED 4/4/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 21
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

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Trip Generation

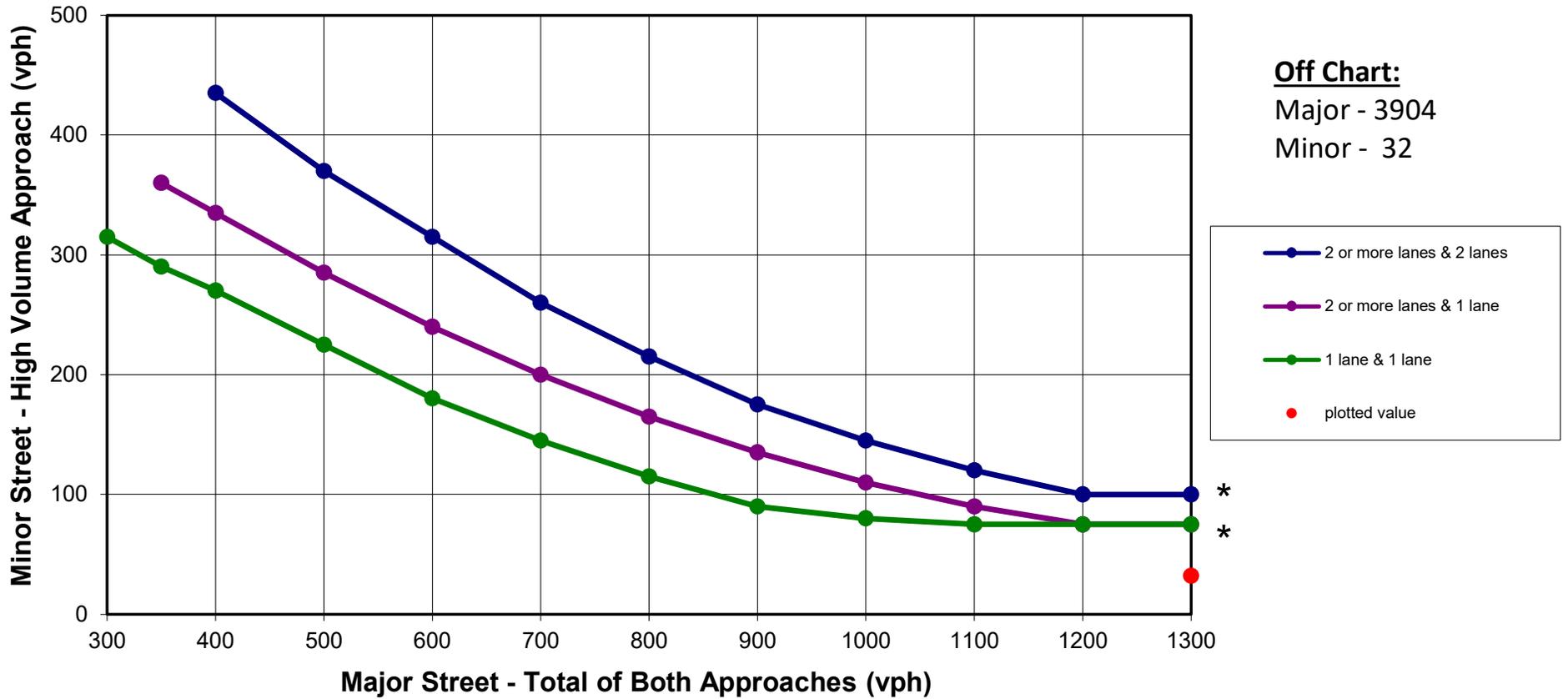
Route MM - I-44 to JRF

ITE Code	Land Use	Setting/Location	Density		Daily	AM Peak Hour			PM Peak Hour		
						Total	Enter	Exit	Total	Enter	Exit
130	Industrial Park	General Urban/Suburban	8,566,010	s.f.	9,499	2,912	2,359	553	2,912	641	2,271
GROSS TRIPS					9,499	2,912	2,359	553	2,912	641	2,271

Signal Warrant

2045 AM Peak Hour Volume Warrant Route MM and Farm Road 144

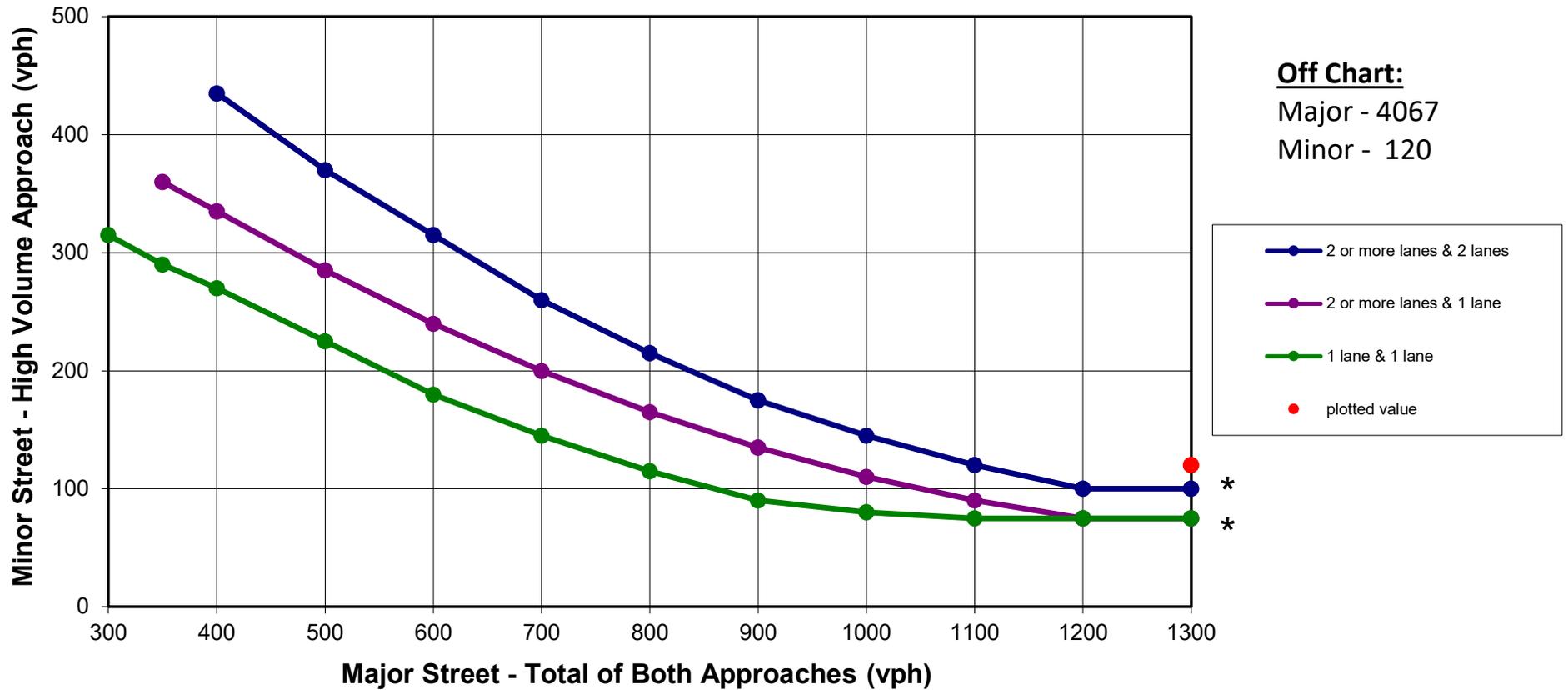
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

2045 PM Peak Hour Volume Warrant Route MM and Farm Road 144

(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Capacity Analysis

Queues
2: Route MM & WB James River Freeway

Route MM
Future Baseline AM 2045



Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	101	970	33	1639	1450	66
v/c Ratio	0.62	2.15	0.15	0.71	0.73	0.07
Control Delay	42.2	542.8	3.9	6.9	14.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	542.8	3.9	6.9	14.8	0.1
Queue Length 50th (ft)	29	~240	2	111	88	0
Queue Length 95th (ft)	#86	#351	8	167	#354	0
Internal Link Dist (ft)				685	1587	
Turn Bay Length (ft)	325	325	250			50
Base Capacity (vph)	162	451	289	2317	1975	994
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	2.15	0.11	0.71	0.73	0.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary

2: Route MM & WB James River Freeway

Route MM
Future Baseline AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖		↖↖	↖	↕↕			↕↕	↖
Traffic Volume (veh/h)	0	0	0	93	0	892	30	1508	0	0	1334	61
Future Volume (veh/h)	0	0	0	93	0	892	30	1508	0	0	1334	61
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		No
Adj Sat Flow, veh/h/ln				1722	0	1826	1144	1796	0	0	1796	1870
Adj Flow Rate, veh/h				101	0	0	33	1639	0	0	1450	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				12	0	5	51	7	0	0	7	2
Cap, veh/h				126	0		236	2407	0	0	1856	
Arrive On Green				0.08	0.00	0.00	0.04	0.71	0.00	0.00	0.54	0.00
Sat Flow, veh/h				1640	0	2723	1090	3503	0	0	3503	1585
Grp Volume(v), veh/h				101	0	0	33	1639	0	0	1450	0
Grp Sat Flow(s),veh/h/ln				1640	0	1362	1090	1706	0	0	1706	1585
Q Serve(g_s), s				2.9	0.0	0.0	0.6	13.1	0.0	0.0	16.2	0.0
Cycle Q Clear(g_c), s				2.9	0.0	0.0	0.6	13.1	0.0	0.0	16.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				126	0		236	2407	0	0	1856	
V/C Ratio(X)				0.80	0.00		0.14	0.68	0.00	0.00	0.78	
Avail Cap(c_a), veh/h				170	0		399	2407	0	0	1856	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				21.9	0.0	0.0	7.6	4.0	0.0	0.0	8.7	0.0
Incr Delay (d2), s/veh				17.4	0.0	0.0	0.3	1.6	0.0	0.0	3.4	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				1.6	0.0	0.0	0.1	0.5	0.0	0.0	3.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				39.3	0.0	0.0	7.9	5.6	0.0	0.0	12.1	0.0
LnGrp LOS				D	A		A	A	A	A	B	
Approach Vol, veh/h					101			1672			1450	
Approach Delay, s/veh					39.3			5.7			12.1	
Approach LOS					D			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		40.0			7.8	32.2		8.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		4.5				
Max Green Setting (Gmax), s		34.0			9.0	19.0		5.0				
Max Q Clear Time (g_c+I1), s		15.1			2.6	18.2		4.9				
Green Ext Time (p_c), s		10.9			0.0	0.6		0.0				

Intersection Summary

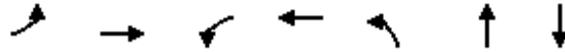
HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Notes

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

Queues
3: Route MM & Carnahan Street

Route MM
Future Baseline AM 2045



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	10	32	43	20	54	2434	1411
v/c Ratio	0.04	0.12	0.18	0.07	0.24	0.90	0.52
Control Delay	15.4	7.4	17.5	4.9	7.6	17.2	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	7.4	17.5	4.9	7.6	17.2	4.6
Queue Length 50th (ft)	2	0	10	0	5	~389	103
Queue Length 95th (ft)	11	15	28	9	25	#548	90
Internal Link Dist (ft)		787		705		1587	785
Turn Bay Length (ft)	200		200		300		
Base Capacity (vph)	620	654	620	654	227	2715	2713
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.05	0.07	0.03	0.24	0.90	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

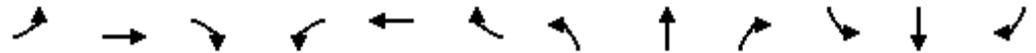
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
3: Route MM & Carnahan Street

Route MM
Future Baseline AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↕↔		↔	↕↔	
Traffic Volume (veh/h)	9	0	29	40	0	18	50	2069	170	0	1192	106
Future Volume (veh/h)	9	0	29	40	0	18	50	2069	170	0	1192	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	0	0	43	0	20	54	2249	185	0	1296	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	124		254	0	105	472	2442	198	160	2607	
Arrive On Green	0.07	0.00	0.00	0.07	0.00	0.07	0.73	0.73	0.73	0.00	1.00	0.00
Sat Flow, veh/h	1392	1870	0	1418	0	1585	425	3329	270	140	3647	0
Grp Volume(v), veh/h	10	0	0	43	0	20	54	1186	1248	0	1296	0
Grp Sat Flow(s),veh/h/ln	1392	1870	0	1418	0	1585	425	1777	1822	140	1777	0
Q Serve(g_s), s	0.3	0.0	0.0	1.3	0.0	0.5	1.7	24.1	26.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.0	1.3	0.0	0.5	1.7	24.1	26.1	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.15	1.00		0.00
Lane Grp Cap(c), veh/h	236	124		254	0	105	472	1303	1336	160	2607	
V/C Ratio(X)	0.04	0.00		0.17	0.00	0.19	0.11	0.91	0.93	0.00	0.50	
Avail Cap(c_a), veh/h	700	748		727	0	634	472	1303	1336	160	2607	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.00	0.87	0.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	20.2	0.0	19.9	1.8	4.8	5.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.9	0.0	1.2	1.6	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.4	0.0	0.2	0.0	0.4	0.6	0.0	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	0.0	0.0	20.5	0.0	20.7	1.9	6.0	6.7	0.0	0.6	0.0
LnGrp LOS	C	A		C	A	C	A	A	A	A	A	
Approach Vol, veh/h		10			63			2488			1296	
Approach Delay, s/veh		20.3			20.6			6.3			0.6	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		7.5		37.5		7.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		28.1		2.8		2.0		3.3				
Green Ext Time (p_c), s		0.0		0.0		7.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay	4.6
HCM 6th LOS	A

Notes

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

Queues
4: Route MM & Farm Road 148

Route MM
Future Baseline AM 2045



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	34	32	2306	233	1374
v/c Ratio	0.13	0.14	0.84	1.27	0.49
Control Delay	17.5	17.4	10.4	173.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	17.4	10.4	173.4	5.6
Queue Length 50th (ft)	8	7	~140	~86	110
Queue Length 95th (ft)	25	24	m#425	m#186	196
Internal Link Dist (ft)	829		785		1357
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	708	633	2735	184	2779
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.05	0.84	1.27	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
4: Route MM & Farm Road 148

Route MM
Future Baseline AM 2045



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	29	1854	268	214	1264
Future Volume (veh/h)	31	29	1854	268	214	1264
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	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	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	32	2015	291	233	1374
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	111	99	2307	325	277	2621
Arrive On Green	0.06	0.06	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1781	1585	3221	441	159	3647
Grp Volume(v), veh/h	34	32	1123	1183	233	1374
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1791	159	1777
Q Serve(g_s), s	0.8	0.9	0.0	0.0	33.2	0.0
Cycle Q Clear(g_c), s	0.8	0.9	0.0	0.0	33.2	0.0
Prop In Lane	1.00	1.00		0.25	1.00	
Lane Grp Cap(c), veh/h	111	99	1311	1321	277	2621
V/C Ratio(X)	0.31	0.32	0.86	0.90	0.84	0.52
Avail Cap(c_a), veh/h	713	634	1311	1321	277	2621
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	0.33	0.33	0.80	0.80
Uniform Delay (d), s/veh	20.2	20.2	0.0	0.0	8.2	0.0
Incr Delay (d2), s/veh	1.5	1.9	2.6	3.6	21.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.3	1.0	1.3	2.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.7	22.1	2.6	3.6	29.3	0.6
LnGrp LOS	C	C	A	A	C	A
Approach Vol, veh/h	66		2306			1607
Approach Delay, s/veh	21.9		3.1			4.8
Approach LOS	C		A			A
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		37.7			37.7	7.3
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		18.0			18.0	18.0
Max Q Clear Time (g_c+I1), s		2.0			35.2	2.9
Green Ext Time (p_c), s		13.4			0.0	0.1
Intersection Summary						
HCM 6th Ctrl Delay			4.1			
HCM 6th LOS			A			

Queues
5: Route MM & Kings Street/King Street

Route MM
Future Baseline AM 2045



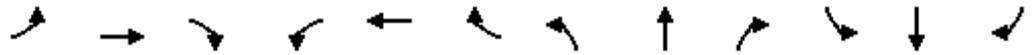
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	32	59	59	71	1865	252	1567
v/c Ratio	0.09	0.11	0.25	0.20	0.38	0.70	1.36	0.58
Control Delay	15.6	7.0	18.2	10.5	15.8	9.4	210.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	7.0	18.2	10.5	15.8	9.4	210.5	6.4
Queue Length 50th (ft)	5	0	14	5	13	183	~102	117
Queue Length 95th (ft)	17	14	35	26	m17	m#263	m#184	192
Internal Link Dist (ft)		805		888		1357		1153
Turn Bay Length (ft)	200		200		350		250	
Base Capacity (vph)	572	654	572	654	185	2665	185	2697
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.05	0.10	0.09	0.38	0.70	1.36	0.58

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
5: Route MM & Kings Street/King Street

Route MM
Future Baseline AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↷		↶	↷	
Traffic Volume (veh/h)	19	0	29	54	0	54	65	1484	232	232	1395	47
Future Volume (veh/h)	19	0	29	54	0	54	65	1484	232	232	1395	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	0	32	59	0	59	71	1613	252	252	1516	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	245	0	156	270	0	156	390	2168	331	332	2461	83
Arrive On Green	0.10	0.00	0.10	0.10	0.00	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1344	0	1585	1377	0	1585	328	3090	472	246	3508	118
Grp Volume(v), veh/h	21	0	32	59	0	59	71	912	953	252	766	801
Grp Sat Flow(s),veh/h/ln	1344	0	1585	1377	0	1585	328	1777	1785	246	1777	1849
Q Serve(g_s), s	0.7	0.0	0.8	1.9	0.0	1.6	0.0	0.0	0.0	31.6	0.0	0.0
Cycle Q Clear(g_c), s	2.2	0.0	0.8	2.7	0.0	1.6	0.0	0.0	0.0	31.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		0.06
Lane Grp Cap(c), veh/h	245	0	156	270	0	156	390	1247	1253	332	1247	1297
V/C Ratio(X)	0.09	0.00	0.21	0.22	0.00	0.38	0.18	0.73	0.76	0.76	0.61	0.62
Avail Cap(c_a), veh/h	651	0	634	685	0	634	390	1247	1253	332	1247	1297
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.44	0.44	0.44	0.74	0.74	0.74
Uniform Delay (d), s/veh	20.0	0.0	18.7	19.9	0.0	19.0	0.0	0.0	0.0	5.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.4	0.0	1.5	0.5	1.7	2.0	11.4	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.3	0.6	0.0	0.6	0.0	0.6	0.7	1.1	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	0.0	19.3	20.3	0.0	20.5	0.5	1.7	2.0	16.4	1.7	1.6
LnGrp LOS	C	A	B	C	A	C	A	A	A	B	A	A
Approach Vol, veh/h		53			118			1936			1819	
Approach Delay, s/veh		19.7			20.4			1.8			3.7	
Approach LOS		B			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.1		8.9		36.1		8.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		2.0		4.2		33.6		4.7				
Green Ext Time (p_c), s		11.6		0.1		0.0		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				3.5								
HCM 6th LOS				A								

Queues
6: Route MM & Farm Road 144

Route MM
Future Baseline AM 2045



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	20	16	63	63	64	1629	268	1741	61
v/c Ratio	0.08	0.05	0.26	0.21	0.35	0.61	1.46	0.64	0.05
Control Delay	15.4	3.5	18.3	10.8	14.4	7.1	245.4	8.4	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	3.5	18.3	10.8	14.4	7.1	245.4	8.4	3.6
Queue Length 50th (ft)	4	0	14	6	8	111	~105	150	1
Queue Length 95th (ft)	16	7	37	27	m18	195	m#171	#233	m6
Internal Link Dist (ft)		956		598		1153		1343	
Turn Bay Length (ft)	250				250		250		250
Base Capacity (vph)	572	654	572	654	184	2651	184	2704	1224
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.02	0.11	0.10	0.35	0.61	1.46	0.64	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

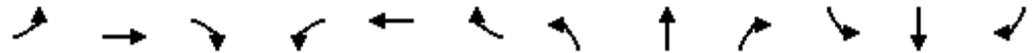
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
6: Route MM & Farm Road 144

Route MM
Future Baseline AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	15	58	0	58	59	1252	247	247	1602	56
Future Volume (veh/h)	18	0	15	58	0	58	59	1252	247	247	1602	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	0	16	63	0	63	64	1361	268	268	1741	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	239	0	153	282	0	153	344	2088	405	377	2500	1115
Arrive On Green	0.10	0.00	0.10	0.10	0.00	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1339	0	1585	1397	0	1585	261	2968	576	309	3554	1585
Grp Volume(v), veh/h	20	0	16	63	0	63	64	806	823	268	1741	61
Grp Sat Flow(s),veh/h/ln	1339	0	1585	1397	0	1585	261	1777	1767	309	1777	1585
Q Serve(g_s), s	0.6	0.0	0.4	1.9	0.0	1.7	0.0	0.0	0.0	31.7	0.0	0.0
Cycle Q Clear(g_c), s	2.3	0.0	0.4	2.4	0.0	1.7	0.0	0.0	0.0	31.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	239	0	153	282	0	153	344	1250	1243	377	2500	1115
V/C Ratio(X)	0.08	0.00	0.10	0.22	0.00	0.41	0.19	0.65	0.66	0.71	0.70	0.05
Avail Cap(c_a), veh/h	646	0	634	706	0	634	344	1250	1243	377	2500	1115
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.66	0.66	0.61	0.61	0.61
Uniform Delay (d), s/veh	20.2	0.0	18.6	19.6	0.0	19.1	0.0	0.0	0.0	3.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3	0.4	0.0	1.8	0.8	1.7	1.8	6.8	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.1	0.6	0.0	0.6	0.1	0.6	0.6	0.7	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	18.9	20.0	0.0	20.9	0.8	1.7	1.8	9.8	1.0	0.1
LnGrp LOS	C	A	B	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		36			126			1693			2070	
Approach Delay, s/veh		19.7			20.5			1.7			2.1	
Approach LOS		B			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.2		8.8		36.2		8.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		2.0		4.3		33.7		4.4				
Green Ext Time (p_c), s		10.4		0.1		0.0		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				2.7								
HCM 6th LOS				A								

Queues
7: Route MM & Industrial Drive

Route MM
Future Baseline AM 2045



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	22	23	20	43	92	1366	185	2041	93
v/c Ratio	0.09	0.09	0.08	0.17	0.50	0.49	0.73	0.73	0.07
Control Delay	17.0	6.3	16.9	9.8	21.9	5.6	26.9	9.3	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	6.3	16.9	9.8	21.9	5.6	26.9	9.3	2.3
Queue Length 50th (ft)	5	0	5	2	15	115	36	207	1
Queue Length 95th (ft)	19	11	17	20	m#35	193	m#64	m#315	m4
Internal Link Dist (ft)		930		945		1343		1156	
Turn Bay Length (ft)	250		250		250		250		250
Base Capacity (vph)	727	654	727	654	183	2767	252	2788	1267
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.04	0.03	0.07	0.50	0.49	0.73	0.73	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
7: Route MM & Industrial Drive

Route MM
Future Baseline AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↕		↗	↕	↗
Traffic Volume (veh/h)	20	0	21	18	0	40	85	1180	76	170	1878	86
Future Volume (veh/h)	20	0	21	18	0	40	85	1180	76	170	1878	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	0	23	20	0	43	92	1283	83	185	2041	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	0	130	256	0	130	295	2432	157	446	2550	1138
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1364	0	1585	1388	0	1585	189	3389	219	398	3554	1585
Grp Volume(v), veh/h	22	0	23	20	0	43	92	672	694	185	2041	93
Grp Sat Flow(s),veh/h/ln	1364	0	1585	1388	0	1585	189	1777	1831	398	1777	1585
Q Serve(g_s), s	0.7	0.0	0.6	0.6	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.6	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	237	0	130	256	0	130	295	1275	1314	446	2550	1138
V/C Ratio(X)	0.09	0.00	0.18	0.08	0.00	0.33	0.31	0.53	0.53	0.42	0.80	0.08
Avail Cap(c_a), veh/h	671	0	634	697	0	634	295	1275	1314	446	2550	1138
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	19.2	19.8	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.1	0.0	1.5	2.1	1.2	1.2	2.8	2.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.2	0.0	0.4	0.2	0.4	0.4	0.4	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	0.0	19.9	19.9	0.0	20.9	2.1	1.2	1.2	2.8	2.7	0.1
LnGrp LOS	C	A	B	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		45			63			1458			2319	
Approach Delay, s/veh		20.2			20.6			1.2			2.6	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.8		8.2		36.8		8.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		2.0		3.8		2.0		3.2				
Green Ext Time (p_c), s		9.9		0.1		13.4		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				2.6								
HCM 6th LOS				A								

Intersection												
Int Delay, s/veh	13.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕↗		↗	↕↗	
Traffic Vol, veh/h	2	0	1	35	0	28	1	1229	8	9	2067	5
Future Vol, veh/h	2	0	1	35	0	28	1	1229	8	9	2067	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	250	-	-	250	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	38	0	30	1	1336	9	10	2247	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	2940	3617	1126	2487	3615	673	2252	0	0	1345	0	0
Stage 1	2270	2270	-	1343	1343	-	-	-	-	-	-	-
Stage 2	670	1347	-	1144	2272	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	7	5	199	~ 15	5	398	225	-	-	508	-	-
Stage 1	41	75	-	160	219	-	-	-	-	-	-	-
Stage 2	413	218	-	213	75	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	6	5	199	~ 15	5	398	225	-	-	508	-	-
Mov Cap-2 Maneuver	6	5	-	~ 15	5	-	-	-	-	-	-	-
Stage 1	41	74	-	159	218	-	-	-	-	-	-	-
Stage 2	380	217	-	208	74	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	\$ 544.8		\$ 683.2		0			0.1		
HCM LOS	F		F							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	225	-	-	6	199	15	398	508	-	-
HCM Lane V/C Ratio	0.005	-	-	0.362	0.005	2.536	0.076	0.019	-	-
HCM Control Delay (s)	21.1	-	-	\$ 805.6	23.2	1217.9	14.8	12.2	-	-
HCM Lane LOS	C	-	-	F	C	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0	5.5	0.2	0.1	-	-

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

Queues
9: Route MM & EB I-44 Ramps

Route MM
Future Baseline AM 2045



Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	508	627	446	15	1750
v/c Ratio	0.08	1.22	0.31	0.41	0.03	0.81
Control Delay	15.8	138.6	7.6	3.8	3.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	15.8	138.6	7.6	3.8	3.1	7.7
Queue Length 50th (ft)	6	~137	22	3	1	148
Queue Length 95th (ft)	21	#285	106	78	m1	m126
Internal Link Dist (ft)			446			347
Turn Bay Length (ft)		275		400	150	
Base Capacity (vph)	334	416	2013	1092	506	2162
Starvation Cap Reductn	0	0	0	0	0	39
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	1.22	0.31	0.41	0.03	0.82

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary

9: Route MM & EB I-44 Ramps

Route MM
Future Baseline AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	467	0	0	0	0	577	410	14	1610	0
Future Volume (veh/h)	25	0	467	0	0	0	0	577	410	14	1610	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	1870	0	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	27	0	508				0	627	446	15	1750	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	336	0	299				0	1749	780	450	2172	0
Arrive On Green	0.19	0.00	0.19				0.00	0.98	0.98	0.03	0.81	0.00
Sat Flow, veh/h	1781	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	27	0	508				0	627	446	15	1750	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	0.6	0.0	8.5				0.0	0.2	0.5	0.2	12.0	0.0
Cycle Q Clear(g_c), s	0.6	0.0	8.5				0.0	0.2	0.5	0.2	12.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	336	0	299				0	1749	780	450	2172	0
V/C Ratio(X)	0.08	0.00	1.70				0.00	0.36	0.57	0.03	0.81	0.00
Avail Cap(c_a), veh/h	336	0	299				0	1749	780	614	2172	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	1.33	1.33	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	15.0	0.0	18.2				0.0	0.2	0.2	4.5	2.8	0.0
Incr Delay (d2), s/veh	0.1	0.0	327.5				0.0	0.6	3.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	29.9				0.0	0.2	0.7	0.0	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	0.0	345.8				0.0	0.8	3.2	4.5	3.1	0.0
LnGrp LOS	B	A	F				A	A	A	A	A	A
Approach Vol, veh/h		535						1073			1765	
Approach Delay, s/veh		329.1						1.8			3.1	
Approach LOS		F						A			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	5.4	26.6		13.0				32.0				
Change Period (Y+Rc), s	4.5	4.5		4.5				4.5				
Max Green Setting (Gmax), s	5.0	18.0		8.5				27.5				
Max Q Clear Time (g_c+I1), s	2.2	2.5		10.5				14.0				
Green Ext Time (p_c), s	0.0	4.7		0.0				9.2				
Intersection Summary												
HCM 6th Ctrl Delay			54.4									
HCM 6th LOS			D									

Queues
2: Route MM & WB James River Freeway

Route MM
Future Baseline PM 2045



Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	239	958	86	716	2527	266
v/c Ratio	0.72	1.04	0.54	0.33	1.30	0.41
Control Delay	55.0	62.1	29.9	0.6	154.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	62.1	29.9	0.6	154.7	2.5
Queue Length 50th (ft)	159	~252	20	0	~1241	14
Queue Length 95th (ft)	#266	#394	73	0	m#1108	m4
Internal Link Dist (ft)				685	1587	
Turn Bay Length (ft)	325	325	250			50
Base Capacity (vph)	331	925	160	2182	1946	649
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.04	0.54	0.33	1.32	0.41

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary

2: Route MM & WB James River Freeway

Route MM
Future Baseline PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖		↖↖	↖	↕↕			↕↕	↖
Traffic Volume (veh/h)	0	0	0	220	0	881	79	659	0	0	2325	245
Future Volume (veh/h)	0	0	0	220	0	881	79	659	0	0	2325	245
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		No
Adj Sat Flow, veh/h/ln				1781	0	1870	1618	1767	0	0	1870	1159
Adj Flow Rate, veh/h				239	0	0	86	716	0	0	2527	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				8	0	2	19	9	0	0	2	50
Cap, veh/h				269	0		287	2345	0	0	1858	
Arrive On Green				0.16	0.00	0.00	0.22	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h				1697	0	2790	1541	3445	0	0	3647	982
Grp Volume(v), veh/h				239	0	0	86	716	0	0	2527	0
Grp Sat Flow(s),veh/h/ln				1697	0	1395	1541	1678	0	0	1777	982
Q Serve(g_s), s				15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				269	0		287	2345	0	0	1858	
V/C Ratio(X)				0.89	0.00		0.30	0.31	0.00	0.00	1.36	
Avail Cap(c_a), veh/h				336	0		287	2345	0	0	1858	
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)				1.00	0.00	0.00	0.89	0.89	0.00	0.00	0.09	0.00
Uniform Delay (d), s/veh				45.3	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				20.6	0.0	0.0	0.5	0.3	0.0	0.0	162.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				7.8	0.0	0.0	1.8	0.1	0.0	0.0	41.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				65.9	0.0	0.0	21.0	0.3	0.0	0.0	162.5	0.0
LnGrp LOS				E	A		C	A	A	A	F	
Approach Vol, veh/h					239			802			2527	
Approach Delay, s/veh					65.9			2.5			162.5	
Approach LOS					E			A			F	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		84.4			19.4	65.0		25.6				
Change Period (Y+Rc), s		7.5			7.5	7.5		8.2				
Max Green Setting (Gmax), s		72.5			7.5	57.5		21.8				
Max Q Clear Time (g_c+I1), s		2.0			2.0	2.0		17.2				
Green Ext Time (p_c), s		4.8			0.1	38.6		0.3				

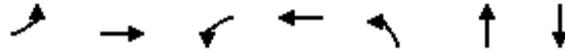
Intersection Summary

HCM 6th Ctrl Delay	120.1
HCM 6th LOS	F

Notes

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

Queues
3: Route MM & Carnahan Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	29	111	180	80	23	1629	2378
v/c Ratio	0.14	0.47	0.80	0.19	0.21	0.69	1.09
Control Delay	37.3	9.8	66.4	1.0	12.3	13.0	60.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	9.8	66.4	1.0	12.3	13.0	60.8
Queue Length 50th (ft)	17	0	114	0	5	270	~200
Queue Length 95th (ft)	42	26	#199	0	m11	m330	#1246
Internal Link Dist (ft)		787		705		1587	785
Turn Bay Length (ft)	200		200		300		
Base Capacity (vph)	245	266	224	423	125	2345	2175
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.42	0.80	0.19	0.18	0.69	1.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary

3: Route MM & Carnahan Street

Route MM
Future Baseline PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	102	166	0	74	21	1453	46	0	2163	25
Future Volume (veh/h)	27	0	102	166	0	74	21	1453	46	0	2163	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1722	1870	1870	1870	966	1811	1870	1870	1841	-1064
Adj Flow Rate, veh/h	29	0	0	180	0	80	23	1579	50	0	2351	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	12	2	2	2	63	6	2	2	4	200
Cap, veh/h	154	31		248	0	108	95	2522	80	268	2272	
Arrive On Green	0.04	0.00	0.00	0.09	0.00	0.07	0.06	1.00	1.00	0.00	1.00	0.00
Sat Flow, veh/h	1781	1870	0	1781	0	1585	920	3405	108	1781	3589	0
Grp Volume(v), veh/h	29	0	0	180	0	80	23	796	833	0	2351	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	0	1585	920	1721	1792	1781	1749	0
Q Serve(g_s), s	1.7	0.0	0.0	9.8	0.0	5.4	0.8	0.0	0.0	0.0	71.4	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	9.8	0.0	5.4	0.8	0.0	0.0	0.0	71.4	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	154	31		248	0	108	95	1274	1327	268	2272	
V/C Ratio(X)	0.19	0.00		0.73	0.00	0.74	0.24	0.62	0.63	0.00	1.03	
Avail Cap(c_a), veh/h	246	167		248	0	141	137	1274	1327	404	2272	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.60	0.60	0.60	0.00	0.38	0.00
Uniform Delay (d), s/veh	50.0	0.0	0.0	47.2	0.0	50.3	28.6	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	10.2	0.0	13.6	0.8	1.4	1.4	0.0	22.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	5.5	0.0	2.6	0.4	0.5	0.5	0.0	7.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.6	0.0	0.0	57.4	0.0	63.8	29.4	1.4	1.4	0.0	22.1	0.0
LnGrp LOS	D	A		E	A	E	C	A	A	A	F	
Approach Vol, veh/h		29			260			1652			2351	
Approach Delay, s/veh		50.6			59.4			1.8			22.1	
Approach LOS		D			E			A			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	88.0	9.3	12.7	10.0	77.9	15.0	7.0				
Change Period (Y+Rc), s	6.5	6.5	5.2	5.2	6.5	6.5	5.2	5.2				
Max Green Setting (Gmax), s	8.5	58.5	9.8	9.8	8.5	58.5	9.8	9.8				
Max Q Clear Time (g_c+I1), s	0.0	2.0	3.7	7.4	2.8	73.4	11.8	0.0				
Green Ext Time (p_c), s	0.0	15.4	0.0	0.1	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	16.7
HCM 6th LOS	B

Notes

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

Queues
4: Route MM & Farm Road 148

Route MM
Future Baseline PM 2045



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	149	191	1709	160	2217
v/c Ratio	0.64	0.57	0.92	0.63	0.88
Control Delay	57.0	19.1	21.6	38.8	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	19.1	21.6	38.8	10.2
Queue Length 50th (ft)	101	29	417	74	107
Queue Length 95th (ft)	160	95	#824	m77	m167
Internal Link Dist (ft)	829		785		1357
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	431	496	1854	253	2516
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.39	0.92	0.63	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
4: Route MM & Farm Road 148

Route MM
Future Baseline PM 2045



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	137	176	1471	101	147	2040
Future Volume (veh/h)	137	176	1471	101	147	2040
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	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	1870	1870	1796	1870	1870	1841
Adj Flow Rate, veh/h	149	191	1599	110	160	2217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	7	2	2	4
Cap, veh/h	255	227	1890	129	345	2498
Arrive On Green	0.14	0.14	1.00	1.00	0.13	1.00
Sat Flow, veh/h	1781	1585	3331	221	1781	3589
Grp Volume(v), veh/h	149	191	837	872	160	2217
Grp Sat Flow(s),veh/h/ln	1781	1585	1706	1756	1781	1749
Q Serve(g_s), s	8.6	12.9	0.0	0.0	3.8	0.0
Cycle Q Clear(g_c), s	8.6	12.9	0.0	0.0	3.8	0.0
Prop In Lane	1.00	1.00		0.13	1.00	
Lane Grp Cap(c), veh/h	255	227	995	1024	345	2498
V/C Ratio(X)	0.59	0.84	0.84	0.85	0.46	0.89
Avail Cap(c_a), veh/h	434	386	995	1024	354	2498
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.67	0.67	0.09	0.09
Uniform Delay (d), s/veh	44.1	45.9	0.0	0.0	6.4	0.0
Incr Delay (d2), s/veh	2.1	8.3	5.9	6.2	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	5.4	1.6	1.8	1.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.2	54.2	5.9	6.2	6.5	0.5
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	340		1709			2377
Approach Delay, s/veh	50.7		6.1			0.9
Approach LOS	D		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	14.4	71.6		23.9		86.1
Change Period (Y+Rc), s	7.5	7.5		8.2		7.5
Max Green Setting (Gmax), s	7.5	52.5		26.8		67.5
Max Q Clear Time (g_c+I1), s	5.8	2.0		14.9		2.0
Green Ext Time (p_c), s	0.1	16.8		0.8		33.6
Intersection Summary						
HCM 6th Ctrl Delay			6.7			
HCM 6th LOS			A			

Queues
5: Route MM & Kings Street/King Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	85	146	242	242	26	1776	68	2019
v/c Ratio	0.49	0.45	1.02	0.66	0.17	1.03	0.35	1.08
Control Delay	42.5	6.4	103.6	19.5	19.4	58.7	20.8	75.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	6.4	103.6	19.5	19.4	58.7	20.8	75.7
Queue Length 50th (ft)	50	0	~186	28	11	~692	22	~921
Queue Length 95th (ft)	84	21	#267	104	m18	m#946	m41	#1131
Internal Link Dist (ft)		805		888		1357		1153
Turn Bay Length (ft)	200		200		350		250	
Base Capacity (vph)	176	428	238	447	162	1722	197	1861
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.34	1.02	0.54	0.16	1.03	0.35	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
5: Route MM & Kings Street/King Street

Route MM
Future Baseline PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	0	134	223	0	223	24	1571	63	63	1833	25
Future Volume (veh/h)	78	0	134	223	0	223	24	1571	63	63	1833	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1870	1826	1870	1870	1870	1604	1811	1870	1870	1841	1574
Adj Flow Rate, veh/h	85	0	146	242	0	242	26	1708	68	68	1992	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	2	5	2	2	2	20	6	2	2	4	22
Cap, veh/h	187	0	248	280	0	267	119	1456	58	165	1598	22
Arrive On Green	0.06	0.00	0.16	0.07	0.00	0.17	0.07	0.86	0.86	0.07	0.60	0.60
Sat Flow, veh/h	1711	0	1585	1781	0	1585	1527	3374	134	1781	3533	48
Grp Volume(v), veh/h	85	0	146	242	0	242	26	867	909	68	984	1035
Grp Sat Flow(s),veh/h/ln	1711	0	1585	1781	0	1585	1527	1721	1787	1781	1749	1832
Q Serve(g_s), s	4.5	0.0	9.4	7.8	0.0	16.5	1.0	47.5	47.5	2.2	49.8	49.8
Cycle Q Clear(g_c), s	4.5	0.0	9.4	7.8	0.0	16.5	1.0	47.5	47.5	2.2	49.8	49.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.03
Lane Grp Cap(c), veh/h	187	0	248	280	0	267	119	742	771	165	791	829
V/C Ratio(X)	0.46	0.00	0.59	0.87	0.00	0.91	0.22	1.17	1.18	0.41	1.24	1.25
Avail Cap(c_a), veh/h	207	0	271	280	0	271	170	742	771	187	791	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.34	0.34	0.34	0.43	0.43	0.43
Uniform Delay (d), s/veh	36.8	0.0	43.1	42.6	0.0	44.9	25.2	7.5	7.5	24.8	21.9	21.9
Incr Delay (d2), s/veh	1.7	0.0	2.8	23.5	0.0	31.2	0.3	80.9	85.3	0.7	114.4	116.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	3.9	4.7	0.0	8.7	0.3	19.3	21.0	0.8	38.7	41.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	0.0	45.9	66.0	0.0	76.1	25.5	88.4	92.8	25.5	136.3	138.6
LnGrp LOS	D	A	D	E	A	E	C	F	F	C	F	F
Approach Vol, veh/h		231			484			1802			2087	
Approach Delay, s/veh		43.2			71.1			89.7			133.9	
Approach LOS		D			E			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.6	55.0	14.7	26.7	11.3	57.3	16.0	25.4				
Change Period (Y+Rc), s	7.5	7.5	8.2	8.2	7.5	7.5	8.2	8.2				
Max Green Setting (Gmax), s	7.5	44.5	7.8	18.8	7.5	44.5	7.8	18.8				
Max Q Clear Time (g_c+I1), s	4.2	49.5	6.5	18.5	3.0	51.8	9.8	11.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	105.4
HCM 6th LOS	F

Queues
6: Route MM & Farm Road 144

Route MM
Future Baseline PM 2045



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	62	72	259	259	20	2009	73	1742	32
v/c Ratio	0.63	0.25	0.91	0.61	0.11	1.08	0.39	0.83	0.03
Control Delay	75.6	2.0	72.5	23.7	3.6	58.2	22.5	26.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	2.0	72.5	23.7	3.6	58.2	22.5	26.5	0.0
Queue Length 50th (ft)	43	0	157	72	1	~948	27	322	0
Queue Length 95th (ft)	#99	0	#287	156	m2	m#936	m53	#805	m0
Internal Link Dist (ft)		956		598		1153		1343	
Turn Bay Length (ft)	250				250		250		250
Base Capacity (vph)	109	303	286	476	190	1858	190	2105	926
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.24	0.91	0.54	0.11	1.08	0.38	0.83	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

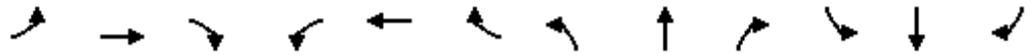
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
6: Route MM & Farm Road 144

Route MM
Future Baseline PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↕	↗
Traffic Volume (veh/h)	57	0	66	238	0	238	18	1781	67	67	1603	29
Future Volume (veh/h)	57	0	66	238	0	238	18	1781	67	67	1603	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1796	1870	1870	1841	1693
Adj Flow Rate, veh/h	62	0	72	259	0	259	20	1936	73	73	1742	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	7	2	2	4	14
Cap, veh/h	147	0	140	295	0	356	254	1704	64	170	1873	768
Arrive On Green	0.09	0.00	0.09	0.10	0.00	0.22	0.06	1.00	1.00	0.11	1.00	1.00
Sat Flow, veh/h	1120	0	1585	1781	0	1585	1781	3354	126	1781	3497	1434
Grp Volume(v), veh/h	62	0	72	259	0	259	20	979	1030	73	1742	32
Grp Sat Flow(s),veh/h/ln	1120	0	1585	1781	0	1585	1781	1706	1774	1781	1749	1434
Q Serve(g_s), s	6.0	0.0	4.8	10.5	0.0	16.7	0.6	55.9	55.9	2.0	0.0	0.0
Cycle Q Clear(g_c), s	7.6	0.0	4.8	10.5	0.0	16.7	0.6	55.9	55.9	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	147	0	140	295	0	356	254	867	901	170	1873	768
V/C Ratio(X)	0.42	0.00	0.52	0.88	0.00	0.73	0.08	1.13	1.14	0.43	0.93	0.04
Avail Cap(c_a), veh/h	159	0	156	295	0	372	323	867	901	190	1873	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.45	0.45	0.45
Uniform Delay (d), s/veh	50.0	0.0	47.9	43.3	0.0	39.5	11.6	0.0	0.0	23.5	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	2.9	24.6	0.0	6.7	0.0	59.8	66.1	0.8	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	1.9	4.0	0.0	7.1	0.2	14.4	16.5	0.8	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.9	0.0	50.8	67.9	0.0	46.3	11.6	59.8	66.1	24.3	5.0	0.0
LnGrp LOS	D	A	D	E	A	D	B	F	F	C	A	A
Approach Vol, veh/h		134			518			2029			1847	
Approach Delay, s/veh		51.4			57.1			62.5			5.6	
Approach LOS		D			E			E			A	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.7	63.4		32.9	10.7	66.4	15.0	17.9				
Change Period (Y+Rc), s	7.5	7.5		8.2	7.5	7.5	4.5	8.2				
Max Green Setting (Gmax), s	7.5	53.5		25.8	7.5	53.5	10.5	10.8				
Max Q Clear Time (g_c+I1), s	4.0	57.9		18.7	2.6	2.0	12.5	9.6				
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	19.2	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay				38.4								
HCM 6th LOS				D								

Queues
7: Route MM & Industrial Drive

Route MM
Future Baseline PM 2045



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	102	77	80	178	21	2170	50	1683	27
v/c Ratio	0.44	0.21	0.62	0.61	0.12	1.19	0.27	0.84	0.03
Control Delay	52.8	1.3	71.1	14.6	3.4	104.8	15.2	27.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.8	1.3	71.1	14.6	3.4	104.8	15.2	27.2	0.0
Queue Length 50th (ft)	69	0	56	0	2	~1039	15	451	0
Queue Length 95th (ft)	125	0	#121	52	m2	m#965	m29	#780	m0
Internal Link Dist (ft)		930		945		1343		1156	
Turn Bay Length (ft)	250		250		250		250		250
Base Capacity (vph)	252	374	131	298	190	1818	190	2012	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.21	0.61	0.60	0.11	1.19	0.26	0.84	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

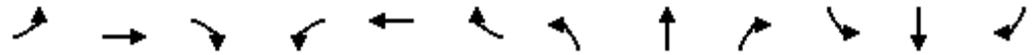
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
7: Route MM & Industrial Drive

Route MM
Future Baseline PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	0	71	74	0	164	19	1975	21	46	1548	25
Future Volume (veh/h)	94	0	71	74	0	164	19	1975	21	46	1548	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	0	77	80	0	178	21	2147	23	50	1683	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	0	108	179	0	112	162	1920	21	154	1964	876
Arrive On Green	0.06	0.00	0.07	0.06	0.00	0.07	0.06	1.00	1.00	0.05	0.55	0.55
Sat Flow, veh/h	1781	0	1585	1781	0	1585	1781	3602	39	1781	3554	1585
Grp Volume(v), veh/h	102	0	77	80	0	178	21	1057	1113	50	1683	27
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1585	1781	1777	1863	1781	1777	1585
Q Serve(g_s), s	2.0	0.0	5.2	4.8	0.0	7.8	0.5	58.6	58.6	1.3	44.3	0.5
Cycle Q Clear(g_c), s	2.0	0.0	5.2	4.8	0.0	7.8	0.5	58.6	58.6	1.3	44.3	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	174	0	108	179	0	112	162	947	993	154	1964	876
V/C Ratio(X)	0.59	0.00	0.71	0.45	0.00	1.58	0.13	1.12	1.12	0.32	0.86	0.03
Avail Cap(c_a), veh/h	257	0	170	192	0	112	230	947	993	187	1964	876
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.8	0.0	50.2	50.4	0.0	51.1	18.7	0.0	0.0	25.5	20.9	3.3
Incr Delay (d2), s/veh	3.1	0.0	8.4	1.7	0.0	300.6	0.0	53.9	55.7	1.2	5.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	2.3	2.2	0.0	12.5	0.2	14.2	15.4	0.7	16.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.9	0.0	58.6	52.1	0.0	351.7	18.7	53.9	55.7	26.7	26.0	3.4
LnGrp LOS	D	A	E	D	A	F	B	F	F	C	C	A
Approach Vol, veh/h		179			258			2191			1760	
Approach Delay, s/veh		54.8			258.8			54.5			25.7	
Approach LOS		D			F			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	66.1	15.2	15.7	10.8	68.3	14.9	16.0				
Change Period (Y+Rc), s	7.5	7.5	8.2	8.2	7.5	7.5	8.2	8.2				
Max Green Setting (Gmax), s	7.5	51.5	7.8	11.8	7.5	51.5	11.8	7.8				
Max Q Clear Time (g_c+I1), s	3.3	60.6	6.8	7.2	2.5	46.3	4.0	9.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.1	0.0	4.1	0.1	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			55.0									
HCM 6th LOS			D									

Intersection													
Int Delay, s/veh	260.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕↗			↗	↕↗	
Traffic Vol, veh/h	4	0	4	59	0	39	4	2109	130	2	63	1551	4
Future Vol, veh/h	4	0	4	59	0	39	4	2109	130	2	63	1551	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free						
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	250	-	-	250	200	-	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	100	2	50	2	2	2	50	7	2	2	2	4	2
Mvmt Flow	4	0	4	64	0	42	4	2292	141	2	68	1686	4

Major/Minor	Minor2		Minor1		Major1			Major2					
Conflicting Flow All	2982	4269	845	3354	4201	1217	1690	0	0	2434	2433	0	0
Stage 1	1828	1828	-	2371	2371	-	-	-	-	-	-	-	-
Stage 2	1154	2441	-	983	1830	-	-	-	-	-	-	-	-
Critical Hdwy	9.5	6.54	7.9	7.54	6.54	6.94	5.1	-	-	6.44	4.14	-	-
Critical Hdwy Stg 1	8.5	5.54	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	8.5	5.54	-	6.54	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	4.5	4.02	3.8	3.52	4.02	3.32	2.7	-	-	2.52	2.22	-	-
Pot Cap-1 Maneuver	~ 1	2	224	~ 3	2	173	215	-	-	38	191	-	-
Stage 1	27	126	-	~ 35	66	-	-	-	-	-	-	-	-
Stage 2	99	61	-	267	126	-	-	-	-	-	-	-	-
Platoon blocked, %								-	-			-	-
Mov Cap-1 Maneuver	0	1	224	~ 2	1	173	215	-	-	163	163	-	-
Mov Cap-2 Maneuver	0	1	-	~ 2	1	-	-	-	-	-	-	-	-
Stage 1	26	71	-	~ 34	65	-	-	-	-	-	-	-	-
Stage 2	73	60	-	148	71	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		\$ 10515.5	0	1.7
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	215	-	-	-	224	2	173	163	-	-
HCM Lane V/C Ratio	0.02	-	-	-	0.019	32.065	0.245	0.433	-	-
HCM Control Delay (s)	22.1	-	-	-	21.4	17445	32.4	43	-	-
HCM Lane LOS	C	-	-	-	C	F	D	E	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	10.1	0.9	2	-	-

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

Queues
9: Route MM & EB I-44 Ramps



Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	58	202	1346	1072	26	1565
v/c Ratio	0.36	0.79	0.58	0.81	0.09	0.59
Control Delay	52.5	42.8	6.1	12.3	6.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	7.4
Total Delay	52.5	42.8	6.1	12.3	6.9	17.8
Queue Length 50th (ft)	38	56	252	684	8	260
Queue Length 95th (ft)	80	#161	m142	m602	m6	m185
Internal Link Dist (ft)			446			347
Turn Bay Length (ft)		275		400	150	
Base Capacity (vph)	186	276	2332	1325	303	2651
Starvation Cap Reductn	0	0	0	0	0	1045
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.73	0.58	0.81	0.09	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary

9: Route MM & EB I-44 Ramps

Route MM
Future Baseline PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	0	186	0	0	0	0	1238	986	24	1440	0
Future Volume (veh/h)	53	0	186	0	0	0	0	1238	986	24	1440	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	1841	0	1870				0	1811	1752	1870	1841	0
Adj Flow Rate, veh/h	58	0	202				0	1346	1072	26	1565	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	0	2				0	6	10	2	4	0
Cap, veh/h	188	0	170				0	2226	960	187	2623	0
Arrive On Green	0.11	0.00	0.11				0.00	0.65	0.65	0.07	1.00	0.00
Sat Flow, veh/h	1753	0	1585				0	3532	1485	1781	3589	0
Grp Volume(v), veh/h	58	0	202				0	1346	1072	26	1565	0
Grp Sat Flow(s),veh/h/ln	1753	0	1585				0	1721	1485	1781	1749	0
Q Serve(g_s), s	3.4	0.0	11.8				0.0	25.0	71.2	0.5	0.0	0.0
Cycle Q Clear(g_c), s	3.4	0.0	11.8				0.0	25.0	71.2	0.5	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	188	0	170				0	2226	960	187	2623	0
V/C Ratio(X)	0.31	0.00	1.19				0.00	0.60	1.12	0.14	0.60	0.00
Avail Cap(c_a), veh/h	188	0	170				0	2226	960	247	2623	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	1.00	0.09	0.09	0.00
Uniform Delay (d), s/veh	45.3	0.0	49.1				0.0	11.3	19.4	8.7	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	128.6				0.0	1.2	66.4	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	10.7				0.0	7.9	36.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	0.0	177.7				0.0	12.5	85.9	8.7	0.1	0.0
LnGrp LOS	D	A	F				A	B	F	A	A	A
Approach Vol, veh/h		260						2418			1591	
Approach Delay, s/veh		148.4						45.0			0.2	
Approach LOS		F						D			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	11.3	78.7		20.0				90.0				
Change Period (Y+Rc), s	7.5	7.5		8.2				7.5				
Max Green Setting (Gmax), s	7.5	67.5		11.8				82.5				
Max Q Clear Time (g_c+I1), s	2.5	73.2		13.8				2.0				
Green Ext Time (p_c), s	0.0	0.0		0.0				16.5				
Intersection Summary												
HCM 6th Ctrl Delay			34.6									
HCM 6th LOS			C									

APPENDIX C

Future Improved Conditions

Capacity Analysis

Queues
2: Route MM & WB James River Freeway

Route MM
Future Improved AM 2045



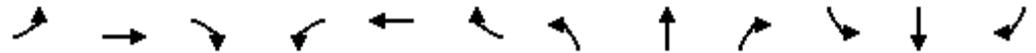
Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	101	1158	33	1787	1495	79
v/c Ratio	0.64	0.75	0.19	0.66	0.62	0.07
Control Delay	82.7	3.5	0.7	0.7	5.1	0.5
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	82.7	3.5	0.7	1.0	5.1	0.5
Queue Length 50th (ft)	97	0	0	0	43	1
Queue Length 95th (ft)	157	0	m0	m0	340	3
Internal Link Dist (ft)				685	660	
Turn Bay Length (ft)	325	325	250			50
Base Capacity (vph)	223	1538	188	2690	2426	1164
Starvation Cap Reductn	0	0	0	326	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.75	0.18	0.76	0.62	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
2: Route MM & WB James River Freeway

Route MM
Future Improved AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰		↰	↰	↕			↕	↰
Traffic Volume (veh/h)	0	0	0	93	0	1065	30	1644	0	0	1375	73
Future Volume (veh/h)	0	0	0	93	0	1065	30	1644	0	0	1375	73
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		No
Adj Sat Flow, veh/h/ln				1722	0	1826	1144	1796	0	0	1796	1870
Adj Flow Rate, veh/h				101	0	0	33	1787	0	0	1495	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				12	0	5	51	7	0	0	7	2
Cap, veh/h				121	0		200	2803	0	0	2514	
Arrive On Green				0.07	0.00	0.00	0.07	1.00	0.00	0.00	0.74	0.00
Sat Flow, veh/h				1640	0	1547	1090	3503	0	0	3503	1585
Grp Volume(v), veh/h				101	0	0	33	1787	0	0	1495	0
Grp Sat Flow(s),veh/h/ln				1640	0	1547	1090	1706	0	0	1706	1585
Q Serve(g_s), s				9.1	0.0	0.0	1.0	0.0	0.0	0.0	30.8	0.0
Cycle Q Clear(g_c), s				9.1	0.0	0.0	1.0	0.0	0.0	0.0	30.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				121	0		200	2803	0	0	2514	
V/C Ratio(X)				0.83	0.00		0.16	0.64	0.00	0.00	0.59	
Avail Cap(c_a), veh/h				227	0		231	2803	0	0	2514	
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.13	0.13	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				68.5	0.0	0.0	7.5	0.0	0.0	0.0	9.3	0.0
Incr Delay (d2), s/veh				13.6	0.0	0.0	0.0	0.1	0.0	0.0	1.0	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				4.2	0.0	0.0	0.2	0.1	0.0	0.0	10.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				82.1	0.0	0.0	7.6	0.1	0.0	0.0	10.3	0.0
LnGrp LOS				F	A		A	A	A	A	B	
Approach Vol, veh/h					101			1820			1495	
Approach Delay, s/veh					82.1			0.3			10.3	
Approach LOS					F			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		130.7			12.7	118.0		19.3				
Change Period (Y+Rc), s		7.5			7.5	7.5		8.2				
Max Green Setting (Gmax), s		113.5			9.5	96.5		20.8				
Max Q Clear Time (g_c+I1), s		2.0			3.0	32.8		11.1				
Green Ext Time (p_c), s		25.6			0.0	16.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay	7.1
HCM 6th LOS	A

Notes

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

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗↗	↗	↗	↗↗	↗
Traffic Vol, veh/h	0	0	32	0	0	22	97	2405	96	95	1282	39
Future Vol, veh/h	0	0	32	0	0	22	97	2405	96	95	1282	39
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									
Storage Length	-	-	0	-	-	0	300	-	150	250	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	35	0	0	24	105	2614	104	103	1393	42

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	697	-	-	1307	1435	0	0	2718	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	383	0	0	150	469	-	-	147	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	383	-	-	150	469	-	-	147	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.3		33.5		0.6		4.9	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	469	-	-	383	150	147	-	-
HCM Lane V/C Ratio	0.225	-	-	0.091	0.159	0.702	-	-
HCM Control Delay (s)	14.9	-	-	15.3	33.5	73.1	-	-
HCM Lane LOS	B	-	-	C	D	F	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.3	0.6	4.1	-	-

Queues
4: Route MM & Farm Road 148

Route MM
Future Improved AM 2045



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	18	8	88	61	67	2176	415	357	1440	85
v/c Ratio	0.13	0.04	0.55	0.19	0.30	0.96	0.39	0.78	0.49	0.06
Control Delay	61.0	0.3	83.2	13.0	9.2	20.6	2.7	60.8	10.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.0	0.3	83.2	13.0	9.2	20.6	2.7	60.8	10.0	2.8
Queue Length 50th (ft)	17	0	44	0	12	402	20	165	315	7
Queue Length 95th (ft)	39	0	75	43	m34	#1375	101	#267	627	m27
Internal Link Dist (ft)		663				785			718	
Turn Bay Length (ft)	200		300	200	250		150	250		150
Base Capacity (vph)	142	217	160	329	220	2273	1067	459	2920	1319
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.04	0.55	0.19	0.30	0.96	0.39	0.78	0.49	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
4: Route MM & Farm Road 148

Route MM
Future Improved AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖↗	↑	↖	↖	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	17	0	7	81	0	56	62	2002	382	328	1325	78
Future Volume (veh/h)	17	0	7	81	0	56	62	2002	382	328	1325	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	0	8	88	0	61	67	2176	415	357	1440	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	0	103	161	222	369	273	2351	1049	395	2935	1309
Arrive On Green	0.02	0.00	0.06	0.05	0.00	0.12	0.66	0.66	0.66	0.23	1.00	1.00
Sat Flow, veh/h	1781	0	1585	3456	1870	1585	342	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	18	0	8	88	0	61	67	2176	415	357	1440	85
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1728	1870	1585	342	1777	1585	1728	1777	1585
Q Serve(g_s), s	1.4	0.0	0.7	3.7	0.0	4.6	12.5	80.2	18.0	15.1	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.7	3.7	0.0	4.6	12.9	80.2	18.0	15.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	166	0	103	161	222	369	273	2351	1049	395	2935	1309
V/C Ratio(X)	0.11	0.00	0.08	0.55	0.00	0.17	0.25	0.93	0.40	0.90	0.49	0.06
Avail Cap(c_a), veh/h	194	0	106	161	222	369	273	2351	1049	403	2935	1309
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.8	0.0	65.9	70.0	0.0	45.9	10.9	22.1	11.6	57.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.3	3.8	0.0	0.2	2.1	7.7	1.1	23.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.3	1.7	0.0	1.8	1.0	32.1	6.2	7.0	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.1	0.0	66.2	73.7	0.0	46.1	13.0	29.9	12.7	80.1	0.6	0.1
LnGrp LOS	E	A	E	E	A	D	B	C	B	F	A	A
Approach Vol, veh/h		26			149			2658			1882	
Approach Delay, s/veh		64.7			62.4			26.8			15.7	
Approach LOS		E			E			C			B	
Timer - Assigned Phs	1	2	3	4	6	7	8					
Phs Duration (G+Y+Rc), s	24.6	107.2	15.2	17.9		131.8	7.1	26.0				
Change Period (Y+Rc), s	7.5	7.5	8.2	* 8.2		7.5	4.5	8.2				
Max Green Setting (Gmax), s	17.5	84.8	7.0	* 10		109.8	5.0	15.0				
Max Q Clear Time (g_c+I1), s	17.1	82.2	5.7	2.7		2.0	3.4	6.6				
Green Ext Time (p_c), s	0.1	2.5	0.0	0.0		16.2	0.0	0.1				

Intersection Summary

HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Notes

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

Queues
5: Route MM & Kings Street/King Street

Route MM
Future Improved AM 2045



Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	29	53	43	76	1858	187	228	1799	82
v/c Ratio	0.16	0.11	0.33	0.13	0.51	0.84	0.18	0.79	0.72	0.07
Control Delay	59.4	0.8	75.1	0.8	35.4	5.8	0.3	43.5	4.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	0.8	75.1	0.8	35.4	5.8	0.3	43.5	4.5	0.1
Queue Length 50th (ft)	18	0	26	0	19	597	8	158	98	0
Queue Length 95th (ft)	45	0	51	0	m27	m24	m0	m206	108	m0
Internal Link Dist (ft)						560			559	
Turn Bay Length (ft)	200	100	200	200	350		150	250		150
Base Capacity (vph)	132	265	160	334	164	2213	1047	287	2488	1158
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.11	0.33	0.13	0.46	0.84	0.18	0.79	0.72	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
5: Route MM & Kings Street/King Street

Route MM
Future Improved AM 2045

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	0	27	49	0	40	70	1709	172	210	1655	75
Future Volume (veh/h)	19	0	27	49	0	40	70	1709	172	210	1655	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	0	29	53	0	43	76	1858	187	228	1799	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	85	72	144	112	95	241	2007	895	389	2341	1044
Arrive On Green	0.03	0.00	0.05	0.04	0.00	0.06	0.09	1.00	1.00	0.28	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	3456	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	21	0	29	53	0	43	76	1858	187	228	1799	82
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	1.7	0.0	2.7	2.2	0.0	2.9	3.1	0.0	0.0	2.6	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	2.7	2.2	0.0	2.9	3.1	0.0	0.0	2.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	159	85	72	144	112	95	241	2007	895	389	2341	1044
V/C Ratio(X)	0.13	0.00	0.40	0.37	0.00	0.45	0.31	0.93	0.21	0.59	0.77	0.08
Avail Cap(c_a), veh/h	193	87	74	161	112	95	274	2007	895	389	2341	1044
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.2	0.0	69.6	70.0	0.0	37.4	16.7	0.0	0.0	32.7	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	3.5	1.6	0.0	3.3	0.7	8.9	0.5	2.3	2.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.2	1.0	0.0	1.7	1.3	2.5	0.1	6.5	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.6	0.0	73.1	71.5	0.0	40.7	17.4	8.9	0.5	34.9	2.5	0.1
LnGrp LOS	E	A	E	E	A	D	B	A	A	C	A	A
Approach Vol, veh/h		50			96			2121			2109	
Approach Delay, s/veh		70.0			57.7			8.4			5.9	
Approach LOS		E			E			A			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.3	92.2	14.4	15.1	14.2	106.3	12.3	17.2				
Change Period (Y+Rc), s	7.5	7.5	8.2	8.2	7.5	7.5	8.2	8.2				
Max Green Setting (Gmax), s	19.9	84.7	7.0	7.0	9.5	95.1	7.0	7.0				
Max Q Clear Time (g_c+I1), s	4.6	2.0	4.2	4.7	5.1	2.0	3.7	4.9				
Green Ext Time (p_c), s	0.5	29.0	0.0	0.0	0.0	26.2	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			9.0									
HCM 6th LOS			A									

Queues
6: Route MM & Farm Road 144

Route MM
Future Improved AM 2045



Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	21	53	43	92	1614	186	228	2036	87
v/c Ratio	0.51	0.08	0.33	0.12	0.54	0.76	0.18	0.68	0.86	0.08
Control Delay	94.3	0.6	75.1	0.8	33.7	9.5	0.9	32.3	6.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.3	0.6	75.1	0.8	33.7	9.5	0.9	32.3	6.0	0.1
Queue Length 50th (ft)	34	0	26	0	51	114	1	140	113	0
Queue Length 95th (ft)	#81	0	51	0	m71	173	m11	m155	m123	m0
Internal Link Dist (ft)						513			659	
Turn Bay Length (ft)	250	100	150	150	250		150	250		250
Base Capacity (vph)	70	270	160	372	169	2131	1033	333	2379	1112
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.08	0.33	0.12	0.54	0.76	0.18	0.68	0.86	0.08

Intersection Summary

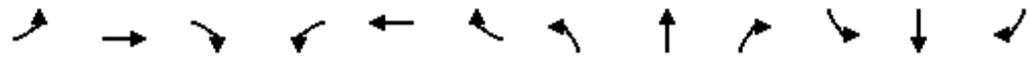
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
6: Route MM & Farm Road 144

Route MM
Future Improved AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	0	19	49	0	40	85	1485	171	210	1873	80
Future Volume (veh/h)	32	0	19	49	0	40	85	1485	171	210	1873	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	0	21	53	0	43	92	1614	186	228	2036	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	111	86	73	144	257	218	290	1997	891	451	2246	1002
Arrive On Green	0.05	0.00	0.05	0.04	0.00	0.14	0.15	1.00	1.00	0.29	1.00	1.00
Sat Flow, veh/h	1364	1870	1585	3456	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	35	0	21	53	0	43	92	1614	186	228	2036	87
Grp Sat Flow(s),veh/h/ln	1364	1870	1585	1728	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.8	0.0	1.9	2.2	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.8	0.0	1.9	2.2	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	111	86	73	144	257	218	290	1997	891	451	2246	1002
V/C Ratio(X)	0.32	0.00	0.29	0.37	0.00	0.20	0.32	0.81	0.21	0.51	0.91	0.09
Avail Cap(c_a), veh/h	116	94	79	161	274	232	290	1997	891	451	2246	1002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.1	0.0	69.2	70.0	0.0	57.4	16.2	0.0	0.0	19.4	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	2.2	1.6	0.0	0.4	0.6	3.6	0.5	0.9	6.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.8	1.0	0.0	1.5	1.8	1.0	0.1	6.2	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.7	0.0	71.3	71.5	0.0	57.8	16.8	3.6	0.5	20.4	6.7	0.2
LnGrp LOS	E	A	E	E	A	E	B	A	A	C	A	A
Approach Vol, veh/h		56			96			1892			2351	
Approach Delay, s/veh		71.6			65.4			4.0			7.8	
Approach LOS		E			E			A			A	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	29.4	91.8	14.4	14.4	18.9	102.3		28.8				
Change Period (Y+Rc), s	7.5	7.5	8.2	7.5	7.5	7.5		8.2				
Max Green Setting (Gmax), s	20.5	84.3	7.0	7.5	10.0	94.8		22.0				
Max Q Clear Time (g_c+I1), s	2.0	2.0	4.2	5.8	2.0	2.0		5.6				
Green Ext Time (p_c), s	0.6	21.3	0.0	0.0	0.1	35.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			8.2									
HCM 6th LOS			A									

Queues
7: Route MM & Industrial Drive

Route MM
Future Improved AM 2045



Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	37	33	82	34	154	1377	146	186	2210	135
v/c Ratio	0.27	0.12	0.51	0.10	0.89	0.62	0.14	0.69	0.96	0.13
Control Delay	61.9	1.0	81.5	0.6	65.4	6.4	0.5	29.1	17.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	1.0	81.5	0.6	65.4	6.4	0.5	29.1	17.9	0.1
Queue Length 50th (ft)	32	0	41	0	92	103	2	67	756	0
Queue Length 95th (ft)	68	0	71	0	m#196	108	m3	m70	m#1234	m0
Internal Link Dist (ft)						604			536	
Turn Bay Length (ft)	250	100	250	100	250		150	250		250
Base Capacity (vph)	135	265	160	339	174	2213	1046	331	2292	1078
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.12	0.51	0.10	0.89	0.62	0.14	0.56	0.96	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary

7: Route MM & Industrial Drive

Route MM
Future Improved AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	0	30	75	0	31	142	1267	134	171	2033	124
Future Volume (veh/h)	34	0	30	75	0	31	142	1267	134	171	2033	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	0	33	82	0	34	154	1377	146	186	2210	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	86	73	156	87	74	253	2252	1005	340	2229	994
Arrive On Green	0.04	0.00	0.05	0.05	0.00	0.05	0.14	1.00	1.00	0.13	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	3456	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	37	0	33	82	0	34	154	1377	146	186	2210	135
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	3.0	3.5	0.0	2.6	0.8	0.0	0.0	7.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	3.0	3.5	0.0	2.6	0.8	0.0	0.0	7.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	191	86	73	156	87	74	253	2252	1005	340	2229	994
V/C Ratio(X)	0.19	0.00	0.45	0.53	0.00	0.46	0.61	0.61	0.15	0.55	0.99	0.14
Avail Cap(c_a), veh/h	194	87	74	161	87	74	253	2252	1005	457	2229	994
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.7	0.0	69.7	70.0	0.0	47.0	41.0	0.0	0.0	13.1	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	4.3	2.9	0.0	4.4	4.2	1.2	0.3	1.4	17.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	1.3	1.6	0.0	1.4	5.3	0.4	0.1	2.7	5.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	0.0	74.0	72.9	0.0	51.4	45.2	1.2	0.3	14.5	17.1	0.3
LnGrp LOS	E	A	E	E	A	D	D	A	A	B	B	A
Approach Vol, veh/h		70			116			1677			2531	
Approach Delay, s/veh		68.8			66.6			5.2			16.0	
Approach LOS		E			E			A			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.4	102.6	15.0	15.1	18.3	101.6	14.9	15.2				
Change Period (Y+Rc), s	7.5	7.5	8.2	8.2	7.5	7.5	8.2	8.2				
Max Green Setting (Gmax), s	19.7	84.9	7.0	7.0	10.5	94.1	7.0	7.0				
Max Q Clear Time (g_c+I1), s	9.5	2.0	5.5	5.0	2.8	2.0	2.0	4.6				
Green Ext Time (p_c), s	0.3	15.2	0.0	0.0	0.2	43.8	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			14.1									
HCM 6th LOS			B									

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗↗	↗	↗	↗↗	↗
Traffic Vol, veh/h	0	0	10	0	0	28	39	1284	8	9	2338	43
Future Vol, veh/h	0	0	10	0	0	28	39	1284	8	9	2338	43
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									
Storage Length	-	-	-	-	-	-	200	-	150	200	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	11	0	0	30	42	1396	9	10	2541	47

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	1271	-	-	698	2588	0	0	1405	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	159	0	0	383	166	-	-	482	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	159	-	-	383	166	-	-	482	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	29.3		15.2		1		0			
HCM LOS	D		C							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	166	-	-	159	383	482	-	-
HCM Lane V/C Ratio	0.255	-	-	0.068	0.079	0.02	-	-
HCM Control Delay (s)	34	-	-	29.3	15.2	12.6	-	-
HCM Lane LOS	D	-	-	D	C	B	-	-
HCM 95th %tile Q(veh)	1	-	-	0.2	0.3	0.1	-	-

Queues
9: Route MM & EB I-44 Ramps



Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	523	627	499	15	2071
v/c Ratio	0.05	1.00	0.31	0.45	0.03	0.97
Control Delay	38.7	83.0	35.1	16.7	8.6	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	25.0
Total Delay	38.7	83.0	35.1	16.7	8.6	54.3
Queue Length 50th (ft)	19	448	266	187	4	600
Queue Length 95th (ft)	45	#698	398	374	m5	#1190
Internal Link Dist (ft)			446			347
Turn Bay Length (ft)		275		400	150	
Base Capacity (vph)	516	523	1998	1111	471	2135
Starvation Cap Reductn	0	0	0	0	0	179
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	1.00	0.31	0.45	0.03	1.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 9: Route MM & EB I-44 Ramps

Route MM
 Future Improved AM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗					↑↑	↗	↖	↑↑	
Traffic Volume (veh/h)	25	0	481	0	0	0	0	577	459	14	1905	0
Future Volume (veh/h)	25	0	481	0	0	0	0	577	459	14	1905	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	1870	0	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	27	0	0				0	627	499	15	2071	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	56	0					0	1801	803	842	3070	0
Arrive On Green	0.03	0.00	0.00				0.00	1.00	1.00	0.61	1.00	0.00
Sat Flow, veh/h	1781	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	27	0	0				0	627	499	15	2071	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	2.2	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.2	0.0	0.0				0.0	0.0	0.0	0.0	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	56	0					0	1801	803	842	3070	0
V/C Ratio(X)	0.48	0.00					0.00	0.35	0.62	0.02	0.67	0.00
Avail Cap(c_a), veh/h	520	0					0	1801	803	842	3070	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	0.60	0.60	0.00
Uniform Delay (d), s/veh	71.4	0.0	0.0				0.0	0.0	0.0	1.7	0.0	0.0
Incr Delay (d2), s/veh	6.3	0.0	0.0				0.0	0.5	3.6	0.0	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	1.1	0.0	0.0				0.0	0.1	0.8	0.0	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.7	0.0	0.0				0.0	0.5	3.6	1.7	0.7	0.0
LnGrp LOS	E	A					A	A	A	A	A	A
Approach Vol, veh/h		27						1126			2086	
Approach Delay, s/veh		77.7						1.9			0.7	
Approach LOS		E						A			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	53.6	83.5		12.9				137.1				
Change Period (Y+Rc), s	7.5	7.5		8.2				7.5				
Max Green Setting (Gmax), s	7.0	76.0		43.8				90.5				
Max Q Clear Time (g_c+I1), s	2.0	2.0		4.2				2.0				
Green Ext Time (p_c), s	0.0	6.8		0.1				35.1				

Intersection Summary

HCM 6th Ctrl Delay	1.8
HCM 6th LOS	A

Notes

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

Queues
2: Route MM & WB James River Freeway



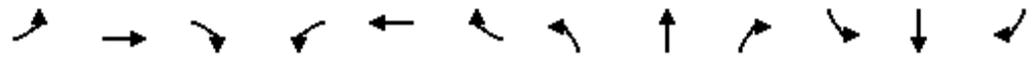
Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	239	997	86	743	2768	342
v/c Ratio	1.14	0.63	0.76	0.29	1.16	0.45
Control Delay	162.3	1.9	83.4	0.6	96.7	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0
Total Delay	162.3	1.9	83.4	0.6	96.9	4.7
Queue Length 50th (ft)	~272	0	61	0	~1681	28
Queue Length 95th (ft)	#453	0	m#143	0	m#1674	m38
Internal Link Dist (ft)				685	660	
Turn Bay Length (ft)	325	325	250			50
Base Capacity (vph)	209	1583	113	2550	2382	755
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	197	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.63	0.76	0.29	1.27	0.45

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
2: Route MM & WB James River Freeway

Route MM
Future Improved PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖		↖	↖	↑↑			↑↑	↖
Traffic Volume (veh/h)	0	0	0	220	0	917	79	684	0	0	2547	315
Future Volume (veh/h)	0	0	0	220	0	917	79	684	0	0	2547	315
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		No
Adj Sat Flow, veh/h/ln				1781	0	1870	1618	1767	0	0	1870	1159
Adj Flow Rate, veh/h				239	0	0	86	743	0	0	2768	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				8	0	2	19	9	0	0	2	50
Cap, veh/h				213	0		120	2585	0	0	2393	
Arrive On Green				0.13	0.00	0.00	0.09	1.00	0.00	0.00	0.67	0.00
Sat Flow, veh/h				1697	0	1585	1541	3445	0	0	3647	982
Grp Volume(v), veh/h				239	0	0	86	743	0	0	2768	0
Grp Sat Flow(s),veh/h/ln				1697	0	1585	1541	1678	0	0	1777	982
Q Serve(g_s), s				18.8	0.0	0.0	3.3	0.0	0.0	0.0	101.0	0.0
Cycle Q Clear(g_c), s				18.8	0.0	0.0	3.3	0.0	0.0	0.0	101.0	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				213	0		120	2585	0	0	2393	
V/C Ratio(X)				1.12	0.00		0.72	0.29	0.00	0.00	1.16	
Avail Cap(c_a), veh/h				213	0		120	2585	0	0	2393	
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.73	0.73	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				65.6	0.0	0.0	65.4	0.0	0.0	0.0	24.5	0.0
Incr Delay (d2), s/veh				99.0	0.0	0.0	13.9	0.2	0.0	0.0	75.7	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				13.9	0.0	0.0	3.5	0.1	0.0	0.0	62.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				164.6	0.0	0.0	79.3	0.2	0.0	0.0	100.2	0.0
LnGrp LOS				F	A		E	A	A	A	F	
Approach Vol, veh/h					239			829			2768	
Approach Delay, s/veh					164.6			8.4			100.2	
Approach LOS					F			A			F	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		123.0			14.5	108.5		27.0				
Change Period (Y+Rc), s		7.5			7.5	7.5		8.2				
Max Green Setting (Gmax), s		115.5			7.0	101.0		18.8				
Max Q Clear Time (g_c+I1), s		2.0			5.3	103.0		20.8				
Green Ext Time (p_c), s		5.5			0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	84.4
HCM 6th LOS	F

Notes

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

Intersection												
Int Delay, s/veh	9.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗↗	↗	↗	↗↗	↗
Traffic Vol, veh/h	0	0	144	0	0	92	26	1533	26	26	2577	4
Future Vol, veh/h	0	0	144	0	0	92	26	1533	26	26	2577	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	0	-	-	0	300	-	150	250	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	12	2	2	2	56	6	2	2	4	200
Mvmt Flow	0	0	157	0	0	100	28	1666	28	28	2801	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	1401	-	-	833	2805	0	0	1694	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	-	-	6.94	5.22	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.42	-	-	3.32	2.76	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	~ 118	0	0	312	54	-	-	373	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	~ 118	-	-	312	54	-	-	373	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	262.6		21.9		2.1		0.2	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	54	-	-	118	312	373	-	-
HCM Lane V/C Ratio	0.523	-	-	1.326	0.321	0.076	-	-
HCM Control Delay (s)	129.4	-	-	262.6	21.9	15.4	-	-
HCM Lane LOS	F	-	-	F	C	C	-	-
HCM 95th %tile Q(veh)	2	-	-	10.4	1.3	0.2	-	-

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

Queues
4: Route MM & Farm Road 148

Route MM
Future Improved PM 2045



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	62	371	309	10	1630	143	193	2392	12
v/c Ratio	0.30	0.26	0.86	1.50	0.20	0.88	0.15	0.73	1.02	0.01
Control Delay	49.7	2.5	84.2	279.0	43.7	50.9	9.6	61.3	30.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	2.5	84.2	279.0	43.7	50.9	9.6	61.3	30.3	0.0
Queue Length 50th (ft)	93	0	185	~332	7	834	28	94	~1348	0
Queue Length 95th (ft)	153	0	#263	#531	m20	928	81	m106	#1470	m0
Internal Link Dist (ft)		663				785			718	
Turn Bay Length (ft)	200		300	200	250		150	250		150
Base Capacity (vph)	387	242	441	206	49	1855	936	263	2349	1101
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.26	0.84	1.50	0.20	0.88	0.15	0.73	1.02	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

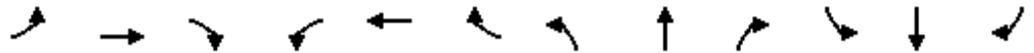
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
4: Route MM & Farm Road 148

Route MM
Future Improved PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖↗	↑	↖	↖	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	108	0	57	341	0	284	9	1500	132	178	2201	11
Future Volume (veh/h)	108	0	57	341	0	284	9	1500	132	178	2201	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1796	1870	1870	1841	1870
Adj Flow Rate, veh/h	117	0	62	371	0	309	10	1630	143	193	2392	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	7	2	2	4	2
Cap, veh/h	274	0	106	416	212	314	48	1786	830	293	2302	1043
Arrive On Green	0.07	0.00	0.07	0.12	0.00	0.11	0.52	0.52	0.52	0.17	1.00	1.00
Sat Flow, veh/h	1781	0	1585	3456	1870	1585	146	3413	1585	3456	3497	1585
Grp Volume(v), veh/h	117	0	62	371	0	309	10	1630	143	193	2392	12
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1728	1870	1585	146	1706	1585	1728	1749	1585
Q Serve(g_s), s	9.1	0.0	5.7	15.9	0.0	12.8	0.0	65.4	3.7	7.8	98.7	0.0
Cycle Q Clear(g_c), s	9.1	0.0	5.7	15.9	0.0	12.8	78.5	65.4	3.7	7.8	98.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	274	0	106	416	212	314	48	1786	830	293	2302	1043
V/C Ratio(X)	0.43	0.00	0.59	0.89	0.00	0.98	0.21	0.91	0.17	0.66	1.04	0.01
Avail Cap(c_a), veh/h	324	0	106	445	212	314	48	1786	830	293	2302	1043
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.3	0.0	68.0	65.0	0.0	37.5	75.0	32.6	5.2	60.2	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	8.2	18.9	0.0	46.1	9.6	8.6	0.5	5.3	29.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	2.5	8.0	0.0	8.3	0.5	27.5	2.5	3.4	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	0.0	76.1	83.9	0.0	83.6	84.6	41.3	5.7	65.6	29.9	0.0
LnGrp LOS	E	A	E	F	A	F	F	D	A	E	F	A
Approach Vol, veh/h		179			680			1783			2597	
Approach Delay, s/veh		65.8			83.8			38.6			32.4	
Approach LOS		E			F			D			C	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.2	86.0	26.3	17.5		106.2	19.3	24.5				
Change Period (Y+Rc), s	7.5	7.5	8.2	7.5		7.5	8.2	7.5				
Max Green Setting (Gmax), s	11.5	78.5	19.3	10.0		97.5	15.3	14.0				
Max Q Clear Time (g_c+I1), s	9.8	80.5	17.9	7.7		100.7	11.1	14.8				
Green Ext Time (p_c), s	0.1	0.0	0.2	0.0		0.0	0.1	0.0				

Intersection Summary

HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

Notes

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

Queues
5: Route MM & Kings Street/King Street

Route MM
Future Improved PM 2045



Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	151	220	179	24	2024	51	62	2229	26
v/c Ratio	0.63	0.67	0.60	0.84	0.19	0.86	0.04	0.42	0.94	0.03
Control Delay	79.1	25.0	70.5	46.8	16.7	22.9	0.0	25.9	19.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.1	25.0	70.5	46.8	16.7	22.9	0.0	25.9	19.3	0.0
Queue Length 50th (ft)	108	4	107	31	10	607	0	11	784	0
Queue Length 95th (ft)	171	76	147	#162	m12	m651	m0	m20	#1357	m0
Internal Link Dist (ft)						560			559	
Turn Bay Length (ft)	200	100	200	200	350		150	250		150
Base Capacity (vph)	180	227	366	214	129	2356	1142	147	2361	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.67	0.60	0.84	0.19	0.86	0.04	0.42	0.94	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
5: Route MM & Kings Street/King Street

Route MM
Future Improved PM 2045

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	0	139	202	0	165	22	1862	47	57	2051	24
Future Volume (veh/h)	104	0	139	202	0	165	22	1862	47	57	2051	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1870	1826	1870	1870	1870	1604	1811	1870	1870	1841	1574
Adj Flow Rate, veh/h	113	0	108	220	0	136	24	2024	51	62	2229	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	2	5	2	2	2	20	6	2	2	4	22
Cap, veh/h	240	97	126	260	97	156	170	2122	977	236	2217	845
Arrive On Green	0.08	0.00	0.05	0.08	0.00	0.05	0.06	1.00	1.00	0.09	1.00	1.00
Sat Flow, veh/h	1711	1870	1547	3456	1870	1585	1527	3441	1585	1781	3497	1334
Grp Volume(v), veh/h	113	0	108	220	0	136	24	2024	51	62	2229	26
Grp Sat Flow(s),veh/h/ln	1711	1870	1547	1728	1870	1585	1527	1721	1585	1781	1749	1334
Q Serve(g_s), s	0.0	0.0	7.7	9.4	0.0	5.7	1.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	7.7	9.4	0.0	5.7	1.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	97	126	260	97	156	170	2122	977	236	2217	845
V/C Ratio(X)	0.47	0.00	0.86	0.85	0.00	0.87	0.14	0.95	0.05	0.26	1.01	0.03
Avail Cap(c_a), veh/h	240	97	126	260	122	178	196	2122	977	236	2217	845
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.0	0.0	39.1	68.5	0.0	66.7	13.0	0.0	0.0	18.7	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	40.5	21.8	0.0	32.0	0.4	11.3	0.1	0.6	20.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	4.4	5.0	0.0	6.5	0.3	3.3	0.0	1.2	6.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	0.0	79.6	90.2	0.0	98.6	13.4	11.3	0.1	19.2	20.5	0.1
LnGrp LOS	E	A	E	F	A	F	B	B	A	B	F	A
Approach Vol, veh/h		221			356			2099			2317	
Approach Delay, s/veh		71.3			93.5			11.1			20.2	
Approach LOS		E			F			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.5	100.0	19.5	16.0	11.9	102.6	19.5	16.0				
Change Period (Y+Rc), s	7.5	7.5	8.2	8.2	7.5	7.5	8.2	8.2				
Max Green Setting (Gmax), s	7.0	92.5	9.3	9.8	7.0	92.5	11.3	7.8				
Max Q Clear Time (g_c+I1), s	2.0	2.0	2.0	7.7	3.0	2.0	11.4	9.7				
Green Ext Time (p_c), s	0.0	34.4	0.1	0.1	0.0	42.8	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			23.9									
HCM 6th LOS			C									

Queues
6: Route MM & Farm Road 144

Route MM
Future Improved PM 2045



Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	98	220	179	25	2263	51	62	1985	35
v/c Ratio	0.67	0.52	0.58	0.78	0.15	0.98	0.05	0.34	0.80	0.03
Control Delay	80.1	16.1	69.2	46.8	4.9	20.2	0.0	21.6	14.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	16.1	69.2	46.8	4.9	20.2	0.0	21.6	14.4	0.0
Queue Length 50th (ft)	124	0	107	56	2	755	0	22	441	0
Queue Length 95th (ft)	191	39	146	#146	m3	#1400	m0	m45	537	m0
Internal Link Dist (ft)						513			659	
Turn Bay Length (ft)	250	100	150	150	250		150	250		250
Base Capacity (vph)	195	188	387	229	164	2312	1124	181	2474	1046
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.52	0.57	0.78	0.15	0.98	0.05	0.34	0.80	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
6: Route MM & Farm Road 144

Route MM
Future Improved PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	0	90	202	0	165	23	2082	47	57	1826	32
Future Volume (veh/h)	120	0	90	202	0	165	23	2082	47	57	1826	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1796	1870	1870	1841	1693
Adj Flow Rate, veh/h	130	0	98	220	0	179	25	2263	51	62	1985	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	7	2	2	4	14
Cap, veh/h	163	87	169	271	172	214	266	2208	1026	125	2203	904
Arrive On Green	0.03	0.00	0.05	0.08	0.00	0.09	0.12	1.00	1.00	0.09	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	3456	1870	1585	1781	3413	1585	1781	3497	1434
Grp Volume(v), veh/h	130	0	98	220	0	179	25	2263	51	62	1985	35
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	1870	1585	1781	1706	1585	1781	1749	1434
Q Serve(g_s), s	1.9	0.0	0.0	9.4	0.0	13.3	0.0	97.1	0.0	2.2	0.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	9.4	0.0	13.3	0.0	97.1	0.0	2.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	87	169	271	172	214	266	2208	1026	125	2203	904
V/C Ratio(X)	0.80	0.00	0.58	0.81	0.00	0.84	0.09	1.02	0.05	0.50	0.90	0.04
Avail Cap(c_a), veh/h	187	97	178	299	172	214	266	2208	1026	131	2203	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.8	0.0	63.8	68.0	0.0	41.4	13.7	0.0	0.0	33.9	0.0	0.0
Incr Delay (d2), s/veh	18.6	0.0	4.2	14.2	0.0	24.0	0.2	25.8	0.1	3.0	6.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	3.7	4.6	0.0	6.6	0.4	7.9	0.0	1.3	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.3	0.0	68.0	82.2	0.0	65.4	13.8	25.8	0.1	37.0	6.5	0.1
LnGrp LOS	F	A	E	F	A	E	B	F	A	D	A	A
Approach Vol, veh/h		228			399			2339			2082	
Approach Delay, s/veh		79.0			74.7			25.1			7.3	
Approach LOS		E			E			C			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	104.6	9.5	22.0	16.5	102.0	16.3	15.2				
Change Period (Y+Rc), s	7.5	7.5	4.5	8.2	7.5	7.5	4.5	8.2				
Max Green Setting (Gmax), s	7.0	94.5	7.0	13.8	7.0	94.5	13.0	7.8				
Max Q Clear Time (g_c+I1), s	4.2	99.1	3.9	15.3	2.0	2.0	11.4	2.0				
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	32.6	0.1	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			24.1									
HCM 6th LOS			C									

Queues
7: Route MM & Industrial Drive

Route MM
Future Improved PM 2045



Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	118	243	139	38	2459	39	51	1713	38
v/c Ratio	0.88	0.72	0.68	0.85	0.19	1.00	0.03	0.38	0.70	0.03
Control Delay	106.1	44.0	74.7	64.6	2.0	20.3	0.0	22.4	5.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.1	44.0	74.7	64.6	2.0	20.3	0.0	22.4	5.4	0.1
Queue Length 50th (ft)	158	25	119	46	2	~901	0	4	120	0
Queue Length 95th (ft)	#286	#116	167	#169	m2	m#1384	m0	m32	180	m0
Internal Link Dist (ft)						604			536	
Turn Bay Length (ft)	250	100	250	100	250		150	250		250
Base Capacity (vph)	195	166	379	166	200	2449	1142	138	2449	1142
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.71	0.64	0.84	0.19	1.00	0.03	0.37	0.70	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
7: Route MM & Industrial Drive

Route MM
Future Improved PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘↗	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (veh/h)	149	0	109	224	0	128	35	2262	36	47	1576	35
Future Volume (veh/h)	149	0	109	224	0	128	35	2262	36	47	1576	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	162	0	118	243	0	139	38	2459	39	51	1713	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	114	194	293	87	171	211	2073	925	234	2073	925
Arrive On Green	0.10	0.00	0.06	0.08	0.00	0.05	0.12	1.00	1.00	0.06	0.58	0.58
Sat Flow, veh/h	1781	1870	1585	3456	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	162	0	118	243	0	139	38	2459	39	51	1713	38
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	12.8	0.0	1.7	10.4	0.0	2.2	0.0	0.0	0.0	0.0	58.2	0.8
Cycle Q Clear(g_c), s	12.8	0.0	1.7	10.4	0.0	2.2	0.0	0.0	0.0	0.0	58.2	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	114	194	293	87	171	211	2073	925	234	2073	925
V/C Ratio(X)	0.57	0.00	0.61	0.83	0.00	0.81	0.18	1.19	0.04	0.22	0.83	0.04
Avail Cap(c_a), veh/h	303	114	194	382	87	172	211	2073	925	234	2073	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.2	0.0	34.1	67.6	0.0	34.9	44.4	0.0	0.0	15.4	25.1	3.5
Incr Delay (d2), s/veh	2.3	0.0	5.3	11.3	0.0	24.6	0.4	89.0	0.1	0.5	3.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.0	3.3	5.1	0.0	4.8	1.1	25.6	0.0	1.0	23.9	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.5	0.0	39.4	78.9	0.0	59.6	44.8	89.0	0.1	15.9	29.1	3.6
LnGrp LOS	E	A	D	E	A	E	D	F	A	B	C	A
Approach Vol, veh/h		280			382			2536			1802	
Approach Delay, s/veh		52.7			71.8			87.0			28.2	
Approach LOS		D			E			F			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.7	95.0	23.1	15.2	16.7	95.0	20.9	17.4				
Change Period (Y+Rc), s	7.5	7.5	8.2	8.2	7.5	7.5	8.2	8.2				
Max Green Setting (Gmax), s	7.5	87.5	16.6	7.0	7.5	87.5	16.6	7.0				
Max Q Clear Time (g_c+I1), s	2.0	2.0	14.8	4.2	2.0	60.2	12.4	3.7				
Green Ext Time (p_c), s	0.0	51.9	0.1	0.1	0.0	15.2	0.3	0.1				

Intersection Summary

HCM 6th Ctrl Delay	62.7
HCM 6th LOS	E

Intersection													
Int Delay, s/veh	1.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗↗	↗		↗	↗↗	↗
Traffic Vol, veh/h	0	0	41	0	0	39	14	2406	130	2	63	1600	14
Future Vol, veh/h	0	0	41	0	0	39	14	2406	130	2	63	1600	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free						
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	200	-	150	-	200	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	50	2	2	2	50	7	2	2	2	4	2
Mvmt Flow	0	0	45	0	0	42	15	2615	141	2	68	1739	15

Major/Minor	Minor2		Minor1		Major1		Major2						
Conflicting Flow All	-	-	870	-	-	1308	1754	0	0	2615	2756	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.9	-	-	6.94	5.1	-	-	6.44	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.8	-	-	3.32	2.7	-	-	2.52	2.22	-	-
Pot Cap-1 Maneuver	0	0	215	0	0	150	200	-	-	29	142	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	215	-	-	150	200	-	-	121	121	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	26.1		38.2		0.1		2.7	
HCM LOS	D		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	200	-	-	215	150	121	-	-
HCM Lane V/C Ratio	0.076	-	-	0.207	0.283	0.584	-	-
HCM Control Delay (s)	24.5	-	-	26.1	38.2	70.3	-	-
HCM Lane LOS	C	-	-	D	E	F	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.8	1.1	2.9	-	-

Queues
9: Route MM & EB I-44 Ramps



Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	58	197	1389	1346	26	1634
v/c Ratio	0.37	0.89	0.55	0.99	0.09	0.59
Control Delay	70.5	73.7	8.7	27.3	0.4	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7
Total Delay	70.5	73.7	8.7	27.3	0.4	1.4
Queue Length 50th (ft)	54	109	233	~534	0	1
Queue Length 95th (ft)	102	#248	m234	m#607	m0	1
Internal Link Dist (ft)			446			347
Turn Bay Length (ft)		275		400	150	
Base Capacity (vph)	171	234	2542	1356	291	2792
Starvation Cap Reductn	0	0	0	0	0	713
Spillback Cap Reductn	0	0	8	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.84	0.55	0.99	0.09	0.79

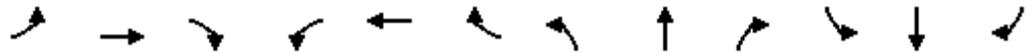
Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary

9: Route MM & EB I-44 Ramps

Route MM
Future Improved PM 2045



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗					↑↑	↖	↗	↑↑	
Traffic Volume (veh/h)	53	0	181	0	0	0	0	1278	1238	24	1503	0
Future Volume (veh/h)	53	0	181	0	0	0	0	1278	1238	24	1503	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	1841	0	1870				0	1811	1752	1870	1841	0
Adj Flow Rate, veh/h	58	0	0				0	1389	1346	26	1634	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	0	2				0	6	10	2	4	0
Cap, veh/h	75	0					0	2656	1146	183	2983	0
Arrive On Green	0.04	0.00	0.00				0.00	1.00	1.00	0.06	1.00	0.00
Sat Flow, veh/h	1753	0	1585				0	3532	1485	1781	3589	0
Grp Volume(v), veh/h	58	0	0				0	1389	1346	26	1634	0
Grp Sat Flow(s),veh/h/ln	1753	0	1585				0	1721	1485	1781	1749	0
Q Serve(g_s), s	4.9	0.0	0.0				0.0	0.0	0.0	0.4	0.0	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.0				0.0	0.0	0.0	0.4	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	75	0					0	2656	1146	183	2983	0
V/C Ratio(X)	0.78	0.00					0.00	0.52	1.17	0.14	0.55	0.00
Avail Cap(c_a), veh/h	173	0					0	2656	1146	212	2983	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(l)	1.00	0.00	0.00				0.00	1.00	1.00	0.51	0.51	0.00
Uniform Delay (d), s/veh	71.1	0.0	0.0				0.0	0.0	0.0	2.5	0.0	0.0
Incr Delay (d2), s/veh	15.8	0.0	0.0				0.0	0.7	88.0	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	0.0				0.0	0.3	28.0	0.1	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.9	0.0	0.0				0.0	0.7	88.0	2.7	0.4	0.0
LnGrp LOS	F	A					A	A	F	A	A	A
Approach Vol, veh/h		58						2735			1660	
Approach Delay, s/veh		86.9						43.7			0.4	
Approach LOS		F						D			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	12.1	123.3		14.6				135.4				
Change Period (Y+Rc), s	7.5	7.5		8.2				7.5				
Max Green Setting (Gmax), s	7.1	104.9		14.8				119.5				
Max Q Clear Time (g_c+I1), s	2.4	2.0		6.9				2.0				
Green Ext Time (p_c), s	0.0	48.3		0.1				20.5				

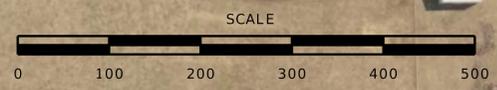
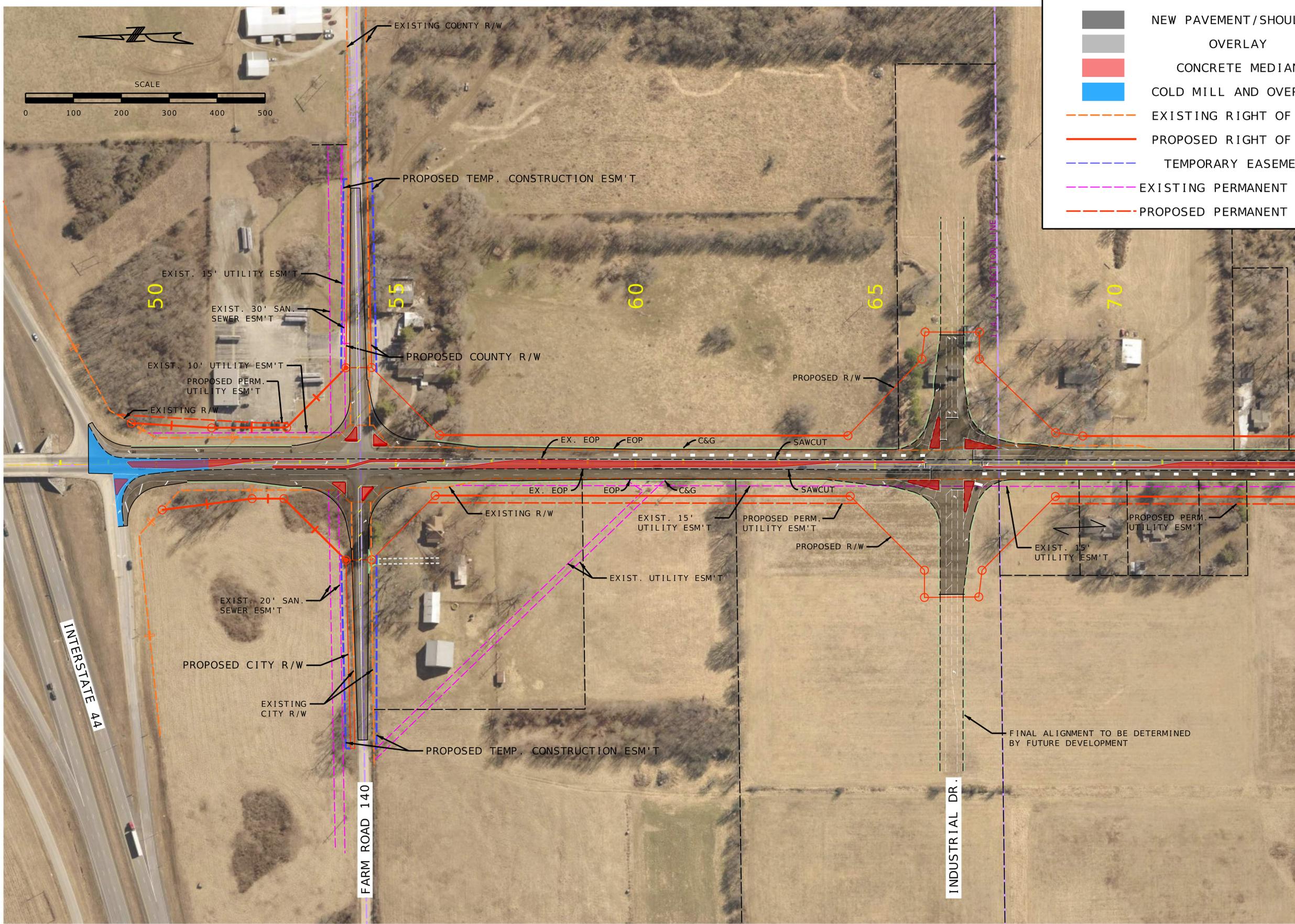
Intersection Summary

HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Notes

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

Future Improved Exhibit



LEGEND

- NEW PAVEMENT/SHOULDER
- OVERLAY
- CONCRETE MEDIAN
- COLD MILL AND OVERLAY
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TEMPORARY EASEMENT
- EXISTING PERMANENT ESM'T
- PROPOSED PERMANENT ESM'T

CONCEPT
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED 3/10/2023	
ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 1
COUNTY GREENE	
JOB NO. J8S0836B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DATE	DESCRIPTION

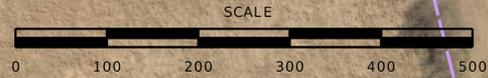
MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION



105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

olsson
550 ST. LOUIS STREET
SPRINGFIELD, MO 65806
CERTIFICATE OF
AUTHORITY NO. 001592

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LEGEND

- NEW PAVEMENT/SHOULDER
- OVERLAY
- CONCRETE MEDIAN
- COLD MILL AND OVERLAY
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- EXISTING PERMANENT ESM'T

CONCEPT
PLANS
NOT FOR
CONSTRUCTION

DATE PREPARED
3/10/2023

ROUTE MM	STATE MO
DISTRICT SW	SHEET NO. 4

COUNTY
GREENE

JOB NO.
J8S0836B

CONTRACT ID.

PROJECT NO.
BRIDGE NO.

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION



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PLAN SHEET
SHEET 4 OF 4

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