

County Road 47 and County Road 39 Realignment-APPLE Study

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Executive Summary

Study Initiation

This study was initiated by Shelby County through the Advanced Planning, Programming, and Logical Engineering (APPLE) program developed by the Regional Planning Commission of Greater Birmingham (RPCGB). The County requested professional planning assistance in evaluating the feasibility of improvements to the at-grade railroad crossing on County Road 47 and the signalized intersection of County Road 47 and County Road 39.

Purpose of the Study

This study was undertaken to assess the feasibility of improving the at-grade railroad crossing on County Road 47 and the signalized intersection of County Road 47 and County Road 39. This document summarizes:

- Existing and expected transportation system operational conditions and deficiencies,
- The process used to identify potential alternatives for improvement,
- The resulting alternatives that were developed from that process, and
- An evaluation of potential positive and negative impacts to the area and adjacent properties that may be associated with each potential improvement.

The purpose of this study is not to select a preferred build option, but to identify feasible improvements and their potential impacts. If the County chooses to move forward with an improvement project for the area, a more detailed Environmental Planning Study would be required for federally funded projects.

Purpose and Need for Improvements

Within the study area, County Road 47 is a two-lane rural minor arterial that connects Chelsea and other rural communities of Shelby County to US-280. The segment of County Road 39 south of County Road 47 is a two-lane rural major collector that connects the entire area of Chelsea to County Road 47; the segment of County Road 39 east of County Road 47 is a two-lane minor collector that connects County Road 47 to US-280.

There is a railroad at-grade crossing on County Road 47 just north of the signalized intersection between County Road 39 and County Road 47; when queues form in the southbound direction, vehicles can become stopped on the railroad tracks, creating an unsafe situation. Crash data shows mainly low-severity crashes in the study area, which can be attributed to the low speed limits on both County Road 47 and County

Road 39; however, several conflicts were observed at the railroad crossing, representing potential risk of severe crash occurrence. Also, long northbound queues were observed during school drop-off and pick-up hours. The Regional Planning Commission of Greater Birmingham (RPCGB) predicts a 5 percent straight-line growth rate per year to Shelby County traffic, which would greatly increase congestion on County Road 47 and County Road 39.

There is a need to improve the safety concerns associated with the at-grade railroad crossing on County Road 47 and mitigate the congestion experienced at the signalized intersection of County Road 47 and County Road 39.

Improvement Alternatives

Different options for improvement exist for improving the geometry and safety concerns related to the proximity of the existing signalized intersection County Road 47 and County Road 39 and the nearby at-grade railroad crossing:

- **No-build** represents existing conditions that are maintained in the future.
- **Alternative A** re-routes traffic in order to eliminate the existing signalized intersection of County Road 39 and County Road 47. The recomposed network would bypass downtown Chelsea by merging County Road 39 and County Road 47 south of downtown Chelsea and essentially shifting the signalized intersection of County Road 39 and County Road 47 to this location where County Road 47 south would "T" into the major movement of County Road 39 to County Road 47. This alternative requires a bridge over the existing railroad. Vertically speaking, the required bridge over the railroad can tie back into the existing County Road 47 without impacting the in-place Yellowleaf Creek Bridge; however, only a 30 mile per hour design speed can be accomplished where a 45 mile per hour design speed is desirable. Figure 11 shows the concept for Alternative A.
- **Alternative B** re-routes County Road 47 so that it no longer travels through downtown Chelsea but connects to County Road 39 north of County Road 337 through property south of Allen Drive. This alternative shifts the existing signalized intersection south and requires a bridge over the railroad and Yellowleaf Creek. In order for the required bridge to connect to grade before Teen Town Road, a design speed of 35 miles per hour is required which is less than the 45 mile per hour desirable design speed. Figure 12 shows the concept for Alternative B.
- **Alternative C** includes extending County Road 47, located south of downtown Chelsea, over the existing railroad via a bridge before connecting to County Road 39, located north of the railroad. During the geometric concept evaluation of Alternative C it was determined that this alignment is not feasible due to

vertical constraints. The required railroad vertical clearances include a 23' required clearance between the top of the rail and the bottom of the bridge girders. In order to maintain this clearance, the proposed bridge would not be able to connect to the existing County Road 39 without exceeding the maximum longitudinal roadway grades. This alternative was eliminated from further study.

- **Alternative D** includes extending the southern portion of CR-39 over the existing railroad before tying to the northern portion of County Road 39 and eventually connecting to US-280. The same vertical constraints seen in Alternative C are experienced with Alternative D so it was also eliminated from further study.
- **Alternative E** re-routes the southern portion of County Road 47 so that it connects to County Road 39 north of County Road 337 through property located south of Allen Drive. This alternative shifts the existing signalized intersection to this location. Additionally, Alternative E includes realigning County Road 39 so that it is located west of City Hall and bridges over the railroad and Yellowleaf Creek. In order to connect to County Road 47 prior to Teen Town Road, the design speed would need to be 40 miles per hour. Figure 13 shows the concept for Alternative E.
- **Alternative F** includes widening County Road 39 and County Road 47 to four (4) travel lanes; a slight realignment of County Road 39 with at-grade improvements to the railroad crossing; and realigning County Road 47 so that it no longer travels through downtown Chelsea but connects to County Road 39 north of County Road 337 through property south of Allen Drive. The signalized intersection shifts to this new intersection location. Figure 14 shows the concept for Alternative F.
- **Alternative F'** maintains two (2) travel lanes and includes a slight realignment of County Road 39 with at-grade improvements to the railroad crossing and realigning County Road 47 so that it no longer travels through downtown Chelsea but connects to County Road 39 north of County Road 337 through property south of Allen Drive. The signalized intersection shifts to this new intersection location and turn lanes are provided. Figure 15 shows the concept for Alternative F'.

Stakeholder Involvement

A project kickoff meeting was conducted on January 25, 2017 at Chelsea City Hall. The purpose of this meeting was to provide an overview of the APPLE program, outline study reporting criteria including previously identified considerations, provide an overview of Federal Aid funding, and determine expectations for the report. Representatives from

the City of Chelsea, Shelby County, and RPCGB were present. Several build options for improvement were discussed during this meeting.

Following the initial kickoff meeting, several follow up meetings were conducted to discuss the study alternatives. During one of these follow up meetings, it was determined that a Public Involvement Meeting would benefit the City of Chelsea.

A Public Involvement Meeting was held on August 15, 2017 immediately following the regularly scheduled Chelsea City Council Meeting.

Next Steps

The purpose of this study was to determine the feasibility of potential improvements to the at-grade crossing on County Road 47, as well as, improvements to the signalized intersection of County Road 47 and County Road 39. If the County chooses to move forward with implementing any of the build options and would like to pursue Federal funding, the next step would be to request inclusion of a project in the Birmingham Regional Transportation Improvement Plan. Once funds are in place for the project an environmental document will need to be prepared. The environmental document must include technical studies and public involvement outreach necessary to comply with procedures of the National Environmental Policy Act (NEPA). Once the environmental study has been completed, design would be finalized, followed by construction. If it is determined that additional right-of-way is required, acquisition would be conducted prior to construction. Due to the nature of the improvements' purpose and need being safety, there is potential for the County to obtain Highway Safety Improvement Program funds administered by ALDOT's Safety Operations Office.

The County may also elect to pursue improvements described in this study without federal funding. If this is the case, coordination between the County, the City of Chelsea, and the railroad company will be required to determine if any partnerships could be made to implement the improvements. In addition, an Alabama Department of Transportation permit for the improvements would have to be obtained for any work that would occur inside ALDOT right-of-way. Other permitting required would include an ADEM permit for any land disturbance greater than one acre and a United States Corps of Engineers permit would be required for any impacts to Yellowleaf Creek.

Table of Contents

1	Introduction.....	1
1.1	Study Initiation	1
1.2	Study Approach.....	1
2	Base Conditions.....	2
2.1	Description of the Study Area	2
2.2	Geometrics	4
2.3	Field Observations.....	4
2.3.1	General Observations.....	4
2.3.2	AM Peak Period	6
2.3.3	Afternoon School Peak Period	8
2.3.4	Commuter PM Peak Period.....	9
2.4	Existing Traffic Operations Evaluation	11
2.4.1	Bicycle and Pedestrian Accommodations.....	11
2.4.2	Traffic Counts	11
2.4.3	Existing Capacity Analysis	13
2.4.4	Crash Data	13
3	Environmental Features.....	14
3.1	Existing Documents.....	14
3.2	Historical Assets	14
3.3	Threatened and Endangered Species	15
3.4	Wetlands and Floodplain	16
3.5	Hazardous Materials Properties.....	16
3.6	Utilities	16
3.7	Environmental Justice	17
4	Improvement Alternatives	18
4.1	No-Build Option.....	18
4.2	Alternative A.....	18
4.3	Alternative B	22
4.4	Alternative C.....	22

4.5	Alternative D.....	22
4.6	Alternative E.....	25
4.7	Alternative F.....	28
4.7.1	Alternative F' Improvement Option.....	31
4.8	Opinion of Probable Cost.....	33
5	Future Conditions	34
5.1	Future Traffic Operations Evaluation (2037)	34
5.2	Future Traffic Operations Evaluation (2027)	46
5.3	Service Life of Alternative F'	50
6	Funding Sources	53
7	Stakeholder Involvement	55
8	Next Steps.....	56

APPENDICES

Appendix A – Level Of Service Description
Appendix B – Crash Data Summary Information
Appendix C – Preliminary Cultural Resources Evaluation
Appendix D – USFWS Concurrence Request Letter and USFWS Response
Appendix E – NRCS Concurrence Request Package and NRCS Response
Appendix F – Utility Map
Appendix G – Opinion of Probable Cost for Alternative F'
Appendix H – HCS Reports (Available Upon Request)
Appendix I – Synchro Reports: Existing Conditions (Available Upon Request)
Appendix J – Synchro Reports: Future Conditions (Available Upon Request)
Appendix K – Public Involvement Comment Forms and Record

List of Figures

Figure 1: Study Area Location Map	3
Figure 2: At-Grade Railroad Crossing on County Road 47	5
Figure 3: Beginning of Northbound Queue Behind School Buses.....	6
Figure 4: AM Northbound Queue on County Road 39 Toward US-280	7
Figure 5: AM Westbound Queue – Looking East	8
Figure 6: Several School Buses at School PM Peak Period.....	9
Figure 7: Commuter PM Southbound Queue – Looking North	10
Figure 8: Commuter PM Southbound Queue – Looking South	10
Figure 9: Existing Peak Hour Volumes.....	12
Figure 10: Alternatives Map.....	20
Figure 11: Alternative A Concept.....	21
Figure 12: Alternative B Concept	24
Figure 13: Alternative E Concept	27
Figure 14: Alternative F Concept	30
Figure 15: Alternative F' Concept.....	32
Figure 16: Study Segments.....	36
Figure 17: Future Peak Hour Volumes: No-Build.....	39
Figure 18: Future Peak Hour Volumes: Alternative A	40
Figure 19: Future Peak Hour Volumes: Alternative B.....	41
Figure 20: Future Peak Hour Volumes: Alternative E.....	42
Figure 21: Lane Configuration: Alternative A	43
Figure 22: Lane Configuration: Alternative B	44
Figure 23: Lane Configuration: Alternative E	45
Figure 24: Future Peak Hour Volumes: Alternative F	48
Figure 25: Lane Configurations: Alternative F.....	49

List of Tables

Table 1: Existing Intersection Conditions LOS	13
Table 2: Socioeconomic Overview	17
Table 3: Alternative A Summary of Improvements	19
Table 4: Alternative B Summary of Improvements	23
Table 5: Alternative E Summary of Improvements	26
Table 6: Alternative F Summary of Improvements	29
Table 7: Alternative F' Summary of Improvements	31
Table 8: Alternatives Cost Comparison	33
Table 9: Number of Lanes to Provide LOS C for 20-Year Design Volumes (2037)	35
Table 10: No-Build Intersection Level of Service (2037)	37
Table 11: Alternative A Intersection Level of Service (2037)	38
Table 12: Alternatives B and E Intersection Level of Service (2037)	38
Table 13: Number of Lanes to Provide LOS C for 10-Year Design Volumes (2027)	47
Table 14: Alternative F Intersection LOS	50
Table 15: Service Life for the Intersection of County Road 39 and County Road 47	52
Table 16: Alternative F' LOS – AM Peak	53
Table 17: Funding Options	53

1 Introduction

1.1 Study Initiation

This study was initiated by Shelby County through the Advanced Planning, Programming, and Logical Engineering (APPLE) program developed by the Regional Planning Commission of Greater Birmingham (RPCGB). The County requested professional planning assistance in evaluating the feasibility of improvements to the at-grade railroad crossing on County Road 47 and the signalized intersection of County Road 47 and County Road 39. This document summarizes:

- Existing and expected transportation system operational conditions and deficiencies,
- The process used to identify potential alternatives for improvement,
- The resulting alternatives that were developed from that process, and
- An evaluation of potential positive and negative impacts to the area and adjacent properties that may be associated with each potential improvement.

1.2 Study Approach

The study was performed using a two-stage process. Stage one included an evaluation of the existing conditions and constraints. After all constraints were identified, an evaluation of future conditions was conducted and alternatives were developed to address identified deficiencies.

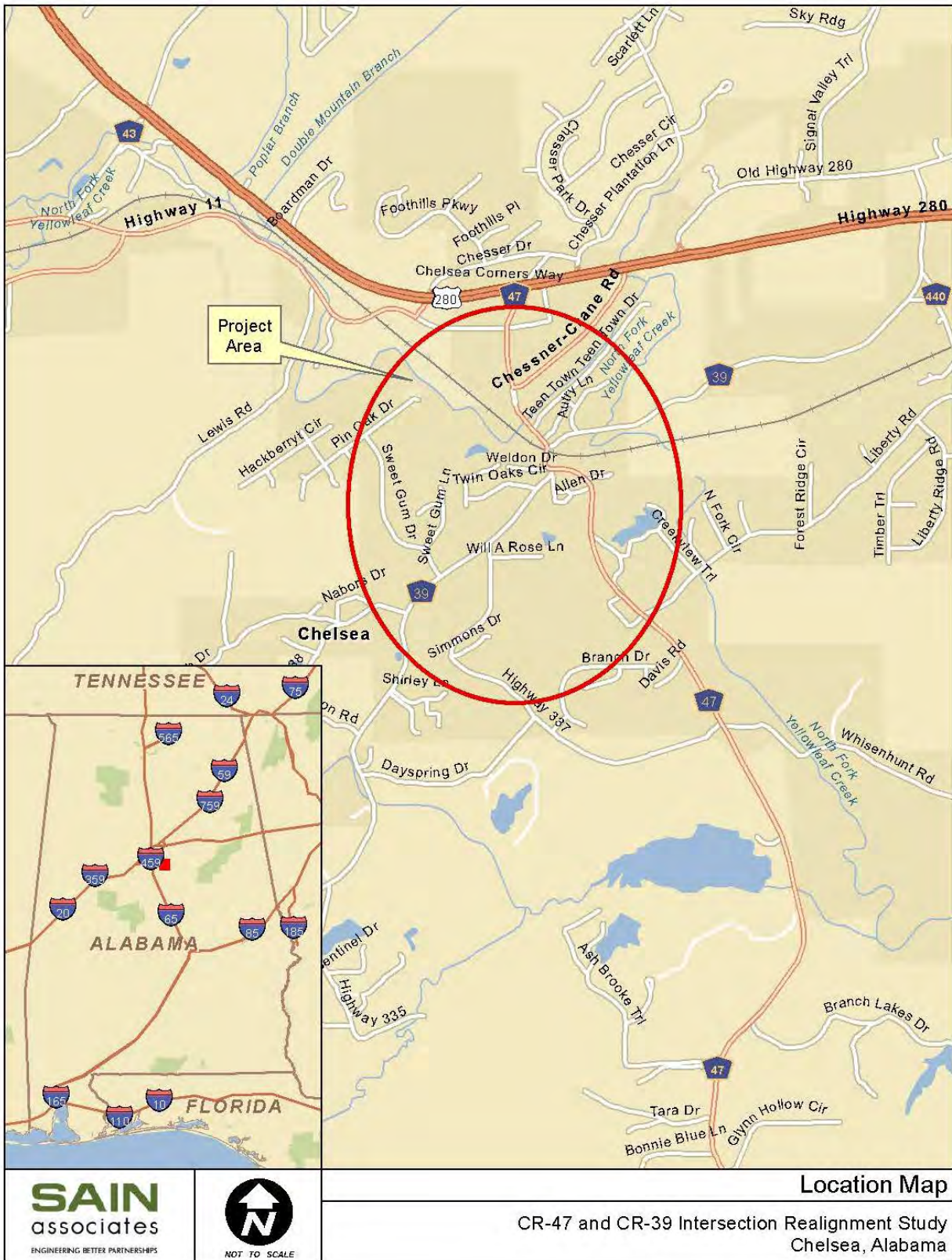
For stage one, existing traffic data was collected and a capacity analysis of the existing conditions was prepared. A base map was prepared using aerial images and available GIS data. All information was compiled and evaluated to define the needs of the corridor and identify constraints and opportunities for improvement. A field review was performed as part of stage one. This field review consisted of observing peak hour traffic patterns and investigating what impacts various improvement options would have to the study area.

For stage two, future traffic volumes were projected and analyzed with the existing roadway conditions (no-build option). Improvement options were developed and evaluated relative to their ability to address the purpose and need for the project (build options).

2 Base Conditions

2.1 Description of the Study Area

The study area, as shown in Figure 1, is located in the City of Chelsea, Shelby County, Alabama approximately 0.5 miles south of US-280. The study area includes both intersections between County Road 47 and County Road 39. The study area is predominantly residential and includes Chelsea City Hall, Shelby County Sheriff's Department, Chelsea Public Library, Mountainview Church (County Road 39), and Chelsea Church of God. The study area is also adjacent to Chelsea Middle School (County Road 39), Forest Oaks Elementary School (County Road 337), Chelsea Creek Community Church (County Road 47), Liberty Baptist Church (County Road 47), and Chelsea Community Center (County Road 47).



2.2 Geometrics

County Road 47 and County Road 39 are two-lane roadways that briefly merge together in downtown Chelsea. The merging of these two facilities occurs between two intersections that are separated by a CSX rail line. On the north side of the railroad, County Road 39 has a 35 MPH speed limit and intersects County Road 47 at a “T” type intersection that is controlled by a stop sign on County Road 39. From this point moving southward across the railroad tracks, the two routes are combined. South of the railroad crossing, the routes curve sharply and then separate at another “T” type intersection that is controlled by a traffic signal. A separate right turn lane is provided on the southbound approach to this intersection.

Moving south from the signalized intersection, County Road 47 has a posted speed limit of 35 MPH and County Road 39 has a 40 MPH speed limit. There are additional side-street stop-controlled intersections along each route as they extend southward through the study area.

Geometrically speaking, there are several noteworthy deficiencies in the studied corridor:

- The vertical alignment of the railroad crossing has a hump that makes it difficult for tractor trailers to traverse it and results in very slow crossing speeds for all vehicles.
- In close proximity to the railroad crossing are a sharp horizontal curve, a vertical curve, and a signalized intersection.
- The stopping sight distance for motorists on County Road 47 southbound (north of the railroad) is not adequate. Based on the posted speed limit of 35 miles per hour, the required stopping sight distance is 250 feet per AASHTO's *A Policy on Geometric Design of Highways and Streets*. The available stopping sight distance was measured at approximately 200 feet.
- Sight distance is severely limited for vehicles making a left turn from westbound County Road 47 onto County Road 39. This is due to the sharp curvature of County Road 39 just west of the intersection as well as the building located just north of the intersection.

2.3 Field Observations

A field review was performed on Monday, October 3, 2016. Peak hour observations were performed during the AM and PM commuter peak hours as well as during the afternoon school peak hour on Thursday, January 12, 2017.

2.3.1 General Observations

There is a railroad at-grade crossing on County Road 47 just north of the County Road 39 and County Road 47 intersection (see Figure 2). Pre-emption for this crossing is programmed into the traffic signal at County Road 39 and County Road 47. While a

train is arriving, the northbound and westbound approaches of the intersection turn red and the southbound/eastbound approach remains green to clear any queued vehicles. These signal indications remain until the train has passed. There are no left turn protected phases provided.

There are no gates at the railroad at-grade crossing on County Road 47. Several vehicles were observed crossing the tracks even after the crossing lights had been activated and the train's horn had been sounded. This occurred during nearly every train crossing throughout the day. There are no stop lines on the approaches to the crossing.

Signage is in good condition, although the retroreflectivity of the signs do not appear to be in compliance with the *Manual of Uniform Traffic Control Devices 2009 edition*. In addition, the spacing for the southbound railroad signage and Signal Ahead (W3-3) sign are too close together and the No Passing Zone pennant is leaning.

Chelsea Middle School is located on County Road 39 approximately 0.5 mile from the County Road 47 intersection. Forest Oaks Elementary School is located on County Road 337 approximately 0.9 mile from County Road 39. School buses that serve these schools must come to a complete stop at the railroad crossing which often leads to queuing behind the bus (see Figure 3).



Figure 2: At-Grade Railroad Crossing on County Road 47



Figure 3: Beginning of Northbound Queue Behind School Buses

2.3.2 AM Peak Period

In the morning, the heaviest movement is vehicles traveling northbound on County Road 39 toward US-280 (see Figure 4). Heavy queues occurred along northbound County Road 39. The longest observed northbound queue occurred around 7:30 a.m. and reached to the County Road 337 intersection, which is approximately 0.3 mile from the County Road 47 intersection. Northbound traffic was slow-moving between County Road 337 and Chelsea Middle School during this time as well.

Queues occurred on both northbound and southbound County Road 39 at the County Road 337 intersection due to vehicles turning right and left onto County Road 337. Traffic queued on County Road 39 in the northbound direction from Chelsea Middle School to County Road 337.

Two trains passed through the at-grade railroad crossing during the morning peak period, one at approximately 6:40 a.m. and another at approximately 7:30 a.m.; heavy queuing occurred on northbound County Road 39 during train passage.

Occasionally, traffic on northbound County Road 47 queued from the railroad at-grade crossing through the intersection with County Road 39, because of vehicles slowing down to cross the railroad tracks. The need for vehicles to slow down at the railroad tracks contributes to the northbound queue on County Road 39 as it reduces the

number of vehicles that can be served during the northbound signal phase, even though vehicles do not always come to a stop between the signal and the railroad crossing.

Vehicles slow down at the crossing in order to look and listen for oncoming trains, but also because of the vertical grade difference between the railroad tracks and the roadway. If the grade difference were to be reduced or eliminated, vehicles would be able to traverse the crossing at a faster speed which would increase the capacity of the roadway segment.

The westbound approach of County Road 47 occasionally queued during the morning peak period (see Figure 5). The highest number of vehicles observed in this queue was ten (10).

School bus drop-off ended around 7:30 a.m. at Chelsea Middle School. By 8:00 a.m. traffic was low and not congested in the study area.



Figure 4: AM Northbound Queue on County Road 39 Toward US-280



Figure 5: AM Westbound Queue – Looking East

2.3.3 Afternoon School Peak Period

The main issue during the afternoon school peak period occurred when all the school buses departed the middle school at the same time, approximately 3:00 p.m., and caused long queues on northbound County Road 39 (see Figure 6). Passenger vehicles leaving the school after picking up students contributed to the queues as well. Significant northbound queues continued until approximately 3:30 p.m.

Several trains passed through the at-grade crossing during the afternoon school peak period. Light queuing occurred on northbound County Road 39 as well as on westbound County Road 47 (at the signal) and southbound County Road 47 (at the railroad crossing) during train passage.



Figure 6: Several School Buses at School PM Peak Period

2.3.4 Commuter PM Peak Period

There was a steady stream of traffic flow on southbound County Road 47 turning right onto County Road 39 throughout the evening peak period.

For the most part, the traffic signal at County Road 39 and County Road 47 served the flow of southbound traffic well during the evening peak period. The southbound through lane on County Road 47 did queue occasionally early on, making it difficult for right-turning vehicles to get into the right turn lane. Later during the peak time, southbound traffic queued more significantly at times, causing vehicles to be stopped between the railroad crossing and the signal. This could create an unsafe situation if vehicles were to become stopped on the railroad tracks (see Figure 7 and Figure 8).



Figure 7: Commuter PM Southbound Queue – Looking North



Figure 8: Commuter PM Southbound Queue – Looking South

2.4 Existing Traffic Operations Evaluation

2.4.1 Bicycle and Pedestrian Accommodations

The land use along the corridor is primarily residential. Chelsea City Hall, Shelby County Sheriff's Department, Chelsea Public Library, Chelsea Middle School, Forest Oaks Elementary School, Chelsea Community Center, and several churches are potential pedestrian and bicycle trip generators located within or adjacent to the study area. There are currently no bicycle or pedestrian accommodations located in the study area nor are there any accommodations at the study area termini. By law, cyclists are allowed to use the travel ways but there are no dedicated bike lanes or additional pavement for them to utilize. County Road 47 has two-foot paved shoulders with no rumble strips, which can be beneficial to cyclists. Overall, the majority of people, especially school age children, would not feel comfortable walking or travelling by bicycle in this area.

2.4.2 Traffic Counts

Traffic Data, LLC., on behalf of Sain Associates, collected 24-hour bi-directional traffic counts (volume, class, and speed) at the following locations on January 12-13, 2017:

- On County Road 47 north of County Road 39 and south of the Yellowleaf Creek bridge,
- On County Road 39 east of County Road 47 and west of Autry Lane,
- On County Road 47 between the signalized intersection with County Road 39, and the at-grade railroad crossing,
- On County Road 47 east of the signalized intersection with County Road 39, and
- On County Road 39 south of the signalized intersection with County Road 47 and north of Twin Oaks Circle.

Additionally, Traffic Data, LLC. collected turning movement counts for the study area during the AM peak period (6:30 – 8:30), school PM peak period (1:30 – 3:30), and commuter PM peak period (4:00 – 6:00) on Thursday, January 12, 2017. Data collection was performed for the following intersections:

- Stop controlled intersection of County Road 39 and County Road 47
- Signalized intersection of County Road 39 and County Road 47
- Intersection of County Road 39 and Twin Oaks Circle
- Intersection of County Road 39 and County Road 337

Figure 9 summarizes the existing traffic counts for the highest one-hour period in each of the morning, mid-afternoon, and afternoon commuter timeframes.



Figure 9: Existing Peak Hour Volumes

2.4.3 Existing Capacity Analysis

Existing Intersection LOS Analysis

Sain conducted a capacity analysis for vehicular traffic at all intersections using Trafficware's Synchro 9 software. Traffic capacities are expressed as levels of service (LOS) ranging from "A" (free-flow conditions) to "F" (very congested conditions). Generally, LOS "C" is desirable, while LOS "D" is considered acceptable during peak hours of traffic flow. A detailed description of each LOS designation is included in Appendix A. Table 1 summarizes the existing LOS for the AM, school PM, and commuter PM peak hours based on intersection approach.

Table 1: Existing Intersection Conditions LOS

EXISTING CONDITIONS LOS					
Intersection	Approach		2017		
			AM Peak	School PM Peak	Commuter PM Peak
County Road 39 at County Road 47 Signalized Intersection	EB	CR-39/47	A	A	A
	WB	CR-47	C	A	B
	NB	CR-39	C	D	D
	Intersection LOS		C	B	B
County Road 39 at County Road 337 Minor Street (CR-337) Stop Controlled Intersection	EB	CR-39	A	A	A
	WB	CR-39	A	A	A
	NB	CR-337	C	B	C
	SB	Driveway	A	A	C
County Road 39 at Twin Oaks Circle Minor Street (Twin Oaks Circle) Stop Controlled Intersection	EB	Twin Oaks Cir	B	B	C
	NB	CR-39	A	A	A
	SB	CR-39	A	A	A
County Road 39 at County Road 47 Minor Street (CR-39) Stop Controlled Intersection	WB	CR-39	D	C	E
	NB	CR-39/47	A	A	A
	SB	CR-47	A	A	A

2.4.4 Crash Data

Crash data for this analysis was provided by Shelby County and included crash information from 2010 to 2016 from the Critical Analysis Reporting Environment (CARE). There were forty-two (42) total crashes in the study area during this period, one (1) possible injury crash and forty-one (41) property damage only crashes. The low-severity nature of crashes can be attributed to the low speed limits and roadway curvature on County Road 39 and County Road 47, as well as the crash type. Most of the crashes that occurred were rear-end crashes which typically result in low-severity. The primary

contributing factors to the crashes included distracted driving, misjudgment of stopping sight distance, and failure to yield the right-of-way. More than fifty (50) percent of crashes occurred along County Road 39. No crashes involved pedestrians, bicyclists, or school buses.

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). Appendix B includes figures that provide an overview of crash behavior in the study area. Although these figures may not account for the RTM bias, they can illustrate crash trends and guide further analysis.

3 Environmental Features

A search of documents, databases, a field review, and compilation of GIS data was performed to analyze existing conditions and identify environmental features. This section further discusses the gathered data.

3.1 Existing Documents

Prior to this study, the County investigated improvement options for the area; however no design plans or bid documents were prepared. Currently, the section of County Road 47 between US-280 and State Route 25 is included on the list of Visionary Plan Capacity Projects in the 2040 Regional Transportation Plan prepared by RPCGB. Improvements include widening from two lanes to four lanes.

3.2 Historical Assets

A preliminary cultural resources evaluation (see Appendix C) was performed by MRS Consultants, LLC. and provided the following findings:

- No archaeological sites are recorded in the study area
- No cultural resources surveys are documented within the study area
- No National Register of Historic Places (NRHP) properties are recorded within the study area
- No National Historic Landmarks (NHL) properties are recorded within the study area

- No Alabama Register of Landmarks and Heritage (ARLH) properties are recorded within the study area.
- The preliminary evaluation revealed six potential historic resources. A brief description of these resources follows:
 - Resource 1 (Weldon General Store): this building dates to 1915. The building is part of a historic commercial district at the intersection of CR-47 and CR-39. As an individual property, the building is considered potentially eligible for nomination to the National Register of Historic Places (NRTP). *The front façade of the Weldon Store was removed and relocated to a Weldon pavilion at an athletic facility in February, 2017. Discussions and planning for the relocation began prior to the start of the APPLE study. Since the Weldon Store was relocated, it is likely the area is not eligible for the National Register of Historic Places (NRHP).*
 - Resources 2 and 3: these resources are commercial buildings that date to the early-mid 1900s. These buildings are part of a historic commercial district; however, they would probably not be eligible for the NRHP as an individual property due to building integrity issues.
 - Resource 4 (Chelsea Masonic Lodge): the building appears to date to the early-mid 1900s. Chelsea Masonic Lodge has integrity issues and would probably disqualify from the NRHP as an individual property, even if it is part of a historic commercial district.
 - Resource 5: this store appears to date to the early-mid 1900s. The building is part of a historic commercial district; however, it may not qualify for the NRHP as an individual property due to building integrity issues.
 - Resource 6: this structure appears to date to the mid-1900s. The building is not individually eligible for the NRHP and it is not part of the historic commercial district.

To verify the historic nature of the area, a full cultural resources report should be prepared should the County opt to utilize federal monies to fund improvement projects within this area.

3.3 Threatened and Endangered Species

A letter was sent to the United States Fish and Wildlife Service (USFW) on February 20, 2017 to obtain background information on potential items of concern. Per their response on February 32, 2017, there are no known endangered or threatened species or critical habitats that occur in the project area. Based on this response no further research would be required if the County decides to move forward with improvements. The concurrence from USFW is attached to this memo in Appendix D.

3.4 Wetlands and Floodplain

The study area is located in the City of Chelsea, Shelby County, Alabama approximately 0.5 miles south of US-280. The study area includes both intersections between CR-47 and CR-39. Per correspondence from the natural Resources Conservation Services (NRCS) dated March 28, 2017, the area of consideration for the CR-47 and CR-39 intersection realignment does not contain "Prime Farmlands" and does not meet the criteria set forth by the Farmland Protection Policy Act (FPPA) and Land Evaluation Site Assessment (LESA) of June 22, 1982. In addition, the area of consideration does not contain hydric soils (blue) that meet the definition for wetland criteria.

It is recommended by NRCS that erosion and sediment control measures should be implemented and maintained during the construction phase to protect land, water, and related resources. Also, NRCS suggests that plans for construction should include sediment basins or traps and other erosion control practices. Appendix E provides the package submitted to NRCS and their concurrence.

3.5 Hazardous Materials Properties

A search of the Alabama Department of Environmental Management's (ADEM) *Cleanup Properties Inventory* database and GIS Inspector tool was performed. Per these sources, there are no known hazardous materials sites located within the study area. Should the County elect to move forward with improvements using Federal or State money, a hazardous materials clearance letter will have to be obtained from ALDOT's Environmental Technical Section (ETS).

3.6 Utilities

Requests were made to utility companies to provide mapping of their facilities in the study area. Data was received for water (Shelby County Water Board) and sanitary sewer (Southwest Water Company). This information was incorporated into the study's GIS mapping. A map showing the collected data is located in Appendix F. The following paragraphs summarize the utility presence in the study area.

South of the existing signalized intersection, the water mains present in the study area are located primarily on the east side of County Road 39 and the west side of County Road 47. North of the signalized intersection, there is a water main located on the east side of County Road 47 and the north side of County Road 39. The Sanitary Sewer mains are located on the west side of County Road 39 and County Road 47. The sewer main travels just to the east side of the Chelsea City Hall. A lift station is located near the at-grade railroad crossing.

It is known that a gas main exists near the at-grade railroad crossing; however, mapping for the gas lines in the study area were not available at the time this study was prepared.

Some utility relocation should be assumed, if the County moves forward with any of the alternatives presented in this study.

3.7 Environmental Justice

Environmental Justice is a component of the National Environmental Policy Act (NEPA) that seeks to ensure that all socio-economic groups share in the benefits and burdens of Federal transportation projects. Two areas of environmental justice that frequently become a concern are areas with a high minority population or areas where the majority of the inhabitants are members of low income households. Table 2 provides a very brief overview of the socioeconomic demographics of the study area as shown in the 2015 American Community Survey (ACS), a statistical survey by the U.S. Census Bureau. When compared to census information for Shelby County, it can be concluded that there are no concerns related to environmental justice. The minority populations and the percentage of families living below the poverty level in the study area are below those seen for the entire County.

Table 2: Socioeconomic Overview

Socioeconomic Overview	City of Chelsea	Shelby County
Population Total	11,386	203,530
White	88.5%	81.3%
African American	6.6%	11.8%
Hispanic	2.9%	5.8%
% Families Living Below Poverty Level	2.4%	5.6%

4 Improvement Alternatives

The goal for incorporating improvements into the study area is to improve the safety concerns associated with the at-grade railroad crossing on County Road 47 and mitigate the congestion experienced at the signalized intersection of County Road 47 and County Road 39. This section of the report details different build options that strive to achieve this goal. Figure 10 provides an overall map showing each improvement alternative.

4.1 No-Build Option

The no-build option assumes no improvements are constructed. This option offers no relief of localized congestion and no improvements to railroad crossing safety.

4.2 Alternative A

Alternative A re-routes traffic in order to move the existing signalized intersection of County Road 39 and County Road 47. The recomposed network would bypass downtown Chelsea by merging County Road 39 and County Road 47 at a location southeast of its current intersection. County Road 47 south would “T” into the major movement of County Road 39 at a signalized intersection. The horizontal curve shown on the concept map (See Figure 11) for Alternative A meets a 35 mile per hour design speed. This alignment was selected for the concept in order to avoid the nearby pond located just south of the relocated County Road 39. It is possible that this radius could be increased during the design of Alternative A, once a survey and more detailed design is performed.

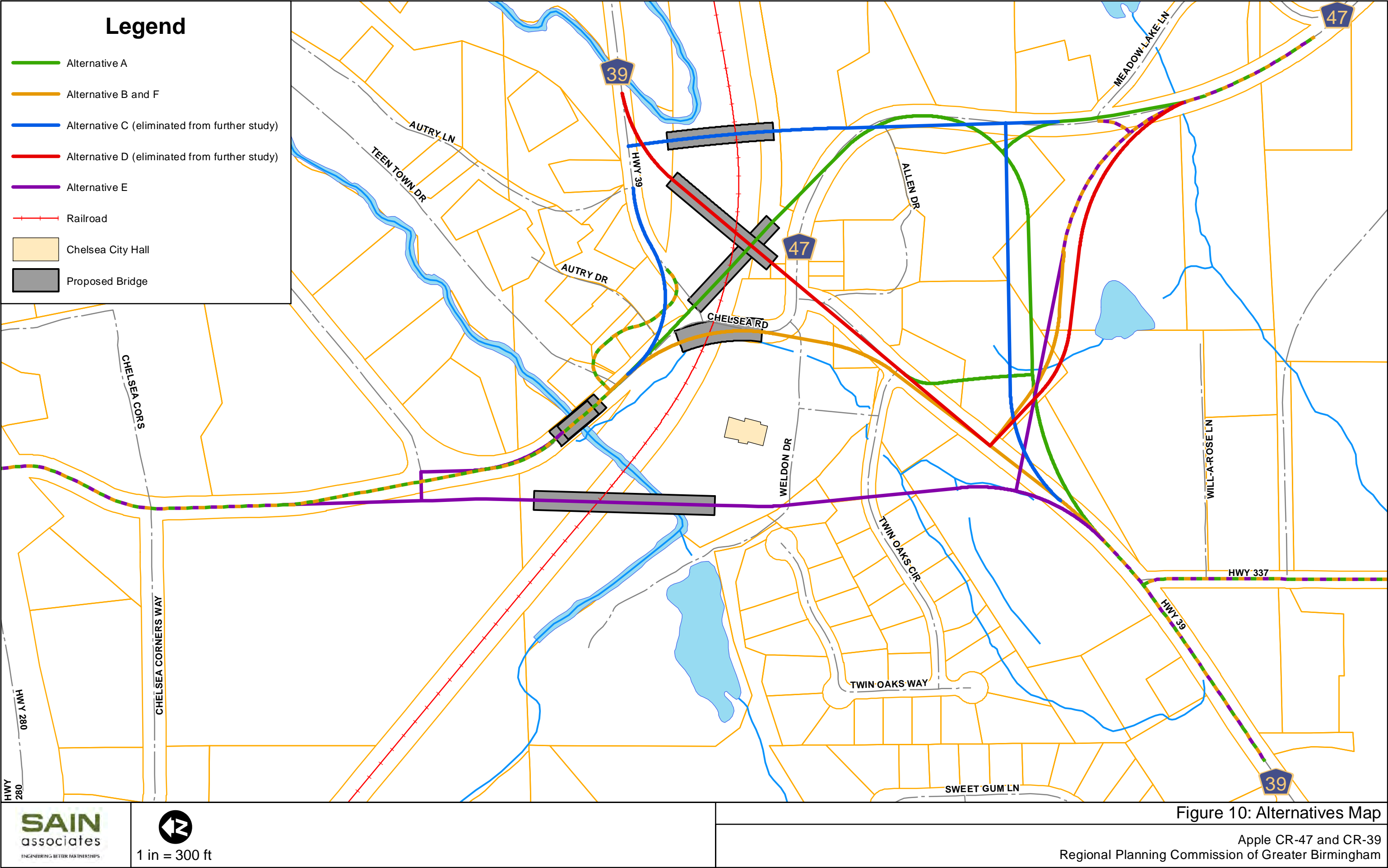
Alternative A requires a bridge over the existing railroad. Vertically speaking, the required bridge over the railroad can tie back into the existing County Road 47 without impacting the in-place Yellowleaf Creek Bridge; however, only a 30 mile per hour design speed can be accomplished where a 45 mile per hour design speed is desirable. For this reason, 30 mile per hour speed limit signs have been added to the concept drawing shown in Figure 11. In addition, in order to provide an adequate level of service, documented in Section 5 of this report, four (4) travel lanes are required on County Road 47 between the signalized intersection and US-280. To achieve four (4) travel lanes, the existing bridge over Yellowleaf Creek would have to be widened or replaced to allow for the additional travel lanes. Table 3 provides a summary of the improvements included in Alternative A.

The cost for Alternative A is estimated at \$21.24M. ALDOT's latest (2009) cost estimate chart was used to estimate the costs for each alternative. Per mile costs were used to determine the costs associated with roadway widening, new location roadway, utility relocation costs, and right-of-way costs. Signal installation was based per each signal. For bridge installation and bridge widening a cost per square foot was used.

Construction Engineering and Inspection (15% of construction costs) and Preliminary Engineering (15% of construction costs) are also included in the cost estimate.

Table 3: Alternative A Summary of Improvements

Alternative A Summary of Improvements	
Location Description	Improvement
County Road 39	<ul style="list-style-type: none"> Widen to allow for two travel lanes in each direction from CR-337 to US-280
	<ul style="list-style-type: none"> Realign CR-39 and shift the existing signalized intersection with CR-47 southward
	<ul style="list-style-type: none"> Construct new two lane roadway to connect Twin Oaks Drive, downtown area, and City Hall to the realigned CR-39
	<ul style="list-style-type: none"> Install bridge over railroad
	<ul style="list-style-type: none"> Widen bridge over Yellowleaf Creek to allow for two travel lanes in each direction
County Road 39 at County Road 337	<ul style="list-style-type: none"> Install signal
	<ul style="list-style-type: none"> Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> Install a left turn lane and a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> Widen CR-337 to allow for two receiving lanes, a left/through lane, and a right turn lane
County Road 39 at County Road 47 (South of railroad)	<ul style="list-style-type: none"> Realign CR-47 to create a signalized T intersection with the realigned CR-39
	<ul style="list-style-type: none"> Install dual right turn lanes and a left turn lane on CR-47
	<ul style="list-style-type: none"> Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> Install a right turn lane on CR-39 northbound
County Road 39 at County Road 47 (North of railroad)	<ul style="list-style-type: none"> Due to changes in elevation as a result of the bridge installation, realign CR-39 in order to maintain a connection to CR-47 north of the railroad
	<ul style="list-style-type: none"> Install a left turn lane and a right turn lane on CR-39 and a right turn lane on CR-47 northbound
Opinion of Probable Cost	<ul style="list-style-type: none"> \$21.24 Million





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consulting engineers
& surveyors



1 in = 200 ft

—+—+— Railroad



Bridge



Remove Road



New Road



Grass Median

Figure 11: Alternative A Concept (2037)

Apple CR-47 and CR-39
Regional Planning Commission of Greater Birmingham

4.3 Alternative B

Alternative B re-routes County Road 47 so that it no longer travels through downtown Chelsea but connects to County Road 39 north of County Road 337 through property south of Allen Drive. This alternative shifts the existing signalized intersection south and includes a bridge over the railroad and Yellowleaf Creek. In order for the railroad bridge to connect to grade before Teen Town Road, a design speed of 35 miles per hour is required which is less than the 45 mile per hour desirable design speed. For this reason, 35 mile per hour speed limit signs have been added to the concept drawing shown in Figure 12. In order to provide an adequate level of service, documented in Section 5 of this report, four (4) travel lanes are required on County Road 47 between the signalized intersection and US-280. To achieve four (4) travel lanes, the existing bridge over Yellowleaf Creek would have to be widened or replaced to allow for the additional travel lanes. Table 4 provides a summary of the improvements included in Alternative B.

The cost for Alternative B is estimated at \$20.61M. ALDOT's latest (2009) cost estimate chart was used to estimate the costs for each alternative. Per mile costs were used to determine the costs associated with roadway widening, new location roadway, utility relocation costs, and right-of-way costs. Signal installation was based per each signal. For bridge installation, a cost per square foot was used. Construction Engineering and Inspection (15% of construction costs) and Preliminary Engineering (15% of construction costs) are also included in the cost estimate.

4.4 Alternative C

Alternative C includes extending County Road 47, from south of downtown Chelsea, over the existing railroad via a bridge before connecting to County Road 39, located north of the railroad (see Figure 10). During the geometric concept evaluation of Alternative C it was determined that this alignment is not feasible due to vertical constraints. The required railroad vertical clearances include a 23' required clearance between the top of the rail and the bottom of the bridge girders. In order to maintain this clearance, the proposed bridge would not be able to connect to the existing County Road 39 without exceeding the maximum longitudinal roadway grades. This alternative was eliminated from further study.

4.5 Alternative D

Alternative D includes extending the southern portion of CR-39 over the existing railroad before tying to the northern portion of County Road 39 and eventually connecting to US-280 (see Figure 10). The same vertical constraints seen in Alternative C are experienced with Alternative D so it was also eliminated from further study.

Table 4: Alternative B Summary of Improvements

Alternative B Summary of Improvements	
Location Description	Improvement
County Road 39	<ul style="list-style-type: none"> Widen to allow for two travel lanes in each direction from CR-337 to US-280
	<ul style="list-style-type: none"> Install bridge over railroad
	<ul style="list-style-type: none"> Install bridge over Yellowleaf Creek
County Road 47	<ul style="list-style-type: none"> Realign CR-47 to create a signalized T intersection with CR-39
	<ul style="list-style-type: none"> Create cul-de-sac for the existing CR-47 in the downtown area
County Road 39 at County Road 47 (South of railroad)	<ul style="list-style-type: none"> Install signal
	<ul style="list-style-type: none"> Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> Install a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> Install a left turn lane and dual right turn lanes on CR-47
County Road 39 at County Road 337	<ul style="list-style-type: none"> Install signal
	<ul style="list-style-type: none"> Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> Install a left turn lane and a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> Widen CR-337 to allow for two receiving lanes, a left/through lane, and a right turn lane
County Road 39 at County Road 47 (North of railroad)	<ul style="list-style-type: none"> Due to changes in elevation as a result of the bridge installation, realign CR-39 in order to maintain a connection to CR-47 north of the railroad
	<ul style="list-style-type: none"> Install a left turn lane and a right turn lane on CR-39 and a right turn lane on CR-47 northbound
Opinion of Probable Cost	<ul style="list-style-type: none"> \$20.61 Million



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1 in = 200 ft

—+—+— Railroad



Bridge



Remove Road



New Road



Grass Median

Figure 12: Alternative B Concept (2037)

Apple CR-47 and CR-39
Regional Planning Commission of Greater Birmingham

4.6 Alternative E

Alternative E re-routes the southern portion of County Road 47 so that it connects to County Road 39 north of County Road 337 through property located south of Allen Drive. This alternative shifts the existing signalized intersection to this location. Additionally, Alternative E includes realigning County Road 39 so that it is located west of City Hall and bridges over the railroad and Yellowleaf Creek. In order to connect to County Road 47 prior to Teen Town Road, the design speed would need to be 40 miles per hour. For this reason, 40 mile per hour speed limit signs have been added to the concept drawing shown in Figure 13. In addition, traffic analysis shows that four (4) travel lanes are required in order to provide an adequate level of service. Table 5 provides a summary of the improvements included in Alternative E.

The cost for Alternative E is estimated at \$20.62M. ALDOT's latest (2009) cost estimate chart was used to estimate the costs for each alternative. Per mile costs were used to determine the costs associated with roadway widening, new location roadway, utility relocation costs, and right-of-way costs. Signal installation was based per each signal. For bridge installation, a cost per square foot was used. Construction Engineering and Inspection (15% of construction costs) and Preliminary Engineering (15% of construction costs) are also included in the cost estimate.

Table 5: Alternative E Summary of Improvements

Alternative E Summary of Improvements	
Location Description	Improvement
County Road 39	<ul style="list-style-type: none"> • Realign CR-39 to a location west of Chelsea City Hall
	<ul style="list-style-type: none"> • Widen to allow for two travel lanes in each direction from CR-337 to US-280
	<ul style="list-style-type: none"> • Install bridge over railroad (maintain existing bridge of Yellowleaf Creek) and remove the at-grade crossing
	<ul style="list-style-type: none"> • Remove stop sign for CR-39 north of the railroad and install horizontal curve connection to CR-47
County Road 47	<ul style="list-style-type: none"> • Realign CR-47 south of the railroad to create a signalized T intersection with CR-39
	<ul style="list-style-type: none"> • Due to elevation changes associated with the bridge installation, realign CR-47 north of the railroad to connect to Chesser Crane Road
County Road 39 at County Road 47 (South of railroad)	<ul style="list-style-type: none"> • Install signal
	<ul style="list-style-type: none"> • Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> • Install a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> • Install a left turn lane and dual right turn lanes on CR-47
County Road 39 at County Road 337	<ul style="list-style-type: none"> • Install signal
	<ul style="list-style-type: none"> • Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> • Install a left turn lane and a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> • Widen CR-337 to allow for two receiving lanes, a left/through lane, and a right turn lane
Opinion of Probable Cost	<ul style="list-style-type: none"> • \$20.62 Million



Figure 13: Alternative E Concept (2037)

Apple CR-47 and CR-39
Regional Planning Commission of Greater Birmingham

4.7 Alternative F

Like Alternative B, Alternative F includes re-routing County Road 47 so that it no longer travels through downtown Chelsea but connects to County Road 39 north of County Road 337 through property south of Allen Drive. This alternative shifts the existing signalized intersection south. However, unlike Alternative B, Alternative F does not include a grade separated railroad crossing but improves the at-grade crossing on County Road 47.

Improvements associated with the at-grade crossing include the addition of gates to the in-place lights and bells; improving the crossing approaches in order to eliminate the existing hump; clearing the vegetation behind the in-place guardrail; and the installation of an additional flashing light positioned to alert southbound motorists of the presence of a train is included in Alternative F. An oversized Stop Sign (R1-1) with red retroreflective strips on the sign posts and gate posted Stop Ahead (W3-1) signs with yellow retroreflective strips on the sign posts are also included in Alternative F. The concept of Alternative F is provided in Figure 14. No changes to the posted speed limit are expected. Table 6 provides a summary of the improvements for Alternative F.

Alternative F is considered an interim option since it does not eliminate the at-grade railroad crossing. However, 10-year traffic projections indicate that four (4) travel lanes are required in order to provide an adequate level of service. See Section 5 of this report for more traffic analysis details. In order to provide an appropriate level of service the existing bridge over Yellowleaf Creek would need to be widened or replaced to allow for the additional travel lanes.

The cost for Alternative F is estimated at \$13.79M. ALDOT's cost estimate chart was used to estimate the costs for each alternative. Per mile costs were used to determine the costs associated with roadway widening, new location roadway, utility relocation costs, and right-of-way costs. Signal installation was based per each signal. Construction Engineering and Inspection (15% of construction costs) and Preliminary Engineering (15% of construction costs) are also included in the cost estimate.

Table 6: Alternative F Summary of Improvements

Alternative F Summary of Improvements	
Location Description	Improvement
County Road 39	<ul style="list-style-type: none"> Widen to allow for two travel lanes in each direction from CR-337 to US-280
	<ul style="list-style-type: none"> Improve the approaches for the at-grade railroad crossing and install gates
	<ul style="list-style-type: none"> Widen bridge over Yellowleaf Creek to allow for two travel lanes in each direction
County Road 47	<ul style="list-style-type: none"> Realign CR-47 south of the railroad to create a signalized T intersection with CR-39
	<ul style="list-style-type: none"> Create cul-de-sac for the existing CR-47 in the downtown area
County Road 39 at County Road 47 (North of railroad)	<ul style="list-style-type: none"> Install gate posted advanced warning signage (Stop Ahead W3-1) on CR-39 with red retroreflective strips on the sign posts
	<ul style="list-style-type: none"> Replace stop sign with oversized stop sign and install red retroreflective strips on the sign posts
County Road 39 at County Road 47 (South of railroad)	<ul style="list-style-type: none"> Install signal
	<ul style="list-style-type: none"> Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> Install a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> Install a left turn lane and dual right turn lanes on CR-47
County Road 39 at County Road 337	<ul style="list-style-type: none"> Install signal
	<ul style="list-style-type: none"> Install dual left turn lanes on CR-39 southbound
	<ul style="list-style-type: none"> Install a left turn lane and a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> Widen CR-337 to allow for two receiving lanes, a left/through lane, and a right turn lane
Opinion of Probable Cost	<ul style="list-style-type: none"> \$13.79 Million



Figure 14: Alternative F Concept (2027)

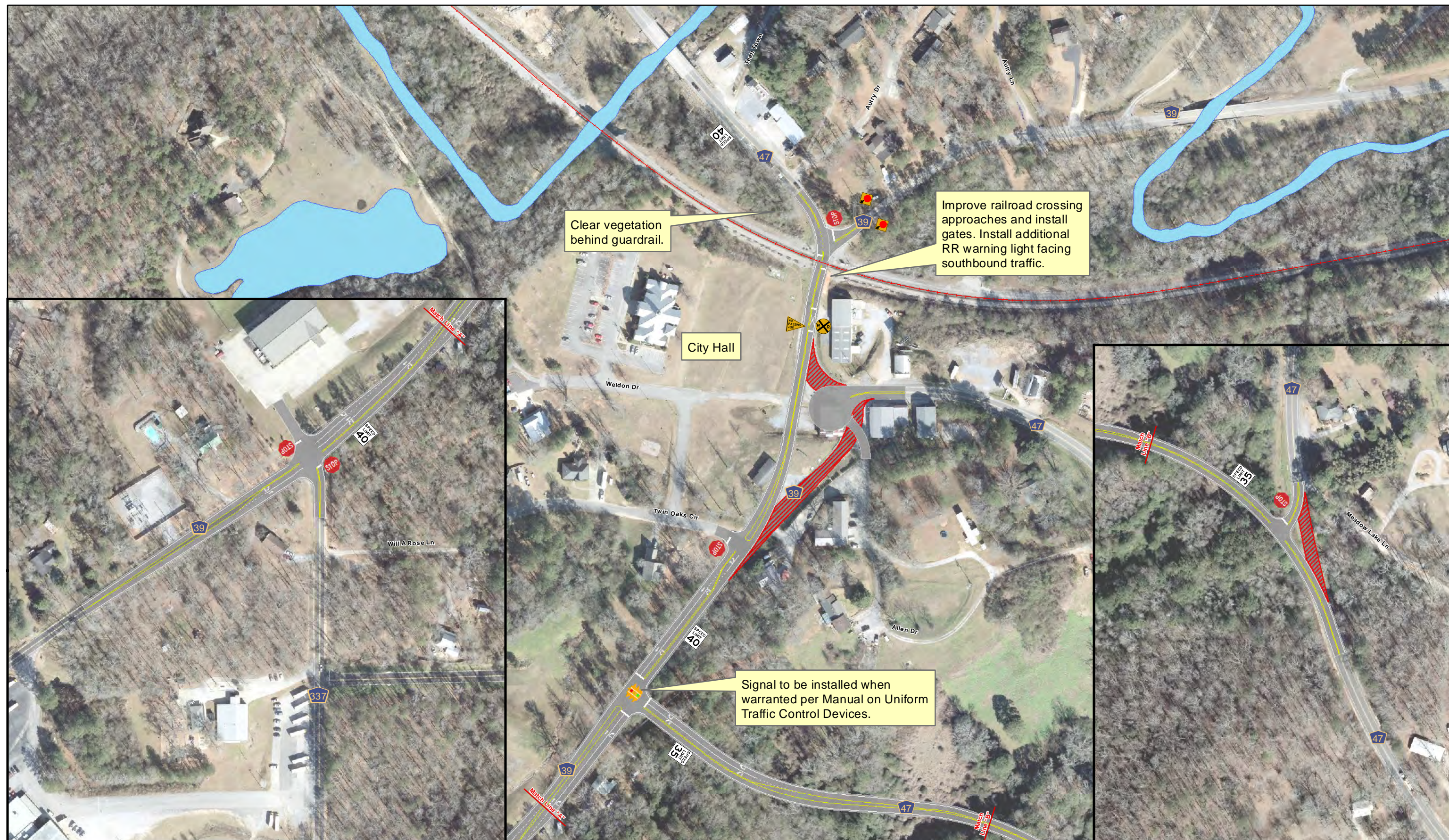
4.7.1 Alternative F' Improvement Option

Since the previously discussed Alternatives A, B, and E had opinions of cost in excess of \$20M and the opinion of cost for Alternative F exceeds \$13M, a lower cost alternative was developed. With Alternative F' the County could still address the safety purpose and need by improving the at-grade railroad crossing, refreshing striping and pavement markings, installing signage, and realigning County Road 47 so that its signalized intersection with County Road 39 is located further from the at-grade railroad crossing. The concept for Alternative F' is shown on Figure 15. Table 7 provides a summary of the improvements for Alternative F'.

The opinion of probable cost for Alternative F' is estimated at \$3.13M. Construction Engineering and Inspection (15% of construction costs) and Preliminary Engineering (15% of construction costs) are included in the cost estimate; these percentages are typical of projects where federal funding is used. If the County chose to use all local funding, the opinion of probable cost could be reduced to \$2.73M since Construction Engineering and Inspection costs would be excluded and the percentage associated with Preliminary Engineering would be reduced to 10%.

Table 7: Alternative F' Summary of Improvements

Alternative F' Summary of Improvements	
Location Description	Improvement
County Road 39	<ul style="list-style-type: none"> Improve the approaches for the at-grade railroad crossing, install gates, and install an additional flashing light positioned toward southbound traffic
	<ul style="list-style-type: none"> Install MUTCD compliant advanced warning signage and pavement markings. Include yellow retroreflective strips on the advanced warning signs
	<ul style="list-style-type: none"> Clear trees and vegetation behind guardrail to improve stopping sight distance
County Road 47	<ul style="list-style-type: none"> Realign CR-47 south of the railroad to create a signalized T intersection with CR-39
	<ul style="list-style-type: none"> Create cul-de-sac for the existing CR-47 in the downtown area
County Road 39 at County Road 47 (North of railroad)	<ul style="list-style-type: none"> Install gate posted advanced warning signage (Stop Ahead W3-1) on CR-39 with red retroreflective strips on the sign posts
	<ul style="list-style-type: none"> Replace stop sign with oversized stop sign and install red retroreflective strips on the sign posts
County Road 39 at County Road 47 (South of railroad)	<ul style="list-style-type: none"> Install signal
	<ul style="list-style-type: none"> Install a single left turn lane on CR-39 southbound
	<ul style="list-style-type: none"> Install a right turn lane on CR-39 northbound
	<ul style="list-style-type: none"> Install a single right turn lane on CR-47
County Road 39 at County Road 337	<ul style="list-style-type: none"> Install signal
	<ul style="list-style-type: none"> Install a single left turn lane on CR-39 southbound
Opinion of Probable Cost	<ul style="list-style-type: none"> \$3.13Million (Federal Funding) / \$2.73 Million (All Local Funding)



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& surveyors



1 in = 200 ft

—+—+— Railroad



Remove Road



New Road

Figure 15: Alternative F' Concept (2033)

Apple CR-47 and CR-39
Regional Planning Commission of Greater Birmingham

4.8 Opinion of Probable Cost

The estimated, planning level cost estimates prepared for Alternatives A, B, E, and F were based on ALDOT's latest (2009) cost estimate chart. This chart divides the state into six different zones with four types of terrain within those zones. Shelby County falls in Zone 2 and the rolling terrain type was selected for this study. With these conditions the chart estimates the following line item costs:

- Grade and drain for new construction roadway,
- Base and pave for new construction roadway,
- Widening,
- Traffic handling
- Utility relocation costs
- Right-of-way costs

The cost estimate chart also provides per square foot costs for bridge installation and bridge widening. Signal installation was based per each signal. In addition, costs associated with improving the railroad crossing and installing gates was assumed based on the experience with past railroad related projects. Construction Engineering and Inspection (15% of construction costs) and Preliminary Engineering (15% of construction costs) are also included in the cost estimates. These percentages are typical of projects where federal funding is used. Table 8 provides a comparison of each alternative and their associated costs.

Table 8: Alternatives Cost Comparison

Alternative	Description	Opinion of Probable Cost
A	Realign CR-39 and install grade separated crossing; provide four travel lanes along CR-39 and CR-47 (see Figure 11); widen bridge over Yellowleaf Creek	\$21.24M
B	Slightly realign CR-39; realign CR-47 to create new signalized intersection with CR-39; install grade separated crossing; install new bridge over Yellowleaf Creek; provide four travel lanes along CR-39 and CR-47 (see Figure 12)	\$20.61M
E	Realign CR-39 to west of City Hall; realign CR-47 to create new signalized intersection with CR-39; install bridge that spans railroad and Yellowleaf Creek; provide four travel lanes along CR-39 and CR-47 (see Figure 13)	\$20.62
F	Realign CR-47 to create new signalized intersection with CR-39; widen CR-47 and CR-39 to four lanes, install turn lanes, improve at-grade crossing; widen bridge over Yellowleaf Creek	\$18.05M
F'	Realign CR-47 to create new signalized intersection with CR-39; install turn lanes, improve at-grade crossing	\$3.13M (Federal) / \$2.73M (Local)

A more detailed cost estimate was prepared for Alternative F'. This estimate is provided in Appendix G and includes unit prices derived from ALDOT bid tabs and experience on other roadway and railroad related projects.

5 Future Conditions

The alternatives described in Section 4 of this report are of a large magnitude. Often times the funding needed to complete a project of that magnitude is not readily available and even when funds are secured, it can take many years to complete design and construction. For this reason a 20-year design horizon was used to perform the capacity analysis for Alternatives A, B, and E. A 20-year view of the traffic provides a better planning tool than just evaluating the current traffic volumes.

In addition, a 10-year design horizon was used to analyze Alternative F since its design and installation would take somewhat less time and money than the grade separated alternatives found in A, B, and E.

Finally, an additional alternative, F', was evaluated to estimate the service life of the study network in the event road widening could not be achieved. Alternative F' would not improve future capacity along the roadway segments; however, safety issues related to the close proximity of the at-grade railroad crossing and the current signalized intersection of County Road 39 and County Road 47 would still be addressed with the alternative F'.

This section discusses the future traffic operations for the varying alternatives.

5.1 Future Traffic Operations Evaluation (2037)

A capacity analysis (Appendices H-J) was performed for the study area considering 20-year design volumes (2037) for Alternatives A, B, and E.

Growth Rate

The growth rate used to forecast 20-year design volumes (2037) was 5.0%, which was the rate used by the Regional Planning Commission of Greater Birmingham (RPCGB) in the long-range transportation plan for Shelby County. Traffic volumes were forecasted based on a straight-line trend.

Design Number of Lanes

A segment capacity analysis was conducted for the study area to determine the number of lanes required to maintain a LOS "C" during peak hours for the 20-year design volumes (2037). The evaluation used McTrans HCS 2010 software analysis tool. The corridor was divided into five (5) study segments (refer to Figure 16). Table 9 summarizes the number of lanes required for each segment.

Table 9: Number of Lanes to Provide LOS C for 20-Year Design Volumes (2037)

Segment		Direction	AM Peak 2037 (5% Growth)	School PM Peak 2037 (5% Growth)	Commuter PM Peak 2037 (5% Growth)	Design Number of Lanes	Overall Section
1	CR-47 north of CR-39 (extends to US-280)	NB	2	1	1	2	4-lane section
		SB	1	2	2	2	
2	CR-39 east of CR-47	EB	1	1	1	1	2-lane section
		WB	1	1	1	1	
3	CR-47 between CR-39 (North) and CR-39 (South-signalized)	NB	2	1	1	2	4-lane section
		SB	1	2	2	2	
4	CR-47 east of CR-39	EB	1	1	1	1	2-lane section
		WB	1	1	1	1	
5	CR-39 south of CR-47	NB	1	1	1	2	4-lane section
		SB	1	1	2	2	

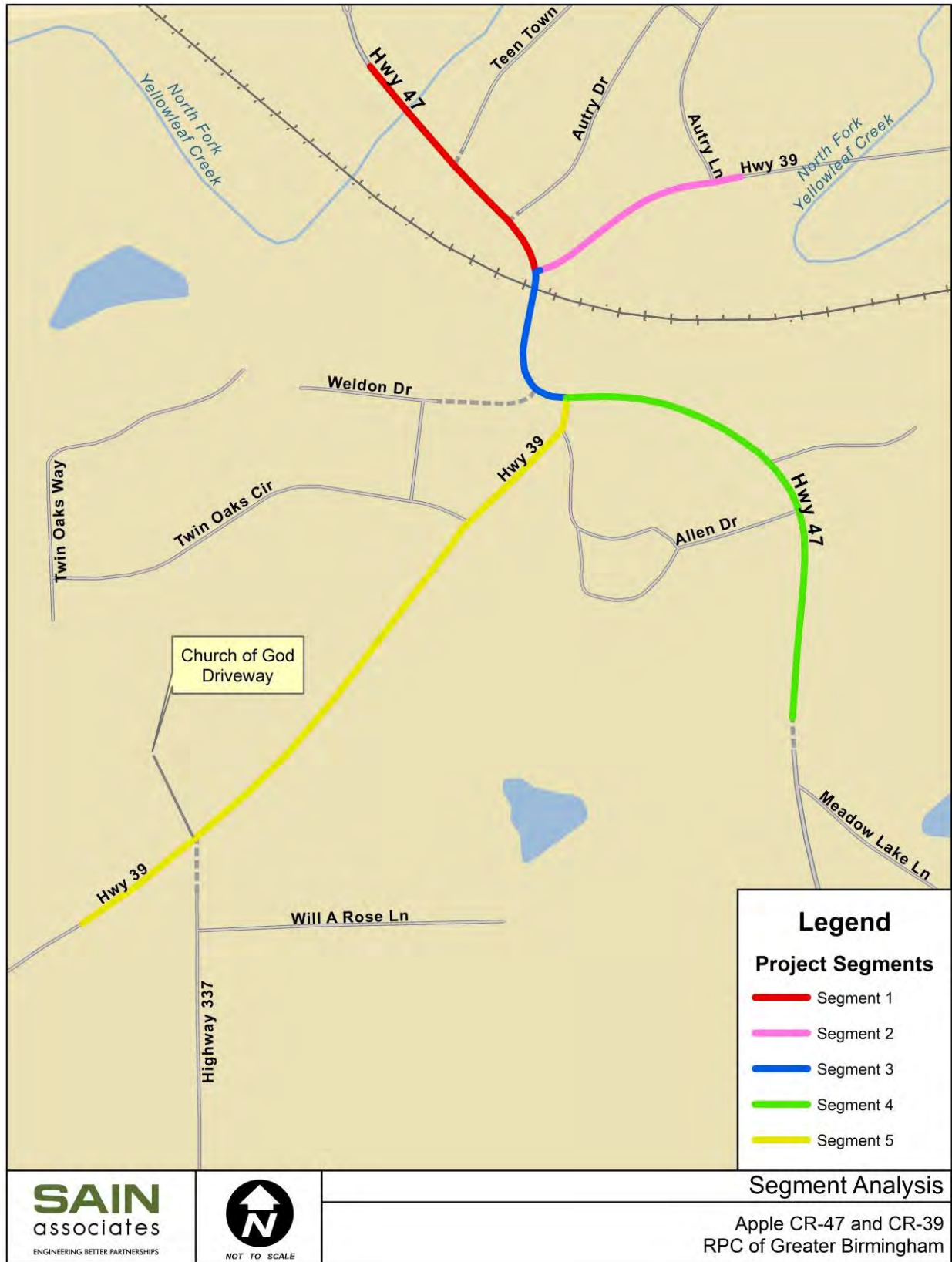


Figure 16: Study Segments

Intersection Capacity Analysis

A future intersection LOS analysis was conducted for the study area with forecasted 20-year design (2037) turning movement counts using Trafficware's Synchro 9 software. Figures 17-20 summarize the future traffic volumes for the highest one-hour period in each of the morning, mid-afternoon, and afternoon commuter timeframes for each design alternative. Figures 21-23 illustrate the lane configurations.

When compared to the no-build option, alternatives A, B, and E included the addition of left and right-turn lanes where warranted as well as a traffic signal at the intersection at County Road 39 and County Road 337. Table 10 summarizes the future no-build LOS and Table 11 shows future Alternative A LOS at each intersection. Even if the alignment differs between the alternatives, intersection geometries for Alternatives B and E have the same configuration. Levels of service for Alternatives B and E can be seen in Table 12.

Table 10: No-Build Intersection Level of Service (2037)

NO BUILD INTERSECTION LOS					
Intersection	Approach		2037 (5% Growth)		
			AM Peak	School PM Peak	Commuter PM Peak
SIGNALIZED INTERSECTION (CR-39 AT CR-47)	EB	CR-39/47	A	A	B
	WB	CR-47	D	B	D
	NB	CR-39	F	D	F
	Intersection LOS		F	C	F
STOP CONTROLLED INTERSECTION (CR-39 AT CR-337)	EB	CR-39	A	A	A
	WB	CR-39	A	A	A
	NB	CR-337	F	E	F
	SB	Driveway	A	B	F
STOP CONTROLLED INTERSECTION (CR-39 AT TWIN OAKS CIR)	EB	Twin Oaks Cir	F	D	F
	NB	CR-39	A	A	A
	SB	CR-39	A	A	A
STOP CONTROLLED INTERSECTION (CR-39 AT CR-47)	WB	CR-39	F	F	F
	NB	CR-39/47	A	A	A
	SB	CR-47	A	A	A

Table 11: Alternative A Intersection Level of Service (2037)

ALTERNATIVE A INTERSECTION LOS					
Intersection	Approach		2037 (5% Growth)		
			AM Peak	School PM Peak	Commuter PM Peak
SIGNALIZED INTERSECTION (CR-39 AT CR-47)	EB	CR-39	C	B	B
	WB	CR-47	B	B	E
	NB	CR-47	B	A	A
	Intersection LOS		C	B	D
SIGNALIZED INTERSECTION (CR-39 AT CR-337)	EB	CR-39	A	A	A
	WB	CR-39	B	A	A
	NB	CR-337	B	B	B
	SB	Driveway	A	A	A
	Intersection LOS		B	A	A
STOP CONTROLLED INTERSECTION (CR-39 AT TWIN OAKS CIR)	EB	CR-39	A	A	A
	WB	CR-39	A	A	A
	SB	Twin Oaks Cir	D	C	F
STOP CONTROLLED INTERSECTION (CR-39 AT CR-47)	WB	CR-39	F	F	F
	NB	CR-47	A	A	A
	SB	CR-47	A	A	A

Table 12: Alternatives B and E Intersection Level of Service (2037)

ALTERNATIVES B and E INTERSECTION LOS					
Intersection	Approach		2037 (5% Growth)		
			AM Peak	School PM Peak	Commuter PM Peak
SIGNALIZED INTERSECTION (CR-39 AT CR-47)	WB	CR-47	B	A	A
	NB	CR-39	C	B	B
	SB	CR-39	B	B	E
	Intersection LOS		C	B	D
SIGNALIZED INTERSECTION (CR-39 AT CR-337)	EB	CR-39	A	A	A
	WB	CR-39	B	A	A
	NB	CR-337	B	B	B
	SB	Driveway	A	A	A
	Intersection LOS		A	A	A
STOP CONTROLLED INTERSECTION (CR-39 AT TWIN OAKS CIR)	EB	Twin Oaks Cir	F	F	F
	NB	CR-39	A	A	A
	SB	CR-39	A	A	A
STOP CONTROLLED INTERSECTION (CR-39 AT CR-47)	WB	CR-39	F	F	F
	NB	CR-39	A	A	A
	SB	CR-47	A	A	A



Figure 17: Future Peak Hour Volumes: No-Build



Figure 18: Future Peak Hour Volumes: Alternative A



Figure 19: Future Peak Hour Volumes: Alternative B



Figure 20: Future Peak Hour Volumes: Alternative E

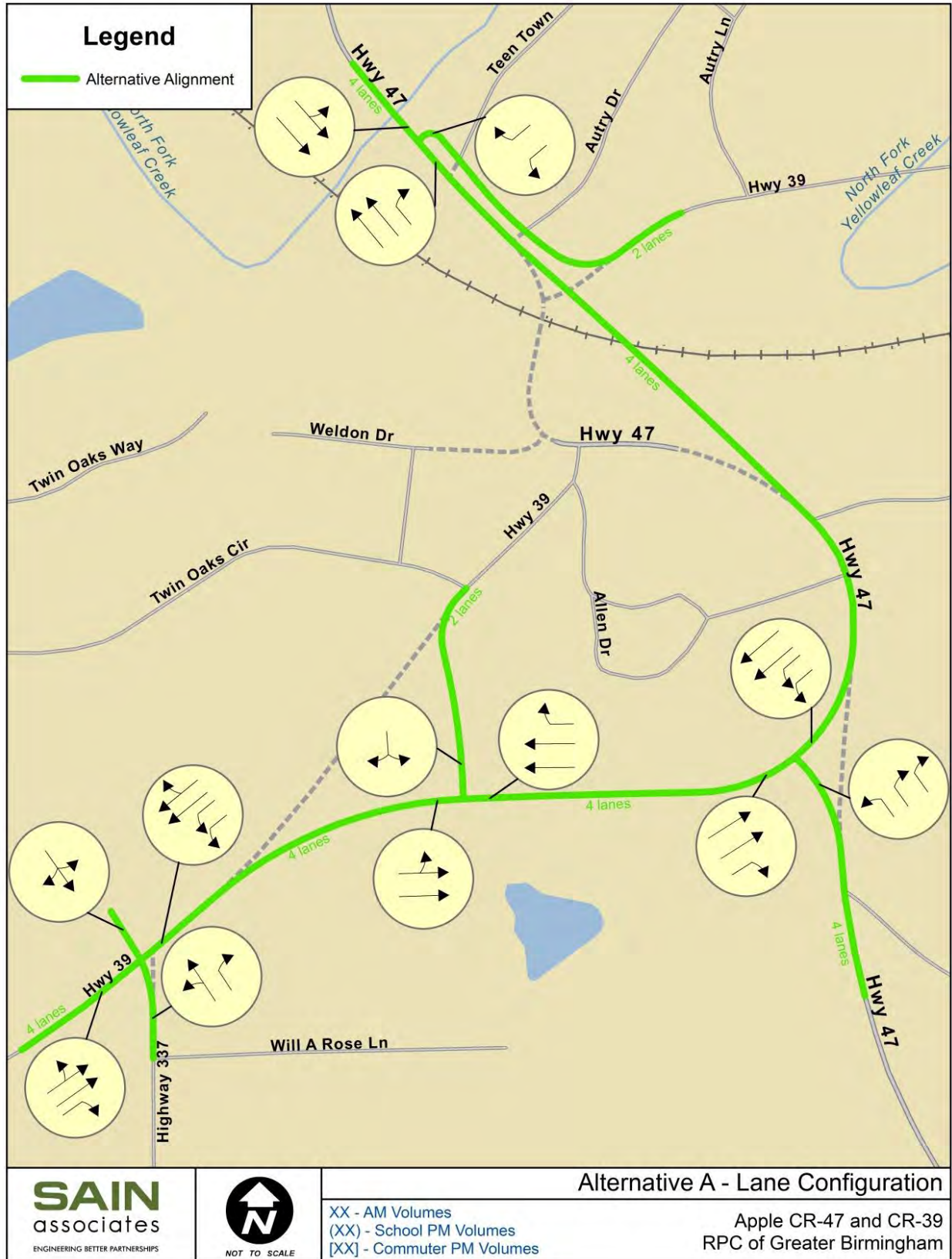
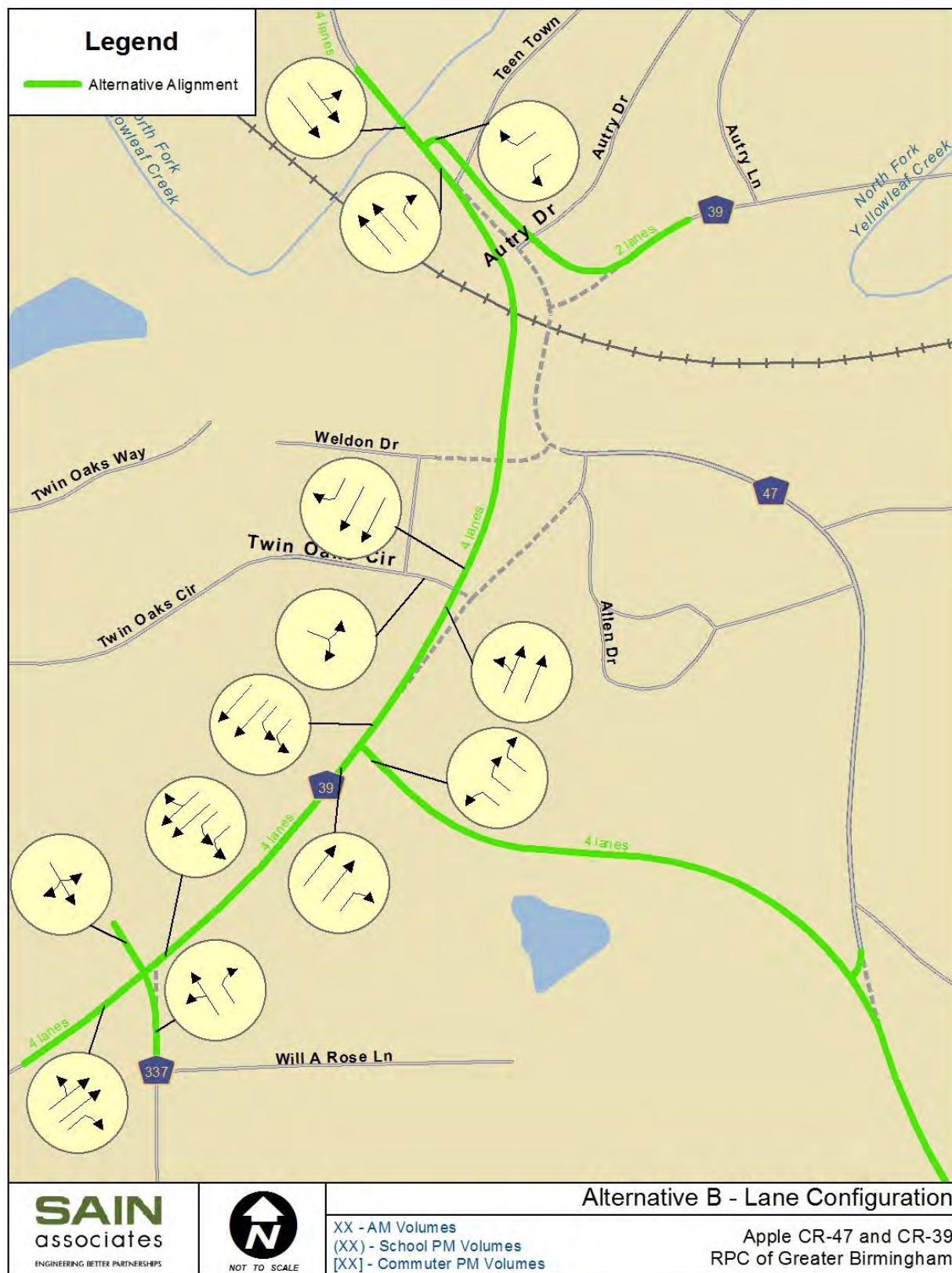


Figure 21: Lane Configuration: Alternative A





Summary

The capacity analysis reveals that the corridor is not expected to continue functioning at acceptable levels of service if the no-build option is chosen. Also, several intersections are experiencing significant delays that are projected to worsen under future no-build conditions.

The segment capacity analysis for 20-year design volumes (2037) determined that a four-lane section is required to provide a desirable LOS "C" for all five segments in the study area. Intersection LOS for Alternatives A, B, and E are similar for future conditions. These alternatives are preferred rather than the no-build option, as they provide improved LOS and roadway alignment.

Alternative A seems to perform slightly better than the other alternatives, as it moves heavier traffic away from the neighborhood around Twin Oaks Circle.

For all future alternatives (A, B, and E), one approach at the signalized intersection between County Road 39 and County Road 47 has future LOS "E" that can be attributed to the high number of left-turning vehicles. However, the overall LOS of the intersection is "D", which is acceptable for peak traffic conditions. LOS "F" is observed for the minor road approach at the stop controlled intersections; however, no modifications were included as these minor roads have low traffic volume and would not warrant a traffic signal.

5.2 Future Traffic Operations Evaluation (2027)

A capacity analysis was performed for Alternative F considering 10-year design volumes (2027). A 10-year horizon was used since Alternative F would provide an interim condition that still addresses the purpose and need of improving safety concerns pertaining to the proximity of the at-grade railroad crossing to the current signalized intersection of County Road 39 and County Road 47. Alternative F does not provide a grade separated railroad crossing but it does propose improvements to the geometrics of the crossing and it shifts the County Road 39/County Road 47 signalized intersection south providing more room for potential queuing.

Growth Rate

As with the 20-year design volumes, the growth rate used to forecast 10-year design volumes (2027) was 5.0%, which was the rate used by the Regional Planning Commission of Greater Birmingham (RPCGB) in the long-term transportation plan for Shelby County. Traffic volumes were forecasted based on a straight-line trend.

Design Number of Lanes

A segment capacity analysis was conducted for Alternative F to determine the number of lanes required to maintain a LOS "C" during peak hours for the 10-year design

volumes (2027). The evaluation used McTrans HCS 2010 software analysis tool. The corridor was divided into five (5) study segments (refer to Figure 16). Table 13 summarizes the number of lanes required for each segment for Alternative F. It should be noted that the existing traffic volumes experienced on the northbound direction of County Road 47 north of the existing signalized intersection exceeds 920 vehicles during the morning peak hour. A typical rule of thumb indicates that four (4) travel lanes are needed once volumes begin to exceed the 900-1000 vehicle range.

Table 13: Number of Lanes to Provide LOS C for 10-Year Design Volumes (2027)

Segment		Direction	AM Peak 2037 (5% Growth)	School PM Peak 2037 (5% Growth)	Commuter PM Peak 2037 (5% Growth)	Design Number of Lanes	Overall Section
1	CR-47 north of CR-39 (extends to US-280)	NB	2	1	1	2	4-lane section
		SB	1	2	2	2	
2	CR-39 east of CR-47	EB	1	1	1	1	2-lane section
		WB	1	1	1	1	
3	CR-47 between CR-39 (North) and CR-39 (South-signalized)	NB	2	1	1	2	4-lane section
		SB	1	2	2	2	
4	CR-47 east of CR-39	EB	1	1	1	1	2-lane section
		WB	1	1	1	1	
5	CR-39 south of CR-47	NB	1	1	1	1	2-lane section
		SB	1	1	1	1	

Intersection Capacity Analysis

A future intersection LOS analysis was conducted for Alternative F with forecasted 10-year design (2027) turning movement counts using Trafficware's Synchro 9 software. Figure 24 summarizes the future traffic volumes for the highest one-hour period in each of the morning, mid-afternoon, and afternoon commuter timeframes for design Alternative F. Table 14 shows future LOS at each intersection for Alternative F and Figure 25 illustrates the lane configurations.



Figure 24: Future Peak Hour Volumes: Alternative F



Table 14: Alternative F Intersection LOS

ALTERNATIVES F INTERSECTION LOS					
Intersection	Approach		2027 (5% Growth)		
			AM Peak	School PM Peak	Commuter PM Peak
SIGNALIZED INTERSECTION (CR-39 AT CR-47)	WB	CR-47	C	B	A
	NB	CR-39	B	B	D
	SB	CR-39	C	B	C
	Intersection LOS		C	B	C
SIGNALIZED INTERSECTION (CR-39 AT CR-337)	EB	CR-39	A	A	A
	WB	CR-39	A	A	A
	NB	CR-337	B	B	B
	SB	Driveway	A	A	A
	Intersection LOS		A	A	A
STOP CONTROLLED INTERSECTION (CR-39 AT TWIN OAKS CIR)	EB	Twin Oaks Cir	E	D	F
	NB	CR-39	A	A	A
	SB	CR-39	A	A	A
STOP CONTROLLED INTERSECTION (CR-39 AT CR-47)	WB	CR-39	E	D	F
	NB	CR-47	A	A	A
	SB	CR-47	A	A	A

Summary

The segment capacity analysis for 10-year design volumes (2027) determined that a four-lane section is required to provide a desirable LOS "C" for two of the five segments in the study area.

Alternative F, does not experience a future LOS "E" for an approach at the signalized intersection between County Road 39 and County Road 47. Even though a high volume of left turns are seen at this intersection the volumes for Alternative F are lower than those for A,B, and E since those alternatives were evaluated using 2037 numbers. LOS "F" is observed for the minor road approach at the stop controlled intersections; however, no changes will be made as these minor roads have low traffic volume and would not warrant a traffic signal.

5.3 Service Life of Alternative F'

Alternative F' has the same roadway alignment as Alternative F with differences in lane geometry. Alternative F' does not address capacity issues at the segment level as it does not include roadway widening; however, it includes improvements associated with the signalized intersection of County Road 39 and County Road 47 as well as the intersection of County Road 39 and County Road 337. Alternative F' still addresses the

purpose and need of improving safety concerns pertaining to the proximity of the at-grade railroad crossing to the current signalized intersection of County Road 39 and County Road 47. A capacity analysis was performed for Alternative F' to determine the service life as a result of the improvements.

Growth Rate

The growth rate used to forecast yearly design volumes was 5.0%, which was the rate used by the Regional Planning Commission of Greater Birmingham (RPCGB) in the long-term transportation plan for Shelby County. Traffic volumes were forecasted based on a straight-line trend.

Intersection Capacity Analysis

The performance of the intersections of County Road 39/County Road 47 and County Road 39/County Road 337 is critical to the performance of the roadway segments that connect them. Analysis of various intersection types was performed to determine what improvements could be made, excluding additional capacity, to improve traffic flow in the area. As requested by Shelby County, the service life threshold for this analysis was defined as the year when the intersection LOS will transition from an E to an F.

LOS with No Turn Lanes

A future intersection LOS analysis was conducted for Alternative F' with forecasted turning movement counts using Trafficware's Synchro 9. The scenario initially evaluated was:

- A) County Road 39 at Realigned County Road 47 (signalized)
 - No turn lanes
- B) County Road 39 at County Road 337
 - Existing geometry

LOS at the intersection of County Road 39 at Realigned County Road 47 transitions from E to F in 2 years (2019) with no turn lanes. In 2019 during the AM peak, the westbound approach LOS is D, which can be attributed to the high volume turning right (505 vehicles); during the commuter PM peak, the southbound approach LOS is F, due to high volumes turning left (406 vehicles) and going through (565 vehicles).

Traffic Signal Warrant Analysis

A 4-hour traffic signal warrant analysis was performed for the existing volumes (2017) at both intersections. Volumes were adjusted based on the ALDOT Traffic Signal Design Guide & Timing Manual method of reducing right turns based on lane geometry and approaching conflicting volumes. The analysis revealed the following:

- A) County Road 39 at Realigned County Road 47
 - Satisfies the 4-hour traffic signal warrant with existing volumes
- B) County Road 39 at County Road 337

- Does not satisfy the 4-hour traffic signal warrant now and is unlikely to satisfy warrants in a 10-year horizon

It should be noted that signal warrant analysis requires a minimum of eight (8) hours of traffic count data. For this study, turning movement counts were only collected during the morning peak, school peak, and commuter peak, a total of six and one-half hours. The available data was used to perform the 4-hour traffic signal warrant analysis discussed previously; however, data should be collected for twelve (12) hours and the warrant analysis re-evaluated to determine if a signal is warranted at either location.

Intersection Alternatives

In order to improve traffic flow in the area, the following alternatives were analyzed to evaluate capacity of these intersection types:

- A) County Road 39 at Realigned County Road 47
 - 1-lane roundabout
 - 2-lane roundabout
 - Single turn-lanes with signal
- B) County Road 39 at County Road 337
 - Eastbound and westbound left-turn lanes

Roundabouts were evaluated using Sidra Solutions' Sidra Intersection 7 software and the single-turn lanes alternative was analyzed using Trafficware's Synchro 9. For the intersection of County Road 39 and County Road 47, the service life for each intersection type can be seen in Table 15.

Table 15: Service Life for the Intersection of County Road 39 and County Road 47

SERVICE LIFE: CR-39 AT CR-47 INTERSECTION		
Intersection Geometry	LOS D to E Transition Year	LOS E to F Transition Year
No Turn Lanes	2018	2019
1-Lane Roundabout	2024	2026
2-Lane Roundabout	2028	2029
Single Turn Lanes	2030	2031

Table 16 shows the future LOS at each intersection for the intersection geometry configuration that has the highest service life of 13 years – Single turn lanes. The volumes seen during the AM peak were responsible for the intersection capacity failure.

Table 16: Alternative F' LOS – AM Peak

ALTERNATIVE F' LOS with Single Turn Lanes							
Intersection	Approach		2017	5 Years (2022)	10 Years (2027)	13 Years (2030)	14 Years (2031)
SIGNALIZED INTERSECTION (CR-39 AT CR-47)	WB	CR-47	B	B	D	E	E
	NB	CR-39	A	C	F	F	F
	SB	CR-39	A	A	A	A	A
	Intersection LOS		A	B	D	E	F
SIGNALIZED INTERSECTION (CR-39 AT CR-337)	EB	CR-39	A	A	A	A	A
	WB	CR-39	A	A	A	A	A
	NB	CR-337	C	D	F	F	F
	SB	Driveway	A	A	A	A	A

It is important to observe that in 2027 capacity issues exist at the signalized County Road 39 and County Road 47 intersection even when the overall intersection LOS is above F. The northbound and westbound queues are estimated at 750 feet and 550 feet respectively. At the intersection of County Road 39 and County Road 337, northbound delay is approximately 110 seconds. In summary, unstable traffic conditions, delays, and queuing may occur in 10 years for Alternative F'.

6 Funding Sources

Costs associated with the design and construction of the proposed alternatives could exceed the County's current available resources. This section discusses funding sources that are available to aid in design and construction. Federal programs are administered by the Alabama Department of Transportation. Table 3 details funding sources, the category of the source and type of project for which the funding can be used.

Table 17: Funding Options

Funding Source	Category	Match Type
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Federal	80% Federal/20% County
Surface Transportation Program (STP)	Federal	80% Federal/20% County
Highway Safety Improvement Program (HSIP)	Federal	90% Federal/10% County
Shelby County	Local	No Federal Match. County could partner with the City of Chelsea

Federal Funding

The *Congestion Mitigation and Air Quality (CMAQ)* funding program has been continued through the Fixing America's Surface Transportation Act (FAST Act). The Metropolitan Planning Organization (MPO) receives approximately \$10 Million of CMAQ funds annually. These funds are then distributed amongst various municipalities and ALDOT. The members of the MPO vote on projects to determine which projects receive funding.

The CMAQ Program's goal is to improve air quality. CMAQ funding can be used for both design and construction of a project. With CMAQ funding, an 80/20 match is required meaning the Federal funding provides 80% of the funding and the County would be responsible for the remaining 20% of funding. Since this report was prepared as part of the APPLE program, it can be used in conjunction with the application and will streamline the County's request for CMAQ funding. The downside to CMAQ 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 a CMAQ funded project is estimated at five to eight years.

http://www.fhwa.dot.gov/environment/air_quality/cmaq/

The *Surface Transportation Program (STP)*, also administered by ALDOT, requires an 80/20 match. The STP program provides flexible funding to the 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, construction of new bridges, and intersections with high levels of congestion.

<https://www.fhwa.dot.gov/specialfunding/stp/160307.cfm>

The *Highway Safety Improvement Program (HSIP)* has 90% Federal/10% Local match and has been continued through the Fixing America's Surface Transportation Act (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 requests, 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 CMAQ 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/>

Local Funding

The County has the option to fund the design and construction of their preferred alternative using only local funds. Choosing this route allows the project design and construction to have shorter timelines and the potential for reduced project costs since fewer plan reviews would be required and County guidelines will govern the project design. It is also possible that the County could team with the City of Chelsea to share the cost burden. The timeline for a locally funded project is estimated at 2-4 years.

7 Stakeholder Involvement

A project kickoff meeting was conducted on January 25, 2017 at Chelsea City Hall. The purpose of this meeting was to provide an overview of the APPLE program, outline study reporting criteria including previously identified considerations, provide an overview of Federal Aid funding, and determine expectations for the report. Representatives from the City of Chelsea, Shelby County, and RPCGB were present. Several build options for improvement were discussed during this meeting.

Following the initial kickoff meeting, the build options were evaluated for geometric feasibility and a capacity analysis performed. On May 2, 2017, the results of the evaluation were presented to the County. A draft of this document was provided May 30, 2017. A meeting to discuss the draft was held at Chelsea City Hall on July 6, 2017. Discussions during this meeting led to the creation of Alternative F' which is presented in section 4 of this document. Alternative F' was further evaluated and a follow up meeting to discuss the evaluation with the County and the City of Chelsea was held on July 25, 2017. From this meeting it was determined that a Public Involvement Meeting would benefit the City of Chelsea.

A Public Involvement Meeting to present Alternative F' was held on August 15, 2017 immediately following the regularly scheduled Chelsea City Council Meeting. Shelby County Engineer Randy Cole provided attendees with an overview of the study including the reason for the study and the status. During the meeting, participants were encouraged to provide feedback via comment forms. During the 10 day comment period, the City posted the concept map and the comment form on their website. The meeting was well attended; however only seven (7) forms were received during the meeting. During the comment period an additional sixteen (16) forms were received and four (4) e-mails were received concerning the concept presented. Of the responses received, there were eleven (11) approvals of the concept; four (4) forms indicated neither approval nor disapproval; and twelve (12) indicated disapproval of the concept. Completed comment forms, email submissions and a public involvement record is provided in Appendix K.

8 Next Steps

The purpose of this study was to determine the feasibility of potential improvements to the at-grade crossing on County Road 47 as well as improvements to the signalized intersection of County Road 47 and County Road 39. If the County chooses to move forward with implementing any of the build options and would like to pursue Federal funding, the next step would be to request inclusion of a project in the Birmingham Regional Transportation Improvement Plan. Once funds are in place for the project an environmental document will need to be prepared. The environmental document must include technical studies and public involvement outreach necessary to comply with procedures of the National Environmental Policy Act (NEPA). Once the environmental study has been completed, design would be finalized, followed by construction. If it is determined that additional right-of-way is required, acquisition would be conducted prior to construction. Due to the nature of the improvements' purpose and need being safety, there is potential for the County to obtain Highway Safety Improvement Program funds administered by ALDOT's Safety Operations Office.

The County may also elect to pursue improvements described in this study without federal funding. If this is the case, coordination between the County, the City of Chelsea, and the railroad company will be required to determine if any partnerships could be made to implement the improvements. In addition, an Alabama Department of Transportation permit for the improvements would have to be obtained for any work that would occur inside ALDOT right-of-way along US Highway 280. Other permitting required would include an ADEM permit for any disturbance greater than one acre and a United States Corps of Engineers permit would be required for any impacts to Yellowleaf Creek.

List of Appendices

- Appendix A – Level Of Service Description
- Appendix B – Crash Data Summary Information
- Appendix C – Preliminary Cultural Resources Evaluation
- Appendix D – USFWS Concurrence Request Letter and USFWS Response
- Appendix E – NRCS Concurrence Request Package and NRCS Response
- Appendix F – Utility Map
- Appendix G – Opinion of Probable Cost for Alternative F'
- Appendix H – HCS Reports (Available Upon Request)
- Appendix I – Synchro Reports: Existing Conditions (Available Upon Request)
- Appendix J – Synchro Reports: Future Conditions (Available Upon Request)
- Appendix K – Public Involvement Comment Forms and Record

Appendix A

Level of Service Description

Levels of Service Signalized Intersections

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

Level of service A describes operations with very low delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of service B describes operations with delay in the range of > 10 to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level of service C describes operations with delay in the range of > 20 to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of service D describes operations with delay in the range of > 35 to 55 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high vehicle/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level of service E describes operations with delay in the range of > 55 to 80 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high vehicle/capacity ratios. Individual cycle failures are frequent occurrences.

Level of service F describes operations with delay in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over saturation, i.e., when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels of Service
Unsignalized Intersections

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

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

Appendix B

Crash Data Summary Information

ADMONITION

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

Crashes by Year

Figure 1 shows an overview of total crashes at the study area from 2010 to 2016. 2014 total crashes were overrepresented. The linear trend line generated by this data suggests a decrease in crashes over these years.

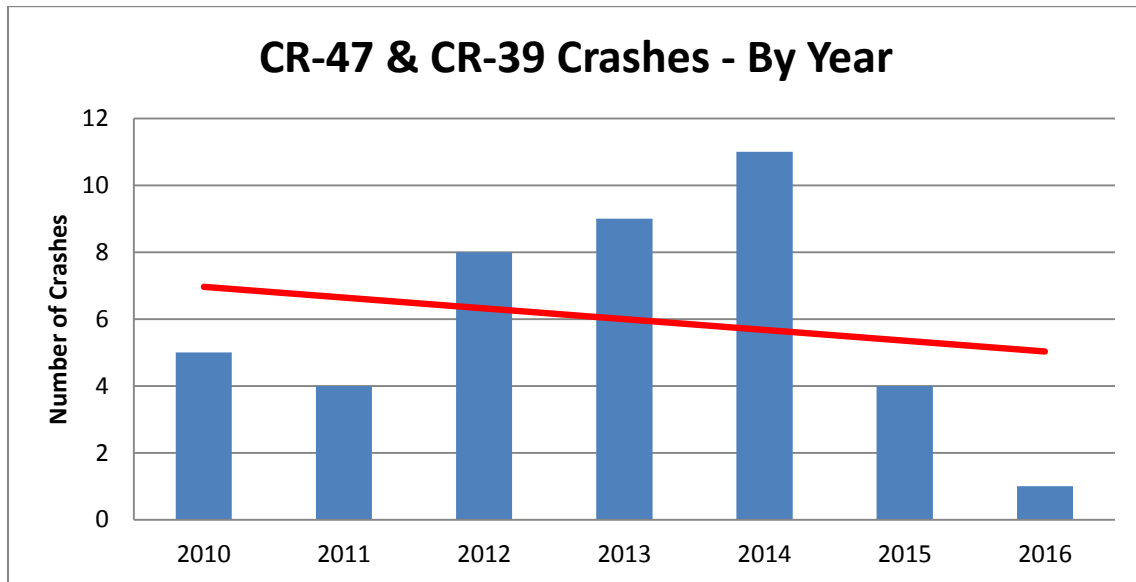


Figure 1: 2010-2016 Crash Trend

Crashes by Day of the Week

Figure 2 illustrates the distribution of crashes by day of the week. Thursdays are underrepresented at the study area. Weekday crashes are more frequent than weekend crashes.

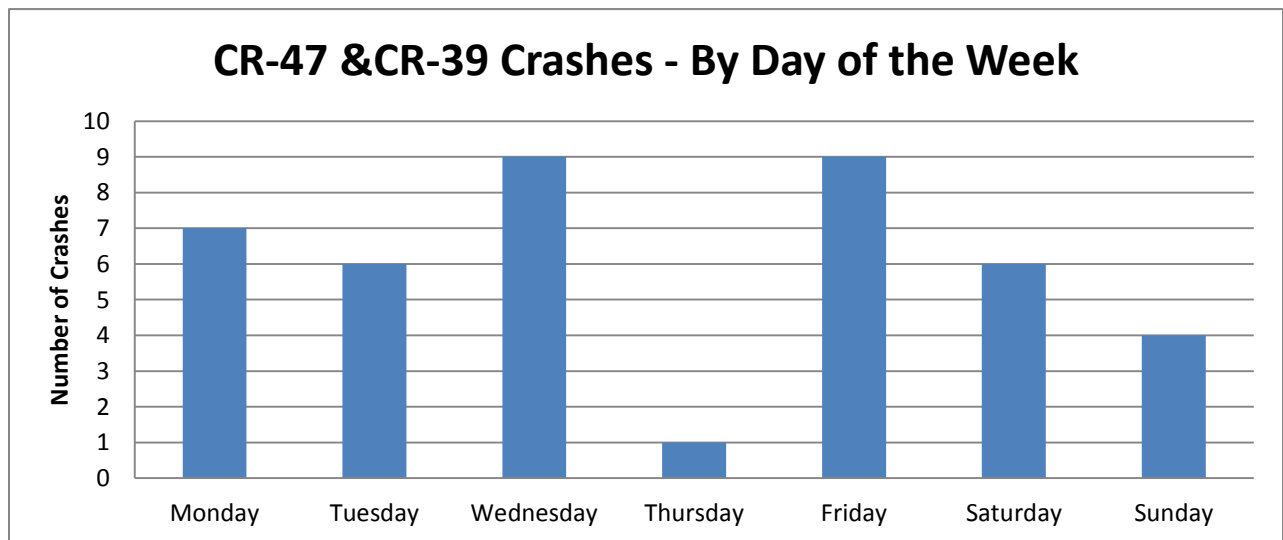


Figure 2: Crashes by Day of the Week

Crashes by Time of Day

Most crashes seem to happen in the early morning and in the afternoon. Several crashes occurred between 6:00 and 8:00 AM, as well as between noon and 6:00 PM. These times coincide with school and commuter peak periods (see Figure 3).

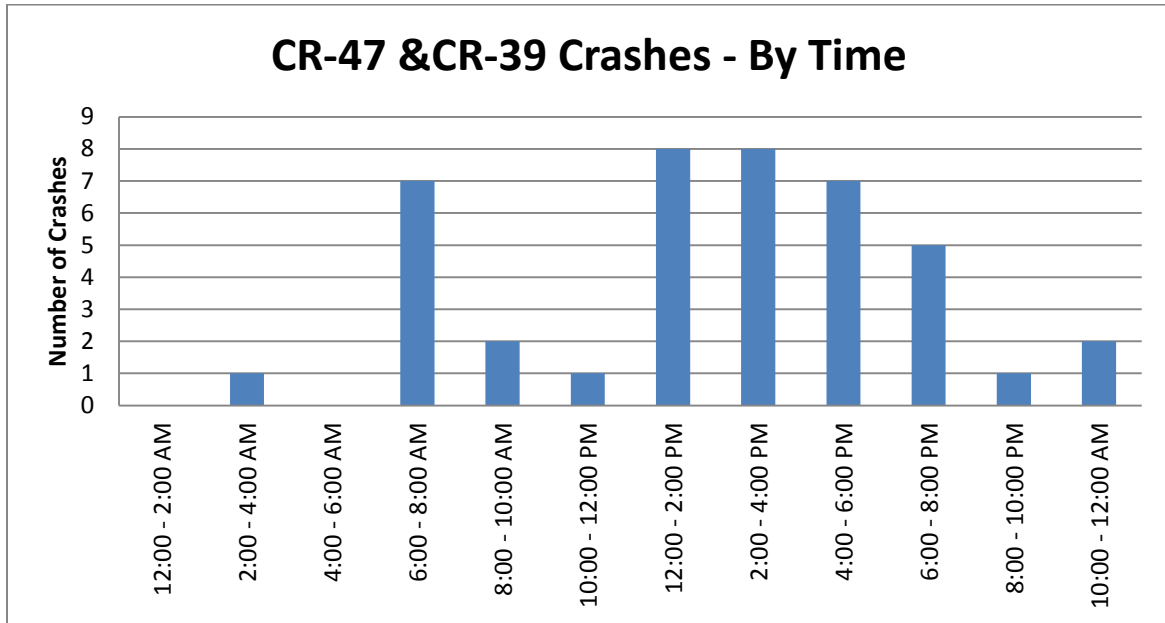


Figure 32: Crashes by Time of the Day

Primary Contributing Factor

Distracted driving and misjudging stopping sight distance each resulted in seventeen (17) percent of total crashes. Failure to yield right-of-way was also an important contributing factor for crashes (see Figure 4).

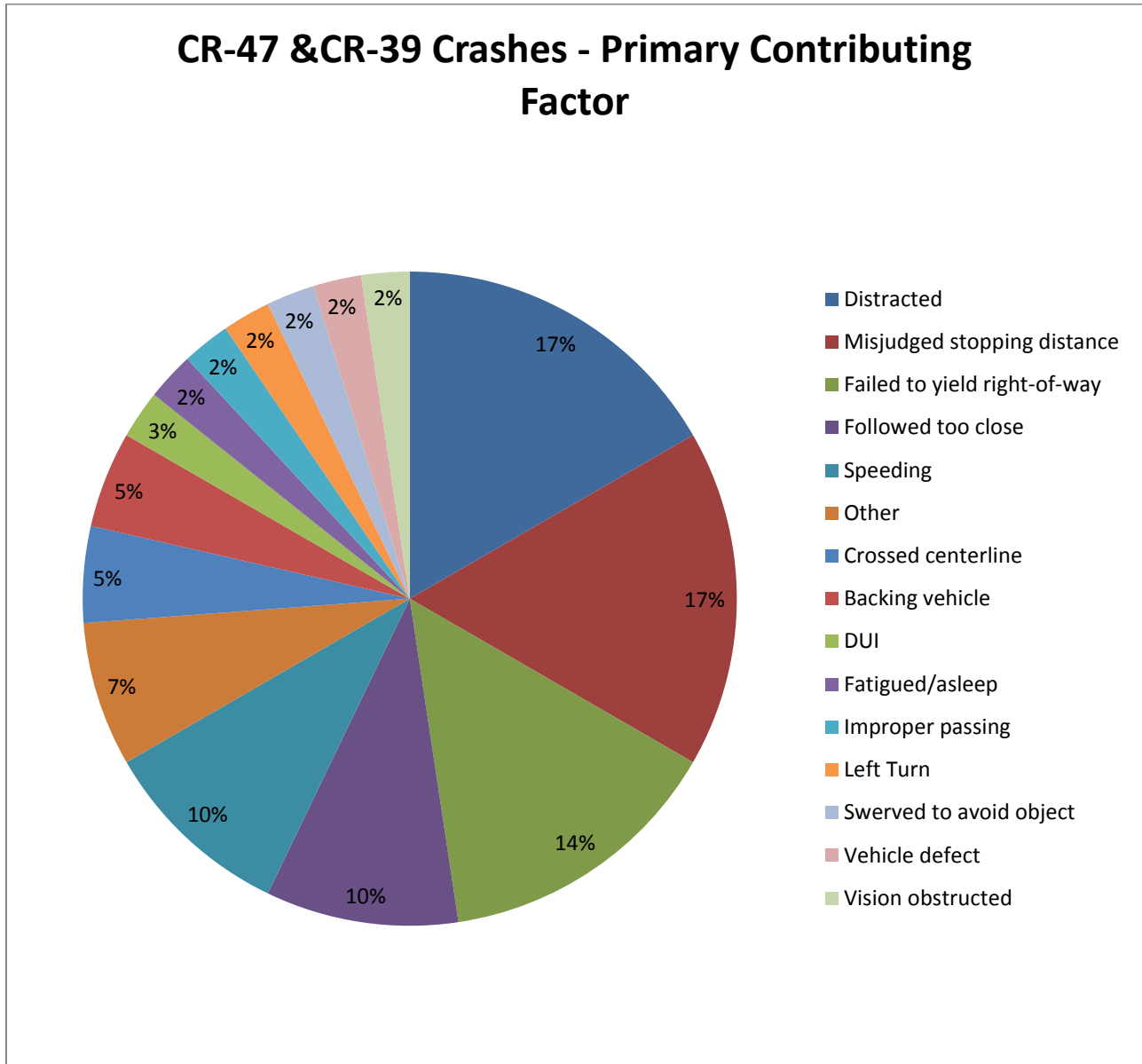


Figure 4: Primary Contributing Factor

Lighting and Weather Conditions

The majority of crashes, almost eighty (80) percent, occurred during the day. Also, sixty-two (62) percent of crashes happened during clear weather conditions. Figure 5 and Figure 6 illustrate lighting and weather conditions for crashes during the study period.

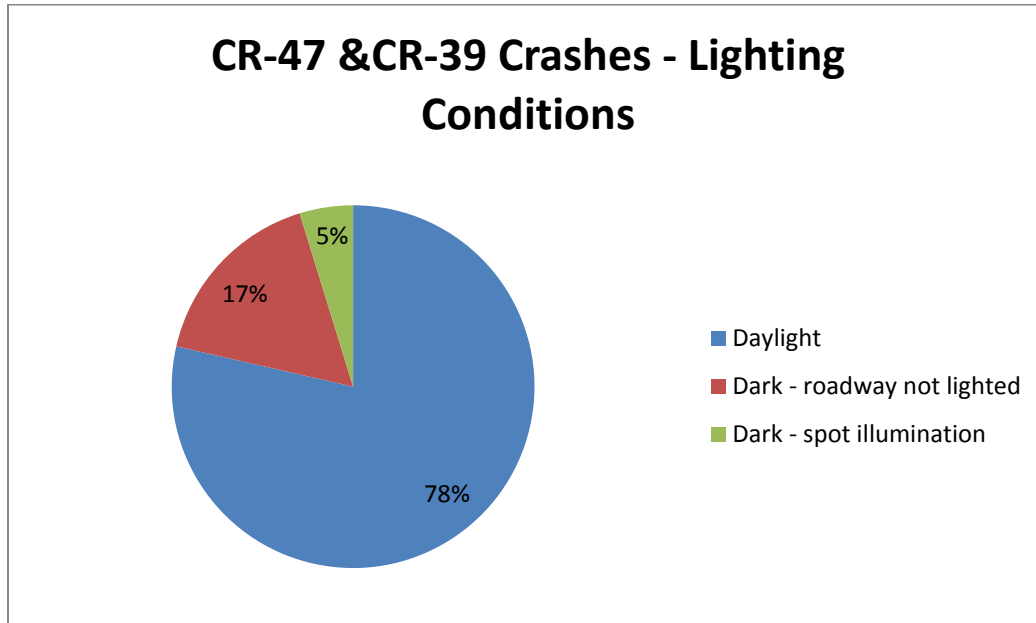


Figure 5: Lighting Conditions

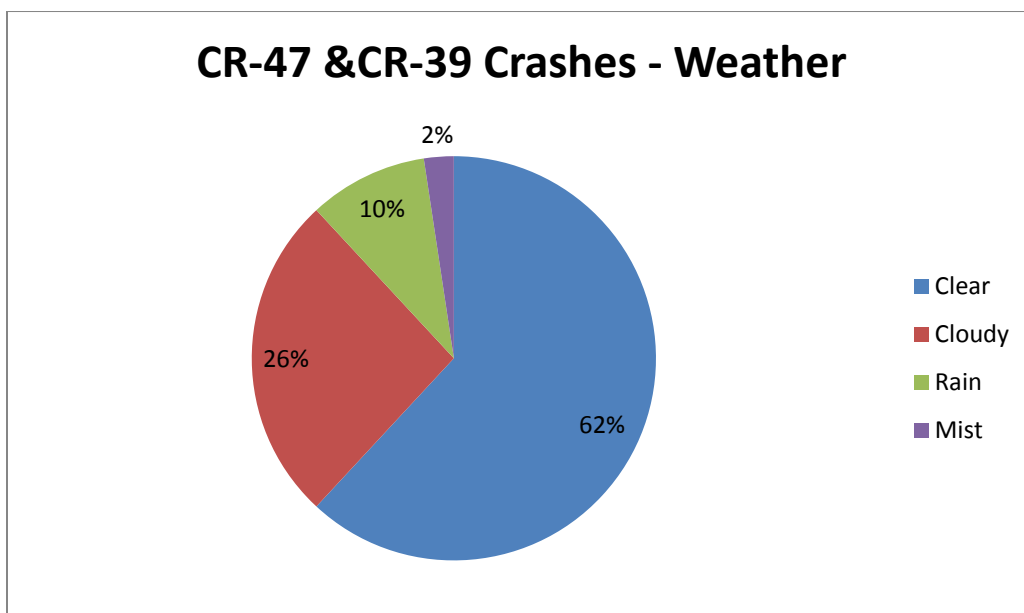


Figure 6: Weather

Crash Type

Rear-end crashes accounted for more than half of all total crashes for both County Road 39 and County Road 47. Also relevant on these roads, Angle crashes accounted for twenty-six (26) percent of crashes along County Road 39 (see Figure 7) and Sideswipe crashes represented fourteen (14) percent of crashes along County Road 47 (see Figure 8).

CR-47 & CR-39 Crashes - CR-39 by Crash Type

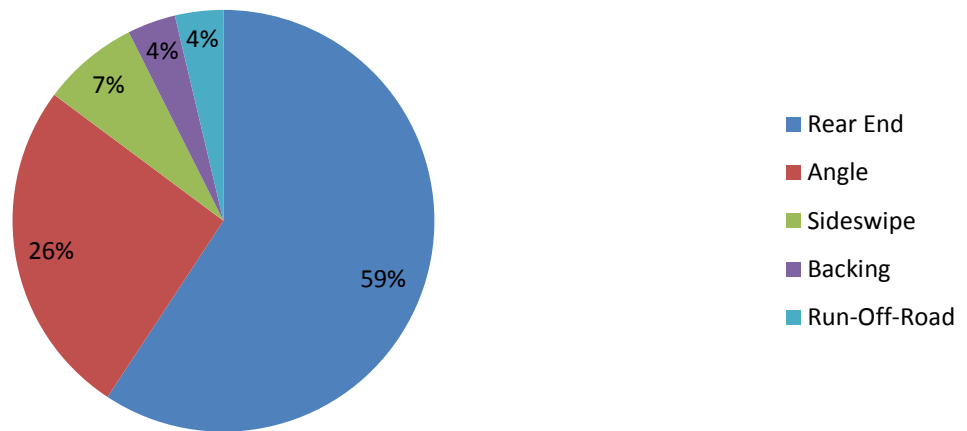


Figure 7: County Road 39 Crashes by Type

CR-47 & CR-39 Crashes - CR-47 by Crash Type

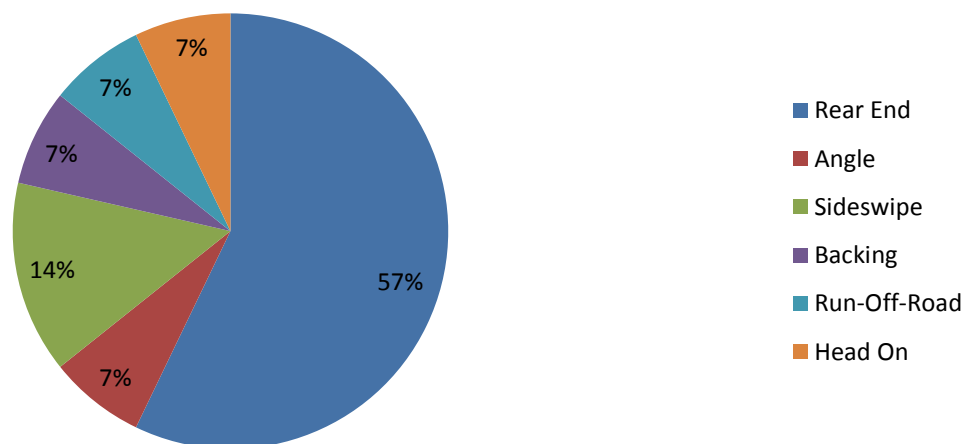


Figure 8: County Road 47 Crashes by Manner

Appendix C

Preliminary Cultural Resources Evaluation

**Cultural Resources Background Research
for the Highway 39-Highway 47 Intersection
in Chelsea, Shelby County, Alabama**

Catherine C. Meyer

PROJECT INFORMATION

Performed for: Sain Associates
Two Perimeter Park South, Suite 500 East
Birmingham, AL 35243
Project No: 16-0231

Performed by: MRS Consultants, LLC.
P.O. Box 3146
Tuscaloosa, AL 35403

BACKGROUND RESEARCH

Township/Range/Section: T19S, R1W, NE 1/4 of Section 34

Quadrangle: USGS 7.5' Chelsea, AL (Figure 1)

Alabama State Site File: No archaeological sites are recorded in the study area.

Previous Surveys: No cultural resources surveys are documented within the study area.

National Register of Historic Places: No NRHP properties are recorded within the study area.

National Historic Landmarks: No NHL properties are recorded within the study area.

Alabama Register of Landmarks and Heritage: No ARLH properties are recorded within the study area.

Review Using Google Streetscape: There are six historic structures within the study area (Figure 2). Below are our preliminary evaluations for these structures.

Resource 1: Resource 1 is the Weldon General Store. Based on newspaper articles found on the Internet, the store was constructed in 1915 by George Washington Weldon. He and his family operated the store between 1915 and 1980. The building has good architectural integrity. As an individual property, it is considered potentially eligible for nomination to the NRHP. It is also part of a small, historic commercial district at the intersection of Highway 39 and Highway 47. It is undetermined if the commercial district will be eligible for the NRHP

Resources 2 and 3: These resources are commercial buildings that date to the early-mid 1900s. The buildings have integrity issues and probably would not be individually eligible for the

NRHP. However, they are part of part of the small, historic commercial district. It is undetermined if the commercial district will be eligible for the NRHP.

Resource 4: This is the Chelsea Masonic Lodge. It appears to date to the early-mid 1900s. The masonic lodge has integrity issues, which may disqualify it from the NRHP as an individual property. However, it is part of part of the small, historic commercial district. It is undetermined if the commercial district will be eligible for the NRHP.

Resource 5: This store appears to date to the early-mid 1900s. The structure has integrity issues, which may disqualify it from the NRHP as an individual property. However, it is part of part of the small, historic commercial district. It is undetermined if the commercial district will be eligible for the NRHP.

Resource 6: This structure appears to date to the mid 1900s. It is currently undetermined if it was built as a residence or if it served a community function. The structure is not individually eligible for the NRHP, nor does it appear to be part of the historic commercial district. However, its original function needs to be determined.

RECOMMENDATIONS

Making improvements at the intersection of Highway 39 and Highway 47 may pose some problems for historic structures. The Weldon General Store (Resource 1) almost certainly is eligible for the NRHP. While the other structures do not appear to be individually eligible, they may be considered NRHP eligible as a historic commercial district (including Resources 1-5). However, these are very preliminary evaluations. More research is needed to make NRHP determinations.

If the proposed road improvements will require a direct impact (i.e. removal) of any of NRHP-eligible structures, then the Federal Highway Administration (FHWA) will require that other alternatives be considered. It is possible that Section 4(f) of The Department of Transportation Act (DOT Act) of 1966 will apply. You may want to reference their website to understand this provision (<https://www.environment.fhwa.dot.gov/4f/index.asp>). We recommend that you consult the Environmental Technical Section at the Alabama Department of Transportation (ALDOT) to understand the best way to approach this project. It is likely that the ALDOT will require that at least three alternatives be considered.



Figure 1. Study Area Shown on the USGS 7.5' Chelsea, AL Quadrangle.

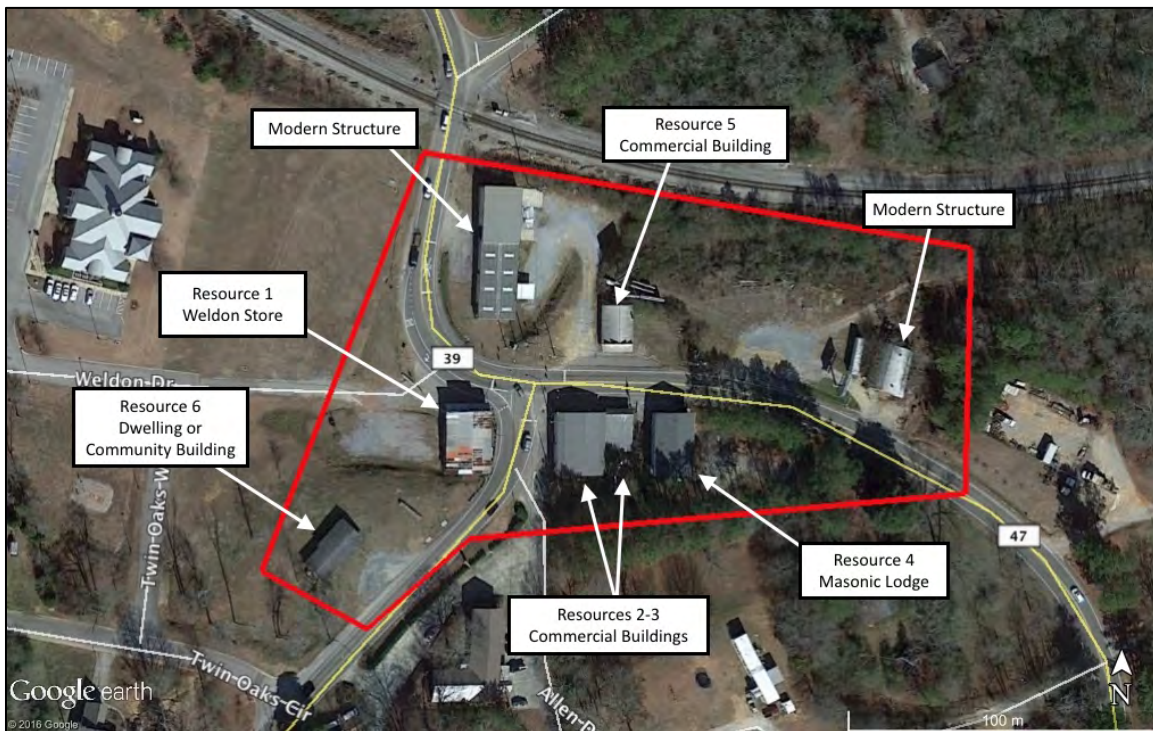


Figure 2. Aerial Photograph Showing the Historic Resources.

Appendix D

**USFWS Concurrence Request Letter and
USFWS Response**



TA/BP
2017-TA-0383



February 20, 2017

Mr. William J. Pearson
Field Supervisor
U.S. Fish and Wildlife Service
1208-B Main Street
Daphne, AL 36526

Subject: **USFWS Species Request
CR-47 and CR-39 Intersection Realignment Study
Regional Planning Commission of Greater Birmingham
Chelsea, Shelby County, Alabama**

Dear Mr. Pearson:

Shelby County in conjunction with the Regional Planning Commission of Greater Birmingham is evaluating the feasibility of realigning the intersection of County Road 47 and County Road 39 located in Chelsea, Alabama. The intent of this letter is to request your assistance in identifying threatened and endangered species that may occur in the vicinity of the study area. The study area is shown on the enclosed map.

Please let me know if you have any questions or need additional information.

Sincerely,

Jennifer G. Brown, PE
Project Manager
Alabama Reg. #32726
205.263.2159
jbrown@sainc.com



U.S. Fish and Wildlife Service
1208-B Main Street – Daphne, Alabama 36526
Phone: 251-441-5181 Fax: 251-441-6222

No endangered or threatened species or critical habitat are known to occur in the project area. As described, the project will have no significant impact on fish and wildlife resources. IF PROJECT DESIGN CHANGES ARE MADE, PLEASE SUBMIT NEW PLANS FOR REVIEW.

William J. Pearson, Field Supervisor

2/23/2017

Date

2

Attachment

Appendix E

**NRCS Concurrence Request Package and
NRCS Concurrence**



February 20, 2017

Mr. Milton Tuck
Resource Soil Scientist
Natural Resources Conservation Service
Milton.tuck@al.usda.gov
420 Hackberry Lane
Tuscaloosa, Alabama 35486

Subject: **Primary and Unique Farmland Concurrence Request
CR-47 and CR-39 Intersection Realignment Study
Regional Planning Commission of Greater Birmingham
Chelsea, Shelby County, Alabama**

Dear Mr. Tuck:

Shelby County in conjunction with the Regional Planning Commission of Greater Birmingham is evaluating the feasibility of realigning the intersection of County Road 47 and County Road 39 located in Chelsea, Alabama. Mapping is included for your use in determining the prime farmland status for the subject project.

Please let me know if you have any questions or need additional information.

Sincerely,

A handwritten signature in black ink that reads "Jennifer G. Brown". The signature is written in a cursive, flowing style.

Jennifer G. Brown, PE
Project Manager
Alabama Reg. #32726
D: (205) 263-2159
jbrown@sain.com

Attachment



Natural Resources Conservation Service
1300 Meridian Street, Suite 23-F
Huntsville, AL 35801

March 28, 2017

ATTN: Jennifer Brown
Sain Associates
Two Perimeter Park S.
Suite 500 East
Birmingham, AL 35243

REF: Primary and Unique Farmland Concurrence Request
CR-47 and CR-39 Intersection Realignment Study
Regional Planning Commission of Greater Birmingham
Chelsea, Shelby County, Alabama

Dear Jennifer Brown:

The area of consideration for the wastewater collection system **does not** contain "Prime Farmlands" as defined in Appendix A of Department Regulation No. DR 9500-3 dated March 22, 1983; and also, **does not** meet the criteria set forth by the Farmland Protection Policy Act (FPPA) and Land Evaluation Site Assessment (LESA) of June 22, 1982.

In addition, area of consideration **does not** contain hydric soils (blue) that meet the definition for wetland criteria, as required by 180-V-NFSAM Third Edition, Amend 2, November 1996 part 513.11.a.

Erosion and sediment control measures should be implemented and maintained during the construction phase to protect land, water, and related resources. Plans for construction should include sediment basins or traps and other erosion control practices, including coverage of bare soil as soon as possible by temporary and permanent vegetation and structures.

If you need further assistance, please contact your local NRCS office, or feel free to call myself, Christopher Ford, Acting Resource Soil Scientist, at (256) 372-5949.

Sincerely,

Christopher Ford
Acting Resource Soil Scientist

Farmland Classification—Shelby County, Alabama



**Natural Resources
Conservation Service**


Web Soil Survey
National Cooperative Soil Survey

2/20/2017
Page 1 of 4

Farmland Classification—Shelby County, Alabama









MAP LEGEND








Area of Interest (AOI)

 Area of Interest (AOI)




Soils








Soil Rating Polygons






-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available







Soil Rating Lines










-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained

-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available

Soil Rating Points


-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available

Water Features

Farmland Classification—Shelby County, Alabama

MAP INFORMATION

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shelby County, Alabama

Survey Area Data: Version 9, Sep 23, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 13, 2011—Mar 1, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Farmland Classification— Summary by Map Unit — Shelby County, Alabama (AL117)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CS	Choccolocco-Sterrett association, frequently flooded	Farmland of statewide importance	11.5	3.2%
NaE	Nauvoo loam, 15 to 35 percent slopes	Not prime farmland	4.4	1.2%
NcD	Nauvoo-Sunlight complex, 8 to 15 percent slopes	Not prime farmland	166.6	46.6%
NcE	Nauvoo-Sunlight complex, 15 to 25 percent slopes	Not prime farmland	175.3	49.0%
Totals for Area of Interest			357.8	100.0%

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Appendix F

Utility Map



Appendix G

Opinion of Probable Cost for Alternative F'

OPINION OF PROBABLE COST
APPLE CR-47 and CR-39 Alternative F Concept

Description: Cost Improvements proposed in Alternative F

Item Description	Unit	Quantity	Unit Price	Amount
Clearing & Grubbing (\$4000/Acre)	LS	1	\$72,000	\$72,000
RR Sight Distance Clearing (\$4000/Acre)	LS	1	\$4,000	\$4,000
Creek Bridge Widening	LS	1	\$320,850	\$320,850
Unclassified Excavation	CY	38750	\$10	\$387,500
Borrow Excavation	CY	65100	\$15	\$976,500
Structure Excavation	CY	1675	\$15	\$25,125
Foundation Backfill	CY	510	\$35	\$17,850
Wearing Surface (2.5")	TON	7200	\$100	\$720,000
Binder (3")	TON	5000	\$100	\$500,000
Crushed Aggregate Base (6")	SY	30080	\$20	\$601,600
Leveling	TON	50	\$120	\$6,000
Tack Coat	GALLON	2475	\$5	\$12,375
Striping	LS	1	\$24,000	\$58,000
Signs	LS	1	\$20,000	\$20,000
Roadway Pipe 24"	LF	240	\$50	\$12,000
Roadway Pipe 36"	LF	320	\$70	\$22,400
Side Drain Pipe 18"	LF	360	\$40	\$14,400
Erosion Control	LS	1	\$135,000	\$135,000
Traffic Control	LS	1	\$115,000	\$115,000
Utility Cost	LS	1	\$1,350,000	\$1,350,000
Railroad Side Light/Gates	LS	1	\$200,000	\$200,000
Signal Cost	EACH	1	\$150,000	\$150,000
Right Of Way Acquisition	LS	1	\$2,200,000	\$2,200,000
Mobilization (9.7% of Overall Cost)	LS	1	\$768,298	\$768,298
Engineering Controls(1.7% of Overall Cost)	LS	1	\$147,711	\$147,711

Total Fixed Cost: \$8,836,609

Contingency (20%) \$1,767,322

Sub Total: \$10,603,931

Preliminary Engineering (15%) \$1,590,590

CE&I and Indirect Costs (15%) \$1,590,590

Grand Total: \$13,786,000

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

Appendix H
HCS Reports
(Available Upon Request)

Appendix I

Synchro Reports: Existing Conditions

(Available Upon Request)

Appendix J

Synchro Reports: Future Conditions

(Available Upon Request)

Appendix K

**Public Involvement Comment Forms and
Record**

CR-47 and CR-39 Intersection Realignment Study-APPLE Program

Public Involvement Record

Chelsea, Alabama

Shelby County

A public involvement meeting was held on Tuesday, August 15, 2016 following the Chelsea City Council Meeting. Shelby County Engineer, Randy Cole, provided attendees with an overview of the study including the reason for the study and the status. During the meeting, participants were encouraged to provide feedback via comment forms. The comment period ended 10 days after the meeting (August 25, 2017). During the comment period the City posted the concept map and the comment form on their website. The meeting was well attended; however only seven (7) forms were received during the meeting. During the comment period an additional sixteen (16) forms were received and four (4) e-mails were received concerning the concept presented. Of the response received, there were eleven (11) approvals of the concept, four (4) indicated neither approval nor disapproval, and twelve (12) indicated disapproval of the concept.

Public Comments

The following is a discussion of the comments received as a result of the public involvement meeting.

	Are you in favor of realigning the intersection of CR-47 and CR-39 to achieve increased safety at the at-grade railroad crossing?	Comment	Response
1	Yes	None.	None.
2	Yes-But this proposal will not accomplish that goal (included in disapproval count)	Moving the intersection closer to the school will cause a quicker traffic backup during school traffic.	The intent of the concept is to improve safety concerns associated with the close proximity of the at-grade crossing and signalized intersection. Relocating the signal further south will address these concerns and provide a signal that operates more efficiently. Also, the addition of turn lanes at the proposed signalized intersection will allow through traffic the ability to clear the intersection quicker.
		The wrecks involving trains involve cars traveling south on CR-47. This proposal does not change the blind curve before the tracks.	The close proximity of the signalized intersection and the at-grade crossing limits the storage space allowed for southbound vehicles and creates the potential for cars to queue over the railroad tracks. Shifting the signal south will allow more storage space and creates a scenario where the signal operation is less dependent upon the presence of a train. The addition of gates, markings, and signs will increase safety as well and clearing of the vegetation behind the guardrail north of the at-grade crossing will improve stopping sight distance.
3	Yes	Concept looks good. This would increase safety and capacity at the intersection. Addition of gates at crossing is good.	None.
4	No	Looks like someone is just going to make money on the sale of land. Really doesn't accomplish anything.	Right-of-way acquisition will be handled by the County and appropriate market value will be determined. Implementing the improvements shown in the concept will improve the safety of the area and improve traffic operations experienced at the signalized intersection.
5	Yes	None.	None.
6	Yes	Like the design as proposed.	None.
7	Yes	The 47 cul-de-sac could be a right turn only. Also, would be nice for the medians to have planters in them.	The addition of a right-in only or right-in/right-out onto the existing CR-47 will be evaluated during the design phase. The use of medians will be evaluated during the design phase.
8	Yes	Can Weldon Drive be connected to 47 for better access to City Hall since the intersection has been moved? For me, the movement to 47 in the afternoon will be critical along with the movement to 47 in the AM. Maybe the AM movement could be improved by a more deliberate rt turn w/ maybe a merge lane.	Connection to Weldon Drive will be evaluated during the design phase.
9	No	Respondent included letter expressing concerns related to access to their business (Best Way Tax and Business Center)	Access to this property will be evaluated during the design phase.

10	Undecided	Respondent included letter expressing concerns related to access to their business (Bradley Realty and Heavenly Smile), impacts to parking, and property value	Access to this property will be evaluated during the design phase. Parking should be maintained, if not, that will be addressed during right-of-way negotiations with the County/City.
11	Yes	We welcome this realignment of CR-47 and 39. The new section of CR 47 begins just south of our property on Meadow Lake Lane. The further south it can be positioned the quieter it will be for us. Commuter traffic on 47 is already noisy and will worsen in the future. Also, sidewalks should be added to any new road projects. Connect the new Community Center, City Hall, the Middle School, and Winn Dixie with a sidewalk network. Thanks.	Whether sidewalks will be included in the design is unknown at this time.
12	No	Respondent included letter expressing concerns related to the closing of CR-47. These concerns are related to property values, access to businesses and the risk of closing businesses, emergency vehicle access, USPS mail routes and County school bus routes, and limited access the community center and Liberty Baptist Church. Respondent suggested straightening CR-39 and including a right turn only lane from CR-39 onto CR-47 and a right turn only lane from CR-47 onto CR-39.	The concept includes realigning CR-47 not complete closure of the roadway. A right turn only lane or right-in/right-out access to the existing CR-47 from the realigned CR-39 will be evaluated during the design phase.
13	Yes	While I am in favor of improving public safety, the proposed change will have a negative effect on property value, emergency access, and access to the Masonic Lodge.	The concept includes realigning CR-47 not complete closure of the roadway. Access to the businesses located on CR-47 will be maintained; however, connection to CR-39 will no longer be where it is currently. A right turn only lane or right-in/right-out access to the existing CR-47 from the realigned CR-39 will be evaluated during the design phase.
14	No	I am 84 years old. I am high risk for falls. Last year I broke my hip and required a hip replacement. Therefore, I am concerned that EMS response would be delayed because of this proposed road closure.	The concept includes realigning CR-47 not complete closure of the roadway. Access to the businesses located on CR-47 will be maintained; however, connection to CR-39 will no longer be where it is currently. A right turn only lane or right-in/right-out access to the existing CR-47 from the realigned CR-39 will be evaluated during the design phase.
15	No	I disagree with this proposed project because it will effect property values. I do not believe this project will improve the current downtown Chelsea area.	The concept includes realigning CR-47 not complete closure of the roadway. Access to the businesses located on CR-47 will be maintained; however, connection to CR-39 will no longer be where it is currently. A right turn only lane or right-in/right-out access to the existing CR-47 from the realigned CR-39 will be evaluated during the design phase.
16	No	This will effect my ability to lease out my rental properties. It's going to create an inconvenience and financial hardship for myself and my blind brother.	The concept includes realigning CR-47 not complete closure of the roadway. Access to the businesses located on CR-47 will be maintained; however, connection to CR-39 will no longer be where it is currently. A right turn only lane or right-in/right-out access to the existing CR-47 from the realigned CR-39 will be evaluated during the design phase.
17	No	This will effect my business. Most of my customers travel from 280 to Hwy 47. This will make a big financial decline in my customers. My business will suffer as a result.	The concept includes realigning CR-47 not complete closure of the roadway. Access to the businesses located on CR-47 will be maintained; however, connection to CR-39 will no longer be where it is currently. A right turn only lane or right-in/right-out access to the existing CR-47 from the realigned CR-39 will be evaluated during the design phase.
18	Yes	Would it be possible to open Weldon Drive giving direct access to City Hall? Will the new traffic light "freeze" while trains pass over CR-47? When will construction begin? How much will it cost? How long will it take to complete? How will existing traffic be handled during construction?	Connection to Weldon Drive will be evaluated during the design phase. It is expected that construction will begin in 1-2 years and it will take an estimated 1-2 years to complete. A detailed traffic control plan will be prepared during the design phase. Railroad preemption is unnecessary due to the distance between the proposed signal and the crossing.

19	No	CSX to help build bridge over railroad tracks and do not change Hwy 47 and Hwy 39. Present condition and suggestions for change does not help RR Tracks problem.	The estimated cost to install a grade separated crossing is approximately \$20M. The County/City have discussed funding with the railroad owner and still deem a bridge option infeasible at this time. To install a bridge over the railroad crossing the vertical clearance required is 23' between the top of the rails and the bottom of the bridge girders. To install a bridge, the existing alignments of CR-39 and CR-47 would have to be modified greatly. With some alternatives that were analyzed, a second bridge over Yellowleaf Creek would also be required.
20	Yes	Respondent suggested installing a roundabout in front of City Hall.	Although roundabouts offer numerous benefits, the proximity of suggested roundabout to the at-grade crossing would not improve the safety concerns associated with cars queuing on the railroad tracks. Also, roundabouts were evaluated during the alternatives analysis and it was revealed that a roundabout had a shorter life span than a signalized intersection.
21	No	Building of bridge to alleviate back up of traffic for residents and EMS. Re-routing Hwy 47 and Hwy 39 is only moving problem closer to school. There is no help for traffic congestion with this suggestion.	The intent of the concept is to improve safety concerns associated with the close proximity of the at-grade crossing and signalized intersection. Relocating the signal further south will address these concerns and provide a signal that operates more efficiently. Also, the addition of turn lanes at the proposed signalized intersection will allow through traffic the ability to clear the intersection quicker. Constructing a bridge is cost prohibitive at this time.
22	Yes	Respondent provided sketch along with the following notes: City already owns most areas where widening is suggested. Remove the block building behind where Weldon's store was. The City has the land, why pay so much to buy more? On another note, put new entrance to Chelsea Community Center around Liberty Cemetery. The City already owns that land too. Sketch included a right turn lanes and left turn lanes at CR-47/City Hall entrance; Left turn onto CR-337; Left turn into Middle School; Left turn lane to Community Center across from Liberty Road.	Turn lanes will be evaluated during the design phase. Turn lanes for the Middle School and the Community Center are outside the scope of this project.
23	No	As proposed this will not help with traffic flow, instead it will all congest at the new traffic light. Extremely high cost for very little traffic relief. There has to be a better solution.	The intent of the concept is to improve safety concerns associated with the close proximity of the at-grade crossing and signalized intersection. Relocating the signal further south will address these concerns and provide a signal that operates more efficiently. Also, the addition of turn lanes at the proposed signalized intersection will allow through traffic the ability to clear the intersection quicker.
24 (e-mail)	Neither Approve or Disapprove	I live on Meadow Lake Ln in Chelsea and would hope you could adjust your plan so Meadow Lake Ln can go directly over to Hwy 47, not the S it would take in your plan as drawn. There are 7 families and two school buses and garbage trucks that use this road and my son, Bob Blackerby, has a heavy equipment company that also uses this road. From the drawing, it looks like it will be almost impossible for the school buses, garbage trucks, and a big truck pulling heavy equipment to get onto Hwy 47 as drawn. I know you are aware of the hill coming down toward 280 from Liberty Baptist is very dangerous now and seems it will be even more so for those of us on Meadow Lake trying to get on to Hwy 47. I didn't think it would be a problem until I saw 47 would be closed near the RR so we could not go out as usual.	Access from Meadow Lake Lane to the realigned CR-47 will be evaluated during the design phase. Also, intersection sight distance will also be evaluated.

25 (e-mail)	No	Has anyone entertained the idea of making 47 & 39 from the train tracks towards 280 into 2 lanes each way. Once they cross the tracks they would split off from lanes marked showing 39 to the right and 47 stay left. There would only need to be a merging lane from 47 onto 39 at the corner. No light would be needed due to merging from 47 only. I am not in favor of making new roads and buying all properties and losing green areas. I am not a "tree hugger" but Chelsea needs some thought on how to preserve our small town atmosphere that we all love. The businesses on 47 have a hard time surviving as is and new business would not want to move in if it is a dead end there. My suggestion, I think, would be less costly and simpler in the long run.	Providing two travel lanes in both directions was evaluated and additional travel lanes will be warranted in the future; however, the cost to do so is estimated at \$13.79M which the County/City have deemed infeasible to fund at this time.
26 (e-mail)	Neither Approve or Disapprove	It looks very nice to have CR-39 straightened. I did have concerns about dead ending CR-47 and not connecting it to the new CR-39. If CR-47 dead ends, that would put a lot of traffic coming from Columbiana and those living on that section of CR-47 onto Liberty Road and onto CR-433 and then onto CR-39 or CR-440 to get to Hwy 280. I know you are aware that the intersection of CR-39 and Hwy 280 is already dangerous and more traffic trying to get onto 280 via CR-39 would just add to the problems that already exists. I appreciate your time and attention to my concerns. I hope you will carefully consider all possibilities as the realignment project moves forward.	The concept includes realigning CR-47 not complete closure of the roadway. Access to the businesses located on CR-47 will be maintained; however, connection to CR-39 will no longer be where it is currently. A right turn only lane or right-in/right-out access to the existing CR-47 from the realigned CR-39 will be evaluated during the design phase.
27 (e-mail)	Neither Approve or Disapprove	There are 3 roads dumping cars on to 39 from 47, plus subdivisions, it is heavily traveled, adding a light will just slow things. There needs to be another way out. An exit at the back of yellow leaf subdivision would accomplish this. The train there is on a trestle no waiting. Safety has been mentioned as a reason for new road, with all improvements mention looks like that would be enough. No road needed.	The existing traffic signal will be relocated only; an additional signal would not be installed unless warranted. Providing a connection from Yellowleaf Ridge Estates to Old 280 would require a new roadway and traffic on the neighborhood streets would see substantial increase.