Conceptual Interchange Study – US 54 at Missouri Route 5

Camdenton, Missouri CD0053

September 16, 2025



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EXECUTIVE SUMMARY

US Route 54 (US 54) is a key mobility corridor for regional and intercity traffic. Nationally, US 54 runs 1,200 miles from Griggsville, Illinois to El Paso, Texas. In Missouri, US 54 connects the Lake of the Ozarks to communities such as Louisiana (near the Champ Clark Mississippi River Bridge at the Illinois border), Bowling Green (at US 61), Mexico, Kingdom City (at I-70), Jefferson City (crossing the Senator Roy Blunt Missouri River Bridge and intersecting US 50 and US 63), and Nevada (at I-49 near the Kansas border). Within the study area, US 54 provides access to/from Missouri Route 5 (MO 5), recreational and entertainment opportunities associated with the Lake of the Ozarks, commercial and residential properties, and schools such as Camdenton High School, Oak Ridge Intermediate School, and Hawthorn Elementary School.

The US 54 corridor has been upgraded to an expressway through the Lake of the Ozarks area over the past 15 years, resulting in the removal of all the traffic signals between Kingdom City and Camdenton. As a result, the traffic signals at the intersections of US 54 with Laker Pride and Cecil Street are the only traffic signals remaining on US 54 between Kingdom City and MO 5. These intersections create capacity bottlenecks along this section of US 54, resulting in congestion and associated roadway crashes.

This study was undertaken to identify and examine alternatives to improve the short and long-term safety and traffic operations of the US 54/MO 5 interchange and of US 54 in Camdenton between the south end of the Lake of the Ozarks US 54 Expressway and the MO 5 interchange. As such, the study examined US 54 between Cecil Street and Business Route 5 as well as MO 5 between Business Route 5 and Missouri Route 7.

The study's preferred alternative is a "Boulevard" configuration, that:

- Widens US 54 to six (6) lanes between Cecil Street and the MO 5 interchange.
- Installs a raised center median in the widened section to control left turns.
- Relocates the Laker Pride Road intersection approximately 1200 feet to the east to a new traffic signal at a commercial driveway in the vicinity of Gerbes.
- Provides a signalized U-turn movement at the Jack Crowell Road traffic signal for westbound traffic.
- Provides a signalized U-turn movement at the Cecil Road traffic signal for eastbound traffic via a new jughandle. The existing eastbound to northbound left turn traffic will also use the new jughandle.

The Boulevard concept recognizes the commercial nature of his section of US 54 and provides an opportunity to extend Camdenton's US 54 urban character east of MO 5 to Cecil Street through elements such as lower speeds, signalized intersections, street lighting, and gateway signage. The posted speed limit for this section of US 54 under the Boulevard concept is recommended to be 35 miles per hour.



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This project can be built in two phases. Phase 1 widens US 54 between the northbound MO 5 ramps and Laker Pride/Jack Crowell Road. Phase 2 relocates Laker Pride Road, installs the U-turn movements, and widens US 54 between Jack Crowell Road and Cecil Street.

Phase 1 includes:

- The construction of a third eastbound lane on US 54 from the northbound MO 5 ramps to Laker Pride Road where it terminates as a right-turn lane at Laker Pride Road.
- Building a third westbound lane on US 54 lane from the eastern approach to Laker Pride Road, terminating as a right-turn at the northbound MO 5 ramps.
- Installs a raised center median on US 54 between the northbound MO 5 ramps to Laker Pride Road/Jack Crowell Road.
- Restriction of all driveways on US 54 between MO 5 and Laker Pride/Jack Crowell Road to right-in right-out access.
 - Businesses on the north side of US 54 have left turn access to/from US 54 via existing connections to Jack Crowell Road.
 - Businesses on the south side of US 54 have left-turn access to/from US 54 via existing and new driveway connections to Laker Pride Road.

Based on property lines obtained from the Camden County GIS website, the construction of Phase 1 will require the acquisition of approximately 0.37 acres, impacting six parcels. The actual existing right-of-way needs will be more precisely determined in the design phase. The construction estimate (rounded) for Phase 1 is \$4,500,000.

Phase 2 extends the widening of US 54 to six lanes from Laker Pride/Jack Crowell Road to Cecil Street. Phase 2 also:

- Installs a raised center median in the widened section to control left turns. This results in the restriction of all driveways on US 54 between Jack Crowell Road and Cecil Street to right-in right-out access.
- Relocates the Laker Pride Road intersection approximately 1200 feet to the east to a
 new traffic signal at a commercial driveway in the vicinity of Gerbes. This intersection
 will include an eastbound US 54 right-turn lane and northbound dual left-turn lanes.
- Provides a signalized U-turn movement at the Jack Crowell Road traffic signal for westbound traffic.
- Provides a signalized U-turn movement at the Cecil Street traffic signal for eastbound traffic via a new jughandle. The existing eastbound to northbound left turn traffic will also use the new jughandle.



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Based on property lines obtained from the Camden County GIS website, the construction of Phase 2 will require the acquisition of approximately 3.33 acres, impacting twenty-four parcels. The actual existing right-of-way needs will be more precisely determined in the design phase. The construction estimate (rounded) for Phase 2 is \$11,000,000.

The study team conducted an analysis of historical crash data and predicted future safety performance. Crashes in the segments between the northbound MO 5 Ramps and Cecil Street are comprised of approximately 39% rear ends and approximately 28% left-turn related crashes. Should improvements be made to minimize or eliminate left-turns from driveways and to reduce congestion and queuing, then significant safety improvements could be expected along these segments, especially when considering the predominate types of crashes in the historical crash data.

The proposed improvements aim to reduce crashes related to left-turning vehicles and rear ends through access management practices. Implementing a median barrier on US 54 instead of a two-way left-turn lane eliminates left-turning conflict points at driveways. The additional lane on US 54 in both directions serves to separate turning vehicles from through traffic to improve traffic flow and reduce the potential for rear end collisions.

Based on the predictive safety analysis, the Phase 2 Build condition is predicted to have approximately 17.2% fewer crashes over the 20-year period when compared to the No-Build Condition within the area of improvement. Also, the US 54 segments between the signalized intersections of the northbound MO 5 ramps and Cecil Street is predicted to have approximately 57.3% reduction in crashes due to the proposed divided highway (median barrier) provided in the build scenario, which eliminates left-turn conflicts in the segments and provides a significant safety improvement.

The study team completed traffic modeling with the VISSIM traffic analysis software to determine capacity needs and estimate how much the proposed improvements would lower delay. The team modeled several scenario years, including 2024 (completion of base traffic counts), 2030 (estimated Phase 1 construction year), and 2050 (design year). For each of these years the study team evaluated AM and PM peak periods for November conditions (when school is in session) as well as the August PM peak period for summer traffic.

Traffic modeling shows that Phase 1 improvements will provide an acceptable level of service (LOS D or better) during the November AM and PM peak periods as well as August PM peak period until sometime around 2035. The Phase 1 improvements, by themselves, will reach their capacity sometime between 2035 and 2050 due to capacity constraints in the existing four-lane section between the Lake Pride/Jack Crowe Road and Cecil Street traffic signals. Phase 2 improvements provide adequate capacity for an acceptable level of service (LOS D or better) through 2050.



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In addition to intersection and freeway operations, VISSIM provides network-wide performance measures that measure the effectiveness of alternatives. VISSIM modeling shows the following network delay reductions for 2024 and 2030 build conditions from 2024 and 2030 no-build conditions, respectively.

| Peak Periods | 2024 Traffic Volumes | 2030 Traffic Volumes |
|------------------|----------------------|----------------------|
| November AM Peak | 39% delay reduction | 54% delay reduction |
| November PM Peak | 57% delay reduction | 69% delay reduction |
| August PM Peak | 66% delay reduction | 64% delay reduction |

These results show considerable improvement in the overall roadway network performance for Phase 1 for short-term growth.

VISSIM modeling shows the following network delay reductions for 2050 traffic volumes.

| Peak Periods | Phase 1 with 2050 Traffic Volumes | Phase 2 with 2050 Traffic Volumes |
|------------------|-----------------------------------|-----------------------------------|
| November AM Peak | 66% delay reduction | 78% delay reduction |
| November PM Peak | 38% delay reduction | 70% delay reduction |
| August PM Peak | 81% delay reduction | 83% delay reduction |

2050 modeling results show that both Phases 1 and 2 provide an improvement in all network-wide metrics. However, the VISSIM models also show that with Phase 1, by 2050 approximately 572 vehicles are unable to enter the road network during the November PM peak period. This "unmet demand" shows that there is not adequate capacity for all the vehicles seeking to travel on US 54 during that time, resulting in roadway congestion. The August PM peak period has an unmet demand of 1114 vehicles. The modeling data also shows that there is an additional travel delay reduction with Phase 2 improvements. The results of this analysis show that Phase 1 improvements will address existing congestion, but that Phase 2 construction will be needed to provide the capacity required for projected traffic growth.

The proposed improvements improve safety and traffic operations by providing needed capacity along US 54 between MO 5 and Cecil Street. These improvements can be constructed in 2 phases. Widening US 54 in this section and widening to 6 lanes recognizes the commercial nature of his section of US 54 and provides an opportunity to extend Camdenton's US 54 urban character east of MO 5 to Cecil Street through elements such as lower speeds, signalized intersections, street lighting, and gateway signage.



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INTRODUCTION

US Route 54 (US 54) is a key mobility corridor for regional and intercity traffic. Nationally, US 54 runs 1,200 miles from Griggsville, Illinois to El Paso, Texas. In Missouri, US 54 connects the Lake of the Ozarks to communities such as Louisiana (near the Champ Clark Mississippi River Bridge at the Illinois border), Bowling Green (at US 61), Mexico, Kingdom City (at I-70), Jefferson City (crossing the Senator Roy Blunt Missouri River Bridge and intersecting US 50 and US 63), and Nevada (at I-49 near the Kansas border). Within the study area, US 54 provides access to/from Missouri Route 5 (MO 5), recreational and entertainment opportunities associated with the Lake of the Ozarks, commercial and residential properties, and schools such as Camdenton High School, Oak Ridge Intermediate School, and Hawthorn Elementary School.

The US 54 corridor has been upgraded to an expressway through the Lake of the Ozarks area over the past 15 years, resulting in the removal of all the traffic signals between Kingdom City and Camdenton. As a result, the traffic signals at the intersections of US 54 with Laker Pride and Cecil Street are the only traffic signals remaining on US 54 between Kingdom City and MO 5. These intersections create capacity bottlenecks along this section of US 54, resulting in congestion and associated roadway crashes.

This study was undertaken to identify and examine alternatives to improve the short and long-term safety and traffic operations of the US 54/MO 5 interchange and of US 54 in Camdenton between the south end of the Lake of the Ozarks US 54 Expressway and the MO 5 interchange.

EXISTING CONDITIONS

Study Area

The study area encompasses US 54 between Cecil Street and Business Route 5, as well as the mainline of MO 5 between Business Route 5 and Missouri Route 7. **Figure 1** is a screenshot from the VISSIM model that shows the study area in yellow.



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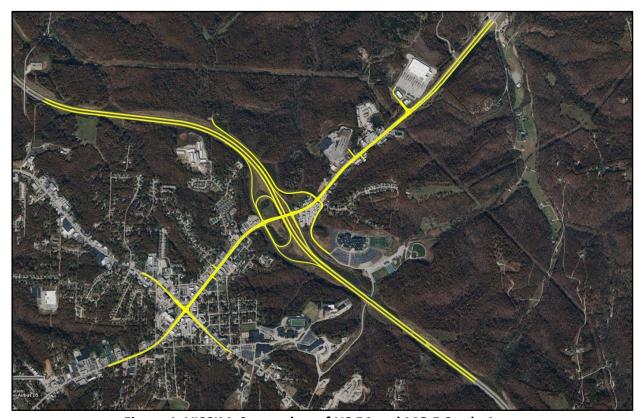


Figure 1: VISSIM Screenshot of US 54 and MO 5 Study Area

Existing Roadway Conditions

The following intersections and roadways are included in the study area:

- US 54 at Cecil Street;
- US 54 at Laker Pride Road/Jack Crowell Road;
- US 54 at Northbound and Southbound MO 5 Ramps;
- US 54 at Business Route 5; and
- Mainline MO 5 (between Business Route 5 and Missouri Route 7).

Missouri Route 5 (MO 5) is Missouri's longest state route and the only Missouri state route that crosses the entire state. MO 5 extends into Iowa north of Unionville ultimately terminating at I-35 on the south side of Des Moines. MO 5 also extends into Arkansas, ultimately terminating at I-30 in Little Rock. In Missouri, MO 5 intersects I-70 at Booneville and I-44 at Lebanon. MO 5 is a popular access route to Lake of the Ozarks from I-44. From 2007 to 2011 Improvements have been made to MO 5 between I-44 and Camdenton to a "Super 2" configuration and upgraded MO 5 to an Expressway on a new alignment through Camdenton. The Super 2 configuration includes three total lanes: one through lane in each direction with alternating passing lanes.



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MO 5 is a major north-south corridor along the west side of the Lake of the Ozarks. Within the City of Camdenton, MO 5 is a free-flow north-south principal arterial expressway that provides access to/from Business Route 5, US 54, and MO 7 via interchanges. MO 5 provides two lanes in each direction, has acceleration and deceleration lanes at the interchanges, and has a posted speed limit of 65 miles per hour (mph). Note, Exhibit 1 shows the posted speed limits within the study area.

Within the study area, US Route 54 (US 54) provides five lanes (two lanes in each direction and a center two-way left-turn lane) between Cecil Street and Business Route 5. East of Cecil Street, US 54 has a posted speed limit of 55 miles per hour (mph). Between Cecil Street and the northbound MO 5 ramps, US 54 has a posted speed limit of 45 mph. Between the northbound MO 5 ramps and Business Route 5, US 54 has a posted speed limit of 40 mph. West of Business Route 5, US 54 has a posted speed limit of 30 mph. Just west of Business Route 5, US 54 transitions to provide three lanes (one lane in each direction and a center two-way left-turn lane). A project is in place to expand this section of US 54 to provide five-lanes (two lanes in each direction and a center two-way left-turn lane), and this project is anticipated to be completed in 2026^{1} .

Generally, a sidewalk is provided along US 54 between Cecil Street and Business Route 5. The sidewalk is located along the north side of the roadway between Cecil Street and Laker Pride Drive/Jack Crowell Road. The sidewalk is located along the south side of the roadway between Laker Pride Drive/Jack Crowell Road and Business Route 5.

Within the study area, US 54 intersects Cecil Street at a signalized intersection. The eastbound US 54 approach provides two left-turn lanes and two through lanes. The westbound US 54 approach provides two through lanes and a right-turn lane. The southbound Cecil Street approach provides two left-turn lanes and a right-turn lane. The intersection of US 54 and Cecil Street is shown in Figure 2. Cecil Street is a local roadway that mainly provides access to a Walmart Supercenter. Although not posted, the speed limit by City of Camdenton ordinance is 25 mph.

¹https://www.modot.org/projects/us-route-54-highway-widening-camdencounty#:~:text=These%20improvements%20are%20projected%20to,closures%2C%20and%20some%20narrowed %20lanes.



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Figure 2: Intersection of US 54 and Cecil Street

US 54 intersects **Laker Pride Road/Jack Crowell Road** at a signalized intersection. The eastbound US 54 approach provides one left-turn lane, one through lane, and one shared through/right-turn lane. The westbound US 54 approach provides one left-turn lane, one through lane, and one shared through/right-turn lane. The northbound Laker Pride Road and southbound Jack Crowell Road approaches provide one left-turn and one shared through/right-turn lane. The intersection of US 54 and Laker Pride Road/Jack Crowell Road is shown in **Figure 3**. Laker Pride Road is a local roadway that primarily provides access to Camdenton High School. Although not posted, the speed limit by City of Camdenton ordinance is 25 mph for Laker Pride Road. Jack Crowell Road is a local roadway that provides access to several commercial properties. Jack Crowell Road has a posted speed limit of 45 mph.



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Figure 3: Intersection of US 54 and Laker Pride Road/Jack Crowell Road

The **northbound MO 5** access to/from US 54 is provided via a signalized intersection. The eastbound US 54 approach provides a left-turn lane and two through lanes. The westbound US 54 approach provides two through lanes and one right-turn lane. The northbound MO 5 approach provides one left-turn lane and two right-turn lanes. The intersection of northbound MO 5 and US 54 is shown in **Figure 4**.

The **southbound MO 5** access to/from US 54 is provided via an unsignalized intersection. The eastbound and westbound US 54 approaches provide two through lanes and one right-turn lane. The southbound MO 5 approaches provide one right-turn lane. The intersection of southbound MO 5 and US 54 is shown in **Figure 5**.



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Figure 4: Intersection of US 54 and Northbound MO 5 Ramps



Figure 5: Intersection of US 54 and Southbound MO 5 Ramps



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US 54 intersects **Business Route 5** at a signalized intersection. The eastbound and westbound US 54 approaches provide one left-turn lane, one through lane, and one shared through/right-turn lane. The northbound Business Route 5 approach provides one left-turn lane, one through lane, and one shared through/right-turn lane. The southbound Business Route 5 approach provides two left-turn lanes, one through lane, and one right-turn lane. The intersection of US 54 and Business Route 5 is shown in **Figure 6**. Business Route 5 is a local roadway with a posted speed limit of 30 mph.



Figure 6: Intersection of US 54 and Business Route 5

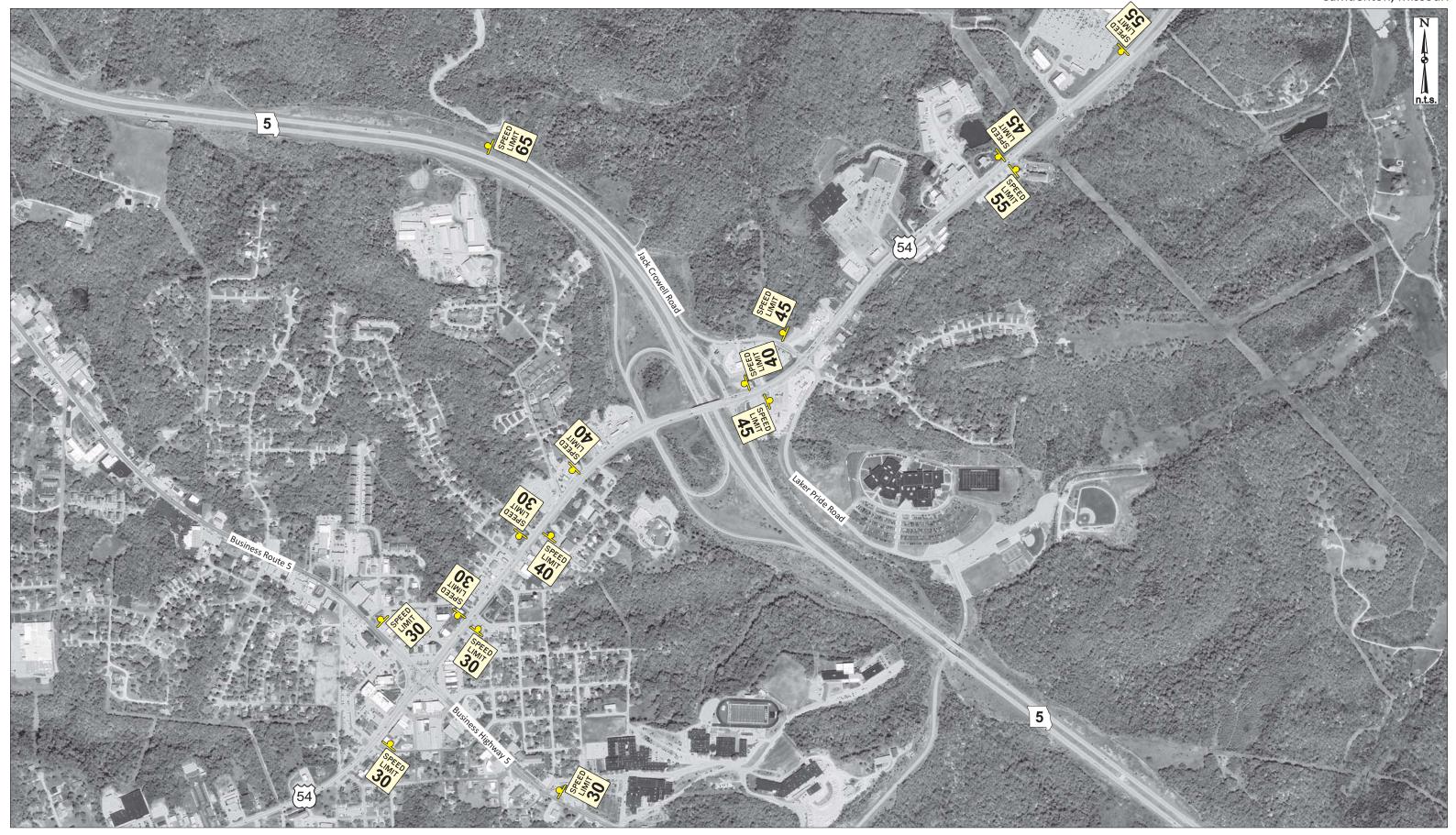


Exhibit 1: Existing Speed Limits and Sign Locations



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Existing Traffic Volumes

Turning movement counts were collected by MoDOT on a typical weekday between 6:00 AM and 6:00 PM for a week at the following locations:

- US 54 at Cecil Street (August and November 2024);
- US 54 at Laker Pride Road/Jack Crowell Road (August and November 2024);
- US 54 at Northbound MO 5 Ramps (August and November 2024);
- US 54 at Southbound MO 5 Ramps (August and November 2024); and
- US 54 at Business Route 5 (August and November 2024).

Note, that CBB obtained hourly traffic counts for mainline MO 5 from MoDOT's DataZone: https://www.modot.org/modatazone/traffic.

The turning movement count data was collected both during summer peak tourist traffic to the Lake of the Ozarks (August 2024) and during a typical month with school in session (November 2024).

Based on the collected data, this study examined a November AM peak hour, a November PM peak hour, and an August PM peak hour. The November AM peak hour occurred between 7:15 and 8:15 AM, the November PM peak hour occurred between 3:15 and 4:15 PM, and the August PM peak hour occurred between 3:30 and 4:30 PM. Note that a review of the count data showed that the PM peak period traffic volumes are 15% to 19% higher during the Friday PM peak period than during the Monday – Thursday PM peak period. Thus, this study examined the higher Friday PM peak period as a worst-case scenario for both the November and August PM peak periods.

The 2024 No-Build traffic volumes are shown in **Exhibit 2**. During the November AM peak, there is a heavy flow of vehicles traveling eastbound on US 54. Moreover, there is a heavy flow of traffic from both directions of MO 5 to eastbound US 54. During both November and August PM peak hours, there is a heavy flow of vehicles traveling westbound on US 54. Furthermore, there is a heavy flow of traffic from westbound US 54 to both directions of MO 5.

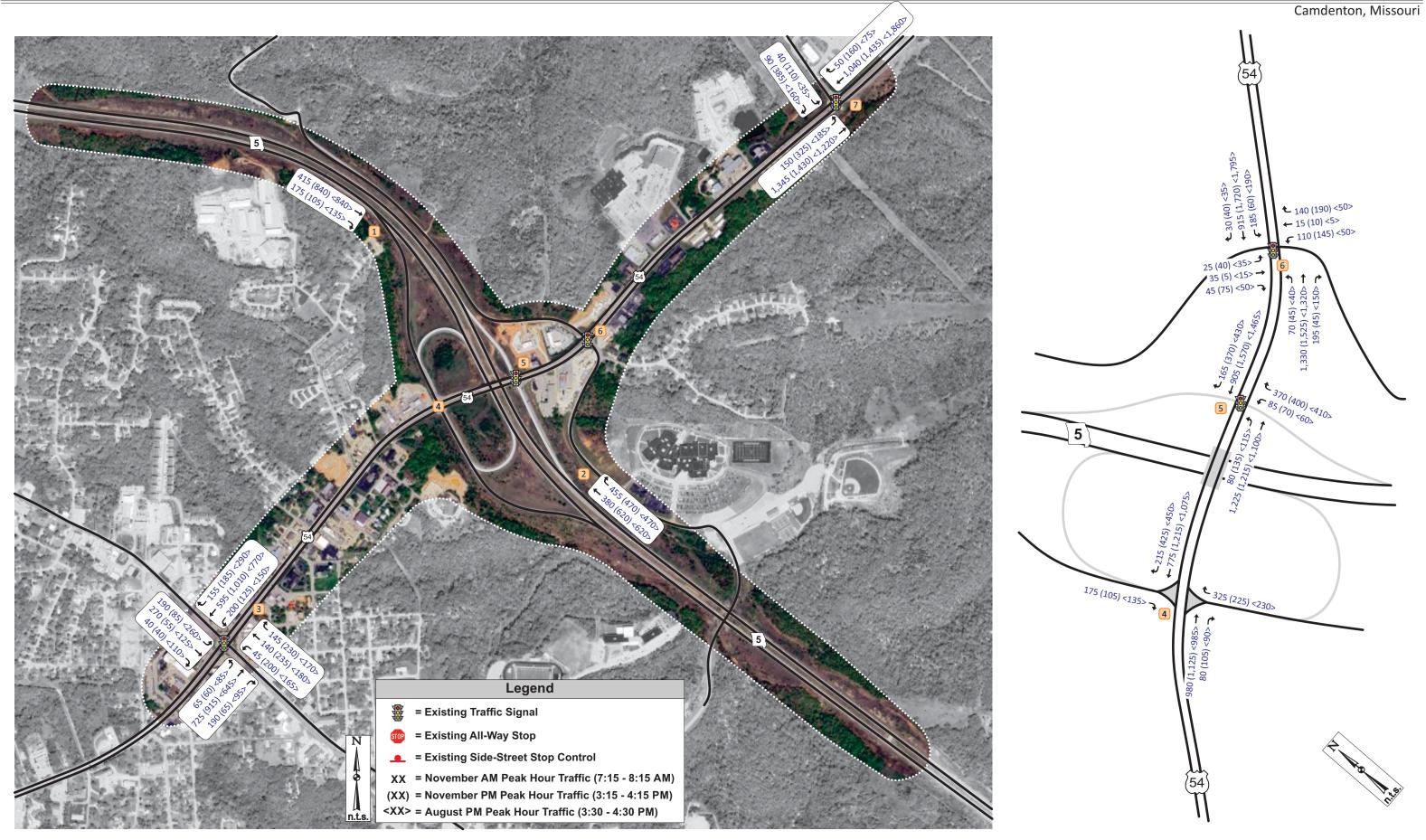


Exhibit 2: 2024 No-Build Traffic Volumes



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Existing Travel Time Data

Travel time data was collected for eastbound and westbound US 54 between Cecil Street and Business Route 5. CBB collected field travel time data by driving the route during a field visit from October 14, 2024, to October 18, 2024. Using a GPS device connected to a computer, latitude, longitude, and speed data were collected every second of each trip along the routes. These data points were processed and summarized to produce a travel time summary for both routes. Summarized travel time data for the November AM and PM peak hours are included in **Appendix A**.

Existing Queue Observations

In addition to travel time data, CBB collected queue observations during the field visit from October 14, 2024, to October 18, 2024. Queue observations were collected during the November AM and PM peak hours at each study intersection.

November AM Peak Observations

During the November AM peak, there was a heavy flow of traffic on eastbound US 54. We observed lengthy eastbound US 54 approach queues at Laker Pride Road, northbound MO 5 ramps, and Business Route 5 intersections. **Figure 7** shows the eastbound US 54 approach queue at Laker Pride Road reaching the northbound MO 5 ramps intersection. **Figure 8** shows the eastbound US 54 approach queue at the northbound MO 5 ramps reaching the southbound MO 5 ramps intersection. **Figure 9** shows the eastbound US 54 approach queue at Business Route 5. We also observed the southbound Business Route 5 approach queue reaching the Court Circle NW intersection, as shown in **Figure 10** and the northbound Laker Pride Road approach queue reaching the Elm Tree Lane intersection, as shown in **Figure 11**.



Figure 7: Eastbound US 54 Approach Queue from Laker Pride Road reaching Northbound MO 5 Ramps



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Figure 8: Eastbound US 54 Approach Queue from Northbound MO 5 Ramps reaching Southbound MO 5 Ramps



Figure 9: Eastbound US 54 Approach Queue at Business Route 5

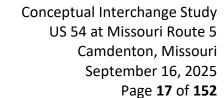






Figure 10: Southbound Business Route 5 Approach Queue from US 54 reaching Court Circle NW



Figure 11: Northbound Laker Pride Road Approach Queue from US 54 reaching Elm Tree Lane



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November PM Peak Observations

During the November PM peak, there was a heavy flow of traffic on westbound US 54. We observed lengthy westbound US 54 approach queues at Laker Pride Road, northbound MO 5 ramps, and Business Route 5 intersections. **Figure 12** shows the westbound US 54 approach queue at Laker Pride Road reaching the Cecil Street intersection. **Figure 13** shows the westbound US 54 approach queue at the northbound MO 5 ramps reaching the Laker Pride Road intersection. **Figure 14** shows the westbound US 54 approach queue at Business Route 5. We also observed the northbound Business Route 5 approach queue reaching the Camden Avenue intersection, as shown in **Figure 15** and the northbound Laker Pride Road approach queue reached the Elm Tree Lane intersection, as shown in **Figure 16**.



Figure 12: Westbound US 54 Approach Queue from Laker Pride Road reaching Cecil Street



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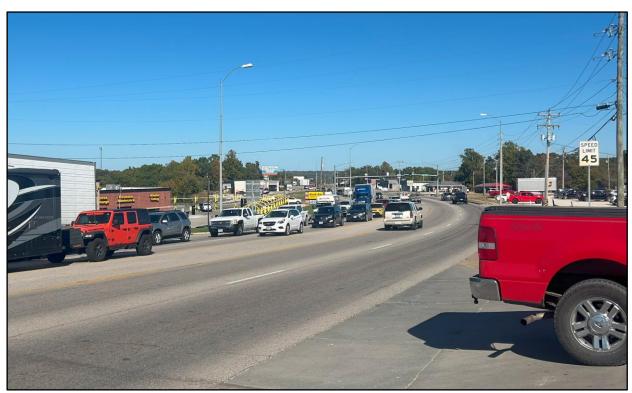


Figure 13: Westbound US 54 Approach Queue from Northbound MO 5 Ramps reaching Laker Pride Road



Figure 14: Westbound US 54 Approach Queue at Business Route 5

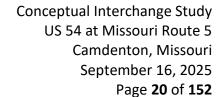






Figure 15: Northbound Business Route 5 Approach Queue from US 54 reaching Camden Avenue



Figure 16: Northbound Laker Pride Road Approach Queue from US 54 reaching Elm Tree Lane



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Existing Safety Conditions

Historical Crash Data - US 54 & MO 5

The crash data for five years between the years 2019 and 2023 was gathered from MoDOT's Transportation Management System along MO 5 between the interchange that is approximately 2.5 miles north of US 54 and the interchange that is approximately 2.5 miles south of MO 5, as well as along US 54 between Cecil Street and Business Route 5 to determine any safety performance issues. A visual representation of the study area is depicted in **Figure 17**

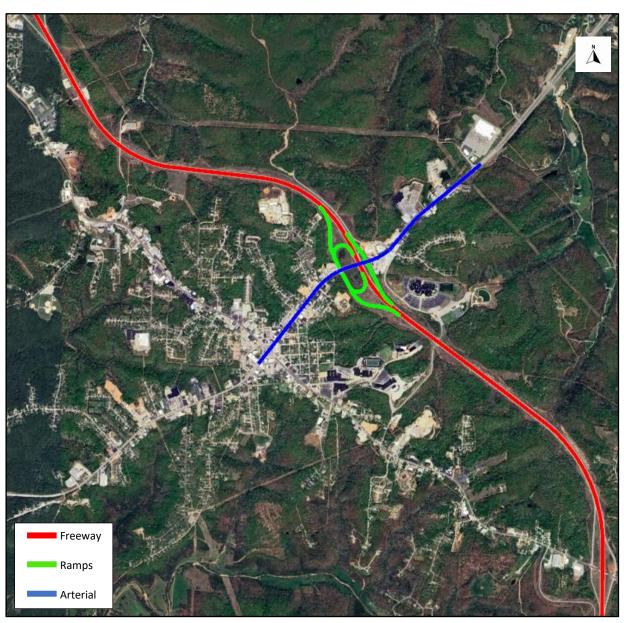


Figure 17: Aerial View of Study Area



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During the 5-year period, 46 crashes were reported along the 5.12-mile segment of freeway (MO 5), 654 crashes were reported along US 54, and 8 crashes were reported on the MO 5 on or off ramps at US 54. **Figure 18** shows the total number of crashes by year for each study corridor, as well as all study areas combined as the total. As can be seen, the total number of crashes is consistent, except in 2020, when there was a noticeable reduction, likely due to the impacts of COVID-19 and associated stay-at-home orders.

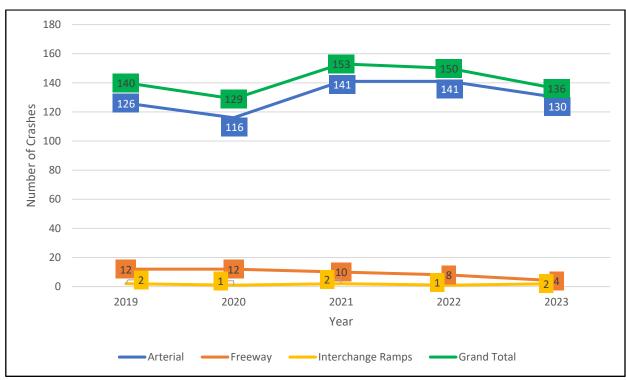


Figure 18: US 54 & MO 5 Crash Data by Year (2019 - 2023)

Information regarding location, time of day, weather conditions, lighting conditions, crash type, and severity was summarized to help determine probable contributing factors. With this data, crash patterns and problem areas were identified and summarized in the subsequent sections.

Freeway Corridor – MO 5

The crash data for the 5-year period between 2019 and 2023 has a total of 46 crashes reported along this 5.12-mile segment of MO 5 between the interchange that is approximately 2.5 miles north of US 54 and the interchange that is approximately 2.5 miles south of MO 5, which resulted in approximately 9.2 crashes per year, on average. Based on the crash data, the average crash rate along MO 5 is approximately 13 crashes per one Hundred Million Vehicle Miles of Travel (HMVMT).



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Of the 46 crashes, 36 resulted in property damage only (78%), 8 minor injury crashes (18%), one serious crash (2%), and one fatal crash (2%). Crashes in 2022 and 2023 were lower than the five-year average (9.2), with 4 and 8 crashes, respectively. **Figure 19** shows the crashes each year and the severity level along MO 5 in the study area.

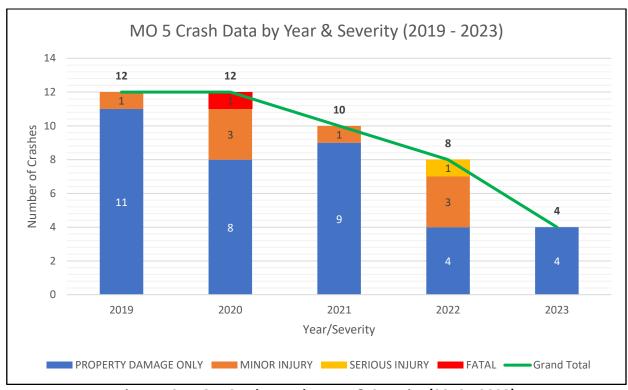


Figure 19: MO 5 Crash Data by Year & Severity (2019 - 2023)

The project area's first fatal crash (of 2) occurred in June 2020 along northbound MO 5, approximately a mile south of the interchange with US 54. The crash report states that a passenger vehicle hit the back of a pickup truck, causing the pickup truck to travel off the right side of the roadway, and the truck hit a rock bluff, which ejected the driver out of the vehicle. The pickup truck driver was pronounced dead at the scene. The passenger vehicle was found to be following too closely and exceeding the speed limit. The crash occurred in dry, clear, daylight conditions.

The project area's first serious injury crash (of 13) occurred in January 2022 along southbound MO 5 about one mile south of US 54. The crash report states that a sports utility vehicle was going too fast for conditions, causing the vehicle to slip on ice and travel to the right shoulder. The vehicle ramped down the ravine and came to rest at the bottom of the ravine upside down. Both the driver and the passenger were unable to give a response to what happened. The crash occurred under ice/frost, snow, and dark-unlighted conditions.



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Table 1 shows the crash types that occurred along MO 5 from 2019 to 2023. The most common type of crash was out-of-control crashes, occurring 16 times on MO 5. One of the 16 out-of-control crashes was a serious injury, five were minor injuries, and ten crashes were property damage only. Of the out-of-control crashes, 62% occurred in wet, iced, or snowy pavement conditions and 69% occurred in daylight.

The second most common type of crash was caused by deer, occurring 9 times on MO 5. It should be noted that 8 of the 9 deer crashes were property damage only, and 6 of the 9 crashes (67%) occurred in the southbound direction.

The third most common type of crash type on MO 5 is rear ends with 7 crashes, 71% occurred on dry pavement, 100% occurred in daylight. One rear end was fatal, while 6 were property damage only.

Table 1: Freeway Mainline MO 5 – Crash Data by Crash Type & Severity (2019 - 2023)

| | | | , | pe ar coronity (= a | |
|----------------|-------|-------------------|-----------------|----------------------|-------|
| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
| OUT OF CONTROL | | 1 | 5 | 10 | 16 |
| DEER | | | 1 | 8 | 9 |
| REAR END | 1 | | | 6 | 7 |
| PASSING | | | | 4 | 4 |
| OTHER | | | | 2 | 2 |
| DEBRIS | | | | 2 | 2 |
| CHANGING LANE | | | 1 | | 1 |
| DOG | | | | 1 | 1 |
| AVOIDING | | | 1 | | 1 |
| SIDESWIPE | | | | 1 | 1 |
| LEFT TURN | | | | 1 | 1 |
| FARM ANIMAL | | | | 1 | 1 |
| Total | 1 | 1 | 8 | 36 | 46 |

Figure 20 is a map that indicates the location of the concentration of crashes along MO 5. The red color indicates a higher concentration of crashes at that location while the green color represents a lower concentration of crashes.



Linn Creek [54] V 5 5 [54] 0

Figure 20: Heat Map of Crashes along MO 5 in Study Area

<u>Freeway Ramps – MO 5 To/From US 54</u>

The crash data for the 5-year period between 2019 and 2023 reported a total of 8 crashes on the freeway ramps between MO 5 and US 54. Of the 8 crashes, 6 crashes resulted in property damage only (75%), one serious injury (12.5%), and one fatal crash (12.5%). The most common type of crash was out of control crashes (5 of 8). **Table 2** summarizes the crash data on the interchange ramps between MO 5 and US 54 from 2019 to 2023. **Figure 21** shows the crashes each year and the severity level on the interchange ramps between MO 5 and US 54.



Table 2: MO 5 Ramps – Crash Data by Crash Type & Severity (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------|-------|-------------------|-----------------|----------------------|-------|
| OUT OF CONTROL | 1 | 1 | | 3 | 5 |
| REAR END | | | | 2 | 2 |
| OTHER | | | | 1 | 1 |
| Total | 1 | 1 | | 6 | 8 |

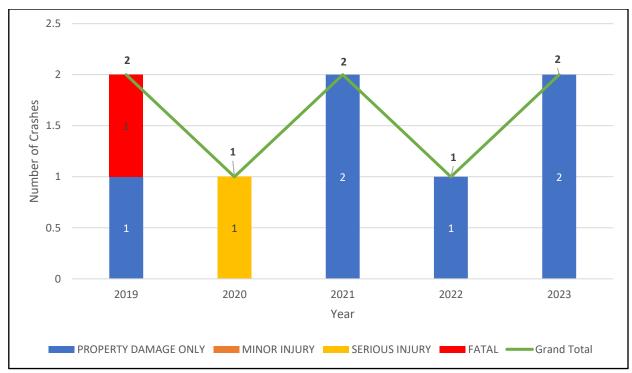


Figure 21: MO 5 Ramps Crash Data by Year & Severity (2019 - 2023)

The project's second fatal crash (of 2) occurred in August 2019 on the MO 5 southbound off-ramp, north of the interchange with US 54. The crash report states that a van ran off the right side of the ramp and traveled 320 feet down an embankment then struck a drainage ditch. The driver was found in the vehicle and pronounced dead. The vehicle was towed from the scene and the reason for this crash is unknown. The crash occurred in dry, cloudy, daylight conditions.

The project area's second serious injury crash (of 13) occurred in August 2020 along MO 5 southbound on-ramp, south of the interchange with US 54. The crash report states that a motorcyclist was driving too fast for the conditions and ran off the right side of the roadway, overturned, and struck the ground. The motorcyclist was transported to Lake Regional Hospital-Osage Beach by Mercy ambulance. The crash occurred under dry, clear, and dark-unlighted conditions.



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Arterial Corridor – US 54

During the 5-year period between 2019 and 2023, 654 total crashes were reported on US 54 between Cecil Street and Business Route 5 (1.7 miles), which resulted in approximately 131 crashes per year, on average. Based on the 5 years of crash data, the average crash rate along US 54 between Cecil Street and Business Route 5 is approximately 940 crashes per one Hundred Million Vehicle Miles of Travel (HMVMT).

Of the 654 crashes, 543 crashes resulted in property damage only (83%), 100 minor injury crashes (15%), 11 serious injury crashes (2%), and zero fatal crashes. Crashes in 2019, 2020 and 2023 were lower than the 5-year average with 126, 116, and 130 crashes, respectively. **Figure 22** shows the severity trend along US 54 between Cecil Street and Business Route 5 over the past five years.



Figure 22: US 54 Corridor Crash Data by Year & Severity (2019 - 2023)

Figure 23 shows the crash types that occurred along US 54 between Cecil Street and Business Route 5 between from 2019 to 2023. As can be seen, the most common crash type was rear end, occurring 358 times (55%). Of the rear ends, 85% occurred on dry pavement and 93% occurred in daylight. The second most common type was left-turn right angle crashes, occurring 66 times (10%). Of the left-turn right angle crashes, 83% occurred on dry pavement and 89% occurred in daylight. The third most common type was passing related crashes, occurring 65 times (10%). Of the passing crashes, 86% occurred on dry pavement and 89% occurred in daylight.



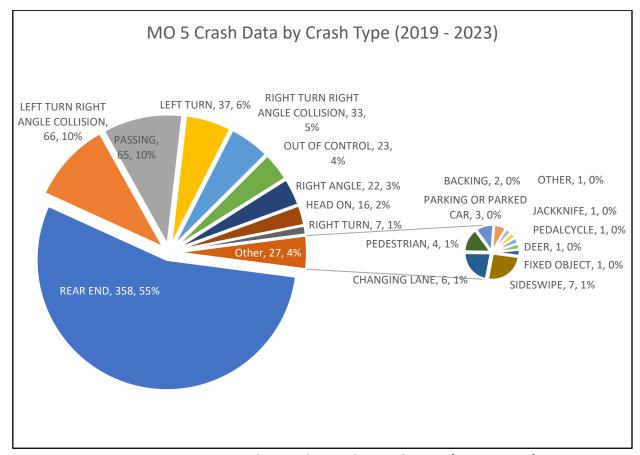


Figure 23: US 54 Corridor Crash Data by Crash Type (2019 - 2023)

Table 3 also shows the crash types along the US 54 corridor and subdivides the crashes into intersection crashes and segment crashes. Turning related crashes in the "segments" most frequently occurred at business driveways.



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Table 3: Arterial Crashes – US 54 Crash Data by Crash Type & Severity (2019 - 2023)

| Table 5: Arterial Crashes – 05 54 Crash Data by Crash Type & Seventy (2019 - 2025) | | | | | | | | |
|--|-------|-------------------|-----------------|----------------------|-------|--|--|--|
| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total | | | |
| Intersection Crashes | | | | | | | | |
| REAR END | | | 39 | 252 | 291 | | | |
| PASSING | | | 2 | 44 | 46 | | | |
| LEFT TURN RIGHT ANGLE COLLISION | | | 10 | 26 | 36 | | | |
| LEFT TURN | | 1 | 2 | 25 | 28 | | | |
| RIGHT TURN RIGHT ANGLE COLLISION | | 1 | 2 | 21 | 24 | | | |
| OUT OF CONTROL | | 3 | 2 | 9 | 14 | | | |
| RIGHT ANGLE | | | 3 | 8 | 11 | | | |
| HEAD ON | | | 1 | 9 | 10 | | | |
| RIGHT TURN | | | | 6 | 6 | | | |
| PEDESTRIAN | | 1 | 3 | | 4 | | | |
| SIDESWIPE | | | 1 | 2 | 3 | | | |
| CHANGING LANE | | | 1 | 2 | 3 | | | |
| PARKING OR PARKED CAR | | | | 2 | 2 | | | |
| BACKING | | | | 1 | 1 | | | |
| FIXED OBJECT | | | | 1 | 1 | | | |
| JACKKNIFE | | | | 1 | 1 | | | |
| OTHER | | | | 1 | 1 | | | |
| PEDALCYCLE | | 1 | | | 1 | | | |
| Intersections Total | 0 | 7 | 66 | 410 | 483 | | | |
| Segment Crashes | | | | | | | | |
| REAR END | | | 12 | 55 | 67 | | | |
| LEFT TURN RIGHT ANGLE COLLISION | | 2 | 8 | 20 | 30 | | | |
| PASSING | | | 1 | 18 | 19 | | | |
| RIGHT ANGLE | | | 4 | 7 | 11 | | | |
| LEFT TURN | | | 3 | 6 | 9 | | | |
| OUT OF CONTROL | | | 2 | 7 | 9 | | | |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 9 | 9 | | | |
| HEAD ON | | 2 | 2 | 2 | 6 | | | |
| SIDESWIPE | | | 2 | 2 | 4 | | | |
| CHANGING LANE | | | | 3 | 3 | | | |
| DEER | | | | 1 | 1 | | | |
| RIGHT TURN | | | | 1 | 1 | | | |
| PARKING OR PARKED CAR | | | | 1 | 1 | | | |
| BACKING | | | | 1 | 1 | | | |
| Segments Total | | 4 | 34 | 133 | 171 | | | |
| Intersections and Segments Total | 0 | 11 | 100 | 543 | 654 | | | |



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US 54 – Intersection Crashes

Based on the crash data, 483 crashes occurred at intersections along US 54 between Cecil Street and Business Route 5 from 2019 to 2023. **Figure 24** shows the location of the concentration of crashes along US 54 and **Figure 25** summarizes the location of the crashes along the US 54 corridor. As can be seen, there is a high number of crashes at the signalized intersections along US 54, specifically, 296 of the 483 intersection crashes (61%) occurred at signalized intersections. The intersection with the most crashes was the signalized intersection of US 54 and Cecil Street, which had 120 crashes over the five-year period. The intersection with the second most crashes is the unsignalized intersection of US 54 and MO 5 southbound ramps with 84 crashes. The intersection with the third most crashes is the signalized intersection of US 54 and Business MO 5 with 76 crashes. The intersection with the fourth most crashes is the signalized intersection of US 54 and MO 5 northbound ramps with 69 crashes.



Figure 24: Heat Map of Crashes along US 54 in Study Area



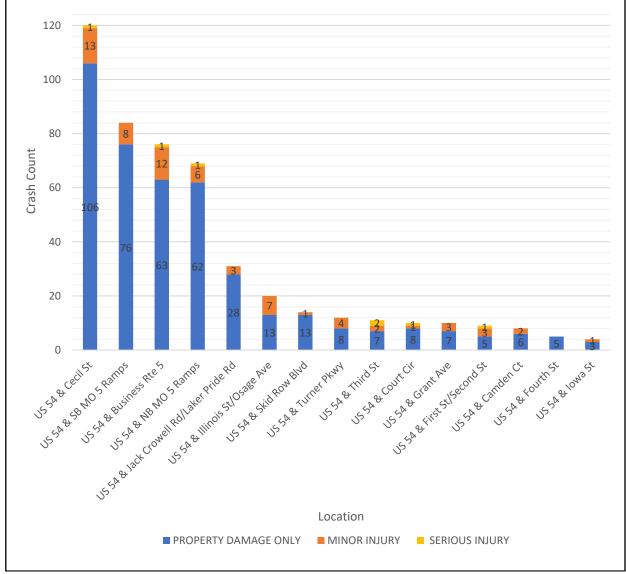


Figure 25: US 54 Corridor - Crash Data by Intersection & Severity (2019 - 2023)

Intersection of US 54 at Cecil Street (Signalized): The intersection of US 54 with Cecil Street had 120 of the 483 intersection crashes, or 25% of the intersection crashes in the US 54 study area. This intersection is a three-leg, signalized intersection that serves a commercial use (Wal-Mart). This intersection is the first signalized intersection after transitioning from a free flow divided highway. Dual eastbound left-turns and a separate westbound right-turn lane are provided along US 54. An offset westbound left-turn lane is currently striped, but there is no development on the south side of the intersection. Cecil Street provides dual southbound left-turns and a separate right-turn lane. Pedestrian accommodations are provided across the north leg.



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Table 4 summarizes the crash data at the signalized intersection of US 54 and Cecil Street from 2019 to 2023. As can be seen, the most common type of crash was rear end crashes (95 of 120) or 79%, followed by 8% passing, 3% left-turn right angle, 3% head on, 1.5% right angle, and less than 1% each for changing lane, jackknife or right-turn right angle. Note, most of the rear end crashes are specifically at the southbound Cecil Street right-turn movement (55 of 95). A review of the crashes report indicates that the vehicles have difficulty performing the right-turn movement when there is a queue from the westbound US 54 approach at Laker Pride Road. During heavy congestion, some vehicles will attempt to make a right-turn but then stop before making the turn because there is not an acceptable gap in traffic. When the vehicle in front moves forward to make the right-turn the vehicle behind often also moves forward. Collisions commonly occur when the front vehicle stops, and the following vehicle fails to also stop, and rear ends the vehicle attempting to make the right-turn.

Although the crash frequency is somewhat high, the intersection of US 54 at Cecil Street had an injury rate of 12% (14 of 120) over the 5-year period. Approximately 87% of crashes occurred on a dry road surface, while 12% occurred on a wet surface and 1% on a snow-covered surface and 91% of the crashes occurred during daylight hours.

Table 4: Intersection Crash Data – US 54 at Cecil Street (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | 10 | 85 | 95 |
| PASSING | | | 1 | 9 | 10 |
| LEFT TURN RIGHT ANGLE COLLISION | | | 2 | 2 | 4 |
| OUT OF CONTROL | | 1 | | 2 | 3 |
| HEAD ON | | | | 3 | 3 |
| RIGHT ANGLE | | | | 2 | 2 |
| CHANGING LANE | | | | 1 | 1 |
| JACKKNIFE | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| Total | 0 | 1 | 13 | 106 | 120 |

The project area's third serious injury crash (of 13) occurred in October 2019 along eastbound US 54 at Cecil Street. The crash report states that a vehicle traveling eastbound on US 54 was turning left onto Cecil Street when the driver's hand slipped on the steering wheel causing the vehicle to strike the curb and traffic control light support pole at the northeast corner of the intersection. The passenger was taken to the hospital by ambulance due to not wearing a seatbelt and the vehicle was towed from the scene. The crash occurred under dry, clear, and daylight conditions.



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Intersection of US 54 at MO 5 Southbound Ramps (Unsignalized – Right-In Right-Out): The intersection of US 54 at MO 5 southbound ramps had 84 of the 483 intersection crashes, or 17% of the intersection crashes in the US 54 study area. The intersection is an unsignalized ramp terminal that is part of a partial cloverleaf interchange and limits the turning movements to right-in/right-out with channelized islands on the ramps and a raised center median along US 54. A short westbound right-turn lane is provided along US 54 while a tapered eastbound right-turn lane is provided along eastbound US 54.

Table 5 summarizes the crash data at the unsignalized intersection US 54 at MO 5 southbound ramps from 2019 to 2023. As can be seen, the most common type of crash was rear end crashes (57 of 84) or 68%, followed by 14% passing, 8% right-turn right angle, 4% left-turn right angle, 2% right-turn, and 1% each for left-turn, out-of-control and other. Most of the rear end crashes are specifically at the southbound MO 5 to eastbound US 54 right-turn movement (50 of 57). A review of the crashes report indicates that the vehicles have difficulty performing the right-turn movement when there is a queue from the eastbound US 54 approach at Northbound MO 5 ramps. The intersection of US 54 at MO 5 southbound ramps had an injury rate of 10% (8 of 84) over the 5-year period. Approximately 85% of crashes occurred on a dry road surface, while 14% occurred on a wet surface and 1% on an icy surface and 95% of the crashes occurred during daylight hours.

Table 5: Intersection Crash Data – US 54 at MO 5 Southbound Ramps (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total | |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|--|
| REAR END | | | 6 | 51 | 57 | |
| PASSING | | | | 12 | 12 | |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 7 | 7 | |
| LEFT TURN RIGHT ANGLE COLLISION | | | 2 | 1 | 3 | |
| RIGHT TURN | | | | 2 | 2 | |
| LEFT TURN | | | | 1 | 1 | |
| OUT OF CONTROL | | | | 1 | 1 | |
| OTHER | | | | 1 | 1 | |
| Total | | | 8 | 76 | 84 | |

Intersection of US 54 at Business Route 5 (Signalized): The intersection of US 54 with Business Route 5 had 76 of the 483 intersection crashes, or 16% of the intersection crashes in the US 54 study area. This intersection is a four-leg, signalized intersection. The eastbound and westbound approaches of US 54 have separate left-turn lanes, while the southbound Business Route 5 approach has dual left-turn lanes and as well as a separate right-turn lane and northbound Business Route 5 has a separate northbound left-turn lane. All four quadrants of the intersection have diagonal parking areas that serve commercial uses and the courthouse.



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Table 6 summarizes the crash data at the signalized intersection of US 54 and Business Route 5 from 2019 to 2023. As can be seen, the most common type of crash was rear end crashes (58 of 76) or 76%, followed by passing, left-turn, right angle at 4% each, follow out-of-control and head on at 2.6%, then changing lane, pedestrian, bicycle, left-turn right angle, and right-turn right angle at 1.3% each. The intersection of US 54 at Business Route 5 had an injury rate of 17% (13 of 76) over the 5-year period. Approximately 79% of crashes occurred on a dry road surface, while 20% occurred on a wet surface and 1% on a snow-covered surface and 91% of the crashes occurred during daylight hours.

Table 6: Intersection Crash Data – US 54 at Business Route 5 (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | 8 | 50 | 58 |
| PASSING | | | | 3 | 3 |
| LEFT TURN | | | | 3 | 3 |
| RIGHT ANGLE | | | 2 | 1 | 3 |
| OUT OF CONTROL | | | 1 | 1 | 2 |
| HEAD ON | | | | 2 | 2 |
| CHANGING LANE | | | | 1 | 1 |
| PEDESTRIAN | | | 1 | | 1 |
| PEDALCYCLE | | 1 | | | 1 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| Grand Total | 0 | 1 | 12 | 63 | 76 |

The project area's fourth serious injury crash (of 13) occurred in September 2022 along northbound Business Route 5 at US 54. The crash report states that a vehicle turning right onto eastbound US 54 had a green light and hit a cyclist that was riding their bike across the crosswalk. The driver and the cyclist both did not see each other and thought it was clear for them to proceed. The cyclist was transported to the hospital by ambulance. The crash occurred under dry, clear, and daylight conditions.

Intersection of US 54 at MO 5 Northbound Ramps (Signalized): The intersection of US 54 with MO 5 northbound ramps had 69 of the 483 intersection crashes, or 14% of the intersection crashes in the US 54 study area. This intersection is a four-leg, signalized diamond terminal with the MO 5 northbound ramps. A separate eastbound left-turn and a very short westbound right-turn/taper lane are provided along US 54. One left-turn lane and dual northbound right-turn lanes are provided on the northbound off ramp of MO 5 at US 54.



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Table 7 summarizes the crash data at the signalized intersection US 54 at MO 5 Northbound Ramps from 2019 to 2023. As can be seen, the most common type of crash was rear end crashes (33 of 69) or 48%, followed by 13% left-turn, 10% right-turn right angle, passing and left-turn right angle at 7% each, out of control and head on at 4% each, and changing lane, fixed object, right turn sideswipe at 1.4% each. The intersection of US 54 at MO 5 Northbound Ramps had an injury rate of 10% (7 of 69) over the 5-year period. Approximately 91% of crashes occurred on a dry road surface, while 7% occurred on a wet surface and 2% on a snow-covered surface and 85% of the crashes occurred during daylight hours.

Table 7: Intersection Crash Data – US 54 at MO 5 Northbound Ramps (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | 3 | 30 | 33 |
| LEFT TURN | | 1 | | 8 | 9 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 7 | 7 |
| PASSING | | | | 5 | 5 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 5 | 5 |
| OUT OF CONTROL | | | 1 | 2 | 3 |
| HEAD ON | | | 1 | 2 | 3 |
| CHANGING LANE | | | 1 | | 1 |
| FIXED OBJECT | | | | 1 | 1 |
| RIGHT TURN | | | | 1 | 1 |
| SIDESWIPE | | | | 1 | 1 |
| Total | | 1 | 6 | 62 | 69 |

The project area's fifth serious injury crash (of 13) occurred in August 2022 along westbound US 54 at the northbound MO 5 ramps. The crash report states that a vehicle pulling a camper was heading westbound with a green light when a motorcycle heading eastbound turned left in front of the vehicle. The vehicle was unable to stop in time and collided with the motorcycle that failed to yield. The driver of the motorcycle was unconscious upon arrival and the motorcycle was towed due to damage. The crash occurred under dry, clear, and daylight conditions.

Intersection of US 54 at Jack Crowell Road/Laker Pride Road (Signalized): The intersection of US 54 with Jack Crowell Road/Laker Pride Road had 31 of the 483 intersection crashes, or 6% of the intersection crashes in the US 54 study area. This intersection is a four-leg, signalized intersection with all approaches providing separate left-turn lanes. Pedestrian accommodations are provided across the north and east legs of the intersection.



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Table 8 summarizes the crash data at the signalized intersection US 54 at Jack Crowell/Laker Pride Road from 2019 to 2023. As can be seen, the most common type of crash was rear end crashes (19 of 311) or 61%, followed by passing (13%), left-turn (10%), left-turn right angle (6%) and head on, right-turn right angle and sideswipe at 3% each. The intersection of US 54 at Jack Crowell /Laker Pride Road had an injury rate of 10% (3 of 31) over the 5-year period.

Approximately 71% of crashes occurred on a dry road surface, while 19% occurred on a wet surface, 7% on a snow-covered surface and 3% on unknown surface conditions and 94% of the crashes occurred during daylight hours.

Table 8: Intersection Crash Data – US 54 at Jack Crowell /Laker Pride Road (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | 3 | 16 | 19 |
| PASSING | | | | 4 | 4 |
| LEFT TURN | | | | 3 | 3 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 2 | 2 |
| HEAD ON | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| SIDESWIPE | | | | 1 | 1 |
| Total | | - | 3 | 28 | 31 |

Intersection of US 54 at Illinois Street/Osage Avenue (Unsignalized): The intersection of US 54 with Illinois Street/Osage Avenue had 20 of the 483 intersection crashes, or 4% of the intersection crashes in the US 54 study area. This intersection is a four-leg, unsignalized intersection with Illinois Street and Osage Avenue required to stop. The eastbound and westbound approaches of US 54 have separate left-turn lanes.

Table 9 summarizes the crash data at the unsignalized intersection US 54 at Illinois Street/Osage Avenue from 2019 to 2023. As can be seen, the most common type of crashes were rear end crashes (8 of 20) or 40%, followed by left-turn right angle (20%), left-turn (15%), and passing, right-turn right angle, right angle, pedestrian and head on at 4% each. The intersection of US 54 at Illinois Street/Osage Avenue had an injury rate of 35% (7 of 20) over the 5-year period. Approximately 85% of crashes occurred on a dry road surface, while 15% occurred on a wet surface and 80% of the crashes occurred during daylight hours.



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Table 9: Intersection Crash Data – US 54 at Illinois Street/Osage Avenue (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | 3 | 5 | 8 |
| LEFT TURN RIGHT ANGLE COLLISION | | | 1 | 3 | 4 |
| LEFT TURN | | | 2 | 1 | 3 |
| PASSING | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| RIGHT ANGLE | | | | 1 | 1 |
| PEDESTRIAN | | | 1 | | 1 |
| HEAD ON | | | | 1 | 1 |
| Total | | | 7 | 13 | 20 |

Intersection of US 54 at Skid Row Boulevard (Unsignalized): The intersection of US 54 with Skid Row Boulevard had 14 of the 483 intersection crashes, or 3% of the intersection crashes in the US 54 study area. This intersection is a three-leg, unsignalized intersection with Skid Row Boulevard required to stop. The eastbound approach of US 54 has a separate left-turn lane.

Table 10 summarizes the crash data at the unsignalized intersection of US 54 at Skid Row Boulevard from 2019 to 2023. The most common type of crash was left turn right angle crash (29%), followed by right angle (21%), passing and right-turn right angle at 14% each and out-of-control, left-turn and rear end at 7% each. The intersection of US 54 at Skid Row Boulevard had an injury rate of 7% (1 of 14) over the 5-year period. Approximately 93% of crashes occurred on a dry road surface, while 7% occurred on a wet surface and 100% of the crashes occurred during daylight hours.

Table 10: Intersection Crash Data – US 54 at Skid Row Boulevard (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|----------------|-----------------|----------------------|-------|
| LEFT TURN RIGHT ANGLE COLLISION | | | 1 | 3 | 4 |
| RIGHT ANGLE | | | | 3 | 3 |
| PASSING | | | | 2 | 2 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 2 | 2 |
| OUT OF CONTROL | | | | 1 | 1 |
| LEFT TURN | | | | 1 | 1 |
| REAR END | | | | 1 | 1 |
| Total | | | 1 | 13 | 14 |



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Intersection of US 54 at Turner Parkway (Unsignalized): The intersection of US 54 with Turner Parkway had 12 of the 483 intersection crashes, or 2.5% of the intersection crashes in the US 54 study area. This intersection is a three-leg, unsignalized intersection with Turner Parkway required to stop. The eastbound approach of US 54 has a separate left-turn lane.

Table 11 summarizes the crash data at the unsignalized intersection of US 54 at Turner Parkway from 2019 to 2023. The most common type of crash was rear end crashes (5 of 12) with a small number of other crash types. The intersection of US 54 at Turner Parkway had an injury rate of 33% (4 of 12) over the 5-year period. Approximately 75% of crashes occurred on a dry road surface while 25% occurred on a wet surface and 83% of the crashes occurred during daylight hours.

Table 11: Intersection Crash Data – US 54 at Turner Parkway (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------|-------|-------------------|-----------------|----------------------------|-------|
| REAR END | | | 1 | 4 | 5 |
| PASSING | | | 1 | 1 | 2 |
| OUT OF CONTROL | | | | 2 | 2 |
| LEFT TURN | | | | 1 | 1 |
| PEDESTRIAN | | | 1 | | 1 |
| SIDESWIPE | | | 1 | | 1 |
| Total | | | 4 | 8 | 12 |

Intersection of US 54 at Third Street (Unsignalized): The intersection of US 54 with Third Street had 11 of the 483 intersection crashes, or 2.5% of the intersection crashes in the US 54 study area. This intersection is a three-leg, unsignalized intersection with Third Street required to stop. The eastbound approach of US 54 has a separate left-turn lane.

Table 12 summarizes the crash data at the unsignalized intersection US 54 at Third Street from 2019 to 2023. The most common type of crash was left turn right angle collision crashes (4 of 11) along with a small number of other crash types. The intersection of US 54 at Third Street had an injury rate of 36% (4 of 11) over the 5-year period. Approximately 91% of crashes occurred on a dry road surface, while 9% occurred on a wet surface and 91% of the crashes occurred during daylight hours.



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Table 12: Intersection Crash Data – US 54 at Third Street (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------------|-------|
| LEFT TURN RIGHT ANGLE COLLISION | | | 1 | 3 | 4 |
| REAR END | | | 1 | 1 | 2 |
| PASSING | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | 1 | | | 1 |
| RIGHT TURN | | | | 1 | 1 |
| RIGHT ANGLE | | | | 1 | 1 |
| PEDESTRIAN | | 1 | | | 1 |
| Total | | 2 | 2 | 7 | 11 |

The project area's sixth serious injury crash (of 13) occurred in January 2020 along westbound US 54 at Third Street. The crash report states that a pedestrian in a wheelchair was trying to cross US 54 while there was oncoming traffic. The vehicle in the right lane saw the pedestrian crossing and slowed down while the vehicle in the left lane had their vision obstructed by the vehicle in the right lane so the vehicle was unable to slow down before they could see the pedestrian. The pedestrian was suspected of having serious injuries and was transported by Mercy Ambulance for medical treatment. The vehicle that hit the pedestrian was towed from the scene. The crash occurred under dry, clear, and daylight conditions.

The project area's seventh serious injury crash (of 13) occurred in July 2022 along westbound US 54 at Third Street. The crash report states that vehicle 1 was traveling southbound on Third street and either failed to stop at the stop sign or failed to yield to oncoming traffic on US 54 causing a collision with vehicle 2 traveling westbound on US 54. After the collision with vehicle 2, vehicle 1 also hit a utility pole nearby. Vehicle 2's driver was transported to the hospital by ambulance and both vehicles were towed due to damage. The crash occurred under dry, clear, and daylight conditions.

Intersection of US 54 at Court Circle (Unsignalized): The intersection of US 54 with Court Circle had 10 of the 483 intersection crashes, or 2% of the intersection crashes in the US 54 study area. This intersection is a four-leg, unsignalized intersection with Court Circle required to stop. The eastbound and westbound approaches of US 54 have separate left-turn lanes.

Table 13 summarizes the crash data at the unsignalized intersection US 54 at Court Circle from 2019 to 2023. The most common type of crash was rear end crashes (4 of 10). The most severe type of crash was out of control crashes with 1 serious injury. The intersection of US 54 at Court Circle had an injury rate of 20% (2 of 10) over the 5-year period. Approximately 80% of crashes occurred on a dry road surface, while 10% occurred on a wet surface and 10% on a snow-covered surface and 100% of the crashes occurred during daylight hours.



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Table 13: Intersection Crash Data – US 54 at Court Circle (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|-----------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | 1 | 3 | 4 |
| PARKING OR PARKED CAR | | | | 2 | 2 |
| OUT OF CONTROL | | 1 | | | 1 |
| BACKING | | | | 1 | 1 |
| LEFT TURN | | | | 1 | 1 |
| PASSING | | | | 1 | 1 |
| Total | | 1 | 1 | 8 | 10 |

The project area's eighth serious injury crash (of 13) occurred in September 2019 along westbound US 54 before Court Circle. The crash report states that a homemade vehicle with three wheels was traveling on westbound US 54 and turning right into the parking lot when the driver lost control causing the vehicle to strike the front of the building, ejecting the driver. The driver was transported to the hospital by ambulance and the vehicle was parked at the scene to be picked up later. The crash occurred under dry, clear, and daylight conditions.

Intersection of US 54 at Grant Avenue (Unsignalized): The intersection of US 54 with Grant Avenue had 10 of the 483 intersection crashes, or 2% of the intersection crashes in the US 54 study area. This intersection is a three-leg, unsignalized intersection with Grant Avenue required to stop. The eastbound approach of US 54 has a separate left-turn lane.

Table 14 summarizes the crash data at the unsignalized intersection US 54 at Grant Avenue from 2019 to 2023. The most common type of crash was rear end crashes (3 of 10) and left turn right angle collision crashes (3 of 10). The intersection of US 54 at Grant Avenue had an injury rate of 30% (3 of 10) over the 5-year period. Approximately 90% of crashes occurred on a dry road surface, while 10% occurred on a wet surface and 90% of the crashes occurred during daylight hours.

Table 14: Intersection Crash Data – US 54 at Grant Avenue (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | 1 | 2 | 3 |
| LEFT TURN RIGHT ANGLE COLLISION | | | 1 | 2 | 3 |
| PASSING | | | | 2 | 2 |
| LEFT TURN | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | 1 | | 1 |
| Total | | | 3 | 7 | 10 |



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Intersection of US 54 at First Street/Second Street (Unsignalized): The intersection of US 54 with First Street/Second Street Avenue had 9 of the 483 intersection crashes, or 1.8% of the intersection crashes in the US 54 study area. This intersection is a four-leg, unsignalized intersection with First Street/Second Street required to stop. The eastbound and westbound approaches of US 54 have separate left-turn lanes.

Table 15 summarizes the crash data at the unsignalized intersection US 54 at First Street/Second Street from 2019 to 2023. The most common type of crash was left turn right angle collision crashes (4 of 9). The most severe type of crash was out of control crashes with 1 serious injury. The intersection of US 54 at First Street/Second Street had an injury rate of 44% (4 of 9) over the 5-year period. Approximately 78% of crashes occurred on a dry road surface, while 22% occurred on a wet surface and 89% of the crashes occurred during daylight hours.

Table 15: Intersection Crash Data – US 54 at First Street/Second Street (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|---------------------------------|-------|-------------------|-----------------|----------------------|-------|
| LEFT TURN RIGHT ANGLE COLLISION | | | 2 | 2 | 4 |
| OUT OF CONTROL | | 1 | | | 1 |
| REAR END | | | 1 | | 1 |
| LEFT TURN | | | | 1 | 1 |
| PASSING | | | | 1 | 1 |
| RIGHT TURN | | | | 1 | 1 |
| Total | | 1 | 3 | 5 | 9 |

The project area's ninth serious injury crash (of 13) occurred in October 2023 along eastbound US 54 after Second Street. The crash report states that a pickup truck was traveling eastbound US 54 when an unknown vehicle pulled out in front of the pickup truck causing the pickup truck to swerve and overcorrect. This caused the pickup truck to hit the curb on the side of the roadway and a retaining wall. The driver of the pickup truck was taken to the hospital by ambulance and the vehicle was towed due to damage. The crash occurred under wet, cloudy, and daylight conditions.

Intersection of MO 5 at Camden Court (Unsignalized): The intersection of MO5 with Camden Court had 8 of the 483 intersection crashes, or 1.6% of the intersection crashes in the US 54 study area. This intersection is very close to the US 54 and MO 5 intersection and is a four-leg, unsignalized intersection with Camden Court required to stop. MO 5 provides a two-way left-turn lane for left-turn vehicles.



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Table 16 summarizes the crash data at the unsignalized intersection MO 5 at Camden Court from 2019 to 2023. The most common type of crash was left turn crashes (3 of 8). The intersection of MO 5 at Camden Court had an injury rate of 25% (2 of 8) over the 5-year period. Approximately 75% of crashes occurred on a dry road surface, while 15% occurred on a wet surface and 100% of the crashes occurred during daylight hours.

Table 16: Intersection Crash Data – US 54 at Camden Court (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|---------------------------------|-------|-------------------|-----------------|----------------------|-------|
| LEFT TURN | | | | 3 | 3 |
| REAR END | | | 1 | 1 | 2 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| PASSING | | | | 1 | 1 |
| RIGHT ANGLE | | | 1 | | 1 |
| Total | | | 2 | 6 | 8 |

Intersection of US 54 at Fourth Street (Unsignalized): The intersection of US 54 with Fourth Street had 5 of the 483 intersection crashes in the US 54 study area. This intersection is a three-leg, unsignalized intersection with Fourth Street required to stop. The westbound approach of US 54 has a separate left-turn lane.

Table 17 summarizes the crash data at the unsignalized intersection US 54 at Fourth Street from 2019 to 2023. The intersection of US 54 at Fourth Street had an injury rate of 0% (0 of 5) over the 5-year period. All types of crashes at this intersection were property damage only.

Table 17: Intersection Crash Data – US 54 at Fourth Street (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|-------------------------|-------|
| REAR END | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| RIGHT TURN | | | | 1 | 1 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| PASSING | | | | 1 | 1 |
| Total | | | | 5 | 5 |

Intersection of US 54 at Iowa Street (Unsignalized): The intersection of US 54 with Iowa Street had 4 of the 483 intersection crashes in the US 54 study area. This intersection is a three-leg, unsignalized intersection with Iowa Street required to stop. The westbound approach of US 54 has a separate left-turn lane.



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Table 18 summarizes the crash data at the unsignalized intersection US 54 at Iowa Street from 2019 to 2023. The most common type of crash was rear end crashes (2 of 4). The most severe type of crash was right turn right angle collision crashes with one minor injury. The intersection of US 54 at Iowa Street had an injury rate of 25% (1 of 4) over the 5-year period.

Table 18: Intersection Crash Data – US 54 at Iowa Street (2019 - 2023)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|----------------------|-------|
| REAR END | | | | 2 | 2 |
| LEFT TURN | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | 1 | | 1 |
| Total | | | 1 | 3 | 4 |

US 54 Segments Crashes

Based on the crash data, 171 crashes occurred along segments on US 54 between Cecil Street and Business Route 5 from 2019 to 2023. 67 of the 171 segment crashes (39%) were rear end crashes related to congestion and traffic queues experienced along US 54. 30 of 171 segment crashes (18%) were left-turn right angle collision crashes which occurred at the various driveways along US 54. **Table 19** summarizes all the segment crashes on US 54 between Cecil Street and Business Route 5 from 2019 to 2023.

Table 19: Segment Crash Data for Entire Roadway by Severity (2019 - 2023)

| Road Segment Along US 54 | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|--------------------------|-------|----------------|-----------------|-------------------------|-------|
| Entire Segment | | 4 | 34 | 133 | 171 |
| Total | 0 | 4 | 34 | 133 | 171 |

Table 20 shows the type of crashes in each segment between each signal along US 54 between Cecil Street and Business Route 5 from 2019 to 2023. As can be seen, rear ends and turn related crashes are the large majority of crashes in the segments. Specifically, rear end crashes are approximately 39% of the segment crashes and turn related crashes (left-turn, left-turn right angle and right angle) make up approximately 28% of the segment crashes between the northbound MO 5 Ramps and Cecil Street. Should improvements be made to minimize or eliminate left-turns and to reduce congestion, then significant safety improvements could be expected along these segments, especially when considering the types of crashes in the historical crash data. Implementing a median barrier on US 54 instead of a two-way left-turn lane eliminates left-turning conflict points at driveways. The addition lane on US 54 in both directions serves to separate turning vehicles from through traffic to improve traffic flow and reduce chances for rear end collisions.



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Table 20: Segment Crash Data by Roadway Segments & Severity (2019 - 2023)

| Crash Type | FATAL | SERIOUS | MINOR | PROPERTY DAMAGE ONLY | Total | | |
|---|-----------|--------------|--------------|-------------------------|-------|--|--|
| Between Cecil Street & Jack Crowell Rd/Laker Pride Rd | | | | | | | |
| REAR END | | | 8 | 30 | 38 | | |
| LEFT TURN RIGHT ANGLE COLLISION | | 1 | 6 | 12 | 19 | | |
| PASSING | | | | 7 | 7 | | |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 6 | 6 | | |
| RIGHT ANGLE | | | 2 | 3 | 5 | | |
| LEFT TURN | | | 2 | 3 | 5 | | |
| HEAD ON | | 1 | 2 | 1 | 4 | | |
| OUT OF CONTROL | | | 1 | 3 | 4 | | |
| CHANGING LANE | | | | 2 | 2 | | |
| OTHER TYPES OF CRASHES* | | | | 3 | 3 | | |
| Between Jack Crowell R | d/Laker I | Pride Rd & I | MO 5 North | bound Ramps | | | |
| REAR END | | | 1 | 6 | 7 | | |
| PASSING | | | | 5 | 5 | | |
| LEFT TURN RIGHT ANGLE COLLISION | | | 1 | 2 | 3 | | |
| OUT OF CONTROL | | | | 2 | 2 | | |
| OTHER TYPES OF CRASHES* | | | 1 | 3 | 4 | | |
| Between MO 5 N | orthbou | nd Ramps & | & Business F | Route 5 | | | |
| REAR END | | | 3 | 19 | 22 | | |
| LEFT TURN RIGHT ANGLE COLLISION | | 1 | 1 | 6 | 8 | | |
| PASSING | | | 1 | 6 | 7 | | |
| RIGHT ANGLE | | | 2 | 3 | 5 | | |
| LEFT TURN | | | 1 | 3 | 4 | | |
| SIDESWIPE | | | 1 | 2 | 3 | | |
| OUT OF CONTROL | | | 1 | 2 | 3 | | |
| HEAD ON | | 1 | | 1 | 2 | | |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 2 | 2 | | |
| CHANGING LANE | | | | 1 | 1 | | |
| Total Segment Crashes | 0 | 4 | 34 | 133 | 171 | | |

^{*}Represents the sum of all other types of crashes with only 1 reported crash



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The project area's tenth serious injury crash (of 13) occurred in July 2021 along westbound US 54 after MO 5 (between MO 5 northbound ramps and Business Route 5). The crash report states that a sport utility vehicle was heading westbound on US 54 when a passenger vehicle turning left onto eastbound US 54 failed to yield causing a collision. The sport utility vehicle came to rest facing southbound in the center turn lane while the passenger vehicle came to rest about 40 feet south of the roadway. Both occupants of the passenger vehicle were transported to the hospital by ambulance and both vehicles were towed due to damage. The crash occurred under dry, clear, and daylight conditions. Both occupants of the passenger vehicle were transported to the hospital by ambulance and both vehicles were towed due to damage. The crash occurred under dry, clear, and daylight conditions.

The project area's eleventh serious injury crash (of 13) occurred in May 2022 along eastbound US 54 after Laker Pride Road (Between Cecil Street and Jack Crowell Rd/Laker Pride Rd). The crash report states that a sport utility vehicle heading eastbound and a pickup truck heading westbound both merged into the shared turn lane at the same time causing a head on collision. After the collision, the sports utility vehicle ran off the eastbound side of the road while the pickup truck ran into a pole in the US Bank parking lot. Both vehicles had to be towed and both drivers as well as a passenger were transported to the hospital by ambulance. The crash occurred in dry, cloudy, and daylight conditions.

The project area's twelfth serious injury crash (of 13) occurred in August 2022 along westbound US 54 after Turner Parkway (Between Cecil Street and Jack Crowell Rd/Laker Pride Rd). The crash report states that a pickup truck was pulling out of the parking lot to turn left onto eastbound US 54 when a passenger vehicle in the left lane of westbound US 54 hit the turning pickup truck. The passenger vehicle was exceeding the speed limit and was unable to slow down in time to avoid the collision. The pickup truck driver claimed they did not see any oncoming traffic. Both vehicles had to be towed, and both drivers were transported to the hospital by ambulance. The crash occurred under dry, clear, and daylight conditions.

The project area's final serious injury crash (of 13) occurred in September 2023 along westbound US 54 before 5th Street (Between MO 5 northbound ramps and Business Route 5). The crash report states that a passenger vehicle was traveling westbound on US 54 when a sport utility vehicle was turning left out of the Sonic to travel eastbound on US 54. The passenger vehicle was unable to stop before the collision with the sport utility vehicle that failed to yield. The passenger vehicle ran off the roadway and ran into some trees. Both vehicles were towed due to damage and both drivers were transported by ambulance to the hospital. The crash occurred under dry, clear, and daylight conditions.



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Safety Conditions Summary

Overall, the historical crash analysis showed that a significant portion of the crashes within the study are on US 54 (92%), while the second most is on MO 5 (7%), and the third most is on the MO 5 on/off ramps (1%). The primary crash type along US 54 is rear end crashes (55%), which are typical in areas with congestion. Additionally, the predominant type of serious injury crashes (5 out of 11) on US 54 relates to turning at intersections or business driveways.

The primary crash type on mainline MO 5 and the MO 5 on/off ramps is out of control crashes, which are typical for higher speed roadways. Additionally, most of the severe (fatal and serious injury) crashes were out of control crashes. One fatal out of control crash occurred on the southbound MO 5 to westbound US 54 off-ramp, one serious injury out of control crash occurred on southbound MO 5 (one mile south of the interchange), and one serious injury out of control crash occurred on the eastbound US 54 to southbound MO 5 on-ramp.

Crashes in the segments between the northbound MO 5 Ramps and Cecil Street are comprised of approximately 39% rear ends and approximately 28% left-turn related crashes (left-turn, left-turn right angle and right angle). Should improvements be made to minimize or eliminate left-turns and to reduce congestion, then significant safety improvements could be expected along these segments.

The proposed improvements aim to reduce crashes related to turning vehicles and rear ends through access management practices. Implementing a median barrier on US 54 instead of a two-way left-turn lane eliminates left-turning conflict points at driveways. The additional lane on US 54 in both directions serves to separate turning vehicles from through traffic to improve traffic flow and reduce chances for rear end collisions.



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Traffic Forecasts

Traffic volumes were forecasted for the 2030 construction year (near-term) and 2050 design year (long-term). These forecasted volumes were then used to perform capacity analysis under future conditions. The near-term and long-term traffic growth forecasts were developed for each component of the study area, considering the specific characteristics of the US 54 and MO 5 corridors. The primary consideration used in forecasting was a historical traffic volume trend analysis.

US 54

Figure 26 illustrates the historical counts on US 54 between Cecil Street and Route V. As can be seen, the US 54 corridor has experienced steady annual traffic growth since the 1970s.

MO 5

Figure 27 illustrates the historical counts on MO 5 between US 54 and MO 7. As can be seen, the MO 5 corridor has experienced steady annual traffic growth since the 1970s.

To be consistent with the steady growth on US 54 and MO 5, we assumed a 1.75% annual projected growth rate for both US 54 and MO 5 (10.5% between 2024 and 2030 and 45.5% between 2024 and 2050).

Forecasted No-Build Traffic Volumes

The near-term (2030) and long-term (2050) traffic volumes forecasts were developed under the existing roadway geometrics (no-build conditions) for the US 54 study area based on the assumption described above. **Exhibit 3** summarizes the forecasted 2030 No-Build traffic volumes and **Exhibit 4** summarizes the forecasted 2050 No-Build traffic volumes.



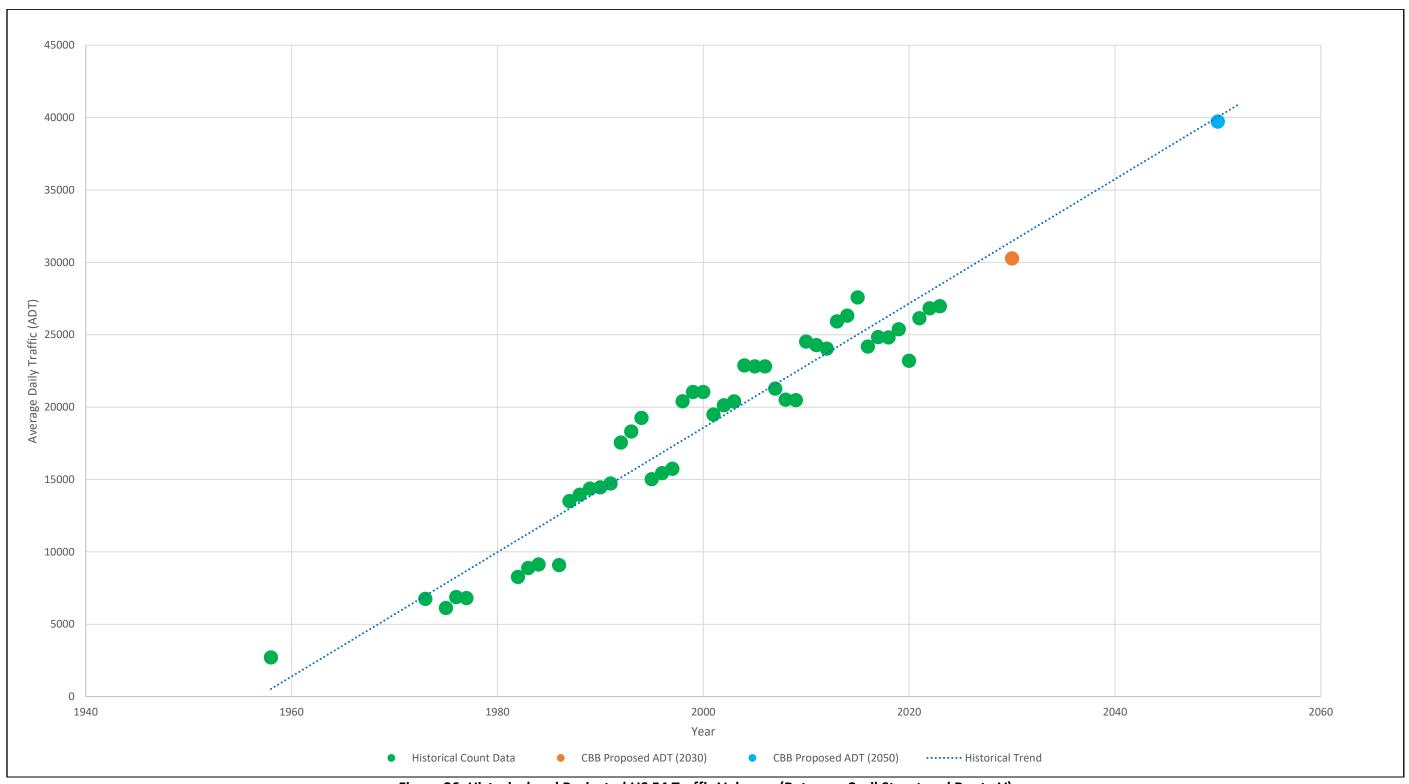


Figure 26: Historical and Projected US 54 Traffic Volumes (Between Cecil Street and Route V)



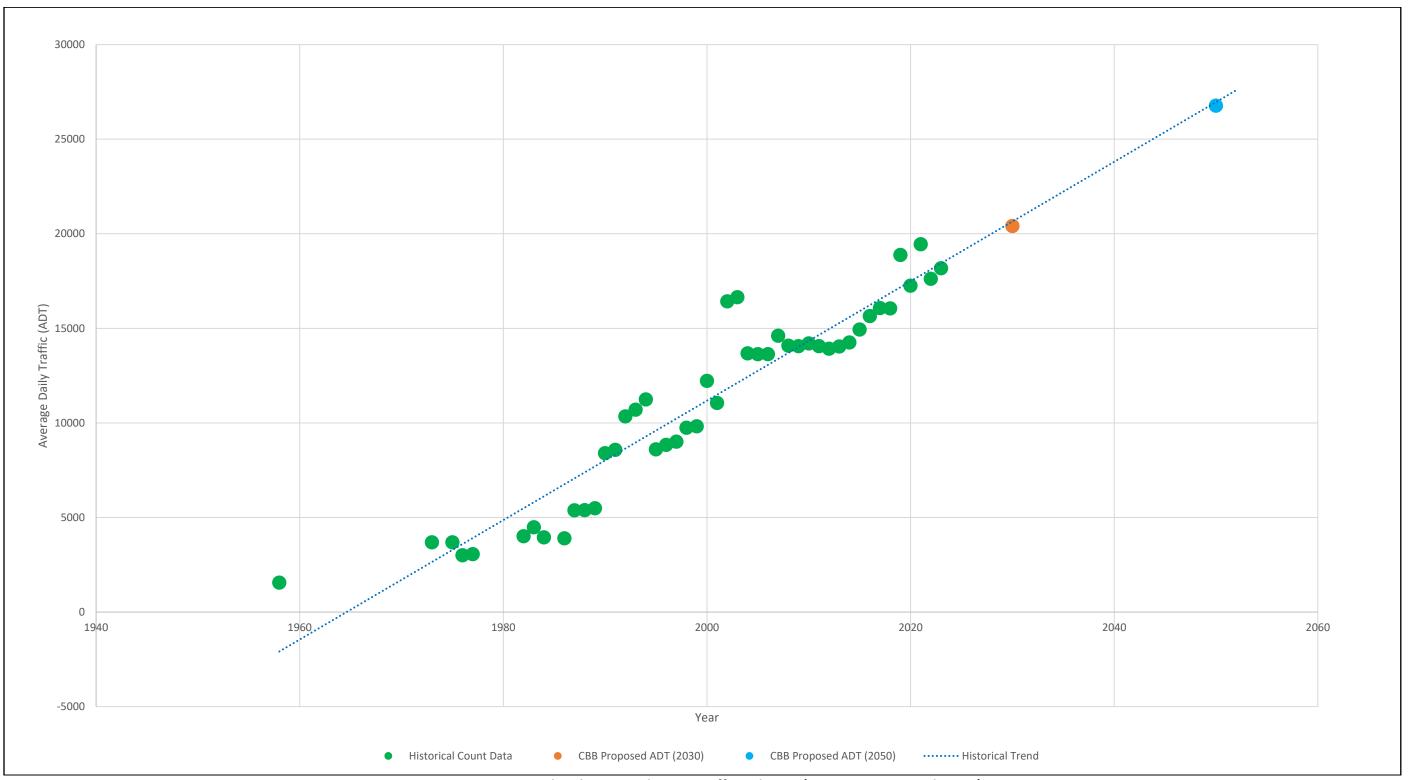


Figure 27: Historical and Projected MO 5 Traffic Volumes (Between US 54 and MO 7)

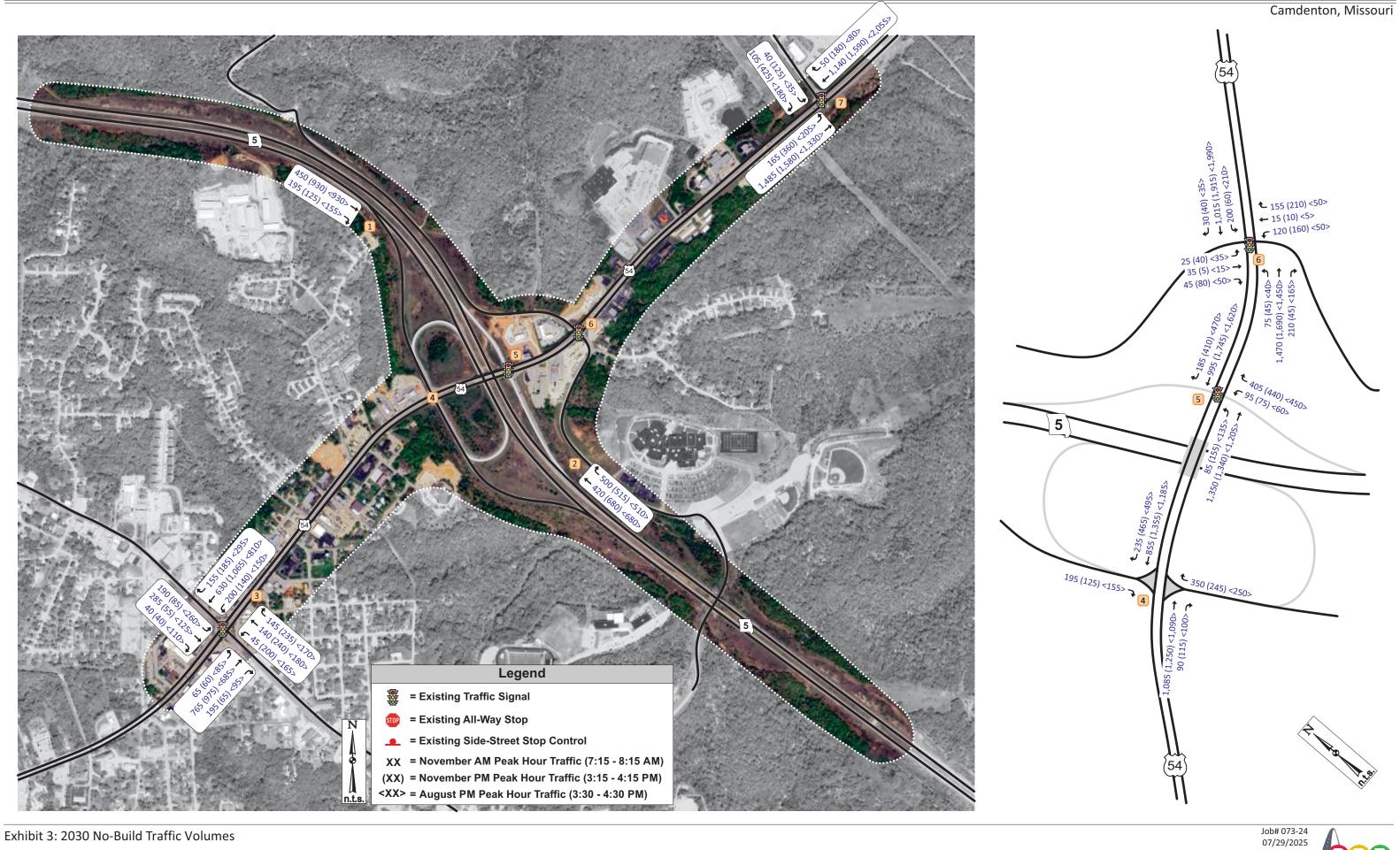


Exhibit 3: 2030 No-Build Traffic Volumes

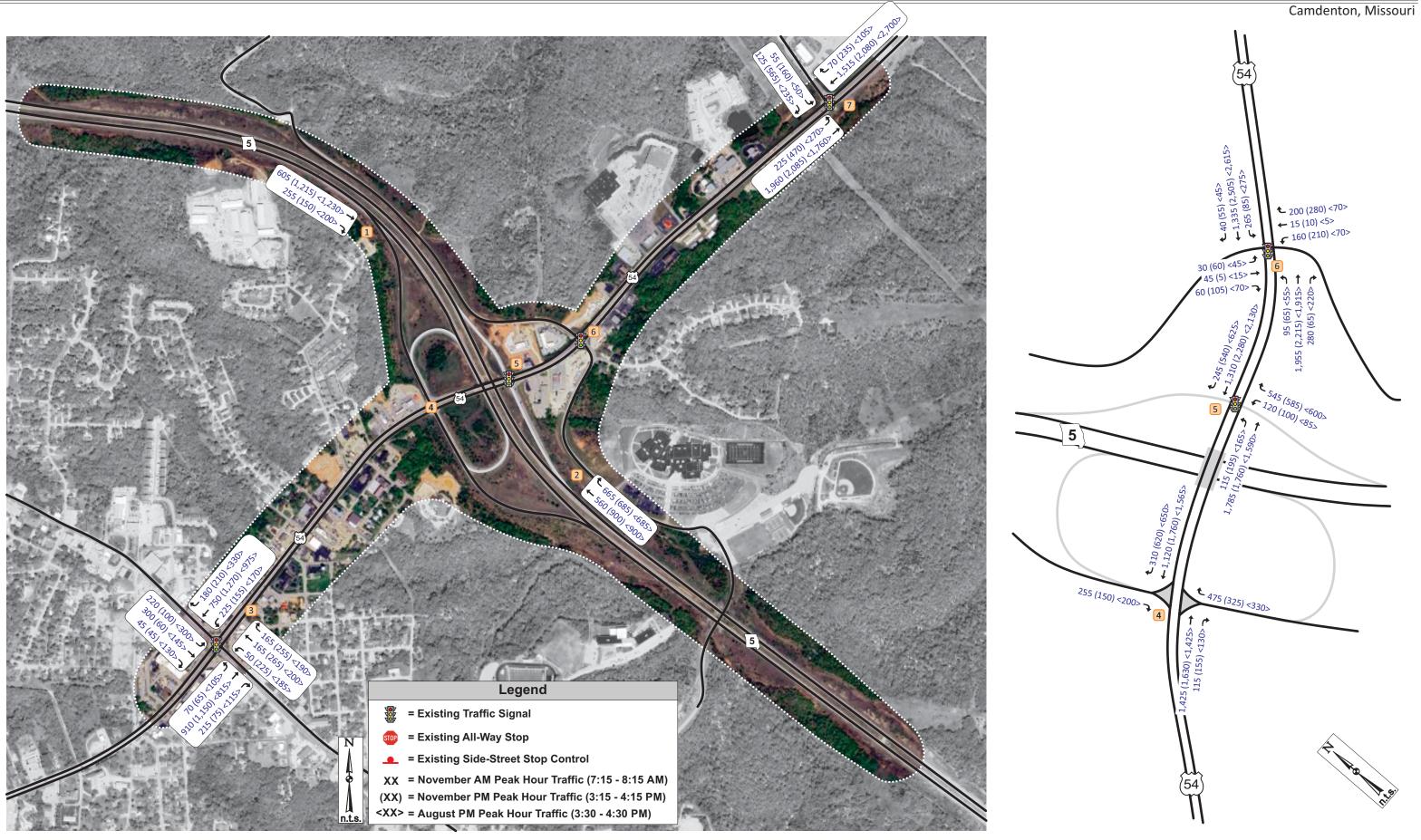


Exhibit 4: 2050 No-Build Traffic Volumes



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ALTERNATIVES DEVELOPMENT

CBB developed and tested several preliminary concepts and discussed this analysis with MoDOT staff at an in-person meeting on March 13, 2025. MoDOT staff provided feedback for each concept based on their knowledge of the corridor. Several of the preliminary concepts were removed and/or modified at this meeting. Two reasonable and feasible concepts were identified to move forward for a more in-depth analysis. These two options included

- 1) an "Expressway" concept that would extend the free-flow expressway to the west across MO 5 through jughandle movements. This concept would remove all traffic signals east of Business Route 5. This concept would have maintained US 54 with two lanes in each direction between Cecil Street and MO 5.
- 2) a "Boulevard" concept, that would widen US 54 to 6-lanes between Cecil Street and MO 5. This concept would retain traffic signals between Cecil Street and the MO 5 interchange.

The in-depth analysis was completed on two concepts and the results were presented to MoDOT staff at a meeting held in person on March 28, 2025. At this meeting, the Boulevard concept was shown to address the project's safety and operational needs.

THE BOULEVARD CONCEPT

- Widens US 54 to six (6) lanes between Cecil Street and the MO 5 interchange.
- Installs a raised center median in the widened section to control left turns.
- Relocates the Laker Pride Road intersection approximately 1200 feet to the east to a new traffic signal at a commercial driveway in the vicinity of Gerbes.
- Provides a signalized U-turn movement at the Jack Crowell Road traffic signal for westbound traffic.
- Provides a signalized U-turn movement at the Cecil Road traffic signal for eastbound traffic via a new jughandle. The existing eastbound to northbound left turn traffic will also use the new jughandle.

The Boulevard concept recognizes the commercial nature of his section of US 54 and provides an opportunity to extend Camdenton's US 54 urban character east of MO 5 to Cecil Street through elements such as lower speeds, signalized intersections, street lighting, and gateway signage. The posted speed limit for this section of US 54 under the Boulevard concept is recommended to be 35 miles per hour.

This project can be built in two phases. Phase 1 widens US 54 between the northbound MO 5 ramps and Laker Pride/Jack Crowell Road. Phase 2 relocates Laker Pride Road, installs the U-turn movements, and widens US 54 between Jack Crowell Road and Cecil Street.



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Phase 1 includes:

- The construction of a third eastbound lane on US 54 from the northbound MO 5 ramps to Laker Pride Road where it terminates as a right-turn lane at Laker Pride Road.
- Building a third westbound lane on US 54 lane from the eastern approach to Laker Pride Road, terminating as a right-turn at the northbound MO 5 ramps.
- Installs a raised center median on US 54 between the northbound MO 5 ramps to Laker Pride Road/Jack Crowell Road.
- Restriction of all driveways on US 54 between MO 5 and Laker Pride/Jack Crowell Road to right-in right-out access.
 - Businesses on the north side of US 54 have left turn access to/from US 54 via existing connections to Jack Crowell Road.
 - Businesses on the south side of US 54 have left-turn access to/from US 54 via existing and new driveway connections to Laker Pride Road.

Phase 2 extends the widening of US 54 to six lanes from Laker Pride/Jack Crowell Road to Cecil Street. Phase 2 also:

- Installs a raised center median in the widened section to control left turns. The results in the restriction of all driveways on US 54 between Jack Crowell Road and Cecil Street to right-in right-out access.
- Relocates the Laker Pride Road intersection approximately 1200 feet to the east to a
 new traffic signal at a commercial driveway in the vicinity of Gerbes. This intersection
 will include an eastbound US 54 right-turn lane and northbound dual left-turn lanes.
- Provides a signalized U-turn movement at the Jack Crowell Road traffic signal for westbound traffic.
- Provides a signalized U-turn movement at the Cecil Street traffic signal for eastbound traffic via a new jughandle. The existing eastbound to northbound left turn traffic will also use the new jughandle.

Detailed descriptions of both phases are provided in the sections below. The presentations from the March 13, 2025 and March 28, 2025 meetings are provided in **Appendices B** and **C**, respectively.



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Phase 1

Roadway Geometrics

Exhibit 5 illustrates a conceptual planning level drawing of the proposed Boulevard concept under Phase 1. As can be seen, the proposed roadway improvements provided a third eastbound US 54 lane from northbound MO 5 ramps to Laker Pride Road, and it terminates as a right-turn lane at Laker Pride Road. Furthermore, a third westbound US 54 lane is provided at the westbound US 54 approach at Laker Pride Road, which continues to the west and terminates as a right-turn at northbound MO 5 ramps. Note, the three through lanes at the westbound US 54 approach at Laker Pride Road will require the eastbound US 54 left-turn lane to operate under protected phasing to be compliant with the MoDOT *Engineering Policy Guide (EPG)*.²

Furthermore, a raised median is also proposed along US 54 between northbound MO 5 ramps and Laker Pride Road to restrict left-turn movements from crossing the proposed three through lanes along both directions of US 54. An existing driveway connection to Jack Crowell Road provides left-turn access for the properties on the north side of US 54 via the traffic signal at US 54 and Jack Crowell Road/Laker Pride Road. A proposed driveway connection to Laker Pride Road provides left-turn access for the properties on the south side of US 54 via the traffic signal at US 54 and Jack Crowell Road/Laker Pride Road.

² https://epg.modot.org/index.php/Main Page

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Right-of-Way Impacts

Exhibit 6 illustrates the right-of-way impact of the Phase 1 improvements. As can be seen, the configuration would impact six parcels. Right-of-way would need to be acquired for about 0.37 acres. The property lines are for reference only and were approximated from the Camden County GIS website³ to estimate right-of-way needs. The actual existing right-of-way needs will be more precisely determined in the design phase.

Opinion of Cost

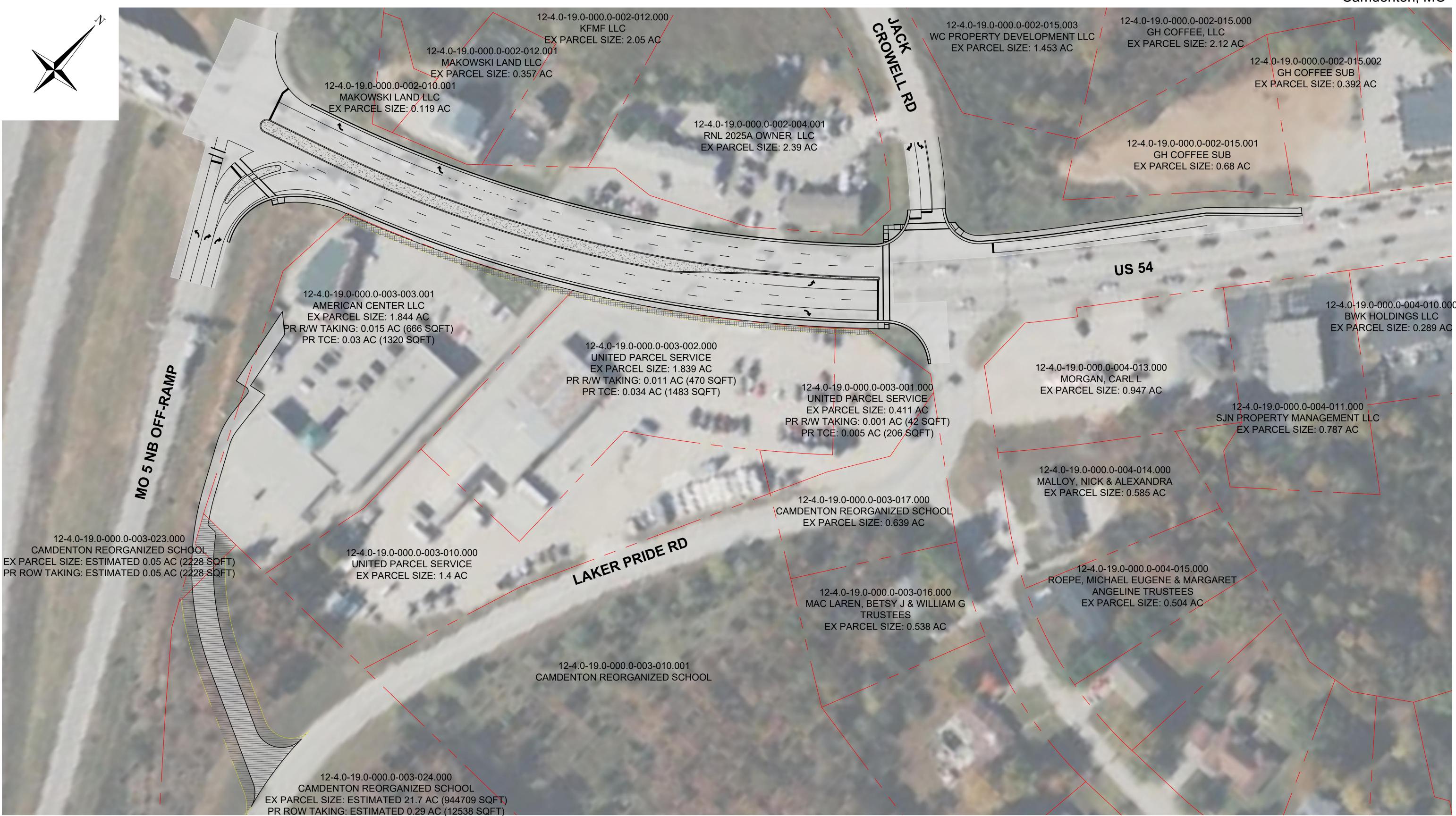
The cost estimate of the proposed Phase 1 improvements includes:

- Roadway \$1,358,450;
- Marking & Signing \$27,716;
- Signal & Lighting \$550,000;
- Utility Relocation \$290,500;
- Survey Cost \$96,900;
- Contingency \$387,300;
- Engineering \$290,500;
- Traffic Control \$193,700;
- Inflation (3% per year for 2 years) \$118,400
- ROW and Easements \$1,179,690
- Total Construction Estimate (Rounded) \$4,500,000;

A full breakdown of the opinion of cost is provided in **Appendix D**. Note that the estimated right-of-way cost was provided by MoDOT. A full breakdown of the right-of-way estimate can be found in **Appendix E**.

³ https://camdengis.integritygis.com/H5/Index.html?viewer=camden

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Phase 2

Roadway Geometrics

Exhibit 7 illustrates a conceptual planning level drawing of the proposed Boulevard concept under Phase 2. As can be seen, all the roadway improvements proposed in Phase 1 would be kept in place. Phase 2 would extend the additional third eastbound and westbound US 54 lane from Laker Pride Road to Cecil Street. Note, as will be discussed in the traffic operations section, the additional lane capacity is needed to provide acceptable operations under forecasted design-year conditions. Furthermore, a raised median is proposed along US 54 between Laker Pride Road and Cecil Street to restrict left-turn movements from crossing the proposed three lane through lanes along both directions of US 54.

U-turn movements at Cecil Street and Jack Crowell Road proposed to provide left-turn access for the properties along both sides of US 54 between Jack Crowell Road and Cecil Street. The eastbound US 54 to westbound US 54 U-Turn is proposed at the Cecil Street intersection through a jug-handle intersection. The jug-handle would be located opposite the Cecil Street approach. Also, to maintain the existing number of signal phases at the Cecil Street intersection, the existing eastbound US 54 left-turn movement to Cecil Street is proposed to be shifted to the jug-handle approach.

The westbound US 54 to eastbound US 54 U-Turn is proposed at the westbound US 54 approach at Jack Crowell Road. To provide this U-Turn at Jack Crowell Road, the northbound Laker Pride Road approach is proposed to be relocated approximately 1,200 feet to the east, opposite a commercial driveway. The relocated Laker Pride Road intersection would be signalized as well as an eastbound US 54 right-turn lane and northbound Laker Pride Road dual left-turn lanes would be provided for the heavy school traffic during the AM and PM peaks.

Similar to Phase 1, the three through lanes at the eastbound US 54 approach at Jack Crowell Road will require the westbound US 54 U-Turn movement to operate under protected phasing. Furthermore, the three through lanes at the eastbound and westbound US 54 approaches at Laker Pride Road/commercial driveway will require the westbound and eastbound US 54 left-turn lanes to operate under protected phasing.









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Right-of-Way Impacts

Exhibit 8 illustrates the right-of-way impact of the Phase 2 improvements. As can be seen, the configuration would impact twenty-four parcels. Right-of-way would need to be acquired for about 3.33 acres. Similar to the Phase 1 right-of-way impacts, the property lines are for reference only and were approximated from the Camden County GIS website to estimate right-of-way needs. The actual existing right-of-way needs will be more precisely determined in the design phase.

Opinion of Cost

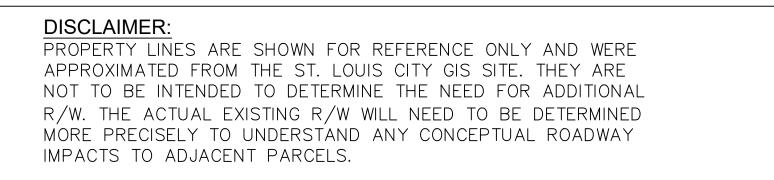
The opinion of cost estimate of the proposed Phase 2 improvements include:

- Roadway \$5,894,225;
- Marking & Signing \$44,781;
- Signal & Lighting \$1,070,000;
- Utility Relocation \$55,740;
- Survey Cost \$350,500;
- Contingency \$1,401,900;
- Engineering \$1,051,400;
- Traffic Control \$701,000;
- Inflation (3% per year for 2 years) \$430,000
- ROW and Easements TBD
- Total Construction Estimate (Rounded) \$11,000,000;

A full breakdown of the opinion of cost estimate is provided in **Appendix F**.











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Forecasted Build Traffic Volumes

The 2024 Build traffic volumes were adjusted to determine the traffic volume forecast under the Boulevard Phase 1 concept (Build conditions). **Exhibit 9** summarizes the anticipated 2024 Build traffic volumes during November AM, November PM, and August PM peak hours.

The 2030 Build traffic volumes were adjusted to determine the traffic volume forecast under the Boulevard Phase 1 concept. **Exhibit 10** summarizes the forecasted 2030 Build traffic volumes during November AM, November PM, and August PM peak hours.

The 2050 Build traffic volumes were adjusted to determine the traffic volume forecast under the Boulevard Phase 1 concept. **Exhibit 11** summarizes the forecasted 2050 Build traffic volumes during November AM, November PM, and August PM peak hours.

The 2050 Build traffic volumes were adjusted to determine the traffic volume forecast under the Boulevard Phase 2 concept. **Exhibit 12** summarizes the forecasted 2050 Build traffic volumes during November AM, November PM, and August PM peak hours.

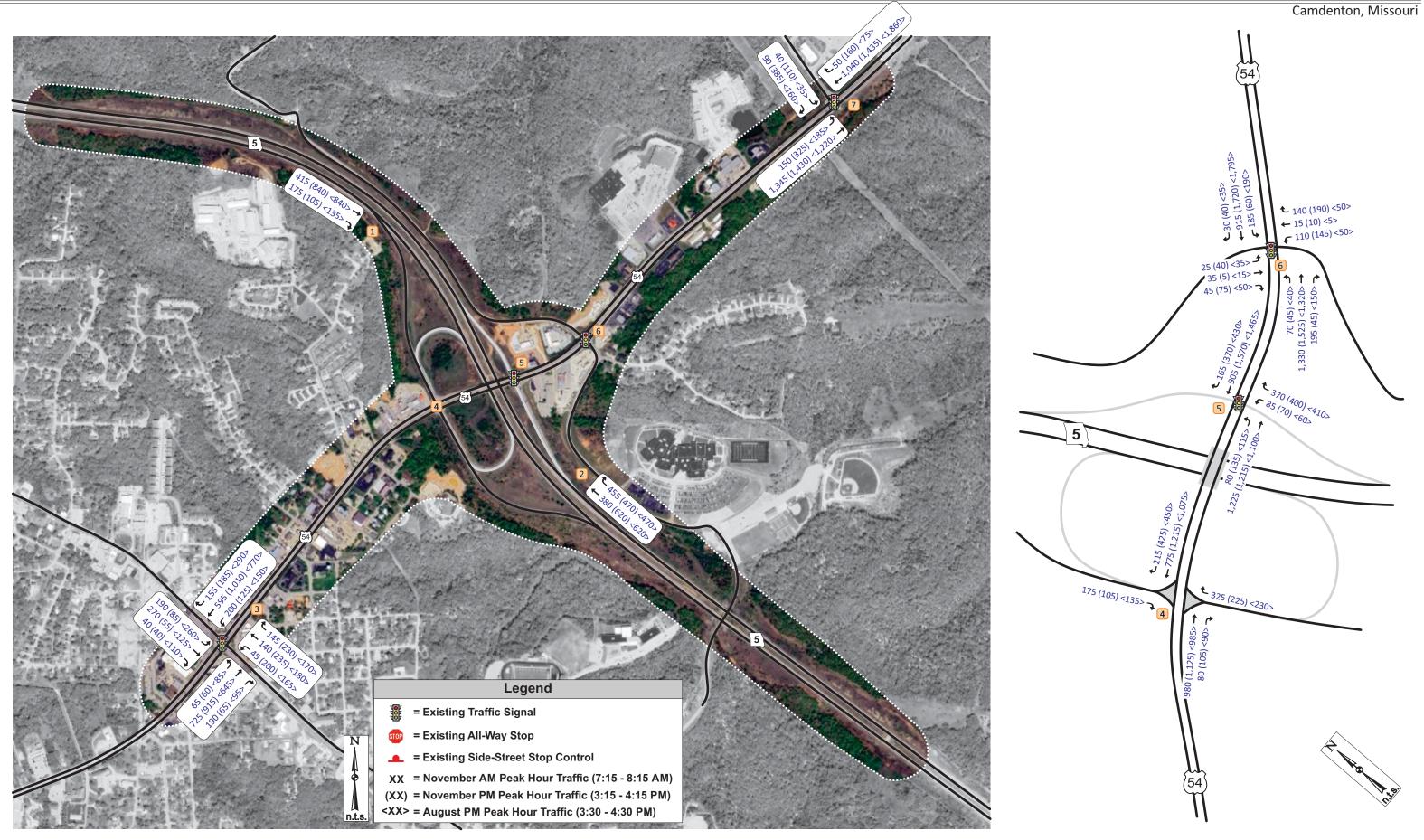
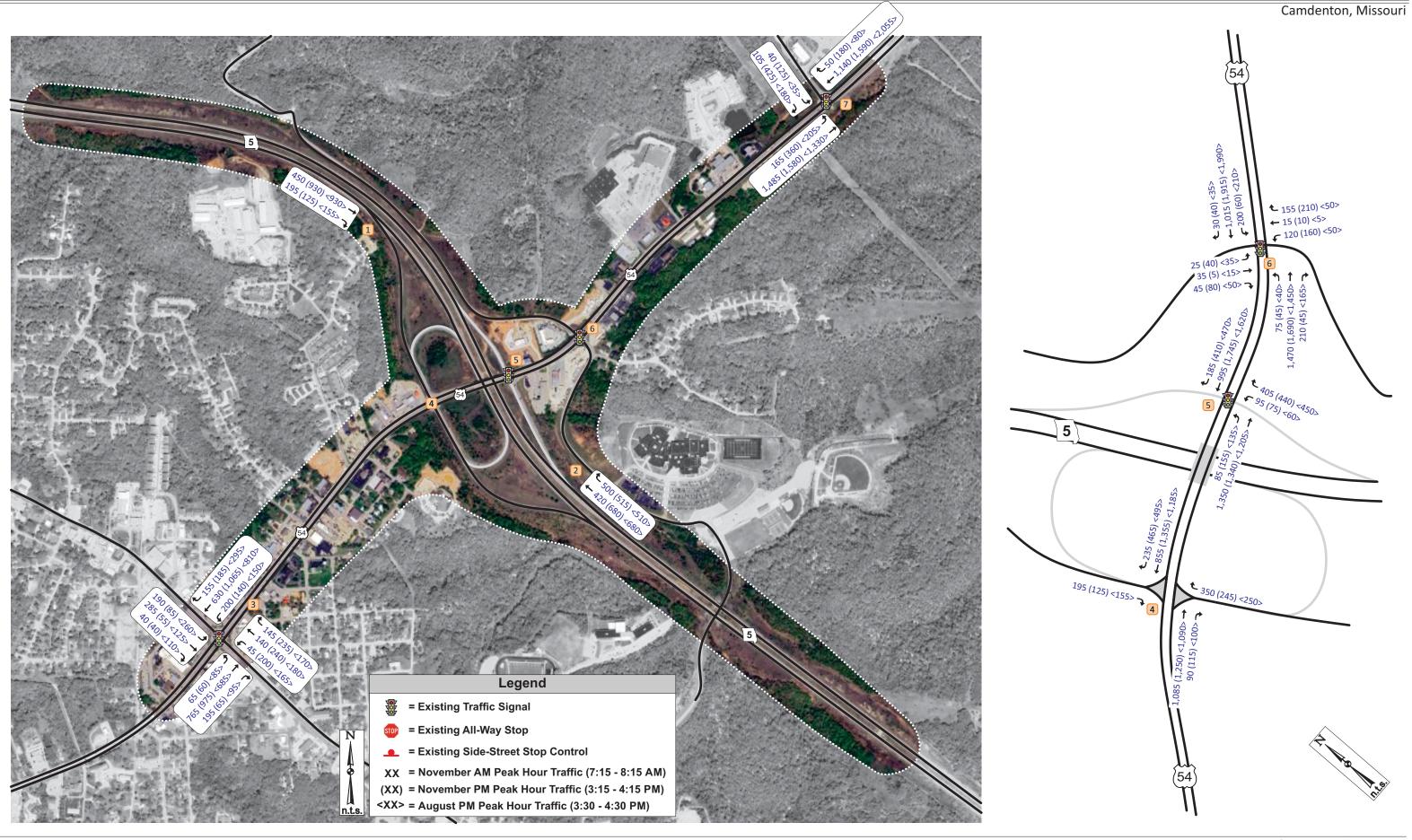


Exhibit 9: 2024 Build (Phase 1) Traffic Volumes



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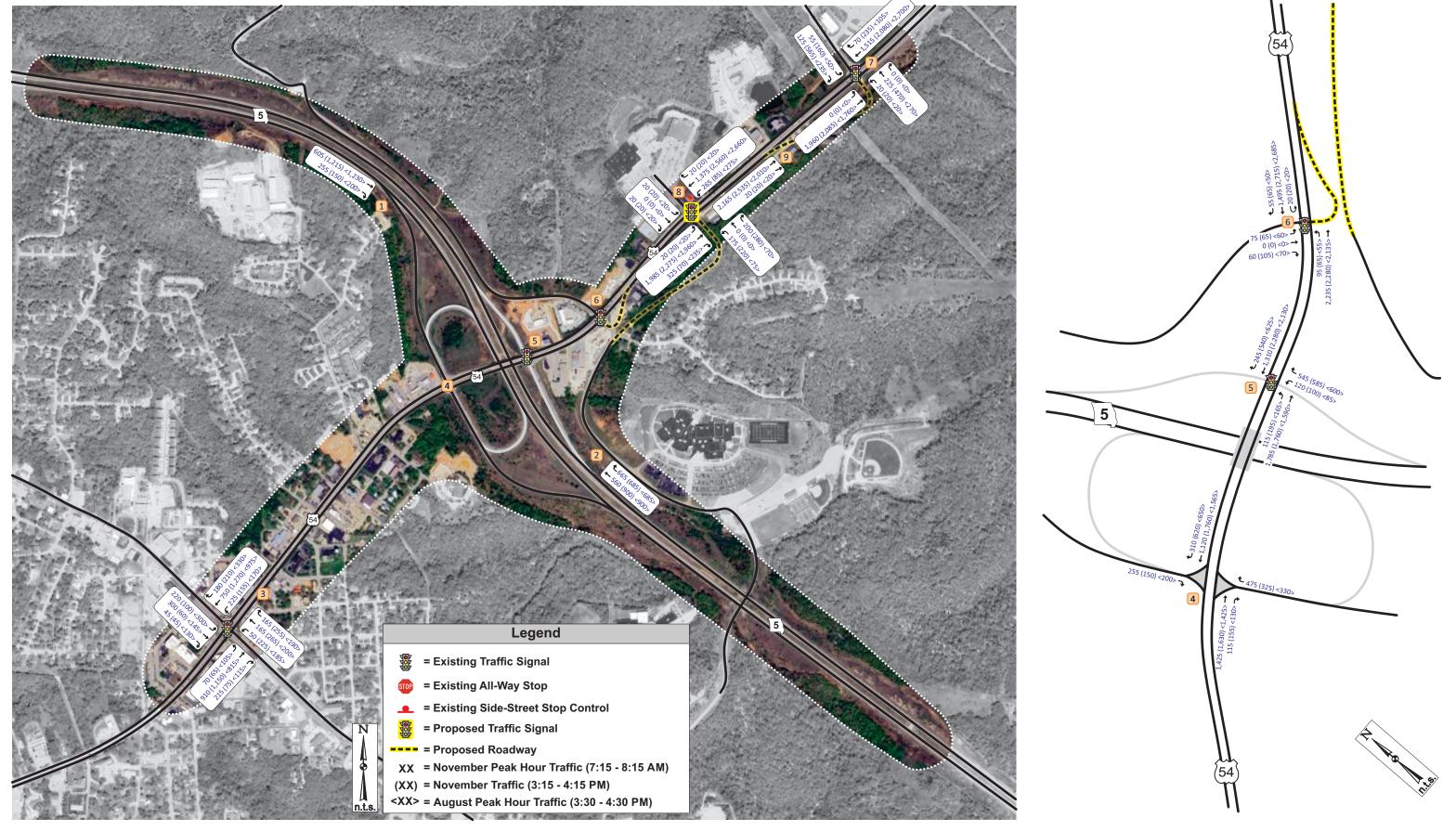


Exhibit 11: 2050 Build (Phase 1) Traffic Volumes

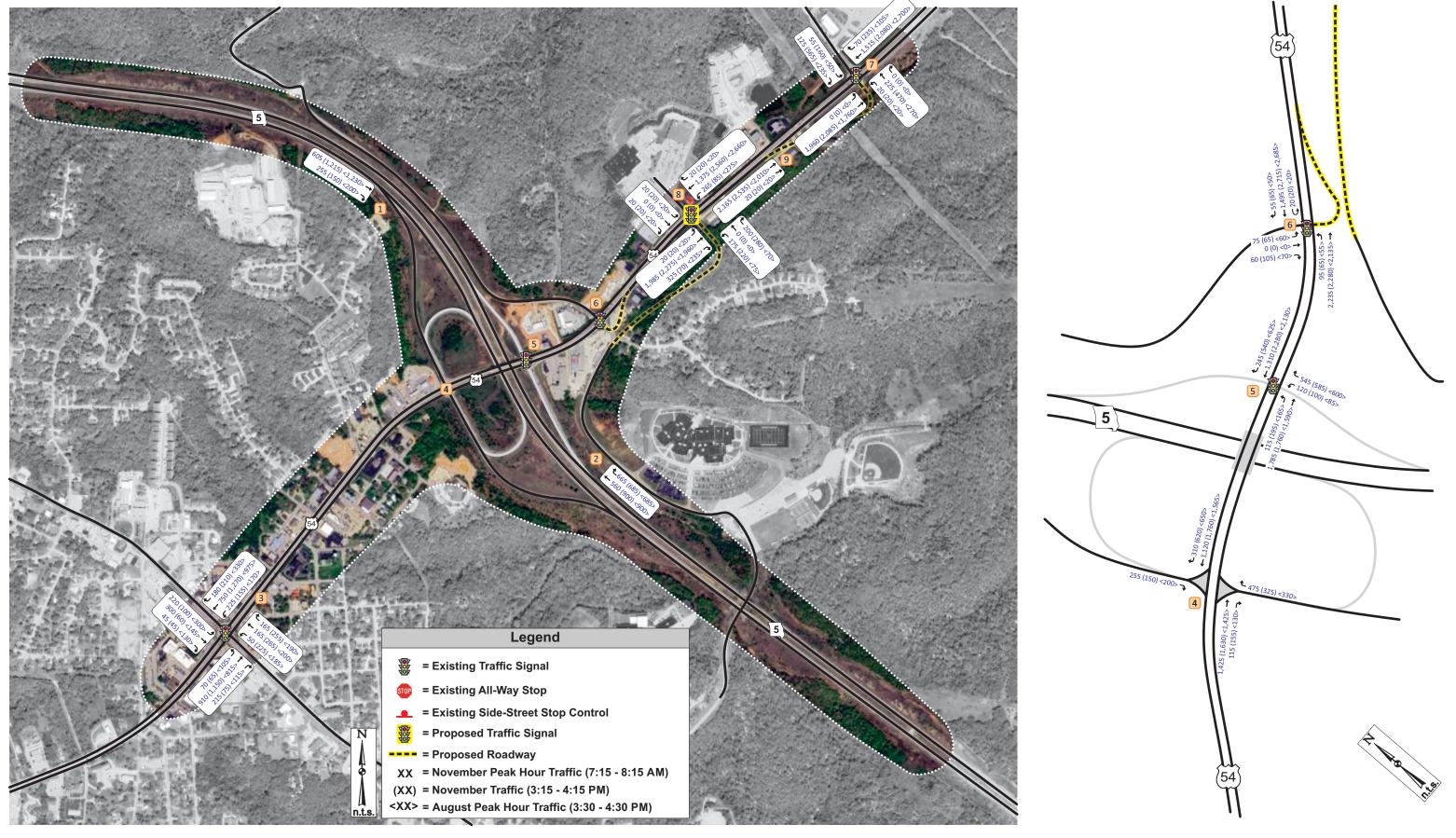


Exhibit 12: 2050 Build (Phase 2) Traffic Volumes



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TRAFFIC OPERATIONS

Study Procedures

No-build and build traffic operations were evaluated by conducting capacity analysis of the roadways and intersections in the study area. These analyses are based on many characteristics, including no-build and build traffic volumes, peaking characteristics, roadway and intersection geometry, and traffic control/traffic signal patterns. The SYNCHRO and VISSIM software packages were utilized in the analysis, capitalizing on the strengths of each software tool and generating results for comparison and verification between the different tools.

SYNCHRO is a macro-level analytical traffic flow model. SYNCHRO is based on study procedures outlined in the Highway Capacity Manual, published by the Transportation Research Board. We used SYNCHRO version 11 for this study. SYNCHRO is recognized as the most widely used tool in the traffic engineering field for analyzing and optimizing traffic flows at signalized intersections. Thus, we used SYNCHRO to evaluate intersection operations.

VISSIM is a micro-simulation traffic flow model that specializes in the analysis of complex transportation systems and was used to evaluate all aspects of the study area, including freeways, ramps, and intersections. We used VISSIM version 22 for this study. It is especially useful for analyzing freeways due to its sophisticated driver behavior algorithms that accurately reflect lane changing and car-following maneuvers. A benefit of VISSIM is that it accounts for system effects; how various elements in the roadway network impact and influence each other.

Several Measures of Effectiveness (MOE) were used in this evaluation including level of service (LOS), volume to capacity ratio (v/c), intersection capacity utilization (ICU), vehicular delay, travel time, and queue length.

LOS are measures of traffic operations which consider speed, delay, traffic interruptions, safety, driver comfort, and convenience. LOS conditions were graded in accordance with six levels of traffic service (Level A "Free Flow" to Level F "Fully Saturated") established by the Highway Capacity Manual. LOS C, which is normally used for design, represents a roadway with volumes ranging from 70% to 80% of its capacity. LOS D is generally considered acceptable for peak hours in urban areas.

For intersections, the LOS is directly related to vehicular delay. At signalized intersections, the LOS criteria differ from that at unsignalized intersections primarily because different transportation facilities create different driver expectations. The expectation is that a signalized intersection is designed to carry higher traffic volumes and, consequently, may experience greater delay than an unsignalized intersection. **Table 21** summarizes the LOS thresholds used in the analysis for intersections.



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Table 21: Level of Service Thresholds

| Lovel of Somice (LOS) | Control Delay per Vehicle (sec/veh) | | | | | | | | | |
|------------------------|-------------------------------------|----------------------------|--|--|--|--|--|--|--|--|
| Level of Service (LOS) | Signalized Intersections | Unsignalized Intersections | | | | | | | | |
| Α | <u><</u> 10 | 0-10 | | | | | | | | |
| В | > 10-20 | > 10-15 | | | | | | | | |
| С | > 20-35 | > 15-25 | | | | | | | | |
| D | > 35-55 | > 25-35 | | | | | | | | |
| E | > 55-80 | > 35-50 | | | | | | | | |
| F | > 80 | > 50 | | | | | | | | |

Cells highlighted in yellow in the intersection MOE tables indicate LOS E while cells highlighted in red indicate LOS F.

In addition to the LOS and vehicular delay, the average and maximum queue length data were collected at each intersection approach. A queue is the distance vehicles are stacked from the intersection approach. The queue length at an intersection approach impacts vehicular delay because the longer the queue is the higher the longer distance a vehicle needs to travel to reach the intersection approach which increases the vehicular delay which in turn impacts LOS. The average and maximum queue length are collected because the average queue length represents the 50th percentile or middle distance the queue will be during the peak hour, and the maximum queue length represents the furthers distance a queue will reach during the peak hour.

Furthermore, v/c and ICU ratios provide important measures of intersection operations. Intersection movements can operate an acceptable LOS (D or better) yet still have unacceptably high v/c ratios. In general, a v/c or ICU ratio of approximately 0.9 corresponds to occasional queuing and cycle failure, and a v/c or ICU ratio between 0.9 and 1.0 corresponds to frequent queuing and cycle failure. A v/c or ICU ratio greater than 1.0 results in general failure of the movement or intersection, respectively. Therefore, v/c and ICU ratios were considered in addition to LOS and queue length when evaluating an intersection's operations. Cells highlighted in yellow indicate v/c and ICU ratios between 0.9 and 1.0 and cells highlighted in red indicate v/c and ICU ratios over 1.0.

For freeway segments, LOS is based on density. Although speed is a major indicator of service quality to drivers, freedom to maneuver within the traffic stream and proximity to other vehicles, as measured by the density of the traffic stream, are equally noticeable concerns. Density increases as flow increases up to capacity, resulting in an MOE that is sensitive to a broad range of flows. For these reasons, density is the parameter used to define LOS for freeway and ramp sections, as described in **Table 22**.



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Table 22: Freeway Level of Service Thresholds

| Level of Service (LOS) | Merging and Diverging Segment Density (pc/mi/ln)* | Basic Freeway Segment Density (pc/mi/ln)* |
|---------------------------|---|--|
| Α | 0 – 10 | 0 – 11 |
| В | > 10 – 20 | > 11 – 18 |
| С | > 20 – 28 | > 18 – 26 |
| D | > 28 – 35 | > 26 – 35 |
| E | > 35 | > 35 |
| F | Demand Exceeds Capacity | > 45 |

^{*}pc/mi/ln = passenger cars per mile per lane

Cells highlighted in yellow in the freeway MOE tables indicate LOS E and cells highlighted in red indicate LOS F.

Results will not be identical between VISSIM and the SYNCHRO models due to differences in software methodologies. SYNCHRO are macroscopic models that analyze roadway geometry in isolation and VVISSIM is a stochastic microscopic model that analyzes the transportation system in its entirety. VISSIM results are impacted by effects such as platooning caused by nearby signals or upstream traffic flow restrictions, and SYNCHRO analyzes how the roadway geometry operates under general conditions not considering the effects of the surrounding roadway system. All the software packages provide different information that is useful in understanding how the concepts will work in the field. The combination of both analysis methods provides information to see how the entire system works together (VISSIM) but also how each individual element works independently (SYNCHRO).



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VISSIM Calibration/Validation

Calibration of a VISSIM model ensures that all measurable parameters generated by the traffic model are in alignment with actual traffic conditions observed during a typical day. Calibrated VISSIM models can accurately determine the impacts of potential roadway changes.

Calibration Criteria

To ensure satisfactory calibration of the model, standards were used to establish targets regarding traffic flows and travel times. The target for the traffic flow calibration effort was set at the values included in MoDOT's Engineering Policy Guide (EPG), section 905.3.5.3.2.3.4 Calibration Targets/Model Validation, shown below in **Table 23**. In addition, the target for travel times calibration effort was set to be within 15% (or 1 minute maximum, if higher) of real-world travel time runs for greater than 85% of cases.

Table 23: MoDOT EPG Calibration Targets for Link Flows and GEH Statistics

| Criteria and Measures | Calibration Acceptance Targets |
|---|-------------------------------------|
| Individual Link Flows | |
| Within 15%, for 700 veh/h < Flow < 2700 veh/h | > 85% of cases |
| Within 100 veh/h, for Flow < 700 veh/h | > 85% of cases |
| Within 400 veh/h, for Flow > 2700 veh/h | > 85% of cases |
| Sum of All Link Flows | Within 5% of sum of all link counts |
| GEH Statistic <5 for Individual Link Flows | > 85% of cases |
| GEH Statistic for Sum of All Link Flows | GEH < 4 for sum of all link counts |
| Source: FHWA Traffic Analysis Toolbox, Volume III, Se | ection 5.6 (Table 4) |

Calibration Process

As previously mentioned, turning movement count data was collected at the study intersections between 6:00 AM and 6:00 PM. From this data source, specific vehicle input flow rates were developed for the pre-peak, peak, and post-peak hours for the November AM, November PM, and August PM models. Initial runs of the model did not yield calibration results within the target ranges as well as visual validation. Based on additional field observations, it was determined that the signal timing at the intersections of US 54 at Laker Pride Road and northbound MO 5 ramps needed to be adjusted to pre-timed mode in all scenarios to replicate similar green times for eastbound and westbound US 54 during the peak hours.

Furthermore, the extensive queueing present on westbound US 54 indicates that the collected count data represents the capacity of the corridor, but not the demand. The vehicle input at westbound US 54 was adjusted during the pre-peak to include the vehicles present in the queue to fully represent the demand during the November and August PM peak hours.



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The models were run again with the pre-timed signal timing and increased vehicle input, but the models still did not yield calibration results within the target ranges as well as visual validation. The westbound US 54 queue would be generated during the pre-peak but would dissipate during the peak. To sustain the westbound US 54 queue during the peak hour, the driver behaviors for westbound US 54 were adjusted within MoDOT's EPG recommended ranges. The adjustment of signal timing, vehicle input flow rates, and driver behaviors yielded calibrated results and visual validation.

Travel Time Comparison

A model is reasonably calibrated when the modeled travel times are within 15% of the average field collected travel time. **Table 24** shows the November AM and PM peak hour travel time calibration results. As shown, in both the November AM and PM models, the travel time results are within the target range. Note that due to the timing of this study, August PM travel time data was not collected.

Table 24: Field and 2024 No-Build VISSIM Travel Time Comparison

| | | | - | | | | | | | | | | |
|-----------------|-------------------|--------------------|--------------------|--|--|--|--|--|--|--|--|--|--|
| November AM | | | | | | | | | | | | | |
| Direction | Field Average (s) | VISSIM Average (s) | Percent Difference | | | | | | | | | | |
| Eastbound US 54 | 205 | 217 | +5.8% | | | | | | | | | | |
| Westbound US 54 | 194 | 190 | -1.7% | | | | | | | | | | |
| November PM | | | | | | | | | | | | | |
| Direction | Field Average (s) | VISSIM Average (s) | Percent Difference | | | | | | | | | | |
| Eastbound US 54 | 181 | 192 | +5.8% | | | | | | | | | | |
| Westbound US 54 | 319 | 319 | 0.0% | | | | | | | | | | |

Traffic Flow Results

A model is reasonably calibrated when the sum of the modeled traffic flows is within 5% of the field collected turning movement counts and the GEH statistic is lower than 4. **Table 25**Table 25 shows the November AM, November PM, and August PM peak hour traffic calibration results. As shown, in all peak hours, the traffic flows are within the target range.

Table 25: Field and 2024 No-Build VISSIM Traffic Flow Comparison

| Peak Hour | Total Tr | affic Flow | GEH | Percent |
|-------------|-------------|--------------|------|------------|
| Peak Hour | Field (veh) | VISSIM (veh) | GER | Difference |
| November AM | 13950 | 13741 | 2.04 | -1.7% |
| November PM | 17910 | 18085 | 0.96 | 0.7% |
| August PM | 16860 | 16824 | 0.62 | -0.5% |



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<u>Visual Inspection of the Model Operations</u>

Visual validation of the models is an imperative step in the development and calibration of the model. It is essential for the modeler to perform thorough visual validation to eliminate any coding errors and achieve logical results. After coding is completed, the models were run and visually inspected multiple times. Any coding errors were then addressed to achieve realistic vehicle movements.

Figure 28 – Figure 30 show several queues from the study area during the 2024 No-Build November AM conditions.

- Figure 28 shows the eastbound US 54 approach queue at Laker Pride Road, reaching northbound MO 5 ramps.
- Figure 29 shows the eastbound US 54 approach queue at northbound MO 5, reaching southbound MO 5 ramps.
- Figure 30 shows the northbound Laker Pride Road approach queue at US 54, reaching Elm Tree Lane.

Figure 31 – Figure 35 show several queues from the study area during the 2024 No-Build November PM conditions.

- Figure 31 shows the westbound US 54 approach queue at Laker Pride Road, reaching Cecile Street.
- Figure 32 shows the westbound US 54 approach queue at northbound MO 5, reaching Laker Pride Road.
- Figure 33 shows the northbound Laker Pride Road approach queue at US 54, reaching Elm Tree Lane.
- Figure 34 shows the westbound US 54 approach queue at Business Route 5, reaching Osage Avenue.
- Figure 35 shows the northbound Business Route 5 approach queue at US 54, reaching Camden Avenue.

Generally, these queue lengths agree with field observations during the November AM and PM peak periods.





Figure 28: Eastbound US 54 approach queue at Laker Pride Road – 2024 No-Build November AM



Figure 29: Eastbound US 54 approach queue at northbound MO 5 – 2024 No-Build November AM



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Figure 30: Northbound Laker Pride Road approach queue at US 54 – 2024 No-Build November AM



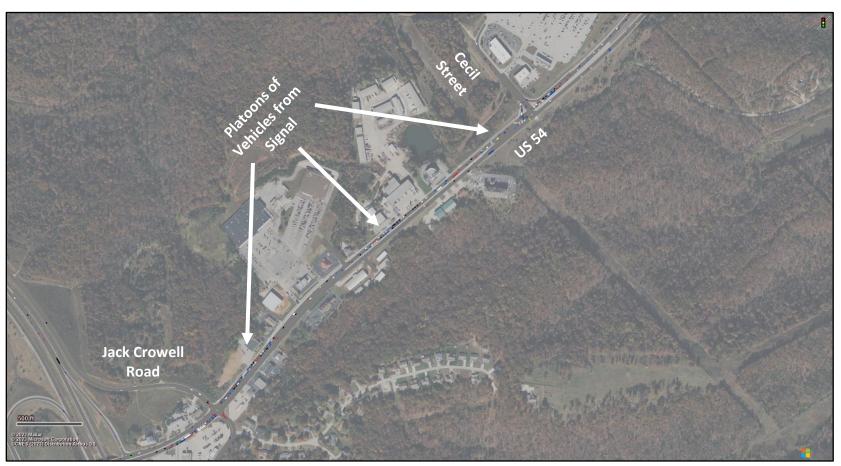


Figure 31: Westbound US 54 approach queue at Laker Pride Road – 2024 No-Build November PM





Figure 32: Westbound US 54 approach queue at northbound MO 5 – 2024 No-Build November PM



Figure 33: Northbound Laker Pride Road approach queue at US 54 – 2024 No-Build November PM





Figure 34: Westbound US 54 approach queue at Business Route 5 – 2024 No-Build November PM



Figure 35: Northbound Business Route 5 approach queue at US 54 – 2024 No-Build November PM.



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Analysis Scenarios

The following scenarios were evaluated for the US 54 study area:

- 2024 No-Build;
- 2024 Build (Phase 1);
- 2030 No-Build;
- 2030 Build (Phase 1);
- 2050 No-Build;
- 2050 Build (Phase 1); and
- 2050 Build (Phase 2).

As previously mentioned, a project is in place to expand US 54 (just west of Business Route 5) from a three-lane section (one lane in each direction and a center two-way left-turn lane) to a five-lane section (two lanes in each direction and a center two-way left-turn lane) and is anticipated to be completed in 2026. As such, the future five-lane section was incorporated in the 2030 and 2050 scenarios.

Network Performance Measures Comparison

In addition to intersection and freeway operations, the VISSIM models provide network-wide performance measures that can be used to see the overall differences between the No-Build and Build scenarios. The following performance measures were compared:

- Average Delay Per Vehicle (seconds);
- Average Speed Per Vehicle (miles per hour);
- Total Delay (Hours); and
- Latent Demand (Vehicles).

Figure 36, **Figure** 37, and **Figure** 38 summarize the network performance measures for the 2024 scenarios during the November AM, November PM, August PM peak hours, respectively.

During the November AM peak, Phase 1 would provide a decrease of 38% and 39% in average delay per vehicle and total delay, respectively, from no-build conditions. During the November PM peak, Phase 1 would provide a decrease of 56% and 57% in average delay per vehicle and total delay, respectively, from no-build conditions. During the August PM peak, Phase 1 would provide a decrease of 65% and 66% in average delay per vehicle and total delay, respectively, from no-build conditions. The decrease in average delay per vehicle and total delay means vehicles are traveling faster through the network which results in an increase in the average speed per vehicle in the network. Phase 1 would provide an increase in average speed per vehicle of 13%, 27%, and 38%, during the November AM and PM and August PM peak hours, respectively, from no-build conditions. Overall, the 2024 results show that Phase 1 would provide a considerable improvement in the overall roadway network performance.



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Figure 39, **Figure** 40, and **Figure** 41 summarize the network performance measures for the 2030 scenarios during the November AM, November PM, August PM peak hours, respectively.

During the November AM peak, Phase 1 would provide a decrease of 54% in average delay per vehicle and total delay from no-build conditions. During the November PM peak, Phase 1 would provide a decrease of 69% in average delay per vehicle and total delay from no-build conditions. During the August PM peak, Phase 1 would provide a decrease of 65% and 64% in average delay per vehicle and total delay, respectively, from no-build conditions. Phase 1 would provide an increase in average speed per vehicle of 27%, 54%, and 43%, during the November AM, November PM, and August PM peak hours, respectively, from no-build conditions. Moreover, the increase in vehicle speed and the decrease in delay within the network allows additional vehicles to enter the model which results in a decrease in latent demand. Phase 1 would provide a 99% decrease in the latent demand during the November PM and August PM peak hours from no-build conditions. Overall, the 2030 results show that Phase 1 would provide a substantial improvement in the overall roadway network performance.

Figure 42, **Figure** 43, and **Figure** 44 summarize the network performance measures for the 2050 scenarios during the November AM, November PM, August PM peak hours, respectively.

During the November AM peak, Phase 1 would provide a decrease of 66% in average delay per vehicle and total delay from no-build conditions. During the November PM peak, Phase 1 would provide a decrease of 41% and 38% in average delay per vehicle and total delay, respectively, from no-build conditions. During the August PM peak, Phase 1 would provide a decrease of 84% and 81% in average delay per vehicle and total delay, respectively, from no-build conditions. Phase 1 would provide an increase in average speed per vehicle of 94%, 39%, and 191%, during the November AM, November PM, and August PM peak hours, respectively, from no-build conditions. Phase 1 would provide a decrease of the latent demand by 93%, 68%, and 68% during November AM, November PM, and August PM peak hours, respectively, from no-build conditions.

Overall, Phase 1 provides an improvement in all network-wide metrics, but approximately 572 and 1114 vehicles during the November and August PM peak hours, respectively, are unable to enter the model due to capacity constraints on US 54 between Laker Pride Road/Jack Crowell Road and Cecil Street. Phase 2 alleviates the congestion seen during the November and August PM peak hours by providing additional lane capacity along US 54.



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During the November AM peak, Phase 2 would provide a decrease of 78% in average delay per vehicle and total delay from no-build conditions. During the November PM peak, Phase 2 would provide a decrease of 72% and 70% in average delay per vehicle and total delay, respectively, from no-build conditions. During the August PM peak, Phase 2 would provide a decrease of 86% and 83% in average delay per vehicle and total delay, respectively, from no-build conditions. Phase 2 would provide an increase in average speed per vehicle of 123%, 87%, and 206%, during the November AM, November PM, and August PM peak hours, respectively, from no-build conditions. Phase 2 would provide a decrease of the latent demand by 99% during all peak hours from no-build conditions. Overall, the 2050 results show that Phase 2 would provide a significant improvement in the overall roadway network performance.



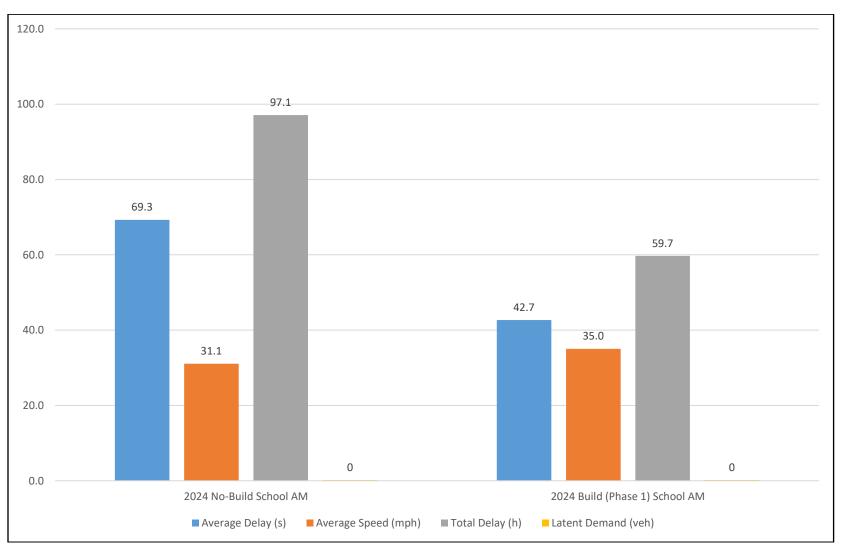


Figure 36: Network-Wide Performance Results – 2024 Scenarios (November AM Peak Hour)



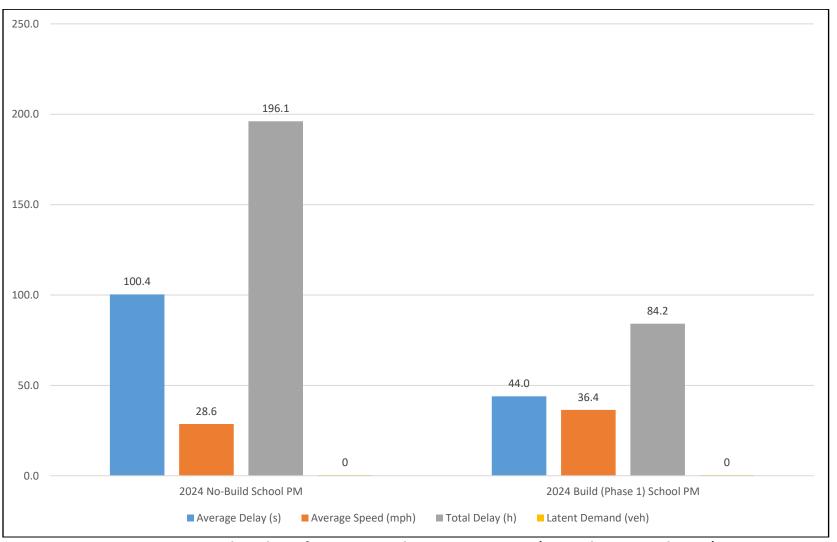


Figure 37: Network-Wide Performance Results – 2024 Scenarios (November PM Peak Hour)



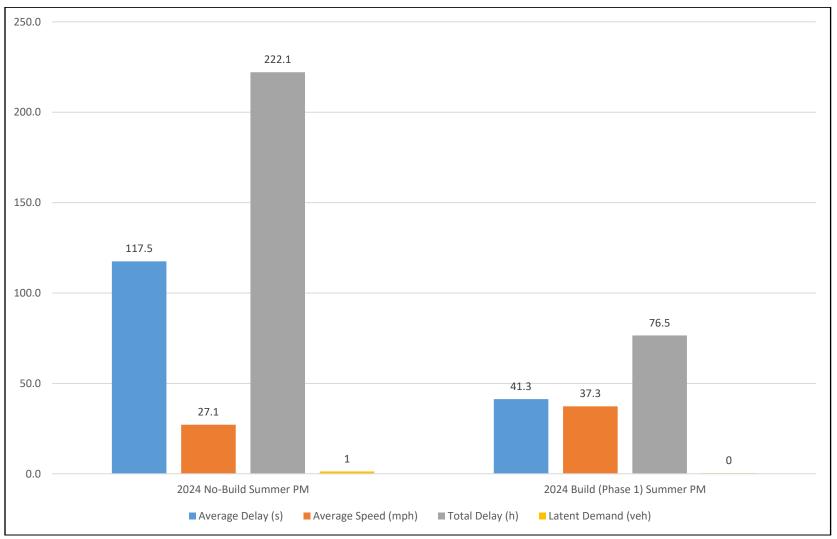


Figure 38: Network-Wide Performance Results – 2024 Scenarios (August PM Peak Hour)



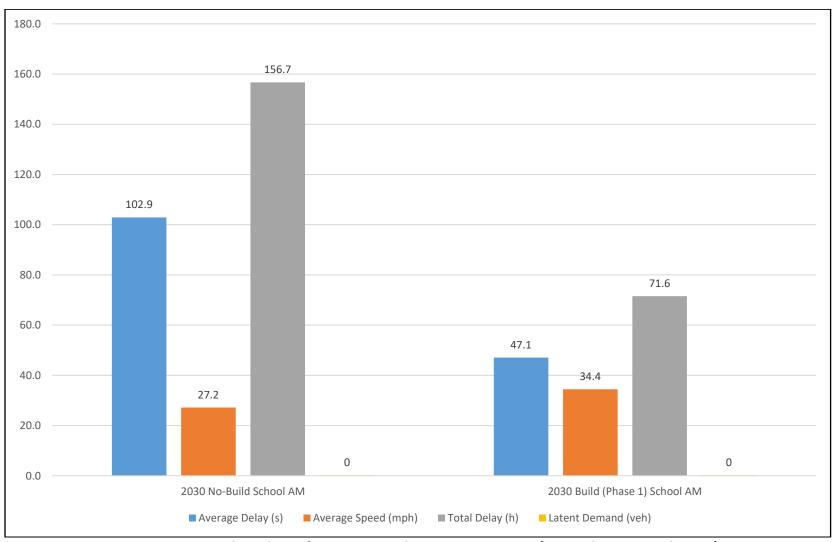


Figure 39: Network-Wide Performance Results – 2030 Scenarios (November AM Peak Hour)



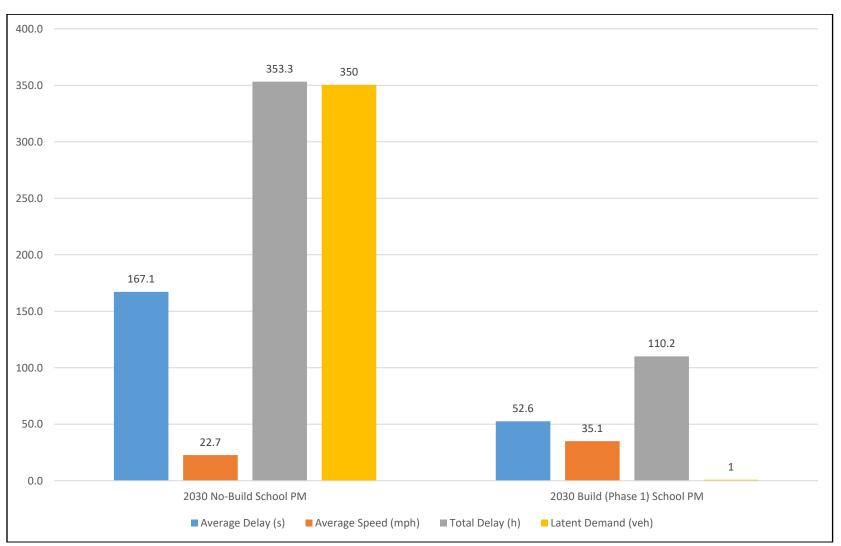


Figure 40: Network-Wide Performance Results – 2030 Scenarios (November PM Peak Hour)



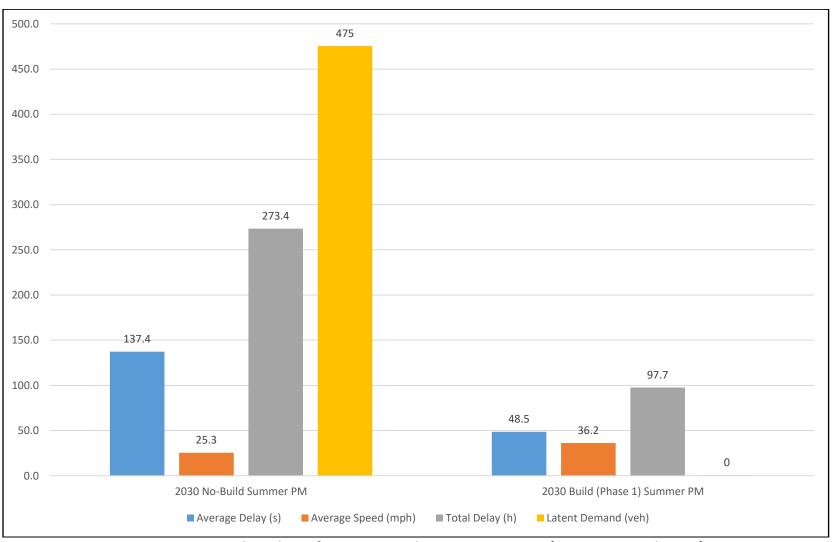


Figure 41: Network-Wide Performance Results – 2030 Scenarios (August PM Peak Hour)



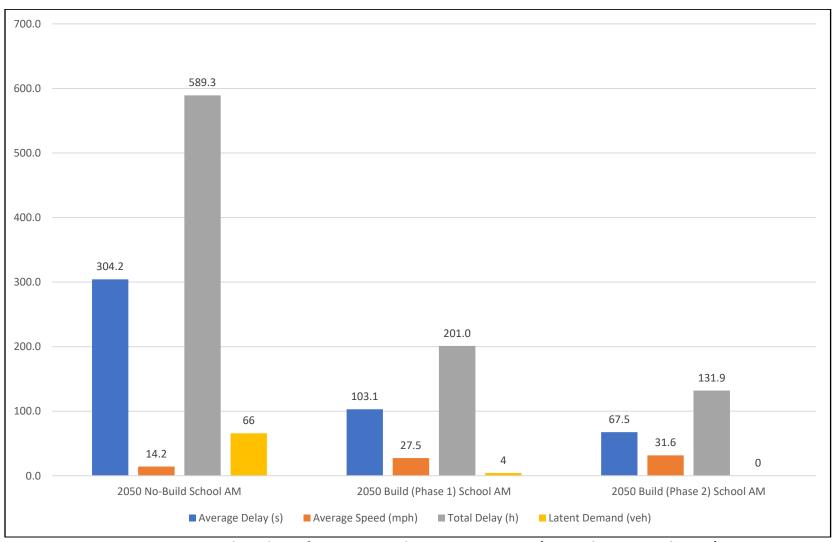


Figure 42: Network-Wide Performance Results – 2050 Scenarios (November AM Peak Hour)



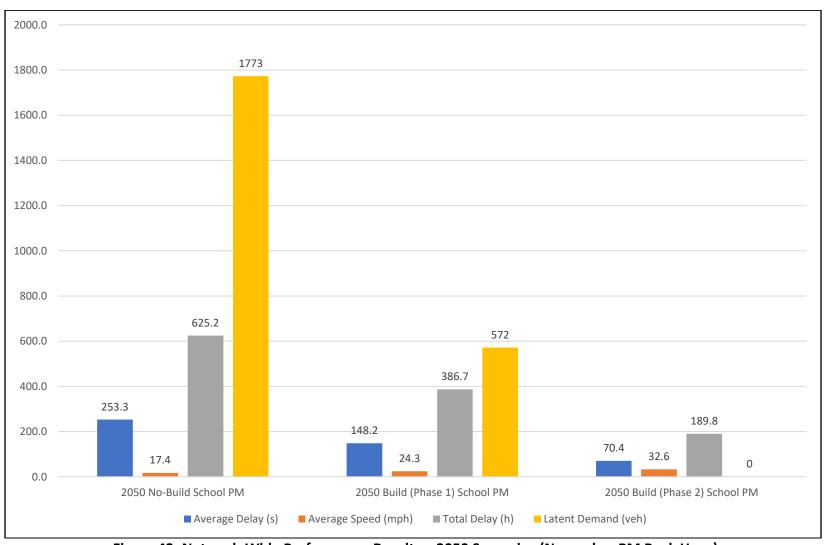


Figure 43: Network-Wide Performance Results – 2050 Scenarios (November PM Peak Hour)



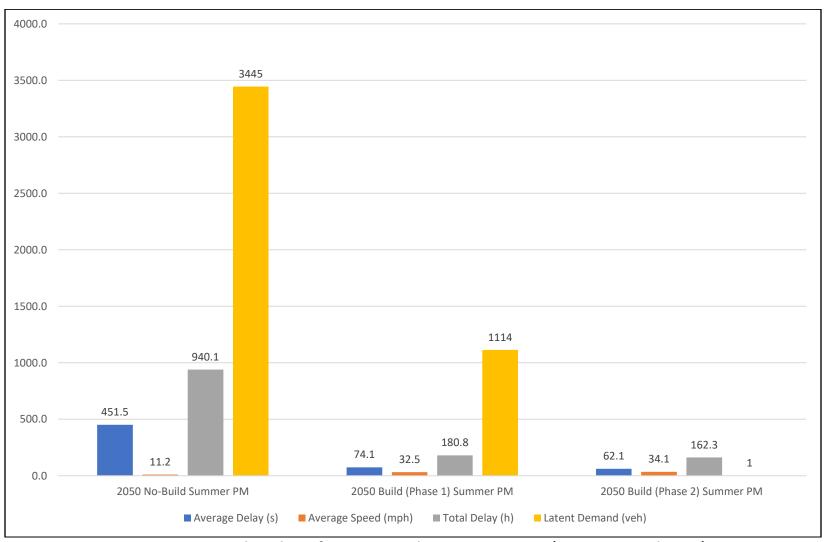


Figure 44: Network-Wide Performance Results – 2050 Scenarios (August PM Peak Hour)



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2024 No-Build Operations

The 2024 No-Build traffic volumes were evaluated in SYNCHRO and VISSIM. The SYNCHRO evaluations are summarized in **Table 26** for the November AM, November PM, and August PM peak hours. The VISSIM evaluations are summarized in **Table 27** and **Table 28** for the November AM, November PM, and August PM peak hours.

The SYNCHRO results show that the overall operating conditions of all study intersections currently operate at an acceptable level of service (LOS D or better) during all peak hours except for the US 54 and Business Route 5 intersection which currently operates at LOS E during the November PM peak hour. Furthermore, all individual intersection approaches currently operate at acceptable LOS during all peak hours, except for the following approaches:

- Southbound Business Route 5 at US 54 during the November AM peak hour (LOS E);
- Westbound US 54 at Business Route 5 during the November PM peak hour (LOS E); and
- Eastbound US 54 at Business Route 5 during the November PM peak hour (LOS E).

The VISSIM results show that all sections of MO 5 currently operate at an acceptable LOS during all peak hours. Also, the VISSIM results show that the overall operating conditions of all study intersections currently operate at an acceptable level of service during all peak hours except for the US 54 and Laker Pride Road/Jack Crowell Road intersection which currently operates at LOS E during the November PM and August PM peak hours. Furthermore, all individual intersection approaches currently operate at acceptable LOS during all peak hours, except for the following approaches:

- Westbound US 54 at Cecil Street during the November PM peak hour (LOS E);
- Southbound Cecil Street at US 54 during the November and August PM peak hours (LOS E);
- Westbound US 54 at Laker Pride Road/Jack Crowell Road during the November and August PM peak hours (LOS F); and
- Northbound Business Route 5 at US 54 during the November PM peak hour (LOS E).

The undesirable operations shown above are primarily due to the capacity constraint at the westbound US 54 approach at Laker Pride Road/Jack Crowell Road. The existing two through lanes at the approach do not provide sufficient capacity during the November PM and August PM peak hours, which results in the maximum approach queues reaching Cecil Street, as shown in **Figure 45** and **Figure 46**, respectively. Note that the undesirable operation at the northbound Business Route 5 at US 54 during the November PM peak hour is caused by the influx of vehicles from the nearby school dismissals.



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Also, the SYNCHRO models are not showing the capacity constraint at the westbound US 54 approach at Laker Pride Road/Jack Crowell Road during the PM peak hours as compared to the VISSIM models. This difference was investigated further via a review of the model signal timing as well as the collection of additional count data and field observations. The review found that the signal timing in the SYNCHRO and VISSIM models matched the field signal timing, and the additional count data and field observations matched previously collected count data and field observations. The difference in results could be because SYNCHRO is unable to accurately represent driver behaviors seen in the field at the intersection of US 54 and Laker Pride Road/Jack Crowell Road. As previously mentioned, the results from SYNCHRO and VISSIM will not be identical due to differences in software methodologies. However, based on extensive field observations and the collected travel time data, CBB is confident that the VISSIM models represent the existing traffic operations at the study intersections.

Overall, the results show that the existing two through lanes at the westbound US 54 approach at Laker Pride Road/Jack Crowell Road result in a bottleneck during the November and August PM peak hours. Additional capacity is needed at this approach to relieve bottlenecks during the November and August PM peak hours.

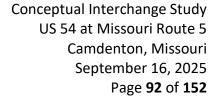






Figure 45: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2024 No-Build November PM

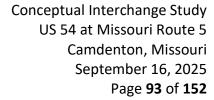






Figure 46: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2024 No-Build August PM



Table 26: Intersection Operating Conditions – 2024 No-Build (SYNCHRO)

| | | Nov | ember AM Pe | | поп орегас | 8 | | nber PM Peal | | | August PM Peak Hour | | | | | |
|---|---|-------|------------------|------------------|------------------|-------------|---------------|------------------|------------------|------------------|---------------------|-------|------------------|------------------|------------------|--|
| Intersection/Approach | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | |
| | US 54 & Cecil Street (Signalized) | | | | | | | | | | | | | | | |
| Eastbound US 54 | Α | 8.5 | 0.54 | 140' | 210' | В | 17.0 | 0.70 | 260' | 340' | В | 10.5 | 0.54 | 115' | 185' | |
| Westbound US 54 | В | 14.9 | 0.63 | 190' | 290' | С | 26.7 | 0.85 | 500' | 670' | С | 27.9 | 0.93 | 545' | 890' | |
| Southbound Cecil Street | В | 19.9 | 0.38 | <25 | 45' | D | 40.1 | 0.90 | 95' | 270' | С | 21.6 | 0.60 | <25 | 65' | |
| Overall Intersection | В | 11.6 | 0.58 | | | С | 24.0 | 0.76 | | | С | 20.6 | 0.81 | | | |
| | US 54 & Laker Pride Road/Jack Crowell Road (Signalized) | | | | | | | | | | | | | | | |
| Eastbound US 54 | В | 15.9 | 0.90 | 180' | 235' | В | 19.8 | 0.83 | 285' | 405' | В | 17.1 | 0.79 | 255' | 340' | |
| Westbound US 54 | В | 17.8 | 0.75 | 195' | 245' | С | 21.5 | 0.83 | 535' | 650' | С | 25.2 | 0.87 | 595' | 720' | |
| Northbound Laker Pride Road | D | 35.9 | 0.73 | 75' | 165' | D | 45.9 | 0.80 | 115' | 225' | С | 32.3 | 0.27 | 35' | 75' | |
| Southbound Jack Crowell Road | С | 28.0 | 0.33 | <25 | 70' | С | 28.2 | 0.36 | 30' | 65' | С | 29.4 | 0.24 | 25' | 60' | |
| Overall Intersection | В | 18.7 | 0.91 | | | С | 23.2 | 0.86 | | | С | 22.3 | 0.82 | | | |
| | | - | • | U | S 54 & Northb | ound MO 5 F | Ramps (Signal | lized) | - | | | • | | - | | |
| Eastbound US 54 | С | 22.6 | 0.77 | 355' | 445' | С | 27.3 | 0.75 | 410' | 495' | С | 23.7 | 0.65 | 330' | 405' | |
| Westbound US 54 | Α | 4.7 | 0.46 | 55' | 65' | А | 3.1 | 0.68 | 65' | 85' | Α | 1.4 | 0.61 | 25' | 30' | |
| Northbound MO 5 Off-Ramp | С | 24.7 | 0.54 | 75' | 120' | С | 29.2 | 0.51 | 110' | 155' | С | 25.6 | 0.42 | 95' | 140' | |
| Overall Intersection | В | 16.2 | 0.58 | | | В | 15.1 | 0.69 | | | В | 12.2 | 0.65 | | | |
| | | | | US | 54 & Southbo | und MO 5 Ra | mps (Unsign | alized) | | | | | | | | |
| Eastbound US 54 | Α | <1.0 | 0.30 | | <25' | Α | <1.0 | 0.35 | | <25' | Α | <1.0 | 0.30 | | <25' | |
| Westbound US 54 | Α | <1.0 | 0.30 | | <25' | А | <1.0 | 0.38 | | <25' | Α | <1.0 | 0.33 | | <25' | |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | D | 25.1 | 0.67 | | 125' | С | 21.6 | 0.53 | | 75' | С | 18.7 | 0.48 | | 65' | |
| Southbound MO 5 to Westbound US 54 Off-Ramp | В | 10.4 | 0.22 | | <25' | В | 10.1 | 0.14 | 1 | <25' | Α | 9.9 | 0.16 | | <25' | |
| Overall Intersection | Α | 3.9 | 0.54 | | | Α | 1.9 | 0.52 | | | Α | 1.9 | 0.48 | | | |
| US 54 & Business Route 5 (Signalized) | | | | | | | | | | | | | | | | |
| Eastbound US 54 | D | 51.9 | 0.89 | 480' | 590' | Е | 64.9 | 1.00 | 550' | 640' | D | 37.0 | 0.59 | 225' | 385' | |
| Westbound US 54 | D | 38.6 | 0.80 | 305' | 385' | Е | 64.0 | 1.02 | 745' | 770' | D | 38.6 | 0.77 | 340' | 555' | |
| Northbound Business Route 5 | D | 36.1 | 0.53 | 75' | 120' | D | 52.5 | 0.80 | 200' | 280' | D | 44.2 | 0.68 | 115' | 220' | |
| Southbound Business Route 5 | Е | 60.3 | 0.80 | 270' | 370' | D | 49.7 | 0.44 | 55' | 95' | D | 48.3 | 0.64 | 95' | 175' | |
| Overall Intersection | D | 47.0 | 0.81 | | | E | 61.1 | 0.83 | | | D | 40.7 | 0.78 | | | |



Table 27: Intersection Operating Conditions – 2024 No-Build (VISSIM)

| | | Nover | nber AM Peak Ho | our | | November P | M Peak Hour | | August PM Peak Hour | | | | |
|---|---------------------------------------|-------|------------------|------------------|--------------------|-------------------|------------------|------------------|---------------------|-------|------------------|------------------|--|
| Intersection/Approach | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | |
| | | | | l | JS 54 & Cecil Stre | et (Signalized) | | | | | | | |
| Eastbound US 54 | Α | 5.8 | 25' | 435' | В | 13.4 | 65' | 600' | А | 9.2 | 40' | 410' | |
| Westbound US 54 | В | 11.4 | 30' | 340' | D | 37.4 | 285' | 1535' | E | 79.6 | 1530' | 2720' | |
| Southbound Cecil Street | В | 14.7 | <25' | 80' | E | 66.9 | 260' | 830' | E | 70.9 | 80' | 390' | |
| Overall Intersection | Α | 8.5 | | | С | 30.3 | | | D | 51.0 | | | |
| US 54 & Laker Pride Road/Jack Crowell Road (Signalized) | | | | | | | | | | | | | |
| Eastbound US 54 | С | 29.2 | 335' | 860' | С | 23.8 | 170' | 785' | С | 24.8 | 150' | 745' | |
| Westbound US 54 | D | 37.8 | 180' | 600' | F | 101.6 | 2135' | 3355' | F | 98.6 | 2785' | 3375' | |
| Northbound Laker Pride Road | С | 23.7 | <25' | 210' | С | 34.3 | 50' | 330' | С | 24.8 | <25' | 100' | |
| Southbound Jack Crowell Road | С | 23.5 | <25' | 70' | С | 30.8 | <25' | 85' | С | 32.0 | <25' | 105' | |
| Overall Intersection | С | 31.7 | | | Е | 61.5 | | | Е | 64.5 | | | |
| | - | | | US 54 & | Northbound MO | 5 Ramps (Signaliz | ed) | | | • | | | |
| Eastbound US 54 | D | 43.4 | 205' | 840' | С | 27.6 | 105' | 580' | С | 27.7 | 95' | 585' | |
| Westbound US 54 | В | 13.6 | 60' | 620' | В | 13.7 | 190' | 865' | В | 13.5 | 170' | 855' | |
| Northbound MO 5 Off-Ramp | D | 45.8 | 60' | 365' | D | 37.8 | 50' | 250' | D | 35.9 | 50' | 230' | |
| Overall Intersection | С | 32.7 | | | С | 21.6 | | | С | 21.3 | | | |
| | - | | | US 54 & 9 | outhbound MO 5 | Ramps (Unsignal | ized) | | | • | | | |
| Eastbound US 54 | Α | 4.9 | <25' | 155' | Α | 0.5 | <25' | <25' | Α | 0.4 | <25' | <25' | |
| Westbound US 54 | Α | 1.1 | <25' | <25' | Α | 1.3 | <25' | <25' | Α | 1.4 | <25' | <25' | |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | D | 25.0 | 65' | 535' | Α | 6.4 | <25' | 170' | А | 5.2 | <25' | 145' | |
| Southbound MO 5 to Westbound US 54 Off-Ramp | Α | 2.5 | <25' | 85' | Α | 2.3 | <25' | 50' | Α | 2.0 | <25' | 70' | |
| Overall Intersection | Α | 5.9 | | | Α | 1.4 | | | Α | 1.4 | | | |
| | US 54 & Business Route 5 (Signalized) | | | | | | | | | | | | |
| Eastbound US 54 | С | 33.8 | 150' | 540' | С | 29.3 | 130' | 535' | С | 32.7 | 120' | 415' | |
| Westbound US 54 | С | 29.9 | 110' | 490' | D | 41.4 | 215' | 865' | С | 32.7 | 135' | 530' | |
| Northbound Business Route 5 | С | 27.3 | <25' | 120' | Е | 55.4 | 140' | 1080' | С | 33.8 | 30' | 225' | |
| Southbound Business Route 5 | D | 45.8 | 90' | 500' | D | 41.2 | 25' | 110' | D | 38.6 | 60' | 215' | |
| Overall Intersection | С | 33.9 | | | D | 40.4 | | | С | 33.9 | | | |



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Table 28: MO 5 Capacity Analysis – 2024 No-Build (VISSIM)

| Traffic | | | | | | Nov | ovember AM Peak hour | | | November PM Peak Hour | | | | August PM Peak Hour | | | |
|--------------------|--|-----------|---------|-------|-----|-----------------------|----------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|--|
| Volume Scenario | Segment | Direction | Type | Lanes | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | |
| | Southbound MO 5 | | | | | | | | | | | | | | | | |
| 2024 | Before US 54 Interchange | SB | Basic | 2 | Α | 5.0 | 61.0 | 587 | Α | 8.1 | 60.0 | 944 | Α | 8.3 | 60.0 | 974 | |
| 2024 | US 54 Off-Ramp | SB | Diverge | 3 | Α | 3.1 | 64.0 | 583 | Α | 4.9 | 64.0 | 944 | Α | 5.1 | 64.0 | 974 | |
| 2024 | Between US 54 Ramps | SB | Basic | 2 | Α | 3.3 | 64.0 | 418 | Α | 6.6 | 64.0 | 838 | Α | 6.5 | 64.0 | 835 | |
| 2024 | Between US 54 On-Ramp and US 54 Off-Ramp | SB | Weave | 3 | Α | 4.2 | 50.0 | 620 | Α | 8.0 | 53.0 | 1275 | Α | 8.1 | 53.0 | 1283 | |
| 2024 | Between US 54 Ramps | SB | Basic | 2 | Α | 2.3 | 62.0 | 289 | Α | 8.3 | 63.0 | 1048 | Α | 8.3 | 63.0 | 1048 | |
| 2024 | US 54 On-Ramp | SB | Merge | 3 | Α | 1.9 | 64.0 | 356 | Α | 6.0 | 63.0 | 1147 | Α | 5.9 | 64.0 | 1135 | |
| 2024 | After US 54 Interchange | SB | Basic | 2 | Α | 2.7 | 65.0 | 354 | Α | 9.0 | 64.0 | 1148 | Α | 8.9 | 64.0 | 1134 | |
| | | | | | | | Northbo | ound MO 5 | | | | | | | | | |
| 2024 | Before US 54 Interchange | NB | Basic | 2 | Α | 7.2 | 60.0 | 835 | Α | 9.4 | 60.0 | 1090 | Α | 9.4 | 60.0 | 1090 | |
| 2024 | US 54 Off-Ramp | NB | Diverge | 3 | Α | 4.4 | 63.0 | 835 | Α | 5.8 | 63.0 | 1089 | Α | 5.8 | 63.0 | 1089 | |
| 2024 | Between US 54 Ramps | NB | Basic | 2 | Α | 3.0 | 65.0 | 390 | Α | 4.8 | 64.0 | 616 | Α | 4.8 | 64.0 | 622 | |
| 2024 | US 54 On-Ramp | NB | Merge | 3 | Α | 3.3 | 63.0 | 616 | Α | 6.2 | 62.0 | 1150 | Α | 6.3 | 62.0 | 1171 | |
| 2024 | After US 54 Interchange | NB | Basic | 2 | Α | 4.8 | 64.0 | 613 | Α | 9.0 | 64.0 | 1153 | Α | 9.2 | 64.0 | 1171 | |



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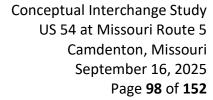
2024 Build Operations (Phase 1)

The 2024 Build (Phase 1) traffic volumes were evaluated in SYNCHRO and VISSIM. The SYNCHRO evaluations are summarized in **Table 29** for the November AM, November PM, and August PM peak hours. The VISSIM evaluations are summarized in **Table 30** and **Table 31** for the November AM, November PM, and August PM peak hours.

As can be seen in the SYNCHRO and VISSIM results, the overall operating conditions of all study area intersections and individual intersection approaches are expected to operate at acceptable level of service (LOS D or better) during all peak hours. Furthermore, the VISSIM results show that all sections of MO 5 are expected to operate at an acceptable LOS during all peak hours. Note that the operational improvements at the US 54 and Business Route 5 intersections can be attributed to signal timing adjustments.

Furthermore, **Figure 47** and **Figure** 48 show that the maximum queues for the westbound US 54 approach at Laker Pride Road/Jack Crowell Road during the November and August PM peak hours, respectively, are expected to decrease significantly from 2024 No-Build conditions and are not expected to impact adjacent signalized intersections.

Overall, the proposed Boulevard (Phase 1) concept improvements are expected to address mobility concerns along US 54 by providing additional lane capacity on westbound US 54, which is expected to relieve the existing westbound US 54 bottleneck at Laker Pride Road/Jack Crowell Road.





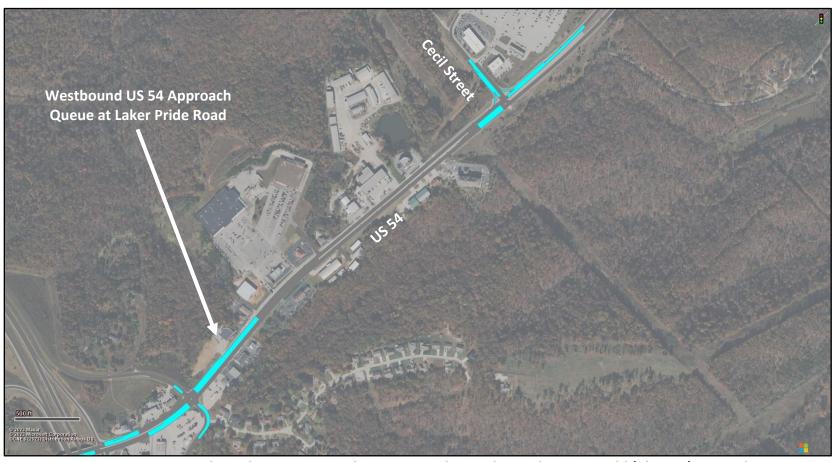
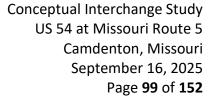


Figure 47: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2024 Build (Phase 1) November PM





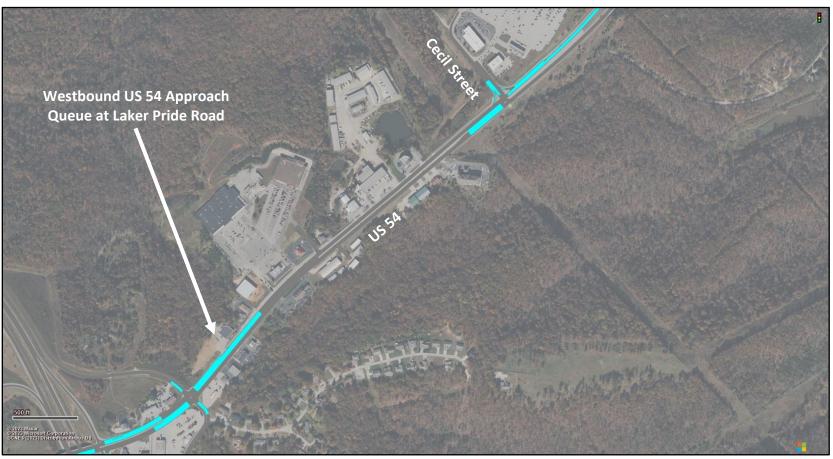


Figure 48: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2024 Build (Phase 1) August PM



Table 29: Intersection Operating Conditions – 2024 Build (Phase 1) (SYNCHRO)

| | | New | | | P | | | nhar DNA Daal | • | , | | A | ust DNA Dools I | | |
|---|-----|-------|------------------|------------------|------------------|----------------|---------------|------------------|------------------|------------------|-----|-------|------------------|------------------|------------------|
| | | NOV | ember AM Pe | T | | | Nover | nber PM Peal | r | _ | | Augi | ust PM Peak I | | |
| Intersection/Approach | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue |
| | | | | | US 54 & | Cecil Street (| (Signalized) | | | | | | | | |
| Eastbound US 54 | Α | 9.0 | 0.54 | 55' | 75' | С | 22.6 | 0.95 | 150' | 240' | В | 12.5 | 0.62 | 230' | 235' |
| Westbound US 54 | В | 10.6 | 0.48 | 200' | 295' | С | 25.2 | 0.81 | 520' | 630' | С | 20.7 | 0.85 | 565' | 815' |
| Southbound Cecil Street | С | 30.5 | 0.51 | <25 | 55' | D | 51.4 | 0.93 | 170' | 350' | С | 24.9 | 0.63 | <25 | 65' |
| Overall Intersection | В | 10.7 | 0.58 | | | С | 27.4 | 0.76 | | | В | 17.7 | 0.81 | | |
| | | | | US 54 | & Laker Pride | Road/Jack Cr | owell Road (| Signalized) | | | | | | | |
| Eastbound US 54 | В | 12.6 | 0.72 | 285' | 325' | Α | 9.9 | 0.69 | 305' | 355' | В | 12.3 | 0.58 | 245' | 420' |
| Westbound US 54 | В | 13.9 | 0.68 | 90' | 175' | Α | 7.4 | 0.55 | 250' | 330' | Α | 6.0 | 0.56 | 80' | 145' |
| Northbound Laker Pride Road | D | 40.2 | 0.75 | 95' | 155' | D | 42.7 | 0.78 | 110' | 180' | D | 41.8 | 0.47 | 40' | 80' |
| Southbound Jack Crowell Road | С | 33.0 | 0.35 | 30' | 75' | С | 26.1 | 0.35 | 30' | 65' | D | 36.4 | 0.37 | 25' | 60' |
| Overall Intersection | В | 16.2 | 0.85 | | | В | 12.1 | 0.86 | | | В | 10.4 | 0.74 | | |
| | = | - | | U | S 54 & Northb | ound MO 5 F | Ramps (Signa | lized) | • | | | - | | • | |
| Eastbound US 54 | Α | 7.6 | 0.60 | 100' | 160' | Α | 9.4 | 0.60 | 140' | 165' | В | 11.0 | 0.47 | 180' | 225' |
| Westbound US 54 | Α | 6.4 | 0.44 | 160' | 195' | Α | 6.4 | 0.68 | 145' | 150' | Α | 3.0 | 0.60 | 105' | 185' |
| Northbound MO 5 Off-Ramp | D | 36.9 | 0.55 | 120' | 170' | D | 41.1 | 0.60 | 135' | 185' | D | 36.7 | 0.59 | 120' | 165' |
| Overall Intersection | В | 11.9 | 0.58 | | | В | 11.8 | 0.69 | | | В | 10.1 | 0.65 | | |
| | | | • | US | 54 & Southbo | und MO 5 Ra | amps (Unsign | alized) | | | | • | | | |
| Eastbound US 54 | Α | <1.0 | 0.30 | | <25' | Α | <1.0 | 0.35 | | <25' | Α | <1.0 | 0.30 | | <25' |
| Westbound US 54 | Α | <1.0 | 0.24 | | <25' | Α | <1.0 | 0.38 | | <25' | Α | <1.0 | 0.33 | | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | D | 25.1 | 0.67 | | 125' | С | 21.6 | 0.53 | | 75' | С | 18.7 | 0.48 | | 65' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | В | 10.4 | 0.21 | | <25' | В | 10.1 | 0.14 | | <25' | В | 10.1 | 0.17 | | <25' |
| Overall Intersection | Α | 3.9 | 0.54 | | | Α | 1.9 | 0.52 | | | Α | 1.9 | 0.48 | | |
| | | | | | US 54 & Bu | siness Route | 5 (Signalized |) | | | | | | | |
| Eastbound US 54 | D | 49.0 | 0.89 | 435' | 565' | D | 53.3 | 0.95 | 505' | 595' | С | 34.8 | 0.68 | 220' | 340' |
| Westbound US 54 | С | 33.6 | 0.79 | 180' | 245' | D | 49.6 | 0.96 | 655' | 660' | С | 26.9 | 0.66 | 190' | 395' |
| Northbound Business Route 5 | D | 40.9 | 0.75 | 65' | 105' | D | 47.9 | 0.84 | 195' | 225' | D | 44.9 | 0.73 | 125' | 190' |
| Southbound Business Route 5 | D | 53.6 | 0.83 | 235' | 335' | D | 50.8 | 0.60 | 55' | 90' | D | 54.8 | 0.83 | 100' | 175' |
| Overall Intersection | D | 43.6 | 0.81 | | | D | 50.5 | 0.83 | | | D | 36.6 | 0.78 | | |



Table 30: Intersection Operating Conditions – 2024 Build (Phase 1) (VISSIM)

| | | Nover | nber AM Peak H | our | | November P | M Peak Hour | | | August PN | 1 Peak Hour | |
|---|-----|-------|------------------|------------------|--------------------|--------------------|------------------|------------------|-----|-----------|------------------|------------------|
| Intersection/Approach | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue |
| | | | | l | JS 54 & Cecil Stre | et (Signalized) | | | | | | |
| Eastbound US 54 | Α | 7.1 | 30' | 240' | В | 14.4 | 75' | 230' | В | 11.4 | 45' | 330' |
| Westbound US 54 | В | 10.3 | 30' | 395' | В | 16.8 | 95' | 805' | В | 18.0 | 160' | 1250' |
| Southbound Cecil Street | С | 20.1 | <25' | 85' | С | 27.3 | 50' | 415' | С | 26.5 | <25' | 185' |
| Overall Intersection | Α | 9.0 | | | В | 17.1 | | | В | 15.8 | | |
| | | | | US 54 & Lake | r Pride Road/Jack | Crowell Road (Sig | gnalized) | | | | | |
| Eastbound US 54 | Α | 8.0 | 30' | 335' | Α | 6.7 | 25' | 380' | А | 8.0 | 30' | 325' |
| Westbound US 54 | Α | 9.9 | 35' | 260' | В | 10.3 | 50' | 740' | А | 8.0 | 40' | 780' |
| Northbound Laker Pride Road | D | 46.6 | 50' | 305' | D | 35.7 | 50' | 315' | С | 31.3 | <25' | 120' |
| Southbound Jack Crowell Road | D | 38.2 | <25' | 95' | С | 24.7 | <25' | 85' | С | 32.9 | <25' | 115' |
| Overall Intersection | В | 13.0 | | | В | 11.5 | | | Α | 9.3 | | |
| | | | | US 54 & | Northbound MO | 5 Ramps (Signaliz | ed) | | | | | |
| Eastbound US 54 | Α | 6.8 | 25' | 290' | Α | 8.0 | 30' | 270' | В | 10.3 | 35' | 270' |
| Westbound US 54 | Α | 3.4 | <25' | 180' | Α | 3.5 | <25' | 280' | А | 4.4 | <25' | 480' |
| Northbound MO 5 Off-Ramp | D | 44.8 | 70' | 290' | D | 46.2 | 75' | 270' | D | 46.3 | 75' | 280' |
| Overall Intersection | В | 11.6 | | | В | 10.5 | | | В | 11.9 | | |
| | • | | | US 54 & S | outhbound MO 5 | Ramps (Unsignal | ized) | - | | | - | • |
| Eastbound US 54 | Α | 0.3 | <25' | <25' | Α | 0.3 | <25' | <25' | А | 0.3 | <25' | <25' |
| Westbound US 54 | Α | 0.8 | <25' | <25' | Α | 1.5 | <25' | 60' | А | 1.9 | <25' | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | Α | 5.6 | <25' | 190' | Α | 4.6 | <25' | 150' | А | 4.1 | <25' | 125' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | Α | 2.4 | <25' | 75' | Α | 3.3 | <25' | 75' | Α | 2.5 | <25' | 65' |
| Overall Intersection | Α | 1.3 | | | Α | 1.3 | | | Α | 1.5 | | |
| | - | | | US ! | 54 & Business Ro | ute 5 (Signalized) | | | | | | |
| Eastbound US 54 | С | 33.2 | 150' | 565' | С | 28.2 | 125' | 550' | С | 32.4 | 120' | 420' |
| Westbound US 54 | С | 28.4 | 115' | 455' | С | 24.3 | 100' | 615' | С | 23.6 | 105' | 580' |
| Northbound Business Route 5 | С | 33.6 | <25' | 130' | D | 48.9 | 130' | 1205' | D | 36.4 | 35' | 225' |
| Southbound Business Route 5 | D | 44.7 | 90' | 455' | D | 45.2 | 25' | 125' | D | 44.5 | 70' | 220' |
| Overall Intersection | С | 33.8 | | | С | 31.9 | | | С | 31.6 | | |



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Table 31: MO 5 Capacity Analysis – 2024 Build (Phase 1) (VISSIM)

| Traffic | | | | | | Nov | ember AM Peak ho | ur | | Nov | ember PM Peak Ho | ur | | Αι | ıgust PM Peak Hour | |
|--------------------|--|-----------|---------|-------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|
| Volume Scenario | Segment | Direction | Type | Lanes | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume |
| | | | | | | | Southbo | ound MO 5 | | | | | | | | |
| 2024 | Before US 54 Interchange | SB | Basic | 2 | Α | 5.0 | 61.0 | 587 | Α | 8.1 | 60.0 | 944 | Α | 8.3 | 60.0 | 974 |
| 2024 | US 54 Off-Ramp | SB | Diverge | 3 | Α | 3.1 | 64.0 | 583 | Α | 4.9 | 64.0 | 944 | Α | 5.1 | 64.0 | 974 |
| 2024 | Between US 54 Ramps | SB | Basic | 2 | Α | 3.3 | 64.0 | 418 | Α | 6.6 | 64.0 | 838 | Α | 6.5 | 64.0 | 835 |
| 2024 | Between US 54 On-Ramp and US 54 Off-Ramp | SB | Weave | 3 | Α | 4.2 | 50.0 | 622 | Α | 7.9 | 53.0 | 1255 | Α | 8.2 | 53.0 | 1288 |
| 2024 | Between US 54 Ramps | SB | Basic | 2 | Α | 2.3 | 62.0 | 292 | Α | 8.2 | 63.0 | 1029 | Α | 8.4 | 63.0 | 1052 |
| 2024 | US 54 On-Ramp | SB | Merge | 3 | Α | 1.9 | 64.0 | 360 | Α | 5.9 | 63.0 | 1128 | Α | 6.0 | 64.0 | 1138 |
| 2024 | After US 54 Interchange | SB | Basic | 2 | Α | 2.8 | 65.0 | 357 | Α | 8.8 | 64.0 | 1127 | Α | 8.9 | 64.0 | 1137 |
| | | | | | | | Northbo | ound MO 5 | | | | | | | | |
| 2024 | Before US 54 Interchange | NB | Basic | 2 | Α | 7.2 | 60.0 | 835 | Α | 9.4 | 60.0 | 1090 | Α | 9.4 | 60.0 | 1090 |
| 2024 | US 54 Off-Ramp | NB | Diverge | 3 | Α | 4.4 | 63.0 | 835 | Α | 5.8 | 63.0 | 1089 | Α | 5.8 | 63.0 | 1089 |
| 2024 | Between US 54 Ramps | NB | Basic | 2 | Α | 3.0 | 65.0 | 390 | Α | 4.8 | 64.0 | 616 | Α | 4.8 | 64.0 | 622 |
| 2024 | US 54 On-Ramp | NB | Merge | 3 | Α | 3.3 | 63.0 | 617 | Α | 6.0 | 62.0 | 1129 | Α | 6.3 | 62.0 | 1169 |
| 2024 | After US 54 Interchange | NB | Basic | 2 | Α | 4.8 | 64.0 | 615 | Α | 8.9 | 64.0 | 1134 | Α | 9.2 | 64.0 | 1171 |



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2030 No-Build Operations

The 2030 No-Build traffic volumes were evaluated in SYNCHRO and VISSIM. The SYNCHRO evaluations are summarized in **Table 32** for the November AM, November PM, and August PM peak hours. The VISSIM evaluations are summarized in **Table 33** and **Table 34** for the November AM, November PM, and August PM peak hours.

The SYNCHRO results show that the overall operating conditions of all study intersections are expected to operate at an acceptable level of service (LOS D or better) during all peak hours except for the US 54 and Business Route 5 intersection which is expected to operate at LOS E during the November PM peak hour. Furthermore, all individual intersection approaches are expected to operate at an acceptable LOS during all peak hours, except for the following approaches:

- Southbound Business Route 5 at US 54 during the November AM peak hour (LOS E);
- Westbound US 54 at Business Route 5 during the November PM peak hour (LOS E); and
- Eastbound US 54 at Business Route 5 during the November AM and PM peak hours (LOS E).

The VISSIM results show that all sections of MO 5 are expected to operate at an acceptable LOS during all peak hours. Also, the VISSIM results show that the overall operating conditions of all study intersections are expected to operate at an acceptable level of service during all peak hours except for US 54 at Laker Pride Road/Jack Crowell Road and Cecil Street intersections which are expected to operate at LOS E or worse during the November and August PM peak hours. Furthermore, all individual intersection approaches are expected to operate at an acceptable LOS during all peak hours, except for the following approaches:

- Westbound US 54 at Cecil Street during the November and August PM peak hours (LOS F);
- Southbound Cecil Street at US 54 during the November and August PM peak hours (LOS F and LOS E);
- Westbound US 54 at Laker Pride Road/Jack Crowell Road during the November AM, November PM, and August PM peak hours (LOS E, LOS F, and LOS F);
- Eastbound US 54 at Northbound MO 5 Ramps during the November AM peak hour (LOS E);
- Northbound MO 5 Off-Ramp at US 54 during the November AM peak hour (LOS E);
- Southbound MO 5 Off-Ramp at US 54 during the November AM peak hour (LOS F); and
- Northbound Business Route 5 at US 54 during the November PM peak hour (LOS E).



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The undesirable operations shown above are largely due to the capacity constraint at the intersection of US 54 and Laker Pride Road/Jack Crowell Road. During the November AM peak, the existing shared through/right-turn at the eastbound US 54 approach does not provide adequate capacity for the heavy inbound November traffic, resulting in a maximum approach queue that reaches the northbound and southbound MO 5 ramps intersections, as shown in **Figure 49**. Furthermore, the existing two through lanes at the westbound US 54 approach still do not provide sufficient capacity during the November and August PM peak hours, which results in maximum approach queues that reach past the Cecil Street, as shown in **Figure 50** and **Figure 51**, respectively.

Overall, the results show that intersection operations are expected to degrade under 2030 No-Build conditions from 2024 No-Build conditions due to the increase in traffic volumes. The results show that the westbound US 54 bottleneck is expected to worsen during the November and August PM peak hours, as well as an eastbound US 54 bottleneck is expected to develop during the November AM peak hour.





Figure 49: Maximum Eastbound US 54 Approach Queue at Laker Pride Road – 2030 No-Build November AM



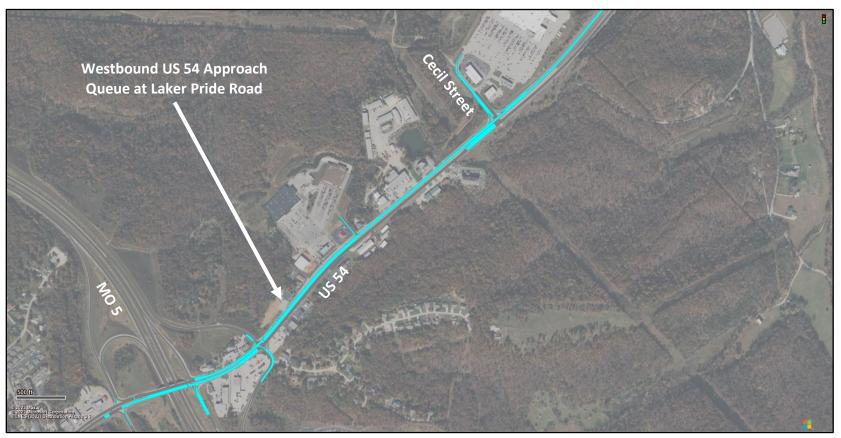


Figure 50: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2030 No-Build November PM





Figure 51: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2030 No-Build August PM



Table 32: Intersection Operating Conditions – 2030 No-Build (SYNCHRO)

| | | Nov | ember AM Pe | | tion Operat | U | | mber PM Peal | | | | Aug | ust PM Peak I | lour | |
|---|-----|-------|------------------|------------------|------------------|----------------|---------------|------------------|------------------|------------------|-----|-------|------------------|------------------|------------------|
| Intersection/Approach | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue |
| | | | | | US 54 & | Cecil Street (| (Signalized) | | | | | | | | |
| Eastbound US 54 | В | 10.0 | 0.64 | 165' | 250' | В | 19.6 | 0.77 | 340' | 405' | В | 11.0 | 0.57 | 135' | 220' |
| Westbound US 54 | В | 16.8 | 0.70 | 225' | 340' | D | 35.8 | 0.94 | 650' | 860' | D | 50.9 | 1.04 | 785' | 1065' |
| Southbound Cecil Street | С | 21.0 | 0.45 | <25 | 50' | D | 48.5 | 0.95 | 145' | 355' | С | 21.2 | 0.63 | <25 | 65' |
| Overall Intersection | В | 13.2 | 0.61 | | | С | 30.0 | 0.82 | | | С | 33.5 | 0.86 | | |
| | | | | US 54 | & Laker Pride | Road/Jack Cr | owell Road (| Signalized) | | | | | | | |
| Eastbound US 54 | С | 27.8 | 0.99 | 200' | 760' | С | 26.1 | 0.92 | 370' | 485' | С | 21.0 | 0.87 | 305' | 415' |
| Westbound US 54 | В | 19.5 | 0.81 | 225' | 280' | С | 27.8 | 0.92 | 675' | 820' | D | 35.4 | 0.96 | 755' | 995' |
| Northbound Laker Pride Road | D | 38.7 | 0.79 | 85' | 185' | D | 54.8 | 0.88 | 125' | 255' | С | 32.3 | 0.27 | 35' | 75' |
| Southbound Jack Crowell Road | С | 28.3 | 0.33 | <25 | 70' | С | 28.9 | 0.42 | 30' | 70' | С | 29.4 | 0.24 | 25' | 60' |
| Overall Intersection | С | 25.7 | 0.96 | | | С | 29.5 | 0.92 | | | С | 29.3 | 0.88 | | |
| | | - | • | U | S 54 & Northb | ound MO 5 F | Ramps (Signa | lized) | | | | | | | |
| Eastbound US 54 | С | 25.9 | 0.84 | 415' | 520' | С | 33.6 | 0.82 | 480' | 580' | С | 26.0 | 0.71 | 380' | 460' |
| Westbound US 54 | Α | 4.8 | 0.50 | 65' | 75' | Α | 3.3 | 0.76 | 75' | 90' | Α | 1.4 | 0.67 | 25' | 30' |
| Northbound MO 5 Off-Ramp | С | 26.4 | 0.61 | 85' | 135' | С | 30.9 | 0.54 | 130' | 180' | С | 27.4 | 0.42 | 120' | 165' |
| Overall Intersection | В | 18.0 | 0.63 | | | В | 17.6 | 0.76 | | | В | 13.1 | 0.70 | | |
| | | - | • | US | 54 & Southbo | und MO 5 Ra | amps (Unsign | alized) | | | | | | | |
| Eastbound US 54 | Α | <1.0 | 0.33 | | <25' | Α | <1.0 | 0.39 | | <25' | Α | <1.0 | 0.34 | - | <25' |
| Westbound US 54 | Α | <1.0 | 0.26 | | <25' | Α | <1.0 | 0.42 | | <25' | Α | <1.0 | 0.37 | | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | D | 34.9 | 0.78 | | 175' | D | 28.0 | 0.63 | | 105' | С | 22.6 | 0.57 | | 90' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | В | 10.5 | 0.24 | | 25' | В | 10.9 | 0.18 | | <25' | В | 10.4 | 0.20 | | <25' |
| Overall Intersection | Α | 5.1 | 0.58 | | | Α | 2.3 | 0.56 | | | Α | 2.2 | 0.52 | | |
| | | | | | US 54 & Bu | siness Route | 5 (Signalized |) | | | | | | | |
| Eastbound US 54 | Е | 57.0 | 0.93 | 520' | 640' | Е | 69.7 | 1.02 | 600' | 715' | D | 37.7 | 0.62 | 245' | 410' |
| Westbound US 54 | D | 39.2 | 0.80 | 325' | 405' | Е | 60.6 | 1.01 | 745' | 830' | D | 39.8 | 0.80 | 365' | 590' |
| Northbound Business Route 5 | D | 35.9 | 0.52 | 75' | 120' | D | 53.0 | 0.81 | 190' | 280' | D | 44.1 | 0.68 | 115' | 220' |
| Southbound Business Route 5 | Е | 61.9 | 0.83 | 285' | 415' | D | 50.0 | 0.44 | 55' | 95' | D | 48.3 | 0.64 | 95' | 175' |
| Overall Intersection | D | 49.3 | 0.83 | | | E | 61.5 | 0.85 | | | D | 41.3 | 0.80 | | |



Table 33: Intersection Operating Conditions – 2030 No-Build (VISSIM)

| | | Noven | nber AM Peak H | our | I | | M Peak Hour | , | | August PN | Л Peak Hour | |
|---|-----|-------|------------------|------------------|--------------------|--------------------|------------------|------------------|-----|-----------|------------------|------------------|
| Intersection/Approach | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue |
| | | | | l | US 54 & Cecil Stre | et (Signalized) | | | | | | |
| Eastbound US 54 | Α | 6.3 | 30' | 520' | В | 14.3 | 80' | 385' | Α | 9.4 | 45' | 475' |
| Westbound US 54 | В | 12.3 | 40' | 435' | F | 143.9 | 2975' | 3285' | F | 101.5 | 2895' | 3280' |
| Southbound Cecil Street | В | 15.6 | <25' | 100' | F | 137.2 | 700' | 870' | Е | 69.4 | 85' | 385' |
| Overall Intersection | Α | 9.2 | | | F | 81.6 | | | E | 60.8 | | |
| | | | | US 54 & Lake | r Pride Road/Jack | Crowell Road (Si | gnalized) | | | | | |
| Eastbound US 54 | С | 31.6 | 460' | 870' | С | 23.7 | 230' | 840' | С | 24.9 | 185' | 805' |
| Westbound US 54 | E | 56.1 | 345' | 835' | F | 113.4 | 2835' | 3380' | F | 100.1 | 2785' | 3370' |
| Northbound Laker Pride Road | С | 24.6 | 25' | 275' | D | 40.3 | 65' | 400' | С | 25.9 | <25' | 90' |
| Southbound Jack Crowell Road | С | 23.7 | <25' | 70' | С | 31.3 | <25' | 95' | С | 34.4 | <25' | 95' |
| Overall Intersection | D | 39.9 | | | E | 65.5 | | | E | 63.9 | | |
| | - | • | | US 54 & | Northbound MO | 5 Ramps (Signaliz | ed) | | | | | |
| Eastbound US 54 | Е | 59.7 | 400' | 890' | С | 33.2 | 155' | 705' | С | 29.7 | 110' | 565' |
| Westbound US 54 | В | 14.3 | 70' | 650' | В | 14.1 | 195' | 865' | В | 13.7 | 170' | 860' |
| Northbound MO 5 Off-Ramp | E | 60.9 | 85' | 505' | D | 44.8 | 60' | 310' | D | 38.1 | 55' | 250' |
| Overall Intersection | D | 42.8 | | | С | 25.2 | | | С | 22.7 | | |
| | - | | | US 54 & 9 | Southbound MO 5 | Ramps (Unsignal | ized) | | | | | |
| Eastbound US 54 | С | 18.6 | 35' | 590' | А | 1.3 | <25' | 55' | А | 0.4 | <25' | <25' |
| Westbound US 54 | А | 1.2 | <25' | <25' | А | 1.2 | <25' | <25' | Α | 1.4 | <25' | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | F | 115.9 | 775' | 1885' | Α | 9.5 | <25' | 205' | Α | 5.8 | <25' | 155' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | Α | 2.9 | <25' | 120' | Α | 2.4 | <25' | 70' | Α | 2.2 | <25' | 75' |
| Overall Intersection | С | 22.5 | | | Α | 1.9 | | | Α | 1.4 | | |
| | - | - | | US | 54 & Business Ro | ute 5 (Signalized) | | | | | | |
| Eastbound US 54 | D | 36.4 | 170' | 705' | С | 30.7 | 145' | 660' | С | 32.4 | 120' | 450' |
| Westbound US 54 | С | 31.4 | 120' | 565' | С | 33.2 | 145' | 650' | С | 30.0 | 120' | 490' |
| Northbound Business Route 5 | С | 27.8 | <25' | 130' | Е | 56.5 | 205' | 1490' | С | 34.9 | 35' | 235' |
| Southbound Business Route 5 | D | 46.3 | 95' | 485' | D | 41.2 | 25' | 115' | D | 38.8 | 60' | 205' |
| Overall Intersection | D | 35.5 | | | D | 37.6 | | | С | 32.9 | | |



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Table 34: MO 5 Capacity Analysis – 2030 No-Build (VISSIM)

| Traffic | | | | | | Nov | ember AM Peak ho | ur | | Nov | ember PM Peak Ho | ur | | Αι | ıgust PM Peak Hour | - |
|--------------------|--|-----------|---------|-------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|
| Volume Scenario | Segment | Direction | Type | Lanes | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume |
| | | - | | - | | | Southbo | ound MO 5 | | - | | | | | | |
| 2030 | Before US 54 Interchange | SB | Basic | 2 | Α | 5.4 | 60.0 | 642 | Α | 9.0 | 60.0 | 1054 | Α | 9.3 | 60.0 | 1083 |
| 2030 | US 54 Off-Ramp | SB | Diverge | 3 | Α | 3.3 | 64.0 | 638 | Α | 5.5 | 64.0 | 1052 | Α | 5.7 | 64.0 | 1081 |
| 2030 | Between US 54 Ramps | SB | Basic | 2 | Α | 3.6 | 63.0 | 454 | Α | 7.2 | 64.0 | 923 | Α | 7.2 | 64.0 | 916 |
| 2030 | Between US 54 On-Ramp and US 54 Off-Ramp | SB | Weave | 3 | В | 19.6 | 27.0 | 672 | Α | 8.5 | 53.0 | 1348 | Α | 8.6 | 53.0 | 1362 |
| 2030 | Between US 54 Ramps | SB | Basic | 2 | Α | 2.6 | 62.0 | 319 | Α | 8.8 | 63.0 | 1103 | Α | 8.9 | 63.0 | 1115 |
| 2030 | US 54 On-Ramp | SB | Merge | 3 | Α | 2.1 | 63.0 | 402 | Α | 6.4 | 63.0 | 1216 | Α | 6.4 | 63.0 | 1214 |
| 2030 | After US 54 Interchange | SB | Basic | 2 | Α | 3.1 | 64.0 | 400 | Α | 9.6 | 64.0 | 1217 | Α | 9.5 | 64.0 | 1214 |
| | | | | | | | Northbo | ound MO 5 | | | | | | | | |
| 2030 | Before US 54 Interchange | NB | Basic | 2 | Α | 7.9 | 60.0 | 920 | Α | 10.3 | 60.0 | 1196 | Α | 10.2 | 60.0 | 1189 |
| 2030 | US 54 Off-Ramp | NB | Diverge | 3 | Α | 4.9 | 62.0 | 920 | Α | 6.3 | 63.0 | 1193 | Α | 6.3 | 63.0 | 1187 |
| 2030 | Between US 54 Ramps | NB | Basic | 2 | Α | 3.3 | 65.0 | 427 | Α | 5.2 | 64.0 | 674 | Α | 5.2 | 64.0 | 670 |
| 2030 | US 54 On-Ramp | NB | Merge | 3 | Α | 3.6 | 63.0 | 675 | Α | 6.6 | 62.0 | 1235 | Α | 6.6 | 62.0 | 1238 |
| 2030 | After US 54 Interchange | NB | Basic | 2 | Α | 5.2 | 64.0 | 675 | Α | 9.7 | 64.0 | 1236 | Α | 9.7 | 64.0 | 1241 |



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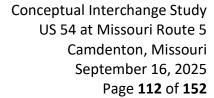
2030 Build Operations (Phase 1)

The 2030 Build (Phase 1) traffic volumes were evaluated in SYNCHRO and VISSIM. The SYNCHRO evaluations are summarized in **Table 35** for the November AM, November PM, and August PM peak hours. The VISSIM evaluations are summarized in **Table 36** and **Table 37** for the November AM, November PM, and August PM peak hours.

As can be seen in the SYNCHRO 10 and VISSIM results, the overall operating conditions of all study area intersections and individual intersection approaches are expected to operate at acceptable level of service (LOS D or better) during all peak hours. Furthermore, the VISSIM results show that all sections of MO 5 are expected to operate at acceptable LOS during all peak hours. Note that the operational improvements at the US 54 and Business Route 5 intersections can be attributed to signal timing adjustments.

Furthermore, **Figure 52**, **Figure 53**, and **Figure 54** show that the maximum queues for the eastbound and westbound approaches at Laker Pride Road/Jack Crowell Road are expected to decrease considerably during the November AM, November PM, and August PM peak hours, respectively, from 2030 No-Build conditions and are not expected to impact adjacent signalized intersections.

Overall, the proposed Boulevard (Phase 1) concept improvements are expected to address mobility concerns along US 54 by providing additional lane capacity at US 54 and Laker Pride Road/Jack Crowell Road, which is expected to relieve the eastbound and westbound US 54 bottlenecks.





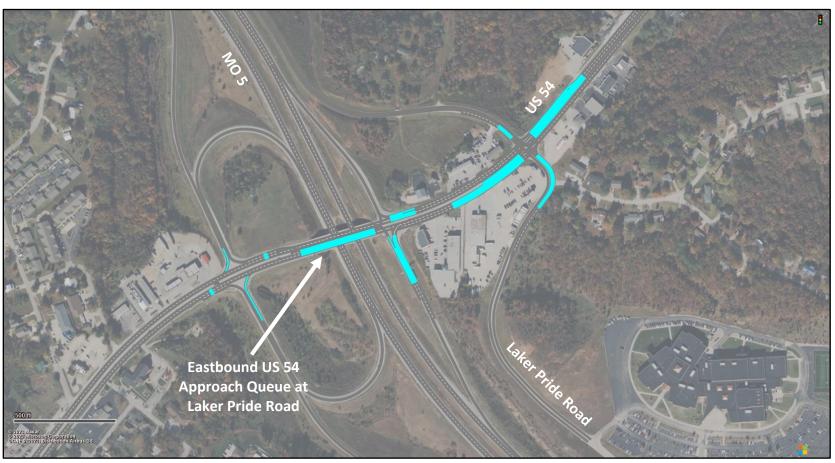


Figure 52: Maximum Eastbound US 54 Approach Queue at Laker Pride Road – 2030 Build (Phase 1) November AM



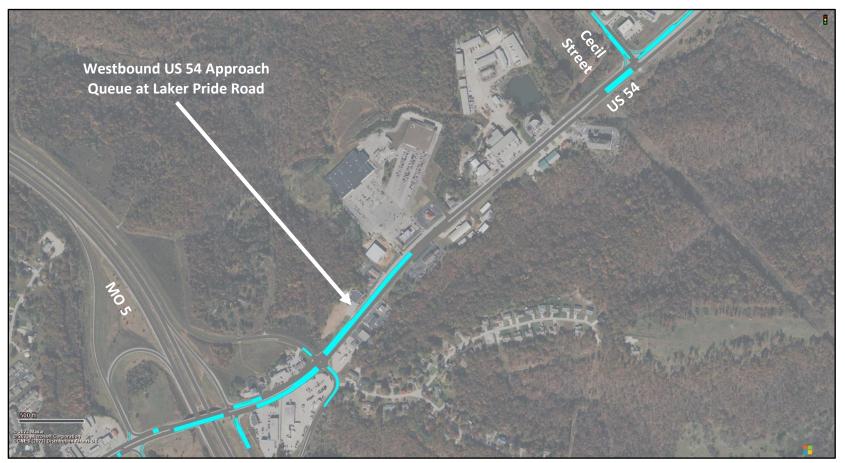


Figure 53: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2030 Build (Phase 1) November PM



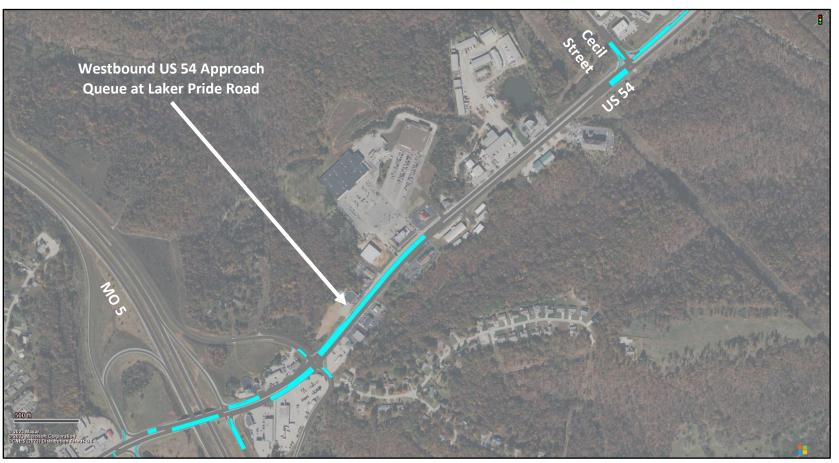


Figure 54: Maximum Westbound US 54 Approach Queue at Laker Pride Road – 2030 Build (Phase 1) August PM



Table 35: Intersection Operating Conditions – 2030 Build (Phase 1) (SYNCHRO)

| | | Nav | | | Operating | | | • | • | , | | A | est DNA Deale I | 1 | |
|---|-----|-------|------------------|------------------|------------------|----------------|---------------|------------------|------------------|------------------|-----|-------|------------------|------------------|------------------|
| | | Nov | ember AM Pe | T | | | Nover | mber PM Peal | r | T | | Augi | ıst PM Peak I | | T |
| Intersection/Approach | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue |
| | | | | | US 54 & | Cecil Street (| Signalized) | | | | | | | | |
| Eastbound US 54 | Α | 8.4 | 0.56 | 75' | 85' | В | 19.1 | 0.91 | 145' | 205' | В | 10.4 | 0.66 | 80' | 115' |
| Westbound US 54 | В | 11.6 | 0.53 | 235' | 345' | D | 38.1 | 0.95 | 685' | 865' | С | 28.9 | 0.95 | 735' | 1085' |
| Southbound Cecil Street | С | 29.1 | 0.54 | <25 | 55' | D | 49.6 | 0.94 | 185' | 375' | С | 24.2 | 0.66 | <25 | 70' |
| Overall Intersection | В | 10.7 | 0.61 | | | С | 30.9 | 0.82 | | | С | 21.3 | 0.86 | | |
| | | | | US 54 | & Laker Pride | Road/Jack Cr | owell Road (S | Signalized) | | | | | | | |
| Eastbound US 54 | В | 14.0 | 0.82 | 280' | 320' | С | 23.6 | 0.86 | 410' | 450' | В | 12.3 | 0.71 | 215' | 360' |
| Westbound US 54 | В | 18.9 | 0.91 | 120' | 280' | Α | 5.7 | 0.64 | 85' | 95' | Α | 7.1 | 0.78 | 90' | 110' |
| Northbound Laker Pride Road | D | 35.5 | 0.69 | 100' | 185' | D | 53.5 | 0.79 | 125' | 240' | С | 34.3 | 0.31 | 35' | 80' |
| Southbound Jack Crowell Road | С | 32.3 | 0.30 | 30' | 80' | С | 26.0 | 0.34 | 30' | 65' | С | 31.1 | 0.27 | 25' | 60' |
| Overall Intersection | В | 18.2 | 0.90 | | | В | 17.9 | 0.88 | | | В | 10.5 | 0.79 | | |
| | | - | | U | S 54 & Northb | ound MO 5 F | Ramps (Signal | lized) | | | | | | | |
| Eastbound US 54 | В | 14.1 | 0.74 | 210' | 245' | В | 18.1 | 0.79 | 215' | 250' | В | 19.7 | 0.65 | 235' | 280' |
| Westbound US 54 | Α | 4.1 | 0.49 | 80' | 95' | Α | 4.0 | 0.76 | 75' | 90' | Α | 3.2 | 0.67 | 55' | 80' |
| Northbound MO 5 Off-Ramp | С | 33.2 | 0.48 | 125' | 180' | С | 33.3 | 0.54 | 135' | 190' | С | 29.0 | 0.43 | 120' | 170' |
| Overall Intersection | В | 13.4 | 0.63 | | | В | 12.7 | 0.76 | | | В | 12.2 | 0.70 | | |
| | | • | | US | 54 & Southbo | und MO 5 Ra | mps (Unsign | alized) | | | | | | | |
| Eastbound US 54 | Α | <1.0 | 0.33 | | <25' | Α | <1.0 | 0.39 | | <25' | Α | <1.0 | 0.34 | | <25' |
| Westbound US 54 | Α | <1.0 | 0.26 | | <25' | Α | <1.0 | 0.42 | | <25' | Α | <1.0 | 0.37 | | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | D | 34.9 | 0.78 | | 175' | D | 28.0 | 0.63 | | 105' | С | 22.6 | 0.57 | | 90' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | В | 10.5 | 0.24 | | 25' | В | 10.9 | 0.18 | | <25' | В | 10.4 | 0.20 | | <25' |
| Overall Intersection | Α | 5.1 | 0.58 | | | Α | 2.3 | 0.56 | | | Α | 2.2 | 0.52 | | |
| | | | | | US 54 & Bu | siness Route | 5 (Signalized |) | | | | | | | |
| Eastbound US 54 | D | 50.8 | 0.91 | 495' | 570' | D | 48.2 | 0.92 | 520' | 535' | D | 35.1 | 0.68 | 235' | 365' |
| Westbound US 54 | С | 34.2 | 0.85 | 240' | 300' | D | 39.0 | 0.94 | 670' | 660' | С | 29.1 | 0.69 | 215' | 425' |
| Northbound Business Route 5 | D | 41.9 | 0.76 | 65' | 105' | D | 50.9 | 0.86 | 185' | 240' | D | 45.1 | 0.73 | 125' | 190' |
| Southbound Business Route 5 | D | 53.8 | 0.85 | 250' | 350' | D | 50.8 | 0.58 | 55' | 90' | D | 54.6 | 0.83 | 100' | 175' |
| Overall Intersection | D | 44.6 | 0.83 | | | D | 45.0 | 0.85 | | | D | 37.4 | 0.80 | | |



Table 36: Intersection Operating Conditions – 2030 Build (Phase 1) (VISSIM)

| | | Nover | nber AM Peak Ho | our | | November P | M Peak Hour | | | August PN | /I Peak Hour | |
|---|-----|-------|------------------|------------------|--------------------|--------------------|------------------|------------------|-----|-----------|------------------|------------------|
| Intersection/Approach | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue |
| | | | | l | JS 54 & Cecil Stre | et (Signalized) | | | | | | |
| Eastbound US 54 | Α | 7.7 | 45' | 160' | В | 15.0 | 90' | 260' | В | 10.5 | 55' | 165' |
| Westbound US 54 | В | 11.0 | 35' | 465' | С | 23.4 | 190' | 1230' | С | 27.4 | 390' | 1905' |
| Southbound Cecil Street | В | 18.9 | <25' | 85' | С | 33.7 | 85' | 505' | С | 30.6 | 30' | 215' |
| Overall Intersection | Α | 9.6 | | | С | 20.9 | | | С | 20.9 | | |
| | | | | US 54 & Lake | r Pride Road/Jack | Crowell Road (Sig | gnalized) | | | | | |
| Eastbound US 54 | В | 11.8 | 60' | 415' | В | 16.5 | 95' | 560' | В | 12.2 | 55' | 400' |
| Westbound US 54 | В | 17.0 | 80' | 385' | В | 15.1 | 105' | 1025' | В | 14.8 | 130' | 1225' |
| Northbound Laker Pride Road | D | 46.4 | 55' | 305' | D | 42.7 | 70' | 365' | С | 32.1 | <25' | 105' |
| Southbound Jack Crowell Road | D | 36.1 | <25' | 90' | С | 25.6 | <25' | 90' | С | 33.3 | <25' | 85' |
| Overall Intersection | В | 17.4 | | | В | 18.4 | | | В | 14.7 | | |
| | | | | US 54 & | Northbound MO | 5 Ramps (Signaliz | ed) | | | | | |
| Eastbound US 54 | В | 12.0 | 50' | 380' | В | 13.8 | 60' | 400' | В | 17.7 | 70' | 375' |
| Westbound US 54 | Α | 3.0 | <25' | 130' | Α | 4.0 | <25' | 225' | Α | 3.9 | <25' | 250' |
| Northbound MO 5 Off-Ramp | D | 39.4 | 65' | 260' | D | 38.2 | 60' | 260' | D | 35.1 | 60' | 260' |
| Overall Intersection | В | 13.0 | | | В | 11.9 | | | В | 12.6 | | |
| | | | | US 54 & 9 | outhbound MO 5 | Ramps (Unsignal | ized) | | | | | |
| Eastbound US 54 | Α | 0.4 | <25' | <25' | Α | 0.4 | <25' | 25' | А | 0.3 | <25' | <25' |
| Westbound US 54 | Α | 1.1 | <25' | <25' | Α | 1.9 | <25' | 45' | А | 2.3 | <25' | 70' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | Α | 6.6 | <25' | 245' | Α | 5.8 | <25' | 195' | А | 4.8 | <25' | 145' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | Α | 3.1 | <25' | 120' | Α | 3.6 | <25' | 75' | Α | 3.0 | <25' | 95' |
| Overall Intersection | Α | 1.6 | | | Α | 1.6 | | | Α | 1.8 | | |
| | | | | US | 54 & Business Rou | ute 5 (Signalized) | | | | | | |
| Eastbound US 54 | С | 33.1 | 155' | 640' | С | 30.5 | 145' | 590' | С | 33.8 | 130' | 470' |
| Westbound US 54 | С | 32.2 | 155' | 565' | С | 29.5 | 155' | 675' | С | 26.6 | 120' | 600' |
| Northbound Business Route 5 | С | 34.9 | <25' | 150' | D | 50.7 | 150' | 1330' | D | 37.0 | 35' | 245' |
| Southbound Business Route 5 | D | 45.9 | 100' | 510' | D | 45.2 | 25' | 125' | D | 45.2 | 70' | 235' |
| Overall Intersection | D | 35.3 | | | D | 35.0 | | | С | 33.3 | | |



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Table 37: MO 5 Capacity Analysis – 2030 Build (Phase 1) (VISSIM)

| Traffic | | | | | | Nov | ember AM Peak ho | ur | | Nov | ember PM Peak Ho | ur | | Αι | ıgust PM Peak Hour | • |
|--------------------|--|-----------|---------|-------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|
| Volume Scenario | Segment | Direction | Type | Lanes | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume |
| | | | | | | | Southbo | ound MO 5 | | | | | | | | |
| 2030 | Before US 54 Interchange | SB | Basic | 2 | Α | 5.4 | 60.0 | 642 | Α | 9.0 | 60.0 | 1054 | Α | 9.3 | 60.0 | 1083 |
| 2030 | US 54 Off-Ramp | SB | Diverge | 3 | Α | 3.3 | 64.0 | 638 | Α | 5.5 | 64.0 | 1052 | Α | 5.7 | 64.0 | 1081 |
| 2030 | Between US 54 Ramps | SB | Basic | 2 | Α | 3.6 | 64.0 | 454 | Α | 7.2 | 64.0 | 923 | Α | 7.2 | 64.0 | 916 |
| 2030 | Between US 54 On-Ramp and US 54 Off-Ramp | SB | Weave | 3 | Α | 4.6 | 50.0 | 672 | Α | 8.7 | 53.0 | 1378 | Α | 8.9 | 53.0 | 1406 |
| 2030 | Between US 54 Ramps | SB | Basic | 2 | Α | 2.6 | 62.0 | 320 | Α | 9.0 | 63.0 | 1133 | Α | 9.2 | 63.0 | 1159 |
| 2030 | US 54 On-Ramp | SB | Merge | 3 | Α | 2.1 | 63.0 | 404 | Α | 6.6 | 63.0 | 1245 | Α | 6.6 | 63.0 | 1259 |
| 2030 | After US 54 Interchange | SB | Basic | 2 | Α | 3.1 | 64.0 | 403 | Α | 9.8 | 64.0 | 1243 | Α | 9.9 | 64.0 | 1257 |
| | | | | | | | Northbo | ound MO 5 | | | | | | | | |
| 2030 | Before US 54 Interchange | NB | Basic | 2 | Α | 7.9 | 60.0 | 920 | Α | 10.3 | 60.0 | 1196 | Α | 10.2 | 60.0 | 1189 |
| 2030 | US 54 Off-Ramp | NB | Diverge | 3 | Α | 4.9 | 62.0 | 920 | Α | 6.3 | 63.0 | 1193 | Α | 6.3 | 63.0 | 1187 |
| 2030 | Between US 54 Ramps | NB | Basic | 2 | Α | 3.3 | 65.0 | 427 | Α | 5.2 | 64.0 | 674 | Α | 5.2 | 64.0 | 670 |
| 2030 | US 54 On-Ramp | NB | Merge | 3 | Α | 3.6 | 63.0 | 675 | Α | 6.7 | 62.0 | 1241 | Α | 6.8 | 62.0 | 1271 |
| 2030 | After US 54 Interchange | NB | Basic | 2 | Α | 5.3 | 64.0 | 676 | Α | 9.7 | 64.0 | 1243 | Α | 10.0 | 64.0 | 1275 |



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2050 No-Build Operations

The 2050 No-Build traffic volumes were evaluated in SYNCHRO and VISSIM. The SYNCHRO evaluations are summarized in **Table 38** for the November AM, November PM, and August PM peak hours. The VISSIM evaluations are summarized in **Table 39** and **Table 40** for the November AM, November PM, and August PM peak hours.

The SYNCHRO results show that the overall operating conditions of the following intersections are expected to operate at undesirable LOS (LOS E or worse):

- US 54 and Cecil Street during the November and August PM peak hours (LOS F);
- US 54 and Laker Pride Road/Jack Crowell Road during the November AM, November PM, and August PM peak hours (LOS F); and
- US 54 and Business Route 5 during the November AM and PM peak hours (LOS E).

Additionally, the SYNCHRO results show that the following intersection approaches are expected to operate at undesirable LOS:

- Westbound US 54 at Cecil Street during the November and August PM peak hours (LOS F):
- Southbound Cecil Street at US 54 during the November PM peak hour (LOS F);
- Eastbound US 54 at Laker Pride Road/Jack Crowell Road during the November AM, November PM, and August PM peak hours (LOS F);
- Westbound US 54 at Laker Pride Road/Jack Crowell Road during the November and August PM peak hours (LOS F);
- Northbound Laker Pride Road at US 54 during the November AM and PM peak hours (LOS E and LOS F);
- Southbound Jack Crowell Road at US 54 during the November PM peak hour (LOS E);
- Eastbound US 54 at Northbound MO 5 ramps during the November AM, November PM, and August PM peak hours (LOS E, LOS F, and LOS F);
- Southbound MO 5 Off-Ramp at US 54 during the November AM, November PM, and August PM peak hours (LOS F);
- Eastbound US 54 at Business Route 5 during the November AM and PM peak hours (LOS F and LOS E);
- Westbound US 54 at Business Route 5 during the November and August PM peak hours (LOS E); and
- Southbound Business Route 5 at US 54 during the November AM peak hour (LOS E).



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The VISSIM results show that the overall operating conditions of the following intersections are expected to operate at an undesirable LOS:

- US 54 and Cecil Street during the November and August PM peak hours (LOS E and LOS F);
- US 54 and Laker Pride Road/Jack Crowell Road during the November AM, November PM, and August PM peak hours (LOS F, LOS E, and LOS F);
- US 54 and Northbound MO 5 ramps during the November AM and August PM peak hours (LOS E and LOS F); and
- US 54 and Southbound MO 5 ramps during the November AM and August PM peak hours (LOS E and LOS F).

The VISSIM results show that the following intersection approaches are expected to operate at undesirable LOS:

- Westbound US 54 at Cecil Street during the November and August PM peak hours (LOS F);
- Southbound Cecil Street at US 54 during the November and August PM peak hours (LOS F):
- Westbound US 54 at Laker Pride Road/Jack Crowell Road during the November AM, November PM, and August PM peak hours (LOS F);
- Northbound Laker Pride Road at US 54 during the November PM peak hour (LOS E);
- Southbound Jack Crowell Road at US 54 during the November AM, November PM, and August PM peak hours (LOS E, LOS E, and LOS F);
- Eastbound US 54 at Northbound MO 5 ramps during the November AM, November PM, and August PM peak hours (LOS E);
- Westbound US 54 at Northbound MO 5 ramps during the August PM peak hour (LOS F);
- Northbound MO 5 Ramps and US 54 during the November AM, November PM, and August PM peak hours (LOS F);
- Eastbound US 54 at Southbound MO 5 ramps during the November AM and PM peak hours (LOS F and LOS E);
- Westbound US 54 at Southbound MO 5 ramps during the August PM peak hour (LOS F);
- Southbound MO 5 Off-Ramp at US 54 during the November AM, November PM, and August PM peak hours (LOS F);
- Northbound Business Route 5 at US 54 during the November PM peak hour (LOS E); and
- Southbound Business Route 5 at US 54 during the November AM peak hour (LOS E).

The VISSIM results show that the following sections of southbound MO 5 are expected to operate at undesirable LOS:

- Before US 54 Interchange during the August PM peak hour (LOS F);
- US 54 Off-Ramp during the November AM and August PM peak hours (LOS E and LOS F);
- Between US 54 Ramps during the November AM, November PM, and August PM peak hours (LOS F, LOS E, and LOS F);



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• Between US 54 On-Ramp and US 54 Off-Ramp during the November AM, November PM, and August PM peak hours (LOS F);

The above undesirable LOS for segments of southbound MO 5 is caused by the eastbound US 54 approach queues at Laker Pride Road/Jack Crowell Road. As shown in **Figure 55**, **Figure** 56, and **Figure** 57 the approach queue reaches mainline southbound MO 5 during the November AM, November PM, and August PM peak hours, respectively, which increases the density and decreases the speed of the impacted segments of southbound MO 5.

Furthermore, **Figure 55**, **Figure** 56, and **Figure** 57 also show that the maximum westbound US 54 approach queues at several study intersections during the November AM, November PM, and August PM peak hours, respectively. As can be seen, these lengthy queues reach the limits of the models, resulting in approximately 66, 1773, and 3445 vehicles during the November AM, November PM, and August PM peak hours, respectively, are unable to enter the model due to capacity constraints on US 54.

Overall, the results show that several intersection approaches and intersections overall are expected to operate at failing level of service under 2050 No-Build conditions during all peak hours. Additional lane capacity along US 54 is needed to improve peak hour operations.



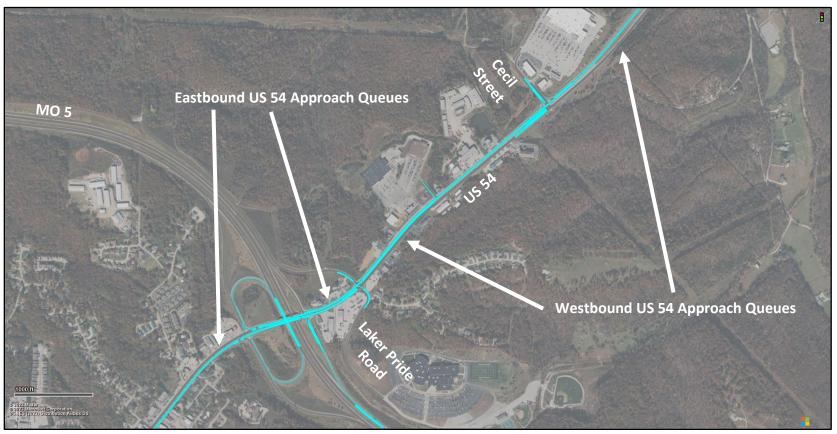


Figure 55: Maximum US 54 Approach Queues – 2050 No-Build November AM



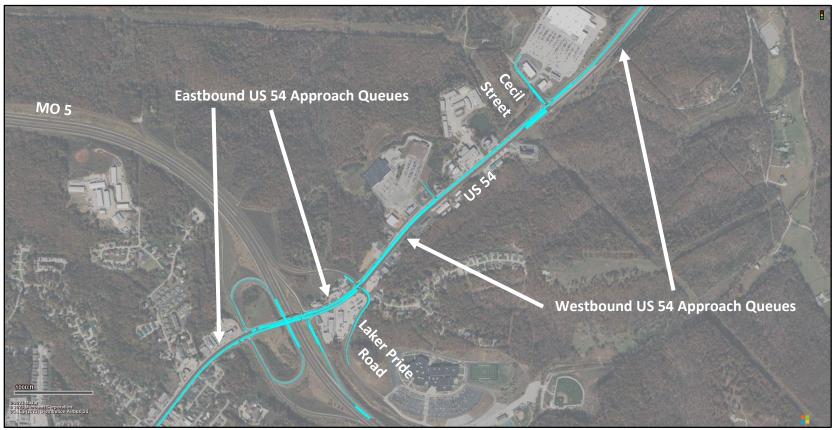


Figure 56: Maximum US 54 Approach Queues – 2050 No-Build November PM



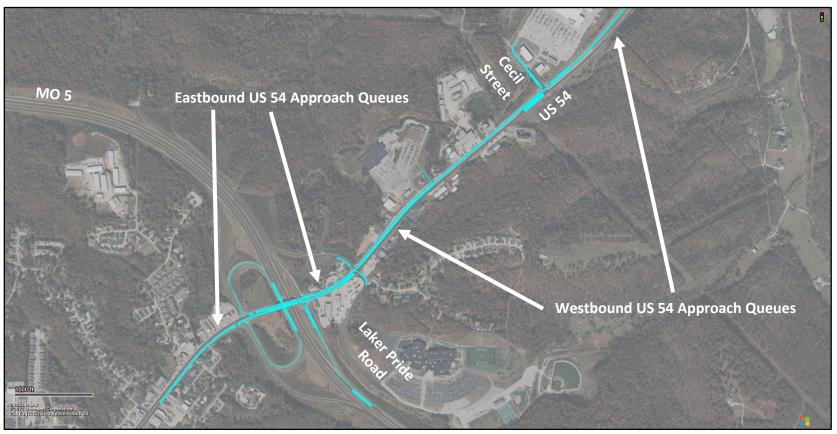


Figure 57: Maximum US 54 Approach Queues – 2050 No-Build August PM



Table 38: Intersection Operating Conditions – 2050 No-Build (SYNCHRO)

| | | Nov | ember AM Pe | | tion Operat | 8 | | nber PM Pea | • | | | Augi | ust PM Peak | Hour | |
|---|-----|-------|------------------|------------------|------------------|----------------|---------------|------------------|------------------|------------------|-----|-------|------------------|------------------|------------------|
| Intersection/Approach | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue |
| | | | | | US 54 & | Cecil Street (| (Signalized) | | | | | | | | |
| Eastbound US 54 | В | 13.0 | 0.78 | 300' | 470' | С | 28.6 | 0.91 | 635' | 775' | В | 13.0 | 0.68 | 225' | 400' |
| Westbound US 54 | В | 20.0 | 0.81 | 390' | 585' | F | 142.7 | 1.28 | 1175' | 1305' | F | 199.8 | 1.40 | 1310' | 1685' |
| Southbound Cecil Street | С | 25.8 | 0.54 | <25 | 60' | F | 126.4 | 1.24 | 405' | 635' | С | 21.9 | 0.69 | <25 | 75' |
| Overall Intersection | В | 16.4 | 0.72 | | | F | 88.5 | 1.04 | | | F | 115.8 | 1.06 | | |
| | | | | US 54 | & Laker Pride | Road/Jack Cr | owell Road (| Signalized) | | | | | | | |
| Eastbound US 54 | F | 159.4 | 1.32 | 1080' | 1045' | F | 116.6 | 1.20 | 1150' | 1075' | F | 93.6 | 1.15 | 1045' | 1180' |
| Westbound US 54 | С | 32.2 | 1.08 | 355' | 435' | F | 117.1 | 1.20 | 1315' | 1445' | F | 141.1 | 1.26 | 1430' | 1560' |
| Northbound Laker Pride Road | E | 66.4 | 1.08 | 130' | 260' | F | 102.7 | 1.19 | 200' | 355' | С | 33.3 | 0.39 | 50' | 100' |
| Southbound Jack Crowell Road | С | 34.2 | 0.44 | 35' | 90' | E | 67.6 | 1.00 | 50' | 145' | С | 28.4 | 0.30 | 35' | 70' |
| Overall Intersection | F | 101.3 | 1.20 | | | F | 114.2 | 1.13 | | | F | 116.2 | 1.07 | | |
| | | | | U | S 54 & Northb | ound MO 5 F | Ramps (Signa | lized) | | | | | | | |
| Eastbound US 54 | Е | 61.2 | 1.06 | 695' | 835' | F | 91.7 | 1.12 | 845' | 985' | F | 85.0 | 0.94 | 600' | 775' |
| Westbound US 54 | Α | 5.3 | 0.63 | 90' | 115' | В | 19.9 | 0.99 | 100' | 90' | Α | 4.2 | 0.89 | 35' | 30' |
| Northbound MO 5 Off-Ramp | С | 30.0 | 0.72 | 130' | 185' | D | 35.5 | 0.72 | 190' | 255' | С | 32.9 | 0.59 | 190' | 250' |
| Overall Intersection | D | 35.0 | 0.80 | | | D | 47.6 | 0.94 | | | D | 35.3 | 0.87 | | |
| | | | | US | 54 & Southbo | und MO 5 Ra | amps (Unsign | alized) | | | | | | | |
| Eastbound US 54 | Α | <1.0 | 0.44 | | <25' | Α | <1.0 | 0.50 | | <25' | Α | <1.0 | 0.44 | | <25' |
| Westbound US 54 | Α | <1.0 | 0.35 | | <25' | Α | <1.0 | 0.55 | | <25' | Α | <1.0 | 0.48 | | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | F | >200 | 1.41 | | 640' | F | 132.8 | 1.41 | | 355' | F | 78.0 | 0.98 | | 275' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | В | 11.2 | 0.31 | | 35' | С | 20.5 | 0.41 | | 50' | В | 14.6 | 0.36 | | 40' |
| Overall Intersection | D | 30.4 | 0.75 | | | Α | 10.0 | 0.72 | | | Α | 6.7 | 0.66 | | |
| | | | | | US 54 & Bu | siness Route | 5 (Signalized |) | | | | | | | |
| Eastbound US 54 | F | 106.8 | 1.13 | 740' | 835' | E | 71.5 | 1.03 | 605' | 910' | D | 44.0 | 0.75 | 340' | 530' |
| Westbound US 54 | D | 44.3 | 0.84 | 425' | 515' | E | 63.9 | 1.02 | 765' | 1065' | Е | 55.2 | 0.96 | 520' | 865' |
| Northbound Business Route 5 | D | 41.5 | 0.61 | 105' | 150' | D | 49.4 | 0.79 | 185' | 340' | D | 49.6 | 0.74 | 145' | 255' |
| Southbound Business Route 5 | Е | 64.6 | 0.86 | 310' | 455' | D | 49.6 | 0.43 | 50' | 105' | D | 52.0 | 0.68 | 120' | 205' |
| Overall Intersection | E | 70.1 | 0.90 | | | E | 62.9 | 0.93 | | | D | 50.6 | 0.88 | | |



Table 39: Intersection Operating Conditions – 2050 No-Build (VISSIM)

| | | Noven | nber AM Peak Ho | our | | November P | M Peak Hour | | | August PN | 1 Peak Hour | |
|---|-----|-------|------------------|------------------|--------------------|-------------------|------------------|------------------|-----|-----------|------------------|------------------|
| Intersection/Approach | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue |
| | | | | l | JS 54 & Cecil Stre | et (Signalized) | | | | | | |
| Eastbound US 54 | Α | 8.2 | 40' | 535' | В | 15.4 | 100' | 350' | Α | 8.4 | 50' | 325' |
| Westbound US 54 | D | 49.1 | 510' | 3005' | F | 153.0 | 3040' | 3310' | F | 371.2 | 3195' | 3280' |
| Southbound Cecil Street | D | 43.3 | 60' | 455' | F | 131.7 | 755' | 865' | F | 606.5 | 745' | 860' |
| Overall Intersection | С | 27.9 | | | E | 76.0 | | | F | 116.2 | | |
| | | | | US 54 & Lake | r Pride Road/Jack | Crowell Road (Sig | gnalized) | | | | | |
| Eastbound US 54 | С | 34.1 | 580' | 875' | С | 26.1 | 495' | 855' | С | 27.1 | 525' | 855' |
| Westbound US 54 | F | 162.7 | 1680' | 3380' | F | 125.1 | 2920' | 3380' | F | 382.6 | 3275' | 3385' |
| Northbound Laker Pride Road | С | 31.2 | 45' | 305' | Е | 63.0 | 200' | 1070' | D | 52.1 | 25' | 175' |
| Southbound Jack Crowell Road | Е | 55.6 | 40' | 245' | Е | 55.7 | 25' | 150' | F | 216.7 | 65' | 215' |
| Overall Intersection | F | 80.6 | | | E | 68.0 | | | F | 115.1 | | |
| | | | | US 54 & | Northbound MO | 5 Ramps (Signaliz | ed) | | | | | |
| Eastbound US 54 | Е | 79.0 | 620' | 900' | E | 61.5 | 570' | 885' | E | 61.4 | 565' | 885' |
| Westbound US 54 | С | 27.8 | 350' | 870' | С | 23.5 | 365' | 875' | F | 167.8 | 775' | 880' |
| Northbound MO 5 Off-Ramp | F | 124.6 | 555' | 1845' | F | 107.7 | 370' | 1520' | F | 137.1 | 530' | 1595' |
| Overall Intersection | Е | 69.8 | | | D | 52.5 | | | F | 103.3 | | |
| | • | | | US 54 & 9 | outhbound MO 5 | Ramps (Unsignal | ized) | • | | | - | • |
| Eastbound US 54 | F | 59.7 | 1305' | 2910' | Е | 38.8 | 835' | 2500' | D | 34.8 | 250' | 1405' |
| Westbound US 54 | Α | 6.4 | 260' | 695' | Α | 8.9 | 185' | 685' | F | 131.6 | 630' | 705' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | F | 98.4 | 2345' | 3550' | F | 320.2 | 1940' | 3545' | F | 398.6 | 3505' | 3565' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | Α | 3.6 | <25' | 130' | Α | 2.6 | <25' | 80' | Α | 2.5 | <25' | 140' |
| Overall Intersection | Е | 36.5 | | | D | 30.7 | | | F | 84.0 | | |
| | - | | | US | 54 & Business Rou | te 5 (Signalized) | | | | | | |
| Eastbound US 54 | D | 51.8 | 280' | 1450' | D | 37.2 | 230' | 1385' | С | 30.0 | 130' | 520' |
| Westbound US 54 | D | 36.8 | 145' | 530' | D | 46.2 | 215' | 870' | С | 28.7 | 55' | 430' |
| Northbound Business Route 5 | D | 36.1 | <25' | 145' | Е | 79.6 | 380' | 1550' | С | 31.6 | 35' | 240' |
| Southbound Business Route 5 | Е | 59.7 | 125' | 645' | D | 45.1 | 30' | 155' | D | 35.1 | 65' | 210' |
| Overall Intersection | D | 46.8 | | | D | 50.0 | | | С | 31.1 | | |



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Table 40: MO 5 Capacity Analysis – 2050 No-Build (VISSIM)

| Traffic | | | | | | Nov | ember AM Peak ho | ur | | Nov | ember PM Peak Ho | ur | | Αι | ıgust PM Peak Hour | |
|--------------------|--|-----------|---------|-------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|
| Volume Scenario | Segment | Direction | Type | Lanes | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume |
| | | | | | | | Southbo | ound MO 5 | | | | | | | | |
| 2050 | Before US 54 Interchange | SB | Basic | 2 | D | 27.0 | 31.0 | 816 | В | 13.2 | 55.0 | 1355 | F | 56.2 | 22.0 | 1257 |
| 2050 | US 54 Off-Ramp | SB | Diverge | 3 | E | 42.1 | 6.0 | 691 | В | 16.9 | 30.0 | 1309 | F | 71.8 | 6.0 | 1136 |
| 2050 | Between US 54 Ramps | SB | Basic | 2 | F | 74.6 | 3.0 | 438 | E | 42.1 | 14.0 | 1109 | F | 131.5 | 4.0 | 951 |
| 2050 | Between US 54 On-Ramp and US 54 Off-Ramp | SB | Weave | 3 | F | 108.3 | 1.0 | 441 | F | 84.4 | 5.0 | 1306 | F | 157.0 | 2.0 | 1053 |
| 2050 | Between US 54 Ramps | SB | Basic | 2 | Α | 1.7 | 59.0 | 199 | Α | 9.2 | 61.0 | 1121 | Α | 7.3 | 57.0 | 819 |
| 2050 | US 54 On-Ramp | SB | Merge | 3 | Α | 1.6 | 63.0 | 306 | Α | 6.7 | 63.0 | 1266 | Α | 5.1 | 62.0 | 951 |
| 2050 | After US 54 Interchange | SB | Basic | 2 | Α | 2.4 | 64.0 | 306 | Α | 10.0 | 64.0 | 1271 | Α | 7.5 | 63.0 | 952 |
| | | | | | | | Northbo | ound MO 5 | | | | | | | | |
| 2050 | Before US 54 Interchange | NB | Basic | 2 | Α | 10.7 | 59.0 | 1224 | В | 13.7 | 59.0 | 1584 | В | 13.8 | 59.0 | 1585 |
| 2050 | US 54 Off-Ramp | NB | Diverge | 3 | В | 17.7 | 34.0 | 1223 | В | 11.1 | 51.0 | 1582 | В | 13.5 | 45.0 | 1585 |
| 2050 | Between US 54 Ramps | NB | Basic | 2 | Α | 4.4 | 64.0 | 561 | Α | 7.0 | 64.0 | 900 | Α | 7.0 | 64.0 | 899 |
| 2050 | US 54 On-Ramp | NB | Merge | 3 | Α | 4.2 | 63.0 | 799 | Α | 7.6 | 62.0 | 1424 | Α | 6.3 | 63.0 | 1181 |
| 2050 | After US 54 Interchange | NB | Basic | 2 | Α | 6.2 | 64.0 | 801 | В | 11.2 | 64.0 | 1430 | Α | 9.3 | 64.0 | 1183 |



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2050 Build (Phase 1) Operations

The 2050 Build (Phase 1) traffic volumes were evaluated in SYNCHRO and VISSIM. The SYNCHRO evaluations are summarized in **Table 41** for the November AM, November PM, and August PM peak hours. The VISSIM evaluations are summarized in **Table 42** and **Table 43** for the November AM, November PM, and August PM peak hours.

The SYNCHRO results show that the overall operating conditions of the following intersections are expected to operate at undesirable LOS (LOS E or worse):

- US 54 and Cecil Street during the November and August PM peak hours (LOS F);
- US 54 and Business Route 5 during the November AM peak hour (LOS E).

Additionally, the SYNCHRO results show that the following intersection approaches are expected to operate at undesirable LOS:

- Westbound US 54 at Cecil Street during the November and August PM peak hours (LOS F);
- Southbound Cecil Street at US 54 during the November PM peak hour (LOS F);
- Eastbound US 54 at Laker Pride Road/Jack Crowell Road during the November AM and November PM peak hours (LOS E and LOS F);
- Northbound Laker Pride Road at US 54 during the November PM peak hour (LOS F);
- Southbound Jack Crowell Road at US 54 during the November PM peak hour (LOS E);
- Eastbound US 54 at Northbound MO 5 ramps during the November PM peak hour (LOS E);
- Southbound MO 5 Off-Ramp at US 54 during the November AM, November PM, and August PM peak hours (LOS F); and
- Eastbound US 54 at Business Route 5 during the November AM peak hour (LOS F).

The VISSIM results show that the overall operating conditions of the following intersections are expected to operate at an undesirable LOS:

- US 54 and Laker Pride Road/Jack Crowell Road during the November AM peak hour (LOS E);
- US 54 and Business Route 5 during the November PM peak hour (LOS E).

The VISSIM results show that the following intersection approaches are expected to operate at undesirable LOS:

- Westbound US 54 at Cecil Street during the November and August PM peak hours (LOS F and LOS E);
- Southbound Cecil Street at US 54 during the November PM peak hour (LOS F);
- Westbound US 54 at Laker Pride Road/Jack Crowell Road during the November AM and PM peak hours (LOS F and LOS E);
- Northbound Laker Pride Road at US 54 during the November AM and PM peak hours (LOS F);



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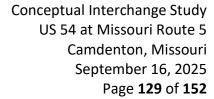
- Southbound MO 5 Off-Ramp at US 54 Off-Ramp during the November PM peak hour (LOS F);
- Northbound Business Route 5 at US 54 during the November PM peak hour (LOS E); and
- Southbound Business Route 5 at US 54 during the November PM peak hour (LOS E).

Also, the VISSIM results show all sections of MO 5 are expected to operate at acceptable LOS during all peak hours. However,

The above results show that the Phase 1 configuration does provide an improvement in traffic operations during all peak hours under 2050 Build (Phase 1) conditions compared to 2050 No-Build conditions. However, the failing approach operations shown in the SYNCHRO and VISSIM intersections results during the November and August PM peak hours are caused by the capacity constraint on eastbound and westbound US 54 between Laker Pride Road/Jack Crowell Road and Cecil Street. The two through lanes in each direction provided on this segment of US 54 are unable to handle the forecasted 2050 traffic volumes during the November and August PM peak hours.

Furthermore, **Figure 58** and **Figure 59** show that the maximum eastbound and westbound US 54 approach queues at several intersections during the November and August PM peak hours, respectively. As can be seen, these lengthy queues reach the limits of the models, resulting in approximately 572 and 1114 vehicles during November and August PM peak hours, respectively, are unable to enter the model due to capacity constraints on US 54.

Overall, the proposed Boulevard (Phase 1) concept improvements are expected to provide operations improvements from 2050 No-Build conditions during all peak hours. However, the existing capacity constraint on US 54 between Laker Pride Road/Jack Crowell Road and Cecil Street is expected to result in several intersection approaches operating at failing level of service under 2050 Build (Phase 1) conditions during the November and August PM peak hours. Additional lane capacity along US 54 is needed to improve peak hour operations.





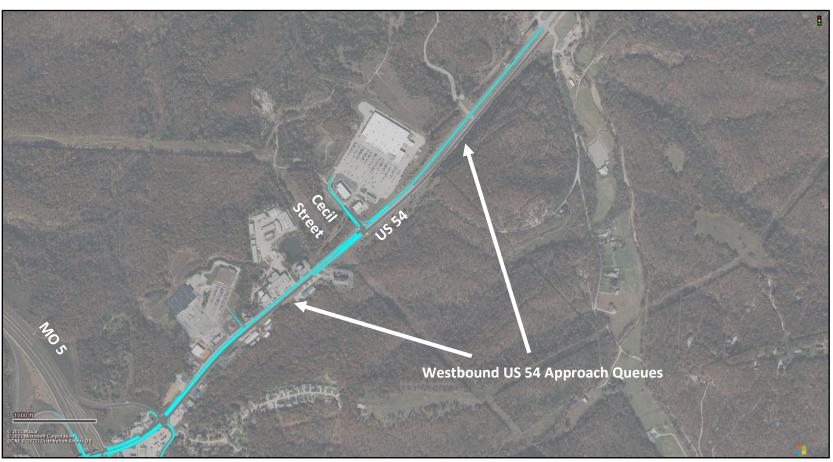
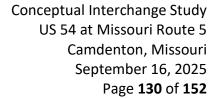


Figure 58: Maximum US 54 Approach Queues – 2050 Build (Phase 1) November PM





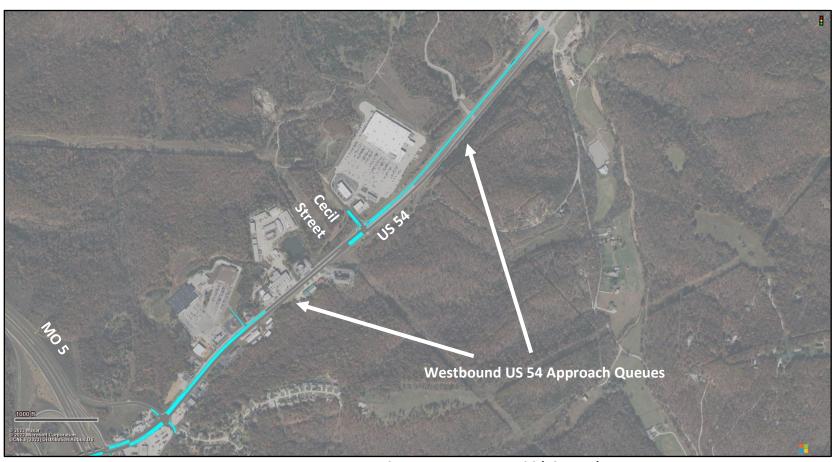


Figure 59: Maximum US 54 Approach Queues – 2050 Build (Phase 1) August PM



Table 41: Intersection Operating Conditions – 2050 Build (Phase 1) (SYNCHRO 10)

| | Operating C | | | nber PM Peal | • | , | August PM Peak Hour | | | | | | | | |
|---|-------------|-------|---------------------------------|------------------|------------------|-------------|---------------------|------------------|------------------|------------------|-----|-------|------------------|------------------|------------------|
| Intersection/Approach | LOS | Delay | ember AM Pe Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue |
| US 54 & Cecil Street (Signalized) | | | | | | | | | | | | | | | |
| Eastbound US 54 | Α | 8.7 | 0.74 | 100' | 90' | С | 34.5 | 1.19 | 240' | 210' | В | 12.3 | 0.81 | 105' | 370' |
| Westbound US 54 | В | 16.4 | 0.72 | 405' | 570' | F | 156.9 | 1.31 | 1175' | 1310' | F | 159.1 | 1.31 | 1490' | 1730' |
| Southbound Cecil Street | С | 30.3 | 0.58 | 25' | 60' | F | 107.0 | 1.18 | 420' | 650' | С | 33.0 | 0.77 | 45' | 125' |
| Overall Intersection | В | 12.7 | 0.72 | | | F | 94.6 | 1.04 | | | F | 93.9 | 1.06 | | |
| US 54 & Laker Pride Road/Jack Crowell Road (Signalized) | | | | | | | | | | | | | | | |
| Eastbound US 54 | Е | 61.1 | 1.09 | 995' | 1115' | F | 82.0 | 1.13 | 1070' | 1115' | С | 21.0 | 0.93 | 380' | 640' |
| Westbound US 54 | С | 31.7 | 1.21 | 235' | 415' | Α | 8.0 | 0.84 | 120' | 95' | В | 18.4 | 1.24 | 230' | 155' |
| Northbound Laker Pride Road | D | 54.4 | 0.94 | 140' | 275' | F | 94.1 | 1.06 | 185' | 340' | D | 35.9 | 0.45 | 55' | 105' |
| Southbound Jack Crowell Road | D | 38.0 | 0.40 | 50' | 105' | Е | 72.4 | 1.02 | 50' | 145' | С | 30.2 | 0.33 | 35' | 75' |
| Overall Intersection | D | 49.1 | 1.11 | | | D | 48.2 | 1.13 | | | С | 20.2 | 0.96 | | |
| | = | - | | U | S 54 & Northb | ound MO 5 F | Ramps (Signa | lized) | • | | | - | | • | |
| Eastbound US 54 | D | 40.0 | 0.92 | 285' | 300' | Е | 78.7 | 1.12 | 315' | 890' | С | 30.9 | 0.91 | 335' | 415' |
| Westbound US 54 | Α | 4.9 | 0.61 | 100' | 135' | В | 15.2 | 0.99 | 1030' | 1145' | Α | 5.9 | 0.89 | 90' | 115' |
| Northbound MO 5 Off-Ramp | D | 37.0 | 0.62 | 180' | 245' | D | 39.4 | 0.72 | 205' | 275' | D | 36.8 | 0.59 | 200' | 270' |
| Overall Intersection | С | 26.3 | 0.80 | | | D | 41.0 | 0.94 | | | В | 18.4 | 0.87 | | |
| | | · | | US | 54 & Southbo | und MO 5 Ra | amps (Unsign | alized) | • | | | - | | | - |
| Eastbound US 54 | Α | <1.0 | 0.44 | | <25' | Α | <1.0 | 0.50 | | <25' | Α | <1.0 | 0.44 | | <25' |
| Westbound US 54 | Α | <1.0 | 0.35 | | <25' | Α | <1.0 | 0.55 | | <25' | Α | <1.0 | 0.48 | | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | F | >200 | 1.41 | | 640' | F | 132.8 | 1.41 | | 355' | F | 78.0 | 0.98 | | 275' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | В | 11.2 | 0.31 | | 35' | С | 20.5 | 0.41 | | 50' | В | 14.6 | 0.36 | | 40' |
| Overall Intersection | D | 30.4 | 0.75 | | | Α | 10.0 | 0.72 | | | Α | 6.7 | 0.66 | | |
| US 54 & Business Route 5 (Signalized) | | | | | | | | | | | | | | | |
| Eastbound US 54 | F | 98.7 | 1.11 | 660' | 730' | D | 48.3 | 0.93 | 530' | 720' | D | 43.0 | 0.82 | 315' | 555' |
| Westbound US 54 | D | 39.5 | 0.92 | 315' | 405' | D | 38.7 | 0.95 | 700' | 755' | D | 35.5 | 0.85 | 375' | 700' |
| Northbound Business Route 5 | D | 49.0 | 0.83 | 85' | 130' | D | 49.6 | 0.84 | 185' | 270' | D | 46.9 | 0.76 | 140' | 205' |
| Southbound Business Route 5 | D | 54.7 | 0.87 | 265' | 385' | D | 50.6 | 0.56 | 50' | 105' | D | 53.4 | 0.84 | 115' | 195' |
| Overall Intersection | E | 64.7 | 0.90 | | | D | 44.7 | 0.93 | | | D | 42.2 | 0.88 | | |



Table 42: Intersection Operating Conditions – 2050 Build (Phase 1) (VISSIM)

| | | Noven | nber AM Peak H | our | | | M Peak Hour | • | August PM Peak Hour | | | | |
|---|-----|-------|------------------|------------------|--------------------|--------------------|------------------|------------------|---------------------|-------|------------------|------------------|--|
| Intersection/Approach | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | |
| | | | | l | JS 54 & Cecil Stre | et (Signalized) | | | | | | | |
| Eastbound US 54 | Α | 8.1 | 60' | 210' | В | 18.5 | 150' | 775' | В | 10.9 | 75' | 210' | |
| Westbound US 54 | D | 37.9 | 295' | 1455' | F | 83.2 | 2905' | 3315' | E | 61.3 | 2675' | 3280' | |
| Southbound Cecil Street | D | 35.3 | 25' | 220' | F | 102.8 | 670' | 870' | D | 36.1 | 50' | 300' | |
| Overall Intersection | С | 21.2 | | | D | 54.3 | | | D | 37.0 | | | |
| | | | | US 54 & Lake | r Pride Road/Jack | Crowell Road (Sig | gnalized) | | | | | | |
| Eastbound US 54 | В | 16.5 | 170' | 840' | В | 17.2 | 155' | 800' | В | 12.7 | 85' | 480' | |
| Westbound US 54 | F | 117.5 | 1535' | 3325' | Е | 58.9 | 1845' | 3200' | С | 21.2 | 260' | 1735' | |
| Northbound Laker Pride Road | F | 101.5 | 350' | 1455' | F | 105.2 | 535' | 1600' | D | 35.5 | <25 | 155' | |
| Southbound Jack Crowell Road | D | 39.4 | <25 | 115' | С | 29.9 | <25 | 105' | С | 34.2 | <25 | 120' | |
| Overall Intersection | E | 59.9 | | | D | 44.2 | | | В | 18.1 | | | |
| | - | | | US 54 & | Northbound MO | 5 Ramps (Signaliz | ed) | | | | | | |
| Eastbound US 54 | В | 17.8 | 135' | 830' | D | 36.0 | 410' | 885' | С | 21.5 | 135' | 690' | |
| Westbound US 54 | Α | 3.4 | <25 | 155' | Α | 5.5 | 45' | 420' | Α | 4.6 | 25' | 260' | |
| Northbound MO 5 Off-Ramp | D | 54.2 | 100' | 390' | D | 47.6 | 90' | 345' | D | 40.8 | 90' | 345' | |
| Overall Intersection | В | 18.6 | | | С | 22.8 | | | В | 16.2 | | | |
| | - | - | | US 54 & 9 | outhbound MO 5 | Ramps (Unsignal | ized) | | | | | | |
| Eastbound US 54 | Α | 1.8 | <25 | 75' | С | 17.0 | 160' | 1020' | Α | 0.7 | <25 | 45' | |
| Westbound US 54 | Α | 1.5 | <25 | <25 | Α | 3.4 | 30' | 425' | Α | 2.5 | <25 | 85' | |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | D | 31.6 | 160' | 765' | F | 130.9 | 730' | 2455' | В | 10.1 | <25 | 260' | |
| Southbound MO 5 to Westbound US 54 Off-Ramp | Α | 4.5 | <25 | 150' | Α | 3.9 | <25 | 90' | Α | 3.5 | <25 | 110' | |
| Overall Intersection | Α | 5.8 | | | С | 16.4 | | | Α | 2.5 | | | |
| | - | | | US | 54 & Business Rou | ute 5 (Signalized) | | | | | | | |
| Eastbound US 54 | D | 39.5 | 240' | 1330' | D | 38.5 | 260' | 1590' | D | 37.3 | 170' | 585' | |
| Westbound US 54 | D | 35.2 | 195' | 620' | Е | 67.1 | 550' | 1710' | С | 30.5 | 135' | 635' | |
| Northbound Business Route 5 | D | 43.2 | 35' | 300' | Е | 76.3 | 335' | 1550' | D | 38.9 | 45' | 240' | |
| Southbound Business Route 5 | D | 48.0 | 115' | 595' | D | 55.0 | 40' | 180' | D | 44.7 | 80' | 285' | |
| Overall Intersection | D | 40.0 | | | Е | 58.3 | | | D | 36.3 | | | |



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Table 43: MO 5 Capacity Analysis – 2050 Build (Phase 1) (VISSIM)

| Traffic | Traffic Volume Segment Scenario | Direction Type | | | November AM Peak hour | | | | November PM Peak Hour | | | | | August PM Peak Hour | | | |
|-----------------|--|----------------|---------|-------|-----------------------|-----------------------|---------------------|-------------------------|-----------------------|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|--|
| | | | Type | Lanes | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | |
| Southbound MO 5 | | | | | | | | | | | | | | | | | |
| 2050 | Before US 54 Interchange | SB | Basic | 2 | Α | 7.3 | 60.0 | 856 | В | 11.7 | 60.0 | 1360 | В | 12.3 | 60.0 | 1426 | |
| 2050 | US 54 Off-Ramp | SB | Diverge | 3 | Α | 4.5 | 63.0 | 854 | Α | 7.1 | 64.0 | 1358 | Α | 7.5 | 64.0 | 1424 | |
| 2050 | Between US 54 Ramps | SB | Basic | 2 | Α | 4.8 | 64.0 | 612 | В | 13.3 | 53.0 | 1196 | Α | 9.6 | 64.0 | 1216 | |
| 2050 | Between US 54 On-Ramp and US 54 Off-Ramp | SB | Weave | 3 | Α | 6.2 | 49.0 | 882 | D | 33.4 | 27.0 | 1655 | В | 11.2 | 52.0 | 1743 | |
| 2050 | Between US 54 Ramps | SB | Basic | 2 | Α | 3.2 | 62.0 | 400 | В | 11.1 | 61.0 | 1361 | В | 11.4 | 62.0 | 1415 | |
| 2050 | US 54 On-Ramp | SB | Merge | 3 | Α | 2.7 | 63.0 | 511 | Α | 8.0 | 63.0 | 1507 | Α | 8.2 | 63.0 | 1545 | |
| 2050 | After US 54 Interchange | SB | Basic | 2 | Α | 4.0 | 64.0 | 509 | В | 11.9 | 63.0 | 1508 | В | 12.2 | 63.0 | 1541 | |
| Northbound MO 5 | | | | | | | | | | | | | | | | | |
| 2050 | Before US 54 Interchange | NB | Basic | 2 | Α | 10.6 | 59.0 | 1224 | В | 13.7 | 59.0 | 1584 | В | 13.8 | 59.0 | 1585 | |
| 2050 | US 54 Off-Ramp | NB | Diverge | 3 | Α | 6.6 | 62.0 | 1223 | Α | 8.4 | 63.0 | 1583 | Α | 8.4 | 63.0 | 1585 | |
| 2050 | Between US 54 Ramps | NB | Basic | 2 | Α | 4.4 | 64.0 | 561 | Α | 7.0 | 64.0 | 900 | Α | 7.0 | 64.0 | 899 | |
| 2050 | US 54 On-Ramp | NB | Merge | 3 | Α | 4.7 | 63.0 | 890 | Α | 8.4 | 62.0 | 1555 | Α | 8.4 | 62.0 | 1559 | |
| 2050 | After US 54 Interchange | NB | Basic | 2 | Α | 6.9 | 64.0 | 890 | В | 12.2 | 64.0 | 1557 | В | 12.3 | 64.0 | 1563 | |



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2050 Build Operations (Phase 2)

The 2050 Build (Phase 2) traffic volumes were evaluated in SYNCHRO and VISSIM. The SYNCHRO evaluations are summarized in **Table 44** for the November AM, November PM, and August PM peak hours. The VISSIM evaluations are summarized in **Table 45** and **Table 46** for the November AM, November PM, and August PM peak hours.

The SYNCHRO results show that the overall operating conditions of all study intersections are expected to operate at an acceptable level of service (LOS D or better) during all peak hours. Furthermore, all individual intersection approaches are expected to operate at an acceptable LOS during all peak hours except for of the following approaches:

- Northbound U-Turn at US 54 during the November AM, November PM, and August PM peak hours (LOS E);
- Southbound Cecil Street at US 54 during the November PM peak hour (LOS F);
- Southbound MO 5 Off-Ramp at US 54 during the November AM, November PM, and August PM peak hours (LOS F); and
- Southbound Business Route 5 at US 54 during the November AM peak hour (LOS E).

The VISSIM results show that the overall operating conditions of all study area intersections and individual intersection approaches are expected to operate at acceptable LOS during all peak hours. Furthermore, the VISSIM results show that all sections of MO 5 are expected to operate at an acceptable LOS during all peak hours.

Furthermore, **Figure 60**, **Figure 61**, and **Figure 62** show that the maximum eastbound and westbound approach queues at several intersections during the November AM, November PM, and August PM peak hours, respectively. As can be seen these approach queues are expected to decrease significantly from 2050 No-Build conditions.

Note, the SYNCHRO results show LOS F operations at the southbound Cecil Street approach at US 54 during the November PM peak hour and the southbound MO 5 to eastbound US 54 offramp during all peak hours due to the heavy right-turn volume. SYNCHRO has difficulties accurately analyzing yielding right-turn delays when the movement is heavy. Under 2050 Build (Phase 2) conditions the southbound Cecil Street at US 54 right-turn volume is 565 vph during the November PM peak hour and the southbound MO 5 to eastbound US 54 off-ramp volume is 475 vph, 325 vph, and 330 vph during the November AM, November PM, and August PM peak hours, respectively. The VISSIM results show that the southbound Cecil Street approach at US 54 is expected to operate at LOS D during the November PM peak hour and the southbound MO 5 to eastbound US 54 off-ramp is expected to operate at LOS D or better during all peak hours. It is our experience that the VISSIM results are more accurate at predicting yielding right-turn delay when the movement is heavy.



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Additionally, the SYNCHRO results show LOS E operations at the southbound Business Route 5 approach at US 54 during the November AM peak hour and at the northbound U-Turn approach at US 54 during all peak hours due to the signal timing adjustments at both these intersections. Under 2050 Build (Phase 2) conditions, the signal timing at Business Route 5 and Cecil Street were adjusted to be coordinated with the other traffic signals along US 54. Much of the green time at Business Route 5 and Cecil Street are allocated to the eastbound and westbound US 54 through movements. The longer green times were used to maximize progress of traffic volume on the major throughfares (US 54), which resulted in increased delays for the side-street movements.

Overall, the proposed Boulevard (Phase 2) concept improvements are expected to address mobility concerns along US 54 by providing additional lane capacity along the corridor between the Northbound MO 5 ramps and Cecil Street, which is expected to relieve the eastbound and westbound US 54 bottlenecks along the corridor.



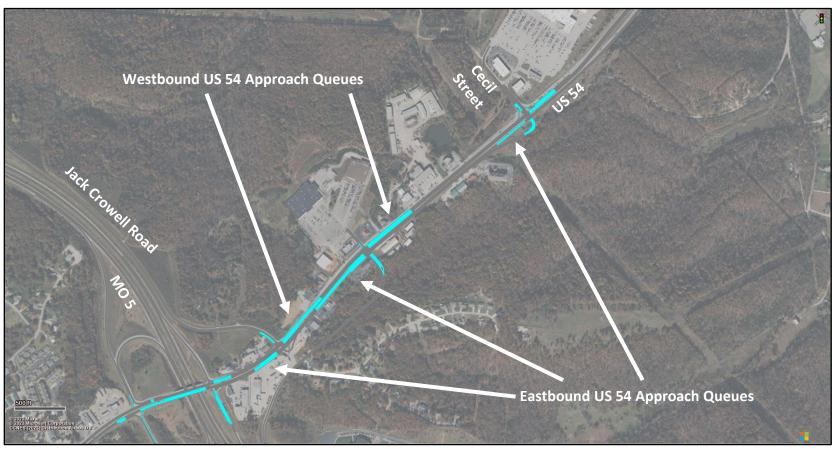


Figure 60: Maximum US 54 Approach Queues - 2050 Build (Phase 2) November AM



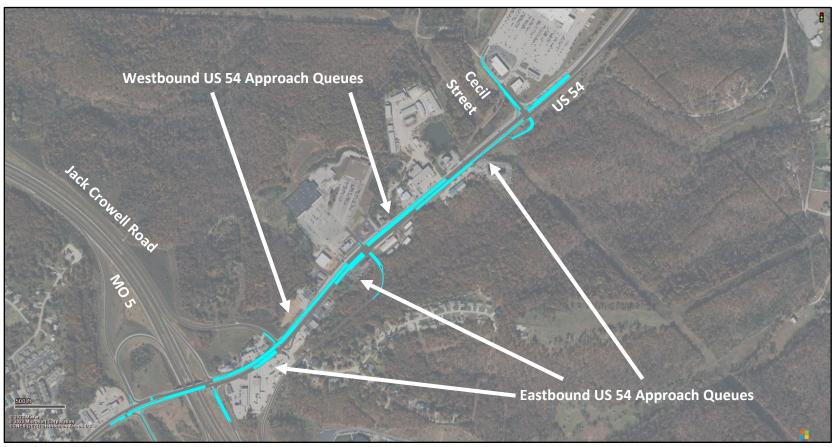


Figure 61: Maximum US 54 Approach Queues – 2050 Build (Phase 2) November PM



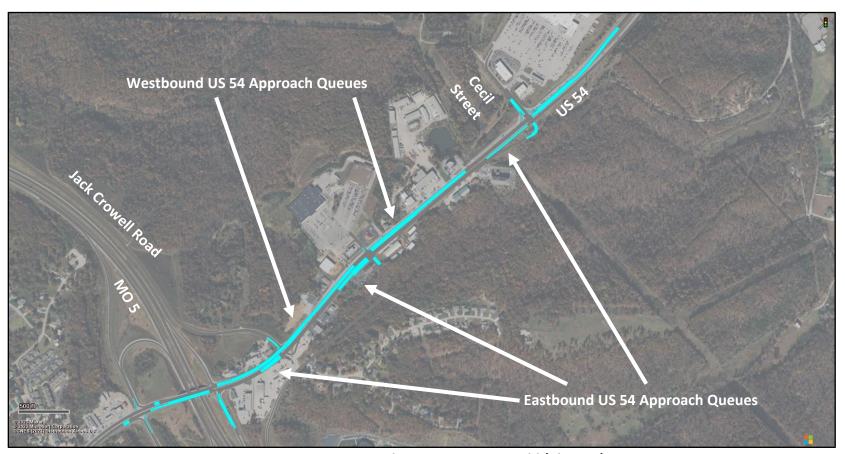


Figure 62: Maximum US 54 Approach Queues – 2050 Build (Phase 2) August PM



Table 44: Intersection Operating Conditions – 2050 Build (Phase 2) (SYNCHRO)

| | | Nov | | | | | | | (Jour | | | A | ust DM Dook I | lla | |
|---|--|-------|------------------------|------------------|------------------|----------------|---------------|------------------|------------------|------------------|-----|-------|------------------|------------------|--------------------|
| Intersection/Approach | | INOV | ember AM Pe Max V/C | | NA a viva v va | | Noven | nber PM Peal | | D.C | | Aug | ust PM Peak I | I | D.C. common common |
| intersection/Approach | LOS | Delay | & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue | LOS | Delay | Max V/C & ICU | Average Queue | Maximum Queue |
| | | • | | | US 54 & | Cecil Street (| (Signalized) | | | | | • | • | • | |
| Eastbound US 54 | С | 22.3 | 0.94 | 340' | 310' | D | 49.2 | 1.03 | 565' | 1095' | С | 32.3 | 0.91 | 395' | 490' |
| Westbound US 54 | В | 11.6 | 0.50 | 230' | 265' | В | 15.9 | 0.72 | 410' | 465' | С | 34.0 | 0.97 | 775' | 935' |
| Northbound U-Turn | Е | 58.7 | 0.65 | 105' | 150' | Е | 78.7 | 0.95 | 215' | 325' | Е | 60.7 | 0.71 | 120' | 195' |
| Southbound Cecil Street | С | 32.2 | 0.61 | 25' | 65' | F | 528.8 | 2.36 | 630' | 860' | D | 46.4 | 0.84 | 85' | 180' |
| Overall Intersection | С | 20.7 | 0.81 | | | F | 100.0 | 1.07 | | | D | 35.6 | 0.93 | | |
| US 54 & Laker Pride Road/Commercial Driveway (Signalized) | | | | | | | | | | | | | | | |
| Eastbound US 54 | С | 32.9 | 0.91 | 340' | 410' | С | 24.0 | 0.85 | 295' | 310' | С | 20.7 | 0.84 | 385' | 480' |
| Westbound US 54 | С | 28.6 | 0.66 | 345' | 405' | В | 18.5 | 0.88 | 360' | 375' | С | 27.4 | 0.84 | 590' | 615' |
| Northbound Laker Pride Road | D | 45.5 | 0.73 | 70' | 160' | Е | 60.8 | 0.76 | 145' | 270' | D | 35.5 | 0.41 | 30' | 70' |
| Southbound Driveway | Α | 1.4 | 0.17 | <25 | <25 | Α | 2.1 | 0.20 | <25 | <25 | А | 1.4 | 0.17 | <25 | <25 |
| Overall Intersection | С | 32.0 | 0.79 | | | С | 24.5 | 0.81 | | | С | 24.7 | 0.81 | | |
| US 54 & Jack Crowell Road (Signalized) | | | | | | | | | | | | | | | |
| Eastbound US 54 | В | 12.5 | 0.75 | 260' | 285' | В | 12.8 | 0.70 | 310' | 355' | Α | 9.5 | 0.66 | 220' | 285' |
| Westbound US 54 | В | 19.2 | 0.59 | 395' | 445' | В | 10.5 | 0.91 | 430' | 160' | В | 12.7 | 0.90 | 120' | 120' |
| Southbound Jack Crowell Road | D | 40.4 | 0.47 | 60' | 115' | С | 32.2 | 0.41 | 50' | 100' | D | 35.8 | 0.38 | 45' | 95' |
| Overall Intersection | В | 16.1 | 0.70 | | | В | 12.2 | 0.72 | | | В | 11.9 | 0.71 | | |
| | | | | U: | 5 54 & Northb | ound MO 5 F | Ramps (Signal | ized) | | | | | | | |
| Eastbound US 54 | С | 31.0 | 0.92 | 545' | 630' | С | 27.5 | 0.97 | 290' | 365' | С | 24.7 | 0.80 | 450' | 555' |
| Westbound US 54 | Α | 7.2 | 0.68 | 75' | 95' | С | 27.5 | 1.04 | 630' | 1175' | В | 13.1 | 0.97 | 135' | 1005' |
| Northbound MO 5 Off-Ramp | D | 42.3 | 0.65 | 205' | 275' | D | 42.0 | 0.68 | 220' | 295' | D | 39.3 | 0.66 | 215' | 285' |
| Overall Intersection | С | 23.9 | 0.80 | | | С | 29.3 | 0.94 | | | С | 20.5 | 0.87 | | |
| | | | | US | 54 & Southbo | und MO 5 Ra | amps (Unsigna | alized) | | | | | | | |
| Eastbound US 54 | Α | <1.0 | 0.44 | | <25' | Α | <1.0 | 0.50 | | <25' | А | <1.0 | 0.44 | | <25' |
| Westbound US 54 | Α | <1.0 | 0.35 | | <25' | Α | <1.0 | 0.55 | | <25' | Α | <1.0 | 0.48 | | <25' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | F | >200 | 1.41 | | 640' | F | 132.8 | 1.41 | - | 355' | F | 78.0 | 0.98 | | 275' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | В | 11.6 | 0.33 | | 35' | С | 19.0 | 0.38 | | 45' | С | 17.9 | 0.43 | | 55' |
| Overall Intersection | D | 30.5 | 0.75 | | | Α | 9.9 | 0.72 | | | Α | 6.8 | 0.66 | | |
| | | | | | US 54 & Bu | siness Route | 5 (Signalized | | | | | | | | |
| Eastbound US 54 | D | 38.5 | 0.88 | 500' | 550' | С | 34.8 | 0.84 | 490' | 595' | С | 24.6 | 0.57 | 275' | 345' |
| Westbound US 54 | D | 36.9 | 1.10 | 210' | 320' | С | 29.2 | 0.90 | 515' | 490' | С | 24.3 | 0.80 | 320' | 385' |
| Northbound Business Route 5 | D | 40.4 | 0.75 | 85' | 135' | D | 51.4 | 0.88 | 170' | 255' | D | 43.0 | 0.80 | 115' | 180' |
| Southbound Business Route 5 | Е | 68.6 | 0.96 | 275' | 420' | D | 49.1 | 0.58 | 45' | 90' | D | 53.8 | 0.77 | 120' | 185' |
| Overall Intersection | D | 43.3 | 0.90 | | | D | 36.4 | 0.93 | | | С | 31.9 | 0.88 | | |



Table 45: Intersection Operating Conditions – 2050 Build (Phase 2) (VISSIM)

| | | Nover | nber AM Peak Ho | | | | M Peak Hour | - | | August PN | 1 Peak Hour | |
|---|----------|--|------------------|------------------|--------------------|--------------------|------------------|------------------|-----|-----------|------------------|------------------|
| Intersection/Approach | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue | LOS | Delay | Average Queue | Maximum Queue |
| | <u> </u> | <u>. </u> | · | | JS 54 & Cecil Stre | et (Signalized) | | | | | • | • |
| Eastbound US 54 | Α | 5.6 | <25' | 365' | С | 21.5 | 305' | 1390' | В | 17.9 | 95' | 525' |
| Westbound US 54 | В | 11.1 | 35' | 335' | В | 16.9 | 90' | 550' | С | 24.9 | 245' | 1240' |
| Northbound U-Turn | D | 42.4 | 35' | 210' | D | 41.2 | 70' | 330' | С | 32.1 | 30' | 210' |
| Southbound Cecil Street | В | 19.1 | <25' | 95' | D | 37.4 | 145' | 725' | С | 26.8 | 35' | 265' |
| Overall Intersection | В | 10.5 | | | С | 23.2 | | | С | 23.0 | | |
| | | | | US 54 & Laker I | Pride Road/Comm | nercial Driveway (| Signalized) | | | | | |
| Eastbound US 54 | С | 29.4 | 215' | 720' | С | 21.8 | 125' | 410' | В | 15.3 | 75' | 420' |
| Westbound US 54 | С | 27.3 | 160' | 585' | С | 20.6 | 195' | 1050' | С | 23.7 | 265' | 1255' |
| Northbound Laker Pride Road | С | 32.0 | 45' | 250' | С | 34.1 | 65' | 535' | С | 31.0 | <25' | 90' |
| Southbound Driveway | В | 16.5 | <25' | 60' | В | 17.0 | <25' | 55' | В | 18.5 | <25' | 55' |
| Overall Intersection | С | 28.8 | | | С | 22.3 | | | С | 20.4 | | |
| | = | | | US 5 | 4 & Jack Crowell | Road (Signalized) | | | | | | |
| Eastbound US 54 | В | 15.1 | 50' | 280' | В | 10.2 | 50' | 280' | А | 8.1 | 40' | 245' |
| Westbound US 54 | В | 16.4 | 70' | 585' | В | 15.0 | 110' | 1010' | В | 19.3 | 150' | 1045' |
| Southbound Jack Crowell Road | D | 51.7 | 25' | 180' | D | 43.2 | 25' | 135' | D | 39.2 | <25' | 140' |
| Overall Intersection | В | 16.8 | | | В | 13.7 | | | В | 15.0 | | |
| | | | | US 54 & | Northbound MO | 5 Ramps (Signaliz | red) | | | | | |
| Eastbound US 54 | В | 14.2 | 100' | 690' | С | 23.7 | 220' | 830' | В | 18.7 | 115' | 615' |
| Westbound US 54 | Α | 7.1 | <25' | 180' | В | 13.0 | 100' | 805' | В | 15.7 | 125' | 835' |
| Northbound MO 5 Off-Ramp | D | 45.8 | 100' | 375' | D | 46.1 | 105' | 370' | D | 44.9 | 105' | 385' |
| Overall Intersection | В | 16.7 | | | С | 21.1 | | | С | 20.6 | | |
| | - | _ | | US 54 & S | outhbound MO 5 | Ramps (Unsignal | ized) | | | | | - |
| Eastbound US 54 | Α | 0.8 | <25' | 95' | Α | 2.5 | <25' | 170' | Α | 0.6 | <25' | 65' |
| Westbound US 54 | Α | 1.3 | <25' | 30' | Α | 3.1 | <25' | 25' | Α | 3.5 | <25' | 50' |
| Southbound MO 5 to Eastbound US 54 Off-Ramp | D | 26.6 | 135' | 765' | D | 30.3 | 110' | 645' | Α | 8.2 | <25' | 215' |
| Southbound MO 5 to Westbound US 54 Off-Ramp | Α | 4.6 | <25' | 140' | Α | 5.7 | <25' | 120' | Α | 6.0 | <25' | 140' |
| Overall Intersection | Α | 4.6 | | | Α | 4.9 | | | Α | 3.0 | | |
| | | | | US | 54 & Business Rou | ute 5 (Signalized) | | | | | | |
| Eastbound US 54 | С | 23.9 | 125' | 630' | С | 23.6 | 130' | 640' | С | 22.5 | 95' | 465' |
| Westbound US 54 | С | 33.7 | 185' | 670' | С | 25.2 | 175' | 980' | С | 20.2 | 105' | 735' |
| Northbound Business Route 5 | D | 46.1 | 40' | 450' | D | 48.1 | 290' | 1555' | С | 33.1 | 35' | 220' |
| Southbound Business Route 5 | D | 49.6 | 110' | 605' | D | 44.4 | 30' | 135' | D | 43.5 | 80' | 265' |
| Overall Intersection | С | 34.2 | | | С | 30.2 | | | С | 26.5 | | |



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Table 46: MO 5 Capacity Analysis – 2050 Build (Phase 2) (VISSIM)

| Traffic | | | | | | Nov | ember AM Peak ho | ur | | Nov | ember PM Peak Ho | ur | August PM Peak Hour | | | |
|--------------------|--|-----------|---------|-------|-----|-----------------------|---------------------|-------------------------|-----|-----------------------|---------------------|-------------------------|---------------------|-----------------------|---------------------|-------------------------|
| Volume Scenario | Segment | Direction | Type | Lanes | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume | LOS | Density (pc/mi/ln) | Average Speed (mph) | Total Traffic Volume |
| | Southbound MO 5 | | | | | | | | | | | | | | | |
| 2050 | Before US 54 Interchange | SB | Basic | 2 | Α | 7.3 | 60.0 | 856 | В | 11.7 | 60.0 | 1360 | В | 12.3 | 60.0 | 1426 |
| 2050 | US 54 Off-Ramp | SB | Diverge | 3 | Α | 4.5 | 63.0 | 854 | Α | 7.1 | 64.0 | 1358 | Α | 7.5 | 64.0 | 1424 |
| 2050 | Between US 54 Ramps | SB | Basic | 2 | Α | 4.8 | 64.0 | 612 | Α | 9.5 | 64.0 | 1203 | Α | 9.6 | 64.0 | 1216 |
| 2050 | Between US 54 On-Ramp and US 54 Off-Ramp | SB | Weave | 3 | Α | 6.5 | 48.0 | 900 | В | 11.7 | 51.0 | 1795 | В | 12.0 | 52.0 | 1841 |
| 2050 | Between US 54 Ramps | SB | Basic | 2 | Α | 3.4 | 62.0 | 419 | В | 11.9 | 62.0 | 1473 | В | 12.2 | 62.0 | 1514 |
| 2050 | US 54 On-Ramp | SB | Merge | 3 | Α | 2.8 | 63.0 | 531 | Α | 8.6 | 63.0 | 1619 | Α | 8.7 | 63.0 | 1644 |
| 2050 | After US 54 Interchange | SB | Basic | 2 | Α | 4.1 | 64.0 | 528 | В | 12.8 | 63.0 | 1617 | В | 13.0 | 63.0 | 1643 |
| | | | | | | | Northbo | ound MO 5 | | | | | | | | |
| 2050 | Before US 54 Interchange | NB | Basic | 2 | Α | 10.6 | 59.0 | 1224 | В | 13.7 | 59.0 | 1584 | В | 13.8 | 59.0 | 1585 |
| 2050 | US 54 Off-Ramp | NB | Diverge | 3 | Α | 6.6 | 62.0 | 1223 | Α | 8.4 | 63.0 | 1583 | Α | 8.4 | 63.0 | 1585 |
| 2050 | Between US 54 Ramps | NB | Basic | 2 | Α | 4.4 | 64.0 | 561 | Α | 7.0 | 64.0 | 900 | Α | 7.0 | 64.0 | 899 |
| 2050 | US 54 On-Ramp | NB | Merge | 3 | Α | 4.8 | 63.0 | 899 | Α | 8.8 | 61.0 | 1627 | Α | 9.1 | 61.0 | 1681 |
| 2050 | After US 54 Interchange | NB | Basic | 2 | Α | 7.0 | 64.0 | 898 | В | 12.8 | 63.0 | 1627 | В | 13.2 | 63.0 | 1679 |



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SAFETY ANALYSIS

Predictive Safety Analysis

To evaluate the safety implication of the proposed changes, safety conditions were analyzed using the AASHTO Highway Safety Manual (HSM; 1st Edition, 2010). The Highway Safety Manual methodologies are the preferred method for predictive safety analysis. The HSM provides guidance for quantifying crashes resulting from design decisions on a specific facility. The HSM methodology estimates future safety performance using Safety Performance Functions (SPFs) for specific facilities that are based in statistical crash data and geometric features. HSM methodologies also allows the ability to apply local calibration factors for specific roadway and intersection types to better estimate the safety performance.

National Cooperative Highway Research Program (NCHRP) has developed spreadsheet tools to assist with the implementation of HSM Part C, predictive methods, based on research studies. The HSM suburban/urban arterial spreadsheet was used to predict crashes along US 54 to compare the No-build Conditions to the Build Conditions.

The first edition of the HSM lacks expansive research on freeway facilities. However, Chapters 18 and 19 of the 2014 Supplement to the HSM includes research on the freeway segments and speed-change lanes as well as freeway ramps and freeway terminals. The Enhanced Interchange Safety Analysis Tool (ISATe), developed in cooperation with NCHRP, incorporates research from Chapters 18 and 19 of HSM for assessing the safety effects of basic geometric design along the freeway mainline, freeway ramps, and freeway terminals. As a result, the ISATe spreadsheet tool was used to predict the change in safety along the mainline freeway, freeway ramps and ramp terminals along the Missouri Route 5 corridor within the project area. The HSM segmentation guidance was followed as closely as practical. Crash prediction models were developed for the future traffic analysis years of 2030 (the projected opening year) to 2050 (design year).



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No-Build Condition

The No-build scenario assumes that the existing geometrics along the freeway and at the existing interchange will stay same over the 20-year timeframe. MO 5 freeway (red lines), freeway ramps (purple lines), and freeway terminals (green circles) and HSM Arterial segments (blue lines) and HSM Arterial intersections (yellow circles) are shown in **Figure 63** for the No-build Condition.

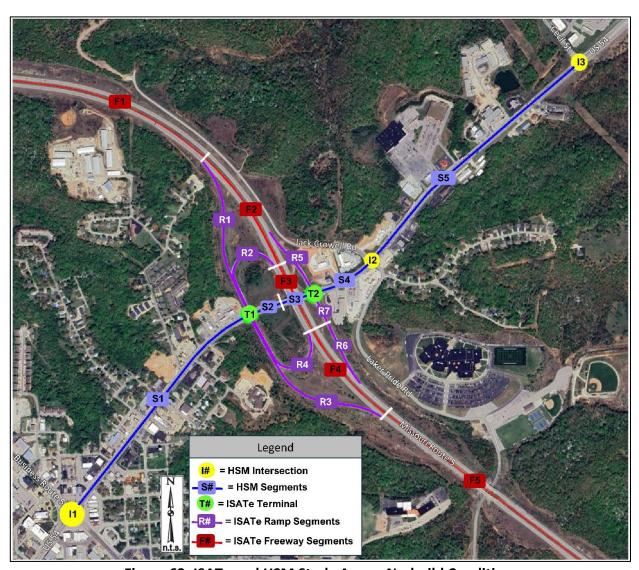


Figure 63: ISATe and HSM Study Area – No-build Condition



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Build Condition

The Build Condition assumes that Laker Pride Road (south side of US 54) will be rerouted to form a new 3-leg signalized intersection with US 54 between Jack Crowell Road and Cecil Street. It also includes expanding US 54 from an undivided five-lane section (two lanes in each direction plus a center two-way left-turn lane) to a divided six-lane section (three lanes in each direction) from Cecil Street to the intersection with the northbound MO 5 ramps, where the westbound lane terminates as a separate right-turn lane to go north on MO 5. It should be noted that the HSM methodology does not currently include a six-lane divided roadway facility type for safety analysis, so a four-lane divided highway was used as the next closest analysis available for the segments. Additionally, for the intersections east of the northbound terminals, the mainline left-turn phasing was assumed to be changed to protected only since mainline left-turns would be crossing three through lanes in the opposing direction. MO 5 (red lines), freeway ramps (purple lines), and freeway terminals (green circles) and HSM Arterial segments (blue lines) and HSM Arterial intersections (yellow circles) are shown in **Figure 64** for the Build Condition.

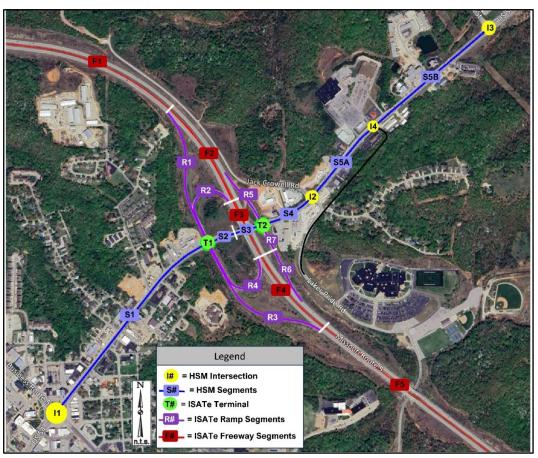


Figure 64: ISATe and HSM Study Area - Build Condition



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The safety analysis considers the same 20-year period (2030 to 2050) as the traffic analysis to determine the potential change in safety between the No-Build Condition and the Build Condition. **Table 47** below shows the predicted change in crashes over twenty years along MO 5 and US 54 between the No-Build Condition and the Build Condition. The detailed results, segmentation map, and printouts of the ISATe/HSM inputs and outputs are provided in the **Appendix G**. It should be noted that the ISATe program does not consider vertical curvature, slowdowns in traffic due to congestion or queuing issues that could be experienced along the corridor(s). As seen in Table 47, the Build improvements to US 54 are predicted to have a 10.4% reduction to the overall study area.

Table 48 below shows the predicted change in crashes over twenty years but limited to the improvement area, along US 54 between the MO 5 northbound ramps and Cecil Street. When focusing in on the improvement area, the proposed changes are predicted to have a **17.2% reduction in crashes when compared to the No Build condition**.

The US 54 and Jack Crowell Road/Laker Pride Road intersection will change from a four-leg intersection to a three-leg intersection which is predicted to have a reduction in crashes. With this change, Laker Pride Road will be re-routed to a separate three-leg signalized intersection with US 54 between Jack Crowell Road and Cecil Street which will add crashes that the no-build condition does not have. Overall, this modification is predicted to have a slight reduction in crashes at the intersections.

For the arterial segments east of the MO 5 northbound terminal (segments 4 and 5), the decrease in crashes is much more significant with a 57.3% reduction as is the direct result of providing a divided highway (median barrier) in the build scenario, which eliminates left-turn conflicts in the segments and proves to be a significant safety improvement.

The minor decrease in crashes at US 54 and Northbound MO 5 ramp terminal is due to the addition of a westbound US 54 right-turn lane at the terminal. Because of the additional lanes along US 54 east of the terminal, the westbound approach gains a separate right-turn lane with improved storage capacity to improve traffic flow.

As mentioned earlier, the HSM calculations do not include impacts related to congestion or queuing. Further, the current HSM methodology does not have the ability to evaluate the safety impacts of adding a through lane at intersections. Therefore, the HSM safety analysis at the intersection of US 54 and Cecil Street does not reflect a reduction in predicted crashes in Table 47 or Table 48. Although the analysis and tables do not show a crash reduction, it is reasonable to anticipate a reduction in crashes due to additional through lanes along US 54 which is intended to reduce queuing and therefore minimize the potential for rear end collisions.

Overall, the Build Condition is predicted to have approximately 17.2% fewer crashes over the 20-year period when compared to the No-Build Condition within the area of improvement.



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Camdenton, Missouri
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Table 47: Safety Results – Change in Predicted Crashes in Overall Study Area Over 20-Years (ISATe & HSM)

| · | No-E | Build Cond | dition | Bu | ild Condi | tion | | Changes | in Crashe | es |
|--|--------|------------|--------|-------|-----------|--------|--------|---------|-----------|-------------------------|
| Facility | F&I | PDO | Total | F&I | PDO | Total | F&I | PDO | Total | % Change in Total |
| Intersection 1 crashes: (US 54 & Business Route 5) | 158.9 | 251.5 | 410.4 | 158.9 | 251.5 | 410.4 | 0.0 | 0.0 | 0.0 | 0.0% |
| Intersection 2 crashes: (No-Build: US 54 & Jack Crowell Road/Laker Pride Road) (Build: US 54 & Jack Crowell Road) | 253.6 | 390.5 | 644.1 | 77.9 | 134.3 | 212.1 | -175.8 | -256.2 | -432.0 | -67.1% |
| Intersection 3 crashes: (US 54 & Cecil Street) | 100.5 | 192.3 | 292.8 | 100.5 | 192.3 | 292.8 | 0.0 | 0.0 | 0.0 | 0.0% |
| Intersection 4 crashes: (Build: US 54 & Laker Pride Road) | | | | 108.7 | 209.1 | 317.8 | 108.7 | 209.1 | 317.8 | |
| Arterial segments (1-3) crashes: | 67.3 | 167.7 | 235.0 | 67.3 | 167.7 | 235.0 | 0.0 | 0.0 | 0.0 | 0.0% |
| Arterial segments (4-5) crashes: | 97.2 | 246.4 | 343.6 | 37.8 | 108.8 | 146.7 | -59.4 | -137.6 | -197.0 | -57.3% |
| Total Arterial HSM Crashes | 677.5 | 1248.4 | 1925.9 | 551.0 | 1063.7 | 1614.7 | -126.5 | -184.7 | -311.2 | -16.2% |
| Freeway segments, crashes: | 72.4 | 245.7 | 318.1 | 72.4 | 245.7 | 318.1 | 0.0 | 0.0 | 0.0 | 0.0% |
| Ramp segments, crashes: | 46.0 | 84.6 | 130.6 | 46.0 | 84.6 | 130.6 | 0.0 | 0.0 | 0.0 | 0.0% |
| Crossroad ramp terminals, crashes: | 261.4 | 737.9 | 999.3 | 238.6 | 722.1 | 960.7 | -22.8 | -15.8 | -38.6 | -4.0% |
| Total ISATe Crashes | 379.8 | 1068.3 | 1448.0 | 356.9 | 1052.5 | 1409.4 | -22.8 | -15.8 | -38.6 | -2.7% |
| Total Study Area Crashes | 1057.3 | 2316.7 | 3373.9 | 907.9 | 2116.3 | 3024.2 | -149.3 | -200.4 | -349.8 | -10.4% |



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Table 48: Safety Results – Change in Predicted Crashes in Modified Study Area Over 20-Years (ISATe & HSM)

| | No-E | Build Cond | dition | Bu | ild Condi | tion | | Changes | in Crash | es |
|--|-------|------------|--------|-------|-----------|--------|--------|---------|----------|-------------------------|
| Facility | F&I | PDO | Total | F&I | PDO | Total | F&I | PDO | Total | % Change in Total |
| Intersection 2 crashes: (No-Build: US 54 & Jack Crowell Road/Laker Pride Road) (Build: US 54 & Jack Crowell Road) | 253.6 | 390.5 | 644.1 | 77.9 | 134.3 | 212.1 | -175.8 | -256.2 | -432.0 | -67.1% |
| Intersection 3 crashes: (US 54 & Cecil Street) | 100.5 | 192.3 | 292.8 | 100.5 | 192.3 | 292.8 | 0.0 | 0.0 | 0.0 | 0.0% |
| Intersection 4 crashes: (Build: US 54 & Laker Pride Road) | | | | 108.7 | 209.1 | 317.8 | 108.7 | 209.1 | 317.8 | |
| US 54 segments (4-5) crashes: (MO 5 NB ramps to Cecil St): | 97.2 | 246.4 | 343.6 | 37.8 | 108.8 | 146.7 | -59.4 | -137.6 | -197.0 | -57.3% |
| US 54 and NB MO 5 ramp terminal, crashes: | 201.6 | 556.1 | 757.7 | 178.8 | 540.4 | 719.1 | -22.8 | -15.8 | -38.6 | -5.1% |
| Total Study Area Crashes | 652.9 | 1385.3 | 2038.2 | 503.7 | 1184.9 | 1688.5 | -149.3 | -200.5 | -349.8 | -17.2% |



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SUMMARY OF FINDINGS

US Route 54 (US 54) is a key mobility corridor for regional and intercity traffic. Nationally, US 54 runs 1,200 miles from Griggsville, Illinois to El Paso, Texas. In Missouri, US 54 connects the Lake of the Ozarks to communities such as Louisiana (near the Champ Clark Mississippi River Bridge at the Illinois border), Bowling Green (at US 61), Mexico, Kingdom City (at I-70), Jefferson City (crossing the Senator Roy Blunt Missouri River Bridge and intersecting US 50 and US 63), and Nevada (at I-49 near the Kansas border). Within the study area, US 54 provides access to/from Missouri Route 5 (MO 5), recreational and entertainment opportunities associated with the Lake of the Ozarks, commercial and residential properties, and schools such as Camdenton High School, Oak Ridge Intermediate School, and Hawthorn Elementary School.

MoDOT has been upgrading US 54 to an expressway through the Lake of the Ozarks area over the past 15 years, resulting in the removal of all the traffic signals between Kingdom City and Camdenton. As a result, the traffic signals at the intersections of US 54 with Laker Pride and Cecil Street are the only traffic signals remaining on US 54 between Kingdom City and MO 5. These intersections create capacity bottlenecks along this section of US 54 resulting in congestion and associated roadway crashes.

This study was undertaken to identify and examine alternatives to improve the short and long-term safety and traffic operations of the US 54/MO 5 interchange and of US 54 in Camdenton between the south end of the Lake of the Ozarks US 54 Expressway and the MO 5 interchange. As such, the study examined US 54 between Cecil Street and Business Route 5 as well as MO 5 between Business Route 5 and Missouri Route 7.

The study's preferred alternative is a "Boulevard" configuration, that:

- Widens US 54 to six (6) lanes between Cecil Street and the MO 5 interchange.
- Installs a raised center median in the widened section to control left turns.
- Relocates the Laker Pride Road intersection approximately 1200 feet to the east to a new traffic signal at a commercial driveway in the vicinity of Gerbes.
- Provides a signalized U-turn movement at the Jack Crowell Road traffic signal for westbound traffic.
- Provides a signalized U-turn movement at the Cecil Road traffic signal for eastbound traffic via a new jughandle. The existing eastbound to northbound left turn traffic will also use the new jughandle.

The Boulevard concept recognizes the commercial nature of his section of US 54 and provides an opportunity to extend Camdenton's US 54 urban character east of MO 5 to Cecil Street through elements such as lower speeds, signalized intersections, street lighting, and gateway signage. The posted speed limit for this section of US 54 under the Boulevard concept is recommended to be 35 miles per hour.



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MoDOT can build this project in two phases. Phase 1 widens US 54 between the northbound MO 5 ramps and Laker Pride/Jack Crowell Road. Phase 2 relocates Laker Pride Road, installs the Uturn movements, and widens US 54 between Jack Crowell Road and Cecil Street.

Phase 1 includes:

- The construction of a third eastbound lane on US 54 from the northbound MO 5 ramps to Laker Pride Road where it terminates as a right-turn lane at Laker Pride Road.
- Building a third westbound lane on US 54 lane from the eastern approach to Laker Pride Road, terminating as a right-turn at the northbound MO 5 ramps.
- Installs a raised center median on US 54 between the northbound MO 5 ramps to Laker Pride Road/Jack Crowell Road.
- Restriction of all driveways on US 54 between MO 5 and Laker Pride/Jack Crowell Road to right-in right-out access.
 - Businesses on the north side of US 54 have left turn access to/from US 54 via existing connections to Jack Crowell Road.
 - Businesses on the south side of US 54 have left-turn access to/from US 54 via existing and new driveway connections to Laker Pride Road.

Based on property lines obtained from the Camden County GIS website, the construction of Phase 1 will require the acquisition of approximately 0.37 acres, impacting six parcels. The actual existing right-of-way needs will be more precisely determined in the design phase. The construction estimate (rounded) for Phase 1 is \$4,500,000.

Phase 2 extends the widening of US 54 to six lanes from Laker Pride/Jack Crowell Road to Cecil Street. Phase 2 also:

- Installs a raised center median in the widened section to control left turns. The results in the restriction of all driveways on US 54 between Jack Crowell Road and Cecil Street to right-in right-out access.
- Relocates the Laker Pride Road intersection approximately 1200 feet to the east to a
 new traffic signal at a commercial driveway in the vicinity of Gerbes. This intersection
 will include an eastbound US 54 right-turn lane and northbound dual left-turn lanes.
- Provides a signalized U-turn movement at the Jack Crowell Road traffic signal for westbound traffic.
- Provides a signalized U-turn movement at the Cecil Street traffic signal for eastbound traffic via a new jughandle. The existing eastbound to northbound left turn traffic will also use the new jughandle.



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Based on property lines obtained from the Camden County GIS website, the construction of Phase 2 will require the acquisition of approximately 3.33 acres, impacting twenty-four parcels. The actual existing right-of-way needs will be more precisely determined in the design phase. The construction estimate (rounded) for Phase 2 is \$11,000,000.

The study team conducted an analysis of historical crash data and predicted future safety performance. Crashes in the segments between the northbound MO 5 Ramps and Cecil Street are comprised of approximately 39% rear ends and approximately 28% left-turn related crashes. Should improvements be made to minimize or eliminate left-turns from driveways and to reduce congestion and queuing, then significant safety improvements could be expected along these segments, especially when considering the predominate types of crashes in the historical crash data.

The proposed improvements aim to reduce crashes related to left turning vehicles and rear ends through access management practices. Implementing a median barrier on US 54 instead of a two-way left-turn lane eliminates left-turning conflict points at driveways. The additional lane on US 54 in both directions serves to separate turning vehicles from through traffic to improve traffic flow and reduce the potential for rear end collisions.

Based on the predictive safety analysis, the Phase 2 Build condition is predicted to have approximately 17.2% fewer crashes over the 20-year period when compared to the No-Build Condition within the area of improvement. Also, the US 54 segments between the signalized intersections of the northbound MO 5 ramps and Cecil Street is predicted to have approximately 57.3% reduction in crashes due to the proposed divided highway (median barrier) provided in the build scenario, which eliminates left-turn conflicts in the segments and provides a significant safety improvement.

For the arterial segments east of the MO 5 northbound terminal (segments 4 and 5), the decrease in crashes is much more significant with a 57.3% reduction as is the direct result of providing a divided highway (median barrier) in the build scenario, which eliminates left-turn conflicts in the segments and proves to be a significant safety improvement.

The study team completed traffic modeling with the VISSIM traffic analysis software to determine capacity needs and estimate how much the proposed improvements would lower delay. The team modeled several scenario years, including 2024 (completion of base traffic counts), 2030 (estimated Phase 1 construction year), and 2050 (design year). For each of these years the study team evaluated AM and PM peak periods for November conditions (when school is in session) as well as the August PM peak period for August traffic.



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Traffic modeling shows that Phase 1 improvements will provide an acceptable level of service (LOS D or better) during the November AM and PM peak periods as well as August PM peak period until sometime around 2035. The Phase 1 improvements, by themselves, will reach their capacity sometime between 2035 and 2050 due to capacity constraints in the existing four-lane section between the Lake Pride/Jack Crowe Road and Cecil Street traffic signals. Phase 2 improvements provide adequate capacity for an acceptable level of service (LOS D or better) through 2050.

In addition to intersection and freeway operations, VISSIM provides network-wide performance measures that measure the effectiveness of alternatives. VISSIM modeling shows the following network delay reductions for 2024 and 2030 build conditions from 2024 and 2030 no-build conditions, respectively.

| Peak Periods | 2024 Traffic Volumes | 2030 Traffic Volumes |
|------------------|----------------------|----------------------|
| November AM Peak | 39% delay reduction | 54% delay reduction |
| November PM Peak | 57% delay reduction | 69% delay reduction |
| August PM Peak | 66% delay reduction | 64% delay reduction |

These results show considerable improvement in the overall roadway network performance for Phase 1 for short-term growth.

VISSIM modeling shows the following network delay reductions for 2050 traffic volumes.

| Peak Periods | Phase 1 with 2050 Traffic Volumes | Phase 2 with 2050 Traffic Volumes | | | |
|------------------|-----------------------------------|-----------------------------------|--|--|--|
| November AM Peak | 66% delay reduction | 78% delay reduction | | | |
| November PM Peak | 38% delay reduction | 70% delay reduction | | | |
| August PM Peak | 81% delay reduction | 83% delay reduction | | | |

2050 modeling results show that both Phases 1 and 2 provide an improvement in all network-wide metrics. However, the VISSIM models also show that with Phase 1, by 2050 approximately 572 vehicles are unable to enter the road network during the November PM peak period. This "unmet demand" shows that there is not adequate capacity for all the vehicles seeking to travel on US 54 during that time, resulting in roadway congestion. The August PM peak period has an unmet demand of 1114 vehicles. The modeling data also shows that there is an additional travel delay reduction with Phase 2 improvements. The results of this analysis show that Phase 1 improvements will address existing congestion, but that Phase 2 construction will be needed to provide the capacity required for projected traffic growth.



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The proposed improvements improve safety and traffic operations by providing needed capacity along US 54 between MO 5 and Cecil Street. These improvements can be constructed in 2 phases. Widening US 54 in this section and widening to 6 lanes recognizes the commercial nature of his section of US 54 and provides an opportunity to extend Camdenton's US 54 urban character east of MO 5 to Cecil Street through elements such as lower speeds, signalized intersections, street lighting, and gateway signage.





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Appendix A – Travel Time Data

US 54 & MO 5 Weekday AM Travel Runs CBB # 073-24

Study Name : US 54 & MO 5 Weekday AM - EB

Study Date : 10/17/2024

Page No. : 1

Study Summary

Runs Used in This Study

| Run Title | Start Date | Start Time | Length | Before/ After | Run Type |
|--------------------------|---------------|---------------|--------|------------------|-------------|
| US 54 & MO-5 AM-2-EB-003 | 10/17/24 | 07:08 | 8024 | Before | Primary |
| US 54 & MO-5 AM-2-EB-004 | 10/17/24 | 07:19 | 8086 | Before | Primary |
| US 54 & MO-5 AM-2-EB-005 | 10/17/24 | 07:30 | 8126 | Before | Primary |
| US 54 & MO-5 AM-2-EB-006 | 10/17/24 | 07:42 | 8073 | Before | Primary |
| US 54 & MO-5 AM-2-EB-007 | 10/17/24 | 07:53 | 8177 | Before | Primary |

Node Info

| # | Len | Name |
|---|------|------------------|
| 1 | 0 | Business Route 5 |
| 2 | 3132 | SB MO-5 Off-Ramp |
| 3 | 769 | NB MO-5 On-Ramp |
| 4 | 810 | Laker Pride Road |
| 5 | 3340 | Cecil Street |

Length of Study Route = 8,051 feet

Notes:

US 54 & MO 5 Weekday AM Travel Runs CBB # 073-24

Study Name : US 54 & MO 5 Weekday AM - EB

Study Date : 3/3/2025 Page No. : 2

Overall Output Statistics

| Node | Length | Node | Travel | # of | Avg | Total | Time <= | Time <= | Time <= |
|-------|--------|------------------|--------|-------|-------|-------|---------|---------|---------|
| # | | | Time | Stops | Speed | Delay | 35 MPH | 40 MPH | 45 MPH |
| 1 | 0 | Business Route 5 | | | | | | | |
| 2 | 3132 | SB MO-5 Off-Ramp | 58.0 | 0.0 | 36.8 | 10.0 | 15.4 | 41.8 | 58.0 |
| 3 | 769 | NB MO-5 On-Ramp | 48.0 | 0.8 | 10.9 | 36.0 | 44.6 | 46.6 | 48.0 |
| 4 | 810 | Laker Pride Road | 41.4 | 0.8 | 13.3 | 28.8 | 41.4 | 41.4 | 41.4 |
| 5 | 3340 | Cecil Street | 57.4 | 0.0 | 39.7 | 7.4 | 12.2 | 22.4 | 47.4 |
| Total | 8,051 | | 204.8 | 1.6 | 26.8 | 82.2 | 113.6 | 152.2 | 194.8 |

Stats based on 5 BEFORE runs. Stops based on a Stop Speed of 5 MPH. Total Delay based on a Normal Speed of 45 MPH.

US 54 & MO 5 Weekday AM Travel Runs CBB # 073-24

Study Name : US 54 & MO 5 Weekday AM - EB

Study Date : 3/3/2025

Page No. : 3

Detailed Statistics By Run

Travel Time (sec) by Section

US 54 & MO-5 AM-2-EB-003

US 54 & MO-5 A

US 54 & MO-5 A

US 54 & MO-5 A US 54 & MO-5 AM-2-EB-004 US 54 & MO-5 AM-2-EB-005 US 54 & MO-5 AM-2-EB-006 US 54 & MO-5 AM-2-EB-007

| Node | Length | Node Name | Run #1 | Run #2 | Run #3 | Run #4 | Run #5 |
|--------|--------|------------------|--------|--------|--------|--------|--------|
| # | | | | | | | |
| 1 | 0 | Business Route 5 | | | | | |
| 2 | 3132 | SB MO-5 Off-Ramp | 56 | 61 | 61 | 57 | 55 |
| 3 | 769 | NB MO-5 On-Ramp | 38 | 15 | 62 | 74 | 51 |
| 4 | 810 | Laker Pride Road | 28 | 25 | 56 | 53 | 45 |
| 5 | 3340 | Cecil Street | 56 | 53 | 58 | 67 | 53 |
| Totals | 8051 | | 178 | 154 | 237 | 251 | 204 |

US 54 & MO 5 Weekday AM Travel Runs CBB # 073-24

Study Name : US 54 & MO 5 Weekday AM - WB

Study Date : 10/17/2024

Page No. :1

Study Summary

Runs Used in This Study

| Run Title | Start Date | Start Time | Length | Before/ After | Run Type |
|--------------------------|---------------|---------------|--------|------------------|-------------|
| US 54 & MO-5 AM-2-WB-002 | 10/17/24 | 06:54 | 8054 | Before | Primary |
| US 54 & MO-5 AM-2-WB-003 | 10/17/24 | 07:04 | 8071 | Before | Primary |
| US 54 & MO-5 AM-2-WB-004 | 10/17/24 | 07:13 | 8043 | Before | Primary |
| US 54 & MO-5 AM-2-WB-005 | 10/17/24 | 07:24 | 8058 | Before | Primary |
| US 54 & MO-5 AM-2-WB-006 | 10/17/24 | 07:36 | 8072 | Before | Primary |

Node Info

| # | Len | Name |
|---|------|------------------|
| 1 | 0 | Cecil Street |
| 2 | 3340 | Laker Pride Road |
| 3 | 810 | NB MO-5 On-Ramp |
| 4 | 769 | SB MO-5 Off-Ramp |
| 5 | 3132 | Business Route 5 |

Length of Study Route = 8,051 feet

Notes:

US 54 & MO 5 Weekday AM Travel Runs CBB # 073-24

Study Name: US 54 & MO 5 Weekday AM - WB

Study Date : 3/3/2025 Page No. : 2

Overall Output Statistics

| Node | Length | Node | Travel | # of | Avg | Total | Time <= | Time <= | Time <= |
|-------|--------|------------------|--------|-------|-------|-------|---------|---------|---------|
| # | | | Time | Stops | Speed | Delay | 35 MPH | 40 MPH | 45 MPH |
| 1 | 0 | Cecil Street | | | | | | | |
| 2 | 3340 | Laker Pride Road | 56.2 | 0.0 | 40.5 | 5.2 | 4.6 | 20.4 | 45.8 |
| 3 | 810 | NB MO-5 On-Ramp | 25.2 | 0.6 | 21.9 | 12.8 | 17.0 | 22.4 | 25.2 |
| 4 | 769 | SB MO-5 Off-Ramp | 16.2 | 0.0 | 32.4 | 4.2 | 9.4 | 16.2 | 16.2 |
| 5 | 3132 | Business Route 5 | 96.4 | 0.8 | 22.2 | 49.2 | 52.6 | 75.0 | 95.4 |
| Total | 8,051 | | 194.0 | 1.4 | 28.3 | 71.4 | 83.6 | 134.0 | 182.6 |

Stats based on 5 BEFORE runs. Stops based on a Stop Speed of 5 MPH. Total Delay based on a Normal Speed of 45 MPH.

US 54 & MO 5 Weekday AM Travel Runs

CBB # 073-24

Study Name: US 54 & MO 5 Weekday AM - WB

Study Date : 3/3/2025

Page No. : 3

Detailed Statistics By Run

Travel Time (sec) by Section

US 54 & MO-5 AM-2-WB-002

US 54 & MO-5 AM

US 54 & MO-5 AM

US 54 & MO-5 AM US 54 & MO-5 AM-2-WB-003 US 54 & MO-5 AM-2-WB-005 US 54 & MO-5 AM-2-WB-006 US 54 & MO-5 AM-2-WB-004

| Node | Length | Node Name | Run #1 | Run #2 | Run #3 | Run #4 | Run #5 |
|--------|--------|------------------|--------|--------|--------|--------|--------|
| # | | | | | | | |
| 1 | 0 | Cecil Street | | | | | |
| 2 | 3340 | Laker Pride Road | 59 | 54 | 55 | 52 | 61 |
| 3 | 810 | NB MO-5 On-Ramp | 41 | 15 | 23 | 14 | 33 |
| 4 | 769 | SB MO-5 Off-Ramp | 18 | 13 | 18 | 15 | 17 |
| 5 | 3132 | Business Route 5 | 87 | 102 | 118 | 123 | 52 |
| Totals | 8051 | | 205 | 184 | 214 | 204 | 163 |

US 54 & MO 5 Friday PM Travel Runs CBB # 073-24

Study Name: US 54 & MO 5 Friday PM - EB

Study Date : 10/18/2024

Page No. :1

Study Summary

Runs Used in This Study

| Run Title | Start Date | Start Time | Length | Before/ After | Run Type |
|----------------------------|---------------|---------------|--------|------------------|-------------|
| US 54 & MO-5 FRI PM-EB-003 | 10/18/24 | 15:10 | 8167 | Before | Primary |
| US 54 & MO-5 FRI PM-EB-004 | 10/18/24 | 15:23 | 8164 | Before | Primary |
| US 54 & MO-5 FRI PM-EB-005 | 10/18/24 | 15:37 | 8140 | Before | Primary |
| US 54 & MO-5 FRI PM-EB-006 | 10/18/24 | 15:49 | 8124 | Before | Primary |
| US 54 & MO-5 FRI PM-EB-007 | 10/18/24 | 16:03 | 8054 | Before | Primary |

Node Info

| # | Len | Name |
|---|------|------------------|
| 1 | 0 | Business Route 5 |
| 2 | 3132 | SB MO-5 Off-Ramp |
| 3 | 769 | NB MO-5 On-Ramp |
| 4 | 810 | Laker Pride Road |
| 5 | 3340 | Cecil Street |

Length of Study Route = 8,051 feet

Notes:

US 54 & MO 5 Friday PM Travel Runs CBB # 073-24

Study Name: US 54 & MO 5 Friday PM - EB

Study Date : 3/3/2025

Page No. : 2

Overall Output Statistics

| Node | Length | Node | Travel | # of | Avg | Total | Time <= | Time <= | Time <= |
|-------|--------|------------------|--------|-------|-------|-------|---------|---------|---------|
| # | | | Time | Stops | Speed | Delay | 35 MPH | 40 MPH | 45 MPH |
| 1 | 0 | Business Route 5 | | | | | | | |
| 2 | 3132 | SB MO-5 Off-Ramp | 62.0 | 0.0 | 34.4 | 14.2 | 31.0 | 54.4 | 62.0 |
| 3 | 769 | NB MO-5 On-Ramp | 27.0 | 0.6 | 19.4 | 15.0 | 20.8 | 25.2 | 27.0 |
| 4 | 810 | Laker Pride Road | 31.8 | 0.4 | 17.4 | 19.2 | 31.8 | 31.8 | 31.8 |
| 5 | 3340 | Cecil Street | 60.6 | 0.0 | 37.6 | 10.0 | 19.6 | 41.2 | 53.6 |
| Total | 8,051 | | 181.4 | 1.0 | 30.3 | 58.4 | 103.2 | 152.6 | 174.4 |

Stats based on 5 BEFORE runs. Stops based on a Stop Speed of 5 MPH. Total Delay based on a Normal Speed of 45 MPH.

US 54 & MO 5 Friday PM Travel Runs CBB # 073-24

Study Date : 3/3/2025

Detailed Statistics By Run

Study Name: US 54 & MO 5 Friday PM - EB

Page No. : 3

Travel Time (sec) by Section

US 54 & MO-5 FRI PM-EB-003

US 54 & MO-5 FRI US 54

US 54 & MO-5 FRI US 54 US 54 & MO-5 FRI PM-EB-004 US 54 & MO-5 FRI PM-EB-005 US 54 & MO-5 FRI PM-EB-006 US 54 & MO-5 FRI PM-EB-007

| Node | Length | Node Name | Run #1 | Run #2 | Run #3 | Run #4 | Run #5 |
|--------|--------|------------------|--------|--------|--------|--------|--------|
| # | | | | | | | |
| 1 | 0 | Business Route 5 | | | | | |
| 2 | 3132 | SB MO-5 Off-Ramp | 60 | 58 | 66 | 66 | 60 |
| 3 | 769 | NB MO-5 On-Ramp | 14 | 15 | 14 | 47 | 45 |
| 4 | 810 | Laker Pride Road | 23 | 45 | 43 | 25 | 23 |
| 5 | 3340 | Cecil Street | 61 | 53 | 59 | 68 | 62 |
| Totals | 8051 | | 158 | 171 | 182 | 206 | 190 |

US 54 & MO 5 Friday PM Travel Runs CBB # 073-24

Study Name: US 54 & MO 5 Friday PM - WB Study Date : 10/18/2024

Page No. : 1

Study Summary

Runs Used in This Study

| Run Title | Start Date | Start Time | Length | Before/ After | Run Type |
|----------------------------|---------------|---------------|--------|------------------|-------------|
| US 54 & MO-5 Fri PM-WB-003 | 10/18/24 | 15:14 | 8080 | Before | Primary |
| US 54 & MO-5 Fri PM-WB-004 | 10/18/24 | 15:29 | 8077 | Before | Primary |
| US 54 & MO-5 Fri PM-WB-005 | 10/18/24 | 15:42 | 8094 | Before | Primary |
| US 54 & MO-5 Fri PM-WB-006 | 10/18/24 | 15:55 | 8042 | Before | Primary |
| US 54 & MO-5 Fri PM-WB-007 | 10/18/24 | 16:09 | 8055 | Before | Primary |

Node Info

| # | Len | Name |
|---|------|------------------|
| 1 | 0 | Cecil Street |
| 2 | 3340 | Laker Pride Road |
| 3 | 810 | NB MO-5 On-Ramp |
| 4 | 769 | SB MO-5 Off-Ramp |
| 5 | 3132 | Business Route 5 |

Length of Study Route = 8,051 feet

Notes:

US 54 & MO 5 Friday PM Travel Runs CBB # 073-24

Study Name: US 54 & MO 5 Friday PM - WB

Study Date : 3/3/2025

Page No. : 2

Overall Output Statistics

| Node | Length | Node | Travel | # of | Avg | Total | Time <= | Time <= | Time <= |
|-------|--------|------------------|--------|-------|-------|-------|---------|---------|---------|
| # | | | Time | Stops | Speed | Delay | 35 MPH | 40 MPH | 45 MPH |
| 1 | 0 | Cecil Street | | | | | | | |
| 2 | 3340 | Laker Pride Road | 159.4 | 2.8 | 14.3 | 108.4 | 159.4 | 159.4 | 159.4 |
| 3 | 810 | NB MO-5 On-Ramp | 47.6 | 1.0 | 11.6 | 35.0 | 47.6 | 47.6 | 47.6 |
| 4 | 769 | SB MO-5 Off-Ramp | 17.0 | 0.0 | 30.8 | 5.0 | 13.4 | 17.0 | 17.0 |
| 5 | 3132 | Business Route 5 | 95.0 | 0.6 | 22.5 | 47.6 | 64.6 | 87.6 | 94.0 |
| Total | 8,051 | | 319.0 | 4.4 | 17.2 | 196.0 | 285.0 | 311.6 | 318.0 |

Stats based on 5 BEFORE runs. Stops based on a Stop Speed of 5 MPH. Total Delay based on a Normal Speed of 45 MPH.

US 54 & MO 5 Friday PM Travel Runs CBB # 073-24

Study Name: US 54 & MO 5 Friday PM - WB

Study Date : 3/3/2025

Page No. : 3

Detailed Statistics By Run

Travel Time (sec) by Section

US 54 & MO-5 Fri PM-WB-003

US 54 & MO-5 Fri US 54 US 54 & MO-5 Fri PM-WB-005 US 54 & MO-5 Fri PM-WB-004 US 54 & MO-5 Fri PM-WB-006 US 54 & MO-5 Fri PM-WB-007

| Node | Length | Node Name | Run #1 | Run #2 | Run #3 | Run #4 | Run #5 |
|--------|--------|------------------|--------|--------|--------|--------|--------|
| # | | | | | | | |
| 1 | 0 | Cecil Street | | | | | |
| 2 | 3340 | Laker Pride Road | 187 | 138 | 160 | 159 | 153 |
| 3 | 810 | NB MO-5 On-Ramp | 55 | 59 | 19 | 48 | 57 |
| 4 | 769 | SB MO-5 Off-Ramp | 18 | 18 | 17 | 16 | 16 |
| 5 | 3132 | Business Route 5 | 60 | 143 | 105 | 99 | 68 |
| Totals | 8051 | | 320 | 358 | 301 | 322 | 294 |





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Appendix B – Presentation from March 13, 2025, Meeting

340 Regency Centre

Collinsville, IL 62234



US 54 & MO 5 Interchange Study Concept Brainstorm

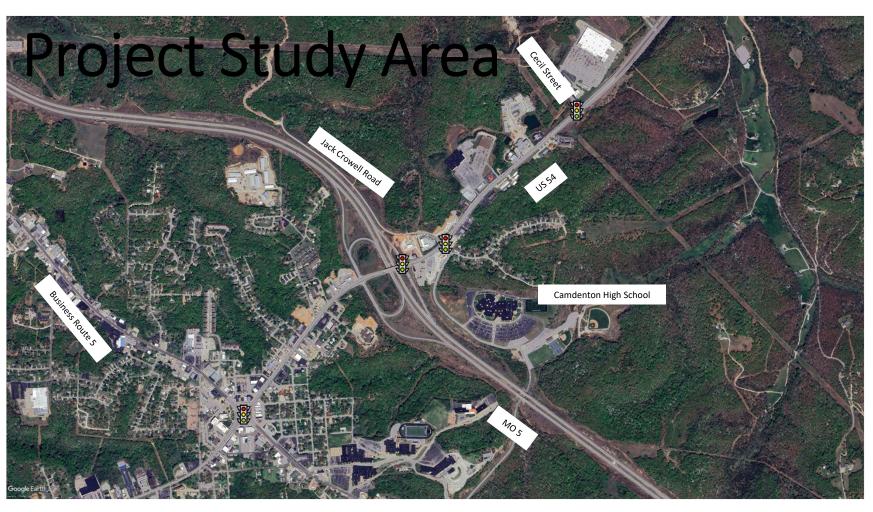
Camdenton, Missouri



Meeting Agenda

- Introductions
- Existing Conditions
- Traffic Forecasts
- Initial Concepts
- Reasonable Alternatives
- Alternative Discussion





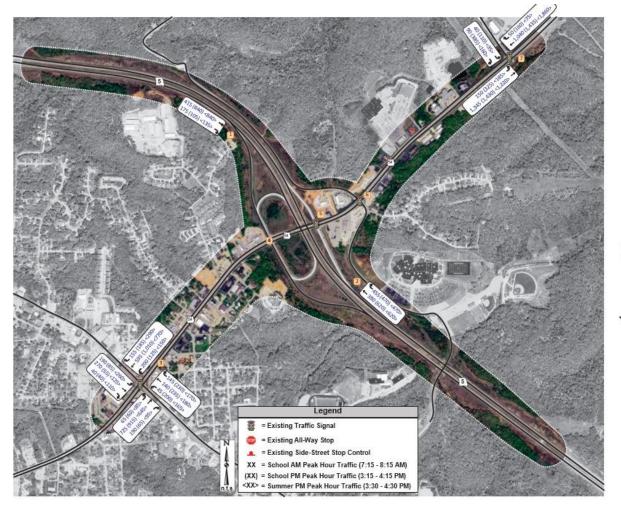


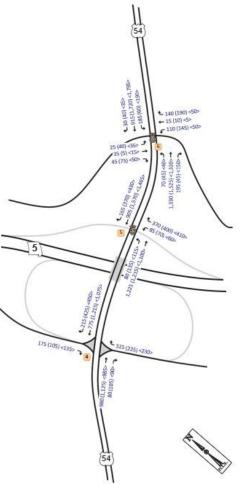
Modeling Methods & Assumptions

- Traffic Counts
- Signal Timing Data
- SYNCHRO
- VISSIM

2024 Traffic Volumes







2024 School AM VISSIM Model



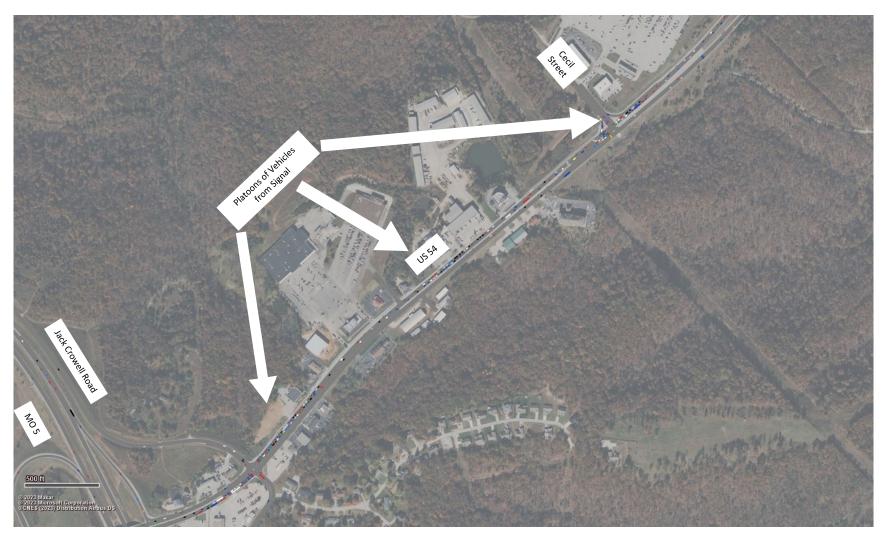


2024 School AM VISSIM Queues



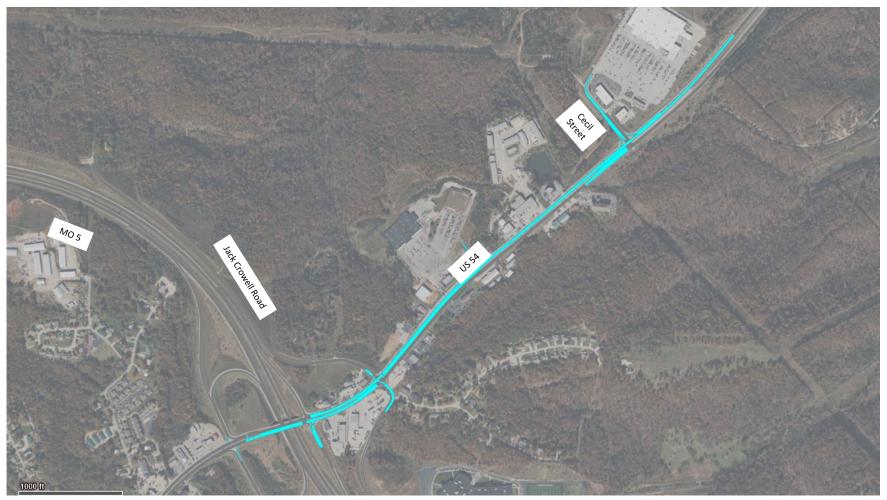
2024 School/Summer PM VISSIM Model





2024 School PM VISSIM Queues







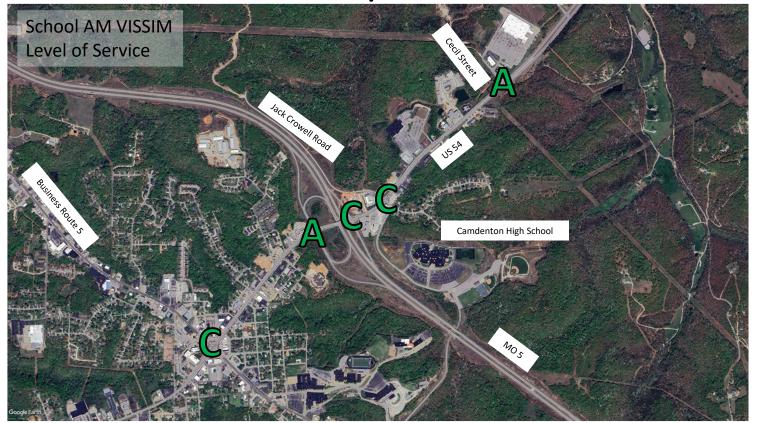
Calibration Results

 Travel times and traffic flows are within MoDOT's target range

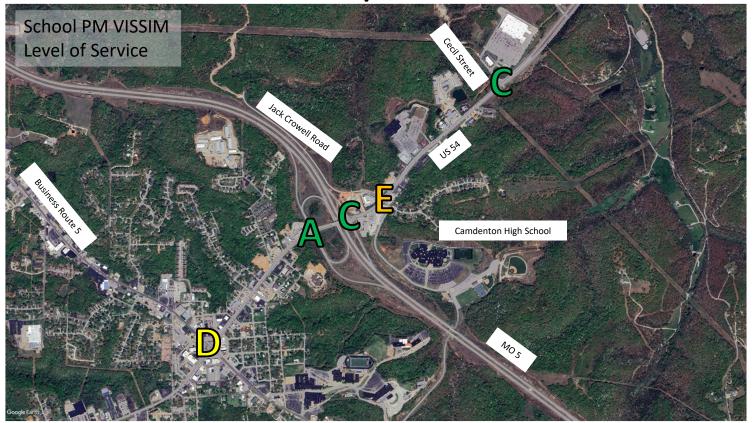
| School AM Travel Times | | | | | |
|------------------------|-------------------|--------------------|---------------------------|--|--|
| Direction | Field Average (s) | VISSIM Average (s) | Percent Difference | | |
| Eastbound US 54 | 205 | 210 | +2.6% | | |
| Westbound US 54 | 194 | 193 | -0.3% | | |
| | School PM | Travel Times | | | |
| Direction | Field Average (s) | VISSIM Average (s) | Percent Difference | | |
| Eastbound US 54 | 181 | 191 | +5.0% | | |
| Westbound US 54 | 319 | 319 | 0.0% | | |

| Dook Hour | Total Tra | affic Flow | GEH | Percent |
|-----------|-------------|--------------|------|------------|
| Peak Hour | Field (veh) | VISSIM (veh) | GER | Difference |
| School AM | 13950 | 13741 | 1.78 | -1.5% |
| School PM | 17910 | 18085 | 1.30 | +1.0% |
| Summer PM | 16860 | 16824 | 0.28 | -0.2% |

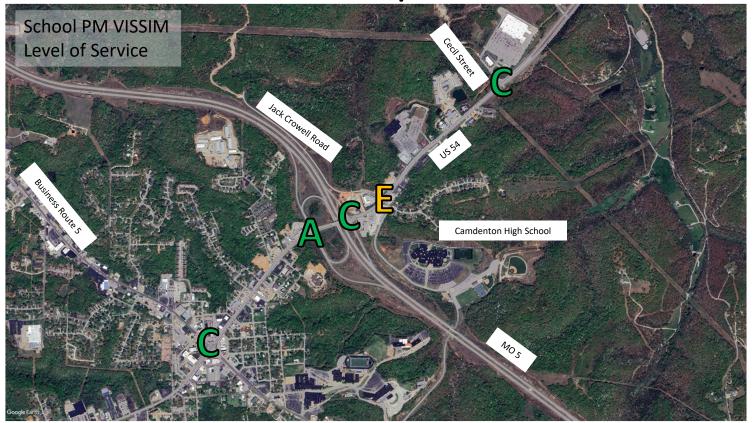
2024 School AM Operations



2024 School PM Operations



2024 Summer PM Operations



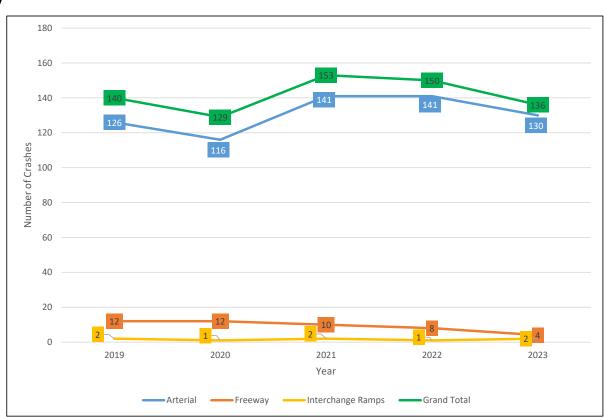


US 54 & MO 5 Study Area

(2019-2023)

• 708 total/141.6 crashes per year

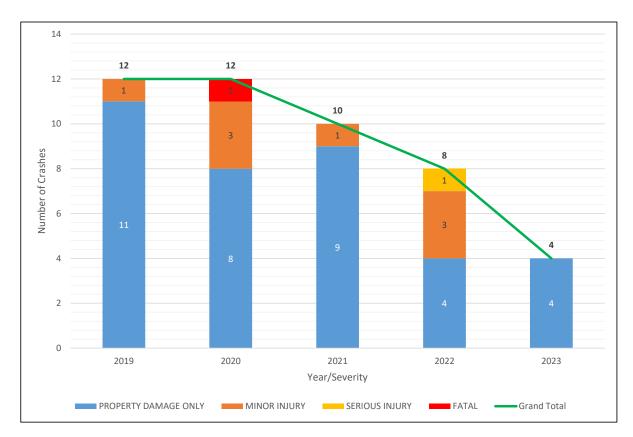
- US 54: 654 total/130.8 crashes per year
- MO 5: 46 total/9.2 crashes per year
- MO 5 On/Off Ramps: 8 total/1.6 crashes per year





MO 5 (2019-2023)

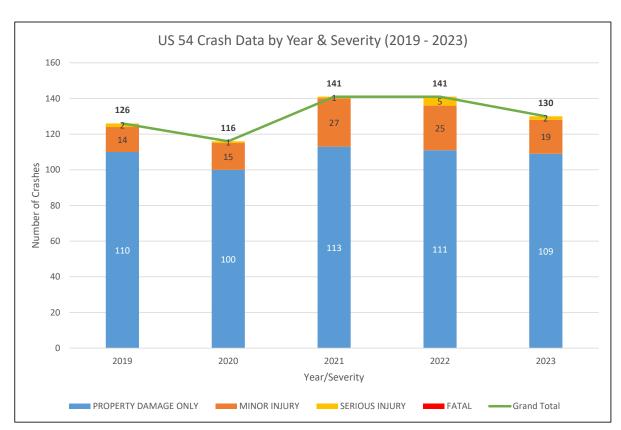
- 78% property damage only
- 8% minor injury
- 1 Disabling Injury (2022)
- 1 Fatal Crash (2020)





US 54 (2019-2023)

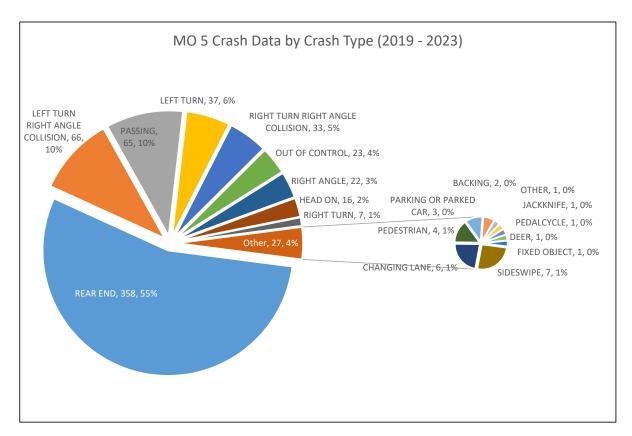
- 83% property damage only
- 15% minor injury
- 11 Disabling Injury
- 0 Fatal Crash





US 54 (2019-2023)

- Rear end (55%)
- Left turns (10%)
- Passing (10%)
- Typical in signalized corridors with congestion and access management issue





US 54 (2019-2023)

- 483 total crashes at intersections
- Cecil Street (25%)
- SB MO 5 Ramps (17%)
- Business Route 5 (16%)
- NB MO 5 Ramps (14%)
- Laker Pride Road (6%)



US 54 & Cecil Street (2019-2023)



- Rear end (79%)
 - 55 SB Cecil Street
 - 6 Minor Injury
 - 24 WB US 54
 - 2 Minor Injury
 - 16 EB US 54
 - 2 Minor Injury
- Passing (8%)
- Left turns (3%)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|-------------------------|-------|
| REAR END | | | 10 | 85 | 95 |
| PASSING | | | 1 | 9 | 10 |
| LEFT TURN RIGHT ANGLE COLLISION | | | 2 | 2 | 4 |
| OUT OF CONTROL | | 1 | | 2 | 3 |
| HEAD ON | | | | 3 | 3 |
| RIGHT ANGLE | | | | 2 | 2 |
| CHANGING LANE | | | | 1 | 1 |
| JACKKNIFE | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| Total | 0 | 1 | 13 | 106 | 120 |

US 54 & SB MO 5 Ramps (2019-2023)



- Rear end (68%)
 - 50 on the SB MO5 to EB US 54Ramp
 - 6 Minor Injury
- Passing (14%)
- Right-Turns (8%)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|-------------------------|-------|
| REAR END | | | 6 | 51 | 57 |
| PASSING | | | | 12 | 12 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 7 | 7 |
| LEFT TURN RIGHT ANGLE COLLISION | | | 2 | 1 | 3 |
| RIGHT TURN | | | | 2 | 2 |
| LEFT TURN | | | | 1 | 1 |
| OUT OF CONTROL | | | | 1 | 1 |
| OTHER | | | | 1 | 1 |
| Total | 0 | 0 | 8 | 76 | 84 |

US 54 & Business Route 5 (2019-2023)



- Rear end (76%)
- Passing (4%)
- Left-Turns (4%)
- Right-Turns (4%)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|-------------------------------------|-------|-------------------|-----------------|-------------------------|-------|
| REAR END | | | 8 | 50 | 58 |
| PASSING | | | | 3 | 3 |
| LEFT TURN | | | | 3 | 3 |
| RIGHT ANGLE | | | 2 | 1 | 3 |
| OUT OF CONTROL | | | 1 | 1 | 2 |
| HEAD ON | | | | 2 | 2 |
| CHANGING LANE | | | | 1 | 1 |
| PEDESTRIAN | | | 1 | | 1 |
| PEDALCYCLE | | 1 | | | 1 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| Grand Total | 0 | 1 | 12 | 63 | 76 |

US 54 & NB MO 5 Ramps (2019-2023)



• Rear end (48%)

• Left-Turns (13%)

• Right-Turns (10%)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|----------------------------------|-------|-------------------|-----------------|-------------------------|-------|
| REAR END | | | 3 | 30 | 33 |
| LEFT TURN | | 1 | | 8 | 9 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 7 | 7 |
| PASSING | | | | 5 | 5 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 5 | 5 |
| OUT OF CONTROL | | | 1 | 2 | 3 |
| HEAD ON | | | 1 | 2 | 3 |
| CHANGING LANE | | | 1 | | 1 |
| FIXED OBJECT | | | | 1 | 1 |
| RIGHT TURN | | | | 1 | 1 |
| SIDESWIPE | | | | 1 | 1 |
| Total | 0 | 1 | 6 | 62 | 69 |

US 54 & Laker Pride Road (2019-2023)

TRANSPORTATION ENGINEERS+PLANNERS

• Rear end (61%)

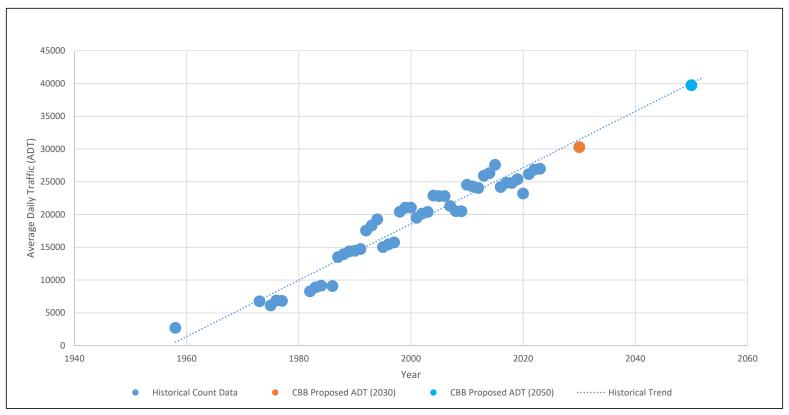
• Passing (13%)

• Left-Turns (10%)

| Crash Type | FATAL | SERIOUS INJURY | MINOR INJURY | PROPERTY DAMAGE ONLY | Total |
|-------------------------------------|-------|-------------------|-----------------|-------------------------|-------|
| REAR END | | | 3 | 16 | 19 |
| PASSING | | | | 4 | 4 |
| LEFT TURN | | | | 3 | 3 |
| LEFT TURN RIGHT ANGLE COLLISION | | | | 2 | 2 |
| HEAD ON | | | | 1 | 1 |
| RIGHT TURN RIGHT ANGLE COLLISION | | | | 1 | 1 |
| SIDESWIPE | | | | 1 | 1 |
| Total | 0 | 0 | 3 | 28 | 31 |



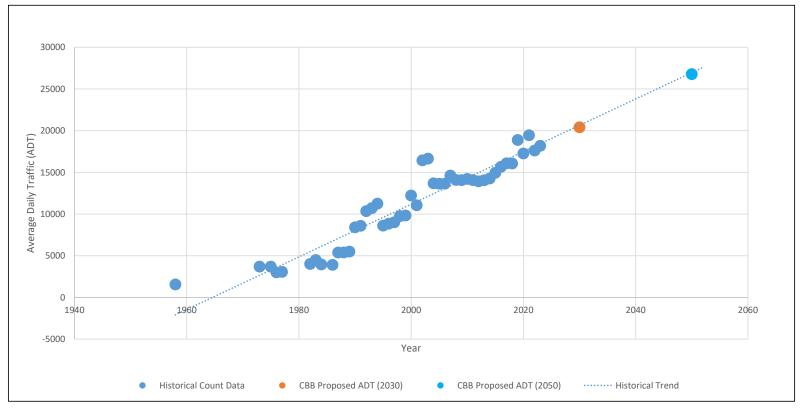
Traffic Forecast (US 54)



- Consistent
 Growth for
 approximately 60
 years
- Growth rate of 1.75% per year



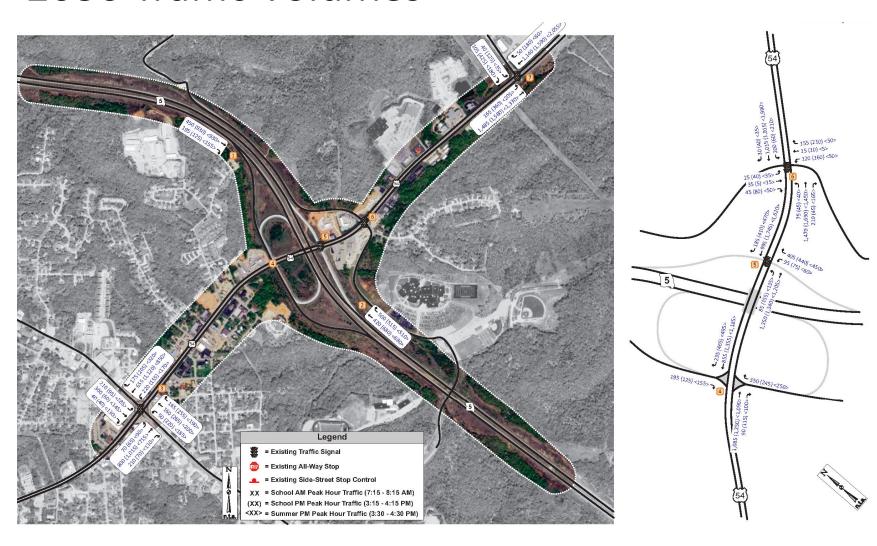
Traffic Forecast (MO 5)



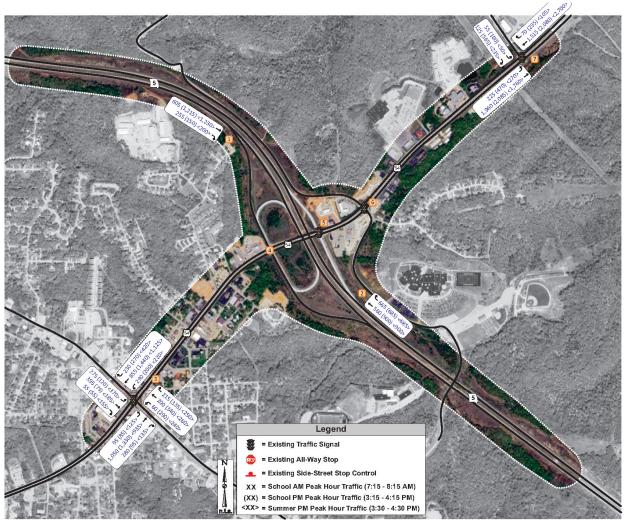
- Consistent
 Growth for
 approximately 60
 years
- Growth rate of 1.75% per year

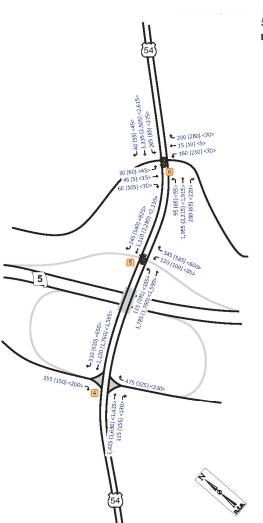
2030 Traffic Volumes





2050 Traffic Volumes

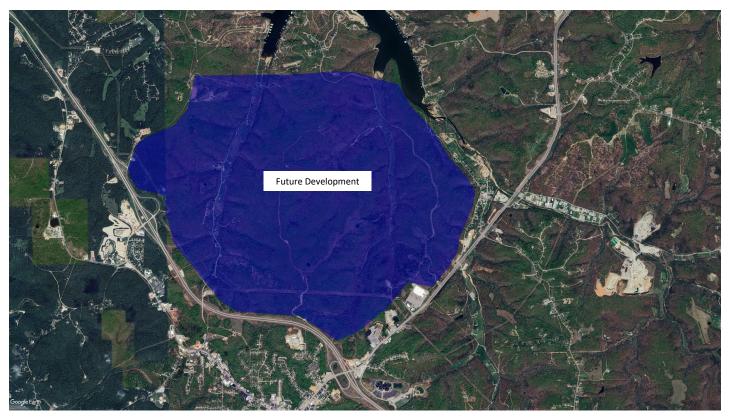




27



Nearby Development



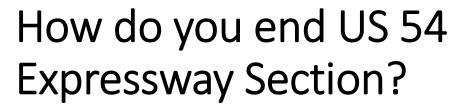
- Potential Future Development
- Currently in the initial phases of development



2050 No-Build Conditions

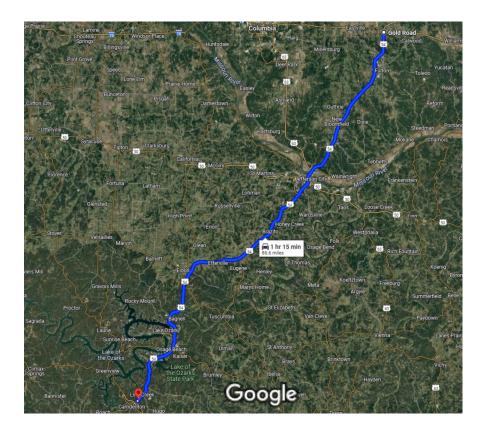
- Already congested conditions exacerbated by increased volumes
- US 54 at Business Route 5 and Cecil Street bottleneck traffic to/from the interchange
- 2050 No-Build conditions create major operational and safety conditions for all users of the roadway





- US 54 is free-flow for approximately 86 miles
- No traffic signals between Janice Avenue (Kingdom City) and Cecil Street (Camdenton)







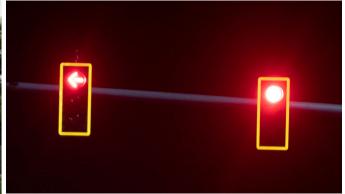
- 1. Basic Safety/Operational Improvements
- 2. 3rd Westbound Lane
- 3. J-Turn
- 4. Jughandles
- 5. Jackson Street Interchange
- 6. Northside CD Road
- 7. Combinations



Basic Operations

- Optimize Signal Timing
- Safety Improvements
 - Dynamic Signal Warning Flashers
 - Reflective Signal Backplates
 - Consider Access Management







Basic Operations

| | PRO'S | CON'S |
|---------------------|---|--|
| CONFIGURATION | Minimal changes to the existing network | No improvement to intersection spacing |
| PROPERTY IMPACTS | No property impacts | |
| OPERATIONS | Minor improvements to operations | |
| SAFETY | Reduction in crashes at study intersections | No improvement to intersection spacing |
| SCHOOL | No impact on high school operations | |



3rd Westbound Lane

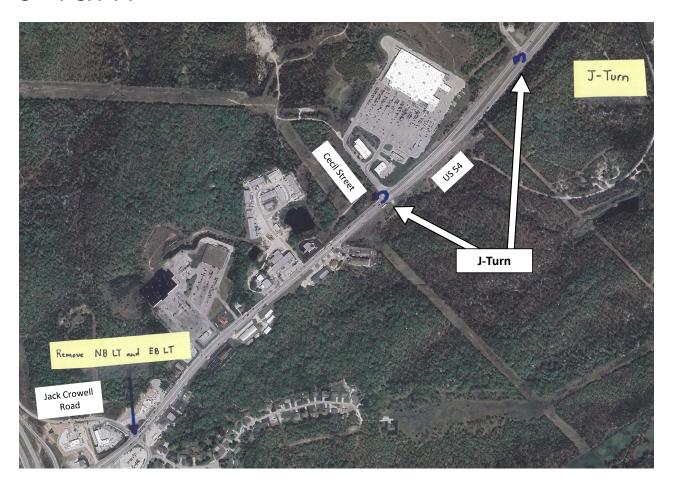




3rd Westbound Lane

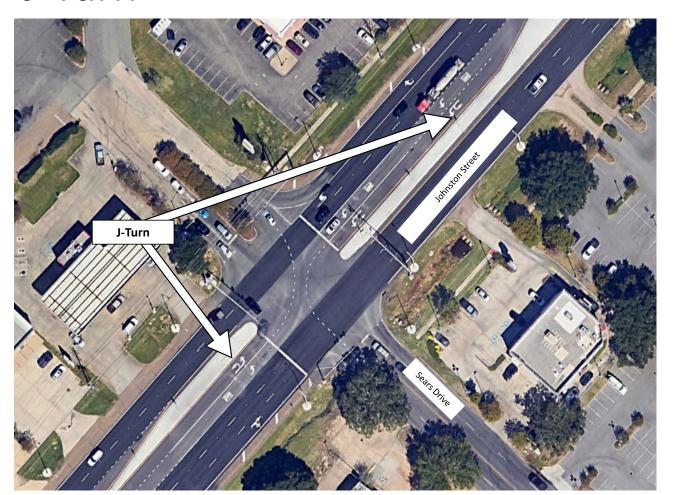
| | PRO'S | CON'S |
|---------------------|---|---|
| CONFIGURATION | Provide individual lanes to heavy westbound US 54 movements | No improvement to intersection spacing |
| PROPERTY IMPACTS | • | Driveways impacted along the west side of US 54 |
| OPERATIONS | Provide additional roadway capacity to WB US 54 | No improvement to intersection spacing |
| SAFETY | EB US 54 to NB Jack Crowell Road converted to protected phasing | No conflict points eliminated |
| SCHOOL | No impact on high school operations | • |













| | PRO'S | CON'S |
|---------------------|---|---|
| CONFIGURATION | Remove heavy left-turn movements at US 54 & Laker Pride Road | No improvement to intersection spacing |
| PROPERTY IMPACTS | No impact on properties near US 54 & Laker Pride | Will impact properties at the J-turn location |
| OPERATIONS | Reduce the number of phases at US 54 & Laker Pride Road Optimize signal timing at US 54 and Laker Pride Road | No improvement to intersection spacing Increases travel time for two movements |
| SAFETY | Remove heavy left-turn movements at US 54 & Laker Pride Road | • |
| SCHOOL | • | Impacts northbound Laker Pride Road left- turn vehicles |

Jughandles





Jughandles

| | PRO'S | CON'S |
|---------------------|--|---|
| CONFIGURATION | Reduces movements at US 54 & Laker Pride Road Roundabouts provide a transition from two-way to one-way roadways | Converts existing two-way roadways to one-way roadways |
| PROPERTY IMPACTS | • | Major impacts on properties along Laker Pride Road and Jack Crowell Road |
| OPERATIONS | Reduce the number of phases at US 54 & Laker Pride Road Optimize signal timing at US 54 and Laker Pride Road | • |
| SAFETY | Reduced number of conflict points at US 54 & Laker Pride Road | No improvement to intersection spacing |
| SCHOOL | • | Major impact on high school operations |



Jackson Street Interchange





Jackson Street Interchange

| | PRO'S | | CON'S |
|---------------------|--|---|---|
| CONFIGURATION | Provide additional access to/from MO 5 Reduce traffic volumes at US 54 and Laker Pride Road | • | No improvement to intersection spacing |
| PROPERTY IMPACTS | No impact on properties along US 54 | • | Potential property impacts near Jackson Street |
| OPERATIONS | Optimize signal timing at US 54 and Laker Pride Road | • | No improvement to intersection spacing |
| SAFETY | Reduce traffic volumes at Southbound MO 5 Weave | • | No conflict points eliminated |
| SCHOOL | • | • | Potential impact on high school operations |

TRANSPORTATION ENGINEERS+PLANNERS

Northside CD Road





Northside CD Road

| | PRO'S | CON'S |
|------------------|--|---|
| CONFIGURATION | Convert US 54 & Laker Pride Road to Right-In/Right-Out Provide CD roadway between US 54 and Jackson Street | Access impacts on properties along Jack Crowell Road/Laker Pride Road |
| PROPERTY IMPACTS | No impacts on existing properties along US 54/Laker Pride Road | Impacts properties along Jack Crowell Road |
| OPERATIONS | Removes a signalized intersection | Concentrates traffic to one intersection |
| SAFETY | Reduced number of conflict points at US 54 & Laker Pride Road Increases intersection spacing between signalized intersections | Concentrates traffic to one intersection |
| SCHOOL | Direct access from northbound MO 5 to schools | Major impact on high school operations |

TRANSPORTATION ENGINEERS+PLANNER

Other Ideas?





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Appendix C – Presentation from March 28, 2025, Meeting

340 Regency Centre

Collinsville, IL 62234



US 54 & MO 5 Interchange Study Concept Alternatives

Camdenton, Missouri



Meeting Agenda

- Introductions
- Boulevard Concept
- Jughandle Concept
- Roundabout Concept
- High Level Opinion of Cost



Boulevard Concept

- Provide 3 lanes along US 54 between Cecil Street and NB MO 5 Ramps
- Provide a median between Cecil Street and NB MO 5 Ramps
- Provide J-Turns for left-turn movements between intersections
- Relocate Laker Pride Road



Boulevard Concept – J-Turns

• WB to EB US 54 J-Turn at Laker Pride Road





Boulevard Concept – J-Turns

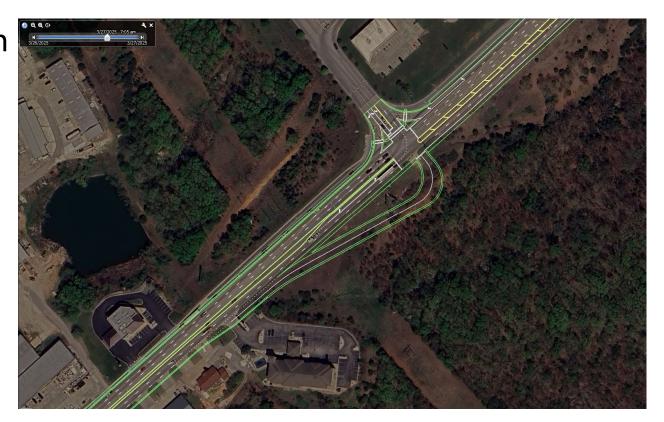
• EB to WB US 54 J-Turn at Cross Creek Drive





Boulevard Concept – J-Turns

• EB to WB US 54 J-Turn at Cecil Street





Boulevard Concept – Relocated Laker Pride Road

- Opposite East Gerbes Driveway
- Impacts the US Bank Drive-Through





Boulevard Concept – Relocated Laker Pride Road

- Opposite West Gerbes Driveway
- Impacts the US Bank parking lot





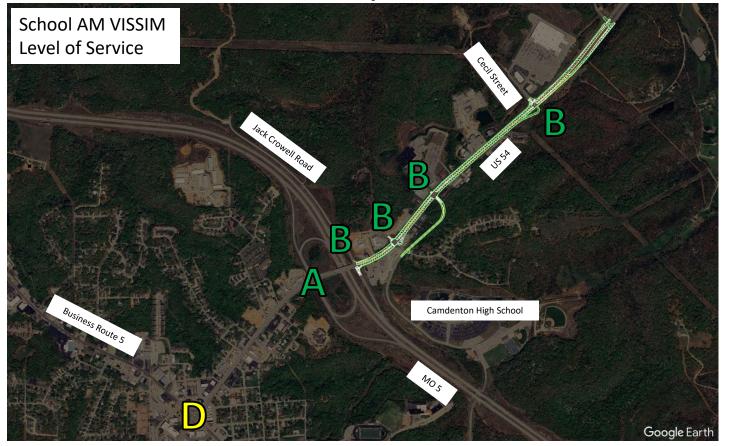
Boulevard Concept – Relocated Laker Pride Road

- Minimize impact on the US Bank site
- Not Opposite of a Gerbes Driveway



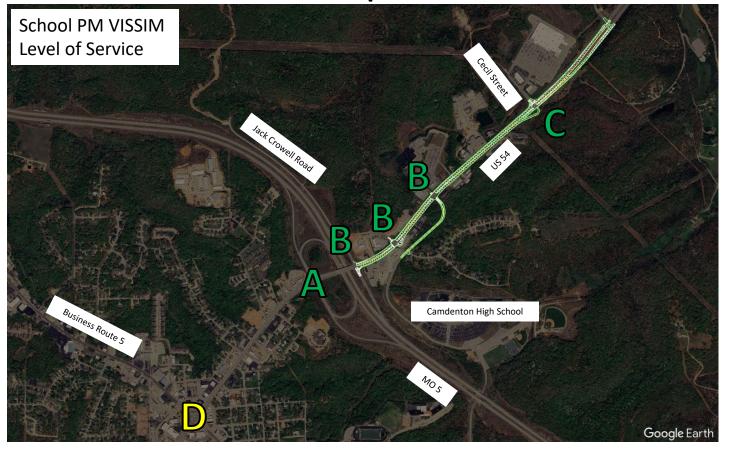


2050 School AM Operations



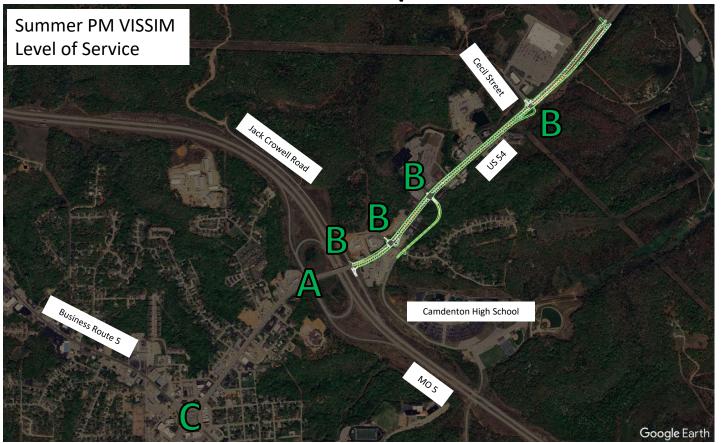


2050 School PM Operations





2050 Summer PM Operations





Jughandle Concept

- Reduce the need for widening along US 54
- Provide two roundabouts on both sides of US 54
- Provide a CD road connection between the roundabouts
- Provide an EB to WB US 54 J-Turn



Jughandle Concept – US 54 Widening

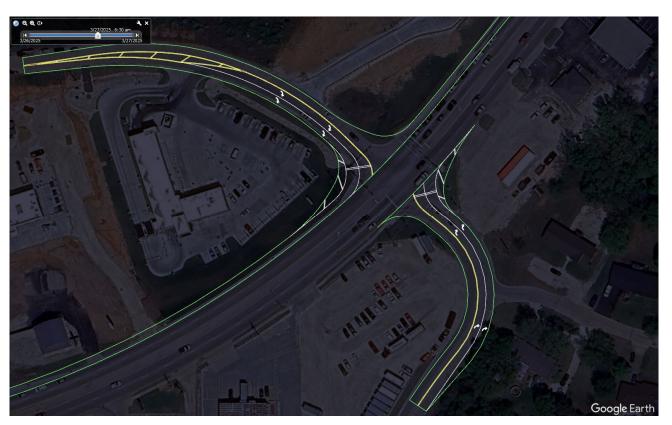
 3 lanes along WB US 54 between Laker Pride Road and NB MO 5 Ramps





Jughandle Concept – RIRO Intersections

- Right-In/Right-Out at Laker Pride Road
- Signalized intersection to provide capacity for right-turn movements





Jughandle Concept – RIRO Intersections

- Right-In/Right-Out at Cecil Street
- EB LT and SB LT movement provided by J-Turn and Jughandle
- Acceleration Lane for SB Right-Turn Movement





Jughandle Concept – J-Turn

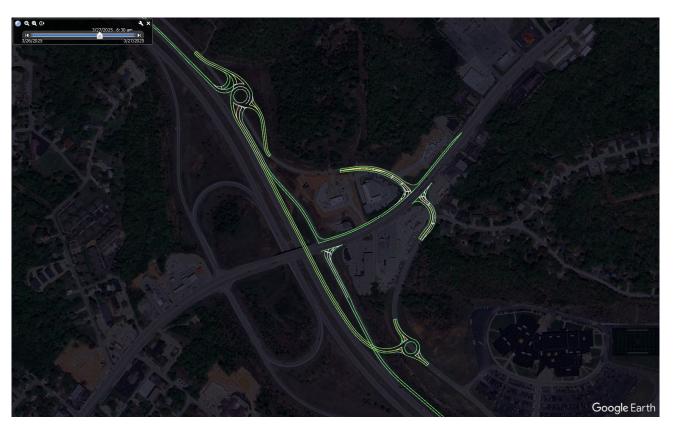
- EB to WB US 54 J-Turn at Cross Creek Drive
- J-Turn provides the EB LT to Cecil Street
- Acceleration Lane is provided
- Requires shifting EB US54 alignment





Jughandle Concept – Roundabouts

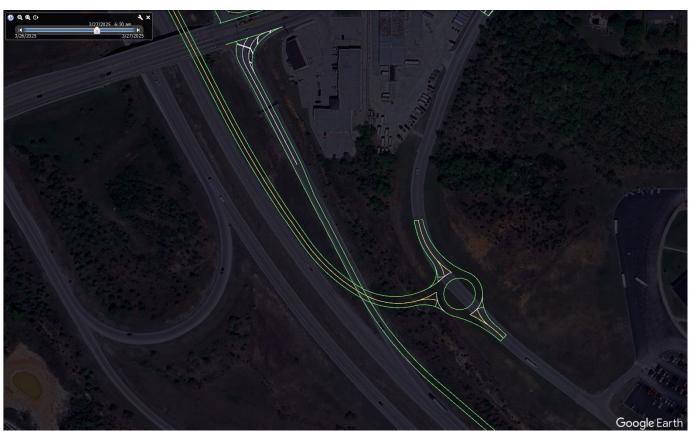
- Roundabouts at Jack Crowell Road and Laker Pride Road
- CD Road connects roundabouts





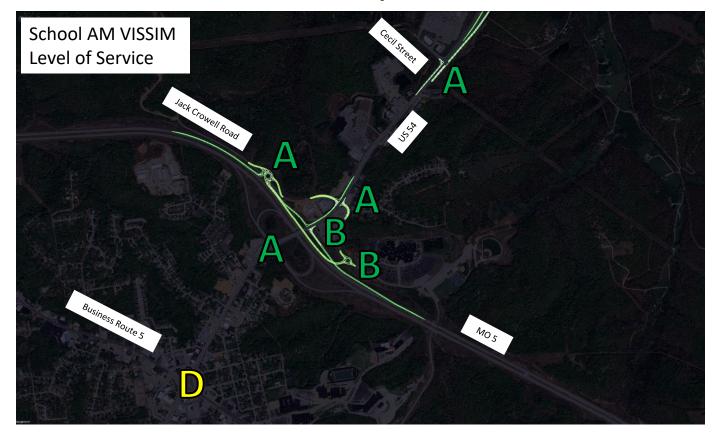
Jughandle Concept – Braided Ramp

Braided Ramp for Northbound MO5 Off-Ramp



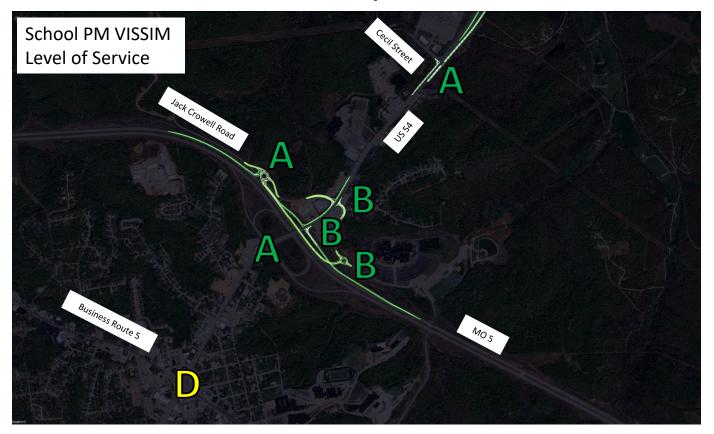


2050 School AM Operations



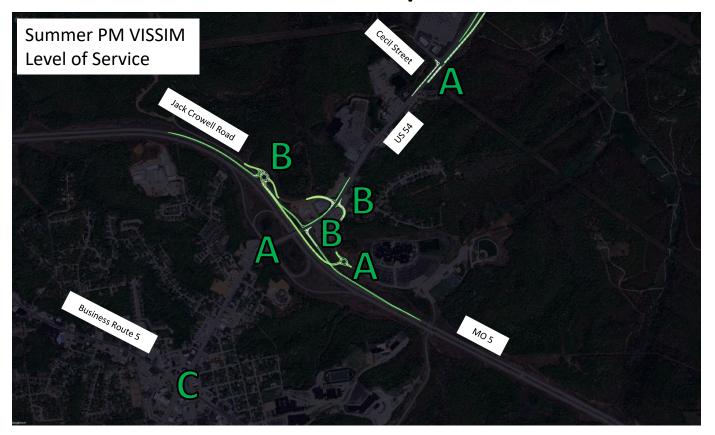


2050 School PM Operations





2050 Summer PM Operations





Roundabout Concept

- Dual Lane
 Roundabouts at
 Laker Pride Road,
 NB MO 5 Ramps,
 and SB MO 5 Ramps
- Undesirable operations under 2050 conditions

| Intersection | 2050 Intersection Operations | | | | |
|--------------------------|------------------------------|-----------|-----------|--|--|
| intersection | School AM | School PM | Summer PM | | |
| Laker Pride Road | F (61.5) | F (141.5) | F (113.0) | | |
| Northbound MO 5 Ramps | F (99.8) | F (135.4) | F (103.6) | | |
| Southbound MO 5 Ramps | E (43.8) | C (19.4) | C (15.3) | | |



High Level Opinion of Cost

- Boulevard Concept
 - \$14,500,000
- Jughandle Concept
 - \$13,912,500
- Roundabout Concept
 - Not developed due to undesirable operations



Discussion and Next Steps

- Feedback on Concepts
- Complete Conceptual Study Report





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Appendix D – Opinion of Cost for Phase 1





| DESCRIPTION | QUANTITY | UNIT | UNIT COST | соѕтѕ |
|---------------------------------------|----------|------|------------|-------------|
| ROADWAY ITEMS | | | | |
| Mobilization | | 5% | of Roadway | \$40,200 |
| Sidewalk (Removal) | 550 | SQYD | \$15 | \$8,250 |
| 8" PCC (Roadway Removal) | 1075 | SQYD | \$15 | \$16,125 |
| 6" PCC (Entrance Removal) | 470 | SQYD | \$15 | \$7,050 |
| Curb & Gutter (Removal) | 2255 | FT | \$10 | \$22,550 |
| PCC (Parking Lot Removal) | 70 | SQYD | \$15 | \$1,050 |
| Tree Removal | 1 | AC | \$15,000 | \$9,000 |
| Other Removals | | 10% | of Removal | \$6,500 |
| Sawcut | 2450 | FT | \$10 | \$24,500 |
| 8" PCC (Roadway) | 2795 | SQYD | \$65 | \$181,675 |
| 6" PCC (Entrance) | 1740 | SQYD | \$60 | \$104,400 |
| Curb & Gutter | 2875 | FT | \$35 | \$100,625 |
| ADA Ramps | 5 | EA | \$3,500 | \$17,500 |
| Sidewalk | 720 | SQYD | \$80 | \$57,600 |
| Tie Bars | 2450 | LBS | \$5 | \$12,250 |
| 2" BP-1 | 2795 | SQYD | \$60 | \$167,700 |
| 4" Aggregate Base | 4220 | SQYD | \$10 | \$42,200 |
| Lawn area (Sodding) | 4195 | SQYD | \$10 | \$41,950 |
| Median (Removal) | 195 | SQYD | \$15 | \$2,925 |
| 6" Concrete Median Strip (Doweled On) | 860 | SQYD | \$55 | \$47,300 |
| Cut Through | 1 | EA | \$2,000 | \$2,000 |
| Earthwork | 1 | LS | \$270,000 | \$270,000 |
| Drainage | 1 | LS | \$175,100 | \$175,100 |
| ROADWAY ITEMS SUB-TOTAL = | | | | \$1,358,450 |





QUANTITY UNIT COST DESCRIPTION UNIT COSTS **MARKING & SIGNING ITEMS** \$1,691 6" White Standard Waterborne Pavement Marking Paint 2255 FT \$0.75 12" White Standard Waterborne Pavement Marking Paint 470 FT \$1.50 \$705 4" Yellow Standard Waterborne Pavement Marking Paint 2040 FT \$0.50 \$1,020 0 \$1.50 \$0 12" Yellow Standard Waterborne Pavement Marking Paint FT Preformed Thermoplastic Pavement Marking, White Symbols 9 EΑ \$1,000 \$9,000 Preformed Thermoplastic Pavement Marking, 24" White \$3,400 170 FT \$20 1 LS \$11,900 \$11,900 Signing MARKING & SIGNING ITEMS SUB-TOTAL= \$27,716 SIGNAL & LIGHTING ITEMS Signal Cost 1 L SUM \$470,000 \$470,000 1 L SUM \$80,000 Lighting \$80,000 SIGNAL, ITS, & LIGHTING ITEMS SUB-TOTAL= \$550,000 **MISCELLANEOUS** 15% of Project **Utility Relocation** \$290,500 5% of Project \$96,900 Survey Cost 20% of Project Contingency \$387,300 Engineering 15% of Project \$290,500 Traffic Control 10% of Project \$193,700 Inflation 3% per year for 2 years \$118,400 **ROW** and Easements L SUM \$1,179,690 **MISCELLANEOUS SUB-TOTAL=** \$2,556,990 Total Project Costs (Rounded) = \$4,500,000





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Appendix E – MoDOT Right-of-Way Cost Estimate

340 Regency Centre

Collinsville, IL 62234

MEMORANDUM



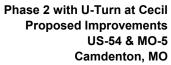
Missouri Department of Transportation

| DATE: | 7/11/2 | 025 | | | | | | |
|---|-------------------------------------|-------------------------------------|------------------------------|----------|----------|--|--|--|
| TO: | - | Ryan Libbert Design Engineer | | | | | | |
| | File-rv | V | | | | | | |
| FROM: | | David Ordway Certified Appraiser | | | | | | |
| SUBJECT: | Right of | f Way Cost Est | timate | | | | | |
| | Route: Job: | CD0053, ST0 | 0156 rsection east to . | Altern | | | | |
| | Date: | 7/11/2025 | | Prepar | er: | <u>David Ordway</u> | | |
| Project Deve Stage: 1. Project I 2. Concept Location 3. Prelimin | Initializat ual Plan/ 1 Study | ion 🔀 | | 4. 5. | _ | t of Way Plan Complete isition Complete | | |
| Estimated R | ight of W | ay Acquisition | n Costs: | | | <u>\$1,149,690</u> | | |
| Estimate of Incidental Costs: | | | \$ <u>30,000</u> | | | | | |
| Total Right | of Way C | Cost Estimate: | | | | <u>\$1,179,690</u> | | |
| Previous To \$ Date | _ | of Way Cost E Explanation f | Estimate: for change from | previo | us estir | mate: | | |
| No known p | revious e | estimate exists. | | | | | | |



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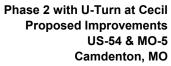
Appendix F – Opinion of Cost for Phase 2





OPC

| ENGINEERS+PLANNERS | | 1 | OPC | |
|---------------------------------------|---------|--------|------------|-------------|
| DESCRIPTION | QUA | NTITY | UNIT COST | COSTS |
| ROADWAY ITEMS | | | | |
| Mobilization | | 5% | of Roadway | \$171,600 |
| Sidewalk (Removal) | 1335 | SQYD | \$15 | \$20,025 |
| 8" PCC (Roadway Removal) | 3985 | SQYD | \$15 | \$59,775 |
| 6" PCC (Entrance Removal) | 2305 | SQYD | \$15 | \$34,575 |
| Curb & Gutter (Removal) | 6605 | FT | \$10 | \$66,050 |
| Tree (Removal) | 2 | AC | \$15,000 | \$30,000 |
| Other Removals | | 10% | of Removal | \$21,100 |
| Sawcut | 8050 | FT | \$10 | \$80,500 |
| 8" PCC (Roadway) | 17240 | SQYD | \$65 | \$1,120,600 |
| 6" PCC (Entrance) | 2305 | SQYD | \$60 | \$138,300 |
| Curb & Gutter | 9635 | FT | \$35 | \$337,225 |
| ADA Ramps | 3 | EA | \$3,500 | \$10,500 |
| Sidewalk | 2195 | SQYD | \$80 | \$175,600 |
| Tie Bars | 7205 | LBS | \$5 | \$36,025 |
| 2" BP-1 | 16845 | SQYD | \$60 | \$1,010,700 |
| 4" Aggregate Base | 19145 | SQYD | \$10 | \$191,450 |
| Lawn area (Sodding) | 10705 | SQYD | \$10 | \$107,050 |
| Shoulder | 1325 | SQYD | \$65 | \$86,125 |
| Shoulder (Removal) | 250 | SQYD | \$15 | \$3,750 |
| Median (Removal) | 0 | SQYD | \$15 | \$0 |
| 6" Concrete Median Strip (Doweled On) | 2225 | SQYD | \$55 | \$122,375 |
| 6" Concrete Island (Doweled On) | 140 | SQYD | \$55 | \$7,700 |
| Cut Through | 2 | EA | \$2,000 | \$4,000 |
| Earthwork | | 30% | of Roadway | \$1,029,600 |
| Drainage | | 30% | of Roadway | \$1,029,600 |
| ROADWAY ITEMS | S SUB-T | OTAL = | | \$5,894,225 |





OPC

| ENGINEERS+PLANNERS | | | | | | | | |
|---|----------|----------|-------------|--------------|--|--|--|--|
| DESCRIPTION | QUA | NTITY | UNIT COST | COSTS | | | | |
| MARKING & SIGNING ITEMS | | | | | | | | |
| 6" White Standard Waterborne Pavement Marking Paint | 7495 | FT | \$0.75 | \$5,621 | | | | |
| 12" White Standard Waterborne Pavement Marking Paint | 320 | FT | \$1.50 | \$480 | | | | |
| 4" Yellow Standard Waterborne Pavement Marking Paint | 15325 | FT | \$0.50 | \$7,663 | | | | |
| 12" Yellow Standard Waterborne Pavement Marking Paint | 345 | FT | \$1.50 | \$518 | | | | |
| Preformed Thermoplastic Pavement Marking, White Symbols | 14 | EA | \$1,000 | \$14,000 | | | | |
| Preformed Thermoplastic Pavement Marking, 24" White | 305 | FT | \$20 | \$6,100 | | | | |
| Signing | | 30% | of Marking | \$10,400 | | | | |
| MARKING & SIGNING ITEMS SUB-TOTAL= | | | | | | | | |
| SIGNAL & LIGHTING ITEMS | | | | | | | | |
| Signal Cost | 1 | L SUM | \$870,000 | \$870,000 | | | | |
| Lighting | 1 | L SUM | \$200,000 | \$200,000 | | | | |
| SIGNAL, ITS, & LIGHTING ITEM | IS SUB- | TOTAL= | | \$1,070,000 | | | | |
| MISCELLANEOUS | | | | | | | | |
| Utility Relocation | | 15% of F | Project | \$1,051,400 | | | | |
| Survey Cost | | 5% of P | roject | \$350,500 | | | | |
| Contingency | | 20% of F | Project | \$1,401,900 | | | | |
| Engineering | | 15% of F | Project | \$1,051,400 | | | | |
| Traffic Control | | 10% of F | Project | \$701,000 | | | | |
| Inflation | 3% | per year | for 2 years | \$430,000 | | | | |
| ROW and Easements | | L SU | JM | TBD | | | | |
| MISCELLANEOU | S SUB- | TOTAL= | | \$3,934,800 | | | | |
| Tot | al Proje | ct Costs | (Rounded) = | \$11,000,000 | | | | |



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Appendix G – Safety Analysis Printouts

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TECHNICAL MEMORANDUM

Date: July 23, 2025

To:

From: Brian Rensing, P.E., PTOE, RSP 21

CBB Job Number: 73-2024

US 54 - MO 5 MoDOT On-Call Project:

Predictive Crash Analysis Summary

Camdenton, Missouri

Predictive Safety Analysis: US 54 and MO 5 Interchange

In order to evaluate the safety implication of the proposed changes, safety conditions were analyzed using the AASHTO Highway Safety Manual (HSM; 1st Edition, 2010). The Highway Safety Manual methodologies are the preferred method for predictive safety analysis. The HSM provides guidance for quantifying crashes resulting from design decisions on a specific facility. The HSM methodology estimates future safety performance using Safety Performance Functions (SPFs) for specific facilities that are based in statistical crash data and geometric features. HSM methodologies also allows the ability to apply local calibration factors for specific roadway and intersection types to better estimate the safety performance.

National Cooperative Highway Research Program (NCHRP) has developed spreadsheet tools to assist with the implementation of HSM Part C, predictive methods, based on research studies. The HSM suburban/urban arterial spreadsheet was used to predict crashes along US 54 to compare the No-build Conditions to the Build Conditions.

The first edition of the HSM lacks expansive research on freeway facilities. However, Chapters 18 and 19 of the 2014 Supplement to the HSM includes research on the freeway segments and speed-change lanes as well as freeway ramps and freeway terminals. The Enhanced Interchange Safety Analysis Tool (ISATe), developed in cooperation with NCHRP, incorporates the research from Chapters 18 and 19 of HSM for assessing the safety effects of basic geometric design along the freeway mainline, freeway ramps, and freeway terminals. As a result, the ISATe spreadsheet tool was used to predict the change in safety along the mainline freeway, freeway ramps and ramp terminals along the Missouri Route 5 corridor within the project area. The HSM segmentation guidance was followed as closely as practical. Crash prediction models were developed for the future traffic analysis years of 2030 (the projected opening year) to 2050 (design year).

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No Build Condition

The No-build scenario assumes that the existing geometrics along the freeway and at the existing interchange will stay same over the 20-year timeframe. The Missouri Route 5 freeway (red lines), freeway ramps (purple lines), and freeway terminals (green circles) and HSM Arterial segments (blue lines) and HSM Arterial intersections (yellow circles) are shown in **Figure 1** for the No-build Condition.

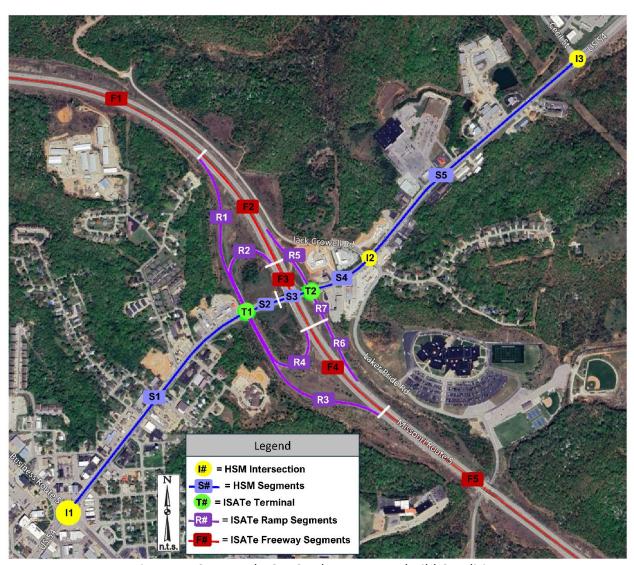


Figure 1: ISATe and HSM Study Area – No-build Condition



Build Condition

The Build Condition assumes that Laker Pride Road (south side of US 54) will be rerouted to form a new 3-leg signalized intersection with US-54 between Jack Crowell Road and Cecil Street. It also includes expanding US-54 from an undivided five-lane section (two lanes in each direction plus a center two-way left-turn lane) to a divided six-lane section (three lanes in each direction) from Cecil Street to the intersection with the northbound MO 5 ramps, where the westbound lane terminates as a separate right-turn lane to go north on MO 5. It should be noted that the HSM methodology does not currently include a six-lane divided roadway facility type for safety analysis, so a four-lane divided highway was used as the next closest analysis available for the segments. Additionally, for the intersections east of the northbound terminals, the mainline left-turn phasing was assumed to be changed to protected only since mainline left-turns would be crossing three through lanes in the opposing direction. The Missouri Route 5 freeway (red lines), freeway ramps (purple lines), and freeway terminals (green circles) and HSM Arterial segments (blue lines) and HSM Arterial intersections (yellow circles) are shown in Figure 2 for the Build Condition.

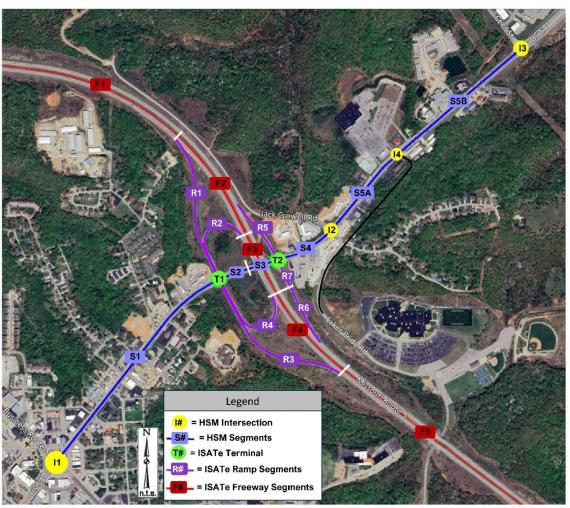


Figure 2: ISATe and HSM Study Area – Build Condition



Predictive Safety Analysis Summary – US-54 & MO 5 Interchange Camdenton, Missouri July 23, 2025 Page 4 of 5

The safety analysis considers the same 20-year period (2030 to 2050) as the traffic analysis to determine the potential change in safety between the No-Build Condition and the Build Condition. **Table 1** below shows the predicted change in crashes over twenty years along the Missouri Route 5 corridor and the US 54 corridors between the No-build Condition and the Build Condition. The detailed results, segmentation map, and printouts of the ISATe/HSM inputs and outputs are provided in the Safety Appendix. It should be noted that the ISATe program does not take into account vertical curvature, slowdowns in traffic due to congestion or queuing issues that could be experienced along the corridor(s).

As seen in Table 1, the Build improvements to US-54 are predicted to have a 16.2% reduction to the US 54 arterial. The US-54 and Jack Crowell Road/Laker Pride Road intersection will change from a four-leg intersection to a three-leg intersection which is predicted to have a reduction in crashes. With this change, Laker Pride Road will be re-routed to a separate three-leg signalized intersection with US-54 between Jack Crowell Road and Cecil Street which will add crashes that the no-build condition does not have. Overall, this modification is predicted to have a slight reduction in crashes at the intersections.

For the arterial east of the MO 5 northbound terminal (segments 4 and 5), the decrease in crashes is due to the addition of providing a divided highway (median barrier) and another lane in both directions of travel along US 54. Instead of a center two-way left-turn lane, the median barrier in the build scenario eliminates left-turn conflicts in the segments.

The minor decrease in crashes at ramp terminals is due to the addition of a westbound US-54 right-turn lane at the terminal with westbound Missouri Route 5. Because of the additional lanes along US-54 east of the terminal, the westbound approach gains a separate right-turn lane with improved storage capacity to improve traffic flow.

Overall, the Build Condition is predicted to have approximately 10.4% fewer crashes over the 20-year period when compared to the No-Build Condition.



Table 1: Safety Results – Change in Predicted Crashes in Study Area Over 20-Years (ISATe & HSM)

| | | | | | | Changes in Crashes | | | | |
|--|--------------------|--------|--------|-----------------|--------|--------------------|--------------------|--------|--------|-------------------|
| | No-Build Condition | | | Build Condition | | | Changes in Crashes | | | |
| Facility | F&I | PDO | Total | F&I | PDO | Total | F&I | PDO | Total | % Change in Total |
| Intersection 1 crashes: (US-54 & Business Route 5) | 158.9 | 251.5 | 410.4 | 158.9 | 251.5 | 410.4 | 0.0 | 0.0 | 0.0 | 0.0% |
| Intersection 2 crashes: (No-Build: US-54 & Jack Crowell Road/Laker Pride Road) (Build: US-54 & Jack Crowell Road) | 253.6 | 390.5 | 644.1 | 77.9 | 134.3 | 212.1 | -175.8 | -256.2 | -432.0 | -67.1% |
| Intersection 3 crashes: (US-54 & Cecil Street) | 100.5 | 192.3 | 292.8 | 100.5 | 192.3 | 292.8 | 0.0 | 0.0 | 0.0 | 0.0% |
| Intersection 4 crashes: (Build: US-54 & Laker Pride Road) | | | | 108.7 | 209.1 | 317.8 | 108.7 | 209.1 | 317.8 | |
| Arterial segments (1-3) crashes: | 67.3 | 167.7 | 235.0 | 67.3 | 167.7 | 235.0 | 0.0 | 0.0 | 0.0 | 0.0% |
| Arterial segments (4-5) crashes: | 97.2 | 246.4 | 343.6 | 37.8 | 108.8 | 146.7 | -59.4 | -137.6 | -197.0 | -57.3% |
| Total Arterial HSM Crashes | 677.5 | 1248.4 | 1925.9 | 551.0 | 1063.7 | 1614.7 | -126.5 | -184.7 | -311.2 | -16.2% |
| Freeway segments, crashes: | 72.4 | 245.7 | 318.1 | 72.4 | 245.7 | 318.1 | 0.0 | 0.0 | 0.0 | 0.0% |
| Ramp segments, crashes: | 46.0 | 84.6 | 130.6 | 46.0 | 84.6 | 130.6 | 0.0 | 0.0 | 0.0 | 0.0% |
| Crossroad ramp terminals, crashes: | 261.4 | 737.9 | 999.3 | 238.6 | 722.1 | 960.7 | -22.8 | -15.8 | -38.6 | -4.0% |
| Total ISATe Crashes | 379.8 | 1068.3 | 1448.0 | 356.9 | 1052.5 | 1409.4 | -22.8 | -15.8 | -38.6 | -2.7% |
| Total Study Area Crashes | 1057.3 | 2316.7 | 3373.9 | 907.9 | 2116.3 | 3024.2 | -149.3 | -200.4 | -349.8 | -10.4% |

Safety Appendix – US 54 & MO 5 Interchange

Notes for ISATe and HSM Model

No-Build Condition - ISATe & HSM Results (2030 - 2050)

ISATe Inputs & Output Summary Report
HSM Inputs & Outputs Summary Report

Predicted Build Condition - ISATe & HSM Results (2030 - 2050)

ISATe Inputs & Output Summary Report
HSM Inputs & Outputs Summary Report

No-Build AADT (2024, 2030, 2050)

Change in Predicted Crashes in Study Area Over 20-Years (ISATe & HSM results)

Notes for ISATe and HSM Models

- The Interchange Statistical Analysis Tool enhanced (ISATe) tool was used to analyze the MO 5 freeway mainline, freeway ramps, and freeway terminals.
 - One ISATe terminal file was generated each for the No-Build Condition and Build Condition under the Folded Diamond Configuration since the terminal type does not change.
 - The ADT included in the ISATe model (freeways and ramps) were calculated based on the 2030 and 2050 forecasted AM and PM peak hours using the following formula.

ADT = (AM Peak hour Volume + PM Peak hour Volume) * 5

- The HSM spreadsheets were used to analyze US 54 including segments and intersections.
 - The 2030 ADT included in the HSM models (segments and intersections) were calculated based on the 2030 forecasted AM and PM peak hours using the following formula.

ADT = (AM Peak hour Volume + PM Peak hour Volume) * 5

- Two HSM files were created for the arterial. In the No-Build Condition, three intersections and five segments were analyzed. The Build Condition consisted of a new 3-leg intersection, switching an existing 4-leg intersection to 3-leg, and expanding US-54 from an undivided five-lane section to a divided six-lane section from Cecil Street to the northbound MO 5 ramps, for a total of 4 intersections and six segments.
 - It should be noted that the HSM methodology does not currently include a six-lane divided roadway facility type for safety analysis, so a four-lane divided highway was used as the next closest analysis available for the segments.
- o HSM growth rate was assumed to be 1.75% per year for all segments and intersections from 2030 to 2050.

Missouri Calibration Factors included as follows:

Missouri Calibration Factors for ISATe

| Facility Type | Fatal & Injury | Property Damage Only | | | | | |
|--|-------------------|----------------------------|--|--|--|--|--|
| Freeway | | | | | | | |
| Urban Four-Lane Freeway Segments for Multiple Vehicle Crashes | 0.71 | 1.46 | | | | | |
| Urban Four-Lane Freeway Segments for Single Vehicle Crashes | 0.60 | 1.20 | | | | | |
| Urban Four-Lane Entrance Speed-Change Lane | 0.598 | 1.314 | | | | | |
| Urban Four-Lane Exit Speed-Change Lane | 0.455 | 0.519 | | | | | |
| Ramps | | | | | | | |
| Urban Entrance Ramp for Multiple Vehicle Crashes | 2.681 | 6.36 | | | | | |
| Urban Exit Ramp for Multiple Vehicle Crashes | 2.354 | 5.252 | | | | | |
| Urban Entrance Ramp for Single Vehicle Crashes | 0.913 | 1.121 | | | | | |
| Urban Exit Ramp for Single Vehicle Crashes | 0.84 | 1.266 | | | | | |
| Terminals | | | | | | | |
| Urban Stop-Controlled D4 Diamond Interchange with Four Lane | 1.226 | 2.025 | | | | | |
| Crossroads Terminal | | | | | | | |
| Signalized D4 Diamond Interchange with Four Lane Crossroads Terminal | 0.853 | 1.83 | | | | | |

Missouri Calibration Factors for HSM Analysis

| Facility Type | All Crashes | | | | | | | |
|---|-------------|--|--|--|--|--|--|--|
| Segments | | | | | | | | |
| 5T – Five-Lane Arterials with center two-way Left-Turn Lane | 0.84 | | | | | | | |
| 4D – Four Lane Divided Arterials | 0.91 | | | | | | | |
| Intersection | | | | | | | | |
| 4 SG – Signalized 4-leg intersection | 5.21 | | | | | | | |
| 3 SG – Signalized 3-leg intersection | 2.95 | | | | | | | |

No-Build – ISATe & HSM Results (2030-2050)

Safety Summary Table – No-Build Conditions

| Encility | No | -Build Conditi | on |
|--|--------|----------------|--------|
| Facility | F&I | PDO | Total |
| Intersection 1 crashes: | 158.9 | 251.5 | 410.4 |
| (US-54 & Business Route 5) | 156.9 | 251.5 | 410.4 |
| Intersection 2 crashes: | 253.6 | 390.5 | 644.1 |
| (US-54 & Jack Crowell Road/Laker Pride Road) | 255.6 | 390.5 | 044.1 |
| Intersection 3 crashes: | 100.5 | 192.3 | 292.8 |
| (US-54 & Cecil Street) | 100.5 | 192.3 | 292.0 |
| Arterial segments (1-3) crashes: | 67.3 | 167.7 | 235.0 |
| Arterial segments (4-5) crashes: | 97.2 | 246.4 | 343.6 |
| Total Arterial HSM Crashes | 677.5 | 1248.4 | 1925.9 |
| Freeway segments, crashes: | 72.4 | 245.7 | 318.1 |
| Ramp segments, crashes: | 46.0 | 84.6 | 130.6 |
| Crossroad ramp terminals, crashes: | 261.4 | 737.9 | 999.3 |
| Total ISATe Crashes | 379.8 | 1068.3 | 1448.0 |
| Total Study Area Crashes | 1057.3 | 2316.7 | 3373.9 |

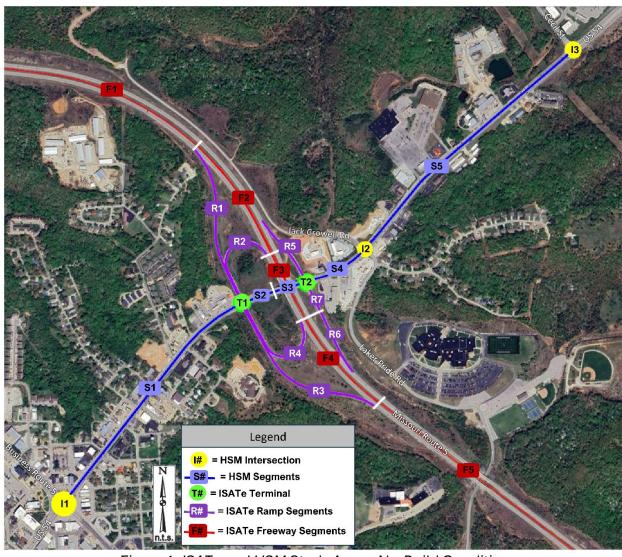


Figure 1: ISATe and HSM Study Area – No-Build Condition

ISATe Inputs & Output Summary Report (No-Build)

| Enhanced Interchange Safety Analysis Tool | | | | | | | | | | |
|--|-------------|------------|------------|--|--------|--------------|----------------|------|--|--|
| General Information | | | | | | | | | | |
| Project description: | US54-MO5 | Predictive | Safety Ana | lysis | | | | | | |
| Analyst: | CBB | | Date: | 7/22/2025 | Area | type: | Urban | | | |
| First year of analysis: | 2030 | | | | | | | | | |
| Last year of analysis: | 2050 | | | | | | | | | |
| Crash Data Description | | | | | | | | | | |
| Freeway segments | No crash o | lata | F | | | | | | | |
| Ramp segments | No crash o | lata | F | | | | | | | |
| Ramp terminals | No crash o | lata | Ţ | | | | | | | |
| | | | | | | , | | | | |
| Program Control | | | | | | | | | | |
| Enter data in the Ma Click Perform Calcu | | , , | | ut Ramp Segments, Inp process. | out Ra | mp Termina | ls worksheets. | | | |
| Perfo | rm Calculat | ions | Prin | t Results (optional) | | Print Site S | Summary (optio | nal) | | |
| | results can | | | otionally, click the Print tput Freeway Segment | | | | | | |

| Warning Messages | | | | | | | | | | | |
|------------------|---------------|----------------|--|--|--|--|--|--|--|--|--|
| Freeway Segments | Ramp Segments | Ramp Terminals | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 1 | | | | | | | | | | | |

| | Inp | ut Worksheet for Freeway Segm | | | | | | | |
|---------------|---|---|-----------|-------------------|-------------|-------------|-------------|-------------------|-----------|
| Clear | Echo Input Values | Check Input Values | Segment 1 | Segment 2 | Segment 3 | Segment 4 | Segment 5 | Segment 6 | Segment 7 |
| | | | Study | Study | Study | Study | Study | Study | Study |
| Basic Roadv | (View results in Column AV) | (View results in Advisory Messages) | Period | Period | Period | Period | Period | Period | Period |
| | rough lanes (n): | | | 4 | 4 | 4 | 4 | 4 | |
| | ment description: | | | · · | · · | | <u> </u> | · | |
| Segment leng | jth (L), mi: | | | 1.64 | 0.29 | 0.16 | 0.36 | 1.4 | |
| Alignment D | | | | | | | | | |
| Horizontal C | | ▼-See note | _ | | | | | | |
| | orizontal curve in segment? | · · | | Both Dir. | Both Dir. | Both Dir. | Both Dir. | Both Dir. | |
| <u> </u> | urve radius (R ₁), ft: | | | 3335 | 3335 | 3269 | 3269 | 3269 | |
| <u> </u> | ength of curve (L _{c1}), mi: | | | 0.68 | 0.68 | 0.36 | 0.36 | 0.36 | |
| | ength of curve in segment (| | | 0.41 | 0.27 | 0.07 | 0.25 | 0.04 | |
| <u> </u> | orizontal curve in segment? | <u>':</u> | | Both Dir. 3315 | No | No | No | Both Dir. 4260 | |
| <u> </u> | urve radius (R ₂), ft: | | | | | | | | |
| ı — | ength of curve (L _{c2}), mi: | | | 0.64 | | | | 0.81 | |
| | ength of curve in segment (| | | 0.64 | | | | 0.39 | |
| <u> </u> | orizontal curve in segment? | : | | No | | | - | No | |
| <u> </u> | urve radius (R ₃), ft: | | | | | | | | |
| | ength of curve (L _{c3}), mi: | | | | | | | | |
| | ength of curve in segment (| L _{c3,seg}), mi: | | | | | | | |
| Cross Section | | | | 10 | | 40 | 40 | 40 | |
| Lane width (V | ** | | | 12 | 11 | 12 | 12 | 12 | |
| | lder width (W _s), ft: | | | 10 | 10 | 7 | 9.5 | 8 | |
| Inside should | er width (W _{is}), ft: | | | 5 | 4.5 | 5 | 4 | 5 | |
| Median width | (W _m), ft: | | | 50 | 50 | 50 | 50 | 50 | |
| Rumble strips | on outside shoulders?: | | | Yes | Yes | Yes | Yes | Yes | |
| _ | ngth of rumble strips for travel in i | | | 1.64 | 0.12 | 0.16 | 0.12 | 1.30 | |
| | ngth of rumble strips for travel in on inside shoulders?: | lecreasing milepost direction, mi: | | 1.52 Yes | 0.24 Yes | 0.00 Yes | 0.21 Yes | 1.19 Yes | |
| | ngth of rumble strips for travel in i | acreasing milenost direction, mir | | 1.64 | 0.29 | 0.16 | 0.36 | 1.35 | |
| | ngth of rumble strips for travel in | | | 1.64 | 0.29 | 0.16 | 0.36 | 1.35 | |
| Presence of b | parrier in median: | 5 . | | Some | None | Some | None | Some | |
| 1 Le | ength of barrier (L _{ib,1}), mi: | | | 0.07 | | 0.04 | | 0.11 | |
| Di | stance from edge of traveled | way to barrier face (W _{off,in,1}), ft: | | 5 | | 22 | | 5 | |
| 2 L€ | ength of barrier (L _{ib,2}), mi: | | | | | | | 0.11 | |
| Di | stance from edge of traveled | way to barrier face (W _{off,in,2}), ft: | | | | | | 5 | |
| | ength of barrier (L _{ib,3}), mi: | | | | | | | | |
| Di | stance from edge of traveled | way to barrier face (W _{off,in,3}), ft: | | | | | | | |
| | ength of barrier (L _{ib,4}), mi: | | | | | | | | |
| | | way to barrier face (W _{off,in,4}), ft: | | | | | | | |
| | ength of barrier (L _{ib,5}), mi: | | | | | | | | |
| | | way to barrier face (W _{off,in,5}), ft: | | | | | | | |
| | er width (W _{ib}), ft: | | | | | | | | |
| | - | way to barrier face (W _{near}), ft: | | | | | | | |
| Roadside Da | | | | | | | | | |
| Clear zone wi | | | | 20 | 18 | 20 | 18 | 14 | |
| | parrier on roadside: | | | Some | None | None | None | Some | |
| l — | ength of barrier (L _{ob,1}), mi: | | | 0.05 | | | | 0.30 | |
| Di | istance from edge of travel | ed way to barrier face (W _{off,o,1}), ft: | | 10 | | | | 8 | |
| | ength of barrier (L _{ob,2}), mi: | | | | | | | 0.27 | |
| Di | stance from edge of travel | ed way to barrier face (W _{off,o,2}), ft: | | | | | | 8 | |
| 3 Le | ength of barrier (L _{ob,3}), mi: | | | | | | | | |
| Di | istance from edge of travel | ed way to barrier face (W _{off,o,3}), ft: | | | | | | | |
| 4 Le | ength of barrier (L _{ob,4}), mi: | | | | | | | | |
| _ | istance from edge of travel | | | | | | | | |
| | ength of barrier (L _{ob.5}), mi: | , ton,0,471 | | | | | | | |
| | | ed way to barrier face (W _{off.o.5}), ft: | | | | | | | |
| | ge of traveled way to barrier face | | | | | | | | |
| | | | | 1 | | | | | |

| Ramp Acc | cess Data | | | | | | | | |
|-------------|---|---------------------------|-----|-----------|----------|-----------|----------|----------|--|
| Travel in I | Increasing Milepost Direction | | | | | | | | |
| | Ramp entrance in segment? (If yes, indicate type.): | | | No | S-C Lane | No | No | No | |
| Ramp | Distance from begin milepost to upstream entrance ramp gore (| X _{b,ent}), mi: | | 0.22 | | 999 | 999 | 999 | |
| | Length of ramp entrance (L _{en,inc}), mi: | | | | 0.14 | | | | |
| | Length of ramp entrance in segment (L _{en,seg,inc}), mi: | | | | 0.14 | | | | |
| | Entrance side?: | | | | Right | | | | |
| Exit | Ramp exit in segment? (If yes, indicate type.): | | | No 999 | No | No 999 | S-C Lane | No | |
| Ramp | Distance from end milepost to downstream exit ramp gore (X _{e,e)} | _t), mi: | | 999 | 999 | 999 | 0.13 | 999 | |
| | Length of ramp exit (L _{ex,inc}), mi: | | | | | | 0.13 | | |
| | Length of ramp exit in segment (L _{ex,seg,inc}), mi: Exit side?: | | | | | | Right | | |
| Weave | Type B weave in segment?: | | No | No | No | No | No | No | |
| vvcavc | Length of weaving section (L _{wev,inc}), mi: | | 140 | 140 | 140 | 140 | 140 | 140 | |
| | Length of weaving section in segment (L _{wev,seg,inc}), I | mi· | | | | | | | |
| Traval in l | Decreasing Milepost Direction | | | | | | | | |
| Entrance | Ramp entrance in segment? (If yes, indicate type.): | | | No | No | Lane Add | No | S-C Lane | |
| Ramp | Distance from end milepost to upstream entrance ramp gore (X | | | 999 | 999 | Lanortaa | 0.16 | C C Lunc | |
| | Length of ramp entrance (L _{en,dec}), mi: | C,CHO. | | | | | | 0.15 | |
| | Length of ramp entrance in segment (Lensed, dec), mi | : | | | | | | 0.15 | |
| | Entrance side?: | | | | | | | Right | |
| Exit | Ramp exit in segment? (If yes, indicate type.): | | | S-C Lane | No | Lane Drop | No | No | |
| Ramp | Distance from begin milepost to downstream exit ramp gore (X _b | ,ext), mi: | | | 0.16 | | 999 | 999 | |
| | Length of ramp exit (L _{ex,dec}), mi: | | | 0.12 | | | | | |
| | Length of ramp exit in segment (L _{ex,seg,dec}), mi: | | | 0.12 | | | | | |
| | Exit side?: | | | Right | | | | | |
| Weave | Type B weave in segment?: | | | No | No | No | No | No | |
| | Length of weaving section (L _{wev,dec}), mi: | | | 1 | | | | | |
| | Length of weaving section in segment ($L_{wev,seg,dec}$), | | | | | | | | |
| Traffic Da | | Year | | | | | | | |
| | of AADT during high-volume hours (P _{hv}): | | | | | | | | |
| | Segment Data | 2030 | | 18175 | 16575 | 15900 | 12925 | 19025 | |
| - | aily traffic (AADT _{fs}) by year, veh/d: | 2031 | | | | | | | |
| | ta only for those years for which | 2032 | | | | | | | |
| it is avail | able, leave other years blank) | 2033 | | | | | | | |
| | | 2034 2035 | | | | | | | |
| | | 2036 | | | | | | | |
| | | 2037 | | | | | | | |
| | | 2038 | | | | | | | |
| | | 2039 | | | | | | | |
| | | 2040 | | | | | | | |
| | | 2041 | | | | | | | |
| | | 2042 | | | | | | | |
| | | 2043 2044 | | | | | | | |
| | | 2045 | | | | | | | |
| | | 2046 | | | | | | | |
| | | 2047 | | | | | | | |
| | | 2048 | | | | | | | |
| | | 2049 | | | | | | | |
| | | 2050 | | 23900 | 21875 | 21050 | 17050 | 25150 | |
| | | 2051 | | 1 | | | | | |
| | | 2052 2053 | | 1 | | | | | |
| Entrance 5 | Ramp Data for Travel in Increasing Milepost Dir. | Year | | | | | | | |
| | aily traffic (AADT _{b ent}) by year, veh/d: | 2030 | | 4175 | 4175 | | | | |
| - | ta only for those years for which | 2031 | | | | | | | |
| , | able, leave other years blank) | 2032 | | | | | | | |
| | , | 2033 | | | | | | | |
| | | 2034 | | | | | | | |
| | | 2035 | | | | | | | |
| | | 2036 | | | | | | | |
| | | 2037 2038 | | | | | | | |
| | | 2038 | | | | | | | |
| | | 2040 | | | | | | | |
| | | 2041 | | | | | | | |
| | | 2042 | | | | | | | |
| | | 2043 | | | | | | | |
| | | 2044 | | | | | | | |
| | | 2045 | | | | | | | |
| | | 2046 2047 | | | | | | | |
| | | 2047 | | | | | | | |
| | | 2046 | | | | | | | |
| | | 2050 | | 5475 | 5475 | | | | |
| | | | | | | | | l | |
| | | 2051 | | | | | | | |
| | | 2051 2052 | | | | | | | |

| Exit Ramp Data for Travel in Increasing Milepost Direction | Year | | | | | | |
|---|--|------|------|------|------|------|----------|
| Average daily traffic (AADT _{e,ext}) by year, veh/d: | 2030 | | | | 5075 | | |
| (enter data only for those years for which | 2030 | | | | 3073 | | |
| it is available, leave other years blank) | 2031 | | | | | | |
| it is available, leave outer years blanky | 2033 | | | | | | |
| | 2034 | | | | | | |
| | 2035 | | | | | | |
| | 2036 | | | | | | |
| | 2037 | | | | | | |
| | 2038 | | | | | | |
| | 2039 | | | | | | |
| | 2040 | | | | | | |
| | 2041 | | | | | | |
| | 2042 | | | | | | |
| | 2043 | | | | | | |
| | 2044 | | | | | | |
| | 2045 | | | | | | |
| | 2047 | | | | | | |
| | 2048 | | | | | | |
| | 2049 | | | | | | |
| | 2050 | | | | 6750 | | |
| | 2051 | | | | | | |
| | 2052 | | | | | | |
| | 2053 | | | | | | |
| Entrance Ramp Data for Travel in Decreasing Milepost Dir. | Year | | | | | | |
| Average daily traffic (AADT _{e,ent}) by year, veh/d: | 2030 | | | 3500 | 3500 | 1025 | |
| (enter data only for those years for which | 2031 | | | | | | |
| it is available, leave other years blank) | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| | 2035 | | | | | | |
| | 2036 | | | | | | |
| | 2037 | | | | | | |
| | 2038 | | | | | | |
| | 2039 | | | | | | |
| | 2041 | | | | | | |
| | 2042 | | | | | | |
| | 2043 | | | | | | |
| | 2044 | | | | | | |
| | 2045 | | | | | | |
| | 2046 | | | | | | |
| | 2047 | | | | | | |
| | 2048 | | | | | | |
| | 2049 | | | | | | |
| | 2050 | | | 4650 | 4650 | 1350 | |
| | 2051 | | | | | | |
| | 2052 | | | | | | |
| Fuit Danie Data for Travel in Danie and Milana of Direction | 2053 | | | | | | <u> </u> |
| Exit Ramp Data for Travel in Decreasing Milepost Direction | Year | | | | | | |
| | 2020 | 4000 | 0075 | 2075 | | | |
| | 2030 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 | 1600 | 2975 | 2975 | | | |
| | 2031 2032 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2041 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2038 2039 2040 2041 2041 2042 2043 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2043 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2044 2045 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2044 2044 2044 2044 2045 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2041 2042 2042 2043 2044 2045 2046 2047 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2047 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2048 2049 | | | | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which it is available, leave other years blank) | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2044 2045 2046 2047 2048 2049 | 1600 | 2975 | 2975 | | | |
| (enter data only for those years for which | 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2048 2049 | | | | | | |

| Crash Data | Year | | Segment C | rashes> | | | |
|--|------|---|-----------|---------|------|--|--|
| Count of Fatal-and-Injury (FI) Crashes by Year | 1 | | | | | | |
| Multiple-vehicle crashes | 2030 | | | | | | |
| (not ramp related) (N _{o,fs,n,mv,fi}) | 2031 | | | | | | |
| , | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Single-vehicle crashes | 2030 | | | | | | |
| (not ramp related) (N _{o,fs,n,sv,fi}) | 2031 | | | | | | |
| | 2032 | 1 | | | | | |
| | 2033 | 1 | | | | | |
| | 2034 | | | | | | |
| Ramp-entrance-related crashes | 2030 | | | | | | |
| $(N_{o,sc,EN,at,fi})$ | 2031 | | | | | | |
| | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Ramp-exit-related crashes | 2030 | 1 | | | | | |
| $(N_{o,sc,EX,at,fi})$ | 2031 | | | | | | |
| | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Count of Property-Damage-Only (PDO) Crashes | | | | | | | |
| Multiple-vehicle crashes | 2030 | | | | | | |
| (not ramp related) (N _{o,fs,n,mv,pdo}) | 2031 | | | | | | |
| | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Single-vehicle crashes | 2030 | 4 | | | | | |
| (not ramp related) (N _{o,fs,n,sv,pdo}) | 2031 | | | | | | |
| | 2032 | 1 | | | | | |
| | 2033 | 1 | | | | | |
| | 2034 | | | | | | |
| Ramp-entrance-related crashes | 2030 | 4 | | | | | |
| $(N_{o,sc,EN,at,pdo})$ | 2031 | 1 | | | | | |
| | 2032 | 4 | | | | | |
| | 2033 | 4 | | | | | |
| | 2034 | | | | | | |
| Ramp-exit-related crashes | 2030 | 4 | | | | | |
| (N _{o,sc,EX,at,pdo}) | 2031 | 1 | | | | | |
| | 2032 | 1 | | | | | |
| | 2033 | 4 | | | | | |
| | 2034 | | | | | | |

| | Input Worksheet for Ramp Segme | ents | | | | | | | |
|---|---|--------------|--------------------|--|--------------------|--------------------|--|----------------------------------|-------------|
| Clear | | Segment 1 | Segment 2 | Segment 3 | Segment 4 | Segment 5 | Segment 6 | Segment 7 | Segment 8 |
| Clear | Echo Input Values Check Input Values | Study | Study | Study | Study | Study | Study | Study | Study |
| Pasia Bas | (View results in Column CJ) (View results in Advisory Messages) | Period | Period | Period | Period | Period | Period | Period | Period |
| | adway Data through lanes (n): | 1 | 1 | 1 1 | 1 1 | 1 | 1 | 2 | |
| | ment description: | | SB Loop On | | <u> </u> | | | NB Off-Ramp | ("2" lanes) |
| Segment le | ength (L), mi: | 0.36 | 0.22 | 0.39 | 0.25 | 0.16 | 0.16 | 0.06 | |
| | affic speed on the freeway (V _{frwy}), mi/h: | 65 | 65 | 65 | 65 | 65 | 65 | 65 | |
| | ype (ramp or collector-distributor road): | Exit | Entrance | Entrance | Exit | Entrance | Exit | Exit | |
| Alignment | ntrol at crossroad ramp terminal: | Yield | None | None | Yield | Signal | Signal | Signal | |
| ľ | I Curve Data ▼See notes → | | | | | | | | |
| | Horizontal curve?: | In Seg. | In Seg. | In Seg. | In Seg. | In Seg. | In Seg. | No | |
| | Curve radius (R ₁), ft: | 1040 | 235 | 810 | 262 | 830 | 1214 | | |
| ł | Length of curve (L _{c1}), mi: | 0.14 | 0.14 | 0.15 | 0.15 | 0.07 | 0.07 | | |
| | Length of curve in segment (L _{c1,seg}), mi: | 0.14 | 0.14 | 0.15 | 0.15 | 0.07 | 0.07 | | |
| | Ramp-mile of beginning of curve in direction of travel (X ₁), mi: | 0.00 | 0.08 | 0.12 | 0.00 | 0.00 | 0.00 | | |
| 2 | Horizontal curve?: | In Seg. | No | In Seg. | No | In Seg. | No | | |
| | Curve radius (R ₂), ft: | 783 | | 1496 | | 862 | | | |
| ł | Length of curve (L _{c2}), mi: | 0.07 | | 0.08 | | 0.05 | | | |
| l | Length of curve in segment (L _{c2,seg}), mi: | 0.07 | | 0.08 | | 0.05 | | | |
| | Ramp-mile of beginning of curve in direction of travel (X ₂), mi: | 0.18 | | 0.31 | | 0.11 | | | |
| 3 | Horizontal curve?: | No | | No | | No | | | |
| i | Curve radius (R ₃), ft: | | | | | | | | |
| 1 | Length of curve (L _{c3}), mi: | | | | | | | | |
| İ | Length of curve in segment (L _{c3,seg}), mi: | | | | | | | | |
| | Ramp-mile of beginning of curve in direction of travel (X ₃), mi: | | | | | | | | |
| 4 | Horizontal curve?: | | | | | | | | |
| İ | Curve radius (R ₄), ft: | | | | | | | | |
| İ | Length of curve (L _{c4}), mi: | | | | | | | | |
| İ | Length of curve in segment (L _{c4,seg}), mi: | | | | | | | | |
| ļ | Ramp-mile of beginning of curve in direction of travel (X ₄), mi: | | | | | | | | |
| 5 | Horizontal curve?: Curve radius (R _s), ft: | | | | | | | | |
| | Cuive radius (N ₅), it. | | | I | 1 | | 1 | 1 | |
| 1 | Longth of ourse (L.) mis | | | | | | | | |
| | Length of curve (L _{c5}), mi: | | | | | | | | |
| | Length of curve in segment (L _{c5,seg}), mi: | | | | | | | | |
| Cross San | Length of curve in segment $(L_{c5,seg})$, mi: Ramp-mile of beginning of curve in direction of travel (X_5) , mi: | | | | | | | | |
| Cross Sec | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: | 12 | 12 | 12 | 12 | 14 | 14 | 12 | |
| Lane width | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: ction Data 1 (W_i), ft: | | | | | | | | |
| Lane width Right shou | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: ction Data (W_1), ft: Ilder width (W_{rs}), ft: | 5 | 4 | 4 | 5 | 5 | 14 5 4 | 4 | |
| Lane width Right shou Left should | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: etion Data (W_1), ft: Ider width (W_{rs}), ft: der width (W_{ls}), ft: | 5 4 | 4 | 4 | 5 5 | 5 4 | 5 4 | 4 3 | |
| Lane width Right shou Left should | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: ction Data (W_1), ft: Ilder width (W_{rs}), ft: | 5 | 4 | 4 | 5 | 5 | 5 | 4 | |
| Lane width Right shou Left should | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W_i), ft: Ider width (W_{rs}), ft: der width (W_{ls}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: | 5 4 | 4 | 4 | 5 5 | 5 4 | 5 4 Lane Add | 4 3 | |
| Lane width Right should Left should Presence of Roadside Presence of | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W_i), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Ider width (W_{ls}), ft: Ider width (W_{ls}), ft: Iden add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data Of barrier on right side of roadway: | 5 4 | 4 | 4 | 5 5 | 5 4 | 5 4 Lane Add 0.04 Yes | 4 3 No Yes | |
| Lane width Right should Left should Presence of Roadside Presence of | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: tion Data (W_i), ft: lder width (W_{rs}), ft: der width (W_{ls}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on right side of roadway: Length of barrier ($L_{rb,1}$), mi: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right shou Left should Presence of Roadside Presence of | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: tion Data (W_i), ft: der width (W_{rs}), ft: der width (W_{ls}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on right side of roadway: Length of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes | 4 3 No Yes | |
| Lane width Right shou Left should Presence of Roadside Presence of | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Ider width | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W_i), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Ider width (| 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W_i), ft: Ider width (W_{rs}), ft: Ider width (W_{is}), mi: Ider width (| 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 | Length of curve in segment (L _{c5,seg}), mi: Ramp-mile of beginning of curve in direction of travel (X ₅), mi: Ition Data (W ₁), ft: Ider width (W _{rs}), ft: Ider width (W _{ls}), ft: Ider width (| 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: tion Data (W _I), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Ider width (V_{ls}), mi: Ider width (V | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W_i), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), mi: Ider width (| 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: tion Data (W _I), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Ider width (V_{ls}), mi: Ider width (V | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: tion Data (W _I), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Ider width (V_{ls}), mi: Ider width (V | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | 4 3 No Yes 0.02 5 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 Fresence of Presence of 1 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W _I), ft: Ider width (W_{rs}), ft: Ider width (W | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 5 | 4 3 No No Yes 0.02 5 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 Fresence of Presence of 1 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W _I), ft: Ider width (W_{rs}), ft: Ider width (W | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data (W _I), ft: Ider width (W_{rs}), ft: Ider width (W | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | 4 3 No No Yes 0.02 5 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (| 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right shoul Left should Presence of 1 2 3 4 5 Presence of 1 2 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (| 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right shoul Left should Presence of 1 2 3 4 5 Presence of 1 2 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (| 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (| 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 3 3 4 5 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (| 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 3 3 4 5 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (| 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 3 4 4 5 4 4 4 | Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (| 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |

| Ramp Acc | cess Data | ▼ See note | 9 | | | | | | | | |
|-------------|--|--|--------------|--|----------|------|------|------|------|------|---|
| Ramp | Ramp entrance in segment? (If yes, ind | | | No | No | No | No | No | No | No | |
| Entrance | Length of entrance s-c lane in segment | (L _{en.sea}), mi: | | | | | | | | | |
| Ramp | Ramp exit in segment? (If yes, indicate | type.): | | No | No | No | No | No | No | No | |
| Exit | Length of exit s-c lane in segment (Lex,se | _{ea}), mi: | | | | | | | | | |
| Weaving | Weave section in collector-distributor ro | | ?: | No | No | No | No | No | No | | |
| Section | Length of weaving section (L _{wev}), mi: | | | | | | | | | | |
| 000 | Length of weaving section in segment (| l mi· | | | | | | | | | |
| Traffic Da | | =wev,seg/; ····· | Year | | | | | | | | |
| | laily traffic (AADT _r or AADT _c) by year, veh | v/d: | 2030 | 1600 | 3500 | 1025 | 2975 | 4175 | 5075 | 5075 | |
| | ta only for those years for which | i/u. | 2030 | 1000 | 3300 | 1023 | 2915 | 4175 | 3073 | 3073 | |
| | lable, leave other years blank) | | 2031 | | | | | | | | |
| it is avail | lable, leave officer years blank) | | 2033 | | | | | | | | |
| | | | 2034 | | | | | | | | |
| | | | 2035 | | | | | | | | |
| | | | 2036 | | | | | | | | |
| | | | 2037 | | | | | | | | |
| | | | 2038 | | | | | | | | |
| | | | 2039 | | | | | | | | |
| | | | 2040 | | | | | | | | |
| | | | 2041 | | | | | | | | |
| | | | 2042 | | | | | | | | |
| | | | 2043 2044 | | | | | | | | |
| | | | 2044 | | | | | | | | |
| | | | 2045 | | | | | | | | |
| | | | 2047 | | | | | | | | |
| | | | 2048 | | | | | | | | |
| | | | 2049 | | | | | | | | |
| | | | 2050 | 2025 | 4650 | 1350 | 4000 | 5475 | 6750 | 6750 | |
| | | | 2051 | | | | | | | | |
| | | | 2052 | | | | | | | | |
| | | | 2053 | | | | | | | | |
| Crash Da | | Year | | Segment C | Crashes> | | | | | | |
| Count of | Fatal-and-Injury (FI) Crashes by Year | 0000 | | | 1 | ı | 1 | | | | 1 |
| | Multiple-vehicle crashes | 2030 | | | | | | | | | |
| 1 | $(N_{o,w,n,mv,fi})$ | 2031 | | - | | | | | | | |
| | | 2032 | | - | | | | | | | |
| | | 2033 | | | | | | - | - | - | |
| 1 | Single-vehicle crashes | 2034 2030 | | - | | | | - | - | - | - |
| 1 | = | 2030 | | - | | | | | | | |
| i | $(N_{o,w,n,sv,fi})$ | 2031 | | | | | | - | - | - | - |
| 1 | | 2032 | | | | | | | | | |
| 1 | | 2033 | | | | | | | | | |
| Count of | Property-Damage-Only (PDO) Crashes | | | | | | | | | | |
| | | | | | | | | | | | |
| | Multiple-vehicle crashes | 2030 | | i | | | | 1 | 1 | 1 | |
| | 1 . | 2030 | | | | | | 1 | I | 1 | |
| | Multiple-vehicle crashes (N _{o,w,n,mv,pdo}) | 2031 | | | | | | | | | |
| | 1 . | | | | | | | | | | |
| | 1 . | 2031 2032 | | | | | | | | | |
| | 1 . | 2031 2032 2033 | | | | | | | | | |
| | (N _{o,w,n,mv,pdo}) | 2031 2032 2033 2034 | | | | | | | | | |
| | (N _{o,w,n,mv,pdo}) Single-vehicle crashes | 2031 2032 2033 2034 2030 | | | | | | | | | |
| | (N _{o,w,n,mv,pdo}) Single-vehicle crashes | 2031 2032 2033 2034 2030 2031 | | | | | | | | | |

| | Input V | Vorksheet for Crossroad Ramp T | erminals | | | | | |
|--------------|---|--|-------------|-------------|------------|------------|------------|------------|
| 01 | | | Terminal 1 | Terminal 2 | Terminal 3 | Terminal 4 | Terminal 5 | Terminal 6 |
| Clear | Echo Input Values | Check Input Values | Study | Study | Study | Study | Study | Study |
| | (View results in Column T) | (View results in Advisory Messages) | Period | Period | Period | Period | Period | Period |
| Basic Inter | rsection Data | | | | | | | |
| Ramp term | inal configuration: | | D4 | D4 | | | | |
| | inal description: | | SB Terminal | NB Terminal | | | | |
| | inal traffic control type: | | One stop | Signal | | | | |
| ls a non-rar | mp public street leg present | at the terminal (I _{ps})?: | No | Ño | | | | |
| Alignment | | | | | | | | |
| Exit ramp s | skew angle (I _{sk}), degrees: | | 4 | 6 | | | | |
| | e next public street intersection on t | | 0.14 | 0.15 | | | | |
| Distance to | the adjacent ramp terminal | (L _{rmp}), mi: | 0.15 | 0.15 | | | | |
| Traffic Cor | ntrol | | | | | | | |
| | Operational Mode | | | | | | | |
| Crossroad | Inside approach | Protected-only mode (I _{p,lt,in})?: | Yes | No | | | | |
| | Outside approach | Protected-only mode (I _{p,lt,out})?: | Yes | No | | | | |
| Right-Turn | Control Type | | | | | | | |
| Ramp | Exit ramp approach | Right-turn control type: | Yield | Yield | | | | |
| Cross Sec | tion Data | | | | | | | |
| Crossroad | median width (W _m), ft: | | 12 | 10 | | | | |
| Number of | f Lanes | | | | | | | |
| Crossroad | Both approaches | Lanes serving through vehicles (n _{th}): | 4 | 4 | | | | |
| , ! | Inside approach | Lanes serving through vehicles (n _{th in}): | 2 | 2 | | | | |
| | Outside approach | Lanes serving through vehicles (n _{th,out}): | 2 | 2 | 0 | 0 | 0 | 0 |
| Ramp | Exit ramp approach | All lanes (n _{ex}): | 1 | 3 | | | | |
| Right-Turn | Channelization | see note: | | | | | | |
| Crossroad | Inside approach | Channelization present (I _{ch,in})?: | Yes | No | | | | |
| l l | Outside approach | Channelization present (I _{ch,out})?: | Yes | Yes | | | | |
| | Exit ramp approach | Channelization present (I _{ch.ex})?: | Yes | Yes | | | | |
| | Lane or Bay | (-cii,ex) | | | | | | |
| | Inside approach | Lane or bay present (I _{bay,It,in})?: | No | Yes | | | | |
| Crossroad | пізіце арргоасті | | 0 | 12 | | | | |
| , | | Width of lane or bay (W _{b,in}), ft: | × | ·- | | | | |
| | Outside approach | Lane or bay present (I _{bay,lt,out})?: | No | No | | | | |
| 1 | | Width of lane or bay (W _{b,out}), ft: | 0 | 0 | | | | |
| Right-Turn | Lane or Bay | | | | | | | |
| Crossroad | Inside approach | Lane or bay present (I _{bay,rt,in})?: | Yes | No | | | | |
| | Outside approach | Lane or bay present (I _{bay,rt,out})?: | No | No | | | | |
| | | | | | | | | |
| Access Da | | | | | | | | |
| Access Da | | | 2 | 2 | | | | |

| Traffic Data | Year | | | | |
|--|------|-------|-------|--|---|
| Inside Crossroad Leg Data | 2030 | 29200 | 29200 | | |
| Average daily traffic (AADT _{in}) by year, veh/d: | 2031 | | | | |
| (enter data only for those years for which | 2032 | | | | |
| it is available, leave other years blank) | 2033 | | | | 1 |
| it is available, leave exist years blank, | 2034 | | | | |
| | 2035 | | | | |
| | 2036 | | | | |
| | 2037 | | | | |
| | 2038 | | | | |
| | 2039 | | | | |
| | 2040 | | | | |
| | 2041 | | | | |
| | 2042 | | | | |
| | 2043 | | | | |
| | 2044 | | | | |
| | 2045 | | | | |
| | 2046 | | | | |
| | 2047 | | | | |
| | 2048 | | | | |
| | 2049 | | | | |
| | 2050 | 38325 | 38325 | | |
| | 2051 | | | | |
| | 2052 | | | | |
| | 2053 | | | | |
| Outside Crossroad Leg Data | 2030 | 25350 | 34350 | | |
| Average daily traffic (AADT _{out}) by year, veh/d: | 2031 | | | | |
| (enter data only for those years for which | 2032 | | | | |
| it is available, leave other years blank) | 2033 | | | | |
| , | 2034 | | | | |
| | 2035 | | | | |
| | 2036 | | | | |
| | 2037 | | | | |
| | 2038 | | | | |
| | 2039 | | | | |
| | 2040 | | | | |
| | 2041 | | | | |
| | 2042 | | | | |
| | 2043 | | | | |
| | 2044 | | | | |
| | 2045 | | | | |
| | 2046 | | | | |
| | 2047 | | | | |
| | 2048 | | | | |
| | 2049 | | | | |
| | 2050 | 33050 | 45250 | | |
| | 2051 | | | | |
| | 2052 | | | | |
| | 2053 | | | | |

| Exit Ramp Data | | 2030 | 4575 | 5075 | | | | |
|--|-----------------------|--------------|-----------|-------------------------|----------|---|----------|--|
| Average daily traffic (AADT _{ex}) by year, veh/d: | | 2031 | | | | | | |
| (enter data only for those years for which | | 2032 | | | | | | |
| it is available, leave other years blank) | | 2033 | | | | | | |
| | | 2034 | | | | | | |
| For a B4 terminal configuration, enter the AADT for th | ne | 2035 | | | | | | |
| diagonal exit ramp (not the loop exit ramp). | | 2036 | | | | | | |
| | | 2037 | | | | | | |
| | | 2038 | | | | | | |
| | | 2039 | | | | | | |
| | | 2040 2041 | | | | | | |
| | | 2041 | | | | | | |
| | | 2042 | | | | | | |
| | | 2044 | | | | | | |
| | | 2045 | | | | | | |
| | | 2046 | | | | | | |
| | | 2047 | | | | | | |
| | | 2048 | | | | | | |
| | | 2049 | | | | | | |
| | | 2050 | 6025 | 6750 | | | | |
| | | 2051 | | | | | | |
| | | 2052 2053 | | | | | | |
| Entrance Ramp Data | | 2030 | 4525 | 4175 | | | | |
| Average daily traffic (AADT _{en}) by year, veh/d: | | 2030 | 4323 | 4173 | | | | |
| (enter data only for those years for which | | 2032 | | | | | | |
| it is available, leave other years blank) | | 2032 | | | | | | |
| it is available, leave other years blank) | | 2034 | | | | | | |
| For an A4 terminal configuration, enter the AADT for | the | 2035 | | | | | | |
| diagonal entrance ramp (not the loop entrance ramp) | | 2036 | | | | | | |
| | | 2037 | | | | | | |
| | | 2038 | | | | | | |
| | | 2039 | | | | | | |
| | | 2040 | | | | | | |
| | | 2041 | | | | | | |
| | | 2042 2043 | | | | | | |
| | | 2043 | | | | | | |
| | | 2045 | | | | | | |
| | | 2046 | | | | | | |
| | | 2047 | | | | | | |
| | | 2048 | | | | | | |
| | | 2049 | | | | | | |
| | | 2050 | 6000 | 5475 | | | | |
| | | 2051 | | | | | | |
| | | 2052 2053 | | | | | | |
| Crash Data | Year | 2000 | Ramp Tor | <u>l</u> minal Crash | <u> </u> | | <u> </u> | |
| Count of Fatal-and-Injury (FI) Crashes by Year | I Cal | | Tamp Tell | minai CraSi | 03 | | | |
| (N _{o,w,ac,at,fi)} | 2030 | | | 1 | | | | |
| (` 'U,w,au,au,ii/ | 2031 | 1 | 1 | | | | | |
| | 2032 | | | | | | | |
| | 2033 | | | | | | | |
| <u> -</u> | 2034 | | | | | | | |
| | | | | | | | | |
| Count of Property-Damage-Only (PDO) Crashes b | y Year | | | | | _ | | |
| | y Year 2030 | | | | | | | |
| Count of Property-Damage-Only (PDO) Crashes by (N _{o,w,ac,at,pdo}) | | | | | | | | |
| | 2030 2031 2032 | | | | | | | |
| | 2030 2031 | | | | | | | |

| | | Out | put Summa | irv | | | | | |
|---|---|--|---|---|---|--|---|--|--|
| General Information | า | | | , | | | | | |
| Project description: | US54-MO5 Predic | tive Safety Anal | vsis | | | | | | |
| Analyst: | CBB | | 7/22/2025 | | Area type: | Ti | Jrban | | |
| First year of analysis | | Date. | 112212020 | | riica type. | | Sibaii | | |
| Last year of analysis | | | | | | | | | |
| | | | | | | | | | |
| Crash Data Descrip | _ | 4! - - -0 | | NI- | I =: + | 6 l l - 4 - | | | |
| Freeway segments | Segment crash da | | | No | | f crash data | | | |
| | Project-level crash | | ' | No | | f crash data: | | | |
| Ramp segments | Segment crash da | | | No | | f crash data: | | | |
| | Project-level crash | |) | No | | f crash data: | | | |
| Ramp terminals | Segment crash da | ta available? | | No | First year o | f crash data: | | | |
| | Project-level crash | ı data available? | • | No | Last year of | f crash data: | | | |
| Estimated Crash St | atistics | | | | | | | | |
| Crashes for Entire | Facility | | Total | K | ΑΙ | В | С | PDO | |
| Estimated number of cras | | rashes: | 1448.0 | 4.0 | 17.6 | 101.1 | 257.1 | 1068.3 | |
| Estimated average crash t | | | 69.0 | 0.2 | | 4.8 | 12.2 | 50.9 | |
| Crashes by Facility | | Nbr. Sites | Total | K | A | В | C | PDO | |
| | | | 318.1 | 2.2 | | | 37.3 | 245.7 | |
| Freeway segments, | | 5 | | | | 27.5 | | | |
| Ramp segments, cra | | 7 | 130.6 | 1.2 | | 18.2 | 22.8 | 84.6 | |
| Crossroad ramp tern | | 2 | 999.3 | 0.6 | | 55.3 | 197.1 | 737.9 | |
| Crashes for Entire | | Year | Total | K | Α | В | С | PDO | |
| Estimated number of | crashes during | 2030 | 57.0 | 0.2 | | 4.1 | 10.1 | 41.9 | |
| the Study Period, cra | ishes: | 2031 | 58.2 | 0.2 | 0.7 | 4.1 | 10.3 | 42.8 | |
| | | 2032 | 59.3 | 0.2 | 0.7 | 4.2 | 10.5 | 43.7 | |
| | | 2033 | 60.5 | 0.2 | 0.7 | 4.3 | 10.7 | 44.5 | |
| | | 2034 | 61.7 | 0.2 | 0.8 | 4.4 | 11.0 | 45.4 | |
| | | 2035 | 62.8 | 0.2 | 0.8 | 4.4 | 11.2 | 46.3 | |
| | | 2036 | 64.0 | 0.2 | 0.8 | 4.5 | 11.4 | 47.2 | |
| | | 2037 | 65.2 | 0.2 | | 4.6 | 11.6 | 48.1 | |
| | | 2038 | 66.4 | 0.2 | 0.8 | 4.7 | 11.8 | 49.0 | |
| | | 2039 | 67.6 | 0.2 | | 4.7 | 12.0 | 49.9 | |
| | | 2040 | 68.8 | 0.2 | | 4.8 | 12.2 | 50.8 | |
| | | 2041 | 70.1 | 0.2 | | 4.9 | 12.4 | 51.7 | |
| | | 2042 | 71.3 | | | 5.0 | 12.4 | | |
| | | | | 0.2 | | | | 52.6 | |
| | | 2043 | 72.5 | 0.2 | | 5.0 | 12.9 | 53.5 | |
| | | 2044 | 73.7 | 0.2 | 0.9 | 5.1 | 13.1 | 54.5 | |
| | | 2045 | 75.0 | 0.2 | | 5.2 | 13.3 | 55.4 | |
| | | 2046 | 76.2 | 0.2 | | 5.3 | 13.5 | 56.3 | |
| | | 2047 | 77.5 | 0.2 | | 5.4 | 13.8 | 57.3 | |
| | | 2048 | 78.8 | 0.2 | | 5.4 | 14.0 | 58.2 | |
| | | 2049 | 80.0 | 0.2 | | 5.5 | 14.2 | 59.1 | |
| | | 2050 | 81.3 | 0.2 | 1.0 | 5.6 | 14.4 | 60.1 | |
| | | 2051 | | | | | | | |
| | | 2052 | | | | | | | |
| | | 2053 | | | | | | | |
| - · · · · · · · · · · · · · · · · · · · | | lity | | | | • | | | |
| Distribution of Cras | shes for Entire Faci | Distribution of Crashes for Entire Facility Estimated Number of | | | | | | | |
| | | | Estima | ted Numb | er of Crash | es During t | he Study P | eriod | |
| Distribution of Cras Crash Type | Crash Type | | Estima Total | ted Numb K | er of Crash | es During t B | he Study P | eriod PDO | |
| Crash Type | Crash Type | | Total | K | Α | В | С | PDO | |
| | Crash Type Head-on crashes: | Category | Total 9.9 | K | A 0.1 | B 0.8 | C 2.6 | PDO 6.4 | |
| Crash Type | Crash Type Head-on crashes: Right-angle crashe | Category | 9.9 273.2 | 0.0 0.2 | 0.1 2.6 | 0.8 16.8 | 2.6 61.0 | PDO 6.4 192.5 | |
| Crash Type | Crash Type Head-on crashes: Right-angle crashes Rear-end crashes | Category es: | 9.9 273.2 606.7 | 0.0 0.2 1.0 | 0.1 2.6 6.7 | 0.8 16.8 41.3 | 2.6 61.0 123.8 | PDO 6.4 192.5 433.9 | |
| Crash Type | Crash Type Head-on crashes: Right-angle crashes Rear-end crashes Sideswipe crashes | Category es: : | 9.9 273.2 606.7 139.9 | 0.0 0.2 1.0 0.2 | 0.1 2.6 6.7 0.7 | B 0.8 16.8 41.3 4.3 | 2.6 61.0 123.8 10.4 | 9DO 6.4 192.5 433.9 124.3 | |
| Crash Type | Crash Type Head-on crashes: Right-angle crashes Rear-end crashes: Sideswipe crashes Other multiple-veh | Category es: : : : : : : : : : : : : : : : : : | 9.9 273.2 606.7 139.9 22.4 | 0.0 0.2 1.0 0.2 0.1 | 0.1 2.6 6.7 0.7 0.2 | B 0.8 16.8 41.3 4.3 1.3 | 2.6 61.0 123.8 10.4 3.0 | 9DO 6.4 192.5 433.9 124.3 17.8 | |
| Crash Type Multiple vehicle | Crash Type Head-on crashes: Right-angle crashes: Rear-end crashes: Sideswipe crashes Other multiple-veh Total multiple-ve | es: : : : : : : : : : : : : : : : : : : | 9.9 273.2 606.7 139.9 22.4 1052.1 | 0.0 0.2 1.0 0.2 0.1 1.5 | 0.1 2.6 6.7 0.7 0.2 10.3 | B 0.8 16.8 41.3 4.3 1.3 64.5 | 2.6 61.0 123.8 10.4 3.0 200.8 | 9DO 6.4 192.5 433.9 124.3 17.8 775.0 | |
| Crash Type | Crash Type Head-on crashes: Right-angle crashes Rear-end crashes: Sideswipe crashes Other multiple-veh Total multiple-ve Crashes with anim | category es: :: :: :: :: :: :: :: :: :: :: :: :: : | 9.9 273.2 606.7 139.9 22.4 1052.1 4.3 | 0.0 0.2 1.0 0.2 0.1 | 0.1 2.6 6.7 0.7 0.2 10.3 | B 0.8 16.8 41.3 4.3 1.3 | 2.6 61.0 123.8 10.4 3.0 | PDO 6.4 192.5 433.9 124.3 17.8 775.0 4.0 | |
| Crash Type Multiple vehicle | Crash Type Head-on crashes: Right-angle crashes: Rear-end crashes: Sideswipe crashes Other multiple-veh Total multiple-ve | category es: :: :: :: :: :: :: :: :: :: :: :: :: : | 9.9 273.2 606.7 139.9 22.4 1052.1 | 0.0 0.2 1.0 0.2 0.1 1.5 | 0.1 2.6 6.7 0.7 0.2 10.3 0.0 | B 0.8 16.8 41.3 4.3 1.3 64.5 | 2.6 61.0 123.8 10.4 3.0 200.8 | 9DO 6.4 192.5 433.9 124.3 17.8 775.0 | |
| Crash Type Multiple vehicle | Crash Type Head-on crashes: Right-angle crashes Rear-end crashes: Sideswipe crashes Other multiple-veh Total multiple-ve Crashes with anim | category es: icicle crashes: chicle crashes: al: object: | 9.9 273.2 606.7 139.9 22.4 1052.1 4.3 | 0.0 0.2 1.0 0.2 0.1 1.5 | 0.1 2.6 6.7 0.7 0.2 10.3 0.0 5.2 | B 0.8 16.8 41.3 4.3 1.3 64.5 0.1 | 2.6 61.0 123.8 10.4 3.0 200.8 0.2 | PDO 6.4 192.5 433.9 124.3 17.8 775.0 4.0 | |
| Crash Type Multiple vehicle | Crash Type Head-on crashes: Right-angle crashes Rear-end crashes: Sideswipe crashes Other multiple-veh Total multiple-ve Crashes with anim Crashes with fixed Crashes with other | category es: icicle crashes: chicle crashes: al: object: r object: | 9.9 273.2 606.7 139.9 22.4 1052.1 4.3 296.4 | 0.0 0.2 1.0 0.2 0.1 1.5 0.0 | 0.1 2.6 6.7 0.7 0.2 10.3 0.0 5.2 | B 0.8 16.8 41.3 4.3 1.3 64.5 0.1 26.2 | 2.6 61.0 123.8 10.4 3.0 200.8 0.2 40.0 | PDO 6.4 192.5 433.9 124.3 17.8 775.0 4.0 223.2 26.2 | |
| Crash Type Multiple vehicle | Crash Type Head-on crashes: Right-angle crashes: Rear-end crashes: Sideswipe crashes Other multiple-veh Total multiple-vee Crashes with anim Crashes with fixed Crashes with other Crashes with park | Category es: icle crashes: chicle crashes: chicle crashes: al: object: r object: ed vehicle: | 70tal 9.9 273.2 606.7 139.9 22.4 1052.1 4.3 296.4 29.4 7.4 | 0.0 0.2 1.0 0.2 0.1 1.5 0.0 1.8 0.1 | 0.1 2.6 6.7 0.7 0.2 10.3 0.0 5.2 0.2 | B 0.8 16.8 41.3 4.3 1.3 64.5 0.1 26.2 1.2 | C 2.6 61.0 123.8 10.4 3.0 200.8 0.2 40.0 1.7 0.7 | PDO 6.4 192.5 433.9 124.3 17.8 775.0 4.0 223.2 26.2 6.0 | |
| Crash Type Multiple vehicle | Crash Type Head-on crashes: Right-angle crashes Rear-end crashes: Sideswipe crashes Other multiple-veh Total multiple-ve Crashes with anim Crashes with fixed Crashes with other | es: : : : : : : : : : : : : : : : : : : | 70tal 9.9 273.2 606.7 139.9 22.4 1052.1 4.3 296.4 29.4 | 0.0 0.2 1.0 0.2 0.1 1.5 0.0 1.8 | 0.1 2.6 6.7 0.7 0.2 10.3 0.0 5.2 0.2 0.1 | B 0.8 16.8 41.3 4.3 1.3 64.5 0.1 26.2 1.2 | 2.6 61.0 123.8 10.4 3.0 200.8 0.2 40.0 | PDO 6.4 192.5 433.9 124.3 17.8 775.0 4.0 223.2 26.2 | |

| | | | | Evaluat | tion Site Si | ımmarv | | | |
|--------------|--------------|--------------|--------------|--------------|--------------|-------------|------------|-------|-----|
| General In | formation | | | | | , | | | |
| Project des | cription: | US54-MO5 | Predictive | Safety Anal | ysis | | | | |
| Analyst: | | CBB | | | 7/22/2025 | | Area type: | Ur | ban |
| First year o | of analysis: | 2030 | Total length | n of freeway | | for Study P | | 3.849 | |
| Last year o | | 2050 | | - | ŭ | • | ` , | | |
| Site Descr | | | | | | | | | |
| Freeway S | | | | | | | | | |
| Number | Lanes | Study Period | Study Perio | od Descripti | on | | | | |
| | | Length (mi) | , | • | | | | | |
| 1 | 0 | 0.000 | 0 | | | | | | |
| 2 | 4 | | 0 | | | | | | |
| 3 | 4 | 0.290 | 0 | | | | | | |
| 4 | 4 | 0.160 | 0 | | | | | | |
| 5 | 4 | 0.359 | 0 | | | | | | |
| 6 | 4 | 1.400 | 0 | | | | | | |
| 7 | 0 | 0.000 | 0 | | | | | | |
| 8 | 0 | 0.000 | 0 | | | | | | |
| 9 | 0 | 0.000 | 0 | | | | | | |
| 10 | 0 | 0.000 | 0 | | | | | | |
| 11 | 0 | 0.000 | 0 | | | | | | |
| 12 | 0 | 0.000 | 0 | | | | | | |
| 13 | 0 | 0.000 | 0 | | | | | | |
| 14 | 0 | 0.000 | 0 | | | | | | |
| 15 | 0 | 0.000 | 0 | | | | | | |
| 16 | 0 | 0.000 | 0 | | | | | | |
| 17 | 0 | 0.000 | 0 | | | | | | |
| 18 | 0 | 0.000 | 0 | | | | | | |
| 19 | 0 | 0.000 | 0 | | | | | | |
| 20 | 0 | 0.000 | 0 | | | | | | |
| Ramp Seg | | 0.000 | | | | | 1 | | |
| Number | Study Peri | od | | | Number | Study Peri | od | | |
| | Description | | | | | Description | | | |
| 1 | SB Off-Ramp | | | | 21 | 0 | | | |
| 2 | SB Loop On | | | | 22 | 0 | | | |
| | SB On-Ramp | | | | 23 | 0 | | | |
| 4 | SB Loop Off | | | | 24 | 0 | | | |
| | NB On-Ramp | | | | 25 | 0 | | | |
| | NB Off-Ramp | | | | 26 | 0 | | | |
| 7 | NB Off-Ramp | ("2" lanes) | | | 27 | 0 | | | |
| 8 | 0 | | | | 28 | 0 | | | |
| 9 | 0 | | | | 29 | 0 | | | |
| 10 | 0 | | | | 30 | 0 | | | |
| | 0 | | | | 31 | 0 | | | |
| | 0 | | | | 32 | 0 | | | |
| | 0 | | | | 33 | 0 | | | |
| | 0 | | | | 34 | 0 | | | |
| 15 | 0 | | | | 35 | 0 | | | |
| | 0 | | | | 36 | 0 | | | |
| | 0 | | | | 37 | 0 | | | |
| | 0 | | | | 38 | 0 | | | |
| | 0 | | | | 39 | 0 | | | |
| 20 | 0 | | | | 40 | 0 | | | |
| Crossroad | | | | | | | | | |
| Number | Config. | Control | Study Perio | od Descripti | on | | | | |
| 1 | D4 | One stop | SB Terminal | | | | | | |
| 2 | D4 | Signal | NB Terminal | | | | | | |
| 3 | 0 | 0 | 0 | | | | | | |
| 4 | 0 | 0 | 0 | | | | | | |
| 5 | 0 | 0 | 0 | | | | | | |
| 6 | 0 | 0 | 0 | | | | | | |
| | | • | | | | | • | | |

HSM Inputs & Output Summary Report (No-Build)

| | | PROJECT SAFETY PERFORMANCE | ANALYSIS INPUT SHEET | |
|------------------------------|---------------|---|------------------------------------|--|
| | | General Informa | ation | |
| Project Name | US54-MO5 MoD | OT On-Call | Contact Email | azarate@cbbtraffic.com |
| Project Description | 2030 No-Build | | Contact Phone | (314) 825 5841 |
| Reference Number | Job# 073-25 | | Date Performed | 07/23/25 |
| Analyst | Alex Zarate | | Analysis Year | 2030 |
| Agency/Company | CBB | | Multiple Year Analysis? | Yes |
| f of Segments in Analysis | 5 | | This spreadsheet calculates the pr | edicted and expected average crash frequency |
| of Intersections in Analysis | 3 | | Duration of crash history? | |
| | | LOCATION INFORMATION | | INTERSECTIONS ONLY |
| INDIVIDUAL PROJECT ELEMENTS | | | JURISDICTION | |
| | Route | Location Description | | Signalized or Unsignalized? |
| | | SEGMENTS | | |
| Segment 1 | US 54 | Business Rt 5 to South Terminal Mediar | MODOT | - |
| segment 2 | US 54 | South Terminal Median | MODOT | - |
| egment 3 | US 54 | outh Terminal Median to North Termin | MODOT | - |
| Segment 4 | US 54 | North Terminal to Laker Pride Rd | MODOT | - |
| Segment 5 | US 54 | Laker Pride Rd to Cecil Rd | MODOT | - |
| | | INTERSECTIO | NS | |
| ntersection 1 | US 54 | US 54 & Business Route 5 | MODOT | Signalized |
| | US 54 | US 54 & Laker Pride Rd/Jack Crowell Rd | MODOT | Signalized |
| ntersection 2 | 03 34 | 03 34 & Laker I Hae Naj Jack Crowell No | 100 | Signatized |

| General Information | | | Location Information | | | | | |
|---|----------------------------------|------------------|-------------------------------------|---------------------------------------|--|-----------------|--|--|
| Analyst Ale | ex Zarate | | Roadway | US 54 | | | | |
| Agency or Company CB | BB | | Roadway Section | Business Rt 5 to South Terminal Media | | | | |
| Date Performed 07 | //23/25 | | Jurisdiction | MODOT | | | | |
| Segment for Analysis Se | gment 1 | | Analysis Year 2030 | | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | way type (2U, 3T, 4U, 4D, 5T) | | | 5T | | | | |
| Length of segment, L (mi) | yth of segment, L (mi) | | | 0.58 | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 53,800 | (veh/day) | | 25,350 | | | | |
| Type of on-street parking (none/parallel/angle) | | | | None | | None | | |
| Proportion of curb length with on-street parkin | ng | | | 0 | | | | |
| Median width (ft) - for divided only | | | | Not Present | | 15 | | |
| Lighting (present / not present) | | | | Present | | Not Present | | |
| Auto speed enforcement (present / not present | t) | | | Not Present | | Not Present | | |
| Major commercial driveways (number) | | | | 0 | | | | |
| Minor commercial driveways (number) | | | | 27 | | | | |
| Major industrial / institutional driveways (numl | ber) | | | 0 | | | | |
| Minor industrial / institutional driveways (num | ber) | | | 13 | | | | |
| Major residential driveways (number) | | | | 1 | | | | |
| Minor residential driveways (number) | | | | 4 | | | | |
| Other driveways (number) | | | | 3 | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 31 | | 0 | | |
| Offset to roadside fixed objects (ft) [If greater t | han 30 or Not Present, input 30] | | | 15 | | 30 | | |
| Calibration Factor, Cr | | | | 0.84 | | 1.00 | | |
| Average Annual Crash History (3 or 5-yr average | ge) | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| with the venicle univeway crashes | | PDO | Property Damage Only | 0.0 | | | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| | | PDO | Property Damage Only | 0.0 | | | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| Single-vertice didsiles | | PDO | Property Damage Only | 0.0 | | | | |
| NOTES: * AADT: It is important to remember th | nat the AADT(major) = AADT(major | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | |

| General Information | | | Location Information | | | | | |
|---|-----------------------------------|------------------|-------------------------------------|---------------------------|--|-----------------|--|--|
| Analyst Al | lex Zarate | | Roadway | US 54 | | | | |
| Agency or Company CE | ВВ | | Roadway Section | South Terminal Median | | | | |
| Date Performed 07 | 7/23/25 | | Jurisdiction | MODOT | | | | |
| Segment for Analysis Se | egment 2 | | Analysis Year | 2030 | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | vay type (2U, 3T, 4U, 4D, 5T) | | | 4D | | | | |
| Length of segment, L (mi) | | | | 0.1 | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 66,000 | (veh/day) | | 29,200 | | | | |
| Type of on-street parking (none/parallel/angle |) | | | None | | None | | |
| Proportion of curb length with on-street parking | ng | | | 0 | | | | |
| Median width (ft) - for divided only | | | | 10 | | 15 | | |
| Lighting (present / not present) | | | | Not Present | | Not Present | | |
| Auto speed enforcement (present / not presen | nt) | | | Not Present | | Not Present | | |
| Major commercial driveways (number) | | | | 0 | | | | |
| Minor commercial driveways (number) | | | | 0 | | | | |
| Major industrial / institutional driveways (num | nber) | | | 0 | | | | |
| Minor industrial / institutional driveways (num | nber) | | | 0 | | | | |
| Major residential driveways (number) | | | | 0 | | | | |
| Minor residential driveways (number) | | | | 0 | | | | |
| Other driveways (number) | | | | 0 | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 0 | | 0 | | |
| Offset to roadside fixed objects (ft) [If greater t | than 30 or Not Present, input 30] | | | 30 | | 30 | | |
| Calibration Factor, Cr | | | | 0.91 | | 1.00 | | |
| Average Annual Crash History (3 or 5-yr avera | age) | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| wurtpie verlicie unveway crasiles | | PDO | Property Damage Only | 0.0 | | | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| ividitiple verifice nondriveway trasfies | | PDO | Property Damage Only | 0.0 | | | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| Single-verticle crasties | | PDO | Property Damage Only | 0.0 | | | | |
| NOTES: * AADT: It is important to remember th | hat the AADT(major) = AADT(major | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | |

| General Information | | | Location Information | | | |
|---|------------------------------------|------------------|-------------------------------------|-------------------------------------|-------|-----------------|
| Analyst Ale | ex Zarate | | Roadway | US 54 | | |
| Agency or Company CB | BB | | Roadway Section | South Terminal Median to North Term | ninal | |
| Date Performed 07 | //23/25 | | Jurisdiction | MODOT | | |
| Segment for Analysis Segment | gment 3 | | Analysis Year | 2030 | | |
| Input Data | | | | Site Conditions | | Base Conditions |
| Roadway type (2U, 3T, 4U, 4D, 5T) | vay type (2U, 3T, 4U, 4D, 5T) | | | 5T | | |
| Length of segment, L (mi) | | | | 0.1 | | |
| AADT (veh/day) is within range | AADT _{MAX} = 53,800 | (veh/day) | | 29,200 | | |
| Type of on-street parking (none/parallel/angle) | | | | None | | None |
| Proportion of curb length with on-street parkin | ng | | | 0 | | |
| Median width (ft) - for divided only | | | | Not Present | | 15 |
| Lighting (present / not present) | | | | Present | | Not Present |
| Auto speed enforcement (present / not present | t) | | | Not Present | | Not Present |
| Major commercial driveways (number) | | | | 0 | | |
| Minor commercial driveways (number) | | | | 0 | | |
| Major industrial / institutional driveways (numb | ber) | | | 0 | | |
| Minor industrial / institutional driveways (numl | ber) | | | 0 | | |
| Major residential driveways (number) | | | | 0 | | |
| Minor residential driveways (number) | | | | 0 | | |
| Other driveways (number) | | | | 0 | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 11 | | 0 |
| Offset to roadside fixed objects (ft) [If greater the | han 30 or Not Present, input 30] | | | 4 | | 30 |
| Calibration Factor, Cr | | | | 0.84 | | 1.00 |
| Average Annual Crash History (3 or 5-yr average | ge) | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | |
| widthpie venicle unveway crashes | | PDO | Property Damage Only | 0.0 | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | |
| | | PDO | Property Damage Only | 0.0 | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | |
| Single-verticle cidSiles | | PDO | Property Damage Only | 0.0 | | |
| NOTES: * AADT: It is important to remember th | nat the AADT(major) = AADT(major a | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | |

| General Information | | | Location Information | | | | | |
|---|------------------------------------|------------------|-------------------------------------|----------------------------------|--|-----------------|--|--|
| Analyst Ale | ex Zarate | | Roadway | US 54 | | | | |
| Agency or Company CB | зв | | Roadway Section | North Terminal to Laker Pride Rd | | | | |
| Date Performed 07 | 7/23/25 | | Jurisdiction | MODOT | | | | |
| Segment for Analysis Se | egment 4 | | Analysis Year | 2030 | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | ype (2U, 3T, 4U, 4D, 5T) | | | 5T | | | | |
| Length of segment, L (mi) | | | | 0.15 | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 53,800 | (veh/day) | | 34,350 | | | | |
| Type of on-street parking (none/parallel/angle) |) | | | None | | None | | |
| Proportion of curb length with on-street parkin | ng | | | 0 | | | | |
| Median width (ft) - for divided only | | | | Not Present | | 15 | | |
| Lighting (present / not present) | | | | Present | | Not Present | | |
| Auto speed enforcement (present / not present | t) | | | Not Present | | Not Present | | |
| Major commercial driveways (number) | | | | 0 | | | | |
| Minor commercial driveways (number) | | | | 3 | | | | |
| Major industrial / institutional driveways (numl | ber) | | | 0 | | | | |
| Minor industrial / institutional driveways (num | ber) | | | 2 | | | | |
| Major residential driveways (number) | | | | 0 | | | | |
| Minor residential driveways (number) | | | | 0 | | | | |
| Other driveways (number) | | | | 0 | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 6 | | 0 | | |
| Offset to roadside fixed objects (ft) [If greater t | han 30 or Not Present, input 30] | | | 23 | | 30 | | |
| Calibration Factor, Cr | | | | 0.84 | | 1.00 | | |
| Average Annual Crash History (3 or 5-yr average | ge) | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| with the venicle univeway crashes | | PDO | Property Damage Only | 0.0 | | | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| | | PDO | Property Damage Only | 0.0 | | | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| Single-vertice didsiles | | PDO | Property Damage Only | 0.0 | | | | |
| NOTES: * AADT: It is important to remember th | nat the AADT(major) = AADT(major a | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | |

| General Information | | | Location Information | | | | | |
|---|--|------------------|-------------------------------------|----------------------------|------|-----------------|--|--|
| Analyst | Alex Zarate | | Roadway US 54 | | | | | |
| Agency or Company C | СВВ | | Roadway Section | Laker Pride Rd to Cecil Rd | | | | |
| Date Performed 0 | 07/23/25 | | Jurisdiction | MODOT | | | | |
| Segment for Analysis S | Segment 5 | | Analysis Year | 2030 | | | | |
| Input Data | | | Site Conditions | | | Base Conditions | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | | | 5T | | | | | |
| Length of segment, L (mi) | | | 0.64 | | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 53,800 | (veh/day) | 34,250 | | | | | |
| Type of on-street parking (none/parallel/angle | rpe of on-street parking (none/parallel/angle) | | | None | None | | | |
| Proportion of curb length with on-street parking | | | 0 | | | | | |
| Median width (ft) - for divided only | | | Not Present | | | 15 | | |
| Lighting (present / not present) | | | Present | | | Not Present | | |
| Auto speed enforcement (present / not present) | | | Not Present | | | Not Present | | |
| Major commercial driveways (number) | | | 2 | | | | | |
| Minor commercial driveways (number) | | | 19 | | | | | |
| Major industrial / institutional driveways (number) | | | 1 | | | | | |
| Minor industrial / institutional driveways (number) | | | 10 | | | | | |
| Major residential driveways (number) | | | 0 | | | | | |
| Minor residential driveways (number) | | | 0 | | | | | |
| Other driveways (number) | | | 2 | | | | | |
| Speed Category | | | Posted Speed Greater than 30 mph | | | | | |
| Roadside fixed object density (fixed objects / r | mi) | | 49 | | | 0 | | |
| Offset to roadside fixed objects (ft) [If greater | than 30 or Not Present, input 30] | | 14 | | | 30 | | |
| Calibration Factor, Cr | | | 0.84 | | | 1.00 | | |
| Average Annual Crash History (3 or 5-yr average | age) | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| Multiple vehicle driveway crashes | | PDO | Property Damage Only | 0.0 | | | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| | | PDO | Property Damage Only | 0.0 | | | | |
| Single-vehicle crashes KABC PDO | | KABC | Fatal and Injury Only | 0.0 | | | | |
| | | PDO | Property Damage Only 0.0 | | | | | |
| NOTES: * AADT: It is important to remember to | that the AADT(major) = AADT(major | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | |

WORKSHEET 2A -- GENERAL INFORMATION AND INPUT DATA FOR URBAN AND SUBURBAN ARTERIAL INTERSECTIONS

| General Information | | | Location Information | | | | | |
|--|---|--------------------|------------------------------|--------------------|--|-----------------|-------------|--|
| Analyst Alex Zarate | Alex Zarate | | Roadway US 5 | | US 54 | | | |
| Agency or Company CBB | CBB | | Location Information | | US 54 & Business Route 5 | | | |
| Date Performed 7/23/2025 | 7/23/2025 | | Jurisdiction | | MODOT | | | |
| Intersection Intersectio | Intersection 1 | | Analysis Year | | 2030 | | | |
| Signalized/Unsignalized Signalized | Signalized | | Ped Volume (after Intx Type) | | Not Known | | ▼ | |
| Input Data | | | | Site Con | ditions | Base Conditions | | |
| Intersection type (3ST, 3SG, 4ST, 4SG) | | | | 4Si | G | | | |
| AADT major (veh/day) (total entering on major approaches)* AADT_MAX = | | 67,700 | (veh/day) | 24,7 | 775 | | | |
| AADT minor (veh/day) (total entering on minor | AADT minor (veh/day) (total entering on minor approaches)* AADT _{MAX} = | | 33,400 | (veh/day) | 9,90 | 00 | | |
| Intersection lighting (present/not present) | | | | | Pres | ent | Not Present | |
| Calibration factor, C | | | | | 5.2 | 21 | 1.00 | |
| Data for unsignalized intersections only: | | | | | | · | | |
| Number of major road approaches w | vith left turn lanes (0,1,2) | | | | θ | | θ | |
| Number of major road approaches w | rith right turn lanes (0,1,2 | 2) | | | θ | | θ | |
| Data for signalized intersections only: | | | | | | | | |
| Number of approaches with left-turn | lanes (0,1,2,3,4) [for 3SG | i, use maximum va | lue of 3] | | 4 | | 0 | |
| Number of approaches with right-tur | n lanes: for 4SG, use max | imum value of 4, | all other, max 2 | 2) | 4 | | 0 | |
| Number of approaches with left-turn | signal phasing [for 3SG, | use maximum valu | ie of 3] | | 4 | | | |
| Type of left-turn signal phasing for Le | eg #1 | | | | Protected | | Permissive | |
| Type of left-turn signal phasing for Le | eg #2 | | | | Protected | | | |
| Type of left-turn signal phasing for Le | eg #3 | | | | Protected | | | |
| Type of left-turn signal phasing for Leg #4 (if applicable) | | | | | Protected | | | |
| Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] | | | | | 0 | | 0 | |
| Intersection red light cameras (prese | nt/not present) | | | | Not Present | | Not Present | |
| Sum of all pedestrian crossing volume | es (PedVol) Signalized | intersections only | | | 50 | | | |
| Maximum number of lanes crossed b | y a pedestrian (n _{lanesx}) | | | | 5 | | | |
| Number of bus stops within 300 m (1 | ,000 ft) of the intersectio | n | | | 0 | | 0 | |
| Schools within 300 m (1,000 ft) of the intersection (present/not present) | | | | | Pres | ent | Not Present | |
| Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection | | | | | 1 to 8 | | 0 | |
| Average Annual Crash History (3 or 5-yr av | verage) | | | | | | | |
| Multiple vehicle crashes | | KABC | Fatal and Inju | ury Only | 0.0 | | | |
| matche vende d'asnes | | PDO | Property Dan | mage Only | 0.0 | | | |
| Single-vehicle crashes | | KABC | Fatal and Inju | ury Only | 0.0 | | | |
| Single-verifice crastics | | PDO | Property Damage Only | | 0.0 | | | |
| NOTES: * AADT: It is important to remember | er that the AADT(major) = | AADT(major app | roach1) + AAD1 | T(minor approach2) | (refer to p.12-8 in Part C of the HSM) | | | |

WORKSHEET 2A -- GENERAL INFORMATION AND INPUT DATA FOR URBAN AND SUBURBAN ARTERIAL INTERSECTIONS

| General Information | | | Location Information | | | | | |
|--|---|-------------------|------------------------------|--------------------|--|-----------------|-------------|--|
| Analyst Alex Zarate | Alex Zarate | | Roadway | | US 54 | | | |
| Agency or Company CBB | СВВ | | Location Information | | US 54 & Laker Pride Rd/Jack Crowell Rd | | | |
| Date Performed 7/23/2025 | 7/23/2025 | | Jurisdiction | | MODOT | | | |
| Intersection Intersection 2 | Intersection 2 | | Analysis Year | | 2030 | | | |
| Signalized/Unsignalized Signalized | Signalized | | Ped Volume (after Intx Type) | | Not Known | | | |
| Input Data | | | | Site Cond | ditions | Base Conditions | | |
| Intersection type (3ST, 3SG, 4ST, 4SG) | | | | 450 | 3 | | | |
| AADT major (veh/day) (total entering on major approaches)* AADT_MAX = | | 67,700 | (veh/day) | 34,3. | 50 | | | |
| AADT minor (veh/day) (total entering on minor | AADT minor (veh/day) (total entering on minor approaches)* AADT _{MAX} = | | 33,400 | (veh/day) | 6,12 | 25 | | |
| Intersection lighting (present/not present) | | | | | Prese | ent | Not Present | |
| Calibration factor, C | | | | | 5.2 | 1 | 1.00 | |
| Data for unsignalized intersections only: | | | | | | | | |
| Number of major road approaches with | h left turn lanes (0,1,2) | | | | θ | | θ | |
| Number of major road approaches with | h right turn lanes (0,1,2 | !) | | | θ | | θ | |
| Data for signalized intersections only: | | | | | | | | |
| Number of approaches with left-turn la | Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] | | | | | 4 | | |
| Number of approaches with right-turn | lanes: for 4SG, use max | imum value of 4, | all other, max 2 | 2) | 4 | 4 | | |
| Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3] | | | | | 4 | | | |
| Type of left-turn signal phasing for Leg | #1 | | | | Protected/Permissive | | Permissive | |
| Type of left-turn signal phasing for Leg | #2 | | | | Protected/Permissive | | | |
| Type of left-turn signal phasing for Leg | #3 | | | | Permissive | | | |
| Type of left-turn signal phasing for Leg #4 (if applicable) | | | | | Permissive | | | |
| Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] | | | | | 0 | | 0 | |
| Intersection red light cameras (present, | /not present) | | | | Not Present | | Not Present | |
| Sum of all pedestrian crossing volumes | (PedVoI) Signalized | ntersections only | | | 50 | | | |
| Maximum number of lanes crossed by a | Maximum number of lanes crossed by a pedestrian (n _{lanesx}) | | | | | 5 | | |
| Number of bus stops within 300 m (1,00 | 00 ft) of the intersectio | n | | | 0 | | 0 | |
| Schools within 300 m (1,000 ft) of the intersection (present/not present) | | | | | Not Present | | Not Present | |
| Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection | | | | | 0 | | 0 | |
| Average Annual Crash History (3 or 5-yr aver | rage) | | | | | | | |
| Multiple vehicle crashes | | KABC | Fatal and Inju | ury Only | 0.0 | | | |
| | | PDO | Property Dar | mage Only | 0.0 | | | |
| Single-vehicle crashes | | KABC | Fatal and Inju | ury Only | 0.0 | | | |
| P | | | Property Damage Only | | 0.0 | | | |
| NOTES: * AADT: It is important to remember | that the AADT(major) = | AADT(major app | roach1) + AAD | T(minor approach2) | (refer to p.12-8 in Part C of the HSM) | | | |

| Analyst Agency or Company | Alex Zarate | Alex Zarate Roadway | | | | | | | | | |
|---|--|-----------------------|----------------|---------------------|------------------|-------------|-----------------|--|--|--|--|
| | | | Roadway | | US 54 | | | | | | |
| 2 . 2 | СВВ | | Location In | formation | US 54 & Cecil St | | | | | | |
| Date Performed | 7/23/2025 | | Jurisdiction | l | MODOT | | | | | | |
| Intersection | Intersection 3 | | Analysis Ye | ar | 2030 | | | | | | |
| Signalized/Unsignalized | Signalized | | Ped Volum | e (after Intx Type) | Not Known | | | | | | |
| Input Data | | | | | Site Cor | nditions | Base Conditions | | | | |
| Intersection type (3ST, 3SG, 4S | T, 4SG) | | | | 35 | 5G | | | | | |
| AADT major (veh/day) (total ente | ering on major approaches)* | AADT _{MAX} = | 58,100 | (veh/day) | 34,7 | 250 | | | | | |
| AADT minor (veh/day) (total ente | ering on minor approaches)* | AADT _{MAX} = | 16,400 | (veh/day) | 7,2 | 250 | | | | | |
| Intersection lighting (present/n | not present) | | | | Pres | Not Present | | | | | |
| Calibration factor, C | | | | | 2.95 | | | | | | |
| Data for unsignalized intersecti | ions only: | | | | | | | | | | |
| Number of major road a | Number of major road approaches with left turn lanes (0,1,2) | | | | | • | 0 | | | | |
| Number of major road approaches with right turn lanes (0,1,2) | | | | | - | 0 | | | | | |
| Data for signalized intersection | ns only: | | | | | - | | | | | |
| Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] | | | | | | 2 | 0 | | | | |
| Number of approaches v | with right-turn lanes: for 4SG, use m | naximum value of 4, | all other, max | (2) | 2 | 2 | 0 | | | | |
| Number of approaches v | with left-turn signal phasing [for 3S0 | G, use maximum val | ue of 3] | | 2 | 2 | | | | | |
| Type of left-turn signal pl | hasing for Leg #1 | | | | Prote | ected | Permissive | | | | |
| Type of left-turn signal pl | hasing for Leg #2 | | | | Prote | ected | | | | | |
| Type of left-turn signal pl | hasing for Leg #3 | | | | Not Ap | plicable | | | | | |
| Type of left-turn signal p | hasing for Leg #4 (if applicable) | | | | Not Ap | plicable | | | | | |
| Number of approaches v | with right-turn-on-red prohibited [fo | or 3SG, use maximu | m value of 3] | | (| 0 | 0 | | | | |
| Intersection red light can | meras (present/not present) | | | | Not Pi | resent | Not Present | | | | |
| Sum of all pedestrian cro | ossing volumes (PedVol) Signalize | d intersections only | / | | 5 | 0 | | | | | |
| Maximum number of lan | nes crossed by a pedestrian (n _{lanesx}) | | | | 4 | 1 | | | | | |
| Number of bus stops wit | thin 300 m (1,000 ft) of the intersect | tion | | | (| 0 | 0 | | | | |
| Schools within 300 m (1,0 | 000 ft) of the intersection (present, | /not present) | | | Not Pr | resent | Not Present | | | | |
| Number of alcohol sales | establishments within 300 m (1,000 | Oft) of the intersect | tion | | 1 to | 08 | 0 | | | | |
| Average Annual Crash History | (3 or 5-yr average) | | | | • | <u> </u> | | | | | |
| Multiple vehicle creekee | | KABC | Fatal and Ir | njury Only | 0.0 | | | | | | |
| Multiple vehicle crashes | | PDO | Property Da | amage Only | 0.0 | | | | | | |
| Cincle collision ! | | KABC | Fatal and Ir | njury Only | 0.0 | | | | | | |
| Single-vehicle crashes | | PDO | Property Da | amage Only | 0.0 | | | | | | |

PROJECT SAFETY PERFORMANCE SUMMARY REPORT

General Information

Project Name US54-MO5 MoDOT On-Call Project Description 2030 No-Build

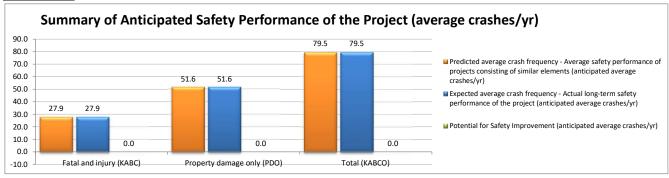
Reference Number Analyst Agency/Company Contact Email Job# 073-25 Alex Zarate CBB azarate@cbbtraffic.com

Contact Phone (314) 825 5841

Date Completed 05/12/11

Years of crash data incorporated into the analysis: 0

PROJECT SUMMARY



| | | Total Crashes/yr (KABCO) | | Fata | and Injury Crasho (KABC) | es/yr | Property Damage Only Crashes/yr (PDO) | | | |
|--------------------------|---|---|------------------------------|--|--|------------------------------|---|---|------------------------------|--|
| Project Element | Predicted average crash frequency N _{predicted (KABCO)} | Expected average crash frequency N _{expected (KABCO)} | Potential for Improvement | Predicted average crash frequency N _{predicted (KABC)} | Expected average crash frequency N _{expected (KABC)} | Potential for Improvement | Predicted average crash frequency N _{predicted (O)} | Expected average crash frequency N _{expected (O)} | Potential for Improvement | |
| INDIVIDUAL SEGMENTS | | | | | | | | | | |
| Segment 1 | 8.1 | 8.1 | 0.0 | 2.3 | 2.3 | 0.0 | 5.8 | 5.8 | 0.0 | |
| Segment 2 | 0.6 | 0.6 | 0.0 | 0.2 | 0.2 | 0.0 | 0.4 | 0.4 | 0.0 | |
| Segment 3 | 1.0 | 1.0 | 0.0 | 0.3 | 0.3 | 0.0 | 0.7 | 0.7 | 0.0 | |
| Segment 4 | 2.2 | 2.2 | 0.0 | 0.6 | 0.6 | 0.0 | 1.6 | 1.6 | 0.0 | |
| Segment 5 | 12.0 | 12.0 | 0.0 | 3.4 | 3.4 | 0.0 | 8.6 | 8.6 | 0.0 | |
| INDIVIDUAL INTERSECTIONS | | | | | | | | | | |
| Intersection 1 | 16.9 | 16.9 | 0.0 | 6.6 | 6.6 | 0.0 | 10.4 | 10.4 | 0.0 | |
| Intersection 2 | 26.6 | 26.6 | 0.0 | 10.5 | 10.5 | 0.0 | 16.1 | 16.1 | 0.0 | |
| Intersection 3 | 12.1 | 12.1 | 0.0 | 4.1 | 4.1 | 0.0 | 8.0 | 8.0 | 0.0 | |
| COMBINED (sum of column) | 79.5 | 79.5 | 0.0 | 27.9 | 27.9 | 0.0 | 51.6 | 51.6 | 0.0 | |

PROJECT SUMMARY -- Site-Specific EB Method Summary Results for Urban and Suburban Arterial Project

| Crash severity level | N predicted(PROJECT) Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated average crashes/yr) | N expected (PROJECT) Expected average crash frequency - Actual long-term safety performance of the project (anticipated average crashes/yr) | N potential for improvement (PROJECT) Potential for Safety Improvement (anticipated average crashes/yr) |
|----------------------------|---|--|--|
| Fatal and injury (KABC) | 27.9 | 27.9 | 0.0 |
| Property damage only (PDO) | 51.6 | 51.6 | 0.0 |
| Total (KABCO) | 79.5 | 79.5 | 0.0 |

HSM1 Extended Spreadsheet for Part C Chapter 12 v.9

Discussion of Results

Given the potential effects of project characteristics on safety performance, results indicate that:

- 1. It is anticipated that the project will, on average, experience 79.5 crashes per year (27.9 fatal and injury crashes per year; and 51.6 property damage only crashes per year).
- 2. A similar project is anticipated, on average, to experience 79.5 crashes per year (27.9 fatal and injury crashes per year; and 51.6 property damage only crashes per year).
- 3. It is anticipated the project has, on average, a potential for safety improvement of 0 crashes per year (0 fatal and injury crashes per year; and 0 property damage only crashes per year).

MULTIPLE YEAR PROJECT SAFETY PERFORMANCE SUMMARY REPORT FOR URBAN AND SUBURBAN ARTERIAL General Information US54-MO5 MoDOT On-Call Project Description 2030 No-Build Job# 073-25 Reference Number Analyst Alex Zarate Agency/Company Contact Email Contact Phone azarate@cbbtraffic.com (314) 825 5841 Date Completed Base Year Analysis Period (Years) Linear Traffic Growth Rate (annual %) PROJECT SUMMARY



■ Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated total number of crashes over 10 years)

■ Expected average crash frequency - Average long-term safety performance of the project (anticipated total number of crashes over 10 years)

■ Potential safety performance - Average project performance compared to threshold set by typical other similar projects (anticipated total number of crashes over 10 years)

| | | | 20-Year Analysis S | ummary Report | | | | | | |
|---------------|-------|----------------------------|--------------------|---------------|-----------------------|---------------|--------------|-------------------------|--------------|--|
| | Pre | dicted Average Crash Frequ | ency | Expec | ted Average Crash Fre | quency | Poter | ntial for Safety Improv | ement | |
| Analysis Year | | (Npredicted) | | | (Nexpected) | | (crashes/yr) | | | |
| | KABC | PDO | Total (KABCO) | KABC | PDO | Total (KABCO) | KABC | PDO | Total (KABCO | |
| 2030 | 27.9 | 51.6 | 79.5 | 27.9 | 51.6 | 79.5 | N/A | N/A | N/A | |
| 2031 | 28.5 | 52.7 | 81.3 | 28.5 | 52.7 | 81.3 | N/A | N/A | N/A | |
| 2032 | 29.1 | 53.9 | 83.0 | 29.1 | 53.9 | 83.0 | N/A | 0.0 | N/A | |
| 2033 | 29.7 | 55.0 | 84.7 | 29.7 | 55.0 | 84.7 | N/A | N/A | N/A | |
| 2034 | 30.4 | 56.1 | 86.5 | 30.4 | 56.1 | 86.5 | N/A | N/A | N/A | |
| 2035 | 31.0 | 57.2 | 88.2 | 31.0 | 57.2 | 88.2 | N/A | 0.0 | N/A | |
| 2036 | 31.6 | 58.4 | 90.0 | 31.6 | 58.4 | 90.0 | N/A | N/A | N/A | |
| 2037 | 32.2 | 59.5 | 91.7 | 32.2 | 59.5 | 91.7 | 0.0 | 0.0 | N/A | |
| 2038 | 32.9 | 60.6 | 93.5 | 32.9 | 60.6 | 93.5 | 0.0 | N/A | N/A | |
| 2039 | 33.5 | 61.8 | 95.3 | 33.5 | 61.8 | 95.3 | 0.0 | N/A | 0.0 | |
| 2040 | 34.1 | 62.9 | 97.1 | 34.1 | 62.9 | 97.1 | N/A | N/A | N/A | |
| 2041 | 34.8 | 64.1 | 98.9 | 34.8 | 64.1 | 98.9 | N/A | N/A | N/A | |
| 2042 | 35.4 | 65.2 | 100.7 | 35.4 | 65.2 | 100.7 | N/A | N/A | N/A | |
| 2043 | 36.1 | 66.4 | 102.5 | 36.1 | 66.4 | 102.5 | N/A | N/A | N/A | |
| 2044 | 36.7 | 67.6 | 104.3 | 36.7 | 67.6 | 104.3 | N/A | N/A | N/A | |
| 2045 | 37.4 | 68.7 | 106.1 | 37.4 | 68.7 | 106.1 | N/A | N/A | N/A | |
| 2046 | 38.0 | 69.9 | 107.9 | 38.0 | 69.9 | 107.9 | N/A | N/A | N/A | |
| 2047 | 38.7 | 71.1 | 109.8 | 38.7 | 71.1 | 109.8 | N/A | N/A | N/A | |
| 2048 | 39.3 | 72.3 | 111.6 | 39.3 | 72.3 | 111.6 | N/A | N/A | N/A | |
| 2049 | 40.0 | 73.4 | 113.4 | 40.0 | 73.4 | 113.4 | 0.0 | 0.0 | 0.0 | |
| Total | 677.5 | 1248.4 | 1925.9 | 677.5 | 1248.4 | 1925.9 | N/A | N/A | N/A | |

PROJECT SUMMARY -- Site-Specific EB Method Summary Results for Urban and Suburban Arterial Project

| Crash severity level | N predicted(PROJECT) Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated total number of crashes over 20 years) | N expected (PROJECT) Expected average crash frequency - Average long-term safety performance of the project (anticipated total number of crashes over 20 years) | N potential for improvement (PROJECT) Potential safety performance - Average project performance compared to threshold set by typical other similar projects (anticipated total number of crashes over 20 years) |
|------------------------------------|---|--|---|
| Fatal and injury crashes (KABC) | 677.5 | 677.5 | N/A |
| Property damage only crashes (PDO) | 1248.4 | 1248.4 | N/A |
| Total crashes (KABCO) | 1925.9 | 1925.9 | N/A |

<u>Discussion of Results</u>

Given the potential effects of project characteristics on safety performance and assuming a 1.75 % growth in AADT over a 20 year analysis period with 2030 as the base year, results indicate that:

- 1. The project is anticipated, on average, to experience 1925.9 crashes over a 20 year analysis period (677.5 fatal and injury crashes; and 1248.4 property damage only crashes).
- 2. A similar project is anticipated, on average, to experience 1925.9 crashes over a 20 year analysis period (677.5 fatal and injury crashes over 20 years; and 1248.4 property damage only crashes over 20 years).

Build Condition - ISATe & HSM Results (2030 – 2050)

Safety Summary Table – Build Conditions

| Facility | | Build Condition | 1 |
|--|-------|-----------------|--------|
| Facility | F&I | PDO | Total |
| Intersection 1 crashes: (US-54 & Business Route 5) | 158.9 | 251.5 | 410.4 |
| Intersection 2 crashes: (US-54 & Jack Crowell Road) | 77.9 | 134.3 | 212.1 |
| Intersection 3 crashes: (US-54 & Cecil Street) | 100.5 | 192.3 | 292.8 |
| Intersection 4 crashes: (US-54 & Laker Pride Road) | 108.7 | 209.1 | 317.8 |
| Arterial segments (1-3) crashes: | 67.3 | 167.7 | 235.0 |
| Arterial segments (4-5) crashes: | 37.8 | 108.8 | 146.7 |
| Total Arterial HSM Crashes | 551.0 | 1063.7 | 1614.7 |
| Freeway segments, crashes: | 72.4 | 245.7 | 318.1 |
| Ramp segments, crashes: | 46.0 | 84.6 | 130.6 |
| Crossroad ramp terminals, crashes: | 238.6 | 722.1 | 960.7 |
| Total ISATe Crashes | 356.9 | 1052.5 | 1409.4 |
| Total Study Area Crashes | 907.9 | 2116.3 | 3024.2 |

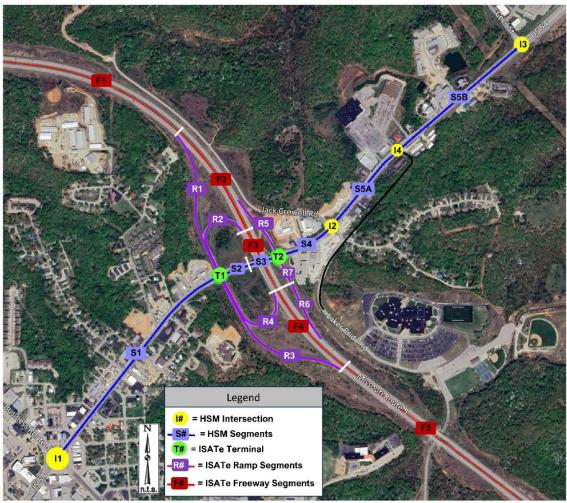


Figure 2: ISATe and HSM Study Area – Build Condition

ISATe Inputs & Output Summary Report (Build)

| | | Enhan | ced Interc | hange Safety Analysi | s Too | | | |
|--|-------------|------------|------------|--|--------|--------------|----------------|-------|
| General Information | | | | | | | | |
| Project description: | US54-MO5 | Predictive | Safety Ana | lysis | | | | |
| Analyst: | CBB | | Date: | 7/22/2025 | Area | type: | Urban | |
| First year of analysis: | 2030 | | | | | | | |
| Last year of analysis: | 2050 | | | | | | | |
| Crash Data Descripti | ion | | | | | | | |
| Freeway segments | No crash o | lata | F | | | | | |
| Ramp segments | No crash o | lata | F | | | | | |
| Ramp terminals | No crash o | lata | Ţ | | | | | |
| | | | | | | , | | |
| Program Control | | | | | | | | |
| Enter data in the Ma Click Perform Calcu | | , , | | ut Ramp Segments, Inp process. | out Ra | mp Termina | ls worksheets. | |
| Perfo | rm Calculat | ions | Prin | t Results (optional) | | Print Site S | ummary (optio | onal) |
| | results can | | | otionally, click the Print tput Freeway Segment | | | | |

| Warning Messages 	← See not | e | |
|-----------------------------|---------------|----------------|
| Freeway Segments | Ramp Segments | Ramp Terminals |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 1 | | |

| | Inp | ut Worksheet for Freeway Segm | | | | | | | |
|----------------|---|--|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|
| Clear | Echo Input Values | Check Input Values | Segment 1 | Segment 2 | Segment 3 | Segment 4 | Segment 5 | Segment 6 | Segment 7 |
| | (View results in Column AV) | (View results in Advisory Messages) | Study Period | Study Period | Study Period | Study Period | Study Period | Study Period | Study Period |
| Basic Roadwa | | (View results in Advisory Messages) | Period | Period | Period | Period | Period | Period | Period |
| Number of thro | • | | | 4 | 4 | 4 | 4 | 4 | |
| | nent description: | | | | | | | | |
| Segment lengt | | | | 1.64 | 0.29 | 0.16 | 0.36 | 1.4 | |
| Alignment Da | | | | | | | | | |
| Horizontal Cu | | ▼-See note | | | | | | | |
| | rizontal curve in segment | ?: | | Both Dir. | Both Dir. 3335 | Both Dir. 3269 | Both Dir. 3269 | Both Dir. 3269 | |
| | rve radius (R ₁), ft: | | | 0.68 | | 0.36 | | | |
| <u> </u> | ngth of curve (L _{c1}), mi: | | | | 0.68 | | 0.36 | 0.36 | |
| | ngth of curve in segment (| | | 0.41 | 0.27 | 0.07 | 0.25 | 0.04 | |
| | rizontal curve in segment | ?: | | Both Dir. 3315 | No | No | No | Both Dir. 4260 | |
| <u> </u> | rve radius (R ₂), ft: | | | 0.64 | | | | 0.81 | |
| | ngth of curve (L _{c2}), mi: | | | | | | | | |
| | ngth of curve in segment (| | | 0.64 | | | | 0.39 | |
| | rizontal curve in segment | ?: | | No | | | | No | |
| | rve radius (R ₃), ft: | | | | | | | | |
| | ngth of curve (L _{c3}), mi: | // \i | | | | | | | |
| | ngth of curve in segment (| (L _{c3,seg}), mi: | | | | | | | |
| Cross Section | | | | 10 | 44 | 10 | 1 40 | 40 | |
| Lane width (W | ** | | | 12 | 11 | 12 | 12 | 12 | |
| | der width (W _s), ft: | | | 10 | 10 | 7 | 9.5 | 8 | |
| Inside shoulde | er width (W _{is}), ft: | | | 5 | 4.5 | 5 | 4 | 5 | |
| Median width (| · · · | | | 50 | 50 | 50 | 50 | 50 | |
| | on outside shoulders?: | | | Yes | Yes | Yes | Yes | Yes | |
| | | increasing milepost direction, mi: | | 1.64 | 0.12 | 0.16 | 0.12 | 1.30 | |
| | on inside shoulders?: | decreasing milepost direction, mi: | | 1.52 Yes | 0.24 Yes | 0.00 Yes | 0.21 Yes | 1.19 Yes | |
| | | increasing milepost direction, mi: | | 1.64 | 0.29 | 0.16 | 0.36 | 1.35 | |
| | | decreasing milepost direction, mi: | | 1.64 | 0.29 | 0.16 | 0.36 | 1.35 | |
| | arrier in median: | | | Some | None | Some | None | Some | |
| 1 Ler | ngth of barrier (L _{ib,1}), mi: | | | 0.07 | | 0.04 | | 0.11 | |
| | | way to barrier face (W _{off,in,1}), ft: | | 5 | | 22 | | 5 | |
| | ngth of barrier (L _{ib,2}), mi: | | | | | | | 0.11 | |
| | | way to barrier face (W _{off,in,2}), ft: | | | | | | 5 | |
| | ngth of barrier (L _{ib,3}), mi: | | | | | | | | |
| | | way to barrier face (W _{off,in,3}), ft: | | | | | | | |
| | ngth of barrier (L _{ib,4}), mi: | | | | | | | | |
| | | way to barrier face (W _{off,in,4}), ft: | | | | | | | |
| | ngth of barrier (L _{ib,5}), mi: | | | | | | | | |
| | | way to barrier face (W _{off,in,5}), ft: | | | | | | | |
| | width (W _{ib}), ft: | | | | | | | | |
| | | way to barrier face (W _{near}), ft: | <u> </u> | <u> </u> | | | <u> </u> | | |
| Roadside Dat | | | | L 00 | 40 | L 00 | 1 40 | 4.1 | |
| Clear zone wid | | | | 20 | 18 | 20 | 18 | 14 | |
| | arrier on roadside: | | | Some | None | None | None | Some | |
| | ngth of barrier (L _{ob,1}), mi: | | | 0.05 | | | | 0.30 | |
| | | led way to barrier face (W _{off,o,1}), ft: | | 10 | | | | 8 | |
| | ngth of barrier (L _{ob,2}), mi: | | | | | | | 0.27 | |
| | | led way to barrier face (W _{off,o,2}), ft: | | | | | | 8 | |
| | ngth of barrier (L _{ob,3}), mi: | | | | | | | | |
| Dis | stance from edge of travel | led way to barrier face (W _{off,o,3}), ft: | | | | | | | |
| 4 Ler | ngth of barrier (L _{ob,4}), mi: | | | | | | | | |
| Dis | stance from edge of travel | led way to barrier face (W _{off,o,4}), ft: | | | | | | | |
| 5 Ler | ngth of barrier (L _{ob,5}), mi: | | | | | | | | |
| | - ' '' | led way to barrier face (W _{off.o.5}), ft: | | | | | 1 | | |
| | | , increasing milepost (W _{off,inc}), ft: | | | | | | | |
| | ge of traveled way to barrier face | | | 1 | | | | | $\overline{}$ |

| Ramp Acc | cess Data | | | | | | | | |
|-------------|---|---------------------------|-----|-----------|----------|-----------|----------|----------|--|
| Travel in I | Increasing Milepost Direction | | | | | | | | |
| | Ramp entrance in segment? (If yes, indicate type.): | | | No | S-C Lane | No | No | No | |
| Ramp | Distance from begin milepost to upstream entrance ramp gore (| X _{b,ent}), mi: | | 0.22 | | 999 | 999 | 999 | |
| | Length of ramp entrance (L _{en,inc}), mi: | | | | 0.14 | | | | |
| | Length of ramp entrance in segment (L _{en,seg,inc}), mi: | | | | 0.14 | | | | |
| | Entrance side?: | | | | Right | | | | |
| Exit | Ramp exit in segment? (If yes, indicate type.): | | | No 999 | No | No 999 | S-C Lane | No | |
| Ramp | Distance from end milepost to downstream exit ramp gore (X _{e,e)} | _t), mi: | | 999 | 999 | 999 | 0.13 | 999 | |
| | Length of ramp exit (L _{ex,inc}), mi: | | | | | | 0.13 | | |
| | Length of ramp exit in segment (L _{ex,seg,inc}), mi: Exit side?: | | | | | | Right | | |
| Weave | Type B weave in segment?: | | No | No | No | No | No | No | |
| vvcavc | Length of weaving section (L _{wev,inc}), mi: | | 140 | 140 | 140 | 140 | 140 | 140 | |
| | Length of weaving section in segment (L _{wev,seg,inc}), I | mi· | | | | | | | |
| Traval in l | Decreasing Milepost Direction | | | | | | | | |
| Entrance | Ramp entrance in segment? (If yes, indicate type.): | | | No | No | Lane Add | No | S-C Lane | |
| Ramp | Distance from end milepost to upstream entrance ramp gore (X | | | 999 | 999 | Lanortaa | 0.16 | C C Lunc | |
| | Length of ramp entrance (L _{en,dec}), mi: | C,CHO · | | | | | | 0.15 | |
| | Length of ramp entrance in segment (Lensed, dec), mi | : | | | | | | 0.15 | |
| | Entrance side?: | | | | | | | Right | |
| Exit | Ramp exit in segment? (If yes, indicate type.): | | | S-C Lane | No | Lane Drop | No | No | |
| Ramp | Distance from begin milepost to downstream exit ramp gore (X _b | ,ext), mi: | | | 0.16 | | 999 | 999 | |
| | Length of ramp exit (L _{ex,dec}), mi: | | | 0.12 | | | | | |
| | Length of ramp exit in segment (L _{ex,seg,dec}), mi: | | | 0.12 | | | | | |
| | Exit side?: | | | Right | | | | | |
| Weave | Type B weave in segment?: | | | No | No | No | No | No | |
| | Length of weaving section (L _{wev,dec}), mi: | | | 1 | | | | | |
| | Length of weaving section in segment ($L_{wev,seg,dec}$), | | | | | | | | |
| Traffic Da | | Year | | | | | | | |
| | of AADT during high-volume hours (P _{hv}): | | | | | | | | |
| | Segment Data | 2030 | | 18175 | 16575 | 15900 | 12925 | 19025 | |
| - | aily traffic (AADT _{fs}) by year, veh/d: | 2031 | | | | | | | |
| | ta only for those years for which | 2032 | | | | | | | |
| it is avail | able, leave other years blank) | 2033 | | | | | | | |
| | | 2034 2035 | | | | | | | |
| | | 2036 | | | | | | | |
| | | 2037 | | | | | | | |
| | | 2038 | | | | | | | |
| | | 2039 | | | | | | | |
| | | 2040 | | | | | | | |
| | | 2041 | | | | | | | |
| | | 2042 | | | | | | | |
| | | 2043 2044 | | | | | | | |
| | | 2045 | | | | | | | |
| | | 2046 | | | | | | | |
| | | 2047 | | | | | | | |
| | | 2048 | | | | | | | |
| | | 2049 | | | | | | | |
| | | 2050 | | 23900 | 21875 | 21050 | 17050 | 25150 | |
| | | 2051 | | 1 | | | | | |
| | | 2052 2053 | | 1 | | | | | |
| Entrance 5 | Ramp Data for Travel in Increasing Milepost Dir. | Year | | | | | | | |
| | aily traffic (AADT _{b ent}) by year, veh/d: | 2030 | | 4175 | 4175 | | | | |
| - | ta only for those years for which | 2031 | | | | | | | |
| , | able, leave other years blank) | 2032 | | | | | | | |
| | , | 2033 | | | | | | | |
| | | 2034 | | | | | | | |
| | | 2035 | | | | | | | |
| | | 2036 | | | | | | | |
| | | 2037 2038 | | | | | | | |
| | | 2038 | | | | | | | |
| | | 2040 | | | | | | | |
| | | 2041 | | | | | | | |
| | | 2042 | | | | | | | |
| | | 2043 | | | | | | | |
| | | 2044 | | | | | | | |
| | | 2045 | | | | | | | |
| | | 2046 2047 | | | | | | | |
| | | 2047 | | | | | | | |
| | | 2046 | | | | | | | |
| | | 2050 | | 5475 | 5475 | | | | |
| | | | | | | | | l | |
| | | 2051 | | | | | | | |
| | | 2051 2052 | | | | | | | |

| Exit Ramp Data for Travel in Increasing Milepost Direction | Year | | | | | | |
|--|---|------|----------|------|------|------|---|
| Average daily traffic (AADT _{e,ext}) by year, veh/d: | 2030 | | 1 | | 5075 | | |
| (enter data only for those years for which | 2031 | | | | | | |
| it is available, leave other years blank) | 2032 | | | | | | |
| , | 2033 | | | | | | |
| | 2034 | | | | | | |
| | 2035 | | | | | | |
| | 2036 | | | | | | |
| | 2037 | | | | | | |
| | 2038 | | | | | | |
| | 2039 | | | | | | |
| | 2040 | | | | | | |
| | 2041 | | | | | | |
| | 2042 | | | | | | |
| | 2044 | | | | | | |
| | 2045 | | | | | | |
| | 2046 | | | | | | |
| | 2047 | | | | | | |
| | 2048 | | | | | | |
| | 2049 | | | | | | |
| | 2050 | | | | 6750 | | |
| | 2051 | | | | | | |
| | 2052 | | | | | | |
| | 2053 | | | | | | |
| Entrance Ramp Data for Travel in Decreasing Milepost Dir. | Year | | | | | | |
| Average daily traffic (AADT _{e,ent}) by year, veh/d: | 2030 | | | 3500 | 3500 | 1025 | |
| (enter data only for those years for which | 2031 | | | | | | |
| it is available, leave other years blank) | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| | 2035 | | | | | | |
| | 2036 | | | | | | |
| | 2037 | | | | | | |
| | 2039 | | | | | | |
| | 2040 | | | | | | |
| | 2041 | | | | | | |
| | 2042 | | | | | | |
| | 2043 | | | | | | |
| | 2044 | | | | | | |
| | 2045 | | | | | | |
| | 2046 | | | | | | |
| | 2047 | | | | | | |
| | 2048 | | | | | | |
| | 2049 | | | | | | |
| | 2050 | | | 4650 | 4650 | 1350 | |
| | 2051 | | | | | | |
| | 2052 | | | | | | 1 |
| | 2052 | | <u> </u> | | | | |
| Exit Pamp Data for Travel in Decreasing Milenest Direction | 2053 Voar | | | | | | |
| Exit Ramp Data for Travel in Decreasing Milepost Direction | Year | 4600 | 2075 | 2075 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: | Year 2030 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: | Year 2030 2031 2032 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | 2030 2031 2032 2033 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | 2030 2031 2032 2033 2034 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2031 2032 2033 2034 2035 2036 2037 2038 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 | | | | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 | 1600 | 2975 | 2975 | | | |
| Average daily traffic (AADT _{b,ext}) by year, veh/d: (enter data only for those years for which | Year 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 | | | | | | |

| Crash Data | Year | | Segment C | rashes> | | | |
|--|------|---|-----------|---------|------|--|--|
| Count of Fatal-and-Injury (FI) Crashes by Year | 1 | | | | | | |
| Multiple-vehicle crashes | 2030 | | | | | | |
| (not ramp related) (N _{o,fs,n,mv,fi}) | 2031 | | | | | | |
| , | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Single-vehicle crashes | 2030 | | | | | | |
| (not ramp related) (N _{o,fs,n,sv,fi}) | 2031 | | | | | | |
| | 2032 | 1 | | | | | |
| | 2033 | 1 | | | | | |
| | 2034 | | | | | | |
| Ramp-entrance-related crashes | 2030 | | | | | | |
| $(N_{o,sc,EN,at,fi})$ | 2031 | | | | | | |
| | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Ramp-exit-related crashes | 2030 | 1 | | | | | |
| $(N_{o,sc,EX,at,fi})$ | 2031 | | | | | | |
| | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Count of Property-Damage-Only (PDO) Crashes | | | | | | | |
| Multiple-vehicle crashes | 2030 | | | | | | |
| (not ramp related) (N _{o,fs,n,mv,pdo}) | 2031 | | | | | | |
| | 2032 | | | | | | |
| | 2033 | | | | | | |
| | 2034 | | | | | | |
| Single-vehicle crashes | 2030 | 4 | | | | | |
| (not ramp related) (N _{o,fs,n,sv,pdo}) | 2031 | | | | | | |
| | 2032 | 1 | | | | | |
| | 2033 | 1 | | | | | |
| | 2034 | | | | | | |
| Ramp-entrance-related crashes | 2030 | 4 | | | | | |
| $(N_{o,sc,EN,at,pdo})$ | 2031 | 1 | | | | | |
| | 2032 | 4 | | | | | |
| | 2033 | 4 | | | | | |
| | 2034 | | | | | | |
| Ramp-exit-related crashes | 2030 | 4 | | | | | |
| (N _{o,sc,EX,at,pdo}) | 2031 | 1 | | | | | |
| | 2032 | 1 | | | | | |
| | 2033 | 4 | | | | | |
| | 2034 | | | | | | |

| | Input Worksheet for Ramp Segme | ents | | | | | | | |
|--|--|--------------|--------------------|--------------------|--------------------|--------------------|--|----------------------------------|-------------|
| Clear | | Segment 1 | Segment 2 | Segment 3 | Segment 4 | Segment 5 | Segment 6 | Segment 7 | Segment 8 |
| Clear | Echo Input Values Check Input Values | Study | Study | Study | Study | Study | Study | Study | Study |
| Pasia Bas | (View results in Column CJ) (View results in Advisory Messages) | Period | Period | Period | Period | Period | Period | Period | Period |
| | adway Data through lanes (n): | 1 | 1 1 | 1 | 1 1 | 1 | 1 | 2 | |
| | ment description: | | SB Loop On | | <u> </u> | | | NB Off-Ramp | ("2" lanes) |
| | ength (L), mi: | 0.36 | 0.22 | 0.39 | 0.25 | 0.16 | 0.16 | 0.06 | |
| | affic speed on the freeway (V _{frwy}), mi/h: | 65 | 65 | 65 | 65 | 65 | 65 | 65 | |
| | ype (ramp or collector-distributor road): | Exit | Entrance | Entrance | Exit | Entrance | Exit | Exit | |
| Alignmen | ntrol at crossroad ramp terminal: | Yield | None | None | Yield | Signal | Signal | Signal | |
| ľ | I Curve Data ▼See notes → | | | | | | | | |
| | Horizontal curve?: | In Seg. | In Seg. | In Seg. | In Seg. | In Seg. | In Seg. | No | |
| | Curve radius (R ₁), ft: | 1040 | 235 | 810 | 262 | 830 | 1214 | | |
| | Length of curve (L _{c1}), mi: | 0.14 | 0.14 | 0.15 | 0.15 | 0.07 | 0.07 | | |
| | Length of curve in segment (L _{c1,seg}), mi: | 0.14 | 0.14 | 0.15 | 0.15 | 0.07 | 0.07 | | |
| | Ramp-mile of beginning of curve in direction of travel (X ₁), mi: | 0.00 | 0.08 | 0.12 | 0.00 | 0.00 | 0.00 | | |
| 2 | Horizontal curve?: | In Seg. | No | In Seg. | No | In Seg. | No | | |
| | Curve radius (R ₂), ft: | 783 | | 1496 | | 862 | | | |
| | Length of curve (L _{c2}), mi: | 0.07 | | 0.08 | | 0.05 | | | |
| I | Length of curve in segment (L _{c2,seg}), mi: | 0.07 | | 0.08 | | 0.05 | | | |
| | Ramp-mile of beginning of curve in direction of travel (X ₂), mi: | 0.18 | | 0.31 | | 0.11 | | | |
| 3 | Horizontal curve?: | No | | No | | No | | | |
| | Curve radius (R ₃), ft: | | | | | | | | |
| I | Length of curve (L _{c3}), mi: | | | | | | | | |
| | Length of curve in segment (L _{c3,seg}), mi: | | | | | | | | |
| | Ramp-mile of beginning of curve in direction of travel (X ₃), mi: | | | | | | | | |
| 4 | Horizontal curve?: | | | | | | | | |
| | Curve radius (R ₄), ft: | | | | | | | | |
| | Length of curve (L _{c4}), mi: | | | | | | | | |
| | Length of curve in segment (L _{c4,seg}), mi: | | | | | | | | |
| | Ramp-mile of beginning of curve in direction of travel (X ₄), mi: Horizontal curve?: | | | | | | | | |
| 5 | | | | | | | | | |
| | | | | | | | | | |
| | Curve radius (R ₅), ft: | | | | | | | | |
| | Length of curve (L _{c5}), mi: | | | | | | | | |
| | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: | | | | | | | | |
| Cross Sec | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: | | | | | | | | |
| Cross Sec | Length of curve (L_{c5}) , mi: Length of curve in segment $(L_{c5,seg})$, mi: Ramp-mile of beginning of curve in direction of travel (X_5) , mi: | 12 | 12 | 12 | 12 | 14 | 14 | 12 | |
| Lane width | Length of curve (L_{c5}) , mi: Length of curve in segment $(L_{c5,seg})$, mi: Ramp-mile of beginning of curve in direction of travel (X_5) , mi: tion Data (W_i) , ft: | 12 | 12 | 12 | 12 | 14 | 14 | 12 | |
| Lane width Right shou | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: ction Data (W ₁), ft: Ilder width (W _{rs}), ft: | | | | | | | | |
| Lane width Right shou Left should | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: ction Data (W_1), ft: Ider width (W_{rs}), ft: der width (W_{ls}), ft: | 5 | 4 | 4 | 5 5 | 5 | 5 4 | 4 | |
| Lane width Right shou Left should | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: ction Data (W ₁), ft: Ilder width (W _{rs}), ft: | 5 4 | 4 | 4 | 5 | 5 4 | 5 | 4 3 | |
| Lane width Right shou Left should | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Idea (W_i), ft: Idea width (W_{is}), ft: Idea add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: | 5 4 | 4 | 4 | 5 5 | 5 4 | 5 4 Lane Add | 4 3 | |
| Lane width Right should Left should Presence of Roadside Presence of | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: der width (W_{ls}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on right side of roadway: | 5 4 | 4 | 4 | 5 5 | 5 4 | 5 4 Lane Add 0.04 Yes | 4 3 No Yes | |
| Lane width Right should Left should Presence of Roadside Presence of | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on right side of roadway: Length of barrier ($L_{rb,1}$), mi: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Left should Presence of Roadside Presence of | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: der width (W_{ls}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on right side of roadway: Length of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes | 4 3 No Yes | |
| Lane width Right should Left should Presence of Roadside Presence of | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls} | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Left should Presence of Roadside Presence of 1 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: Ider width (W_{ls} | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Left should Presence of Roadside Presence of 1 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), mi: Ider width (W_{l | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: Ider width (W_{ls} | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: tion Data (W ₁), ft: Ider width (W_{rs}), ft: der width (W_{rs}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on <u>right</u> side of roadway: Length of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Length of barrier ($L_{rb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,2}$), ft: Length of barrier ($L_{rb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Length of barrier ($L_{rb,3}$), mi: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W_1), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), mi: Iden add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,1}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,2}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,2}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,2}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,2}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,2}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,3}$), mi: Iden add or lane drop by taper: Length of barrier ($L_{rb,4}$), mi: Iden by taper in segment ($L_{rb,4}$), mi: Iden by taper in segment ($L_{rb,4}$), mi: Iden by taper in segment ($L_{rb,4}$), mi: Iden by taper in segment ($L_{rb,4}$), mi: Iden by taper in segment ($L_{rb,4}$), mi: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 | Length of curve (L_{c5}) , mi: Length of curve in segment $(L_{c5,seg})$, mi: Ramp-mile of beginning of curve in direction of travel (X_5) , mi: tion Data (W _I), ft: Ider width (W_{rs}) , ft: Ider width (W_{rs}) , ft: Ider width (W_{ls}) , ft: Ider width (W_{ls}) , ft: Ider width (U_{rs}) , mi: Distance from edge of traveled way to barrier face $(W_{off,r,1})$, ft: Ider width (U_{rs}) , mi: Distance from edge of traveled way to barrier face $(W_{off,r,2})$, ft: Length of barrier $(L_{rb,2})$, mi: Distance from edge of traveled way to barrier face $(W_{off,r,3})$, ft: Length of barrier $(L_{rb,4})$, mi: Distance from edge of traveled way to barrier face $(W_{off,r,4})$, ft: Length of barrier $(L_{rb,5})$, mi: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 | 4 3 No Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: tion Data (W _I), ft: Ider width (W_{rs}), ft: der width (W_{rs}), ft: of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on <u>right</u> side of roadway: Length of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Length of barrier ($L_{rb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Length of barrier ($L_{rb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Length of barrier ($L_{rb,4}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Length of barrier ($L_{rb,4}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Length of barrier ($L_{rb,5}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Length of barrier ($L_{rb,5}$), mi: | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | 4 3 No Yes 0.02 5 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 Fresence of Presence of 1 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data In the partial of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Length of barrier ($L_{rb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,2}$), ft: Length of barrier ($L_{rb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Length of barrier ($L_{rb,4}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Length of barrier ($L_{rb,5}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Length of barrier ($L_{rb,5}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: of barrier on left side of roadway: | 5 4 No | 4 4 No | 4 4 No | 5 5 No | 5 4 No | 5 4 Lane Add 0.04 Yes 0.02 5 | 4 3 No No Yes 0.02 5 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 Fresence of Presence of 1 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), ft: Of lane add or lane drop by taper: Length of taper in segment ($L_{add,seg}$ or $L_{drop,seg}$), mi: Data of barrier on <u>right</u> side of roadway: Length of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Length of barrier ($L_{rb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,2}$), ft: Length of barrier ($L_{rb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Length of barrier ($L_{rb,4}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Length of barrier ($L_{rb,5}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Length of barrier ($L_{rb,5}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: of barrier on left side of roadway: Length of barrier ($L_{lb,1}$), mi: | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), mi: Ider width (W_{rs} | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | 4 3 No No Yes 0.02 5 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,2}$), ft: Length of barrier (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Length of barrier (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{ls}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,2}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), mi: Distance from edge of | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs} | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 3 4 5 Presence of 1 2 3 4 5 Presence of 1 3 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Length of barrier ($L_{rb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Length of barrier ($L_{rb,5}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: of barrier on left side of roadway: Length of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: of barrier on left side of roadway: Length of barrier ($L_{rb,1}$), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 3 4 5 Presence of 1 2 3 4 5 Presence of 1 3 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,2}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,l,1}$), ft: Length of barrier ($L_{lb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,1}$), ft: Length of barrier ($L_{lb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,2}$), ft: Length of barrier ($L_{lb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,2}$), ft: Length of barrier ($L_{lb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,3}$), ft: Length of barrier ($L_{lb,3}$), mi: | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 3 4 4 5 4 4 4 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,3}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,3}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of traveled way to barrier face ($V_{off,r,5}$), ft: Ider width (V_{rs}), mi: Distance from edge of | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |
| Lane width Right should Presence of Roadside Presence of 1 2 3 4 5 Presence of 1 2 3 4 4 5 4 4 4 | Length of curve (L_{c5}), mi: Length of curve in segment ($L_{c5,seg}$), mi: Ramp-mile of beginning of curve in direction of travel (X_5), mi: Ition Data 1 (W ₁), ft: Ider width (W_{rs}), ft: Ider width (W_{rs}), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,1}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,2}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,4}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,r,5}$), ft: Ider width (W_{ls}), mi: Distance from edge of traveled way to barrier face ($W_{off,l,1}$), ft: Length of barrier ($L_{lb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,1}$), ft: Length of barrier ($L_{lb,2}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,2}$), ft: Length of barrier ($L_{lb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,2}$), ft: Length of barrier ($L_{lb,3}$), mi: Distance from edge of traveled way to barrier face ($W_{off,l,3}$), ft: Length of barrier ($L_{lb,3}$), mi: | 5 4 No | 4 4 No No | 4 4 No No | 5 5 No No | 5 4 No No | 5 4 Lane Add 0.04 Yes 0.02 5 | Yes 0.02 5 Yes 0.02 | |

| Ramp Acc | cess Data | ▼ See note | 9 | | | | | | | | |
|-------------|--|--|--------------|--|----------|------|------|------|------|------|---|
| Ramp | Ramp entrance in segment? (If yes, ind | | | No | No | No | No | No | No | No | |
| Entrance | Length of entrance s-c lane in segment | (L _{en.sea}), mi: | | | | | | | | | |
| Ramp | Ramp exit in segment? (If yes, indicate | type.): | | No | No | No | No | No | No | No | |
| Exit | Length of exit s-c lane in segment (Lex se | Length of exit s-c lane in segment (L _{ex,seg}), mi: | | | | | | | | | |
| Weaving | Weave section in collector-distributor ro | | ?: | No | No | No | No | No | No | | |
| Section | Length of weaving section (L _{wev}), mi: | | | | | | | | | | |
| 000 | Length of weaving section in segment (| l mi· | | | | | | | | | |
| Traffic Da | | =wev,seg/; ····· | Year | | | | | | | | |
| | laily traffic (AADT _r or AADT _c) by year, veh | v/d: | 2030 | 1600 | 3500 | 1025 | 2975 | 4175 | 5075 | 5075 | |
| | ta only for those years for which | i/u. | 2030 | 1000 | 3300 | 1023 | 2915 | 4175 | 3073 | 3073 | |
| | lable, leave other years blank) | | 2031 | | | | | | | | |
| it is avail | lable, leave officer years blank) | | 2033 | | | | | | | | |
| | | | 2034 | | | | | | | | |
| | | | 2035 | | | | | | | | |
| | | | 2036 | | | | | | | | |
| | | | 2037 | | | | | | | | |
| | | | 2038 | | | | | | | | |
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| | | | 2043 2044 | | | | | | | | |
| | | | 2044 | | | | | | | | |
| | | | 2045 | | | | | | | | |
| | | | 2047 | | | | | | | | |
| | | | 2048 | | | | | | | | |
| | | | 2049 | | | | | | | | |
| | | | 2050 | 2025 | 4650 | 1350 | 4000 | 5475 | 6750 | 6750 | |
| | | | 2051 | | | | | | | | |
| | | | 2052 | | | | | | | | |
| | | | 2053 | | | | | | | | |
| Crash Da | | Year | | Segment C | Crashes> | | | | | | |
| Count of | Fatal-and-Injury (FI) Crashes by Year | 0000 | | | 1 | ı | 1 | | | | 1 |
| | Multiple-vehicle crashes | 2030 | | | | | | | | | |
| 1 | $(N_{o,w,n,mv,fi})$ | 2031 | | - | | | | | | | |
| | | 2032 | | - | | | | | | | |
| | | 2033 | | | | | | - | - | - | |
| 1 | Single-vehicle crashes | 2034 2030 | | - | | | | - | - | - | - |
| 1 | = | 2030 | | - | | | | | | | |
| i | $(N_{o,w,n,sv,fi})$ | 2031 | | | | | | - | - | - | - |
| 1 | | 2032 | | | | | | | | | |
| 1 | | 2033 | | | | | | | | | |
| Count of | Property-Damage-Only (PDO) Crashes | | | | | | | | | | |
| | | | | | | | | | | | |
| | Multiple-vehicle crashes | 2030 | | i | | | | 1 | 1 | 1 | |
| | 1 . | 2030 | | | | | | 1 | I | 1 | |
| | Multiple-vehicle crashes (N _{o,w,n,mv,pdo}) | 2031 | | | | | | | | | |
| | 1 . | | | | | | | | | | |
| | 1 . | 2031 2032 | | | | | | | | | |
| | 1 . | 2031 2032 2033 | | | | | | | | | |
| | (N _{o,w,n,mv,pdo}) | 2031 2032 2033 2034 | | | | | | | | | |
| | (N _{o,w,n,mv,pdo}) Single-vehicle crashes | 2031 2032 2033 2034 2030 | | | | | | | | | |
| | (N _{o,w,n,mv,pdo}) Single-vehicle crashes | 2031 2032 2033 2034 2030 2031 | | | | | | | | | |

| | Input V | Vorksheet for Crossroad Ramp T | erminals | | | | | |
|-------------|---|--|-------------|-------------|------------|------------|------------|------------|
| Class | • | | Terminal 1 | Terminal 2 | Terminal 3 | Terminal 4 | Terminal 5 | Terminal 6 |
| Clear | Echo Input Values | Check Input Values | Study | Study | Study | Study | Study | Study |
| | (View results in Column T) | (View results in Advisory Messages) | Period | Period | Period | Period | Period | Period |
| Basic Inte | rsection Data | | | | | | | |
| | ninal configuration: | | D4 | D4 | | | | |
| | ninal description: | | SB Terminal | NB Terminal | | | | |
| | ninal traffic control type: | | One stop | Signal | | | | |
| ls a non-ra | mp public street leg present | at the terminal (I _{ps})?: | No | Ño | | | | |
| Alignmen | | | | | | | | |
| Exit ramp s | skew angle (I _{sk}), degrees: | | 4 | 6 | | | | |
| | e next public street intersection on t | | 0.14 | 0.15 | | | | |
| Distance to | the adjacent ramp terminal | (L _{rmp}), mi: | 0.15 | 0.15 | | | | |
| Traffic Co. | ntrol | | | | | | | |
| | Operational Mode | | | | | | | |
| Crossroad | Inside approach | Protected-only mode (I _{p,lt,in})?: | Yes | No | | | | |
| | Outside approach | Protected-only mode (I _{p,lt,out})?: | Yes | No | | | | |
| Right-Turi | n Control Type | 1177 | | | | | | |
| Ramp | Exit ramp approach | Right-turn control type: | Yield | Signal | | | | |
| Cross Sec | tion Data | | • | | | | | |
| Crossroad | median width (W _m), ft: | | 12 | 10 | | | | |
| Number o | f Lanes | | | | | | | |
| Crossroad | Both approaches | Lanes serving through vehicles (n _{th}): | 4 | 4 | | | | |
| | Inside approach | Lanes serving through vehicles (n _{th.in}): | 2 | 2 | | | | |
| | Outside approach | Lanes serving through vehicles (n _{th,out}): | 2 | 2 | 0 | 0 | 0 | 0 |
| Ramp | Exit ramp approach | All lanes (n _{ex}): | 1 | 3 | | | | |
| Right-Turi | n Channelization | see note: | • | • | | | | |
| Crossroad | Inside approach | Channelization present (I _{ch,in})?: | Yes | No | | | | |
| | Outside approach | Channelization present (I _{ch,out})?: | Yes | Yes | | | | |
| Ramp | Exit ramp approach | Channelization present (I _{ch.ex})?: | Yes | Yes | | | | |
| • | Lane or Bay | - I (di,ex/ | | | | | | |
| Crossroad | Inside approach | Lane or bay present (I _{bay,lt,in})?: | No | Yes | | | | |
| Ciussiuau | Illiside approach | Width of lane or bay (W _{b.in}), ft: | 0 | 12 | | | | |
| | | | No | No | | | | |
| | Outside approach | Lane or bay present (I _{bay,lt,out})?: | | | | | | |
| | | Width of lane or bay (W _{b,out}), ft: | 0 | 0 | | | | |
| Right-Turi | n Lane or Bay | | | | | | | |
| Crossroad | Inside approach | Lane or bay present (I _{bay,rt,in})?: | Yes | No | | | | |
| | Outside approach | Lane or bay present (I _{bay,rt,out})?: | No | Yes | | | | |
| Access Da | ata | <u></u> | | | | | | |
| | | 11 /) | | | | | | |
| Number of | driveways on the outside cr | ossroad leg (n _{dw}): | 2 | 2 | | | | |

| Traffic Data | Year | | | | |
|--|------|-------|-------|--|---|
| Inside Crossroad Leg Data | 2030 | 29200 | 29200 | | |
| Average daily traffic (AADT _{in}) by year, veh/d: | 2031 | | | | |
| (enter data only for those years for which | 2032 | | | | |
| it is available, leave other years blank) | 2033 | | | | 1 |
| it is available, leave exist years blank, | 2034 | | | | |
| | 2035 | | | | |
| | 2036 | | | | |
| | 2037 | | | | |
| | 2038 | | | | |
| | 2039 | | | | |
| | 2040 | | | | |
| | 2041 | | | | |
| | 2042 | | | | |
| | 2043 | | | | |
| | 2044 | | | | |
| | 2045 | | | | |
| | 2046 | | | | |
| | 2047 | | | | |
| | 2048 | | | | |
| | 2049 | | | | |
| | 2050 | 38325 | 38325 | | |
| | 2051 | | | | |
| | 2052 | | | | |
| | 2053 | | | | |
| Outside Crossroad Leg Data | 2030 | 25350 | 34350 | | |
| Average daily traffic (AADT _{out}) by year, veh/d: | 2031 | | | | |
| (enter data only for those years for which | 2032 | | | | |
| it is available, leave other years blank) | 2033 | | | | |
| , | 2034 | | | | |
| | 2035 | | | | |
| | 2036 | | | | |
| | 2037 | | | | |
| | 2038 | | | | |
| | 2039 | | | | |
| | 2040 | | | | |
| | 2041 | | | | |
| | 2042 | | | | |
| | 2043 | | | | |
| | 2044 | | | | |
| | 2045 | | | | |
| | 2046 | | | | |
| | 2047 | | | | |
| | 2048 | | | | |
| | 2049 | | | | |
| | 2050 | 33050 | 45250 | | |
| | 2051 | | | | |
| | 2052 | | | | |
| | 2053 | | | | |

| Exit Ramp Data | | 2030 | 4575 | 5075 | | | | |
|--|-----------------------|--------------|-----------|-------------------------|----------|---|----------|--|
| Average daily traffic (AADT _{ex}) by year, veh/d: | | 2031 | | | | | | |
| (enter data only for those years for which | | 2032 | | | | | | |
| it is available, leave other years blank) | | 2033 | | | | | | |
| | | 2034 | | | | | | |
| For a B4 terminal configuration, enter the AADT for th | ne | 2035 | | | | | | |
| diagonal exit ramp (not the loop exit ramp). | | 2036 | | | | | | |
| | | 2037 | | | | | | |
| | | 2038 | | | | | | |
| | | 2039 | | | | | | |
| | | 2040 2041 | | | | | | |
| | | 2041 | | | | | | |
| | | 2042 | | | | | | |
| | | 2044 | | | | | | |
| | | 2045 | | | | | | |
| | | 2046 | | | | | | |
| | | 2047 | | | | | | |
| | | 2048 | | | | | | |
| | | 2049 | | | | | | |
| | | 2050 | 6025 | 6750 | | | | |
| | | 2051 | | | | | | |
| | | 2052 2053 | | | | | | |
| Entrance Ramp Data | | 2030 | 4525 | 4175 | | | | |
| Average daily traffic (AADT _{en}) by year, veh/d: | | 2030 | 4323 | 4173 | | | | |
| (enter data only for those years for which | | 2032 | | | | | | |
| it is available, leave other years blank) | | 2032 | | | | | | |
| it is available, leave other years blank) | | 2034 | | | | | | |
| For an A4 terminal configuration, enter the AADT for | the | 2035 | | | | | | |
| diagonal entrance ramp (not the loop entrance ramp) | | 2036 | | | | | | |
| | | 2037 | | | | | | |
| | | 2038 | | | | | | |
| | | 2039 | | | | | | |
| | | 2040 | | | | | | |
| | | 2041 | | | | | | |
| | | 2042 2043 | | | | | | |
| | | 2043 | | | | | | |
| | | 2045 | | | | | | |
| | | 2046 | | | | | | |
| | | 2047 | | | | | | |
| | | 2048 | | | | | | |
| | | 2049 | | | | | | |
| | | 2050 | 6000 | 5475 | | | | |
| | | 2051 | | | | | | |
| | | 2052 2053 | | | | | | |
| Crash Data | Year | 2000 | Ramp Tor | <u>l</u> minal Crash | <u> </u> | | <u> </u> | |
| Count of Fatal-and-Injury (FI) Crashes by Year | I Cal | | Tamp Tell | minai CraSi | 03 | | | |
| (N _{o,w,ac,at,fi)} | 2030 | | | 1 | | | | |
| (` 'U,w,au,au,ii/ | 2031 | | 1 | | | | | |
| | 2032 | | | | | | | |
| | 2033 | | | | | | | |
| <u> -</u> | 2034 | | | | | | | |
| | | | | | | | | |
| Count of Property-Damage-Only (PDO) Crashes b | y Year | | | | | _ | | |
| | y Year 2030 | | | | | | | |
| Count of Property-Damage-Only (PDO) Crashes by (N _{o,w,ac,at,pdo}) | | | | | | | | |
| | 2030 2031 2032 | | | | | | | |
| | 2030 2031 | | | | | | | |

| | | | 0 | 0 | | | | | |
|-----------------------------|----------------|----------------|---------------|--------------|---------------|--------------|---------------|------------|--------|
| O | | | Out | put Summa | ary | | | | |
| General Information | 1 | | 0.6.1.1.1 | <u> </u> | | | | | |
| Project description: | | Predictive | Safety Analy | | | | | | |
| Analyst: | CBB | ı | Date: | 7/22/2025 | | Area type: | | Jrban | |
| First year of analysis: | 2030 | ļ | | | | | | | |
| Last year of analysis: | 2050 | | | | | | | | |
| Crash Data Descript | | | | | | | | | |
| Freeway segments | | rash data a | | | No | | f crash data: | | |
| | Project-lev | el crash dat | ta available? |) | No | | f crash data: | | |
| Ramp segments | Segment c | rash data a | vailable? | | No | | f crash data: | | |
| | | | ta available? | • | No | | f crash data: | | |
| Ramp terminals | Segment c | rash data a | vailable? | | No | First year o | f crash data: | : | |
| | ta available? | • | No | Last year o | f crash data: | | | | |
| Estimated Crash Sta | tistics | | | | | | | | |
| Crashes for Entire F | acility | | | Total | K | Α | В | С | PDO |
| Estimated number of crashe | s during Study | Period, crash | es: | 1409.4 | 4.0 | 16.8 | 96.0 | 240.1 | 1052.5 |
| Estimated average crash fre | | | | 67.1 | 0.2 | 0.8 | 4.6 | 11.4 | 50.1 |
| Crashes by Facility (| | | Nbr. Sites | Total | K | Α | В | С | PDO |
| Freeway segments, cr | | | 5 | 318.1 | 2.2 | 5.4 | 27.5 | 37.3 | 245.7 |
| Ramp segments, cras | | | 7 | 130.6 | 1.2 | 3.7 | 18.2 | 22.8 | 84.6 |
| Crossroad ramp termi | | es. | 2 | 960.7 | 0.6 | 7.7 | 50.3 | 180.1 | 722.1 |
| Crashes for Entire F | | | Year | Total | K 0.0 | Α | В | C | PDO |
| | | | 2030 | | 0.2 | 0.7 | 3.9 | 9.5 | 41.3 |
| Estimated number of o | | iig | 2030 | 55.5 | 0.2 | 0.7 | 3.9 | 9.5 | 41.3 |
| the Study Period, cras | Hes. | | 2031 | 56.6 | 0.2 | 0.7 | 4.0 | 9.7 | |
| | | | | 57.8 | | | | | 43.0 |
| | | | 2033 | 58.9 | 0.2 | 0.7 | 4.1 | 10.0 | 43.9 |
| | | | 2034 | 60.0 | 0.2 | 0.7 | 4.1 | 10.2 | 44.8 |
| | | | 2035 | 61.2 | 0.2 | 0.7 | 4.2 | 10.4 | 45.6 |
| | | | 2036 | 62.3 | 0.2 | 0.8 | 4.3 | 10.6 | 46.5 |
| | | | 2037 | 63.5 | 0.2 | 0.8 | 4.4 | 10.8 | 47.4 |
| | | | 2038 | 64.7 | 0.2 | 0.8 | 4.4 | 11.0 | 48.3 |
| | | | 2039 | 65.8 | 0.2 | 0.8 | 4.5 | 11.2 | 49.1 |
| | | | 2040 | 67.0 | 0.2 | 0.8 | 4.6 | 11.4 | 50.0 |
| | | | 2041 | 68.2 | 0.2 | 0.8 | 4.6 | 11.6 | 50.9 |
| | | | 2042 | 69.4 | 0.2 | 0.8 | 4.7 | 11.8 | 51.8 |
| | | | 2043 | 70.6 | 0.2 | 0.8 | 4.8 | 12.0 | 52.7 |
| | | | 2044 | 71.8 | 0.2 | 0.8 | 4.9 | 12.2 | 53.6 |
| | | | 2045 | 73.0 | 0.2 | 0.9 | 4.9 | 12.4 | 54.6 |
| | | | 2046 | 74.2 | 0.2 | 0.9 | 5.0 | 12.6 | 55.5 |
| | | | 2047 | 75.4 | 0.2 | 0.9 | 5.1 | 12.8 | 56.4 |
| | | | 2048 | 76.6 | 0.2 | 0.9 | 5.2 | 13.1 | 57.3 |
| | | | 2049 | 77.9 | 0.2 | 0.9 | 5.2 | 13.3 | 58.3 |
| | | | 2050 | 79.1 | 0.2 | 0.9 | 5.3 | 13.5 | 59.2 |
| | | | 2051 | | | | | | |
| | | | 2052 | | | | | | |
| | | | 2053 | | | | | | |
| Distribution of Crast | nes for Enti | re Facility | | | | | | | |
| Cupak Torre | | . T 2 1 | | Estima | ted Numb | er of Crash | es During t | he Study F | eriod |
| Crash Type | Crasi | h Type Cat | egory | Total | K | Α | В | С | PDO |
| Multiple vehicle | Head-on ci | rashes: | | 9.6 | 0.0 | 0.1 | 0.7 | 2.4 | 6.3 |
| | Right-angle | | | 263.8 | 0.2 | 2.4 | 15.5 | 56.6 | 189.1 |
| | Rear-end o | | | 583.8 | 1.0 | 6.2 | 38.1 | 113.2 | 425.3 |
| | Sideswipe | | | 136.6 | 0.2 | 0.7 | 4.1 | 9.6 | 122.0 |
| | | iple-vehicle | crashes: | 21.8 | 0.1 | 0.2 | 1.2 | 2.9 | 17.5 |
| | | Itiple-vehicle | | 1015.7 | 1.5 | 9.6 | 59.7 | 184.7 | 760.2 |
| Single vehicle | Crashes w | | C GIASHES. | | | | 0.1 | | 4.0 |
| Single vehicle | | ith fixed obj | oct: | 4.3 294.9 | 0.0 1.8 | 0.0 5.2 | | 0.2 | 222.4 |
| | | ith other ob | | | | | 26.0 | 39.5 | |
| | | | , | 29.3 | 0.1 | 0.2 | 1.2 | 1.6 | 26.2 |
| | | ith parked v | | 7.3 | 0.0 | 0.1 | 0.5 | 0.7 | 6.0 |
| | | e-vehicle ci | | 57.9 | 0.6 | | 8.5 | 13.4 | 33.7 |
| | l otal sin | gle-vehicle | | 393.8 | 2.5 | | 36.3 | 55.4 | 292.3 |
| | | Total crash | ies: | 1409.4 | 4.0 | 16.8 | 96.0 | 240.1 | 1052.5 |

| | | | | Evaluat | tion Site Si | ımmarv | | | |
|--------------|--------------|--------------|--------------|--------------|--------------|-------------|------------|-------|-----|
| General In | formation | | | | | , | | | |
| Project des | cription: | US54-MO5 | Predictive | Safety Anal | ysis | | | | |
| Analyst: | | CBB | | | 7/22/2025 | | Area type: | Ur | ban |
| First year o | of analysis: | 2030 | Total length | n of freeway | | for Study P | | 3.849 | |
| Last year o | | 2050 | | - | Ü | • | ` , | | |
| Site Descr | | | | | | | | | |
| Freeway S | | | | | | | | | |
| Number | Lanes | Study Period | Study Perio | od Descripti | on | | | | |
| | | Length (mi) | , | • | | | | | |
| 1 | 0 | 0.000 | 0 | | | | | | |
| 2 | 4 | | 0 | | | | | | |
| 3 | 4 | 0.290 | 0 | | | | | | |
| 4 | 4 | 0.160 | 0 | | | | | | |
| 5 | 4 | 0.359 | 0 | | | | | | |
| 6 | 4 | 1.400 | 0 | | | | | | |
| 7 | 0 | 0.000 | 0 | | | | | | |
| 8 | 0 | 0.000 | 0 | | | | | | |
| 9 | 0 | 0.000 | 0 | | | | | | |
| 10 | 0 | 0.000 | 0 | | | | | | |
| 11 | 0 | 0.000 | 0 | | | | | | |
| 12 | 0 | 0.000 | 0 | | | | | | |
| 13 | 0 | 0.000 | 0 | | | | | | |
| 14 | 0 | 0.000 | 0 | | | | | | |
| 15 | 0 | 0.000 | 0 | | | | | | |
| 16 | 0 | 0.000 | 0 | | | | | | |
| 17 | 0 | 0.000 | 0 | | | | | | |
| 18 | 0 | 0.000 | 0 | | | | | | |
| 19 | 0 | 0.000 | 0 | | | | | | |
| 20 | 0 | 0.000 | 0 | | | | | | |
| Ramp Seg | | 0.000 | | | | | 1 | | |
| Number | Study Peri | od | | | Number | Study Peri | od | | |
| | Description | | | | | Description | | | |
| 1 | SB Off-Ramp | | | | 21 | 0 | | | |
| 2 | SB Loop On | | | | 22 | 0 | | | |
| | SB On-Ramp | | | | 23 | 0 | | | |
| 4 | SB Loop Off | | | | 24 | 0 | | | |
| | NB On-Ramp | | | | 25 | 0 | | | |
| | NB Off-Ramp | | | | 26 | 0 | | | |
| 7 | NB Off-Ramp | ("2" lanes) | | | 27 | 0 | | | |
| 8 | 0 | | | | 28 | 0 | | | |
| 9 | 0 | | | | 29 | 0 | | | |
| 10 | 0 | | | | 30 | 0 | | | |
| | 0 | | | | 31 | 0 | | | |
| | 0 | | | | 32 | 0 | | | |
| | 0 | | | | 33 | 0 | | | |
| | 0 | | | | 34 | 0 | | | |
| 15 | 0 | | | | 35 | 0 | | | |
| | 0 | | | | 36 | 0 | | | |
| | 0 | | | | 37 | 0 | | | |
| | 0 | | | | 38 | 0 | | | |
| | 0 | | | | 39 | 0 | | | |
| 20 | 0 | | | | 40 | 0 | | | |
| Crossroad | | | | | | | | | |
| Number | Config. | Control | Study Perio | od Descripti | on | | | | |
| 1 | D4 | One stop | SB Terminal | | | | | | |
| 2 | D4 | Signal | NB Terminal | | | | | | |
| 3 | 0 | 0 | 0 | | | | | | |
| 4 | 0 | 0 | 0 | | | | | | |
| 5 | 0 | 0 | 0 | | | | | | |
| 6 | 0 | 0 | 0 | | | | | | |
| | | • | | | | | • | | |

HSM Inputs & Output Summary Report (Build)

| | | PROJECT SAFETY PERFORMANCE | ANALYSIS INPUT SHEET | |
|--------------------------------|--------------|---|-----------------------------------|---|
| | | General Informa | ation | |
| Project Name | US54-MO5 MoD | OT On-Call | Contact Email | azarate@cbbtraffic.com |
| Project Description | 2030 Build | | Contact Phone | (314) 825 5841 |
| Reference Number | Job# 073-25 | | Date Performed | 07/23/25 |
| Analyst | Alex Zarate | | Analysis Year | 2030 |
| Agency/Company | СВВ | | Multiple Year Analysis? | Yes |
| of Segments in Analysis | 6 | | This spreadsheet calculates the p | redicted and expected average crash frequency |
| # of Intersections in Analysis | 4 | | Duration of crash history? | |
| | | LOCATION INFORMATION | | INTERSECTIONS ONLY |
| INDIVIDUAL PROJECT ELEMENTS | | | JURISDICTION | |
| | Route | Location Description | | Signalized or Unsignalized? |
| | | SEGMENTS | | |
| Segment 1 | US 54 | Business Rt 5 to South Terminal Mediar | MODOT | - |
| Segment 2 | US 54 | South Terminal Median | MODOT | - |
| Segment 3 | US 54 | outh Terminal Median to North Termin | MODOT | - |
| Segment 4 | US 54 | North Terminal to Jack Crowell Rd | MODOT | - |
| Segment 5 | US 54 | ck Crowell Rd to Diverted Laker Pride F | MODOT | - |
| Segment 6 | US 54 | Diverted Laker Pride Rd to Cecil Rd | MODOT | - |
| | | INTERSECTIO | NS | |
| ntersection 1 | US 54 | US 54 & Business Route 5 | MODOT | Signalized |
| ntersection 2 | US 54 | US 54 & Jack Crowell Rd | MODOT | Signalized |
| ntersection 3 | US 54 | US 54 & Cecil St | MODOT | Signalized |
| ntersection 4 | US 54 | US 54 & Diverted Laker Pride Rd | MODOT | Signalized |

| General Information | | | | | | | | |
|---|----------------------------------|------------------|-------------------------------------|---------------------------------------|--|-----------------|--|--|
| Analyst Ale | ex Zarate | | Roadway | US 54 | | | | |
| Agency or Company CB | BB | | Roadway Section | Business Rt 5 to South Terminal Media | | | | |
| Date Performed 07 | 7/23/25 | | Jurisdiction | MODOT | | | | |
| Segment for Analysis Se | gment 1 | | Analysis Year | 2030 | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | | | | 5T | | | | |
| Length of segment, L (mi) | | | | 0.58 | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 53,800 | (veh/day) | | 25,350 | | | | |
| Type of on-street parking (none/parallel/angle) | | | | None | | None | | |
| Proportion of curb length with on-street parkin | ng | | | 0 | | | | |
| Median width (ft) - for divided only | | | | Not Present | | 15 | | |
| Lighting (present / not present) | | | | Present | | Not Present | | |
| Auto speed enforcement (present / not present | t) | | | Not Present | | Not Present | | |
| Major commercial driveways (number) | | | | 0 | | | | |
| Minor commercial driveways (number) | | | | 27 | | | | |
| Major industrial / institutional driveways (numl | ber) | | | 0 | | | | |
| Minor industrial / institutional driveways (num | ber) | | | 13 | | | | |
| Major residential driveways (number) | | | | 1 | | | | |
| Minor residential driveways (number) | | | | 4 | | | | |
| Other driveways (number) | | | | 3 | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 31 | | 0 | | |
| Offset to roadside fixed objects (ft) [If greater t | han 30 or Not Present, input 30] | | | 15 | | 30 | | |
| Calibration Factor, Cr | | | | 0.84 | | 1.00 | | |
| Average Annual Crash History (3 or 5-yr average | ge) | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| with the venicle univeway crashes | | PDO | Property Damage Only | 0.0 | | | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| | | PDO | Property Damage Only | 0.0 | | | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| Single-vertice didsiles | | PDO | Property Damage Only 0.0 | | | | | |
| NOTES: * AADT: It is important to remember th | nat the AADT(major) = AADT(major | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | |

| General Information | | | | | | | | |
|---|-----------------------------------|------------------|-------------------------------------|---------------------------|--|-----------------|--|--|
| Analyst Al | lex Zarate | | Roadway | US 54 | | | | |
| Agency or Company CE | ВВ | | Roadway Section | South Terminal Median | | | | |
| Date Performed 07 | 7/23/25 | | Jurisdiction | MODOT | | | | |
| Segment for Analysis Se | egment 2 | | Analysis Year | 2030 | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | adway type (2U, 3T, 4U, 4D, 5T) | | | 4D | | | | |
| Length of segment, L (mi) | | | | 0.1 | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 66,000 | (veh/day) | | 29,200 | | | | |
| Type of on-street parking (none/parallel/angle |) | | | None | | None | | |
| Proportion of curb length with on-street parking | ng | | | 0 | | | | |
| Median width (ft) - for divided only | | | | 10 | | 15 | | |
| Lighting (present / not present) | | | | Not Present | | Not Present | | |
| Auto speed enforcement (present / not presen | nt) | | | Not Present | | Not Present | | |
| Major commercial driveways (number) | | | | 0 | | | | |
| Minor commercial driveways (number) | | | | 0 | | | | |
| Major industrial / institutional driveways (num | nber) | | | 0 | | | | |
| Minor industrial / institutional driveways (num | nber) | | | 0 | | | | |
| Major residential driveways (number) | | | | 0 | | | | |
| Minor residential driveways (number) | | | | 0 | | | | |
| Other driveways (number) | | | | 0 | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 0 | | 0 | | |
| Offset to roadside fixed objects (ft) [If greater t | than 30 or Not Present, input 30] | | | 30 | | 30 | | |
| Calibration Factor, Cr | | | | 0.91 | | 1.00 | | |
| Average Annual Crash History (3 or 5-yr avera | age) | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| wurtpie verlicie unveway crasiles | | PDO | Property Damage Only | 0.0 | | | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| ividitiple verifice nondriveway trasfies | | PDO | Property Damage Only | 0.0 | | | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| Single-verticle crasties | | PDO | Property Damage Only | 0.0 | | | | |
| NOTES: * AADT: It is important to remember th | hat the AADT(major) = AADT(major | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | |

| General Information | | | | | | | | |
|---|------------------------------------|------------------|-------------------------------------|---|--|-----------------|--|--|
| Analyst Ale | ex Zarate | | Roadway | US 54 | | | | |
| Agency or Company CB | BB | | Roadway Section | South Terminal Median to North Terminal | | | | |
| Date Performed 07 | //23/25 | | Jurisdiction | MODOT | | | | |
| Segment for Analysis Segment | gment 3 | | Analysis Year | 2030 | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | | | | 5T | | | | |
| Length of segment, L (mi) | | | | 0.1 | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 53,800 | (veh/day) | | 29,200 | | | | |
| Type of on-street parking (none/parallel/angle) | | | | None | | None | | |
| Proportion of curb length with on-street parkin | ng | | | 0 | | | | |
| Median width (ft) - for divided only | | | | Not Present | | 15 | | |
| Lighting (present / not present) | | | | Present | | Not Present | | |
| Auto speed enforcement (present / not present | t) | | | Not Present | | Not Present | | |
| Major commercial driveways (number) | | | | 0 | | | | |
| Minor commercial driveways (number) | | | | 0 | | | | |
| Major industrial / institutional driveways (numb | ber) | | | 0 | | | | |
| Minor industrial / institutional driveways (numl | ber) | | | 0 | | | | |
| Major residential driveways (number) | | | | 0 | | | | |
| Minor residential driveways (number) | | | | 0 | | | | |
| Other driveways (number) | | | | 0 | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 11 | | 0 | | |
| Offset to roadside fixed objects (ft) [If greater the | han 30 or Not Present, input 30] | | | 4 | | 30 | | |
| Calibration Factor, Cr | | | | 0.84 | | 1.00 | | |
| Average Annual Crash History (3 or 5-yr average | ge) | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| widthpie venicle unveway crashes | | PDO | Property Damage Only | 0.0 | | | | |
| Multiple vehicle nondriveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| | | PDO | Property Damage Only | 0.0 | | | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | | | |
| Single-verticle cidSiles | | PDO | Property Damage Only 0.0 | | | | | |
| NOTES: * AADT: It is important to remember th | nat the AADT(major) = AADT(major a | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | |

| General Information | | | Location Information | | | | | | |
|---|-----------------------------------|------------------|-------------------------------------|-----------------------------------|--|-----------------|--|--|--|
| Analyst | Alex Zarate | | Roadway | · | | | | | |
| Agency or Company C | СВВ | | Roadway Section | North Terminal to Jack Crowell Rd | | | | | |
| Date Performed 0 | 07/23/25 | | Jurisdiction | MODOT | | | | | |
| Segment for Analysis S | Segment 4 | | Analysis Year | 2030 | | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | | | | 4D | | | | | |
| Length of segment, L (mi) | | | | 0.15 | | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 66,000 | (veh/day) | | 34,350 | | | | | |
| Type of on-street parking (none/parallel/angle | e) | | | None | | None | | | |
| Proportion of curb length with on-street parki | ing | | | 0 | | | | | |
| Median width (ft) - for divided only | | | | 10 | | 15 | | | |
| Lighting (present / not present) | | | | Present | | Not Present | | | |
| Auto speed enforcement (present / not prese | ent) | | | Not Present | | Not Present | | | |
| Major commercial driveways (number) | | | | 0 | | | | | |
| Minor commercial driveways (number) | | | | 3 | | | | | |
| Major industrial / institutional driveways (nun | mber) | | | 0 | | | | | |
| Minor industrial / institutional driveways (nun | mber) | | | 2 | | | | | |
| Major residential driveways (number) | | | | 0 | | | | | |
| Minor residential driveways (number) | | | | 0 | | | | | |
| Other driveways (number) | | | | 0 | | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | | |
| Roadside fixed object density (fixed objects / | mi) | | | 6 | | 0 | | | |
| Offset to roadside fixed objects (ft) [If greater | than 30 or Not Present, input 30] | | | 23 | | 30 | | | |
| Calibration Factor, Cr | | | | 0.91 | | 1.00 | | | |
| Average Annual Crash History (3 or 5-yr aver | age) | | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | | |
| Multiple vehicle driveway crashes | | PDO | Property Damage Only | 0.0 | | | | | |
| NA. Ikinia wakisia a madai mwa masaka a | | KABC | Fatal and Injury Only | 0.0 | | | | | |
| Multiple vehicle nondriveway crashes | | PDO | Property Damage Only | 0.0 | | | | | |
| Single vehicle grashes | | KABC | Fatal and Injury Only | 0.0 | | | | | |
| Single-vehicle crashes | | PDO | Property Damage Only | | | | | | |
| NOTES: * AADT: It is important to remember t | that the AADT(major) = AADT(major | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | | | | |

| General Information | | | Location Information | | | ocation Information | | | | | | |
|---|--|-----------|---------------------------|---|------|---------------------|--|--|--|--|--|--|
| Analyst | Alex Zarate | | Roadway | US 54 | | | | | | | | |
| Agency or Company | СВВ | | Roadway Section | Jack Crowell Rd to Diverted Laker Pride | e Rd | | | | | | | |
| Date Performed | 07/23/25 | | Jurisdiction | MODOT | | | | | | | | |
| Segment for Analysis | Segment 5 | | Analysis Year | 2030 | | | | | | | | |
| Input Data | | | | Site Conditions | | Base Conditions | | | | | | |
| Roadway type (2U, 3T, 4U, 4D, 5T) | | | | 4D | | | | | | | | |
| Length of segment, L (mi) | | | | 0.24 | | | | | | | | |
| AADT (veh/day) is within range | AADT _{MAX} = 66,000 | (veh/day) | | 34,250 | | | | | | | | |
| Type of on-street parking (none/parallel/ang | gle) | | | None | | None | | | | | | |
| Proportion of curb length with on-street par | king | | | 0 | | | | | | | | |
| Median width (ft) - for divided only | | | | 10 | | 15 | | | | | | |
| Lighting (present / not present) | | | | Present | | Not Present | | | | | | |
| Auto speed enforcement (present / not pres | sent) | | | Not Present | | Not Present | | | | | | |
| Major commercial driveways (number) | | | | 1 | | | | | | | | |
| Minor commercial driveways (number) | | | | 12 | | | | | | | | |
| Major industrial / institutional driveways (n | umber) | | | 0 | | | | | | | | |
| Minor industrial / institutional driveways (n | umber) | | | 0 | | | | | | | | |
| Major residential driveways (number) | | | | 0 | | | | | | | | |
| Minor residential driveways (number) | | | | 0 | | | | | | | | |
| Other driveways (number) | | | | 2 | | | | | | | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | | | | | | | |
| Roadside fixed object density (fixed objects | / mi) | | | 18 | | 0 | | | | | | |
| Offset to roadside fixed objects (ft) [If great | er than 30 or Not Present, input 30] | | | 14 | | 30 | | | | | | |
| Calibration Factor, Cr | | | | 0.91 | | 1.00 | | | | | | |
| Average Annual Crash History (3 or 5-yr av | erage) | | | | | | | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | | | | | | | |
| Multiple vehicle driveway crashes | | PDO | Property Damage Only | 0.0 | | | | | | | | |
| KABC | | KABC | Fatal and Injury Only | 0.0 | | | | | | | | |
| widiciple vehicle nonuriveway crasnes | Multiple vehicle nondriveway crashes PDO | | Property Damage Only | 0.0 | | | | | | | | |
| Single vehicle craches | | KABC | Fatal and Injury Only 0.0 | | | | | | | | | |
| Single-vehicle crashes PDO | | | Property Damage Only 0.0 | | | | | | | | | |

| General Information | | | Location Information | | | |
|---|--|------------------|-------------------------------------|-------------------------------------|--|-----------------|
| Analyst Al | lex Zarate | | Roadway | US 54 | | |
| Agency or Company CE | ВВ | | Roadway Section | Diverted Laker Pride Rd to Cecil Rd | | |
| Date Performed 07 | 7/23/25 | | Jurisdiction | MODOT | | |
| Segment for Analysis Se | egment 6 | | Analysis Year | 2030 | | |
| Input Data | | | | Site Conditions | | Base Conditions |
| Roadway type (2U, 3T, 4U, 4D, 5T) | | | | 4D | | |
| Length of segment, L (mi) | | | | 0.4 | | |
| AADT (veh/day) is within range | AADT _{MAX} = 66,000 | (veh/day) | | 34,250 | | |
| Type of on-street parking (none/parallel/angle |) | | | None | | None |
| Proportion of curb length with on-street parking | ng | | | 0 | | |
| Median width (ft) - for divided only | | | | 10 | | 15 |
| Lighting (present / not present) | | | | Present | | Not Present |
| Auto speed enforcement (present / not presen | nt) | | | Not Present | | Not Present |
| Major commercial driveways (number) | | | | 0 | | |
| Minor commercial driveways (number) | | | | 6 | | |
| Major industrial / institutional driveways (num | ber) | | | 1 | | |
| Minor industrial / institutional driveways (num | iber) | | | 10 | | |
| Major residential driveways (number) | | | | 0 | | |
| Minor residential driveways (number) | | | | 0 | | |
| Other driveways (number) | | | | 0 | | |
| Speed Category | | | Posted | Speed Greater than 30 mph | | |
| Roadside fixed object density (fixed objects / m | ni) | | | 31 | | 0 |
| Offset to roadside fixed objects (ft) [If greater t | than 30 or Not Present, input 30] | | | 14 | | 30 |
| Calibration Factor, Cr | | | | 0.91 | | 1.00 |
| Average Annual Crash History (3 or 5-yr avera | ige) | | | | | |
| Multiple vehicle driveway crashes | | KABC | Fatal and Injury Only | 0.0 | | |
| Multiple vehicle univeway crashes | | PDO | Property Damage Only | 0.0 | | |
| NA. Ikirala wakirala wana daiwawa wanaka a | | KABC | Fatal and Injury Only | 0.0 | | |
| widitiple vehicle floridiffeway crasiles | Multiple vehicle nondriveway crashes PDO | | Property Damage Only | 0.0 | | |
| Single-vehicle crashes | | KABC | Fatal and Injury Only | 0.0 | | |
| PDO PDO | | | Property Damage Only | 0.0 | | |
| NOTES: * AADT: It is important to remember th | hat the AADT(major) = AADT(major | approach1) + AAD | T(minor approach2) (refer to p.12-8 | in Part C of the HSM) | | |

| Apalyst Alex Zarate | General Information | | | Location Info | ormation | | | | | | |
|--|---|---|-----------------------|----------------|-------------------|--------------------------|---------|-----------------|--|--|--|
| Date Performed 7/23/2025 Durisdiction MoDDT | Analyst | Alex Zarate | | Roadway | | US 54 | | | | | |
| Intersection Int | Agency or Company | CBB | | Location Info | ormation | US 54 & Business Route 5 | | | | | |
| Signalized Signalized Signalized Ped Volume (after Into Type) Not Known | Date Performed | 7/23/2025 | | Jurisdiction | | MODOT | | | | | |
| Imput Data Site Conditions Site Conditions Sase Conditions Sase Conditions Intersection type (357, 35G, 457, 45G) | Intersection | Intersection 1 | | Analysis Year | r | 2030 | | | | | |
| MADT | Signalized/Unsignalized | Signalized | | Ped Volume | (after Intx Type) | Not Known | | | | | |
| AADT majer veh/day (total entering on major approaches)* AADT MADT | Input Data | | | | | Site Cor | ditions | Base Conditions | | | |
| ADT miles Vehf day (total entering on minor approaches)* ADT MADT | Intersection type (3ST, 3SG, 4ST, | , 4SG) | | | | 45 | G | | | | |
| Intersection lighting (present/not present) Calibration factor, C, Data for unsignatized intersections only: Number of major road approaches with left-turn lanes (0,1,2) Number of major road approaches with left-turn lanes (0,1,2,34) [for 3SG, use maximum value of 3] Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 4, all other, max 2) Number of approaches with right-turn lanes for 4SG, use maximum value of 3] Number of approaches with right-turn lanes for 4SG, use maximum value of 3] Protected Permissive Type of left-turn signal phasing for Leg #1 Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Protected Summary of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] O O Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] O O Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] O O O Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] O O O O O O O O O O O O O O O O O O O | AADT major (veh/day) (total enter | ring on major approaches)* | AADT _{MAX} = | 67,700 | (veh/day) | 24,7 | 775 | | | | |
| Calibration factor, C Data for unsignalized intersections only: Number of major-road approaches with left-turn lanes (0,1,2,3) Number of major-road approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 4, all other, max 2) Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3] Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3] Number of approaches with left-turn signal phasing [for 1eg #1 Protected Permissive Type of left-turn signal phasing for Leg #1 Protected Permissive Type of left-turn signal phasing for Leg #2 Protected Type of left-turn signal phasing for Leg #4 (if applicable) Protected Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] O Not Present Sum of all pedestrian crossing volumes (PedVol) - Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{bness}) Schools within 300 m (1,000 th) of the intersection Present Number of abort solves setablishments within 300 m (1,000 th) of the intersection Property Damage Only Property Damage Only Single-vehicle crashes Single-vehicle crashes Not Present Single-vehicle crashes | AADT minor (veh/day) (total enter | ring on minor approaches)* | AADT _{MAX} = | 33,400 | (veh/day) | 9,9 | 00 | | | | |
| Data for unsignalized intersections only: | Intersection lighting (present/no | ot present) | | | | Pres | ent | Not Present | | | |
| Number of major road approaches with left-turn lanes (0,1,2) Number of approaches with right-turn lanes (0,1,2), and the signal placed intersections only. Number of approaches with left-turn lanes (0,1,2,3,4) [for 35G, use maximum value of 3] Number of approaches with left-turn signal phasing [for 35G, use maximum value of 4, all other, max 2) Number of approaches with left-turn signal phasing [for 35G, use maximum value of 3] Number of approaches with left-turn signal phasing [for 35G, use maximum value of 3] Number of approaches with left-turn signal phasing [for 16 gf 1] Number of approaches with left-turn signal phasing [for 16 gf 1] Number of approaches with left-turn signal phasing [for 16 gf 1] Protected Permissive Protected Permissive Protected Protected Number of approaches with right-turn-on-red prohibited [for 35G, use maximum value of 3] Number of approaches with right-turn-on-red prohibited [for 35G, use maximum value of 3] Number of approaches with right-turn-on-red prohibited [for 35G, use maximum value of 3] Number of approaches with right-turn-on-red prohibited [for 35G, use maximum value of 3] Number of approaches with right-turn-on-red prohibited [for 35G, use maximum value of 3] Number of approaches with right-turn-on-red prohibited [for 35G, use maximum value of 3] O Intersection red light cameras (present/not present) Not Present | Calibration factor, C | | | | | 5.2 | 21 | 1.00 | | | |
| Number of major road approaches with right turn lanes (0,1,2) 9 | Data for unsignalized intersection | ons only: | | | | | | | | | |
| Data for signalized intersections only: Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] 4 0 Number of approaches with right-turn lanes; for 4SG, use maximum value of 4, all other, max 2) 4 0 Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3] 4 Type of left-turn signal phasing for Leg #1 Protected Permissive Type of left-turn signal phasing for Leg #2 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #4 Graphical Protection Protected Type of left-turn signal phasing for Leg #4 Graphical Protection Protected Type of left-turn signal phasing for Leg #4 Graphical Protection Protected Type of left-turn signal phasing for Leg #4 Graphical Protection Protected Type of left-turn signal phasing for Leg #4 Protected Type of left-turn signal phasing for Leg #4 Graphical Protected Protected Type of left-turn signal phasing for Leg #4 Graphical Protected Type of left-turn signal phasing for Leg #4 Graphical Protected Protected Protected - | Number of major road ap | | | | | | • | 0 | | | |
| Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] Number of approaches with right-turn lanes: for 4SG, use maximum value of 4, all other, max 2) Number of approaches with right-turn signal phasing [for 3SG, use maximum value of 3] Type of left-turn signal phasing for Leg #1 Type of left-turn signal phasing for Leg #2 Protected Protected Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] Not Present N | Number of major road approaches with right turn lanes (0,1,2) | | | | | € |) | θ | | | |
| Number of approaches with right-turn lanes: for 4SG, use maximum value of 4, all other, max 2) Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3] Type of left-turn signal phasing for Leg #1 Protected Permissive Type of left-turn signal phasing for Leg #2 Protected Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] Intersection red light cameras (present/not present) Not Present Sum of all pedestrian crossing volumes (PedVol) — Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{aness}) Not Present | Data for signalized intersections | only: | | | | | · | | | | |
| Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3] Type of left-turn signal phasing for Leg #1 Type of left-turn signal phasing for Leg #2 Type of left-turn signal phasing for Leg #2 Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #4 Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] Intersection red light cameras (present/not present) Sum of all pedestrian crossing volumes (PedVol) — Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{anexx}) Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection Average Annual Crash History (3 or 5-yr average) KABC Fatal and Injury Only Single-vehicle crashes KABC Fatal and Injury Only Single-vehicle crashes | Number of approaches wi | ith left-turn lanes (0,1,2,3,4) [for 3SG | i, use maximum v | alue of 3] | | 4 | | 0 | | | |
| Type of left-turn signal phasing for Leg #1 Type of left-turn signal phasing for Leg #2 Type of left-turn signal phasing for Leg #3 Type of left-turn signal phasing for Leg #3 Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] Intersection red light cameras (present/not present) Sum of all pedestrian crossing volumes (PedVol) Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{aness}) Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection Number of alcohol sales setablishments within 300 m (1,000 ft) of the intersection Number of alcohol sales setablishments within 300 m (1,000 ft) of the intersection Number of alcohol sales setablishments within 300 m (1,000 ft) of the intersection Not Present Not Present Not Present Not Present Not Present Not Present Not Present Not Present Not Present Not Present Not Present Not Present Not Present Not Present Average Annual Crash History (3 or 5-yr average) KABC PDO Property Damage Only O.0 Single-vehicle crashes KABC Fatal and Injury Only O.0 Single-vehicle crashes | Number of approaches wi | ith right-turn lanes: for 4SG, use max | imum value of 4, | all other, max | 2) | 4 | | 0 | | | |
| Type of left-turn signal phasing for Leg #2 Type of left-turn signal phasing for Leg #3 Protected Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] Intersection red light cameras (present/not present) Sum of all pedestrian crossing volumes (PedVol) Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{laness}) Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection Multiple vehicle crashes KABC Fatal and Injury Only 0.0 Single-vehicle crashes KABC Fatal and Injury Only 0.0 Single-vehicle crashes | Number of approaches wi | ith left-turn signal phasing [for 3SG, ı | use maximum val | ue of 3] | | | | | | | |
| Type of left-turn signal phasing for Leg #3 Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] Intersection red light cameras (present/not present) Sum of all pedestrian crossing volumes (PedVol) Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{lanesx}) Not Present Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection Not Present | Type of left-turn signal ph | asing for Leg #1 | | | | Prote | ected | Permissive | | | |
| Type of left-turn signal phasing for Leg #4 (if applicable) Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] Intersection red light cameras (present/not present) Sum of all pedestrian crossing volumes (PedVol) Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{lanesx}) Number of bus stops within 300 m (1,000 ft) of the intersection Number of success of the intersection present/not present property of the intersection present property of the intersection present property of the intersection present property of the intersection present property of the intersection present property of the intersection present property of the intersection present property of the intersection present property of the intersection property of the intersection present property of the intersection property of the intersection property of the intersection property of the intersection property of the intersection present property of the intersection property of the | Type of left-turn signal ph | asing for Leg #2 | | | | Prote | | | | | |
| Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3] 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Type of left-turn signal ph | asing for Leg #3 | | | | Prote | | | | | |
| Intersection red light cameras (present/not present) Sum of all pedestrian crossing volumes (PedVol) Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{lanesx}) Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection 1 to 8 O Average Annual Crash History (3 or 5-yr average) Multiple vehicle crashes KABC Fatal and Injury Only PDO Property Damage Only Single-vehicle crashes KABC Fatal and Injury Only O.0 Single-vehicle crashes | Type of left-turn signal ph | asing for Leg #4 (if applicable) | | | | Prote | ected | | | | |
| Sum of all pedestrian crossing volumes (PedVol) Signalized intersections only Maximum number of lanes crossed by a pedestrian (n _{lanesx}) Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection 1 to 8 O Average Annual Crash History (3 or 5-yr average) Multiple vehicle crashes KABC Fatal and Injury Only Property Damage Only Single-vehicle crashes KABC Fatal and Injury Only Single-vehicle crashes | Number of approaches wi | ith right-turn-on-red prohibited [for | 3SG, use maximu | m value of 3] | | (|) | 0 | | | |
| Maximum number of lanes crossed by a pedestrian (n _{lanesx}) Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection 1 to 8 O Average Annual Crash History (3 or 5-yr average) Multiple vehicle crashes KABC Fatal and Injury Only Property Damage Only Single-vehicle crashes KABC Fatal and Injury Only O.0 Single-vehicle crashes | Intersection red light came | eras (present/not present) | | | | Not Pr | resent | Not Present | | | |
| Number of bus stops within 300 m (1,000 ft) of the intersection Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection 1 to 8 O Average Annual Crash History (3 or 5-yr average) Multiple vehicle crashes KABC Fatal and Injury Only Property Damage Only Single-vehicle crashes KABC Fatal and Injury Only Single-vehicle crashes | Sum of all pedestrian cros | sing volumes (PedVol) Signalized i | ntersections only | 1 | | 5 | 0 | | | | |
| Schools within 300 m (1,000 ft) of the intersection (present/not present) Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection 1 to 8 0 Average Annual Crash History (3 or 5-yr average) Multiple vehicle crashes KABC Fatal and Injury Only Property Damage Only 0.0 Single-vehicle crashes KABC Fatal and Injury Only 0.0 Single-vehicle crashes | Maximum number of lane | es crossed by a pedestrian (n _{lanesx}) | | | | 5 | i | | | | |
| Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection Average Annual Crash History (3 or 5-yr average) Multiple vehicle crashes KABC Fatal and Injury Only 0.0 Property Damage Only 0.0 Single-vehicle crashes KABC Fatal and Injury Only 0.0 | Number of bus stops with | in 300 m (1,000 ft) of the intersectio | n | | | C |) | 0 | | | |
| Average Annual Crash History (3 or 5-yr average) Multiple vehicle crashes KABC Fatal and Injury Only 0.0 Property Damage Only 0.0 Single-vehicle crashes KABC Fatal and Injury Only 0.0 For perty Damage Only 0.0 | Schools within 300 m (1,00 | 00 ft) of the intersection (present/no | ot present) | | | Pres | sent | Not Present | | | |
| Multiple vehicle crashes KABC Fatal and Injury Only 0.0 PDO Property Damage Only 0.0 KABC Fatal and Injury Only 0.0 KABC Fatal and Injury Only 0.0 | Number of alcohol sales e | stablishments within 300 m (1,000 f | t) of the intersect | ion | | 1 to 8 0 | | | | | |
| Multiple vehicle crashes PDO Property Damage Only 0.0 Single-vehicle crashes KABC Fatal and Injury Only 0.0 | Average Annual Crash History (| 3 or 5-yr average) | | | | | · | | | | |
| PDO Property Damage Only 0.0 Single-vehicle crashes KABC Fatal and Injury Only 0.0 | Multiple vehicle erretes | | KABC | Fatal and Inju | ury Only | 0.0 | | | | | |
| Single-vehicle crashes | iviulupie veriicie crasnes | | PDO | Property Dar | mage Only | 0.0 | | | | | |
| Single-verifice crashes PDO Property Damage Only 0.0 | Cinala wakiala araakaa | | KABC | Fatal and Inju | ury Only | 0.0 | | | | | |
| FDO ITOPETTY Datitage Offity 0.0 | orngie-venicie crasnes | | PDO | Property Dar | mage Only | 0.0 | | | | | |

| General Information | | | Location Info | ormation | | | |
|---|--|-----------------------|------------------|----------------------|---------------------------------------|---------|-----------------|
| Analyst Ale | lex Zarate | | Roadway | | US 54 | | |
| Agency or Company CB | ВВ | | Location Info | ormation | US 54 & Jack Crowell Rd | | |
| Date Performed 7/ | /23/2025 | | Jurisdiction | | MODOT | | |
| Intersection Int | tersection 2 | | Analysis Year | f | 2030 | | |
| Signalized/Unsignalized Sig | gnalized | | Ped Volume | (after Intx Type) | Not Known | | ▼ |
| Input Data | | | | | Site Cond | ditions | Base Conditions |
| Intersection type (3ST, 3SG, 4ST, 4ST, 4ST, 4ST, 4ST, 4ST, 4ST, 4ST | ISG) | | | | 350 | 3 | |
| AADT major (veh/day) (total entering | ng on major approaches)* | AADT _{MAX} = | 58,100 | (veh/day) | 34,3 | 50 | |
| AADT _{minor} (veh/day) (total entering | ng on minor approaches)* | AADT _{MAX} = | 16,400 | (veh/day) | 2,02 | 25 | |
| Intersection lighting (present/not p | ersection lighting (present/not present) | | | | Prese | ent | Not Present |
| Calibration factor, C _i | | | | | 2.9 | 5 | 1.00 |
| Data for unsignalized intersections | s only: | | | | | | |
| Number of major road appre | Number of major road approaches with left turn lanes (0,1,2) | | | | 0 | | θ |
| Number of major road approaches with right turn lanes (0,1,2) | | | | | 9 | | θ |
| Data for signalized intersections or | nly: | | | | | • | |
| Number of approaches with | left-turn lanes (0,1,2,3,4) [for 3SG, | use maximum va | lue of 3] | | 2 | | 0 |
| Number of approaches with | right-turn lanes: for 4SG, use maxi | mum value of 4, a | all other, max 2 | 2) | 2 | | 0 |
| Number of approaches with | n left-turn signal phasing [for 3SG, u | se maximum valu | e of 3] | | 2 | | |
| Type of left-turn signal phasi | ing for Leg #1 | | | | Protec | cted | Permissive |
| Type of left-turn signal phasi | ing for Leg #2 | | | | Protec | | |
| Type of left-turn signal phasi | ing for Leg #3 | | | | Not App | | |
| Type of left-turn signal phasi | ing for Leg #4 (if applicable) | | | | Not App | | |
| Number of approaches with | right-turn-on-red prohibited [for 3 | SG, use maximun | n value of 3] | | 0 | | 0 |
| Intersection red light camera | as (present/not present) | | | | Not Pre | esent | Not Present |
| Sum of all pedestrian crossin | ng volumes (PedVol) Signalized in | ntersections only | | | 50 |) | |
| Maximum number of lanes of | crossed by a pedestrian (n _{lanesx}) | | | | 6 | | |
| Number of bus stops within | 300 m (1,000 ft) of the intersection | 1 | | | 0 | | 0 |
| Schools within 300 m (1,000 | ft) of the intersection (present/no | t present) | | | Not Pre | esent | Not Present |
| Number of alcohol sales esta | ablishments within 300 m (1,000 ft | of the intersection | on | | 0 0 | | |
| Average Annual Crash History (3 o | or 5-yr average) | | | | | | |
| Multiple vehicle crashes | | KABC | Fatal and Inju | ury Only | 0.0 | | |
| | | PDO | Property Dar | mage Only | 0.0 | | |
| Single-vehicle crashes | | KABC | Fatal and Inju | ury Only | 0.0 | | |
| Single-verifice crasiles | | PDO | Property Dar | mage Only | 0.0 | | |
| NOTES: * AADT: It is important to | remember that the AADT(major) = | AADT(major appr | oach1) + AAD | T(minor approach2) (| refer to p.12-8 in Part C of the HSM) | | |

| General Information | | | Location In | formation | | | | | | |
|------------------------------|---|-----------------------|------------------|---------------------|------------------|----------|-----------------|--|--|--|
| Analyst | Alex Zarate | | Roadway | | US 54 | | | | | |
| Agency or Company | СВВ | | Location In | formation | US 54 & Cecil St | | | | | |
| Date Performed | 7/23/2025 | | Jurisdiction | 1 | MODOT | | | | | |
| Intersection | Intersection 3 | | Analysis Ye | ar | 2030 | | | | | |
| Signalized/Unsignalized | Signalized | | Ped Volum | e (after Intx Type) | Not Known | | | | | |
| Input Data | • | | • | | Site Con- | ditions | Base Conditions | | | |
| Intersection type (3ST, 3SG | G, 4ST, 4SG) | | | | 350 | G | | | | |
| AADT major (veh/day) (total | entering on major approaches)* | AADT _{MAX} = | 58,100 | (veh/day) | 34,2 | 250 | | | | |
| AADT minor (veh/day) (total | entering on minor approaches)* | AADT _{MAX} = | 16,400 | (veh/day) | 7,25 | 50 | | | | |
| Intersection lighting (prese | ent/not present) | | | | Preso | ent | Not Present | | | |
| Calibration factor, C | | | | | 2.9 | 95 | 1.00 | | | |
| Data for unsignalized inter | rsections only: | | | | | • | | | | |
| Number of major re | pad approaches with left turn lanes (0,1,2) | | | 0 | | 9 | | | | |
| Number of major re | Number of major road approaches with right turn lanes (0,1,2) | | | | | | θ | | | |
| Data for signalized interse | ctions only: | | | | • | • | | | | |
| Number of approac | hes with left-turn lanes (0,1,2,3,4) [for 3SG | , use maximum | value of 3] | | 2 | : | 0 | | | |
| Number of approac | hes with right-turn lanes: for 4SG, use max | kimum value of 4 | , all other, max | x 2) | 2 | 1 | 0 | | | |
| Number of approac | hes with left-turn signal phasing [for 3SG, | use maximum va | lue of 3] | | 2 | : | | | | |
| Type of left-turn sig | nal phasing for Leg #1 | | | | Protei | cted | Permissive | | | |
| Type of left-turn sig | nal phasing for Leg #2 | | | | Protei | | | | | |
| Type of left-turn sig | nal phasing for Leg #3 | | | | Not App | olicable | | | | |
| Type of left-turn sig | nal phasing for Leg #4 (if applicable) | | | | Not App | olicable | | | | |
| Number of approac | hes with right-turn-on-red prohibited [for | 3SG, use maximu | um value of 3] | | 0 | | 0 | | | |
| Intersection red ligh | t cameras (present/not present) | | | | Not Pro | esent | Not Present | | | |
| Sum of all pedestria | n crossing volumes (PedVol) Signalized | intersections onl | У | | 50 |) | | | | |
| Maximum number o | of lanes crossed by a pedestrian (n _{lanesx}) | | | | 4 | | | | | |
| Number of bus stop | s within 300 m (1,000 ft) of the intersection | on | | | 0 | 1 | 0 | | | |
| Schools within 300 r | m (1,000 ft) of the intersection (present/no | ot present) | | | Not Pro | esent | Not Present | | | |
| Number of alcohol s | ales establishments within 300 m (1,000 f | t) of the intersec | tion | | 1 to 8 0 | | | | | |
| Average Annual Crash His | story (3 or 5-yr average) | | | | · | • | | | | |
| Multiple vehicle cra | chos | KABC | Fatal and Ir | njury Only | 0.0 | | | | | |
| iviuitipie veriicie cra | DITES | PDO | Property D | amage Only | 0.0 | | | | | |
| Single-vehicle crash | 0.5 | KABC | Fatal and Ir | njury Only | 0.0 | | | | | |
| Single-verticle crash | E3 | PDO | Property D | amage Only | 0.0 | | | | | |

| General Information | | | Location In | formation | | | |
|---|--|-----------------------|----------------|---------------------|--|-----------|-----------------|
| Analyst | Alex Zarate | | Roadway | | US 54 | | |
| Agency or Company | CBB | | Location In | formation | US 54 & Diverted Laker Pride Rd | | |
| Date Performed | 7/23/2025 | | Jurisdiction | ı | MODOT | | |
| Intersection | Intersection 4 | | Analysis Ye | ar | 2030 | | |
| Signalized/Unsignalized | Signalized | | Ped Volum | e (after Intx Type) | Not Known | | ▼ |
| Input Data | · | | | | Site Cond | ditions | Base Conditions |
| Intersection type (3ST, 3SG | i, 4ST, 4SG) | | | | 350 | 3 | |
| AADT major (veh/day) (total | entering on major approaches)* | AADT _{MAX} = | 58,100 | (veh/day) | 34,2 | 50 | |
| AADT _{minor} (veh/day) (total | entering on minor approaches)* | AADT _{MAX} = | 16,400 | (veh/day) | 5,92 | 25 | |
| Intersection lighting (prese | nt/not present) | - | | | Prese | ent | Not Present |
| Calibration factor, C | | | | | 2.9 | 5 | 1.00 |
| Data for unsignalized inters | sections only: | | | | | | |
| Number of major road approaches with left turn lanes (0,1,2) | | | | | θ | | θ |
| Number of major road approaches with right turn lanes (0,1,2) | | | | | 0 | | θ |
| Data for signalized intersec | ctions only: | | | | | | |
| Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3] | | | | | 2 | | 0 |
| Number of approach | es with right-turn lanes: for 4SG, use max | kimum value of 4, | all other, max | < 2) | 2 | | 0 |
| Number of approach | es with left-turn signal phasing [for 3SG, | use maximum valu | ue of 3] | | 0 | | |
| Type of left-turn sign | al phasing for Leg #1 | | | | Protected/F | ermissive | Permissive |
| Type of left-turn sign | al phasing for Leg #2 | | | | Protec | | |
| Type of left-turn sign | al phasing for Leg #3 | | | | Not App | | |
| Type of left-turn sign | al phasing for Leg #4 (if applicable) | | | | Not App | | |
| Number of approach | es with right-turn-on-red prohibited [for | 3SG, use maximur | m value of 3] | | 0 | 0 | |
| Intersection red light | cameras (present/not present) | | | | Not Pre | esent | Not Present |
| Sum of all pedestriar | crossing volumes (PedVol) Signalized | intersections only | | | 50 | 1 | |
| Maximum number of | f lanes crossed by a pedestrian (n _{lanesx}) | | | | 6 | | |
| Number of bus stops | within 300 m (1,000 ft) of the intersection | in | | | 0 | | 0 |
| Schools within 300 m | (1,000 ft) of the intersection (present/no | ot present) | | | Not Pre | esent | Not Present |
| Number of alcohol sa | ales establishments within 300 m (1,000 f | t) of the intersecti | ion | | 0 | | 0 |
| Average Annual Crash Hist | tory (3 or 5-yr average) | | | | | | |
| Multiple vehicle area | has | KABC | Fatal and Ir | njury Only | 0.0 | | |
| Multiple vehicle cras | nes | PDO | Property Da | amage Only | 0.0 | | |
| Cincle webiele | | KABC | Fatal and Ir | njury Only | 0.0 | | |
| Single-vehicle crashe | S | PDO | Property Da | amage Only | 0.0 | | |
| NOTES: * AADT: It is import | tant to remember that the AADT(major) : | = AADT(major app | roach1) + AA | DT(minor approach2) | (refer to p.12-8 in Part C of the HSM) | | |

PROJECT SAFETY PERFORMANCE SUMMARY REPORT

General Information

Project Name US54-MO5 MoDOT On-Call

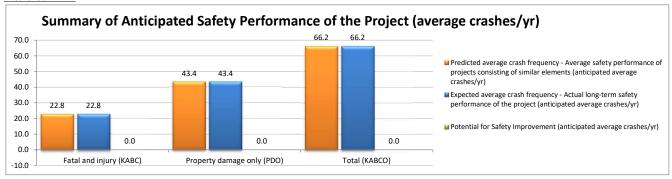
Project Description 2030 Build Reference Number Job# 073-25 Analyst Alex Zarate

Agency/Company CBB

Contact Email azarate@cbbtraffic.com
Contact Phone (314) 825 5841
Date Completed 05/12/11

Years of crash data incorporated into the analysis: 0

PROJECT SUMMARY



| | | Total Crashes/yr (KABCO) | | Fata | l and Injury Crasho (KABC) | es/yr | Property Damage Only Crashes/yr (PDO) | | | |
|--------------------------|---|---|------------------------------|--|--|------------------------------|---|---|------------------------------|--|
| Project Element | Predicted average crash frequency N _{predicted (KABCO)} | Expected average crash frequency N _{expected (KABCO)} | Potential for Improvement | Predicted average crash frequency N _{predicted (KABC)} | Expected average crash frequency N _{expected (KABC)} | Potential for Improvement | Predicted average crash frequency N _{predicted (O)} | Expected average crash frequency N _{expected (O)} | Potential for Improvement | |
| INDIVIDUAL SEGMENTS | | | | | | | | | | |
| Segment 1 | 8.1 | 8.1 | 0.0 | 2.3 | 2.3 | 0.0 | 5.8 | 5.8 | 0.0 | |
| Segment 2 | 0.6 | 0.6 | 0.0 | 0.2 | 0.2 | 0.0 | 0.4 | 0.4 | 0.0 | |
| Segment 3 | 1.0 | 1.0 | 0.0 | 0.3 | 0.3 | 0.0 | 0.7 | 0.7 | 0.0 | |
| Segment 4 | 1.0 | 1.0 | 0.0 | 0.3 | 0.3 | 0.0 | 0.7 | 0.7 | 0.0 | |
| Segment 5 | 1.9 | 1.9 | 0.0 | 0.5 | 0.5 | 0.0 | 1.4 | 1.4 | 0.0 | |
| Segment 6 | 2.9 | 2.9 | 0.0 | 0.8 | 0.8 | 0.0 | 2.1 | 2.1 | 0.0 | |
| INDIVIDUAL INTERSECTIONS | | | | | | | | | | |
| Intersection 1 | 16.9 | 16.9 | 0.0 | 6.6 | 6.6 | 0.0 | 10.4 | 10.4 | 0.0 | |
| Intersection 2 | 8.6 | 8.6 | 0.0 | 3.2 | 3.2 | 0.0 | 5.4 | 5.4 | 0.0 | |
| Intersection 3 | 12.1 | 12.1 | 0.0 | 4.1 | 4.1 | 0.0 | 8.0 | 8.0 | 0.0 | |
| Intersection 4 | 13.0 | 13.0 | 0.0 | 4.5 | 4.5 | 0.0 | 8.5 | 8.5 | 0.0 | |
| COMBINED (sum of column) | 66.2 | 66.2 | 0.0 | 22.8 | 22.8 | 0.0 | 43.4 | 43.4 | 0.0 | |

PROJECT SUMMARY -- Site-Specific EB Method Summary Results for Urban and Suburban Arterial Project

| Crash severity level | N predicted(PROJECT) Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated average crashes/yr) | N expected (PROJECT) Expected average crash frequency - Actual long-term safety performance of the project (anticipated average crashes/yr) | N potential for improvement (PROJECT) Potential for Safety Improvement (anticipated average crashes/yr) |
|----------------------------|---|--|--|
| Fatal and injury (KABC) | 22.8 | 22.8 | 0.0 |
| Property damage only (PDO) | 43.4 | 43.4 | 0.0 |
| Total (KABCO) | 66.2 | 66.2 | 0.0 |

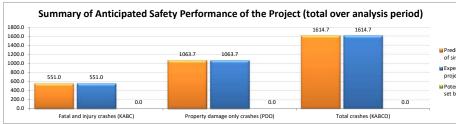
HSM1 Extended Spreadsheet for Part C Chapter 12 v.9

Discussion of Results

Given the potential effects of project characteristics on safety performance, results indicate that:

- 1. It is anticipated that the project will, on average, experience 66.2 crashes per year (22.8 fatal and injury crashes per year; and 43.4 property damage only crashes per year).
- 2. A similar project is anticipated, on average, to experience 66.2 crashes per year (22.8 fatal and injury crashes per year; and 43.4 property damage only crashes per year).
- 3. It is anticipated the project has, on average, a potential for safety improvement of 0 crashes per year (0 fatal and injury crashes per year; and 0 property damage only crashes per year).

MULTIPLE YEAR PROJECT SAFETY PERFORMANCE SUMMARY REPORT FOR URBAN AND SUBURBAN ARTERIAL General Information US54-MO5 MoDOT On-Call Project Description 2030 Build Reference Number Job# 073-25 Analyst Alex Zarate Agency/Company Contact Email Contact Phone azarate@cbbtraffic.com (314) 825 5841 Date Completed Base Year Analysis Period (Years) Linear Traffic Growth Rate (annual %) PROJECT SUMMARY



■ Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated total number of crashes over 10 years)

■ Expected average crash frequency - Average long-term safety performance of the project (anticipated total number of crashes over 10 years)

■ Potential safety performance - Average project performance compared to threshold set by typical other similar projects (anticipated total number of crashes over 10 years)

| | 20-Year Analysis Summary Report | | | | | | | | | | | |
|---------------|---------------------------------|---|---------------|-------|---------------------------------------|---------------|--|-----|---------------|--|--|--|
| Analysis Year | Pre | dicted Average Crash Freque (Npredicted) | ency | Expec | ted Average Crash Free (Nexpected) | quency | Potential for Safety Improvement (crashes/yr) | | | | | |
| | KABC | PDO | Total (KABCO) | KABC | PDO | Total (KABCO) | KABC | PDO | Total (KABCO) | | | |
| 2030 | 22.8 | 43.4 | 66.2 | 22.8 | 43.4 | 66.2 | N/A | N/A | N/A | | | |
| 2031 | 23.3 | 44.4 | 67.7 | 23.3 | 44.4 | 67.7 | 0.0 | 0.0 | N/A | | | |
| 2032 | 23.8 | 45.4 | 69.2 | 23.8 | 45.4 | 69.2 | N/A | N/A | 0.0 | | | |
| 2033 | 24.3 | 46.4 | 70.7 | 24.3 | 46.4 | 70.7 | N/A | N/A | N/A | | | |
| 2034 | 24.8 | 47.4 | 72.2 | 24.8 | 47.4 | 72.2 | N/A | 0.0 | N/A | | | |
| 2035 | 25.3 | 48.4 | 73.7 | 25.3 | 48.4 | 73.7 | N/A | N/A | N/A | | | |
| 2036 | 25.8 | 49.5 | 75.2 | 25.8 | 49.5 | 75.2 | N/A | N/A | N/A | | | |
| 2037 | 26.3 | 50.5 | 76.8 | 26.3 | 50.5 | 76.8 | N/A | N/A | N/A | | | |
| 2038 | 26.8 | 51.5 | 78.3 | 26.8 | 51.5 | 78.3 | N/A | 0.0 | 0.0 | | | |
| 2039 | 27.3 | 52.6 | 79.8 | 27.3 | 52.6 | 79.8 | N/A | N/A | N/A | | | |
| 2040 | 27.8 | 53.6 | 81.4 | 27.8 | 53.6 | 81.4 | N/A | N/A | N/A | | | |
| 2041 | 28.3 | 54.7 | 83.0 | 28.3 | 54.7 | 83.0 | N/A | 0.0 | 0.0 | | | |
| 2042 | 28.8 | 55.7 | 84.5 | 28.8 | 55.7 | 84.5 | N/A | N/A | N/A | | | |
| 2043 | 29.3 | 56.8 | 86.1 | 29.3 | 56.8 | 86.1 | N/A | N/A | N/A | | | |
| 2044 | 29.8 | 57.9 | 87.7 | 29.8 | 57.9 | 87.7 | N/A | N/A | N/A | | | |
| 2045 | 30.3 | 58.9 | 89.3 | 30.3 | 58.9 | 89.3 | N/A | N/A | N/A | | | |
| 2046 | 30.8 | 60.0 | 90.8 | 30.8 | 60.0 | 90.8 | N/A | N/A | N/A | | | |
| 2047 | 31.3 | 61.1 | 92.4 | 31.3 | 61.1 | 92.4 | N/A | N/A | N/A | | | |
| 2048 | 31.9 | 62.2 | 94.0 | 31.9 | 62.2 | 94.0 | N/A | N/A | N/A | | | |
| 2049 | 32.4 | 63.3 | 95.7 | 32.4 | 63.3 | 95.7 | N/A | 0.0 | N/A | | | |
| Total | 551.0 | 1063.7 | 1614.7 | 551.0 | 1063.7 | 1614.7 | N/A | N/A | N/A | | | |

PROJECT SUMMARY -- Site-Specific EB Method Summary Results for Urban and Suburban Arterial Project

| Crash severity level | N predicted(PRODICT) Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated total number of crashes over 20 years) | N expected average crash frequency - Average long-term safety performance of the project (anticipated total number of crashes over 20 years) | N potential for improvement (PROLICT) Potential safety performance - Average project performance compared to threshold set by typical other similar projects (anticipated total number of crashes over 20 years) | |
|------------------------------------|---|--|---|--|
| Fatal and injury crashes (KABC) | 551.0 | 551.0 | N/A | |
| Property damage only crashes (PDO) | 1063.7 | 1063.7 | N/A | |
| Total crashes (KABCO) | 1614.7 | 1614.7 | N/A | |

<u>Discussion of Results</u>

Given the potential effects of project characteristics on safety performance and assuming a 1.75 % growth in AADT over a 20 year analysis period with 2030 as the base year, results indicate that:

- 1. The project is anticipated, on average, to experience 1614.7 crashes over a 20 year analysis period (551 fatal and injury crashes; and 1063.7 property damage only crashes).
- 2. A similar project is anticipated, on average, to experience 1614.7 crashes over a 20 year analysis period (551 fatal and injury crashes over 20 years; and 1063.7 property damage only crashes over 20 years).

No-Build AADT (2024, 2030, 2050)

| AADT | | | |
|--|-------|-------|-------|
| Road Segment* | 2024 | 2030 | 2050 |
| MO 5 – Freeway Segment 1 | 16425 | 18175 | 23900 |
| MO 5 – Freeway Segment 2 | 15025 | 16575 | 21875 |
| MO 5 – Freeway Segment 3 | 14475 | 15900 | 21050 |
| MO 5 – Freeway Segment 4 | 11725 | 12925 | 17050 |
| MO 5 – Freeway Segment 5 | 17275 | 19025 | 25150 |
| SB Off-Ramp (Ramp 1) | 1400 | 1600 | 2025 |
| SB Loop On-Ramp (Ramp 2) | 3200 | 3500 | 4650 |
| SB On-Ramp (Ramp 3) | 925 | 1025 | 1350 |
| SB Loop Off-Ramp (Ramp 4) | 2750 | 2975 | 4000 |
| NB On-Ramp (Ramp 5) | 3750 | 4175 | 5475 |
| NB Off-Ramp (Ramp 6 & 7) | 4625 | 5075 | 6750 |
| US 54 – Business Rt 5 to SB Terminal | 22800 | 25350 | 33050 |
| US 54 – SB Terminal to NB Terminal | 26425 | 29200 | 38325 |
| US 54 – NB Terminal to Jack Crowell Rd | 31100 | 34350 | 45250 |
| US 54 – Jack Crowell Rd to Cecil St | 31000 | 34250 | 45125 |
| Business Rt 5 | 9500 | 9900 | 10775 |
| Jack Crowell Rd/Laker Pride Rd | 5675 | 6125 | 8100 |
| Cecil St | 6550 | 7250 | 9525 |

^{*}Segment and ramp numbers are shown on figure diagrams

Change in Predicted Crashes in Study Area Over 20-Years (ISATe & HSM)

| | No-E | Build Cond | ition | Ві | ild Condit | ion | | Changes | in Crashe | 5 |
|--|--------|------------|--------|-------|------------|--------|--------|---------|-----------|-------------------|
| Facility | F&I | PDO | Total | F&I | PDO | Total | F&I | PDO | Total | % Change in Total |
| Intersection 1 crashes: (US-54 & Business Route 5) | 158.9 | 251.5 | 410.4 | 158.9 | 251.5 | 410.4 | 0.0 | 0.0 | 0.0 | 0.0% |
| Intersection 2 crashes: (No-Build: US-54 & Jack Crowell Road/Laker Pride Road) (Build: US-54 & Jack Crowell Road) | 253.6 | 390.5 | 644.1 | 77.9 | 134.3 | 212.1 | -175.8 | -256.2 | -432.0 | -67.1% |
| Intersection 3 crashes: (US-54 & Cecil Street) | 100.5 | 192.3 | 292.8 | 100.5 | 192.3 | 292.8 | 0.0 | 0.0 | 0.0 | 0.0% |
| Intersection 4 crashes: (Build: US-54 & Laker Pride Road) | | | | 108.7 | 209.1 | 317.8 | 108.7 | 209.1 | 317.8 | |
| Arterial segments (1-3) crashes: | 67.3 | 167.7 | 235.0 | 67.3 | 167.7 | 235.0 | 0.0 | 0.0 | 0.0 | 0.0% |
| Arterial segments (4-5) crashes: | 97.2 | 246.4 | 343.6 | 37.8 | 108.8 | 146.7 | -59.4 | -137.6 | -197.0 | -57.3% |
| Total Arterial HSM Crashes | 677.5 | 1248.4 | 1925.9 | 551.0 | 1063.7 | 1614.7 | -126.5 | -184.7 | -311.2 | -16.2% |
| Freeway segments, crashes: | 72.4 | 245.7 | 318.1 | 72.4 | 245.7 | 318.1 | 0.0 | 0.0 | 0.0 | 0.0% |
| Ramp segments, crashes: | 46.0 | 84.6 | 130.6 | 46.0 | 84.6 | 130.6 | 0.0 | 0.0 | 0.0 | 0.0% |
| Crossroad ramp terminals, crashes: | 261.4 | 737.9 | 999.3 | 238.6 | 722.1 | 960.7 | -22.8 | -15.8 | -38.6 | -4.0% |
| Total ISATe Crashes | 379.8 | 1068.3 | 1448.0 | 356.9 | 1052.5 | 1409.4 | -22.8 | -15.8 | -38.6 | -2.7% |
| Total Study Area Crashes | 1057.3 | 2316.7 | 3373.9 | 907.9 | 2116.3 | 3024.2 | -149.3 | -200.4 | -349.8 | -10.4% |

CBB Job No. 073-2024