Operational and Safety Analysis for US-31 from Amphitheater Road to South Colonial Parkway Shelby County, AL

Submitted 04/23/2021
Sain Project #19-0389

PREPARED FOR

Regional Planning Commission of Greater Birmingham

Two 20th St N
Suite 1200
Birmingham, AL 35203

PREPARED BY

Sain Associates, Inc.
Two Perimeter Park South, Suite 500 East
Birmingham, AL 35243

ADMONITION

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OTHER INFORMATION

Sources of information other than Sain Associates, Inc. used in preparation of this document include:

- Alabama Department of Transportation (ALDOT)
- Regional Planning Commission of Greater Birmingham (RPCGB)
- Federal Highway Administration (FHWA)
- Manual on Uniform Traffic Control Devices (MUTCD)
- Center for Advanced Public Safety (CAPS)
- Crash Modification Factors (CMF) Clearinghouse
- Google Earth
- Google Maps

EXECUTIVE SUMMARY

STUDY INITIATION AND PURPOSE

This study was initiated by the Regional Planning Commission of Greater Birmingham (RPCGB) in response to an Alabama Department of Transportation (ALDOT) memorandum dated July 3, 2019 which solicited applications for planning (PL) funding. The segment of US-31 between Pelham and Alabaster was determined to be a good candidate for an access management study.

The purpose of this study is to identify potential improvements along US-31 to improve the performance of the corridor in terms of both traffic operations and safety. A review of roadway geometry, traffic control equipment, crash trends, and observed traffic operations was conducted to inform the improvement recommendations.

STUDY AREA

The study corridor is a 7.7-mile long segment of US-31 between Amphitheater Road in Pelham and South Colonial Parkway in Alabaster. The roadway geometry is predominately a 4-lane, divided section with a posted speed limit of 50 miles per hour (MPH). Grassed medians are present, as well as some sections of two-way left turn lane. There are currently nineteen (19) signalized intersections and sixty-nine (69) unsignalized median openings along the corridor. Land uses adjacent to the corridor include commercial, residential, and wooded.

Figure 1 shows the study area location as it relates to the surrounding roadway network.

IDENTIFIED DEFICIENCIES AND IMPROVEMENT RECOMMENDATIONS

Sain Associates identified various operational and safety-related deficiencies along the study corridor. Common deficiencies identified within the study area include the following:

- Redundant driveway
- Redundant median opening
- Excessive driveway width
- Inadequate turn lane length
- Poorly defined access point

A review of roadway geometry, traffic control equipment, crash trends, planned projects and developments, and observed traffic operations along with access management principles was conducted to inform the improvement recommendations for US-31. Typical improvement recommendations for the study area include the following:

- Driveway closure
- Median opening closure
- Turn lane construction
- Turn lane extension
- Driveway delineation
- Striping and pavement marking modification

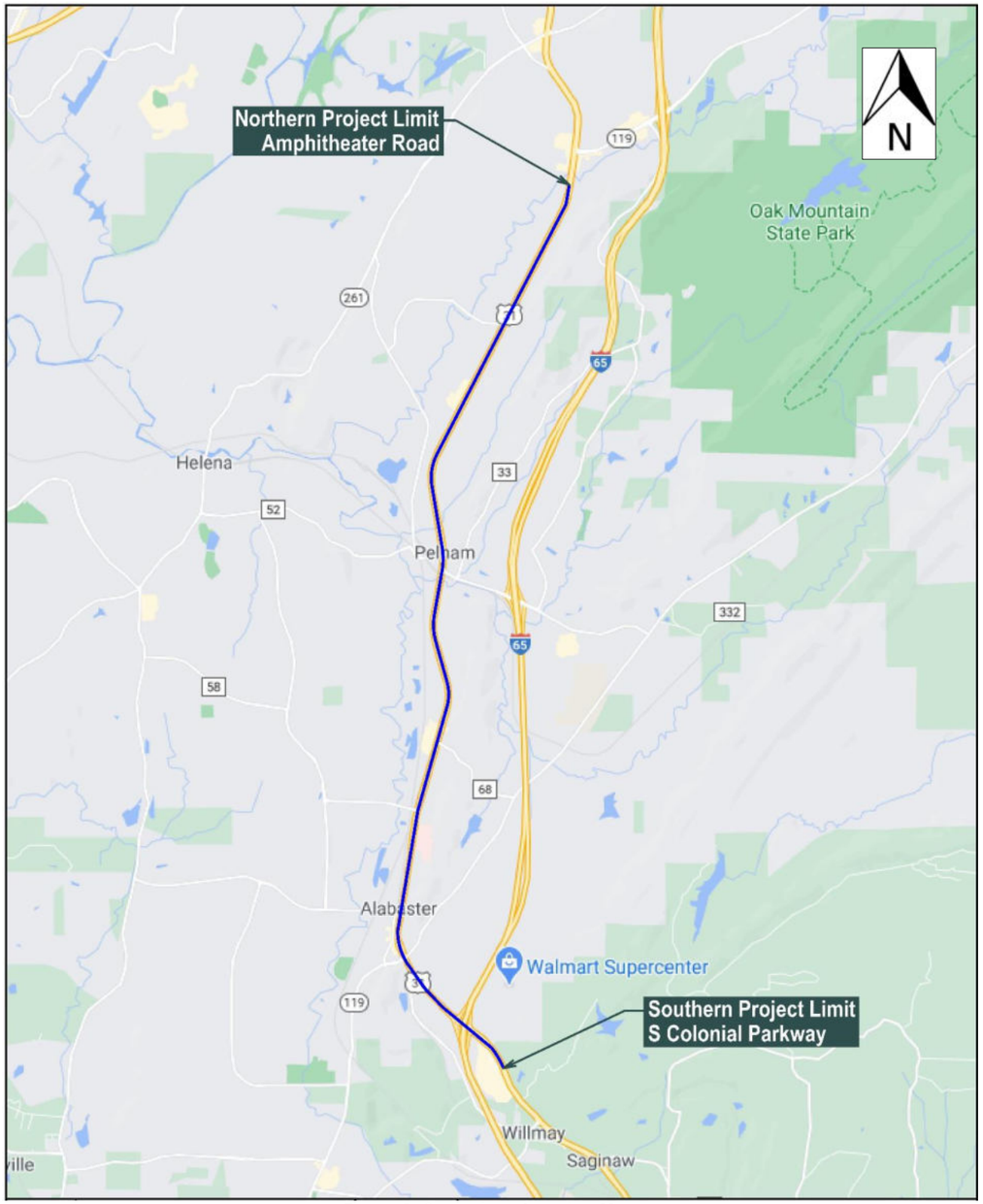

Figure 1: Study Area Location Map

1.0 PURPOSE

This study was initiated by the Regional Planning Commission of Greater Birmingham (RPCGB) in response to an Alabama Department of Transportation (ALDOT) memorandum dated July 3, 2019 which solicited applications for planning (PL) funding. The segment of US-31 between Pelham and Alabaster was determined to be a good candidate for an access management study.

The purpose of this study is to identify potential improvements along US-31 to improve the performance of the corridor in terms of both traffic operations and safety. A review of roadway geometry, traffic control equipment, crash trends, and observed traffic operations was conducted to inform the improvement recommendations.

2.0 EXISTING CONDITIONS

2.1 STUDY AREA

The study corridor is a 7.7-mile long segment of US-31 between Amphitheater Road in Pelham and South Colonial Parkway in Alabaster. The roadway geometry is predominately a 4-lane, divided section with a posted speed limit of 50 miles per hour (MPH). Grassed medians are present, as well as some sections of two-way left turn lane. There are currently nineteen (19) signalized intersections and sixty-nine (69) unsignalized median openings along the corridor. Land uses adjacent to the corridor include commercial, residential, and wooded.

2.2 SIGNAL EQUIPMENT INVENTORY

Sain Associates performed a high-level traffic signal equipment inventory and operational status review at nineteen (19) signalized intersections along the study corridor on May 4, 2020. Due to ongoing construction at the intersections of US-31 and the I-65 ramps at the time, a supplemental inventory of those two intersections was conducted on February 1, 2021. Technical memoranda summarizing the findings of these inventories are included in Appendix A.

2.3 CRASH ANALYSIS

Crash data for this analysis was provided by the RPCGB. Data included crash information from January 2016 to December 2018 from the Critical Analysis Reporting Environment (CARE) database maintained by the Center for Advanced Public Safety (CAPS) at The University of Alabama. The data for US-31 is summarized for the corridor level and for each intersection identified as a hotspot along the corridor.

2.3.1 CORRIDOR CRASH EVALUATION

The study corridor includes the US-31 roadway segment from Amphitheater Road to South Colonial Parkway. Crash data showed the following for the study corridor:

- One thousand three hundred and thirty-four (1,334) total crashes reported
- Zero (0) fatal crashes
- Seventeen (17) incapacitating injury crashes
- Fifty-six (56) non-incapacitating injury crashes
- One hundred and seventeen (117) possible injury crashes
- One thousand one hundred and fifteen (1,115) property damage only crashes
- Twenty-nine (29) crashes reported no crash severity

The majority of the reported crashes in the dataset involved rear end collisions (59%). This is expected considering the prevalence of signalized intersections along the study corridor. Further, 25% of crashes involved angle collisions, which can also be attributed to the presence of numerous signalized intersections, as well as a high number of driveways and median openings throughout the segment. The permissive and protected-permissive phasing at many signalized intersections throughout the study area also contributes to the high number of angle crashes. Figure 2 shows the breakdown of the corridor crashes by collision type.

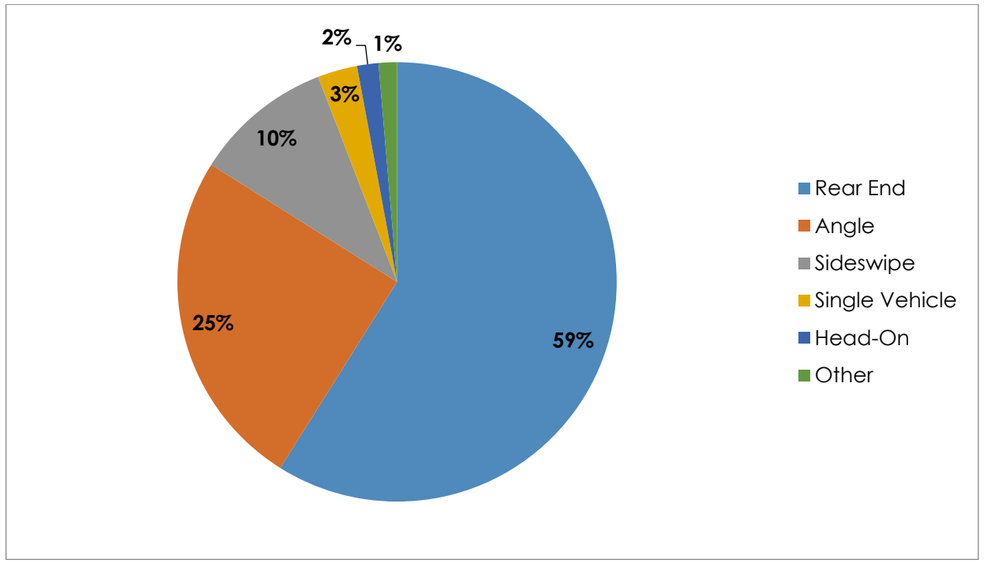

Figure 2: Crash Data Breakdown by Collision Type

Almost 85% of the corridor crashes were property damage only crashes, as shown in Table 1. Further, only 1% of total crashes resulted in severe injuries.

Table 1: Crash Data Breakdown by Severity

Crash Severity	% of Total Crashes
Incapacatating Injury	1%
Non-incapacatating Injury	4%
Possible Injury	9%
Property Damage Only	84%
Unknown	2%

Figure 3 and Figure 4 show a breakdown of crash type by severity. The percentages shown in the figures represent the proportion of each category in relation to total crashes. The majority of incapacitating injury and non-incapacitating injury crashes involved angle crashes, as shown in Figure 3. Property damage only crashes were mostly rear end crashes, as shown in Figure 4.

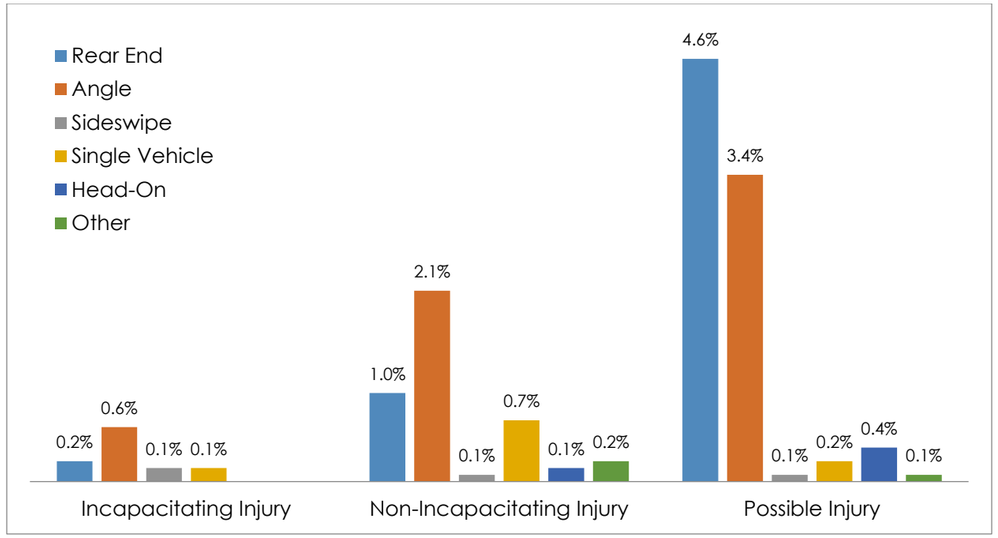

Figure 3: Percent of Corridor Injury Crashes by Collision Type

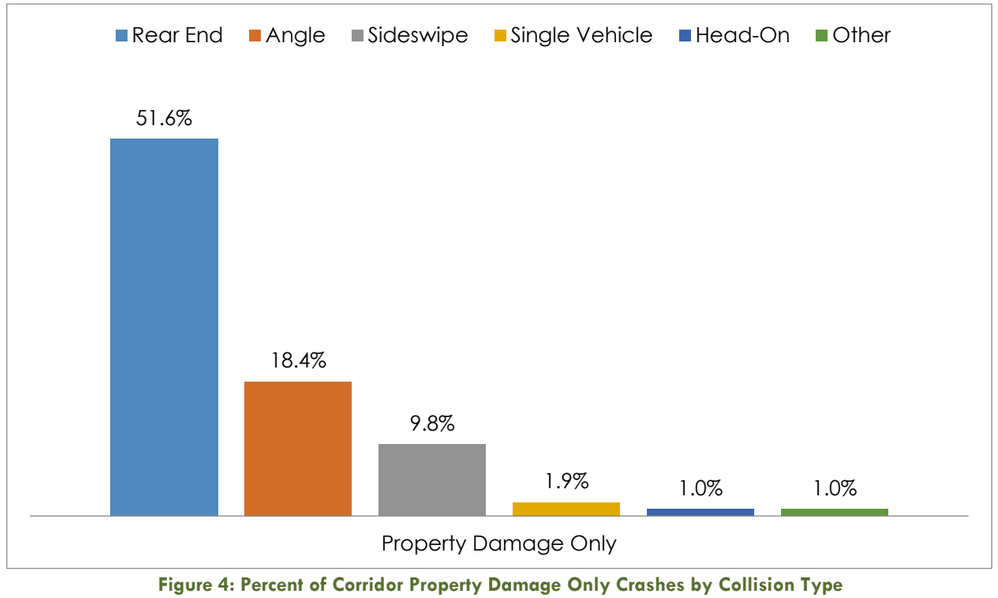

Figure 4: Percent of Corridor Property Damage Only Crashes by Collision Type

Regarding roadway users and vehicle types, the following was shown in the crash data for the US-31 study corridor:

- One (1) crash involved a pedestrian and it resulted in a possible injury
- One (1) crash involved a bicycle and it did not result in injuries
- Two (2) crashes involved school buses and they did not result in injuries
- Fifty-one (51) crashes involved commercial vehicles

The exploratory crash data analysis of the study corridor also showed the following:

- 80% of total crashes occurred during the day
- 32% percent (432 crashes) of all crashes occurred in 2016, 33% (444 crashes) in 2017, and 34% (458 crashes) in 2018
- September was the month with the lowest crash frequency (87 crashes) and March was the month with the highest crash frequency (126 crashes)
- Approximately 2% of total crashes had DUI as a contributing factor
- Approximately 1% of total crashes had speeding as a contributing factor

As shown in Figure 5, the primary contributing circumstance of the majority of the corridor crashes (22%) was "followed too close", followed by "failed to yield right-of-way" (18%) and "misjudged stopping distance" (14%).

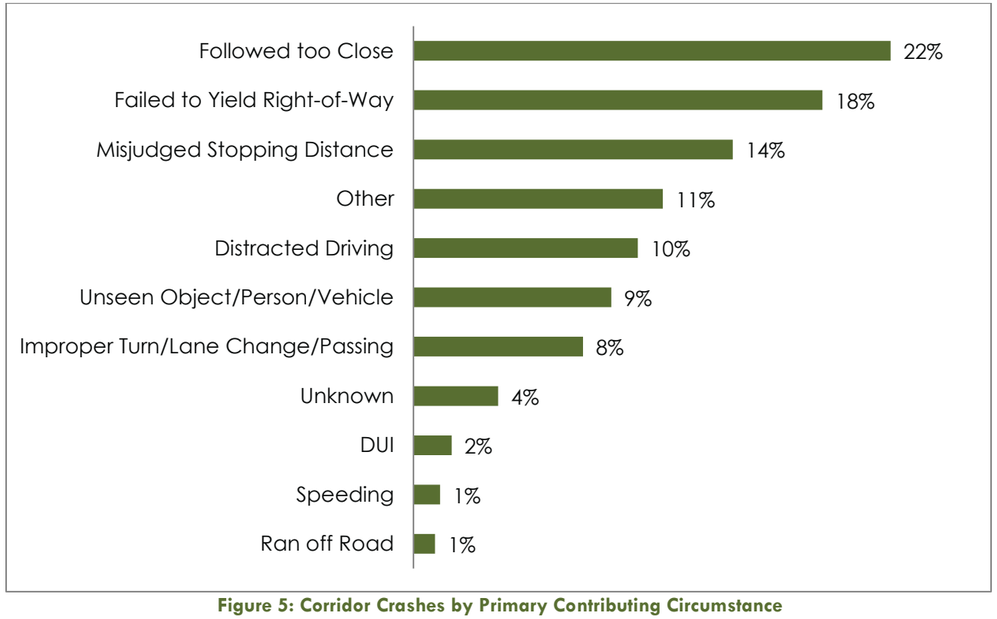

Figure 5: Corridor Crashes by Primary Contributing Circumstance

2.3.2 CORRIDOR HOTSPOTS

Within the study corridor, thirteen (13) intersections were identified as hotspots. The criteria for selecting hotspots was based on crash frequency and severity. These hotspots had higher crash frequencies and more crashes that resulted in injury than other intersection locations.

Of the thirteen (13) intersections identified as hotspots along the US-31 study corridor, twelve (12) are signalized and one (1) is unsignalized. The total number of crashes at these intersections within the dataset is eight hundred and seven (807) crashes, which represent approximately 60% of all corridor crashes. The breakdown of crash severity at the hotspots mirrors that of the entire study area dataset.

Overall, permissive and protected-permissive left turn signal phasing is a common theme throughout multiple intersections identified as hotspots. Though it is generally efficient for vehicle traffic and is unavoidable at certain locations, this type of signal phasing results in more confusion for drivers when they are required to interpret who has the right-of-way at the intersection. This is evident in the higher share of rear end and angle collisions at each intersection with this method of signal phasing.

This section summarized safety conditions for the study corridor on US-31 based on the three most recent years of available crash data. It is important to note that crashes are to some degree random events; therefore, crash frequencies naturally fluctuate over time at a given site. This randomness indicates that short-term crash frequencies alone are not a reliable estimator of long-term crash frequency. The crash fluctuation over time makes it difficult to determine whether changes in the observed crash frequency are due to changes in site conditions or are due to natural fluctuations. When a period with high crash frequency is observed, it is statistically probable that the following period will have low crash frequency. This tendency is known as regression-to-the-mean (RTM). Not accounting for the effects of RTM introduces the potential for "RTM bias" (refer to the *Highway Safety Manual* for more information).

2.4 IDENTIFIED CORRDIOR DEFICIENCIES

Sain Associates identified various operational and safety-related deficiencies along the study corridor. Common deficiencies identified within the study area include the following:

- Redundant driveway
- Redundant median opening
- Excessive driveway width
- Inadequate turn lane length
- Poorly defined access point

Standards from ALDOT's *Access Management Manual* were applied to determine corridor deficiencies. Due to the highly developed nature of US-31, engineering judgement indicated that some identified deficiencies could not be feasibly retrofitted to comply with ALDOT standards.

Maps of the identified deficiencies with corresponding recommendations as they were provided to stakeholders prior to the August/September 2020 work sessions are included in Appendix B. Short-term action items identified during the signal equipment inventory (see Section 2.2 – Signal Equipment Inventory) were included on these maps.

3.0 INTRODUCTION TO ACCESS MANAGEMENT PRINCIPLES

3.1 GENERAL OVERVIEW

US-31 is currently experiencing delays during the AM and PM peak hours. These delays are caused by high volumes and numerous conflicting movements, which in part is a byproduct of too many access points to properties in high volume areas. A successful access management plan will mitigate these problems by closing some driveways, reducing the size of some driveways, and installing medians to reduce and restrict conflicting movements to promote better mobility along the roadway and maintain the accessibility function of driveways. Additionally, access management provides opportunities to improve a corridor's aesthetics, which can help preserve the roadway's character, advance economic development goals, and increase the public's acceptance.

3.2 MOBILITY AND LAND ACCESS

A primary goal of access management is to minimize the number of access points along a roadway facility. The proper application of access management will preserve street capacity, reduce travel times, reduce traffic crashes and congestion, and can preserve the value of adjacent property. The relationship between mobility and accessibility is shown in Figure 6. Increased capacity is possible by minimizing the amount of access. This becomes particularly important for higher volume, higher speed roadways. For example, freeways function to move large volumes of traffic at high speeds for long distances because access is limited. In contrast, residential streets function primarily to provide access to residences.

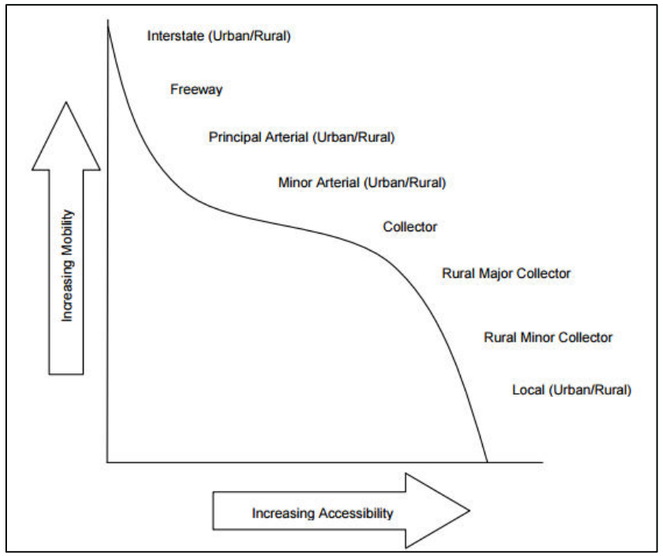

Figure 6: Mobility vs. Accessibility (Source: ALDOT)

3.3 MINIMIZE CONFLICT POINTS

Access management minimizes the number of vehicle conflict points and directs turning vehicles to strategically identified locations. Conflict points, or crossing interactions between vehicles, represent opportunities for delay due to congestion and crashes. Multiple conflict points increase the decision-making process for drivers. Ideally, drivers would only mentally process a single conflict point at a time. Designs with few traffic signals, non-traversable medians, channelized left-turn lanes, and "right-in/right-out" driveways are effective in promoting access management and minimizing conflict points. Without applying appropriate access management techniques, a typical four-leg intersection has 32 total conflict points, while a typical three-leg intersection has nine total conflict points. By applying the technique of constructing a non-traversable median combined with a "right-in/right-out" driveway, the number of conflict points is reduced to only two. These three scenarios are shown in Figure 7.

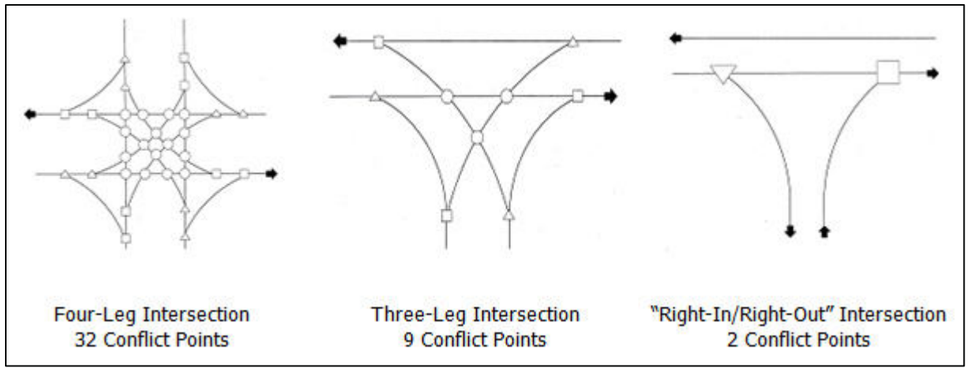

Figure 7: Intersection Conflict Points (Source: FHWA)

The various access management techniques function to minimize vehicle interaction between through traffic and turning traffic. A reduced number of turning vehicles equates to less stop-and-go traffic, less delay, and fewer and less severe crashes. Less stop-and-go traffic helps reduce air pollution and lessens fuel consumption. Fewer crashes in the corridor mean safer access to property. This is particularly important to commercial property owners who wish to provide their customers safe access to and from their property. Unsafe access can impact a commercial property's economic success.

Non-traversable medians minimize crossing vehicle maneuvers from left-turning vehicles. Fewer left-turn maneuvers will lower the number of vehicle crossing crashes, which can often be severe. Channelized left or right-turn lanes serve to remove turning vehicles from the through lanes, improve traffic flow, and reduce the likelihood of rear-end crashes. Shared and interparcel accesses also improve traffic flow and reduce the possibility of crashes by reducing the interaction of a corridor's through traffic from traffic wishing to access a corridor's various land uses.

4.0 ADJACENT PROJECTS

The following projects are either proposed or currently under construction along US-31. Potential impacts on the roadway network were considered in the development of the improvement recommendations.

4.1 DISTRICT 31

District 31 is a proposed mixed-use development just north of the I-65/US-31 interchange in Alabaster. The development will be approximately 75 acres in size and contain over 350,000 square feet of retail shops. The site plan includes proposed improvements to the I-65 southbound exit ramp, 9th Avenue SE, and 7th Avenue SE at their intersections with US-31. The southernmost intersection of 7th Avenue SE and US-31 is proposed to be realigned and have a traffic signal installed. This would serve as the main entrance into the District 31 development. Proposed improvements as shown on the concept maps in this area reflect information provided by the City and the project developer.
https://www.district31al.com/

4.2 CR-52 IMPROVEMENTS

ALDOT project #STPBH-7012(602) contains proposed improvements to CR-52 between US-31 and I-65 in Pelham. The project would also affect US-31 beginning approximately 0.3 miles north of Stonehaven Trail and ending near Yeager Parkway. Proposed improvements to US-31 include widening of the bridge over Peavine Creek and the implementation of "Michigan left" configurations for both US-31/CR-52 intersections. At the time this study was conducted, the date of implementation for the project was unknown; therefore, the recommendations in this area are intended as interim improvements until the full CR-52 project is implemented.

4.3 CAMPUS 124

Campus 124 is a proposed mixed-use development at the intersection of US-31 and Meadowview Lane/Opportunity Drive. It will contain a combination of commercial and residential land uses. Because information regarding specific land uses was not finalized at the time this study was conducted, it was assumed that the development would utilize existing accesses along US-31.

5.0 PROPOSED IMPROVEMENTS

5.1 IMPROVEMENT RECOMMENDATIONS

A review of roadway geometry, traffic control equipment, crash trends, planned projects and developments, and observed traffic operations along with access management principles was conducted to inform the improvement recommendations for US-31. Typical improvement recommendations for the study area include the following:

- Driveway closure
- Median opening closure
- Turn lane construction
- Turn lane extension
- U-turn bulb-out construction
- Striping and pavement marking modification

Concept drawings of the proposed improvements are included in Appendix C. Short-term action items identified during the signal equipment inventory (see Section 2.2 – Signal Equipment Inventory) were also included on these maps.

5.2 OPINIONS OF PROBABLE COST

Planning-level opinions of probable cost were developed for the proposed improvements and the short-term maintenance action items. The estimates are based on the engineer's experiences and qualifications and represent the engineer's best judgement within the industry. The engineer does not guarantee that proposals, bids, or actual costs will not vary from the engineer's opinions of probable cost. The opinions of probable cost were estimated in 2021 dollars; for budgeting future year projects, the Cities will need to escalate the costs to future year dollars. A contingency of 25% was included in the estimates to include miscellaneous and/or unknown items that cannot be quantified at the time the study was conducted. The contingency does not cover costs associated with utility work, right-of-way acquisition, or pavement resurfacing. The opinions of probable cost represent construction costs only and do not include preliminary engineering services.

Table 2 lists approximate unit costs used to develop the planning-level opinions of probable cost. Tables 3 and 4 summarize the opinions of probable cost for the cities of Alabaster and Pelham, respectively.

The improvements are divided into potential project groupings; however, access management projects such as these are typically not funded all at once. Portions of the proposed improvements could be implemented in conjunction with other planned projects, which would help reduce costs and accelerate implementation. The Cities should consider including various access management recommendations in projects such as resurfacing/maintenance work and private developments.

Table 2: Typical Improvement Unit Costs

Improvement	Approximate Unit Cost
Driveway closure	$7,500
Median opening closure	$7,500
Turn lane extension	$60,000 - $200,000*
New turn lane construction	$250,000
U-turn bulb-out construction	$100,000

*Based on length of extension

Table 3: Opinions of Probable Cost Per Improvement Group – Alabaster

Location	Map #	Mileage	Description of Work	Approximate Cost
S Colonial Pkwy to Montevallo Rd/SR-119/Simmsville Rd/CR-11	1-3	0.57	• 5 full driveway closures • 4 median opening closures • 1 turn lane extension • 5 new turn lanes • 1 U-turn bulb out • Signs & markings	$2,360,000
Montevallo Rd/SR-119/Simmsville Rd/CR-11 to Industrial Rd/CR-66	3-5	1.21	• 9 full & 5 partial driveway closures • 2 median opening closures • 1 turn lane extension • 1 U-turn bulb-out • Signs & markings • Striping modifications at 2nd Pl NW	$510,000
Industrial Rd/CR-66 to CR-68	5-6	1.17	• 6 full driveway closures • 7 median opening closures • 2 turn lane extensions • 2 U-turn bulb-outs	$730,000

Table 4: Opinions of Probable Cost Per Improvement Group – Pelham

Location	Map #	Mileage	Description of Work	Approximate Cost
CR-68 to Stonehaven Trail	6-8	0.82	• 8 full & 7 partial driveway closures • 10 median opening closures • 4 turn lane extensions • 4 new turn lanes • 1 U-turn bulb-out	$2,110,000
Stonehaven Trail to Word Dr/CR-52	8-9	0.75	• 2 median opening closures • 2 turn lane extension • 4 new turn lanes • Striping modifications on Word Dr	$1,690,000
Word Dr/CR-52 to Industrial Park Dr/CR-105	9-10	0.75	• 12 full & 3 partial driveway closures • 4 median opening closures • 2 turn lane extensions • 1 new turn lane • 1 U-turn bulb-out • Actuated flashing warning devices • Traffic signal removal	$1,060,000
Industrial Park Dr/CR-105 to Crosscreek Trail	10-12	1.22	• 6 full & 7 partial driveway closures • 8 median opening closures • 6 turn lane extensions • 5 new turn lanes • 1 U-turn bulb-out • Signs & markings	$2,840,000
Crosscreek Trail to Amphitheater Rd	12-14	1.18	• 8 full driveway closures • 9 median opening closures • 4 turn lane extensions • 7 new turn lanes	$3,330,000

5.3 CRASH MODIFICATION FACTORS

Crash modification factors (CMFs) can be used to prioritize improvements based on their safety impacts. According to the Crash Modification Factors Clearinghouse, "a CMF is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. A CMF reflects the safety effect of a countermeasure, whether it is a decrease in crashes (CMF below 1.0), increase in crashes (CMF over 1.0), or no change in crashes (CMF of 1.0)." A countermeasure is defined as "a strategy intended to reduce crash frequency or severity on the road." Countermeasures may improve the operation and safety of a particular area, but they are most effective in coordination with each other to improve the corridor as a whole.

Table 5 gives CMF values for various recommended improvements. Median opening closures should be given priority over other improvement options, both because of their effectiveness at reducing crashes and relatively low cost to implement.

Table 5: Crash Modification Factors

Countermeasure	Crash/Injury Type	CMF
Reducing access point density	All injuries	0.75
Median opening closure	All crashes	0.51
Change driveway density from X to Y	All crashes	calculated
Addition of left/right turn lane (1 approach)	All crashes	0.96
	All injuries	0.91
Addition of left/right turn lane (2 approaches)	All crashes	0.92
	All injuries	0.83
Median conversion to directed left turns	All injuries	0.64

6.0 STAKEHOLDER INVOLVEMENT

Several stakeholder meetings were conducted during the course of the study. Prior to the three work sessions in August and September 2020, Sain Associates prepared and provided the stakeholders with maps of the study area displaying identified deficiencies and potential improvements. Meeting minutes are included in Appendix D.

Project Kickoff Meeting – May 19, 2020
The purpose of this meeting was to formally begin the study by discussing the scope, gathering input from stakeholders, and defining expectations for the final deliverable. The meeting was attended by representatives of Sain Associates, the City of Pelham, the City of Alabaster, the RPCGB, and ALDOT.

At this meeting, the Cities of Pelham and Alabaster both expressed a desire for the study to focus on closure of median openings and consolidation of driveways. ALDOT expressed interest in including applicable access management measures in a resurfacing project for the Alabaster portion of US-31. Sain Associates agreed to perform a field inventory of traffic signal equipment and produce a technical memorandum to document any short-term action items. Sain also agreed to identify access management deficiencies and discuss with the Cities potential improvements to mitigate the deficiencies.

First Pelham Work Session – August 24, 2020
The purpose of this meeting was to discuss the deficiencies and improvements for the Pelham portion of the study corridor and solicit feedback and concurrence from stakeholders. The meeting was attended by representatives of Sain Associates, the City of Pelham, the RPCGB, and ALDOT.

At this meeting, the City of Pelham agreed to provide Sain Associates with a summary of the CR-52 project status. Also, the following areas were identified for further analysis:

- US-31 at Tony Holmes Drive, near Regions Bank and the Post Office
- US-31 at Phillip Davis Street
- Left turn lane area located north of CR-68

First Alabaster Work Session – August 24, 2020
The purpose of this meeting was to discuss the deficiencies and improvements for the Alabaster portion of the study corridor and solicit feedback and concurrence from stakeholders. The meeting was attended by representatives of Sain Associates, the City of Alabaster, the RPCGB, and ALDOT.

At this meeting, the City of Alabaster agreed to provide Sain Associates with information regarding the District 31 development, including scheduling and planned accesses. The City also agreed to investigate ownership of the alley located behind the police station near 2nd Place NW. Additionally, the following areas were identified for further analysis:

- I-65 southbound ramp right turn lane onto US-31 northbound
- US-31 at 2nd Place NW
- US-31 at SR-119
- US-31 at Industrial Drive
- Driveways for any car dealerships

ALDOT Work Session – September 9, 2020
The purpose of this meeting was to discuss the deficiencies and improvements for the entire study corridor and solicit feedback and concurrence from stakeholders. The meeting was attended by representatives of Sain Associates, the RPCGB, and ALDOT.

At this meeting, it was agreed that 2016 traffic volumes with an applied growth rate could be used for analysis, instead of collecting new traffic counts.

Phillip Davis Street Discussion – January 20, 2021
The purpose of this meeting was to discuss the possibility of installing an emergency traffic signal at the intersection of US-31 and Phillip Davis Street in Pelham to service the nearby police and fire stations. The meeting was attended by representatives of Sain Associates, the City of Pelham, Pelham Fire Department, and Pelham Police Department. The meeting was conducted outside Pelham City Hall.

The southbound approach of the US-31/CR-52 intersection regularly experiences extreme queueing, especially during peak periods of traffic flow, that extends beyond Phillip Davis Street; this prevents emergency vehicles from turning onto US-31 when responding to a call. Gate-posted "DO NOT BLOCK INTERSECTION" signs had been installed on southbound US-31, but the City representatives reported that they had little effect. ALDOT had plans to stripe the intersection and install "DON'T BLOCK THE BOX" signs as a temporary measure. All meeting attendees agreed about the necessity of an emergency signal. Due to the proximity to the CR-52 traffic signal, it was decided to pursue an emergency vehicle hybrid beacon (with accompanying signage) instead of a full emergency traffic signal.

Final Pelham Work Session – March 15, 2021
The purpose of this meeting was to discuss the improvements for the Pelham portion of the study corridor and solicit any final feedback from the stakeholders. The meeting was attended by representatives of Sain Associates, the City of Pelham, the RPCGB, and ALDOT.

After this meeting, the concept drawings were edited according to stakeholder feedback and finalized. The major changes from this discussion were the addition of directed left turns at various median openings and a few additional median opening closures.

Final Alabaster Stakeholder Discussion – March 30, 2021
Sain met with the City of Alabaster to discuss proposed improvements. Prior to March 30, 2021, the City of Alabaster met with ALDOT to discuss the possibility of incorporating improvements identified in this study in ALDOT's upcoming resurfacing of US-31 through Alabaster. ALDOT informed the City that due to the advanced stage of the resurfacing project, additional scope could not be added. The City will continue coordination with ALDOT.

During the meeting between the City of Alabaster and ALDOT, ALDOT expressed concern related to the ability of motorists, specifically large trucks, to make U-turn movements along the corridor. Concepts were evaluated to confirm U-turn movements could be made and in areas where additional pavement would be required to accommodate a U-turn, concept mapping was revised as such.

7.0 POTENTIAL FUNDING SOURCES

Costs associated with the design and construction of the proposed improvements could exceed either of the Cities' current available resources, in which case there are funding sources available. Federal assistance programs are administered by ALDOT. Table 6 summarizes some potential funding sources.

Table 6: Funding Options

Funding Source	Category	Match Type
Surface Transportation Plan (STP)	Federal	80% federal/20% city
Highway Safety Improvement Plan (HSIP)	Federal	90% federal/10% city
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Federal	80% federal/20% city
Alabama Transportation Rehabilitation and Improvement Program-II (ATRIP-2)	State	No match required
Rebuild Alabama Act Grant Program	State	No match required

7.1 SURFACE TRANSPORTATION PROGRAM

The Surface Transportation Program (STP), administered by ALDOT, requires an 80% federal/20% local match. The STP program provides flexible funding to states and localities for their use in preserving and improving the conditions and performance of a roadway. STP-eligible activities applicable to the alternatives studied include operational improvements for highways and intersections with high levels of congestion. A potential downside to STP funding is the time it adds to the overall project. Additional time is required in order to account for ALDOT and FHWA involvement, including additional plan reviews and more stringent design and construction standards. For these reasons, a timeframe for completing an STP-funded project is estimated at five to eight years.
https://www.fhwa.dot.gov/specialfunding/stp/160307.cfm

7.2 HIGHWAY SAFETY IMPROVEMENT PLAN

The Highway Safety Improvement Program (HSIP) is a 90% federal/10% local match program and has been continued through the Fixing America's Surface Transportation (FAST) Act. HSIP exists to provide funding to perform projects that seek to reduce the number of fatalities and serious injuries resulting from traffic crashes. HSIP funds are administered by ALDOT's Safety Operations Office. The application for HSIP funds requires, among other general project details, that the project sponsor show how the proposed project will improve safety using Crash Reduction Factors (CRF). A benefit/cost ratio is also a requirement of the application. The application must be signed by a Professional Engineer. Like STP funding, HSIP funded projects require additional time in order to account for ALDOT and FHWA involvement including additional plan reviews and more stringent design and construction standards. For these reasons, a timeframe for completing a HSIP-funded project is estimated at five to eight years.
https://safety.fhwa.dot.gov/hsip/

7.3 CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) is an 80% federal/20% local match program and has been continued through the Fixing America's Surface Transportation (FAST) Act. CMAQ funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for various pollutants. Any project must be included in the metropolitan planning organization's (MPO) current transportation plan and transportation improvement plan (TIP).
https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm

7.4 ALABAMA TRANSPORTATION REHABILITATION AND IMPROVEMENT PROGRAM-II

The Alabama Transportation Rehabilitation and Improvement Program-II (ATRIP-2) is administered by ALDOT through a competitive project selection process. The purpose of ATRIP-2 is to support projects of local interest that benefit the state-maintained highway system. Any local public agency is eligible to apply for funding, and applications may be submitted jointly for projects of interest to more than one local government entity. For projects selected in fiscal year 2021, the maximum available funding for one project was $2,000,000 and funds were available for a period of two (2) years after being awarded. The application window for fiscal year 2021 projects closed on October 30, 2020. The deadline to apply for fiscal year 2022 projects is not yet known. A local match is not required for the grant funding; however, projects that include a local funding commitment are viewed favorably.

7.5 REBUILD ALABAMA ACT ANNUAL GRANT PROGRAM

The Rebuild Alabama Act (RAA) Annual Grant Program is administered by ALDOT and they determine the final eligibility of projects. The Grant Program funds are awarded through a competitive project selection process and at the time this report was prepared, the maximum available funding was $250,000 per project. Funds may only be applied to construction-related activities. The application window for fiscal year 2021 projects closed on November 30, 2020. The deadline to apply for fiscal year 2022 projects is not yet known. A local match is not required for the grant funding; however, projects that include a local funding commitment are viewed favorably.