Railroad Overpass Feasibility Study
Starke, Florida
FPID 436558-1-22-01

January 2016

FDOT

EXECUTIVE SUMMARY

This feasibility study develops construction alternatives that provide a grade separated railroad overpass in Starke, Bradford County, Florida. This study documents alternatives considered, public involvement efforts and presents a recommendation for alternatives to carry forward to the PD&E Study.

The primary goal of this study is to alleviate congestion caused by vehicles having to stop at blocked railroad crossings. A grade separated railroad overpass for the City of Starke will also provide emergency responders a reliable response time when a train is blocking the at-grade crossing. The existing at-grade crossing contributes to local travel delay in excess of two minutes while the gates are closed for a train passing.

Emergency responders experience increased response times as a result of the trains. A grade separated overpass will provide more timely emergency response in a situation where railroad crossings are blocked. All of the emergency services are located on the west side of the railroad while the hospital is located on the east side of the railroad. The railroad creates a barrier for emergency responders when a train is present. Minutes of delay can be significant in the transport of a critical condition patient.

Vehicles stopped at a blocked SR 100 railroad crossing routinely queue, or stack-up, to the US 301 intersection and at times extend to Winn Dixie. Excessive queues also occur at the SR 16 railroad crossing. This creates an undesirable situation with a risk of vehicles blocking the US 301 intersection and increasing the risk of vehicle crashes.

After a thorough review of the project study area, constraints were identified that limited potential locations of the overpass. In the initial phase, seven alternatives were studied including a tunnel option. At this time the SE 144th Avenue, SR 100 and no-build alternative are still under consideration.

A public meeting will be held January 4th, 2016 to seek input from stakeholders on these two build alternatives. After this meeting FDOT will seek feedback from the City and County Commissions. After receiving input, FDOT will make a recommendation on the preferred alternative and hold a public hearing to advise the public of the decision and seek additional public input.

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1. PROJECT INFORMATION

1.1 Introduction

The Florida Department of Transportation is conducting a Project Development and Environment (PD&E) study to evaluate the feasibility for construction of an east-west grade separated railroad overpass over the CSX S-line in the City of Starke in Bradford County Florida. A PD&E study is a process that utilizes engineering and environmental analysis to evaluate social, economic, natural and physical environmental impacts associated with a proposed transportation improvement. During the PD&E Study, alternatives are proposed and evaluated with regards to community, social economic, environmental and historical/cultural conditions and project cost factors such as right-of-way acquisition, business damages and construction. Safety as well as stakeholder input are also important elements of the study.

The City of Starke is currently divided by the CSX railroad that runs parallel to the US 301 corridor. There are approximately 29 trains per day that utilize the CSX S-line and this number is anticipated to increase based on normal growth. A train blocked crossing results in motorist delay and potentially disrupts emergency vehicle response times. Although there are currently nine at-grade railroad crossings in Starke, there are no raised crossings over the railroad.

1.2 Purpose and Need

The primary goal of this study is to alleviate congestion of vehicles queued at blocked railroad crossings. A grade separated railroad overpass for the City of Starke will also provide emergency responders a reliable response time when a train is blocking the at-grade crossing. The existing at-grade crossing contribute to local travel delay in excess of two minutes while the gates are closed for a train passing. Emergency services are located on the west side of the railroad and access to/from the east maybe hindered by the rail traffic.

State Road (SR) 100 and SR 16 are the two primary east-west roadways that cross the railroad. The existing (2015) Average Annual Daily Traffic (AADT) for SR 100 and SR 16 is approximately 8,900 and 7,600 vehicles per day, respectively. It is anticipated that these roadways would see an increase in traffic of more than 10 percent by 2040. The roadways currently operate acceptably and are not operating beyond their capacity. The primary needs for the project are to reduce travel delay experienced by motorists, improve safety and decrease emergency response time.

The purpose of this feasibility study is to develop construction alternatives. This study documents alternatives considered, public involvement efforts and presents recommendations for alternatives to carry forward to the PD&E Study.

1.3 Study Area

The limits of the project study is bounded by SE 144th Avenue to the south, SR 16 to the north, US 301 (SR 200) to the west and SR 100/Water Street to the east. The project study area is shown in Figure 1.

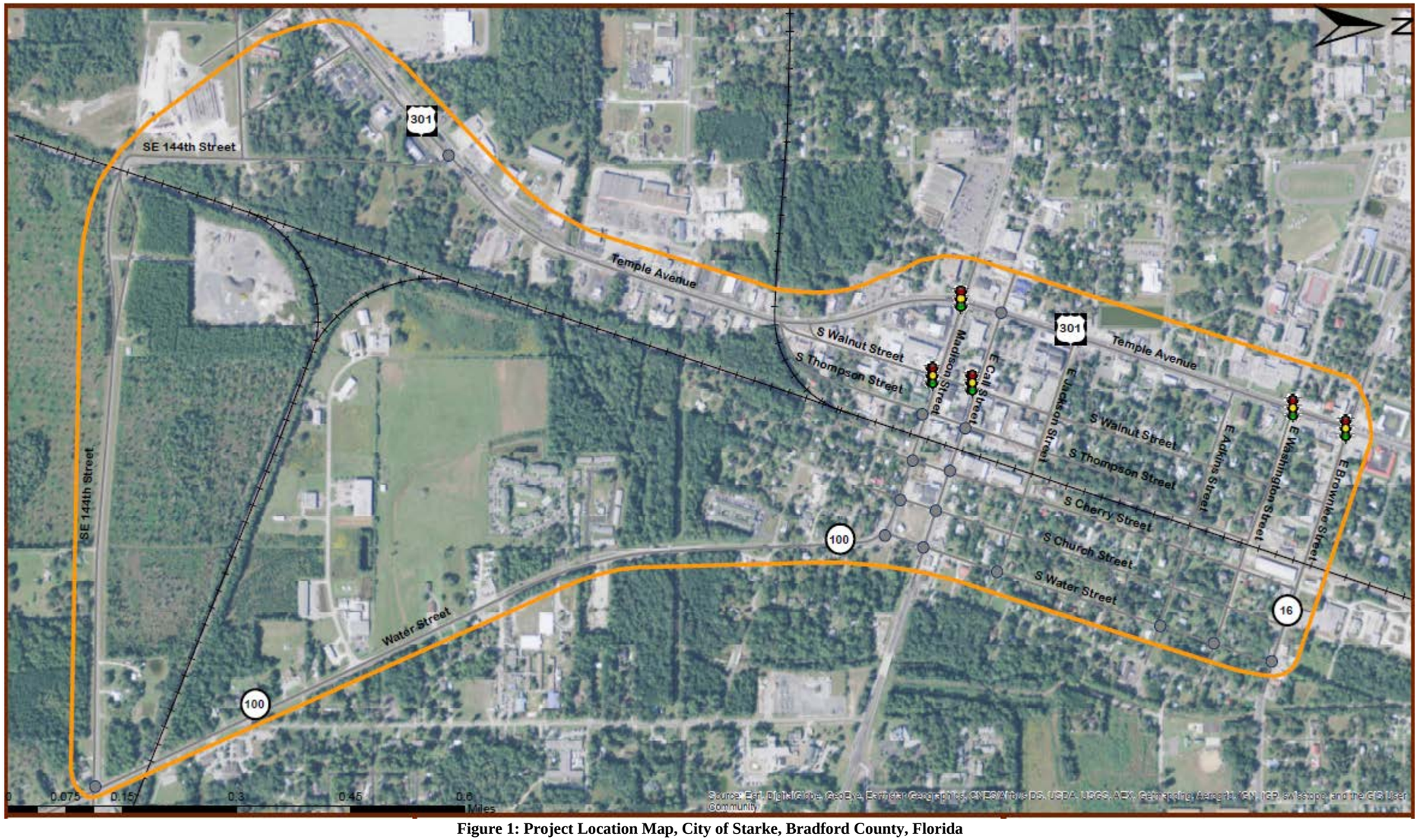

Figure 1: Project Location Map, City of Starke, Bradford County, Florida

2. EXISTING CONDITIONS

Starke was founded in 1858 with a total area of approximately 40 acres and a documented population of 138. During this same year, the Florida Railroad arrived in Starke creating a transportation and agricultural hub for the region. The principal industrial activities for Starke were lumber, cotton and naval store production. The introduction of the railroad to Starke helped to facilitate the growth of these industries and the population in this community.

Today, Starke represents the largest city in Bradford County with a population of 5,449 and city limits encompassing 7.2 square miles (2010 U.S. census data). Starke continues to be located at a major transportation hub where the north-south U.S. 301 roadway corridor intersects the SR 100 and SR 16 east-west roadway corridors near the downtown area. The Bradford County Seat is located in Starke as well as a hospital, emergency response services, educational/judicial facilities and a large number of businesses representing a variety of industries. This section documents the existing roadway and rail networks as well as existing traffic conditions and analysis.

2.1 Roadways

Starke has several major roadways that serve regional traffic in addition to the local roadway network. These major roadways are US 301, SR 100, SR 230 (Call Street) and SR 16. US 301, SR 100 and SR 16 are all part of the Florida's Strategic Intermodal System (SIS). The SIS is a transportation system that is made up of facilities and services of statewide and interregional significance (strategic), contains all forms of transportation for moving both people and goods, including linkages that provide for smooth and efficient transfers between modes and major facilities (intermodal) and integrates individual facilities, services, forms of transportation (modes) and linkages into a single, integrated transportation network (system).

US-301 is a major arterial roadway through Starke and provides the primary north-south traffic movement. Starke has predominately developed along US 301 with the majority of businesses fronting that roadway. Starke has three major east-west arterial roadways SR 100, SR 230 and SR 16. SR 100 is a major arterial roadway serving northeastern Florida from Lake City to Flagler Beach. SR 230 connects US 301 in Starke to SR 16 at Camp Blanding. SR 16 is a major arterial roadway connecting Raiford to St. Augustine.

2.1.1 Traffic Data Collection

A comprehensive traffic count program was performed for this project. Roadway and intersection data was collected within the project study area. The traffic data collection task effort included twelve 48-hour volume counts and thirteen 8-hour intersection turning movement counts. The *Technical Traffic Memorandum*, including all collected traffic data, can be found in Appendix A.

2.1.2 Existing Traffic Volumes

The traffic count data collected was seasonally adjusted utilizing the FDOT seasonal adjustment factors. The existing traffic information, including assumptions and analysis, can be found in Appendix A in the *Technical Traffic Memorandum*.

2.2 Rail

CSX is a Class I railroad operating over 1,500 route miles in the State of Florida. CSX's Florida route miles represent an estimated eight percent of the company's 23,000 national route miles. CSX, headquartered in Jacksonville, provides the state with its principal connections to the national rail network. There are two major north-south rail corridors in Florida the CSX "A" Line and the "S" Line.

The CSX "A" Line is a major north-south rail line, primarily located along the eastern portion of Florida. The line spans approximately 200 miles from Callahan to Tampa. The CSX "S" Line is located west of the CSX "A" Line, extending from Callahan through the Central Florida region providing rail service to Tampa and Miami.

A 61-mile segment of the existing "A" Line between DeLand and Poinciana has been purchased from CSX Transportation for SunRail. SunRail is a commuter rail system in the Orlando, Florida area that began service on May 1, 2014. Although CSX still runs a limited number of trains along the line at night, the majority of the traffic has been rerouted from the "A" Line to the "S" Line. This diversion of traffic along the "S" Line has increased the number of trains though Starke and other towns located along the "S" Line.

Railroad overpasses along US 301 have been constructed in Ocala, Hawthorne, Orange Heights, Maxville and Ocala. As part of the Baldwin Bypass Project, an overpass over the railroad will be constructed. This project is scheduled to go to construction in the spring of 2017.

An important consideration for this study is that CSX is not a public entity and is a private property owner. Agreements must be made with CSX to ensure the safety of maintaining any at-grade rail crossings associated with any location that maintains at grade crossings.

2.2.1 Railroad Crossing Data Collection

Data was collected at three of the nine railroad crossings in Starke: SE 144th Avenue, SR 100 and SR 16. Data was collected for three weekdays in June 2015 and included train travel direction, time of gate closure, minutes of gate closure and number of vehicles in the queue. Table 1 summarizes the information gathered in the field. Detailed data of the railroad crossing data can be found in the *Technical Traffic Memorandum* in Appendix A.

Table 1: Railroad Crossing Data

Intersection	Control Type
Average numbers of trains per day	29 trains
Average minutes the gates are down for each train event	2.24 minutes
Average number of hours per day the railroad gates are closed	1.10 hours
Average number of minutes per peak periods (6 hours representing 7-9 am, 11 am-1 pm, 4-6 pm) when the railroad gates are closed	Approximately 19 minutes
Average number of vehicles in queue per day when the railroad gates are closed	4-5% of the AADT at every crossing
Average number of vehicles in queue per peak periods (6 hours) when the railroad gates are closed	43-46 percent of the daily volume of vehicles affected by the railroad gate closure

2.3 Origin-Destination Study

An Origin-Destination (O-D) survey was used to determine travel patterns of traffic during a typical day. Vehicle trips were defined as one-way, from where a vehicle starts (origin) to where the vehicle is going (destination). The objective of this task was to determine the travel patterns of traffic during a typical weekday. Vehicle identification using Bluetooth signal data has emerged as an effective and economical means for collecting traffic data including O-D information, which is crucial for transportation planning. Bluetooth technology was used to conduct the O-D Survey. The Bluetooth receivers were placed at 16 locations.

Given the characteristics of Starke, the Bluetooth data was collected for 72-hours instead of 24-hours to obtain more data samples and a better estimate of travel patterns. The Bluetooth data was collected from May 19, 2015 (Tuesday) through May 21, 2015 (Thursday). A summary of the O-D survey data and analysis of this data can be found in the *Technical Traffic Memorandum* in Appendix A.

Demand was analyzed for both the local and regional traffic to determine where the demand was for the major east-west corridors. It should be noted that the destinations do not sum to 100%, the reason for this is that although a trip may have been recorded at one location it did not pass through any additional locations where Bluetooth data was collected.

Table 2 below documents the destinations for the three major east-west corridors (SR 100, SR 230 and SR 16) for the local and regional trips combined. These sites as shown on Figure 2 are all located in the city limits and are representative of both local and regional trips combined. The results show that the primary destination for the SR 100 location just east of US 301 is to travel on US 301 just south of Edwards Road (28%). At Call Street the primary destination was split between SR 100 (32%) and US 301 just south of Edwards Road (35%). At the SR 16 location, there were also two primary destinations, US 301 South of Edwards Road (26%) and US 301 South of Davis Street (27%).

Table 2: Local and Regional Trip Daily Traffic Origin and Destinations

Origin (Site No.)	Destination (Site No.)	% of Daily Traffic
SR 100, East of US 301 (7)	US 301, South of Edwards Road (4)	28%
	SR 100, West of US 301 (6)	17%
	SR 16, West of US 301 (11)	6%
	US 301, South of Davis Street (14)	15%
	SR 16, East of US 301 (12)	13%
	Call Street, East of Redgrave Street (8)	6%
Call Street, East of Redgrave Street (8)	US 301, South of Edwards Road (4)	32%
	SR 100, West of US 301 (6)	13%
	SR 16, West of US 301 (11)	8%
	US 301, South of Davis Street (14)	10%
	SR 16, East of US 301 (12)	13%
	SR 100, East of US 301 (7)	35%
SR 16, East of US 301 (12)	US 301, South of Edwards Road (4)	26%
	SR 100, West of US 301 (6)	8%
	SR 16, West of US 301 (11)	14%
	US 301, South of Davis Street (14)	27%
	Call Street, East of Redgrave Street (8)	2%
	SR 100, East of US 301 (7)	13%

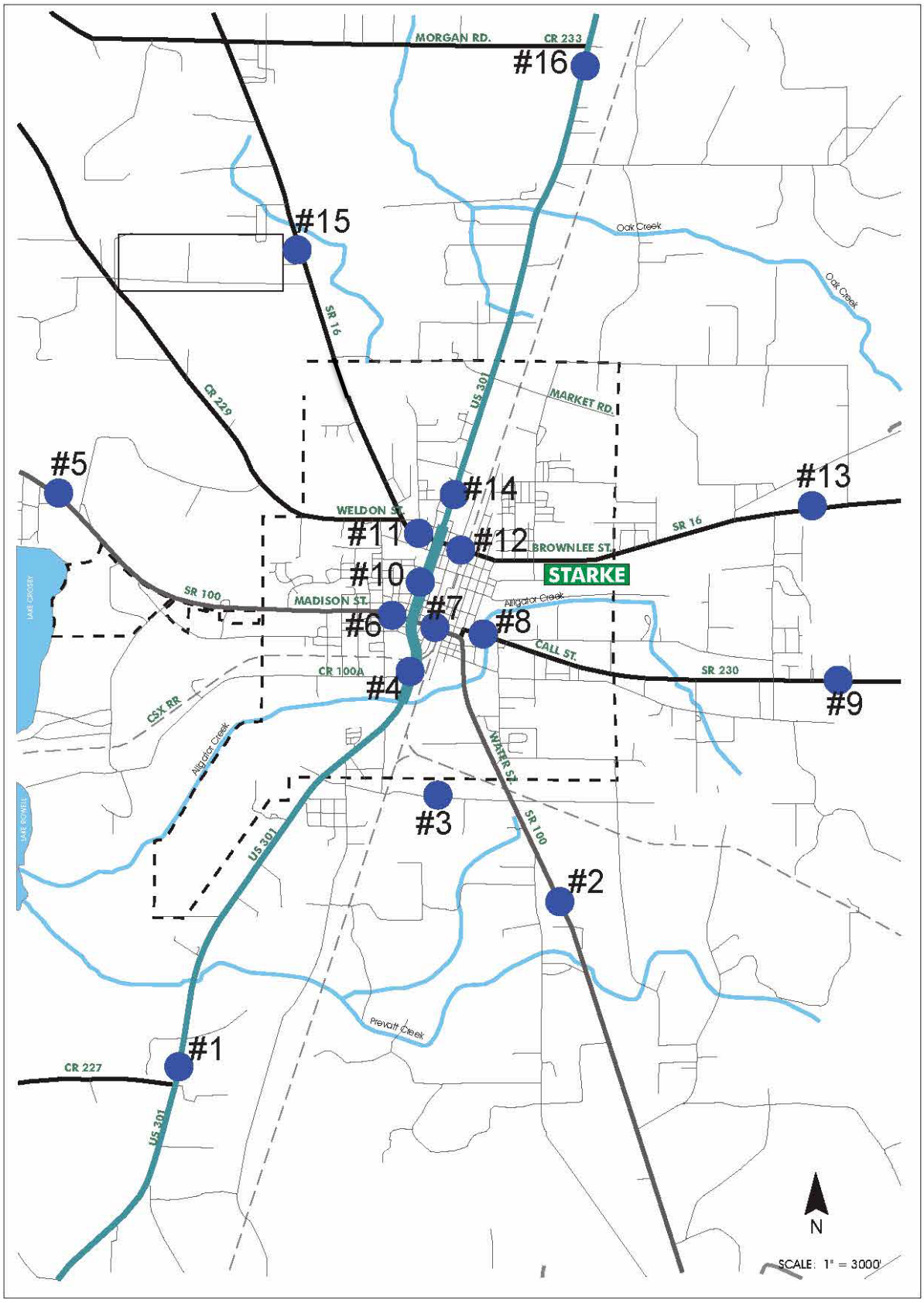

Figure 2: Bluetooth Collection Locations

The O-D data was also reviewed to see if there were any patterns for the regional trips, to determine the destination for trips outside the city limits. A regional trip might demonstrate a different overpass location need, compared to the data collected within the city limits. These are summarized in Table 3. The results show that for the SR 100 location south of 21st Avenue, the major trip was SR 100 east of SW 64th Avenue (28%). This shows demand for traffic passing through Starke and continuing along SR 100 outside of the city limits of Starke. The SR 230 data shows that the major destination is US 301 south of Starke (35%). Similarly, the SR 16 location showed the major destination as US 301 south of Starke (34%).

Table 3: Regional Trip Daily Traffic Origin and Destinations

Origin (Site No.)	Destination (Site No.)	% of Daily Traffic
SR 100, South of SE 21st Avenue (2)	US 301, South of SE 21st Avenue (1)	2%
	SR 100, East of SW 64th Avenue (5)	28%
	SR 16, North of NW 179th Street (15)	11%
	US 301, South of CR 233 (16)	11%
	SR 16, East of NE 12th Avenue (13)	2%
	Call Street, East of NE 6th Lane (9)	3%
SR 230, East of NE 6th Lane(9)	US 301, South of SE 21st Avenue (1)	35%
	SR 100, East of SW 64th Avenue (5)	18%
	SR 16, North of NW 179th Street (15)	2%
	US 301, South of CR 233 (16)	3%
	SR 16, East of NE 12th Avenue (13)	6%
	SR 100, South of SE 21st Avenue (2)	7%
SR 16, East of 12th Avenue (13)	US 301, South of SE 21st Avenue (1)	34%
	SR 100, East of SW 64th Avenue (5)	12%
	SR 16, North of NW 179th Street (15)	4%
	US 301, South of CR 233 (16)	9%
	Call Street, East of NE 6th Lane (9)	3%
	SR 100, South of SE 21st Avenue (2)	5%

2.4 Land Use

Existing and future land use data was obtained from the comprehensive plans from Bradford County and the City of Starke utilizing the North Central Florida Regional Planning Council data. The data in Figure 3 and Figure 4 show that the existing land use within the project limits is a mix of low density residential, medium density residential, commercial (primarily along US 301), agriculture and public. The anticipate changes to the future land use within the project limits suggest an increase in the medium density residential.

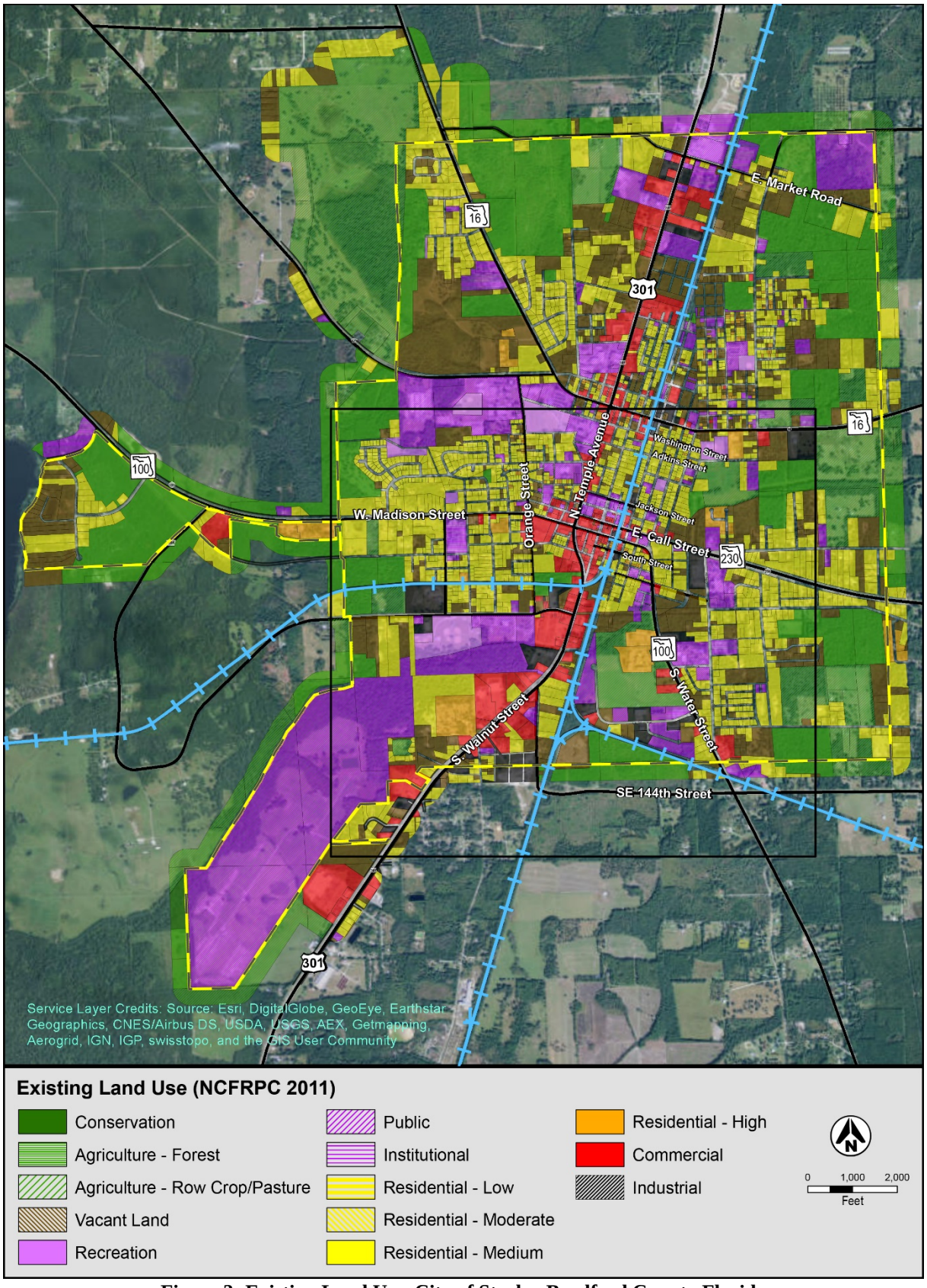

Figure 3: Existing Land Use, City of Starke, Bradford County Florida

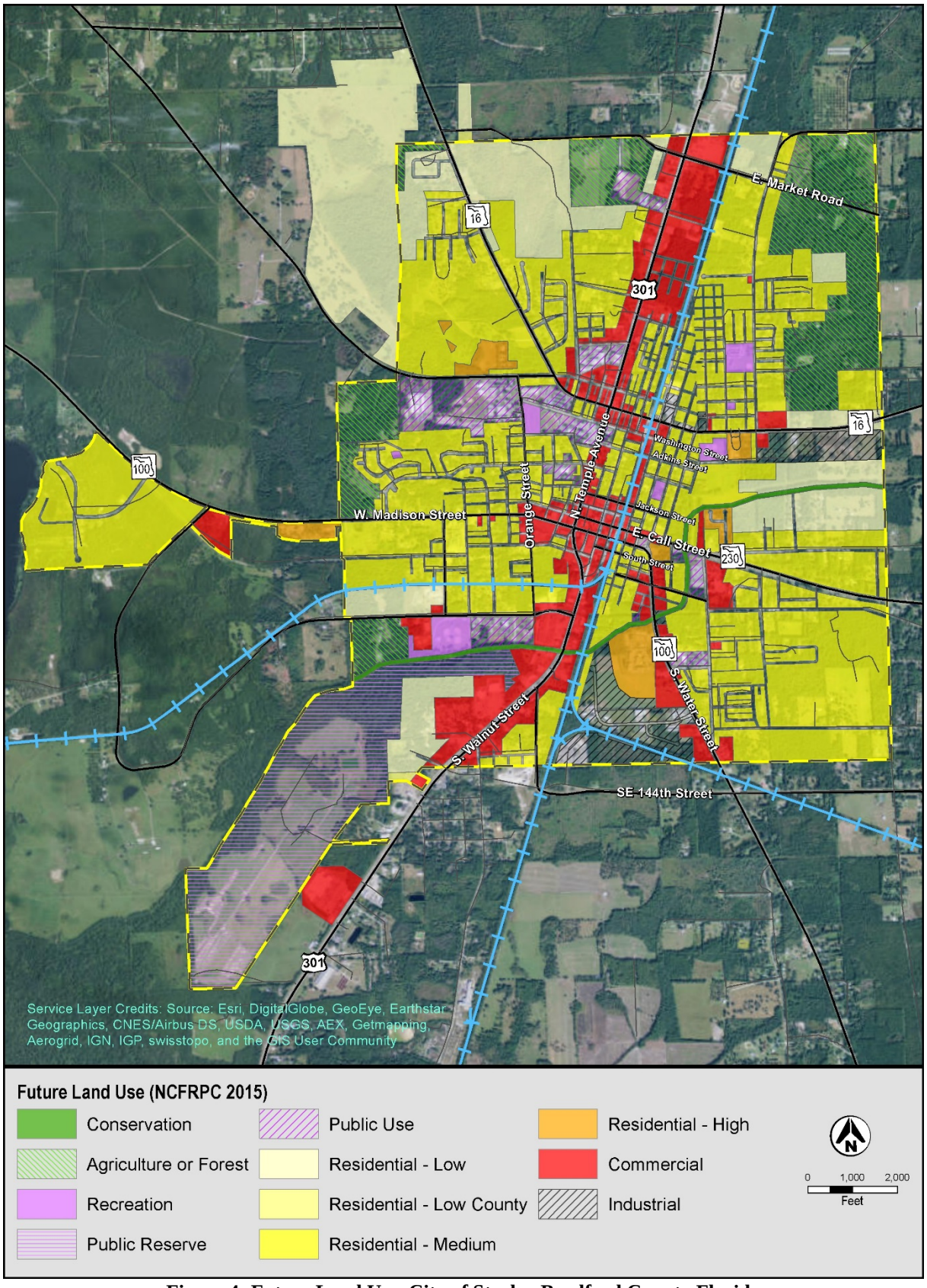

Figure 4: Future Land Use, City of Starke, Bradford County Florida

2.5 Safety

At-grade crossings introduce a conflict point between rail and vehicular traffic when roadways intersect the rail alignment at the same level. Trains have the right-of-way, resulting in delay. This delay occurs because roadway crossings traverse the rail right-of-way which is private property of the respective railroad owners. Some drivers choose to ignore crossing gates and proceed, without yielding to oncoming trains.

Emergency responders experience increased response times as a result of the trains. A grade separated overpass will provide more timely emergency response through the rail crossing. All of the emergency services are located on the west side of the railroad while the hospital is located on the east side of the railroad. The railroad creates a barrier for emergency responders when a train is present. Minutes of delay can be significant in the transport of a critical condition patient. The fire department is located on the northeast corner of Jackson and Walnut Street and is also subject to delays in response time when a train is present at the crossing.

Lastly, vehicles stopped at a blocked SR 100 railroad crossing routinely queue up to the US 301 intersection and at times these extend to Winn Dixie. Excessive queues also occur at the SR 16 railroad crossing. This creates an undesirable situation with a risk of vehicles blocking the US 301 intersection and increasing the risk of vehicle crashes.

2.6 Festivals

Several significant festivals and events are held on Call Street every year. These events increase commerce for local businesses and merchants. The festivals are held on Call Street between US 301 and Water Street. During this time Call Street is closed to vehicular traffic, allowing only pedestrians. In April the Strawberry Festival attracts thousands to the Call Street area. In October the Bike Festival is held at the same location.

2.7 US 301 Starke Alternate Truck Route

The US 301 Alternate Truck Route is scheduled to go out to bid for construction in the summer of 2016. Construction is estimated to be complete in fiscal year 2019. The alternate truck route is estimated to reduce traffic on US 301 by approximately 50 percent. The facility will carry 25,300 vehicles a day in 2020 and increase to 31,400 vehicles a day in 2040. This 7.3-mile long limited access four-lane truck route on the west side of Starke will be built between CR 227 and CR 233. The purpose of this new roadway is to relieve congestion on the US 301 corridor within Starke and provide the needed capacity for future traffic growth. The alternate route for trucks carrying freight will reduce congestion in downtown Starke that hinders local traffic flow for the community.

3. ALTERNATIVES

As part of the initial data collection effort, one of the first steps was to identify locations where an overpass would be feasible. The Department looked at various options and used a tiered approach to developing alternatives/concepts. The tiered approach was a three step process and further refined the alternatives as the study progressed. In addition to the build alternatives, the no-build alternative is also under consideration.

3.1 No-build Alternative

The no-build alternative is considered a viable option and will remain so during the duration of the study. The no-build alternative involves no changes to the transportation facilities within the project study area beyond currently planned and programmed projects. In addition, the no-build alternative forms the basis of the comparative analysis for each of the build alternatives.

3.2 Build Alternatives

3.2.1 Study Area Constraints

Various build alternative options were examined to determine locations to provide an east-west railroad overpass. The project team conducted field visits to the project site to identify suitable railroad overpass locations. Previous studies were also reviewed to determine any known constraints in the project area.

A field review of the historic and cultural resources in the area was completed. This documentation is included in a technical memorandum in Appendix B. The purpose of the cultural resources review is to identify any potential and previously recorded historic resources listed, or eligible for listing, in the National Register of Historic Places (NRHP). The Florida Master Site File (FMSF) database was reviewed for any previous surveys or previously recorded resources. In addition, the Bradford County Property Appraiser's database was reviewed to determine the location of unrecorded historic buildings (i.e. parcels with build dates prior to 1970).

The Call Street Historic District was listed in the NRHP on December 12, 1985. The District contains 41 resources. Of these 41 resources, 24 are considered contributing resources, and 17 are considered noncontributing resources to the District. Three of the contributing resources, the Bradford County Bank Building, the Original Bradford County Bank, and the Vaughn-Johnson Co/Coke Plant, are also individually eligible for listing in the NRHP. The District is bounded by Jefferson Street to the north, the south side of W. Call Street to the south, Temple Ave. (US 301) on the west, and the Florida Railroad on the east.

The Call Street Historic District is primarily a commercial area. Buildings in the Call Street Historic District include smaller wood-framed and masonry commercial buildings, including buildings used as offices, shops, restaurants, and storage facilities. The district has a distinct concentration of commercial resources with a unified setting and feeling, and although development has continued around it, the area itself is more representative of its period of significance, ca. 1887—1938. In contrast, modern development and the alteration and demolition of historic resources within the Starke community has limited the ability of that community to convey its historic setting and feeling.

The preliminary evaluation also showed other resources as being eligible for listing in the NRHP within the project study area. Due to the geographical area that the Call Street Historic District encompasses and historical significance it was determined that this area will be avoided since there were feasible alternatives outside the historic district. Additional work will be needed once a preferred alternative has been selected which will include a more detailed review to look at potential effects on other historic properties.

It is necessary to avoid or minimize impacts to cultural and historic resources. It was determined that the area north of SR 100 and south of SR 16 would be avoided due to the Call Street Historic District. The number of residential homes located along both the east and west side of the railroad in that area, is also a concern.

Approximately 900 linear feet of slope transition is needed on both roadway approaches to the railroad. This provides the required vertical clearance over the railroad to meet urban design standards. North of SR 100, the buffer distance between the railroad and US 301 remains consistent at approximately 900 feet. Between SE 144th Avenue to SR 100 the railroad and US 301 converge closer providing only 400 feet of buffer in some locations. To bridge the railroad between SE 144th Avenue and SR 100, an additional bridge would be needed to take the overpass over US 301 and a loop ramp would be needed to tie back into existing US 301. This approach was not deemed practical due to the cost required for an additional bridge structure over US 301 and the impacts associated to businesses located along both sides of US 301.

In summary, the study area constraints limited the potential locations of the overpass to south of SE 144th Avenue, SE 144th Avenue, SR 100, SR16 and north of SR 16.

3.2.2 Tier I

In the first tier of the study, concepts were developed for several locations. Several of these were presented to the public at the Kickoff Meeting that was held as part of this project. The public involvement effort is documented in Section 5. The initial concepts are shown in Figure 5 and are discussed below.

SE 144th Avenue

SE 144th Avenue was an unimproved roadway and has recently been paved by the county. In 2015, SE 144th Avenue was reconstructed to tie into the northernmost driveway of the shopping center (Deerfoot Village) located across from Alexander Road. The median opening on US 301 was shifted to the northern most driveway of the shopping center and new turn lanes were constructed on US 301. A traffic signal was installed at this location. The traffic signal at the south shopping center driveway was removed and the median opening at that driveway was closed. A new directional median opening was constructed at the driveway south of the removed traffic signal for the US 301 southbound traffic to turn left into the commercial property on the east side of US 301. This reconstructed intersection became the western terminus of the SE 144th Avenue alternative. Similarly the intersection of SR 100 and SE 144th Avenue that was recently paved by the county was the eastern terminus of the alternative. This alternative would provide a new overpass over the railroad and also the railroad spur located to the west of the main railroad tracks. This alternative is located outside the city limits and is the southernmost alternative that was

studied.

SR 100

Two initial alternatives were developed for SR 100. The first being the new alignment concept that would shift the alignment of SR 100 south of its existing alignment between Walnut and Water Streets. This alternative was developed in order to reduce impacts to the local traffic utilizing SR 100 during construction. The second alternative would construct the overpass along the existing SR 100 alignment. This concept would require SR 100 to be closed to traffic during the majority of the construction phase. Call Street located one block to the north of SR 100 would primarily be used for maintenance of traffic for this alternative. Both of these options at SR 100 would provide an overpass over the railroad.

Laura Street

Since providing access to the hospital is an important need for this project, a concept on new alignment was developed that would connect at the intersection of Walnut Street and SR 100 and tie into the Laura Street and SR 100 intersection. The concept would connect into a central location at Walnut Street while providing a connection to the hospital by utilizing Laura Street. This alternative was discarded due to the impacts to the residential neighborhoods, located along the proposed corridor. Also there was concern regarding how much traffic would actually utilize this concept since the existing SR 100 connection is more direct than Laura Street.

SR 16

The SR 16 location was studied to develop a suitable alternative at this location. It was determined that it would be very difficult to provide an overpass at SR 16. There were several concerns that the project team felt would be very difficult to mitigate for. For example several businesses and residences are located on both sides of SR 16. Access to Clark Street was also a concern. Frontage roads were considered to provide access. Additional right-of-way is needed to construct them and would result in substantial impacts. Maintenance of traffic during construction was also a significant concern as there were no feasible detours available. A decision was made to develop an overpass alternative one block to the north. This new alternative would utilize Weldon Street to allow traffic to remain on SR 16 during construction and SR 16 was eliminated from consideration.

Weldon Street

The Weldon Street concept was developed based on the concerns the SR 16 existing corridor provided. This alternative would connect to SR 16 west of US 301 near the CR 229 (Brownlee Road) and SR 16 intersection and also connect into existing SR 16 at Walnut Street.

SR 16 to Market Road

Several concepts were looked at between Weldon Street and Market Road. These concepts were discarded early due to low traffic demand in the area. Concepts in this area would utilize local streets through residential neighborhoods to reach a major east-west corridor thus creating an undesirable situation.

Jackson Street Tunnel Option

As part of this project a technical memorandum was completed to investigate the feasibility of tunneling under the CSX railroad along Jackson Street in Starke. As part of this effort, contractors were engaged to gain an understanding of the construction methods and costs. Two types of construction methods were examined. The top down method which would require the closing of the CSX line for a period of time. The second type of construction would be similar to a jack and bore type method. Due to the sensitive nature of the CSX railroad the contractors did not think the jack and bore method would be a viable option. The best option would be the top down construction method.

The depth of the tunnel along with the high water table in the area would require the use of a stormwater pump. The pump would increase the cost of the project but also require yearly maintenance. The tunnel would impact approximately 11 parcels. The construction cost has been estimated at $39.5 million for the tunnel. Due to the cost, closing of the CSX line for a period of time, and the annual maintenance associated with the pump the tunnel option was not carried forward.

Alternatives Carried Forward

Initially three locations were carried forward to the Tier II Study. As mentioned above these alternatives were presented to the public at the public kickoff meeting. The alternatives that were carried forward to Tier II were:

- SE 144th Street
- SR 100
- Weldon Street

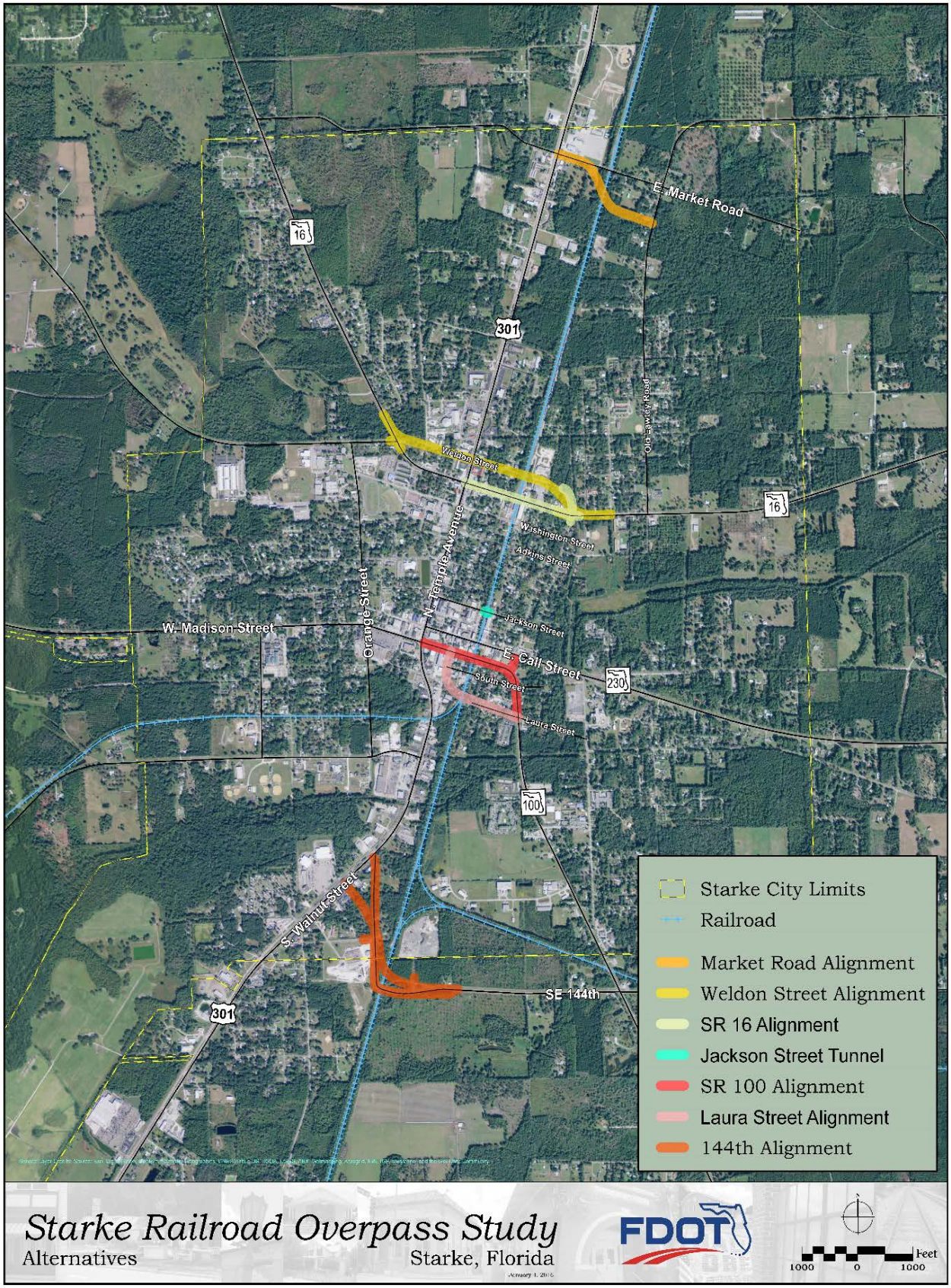

Figure 5: Tier I Alternatives, City of Starke, Bradford County, Florida

3.2.3 Tier Two

In the second tier of the analysis three locations for a railroad overpass were evaluated. These three locations were SE 144th Avenue, SR 100 and Weldon Street.

SE 144th Avenue

This concept underwent minor revisions during this portion of the study. The cost estimate along with the right-of-way estimate were updated.

SR 100

Based on comments received from local stakeholders regarding access, maintenance of traffic during construction, and aesthetics, the two options presented to the public at the kickoff meeting underwent substantial modifications. The comments received stated that an overpass at SR 100 should provide reasonable access to the local businesses along Call Street. Maintenance of traffic would need to be maintained primarily during construction along SR 100. A repeated comment received was how this overpass would blend into the local community.

Based on these comments, both SR 100 options were discarded and a revised alternative was developed. This revised option has a one-way frontage road along both the north and south sides of the overpass. The frontage roads would provide local circulation but also provide an area where community events could be held and additional parking could be provided for local businesses. The frontage roads would also be used to maintain traffic during construction while the contractor built the overpass between the frontage roads.

The vertical profile of the overpass was thoroughly examined during this stage of the project and it was determined that Walnut Street would need to be closed to northbound and southbound through traffic. Walnut Street would need to be closed in order to provide sufficient distance for westbound SR 100 traffic to stop at the stop bar while the signal was red allowing room for traffic to queue up. This has been accomplished by lowering the profile of the overpass and tie-down point further east on SR 100. In doing so, this would not provide sufficient height for traffic to travel underneath the overpass at Walnut Street. Traffic utilizing Walnut Street from the south would need to take the eastbound frontage road to Thompson Street to reach the downtown Call Street area. Traffic north of SR 100 on Walnut Street would utilize the westbound frontage road to access US 301. A separate signal phase would be required at the US 301 and SR 100 intersection to allow westbound frontage road traffic to access US 301 or continue on SR 100.

The initial reaction to this westbound frontage road requiring an additional phase, was that it would further increase the delay at the signal since it is introduces an additional phase at the US 301 and SR 100 intersection. With the construction of the Alternate Truck Route, the traffic on US 301 is expected to be reduced by half. Although, closing Walnut Street will require some traffic to change their current traffic patterns, these shifts will be minor and the benefit provided by closing Walnut will result in safer operations. This is further explained in Section 4.

A significant amount of work went into developing aesthetic options that incorporated the

historical and architecture history of Starke into the SR 100 concept. Aesthetic impacts are a major drawback to this location. An initial concept was developed that blended the railroad overpass into the surrounding landscape.

Weldon Street

It was decided to eliminate the Weldon Street alternative from consideration. Feedback from local stakeholders suggested that this alternative could add traffic to the local street network and around the schools. One major drawback with this option and the SR 16 location was that Water Street would be used in order to provide direct access to the hospital. This would increase traffic through a local roadway with a residential setting.

3.2.4 Tier Three

The SR 100 and SE 144th Avenue alternatives are still under consideration and were presented to the public at the August 17, 2015 meeting. Minor revisions were made to these concepts since the August 2015 public meeting and will be presented to the public on January 4, 2016. As part of the August 2015 meeting, stakeholders provided comments on the access to local businesses and the connection of SR 100 and Water Street. These concerns were researched and the alternatives have been revised since that time. The intersection of SR 100 and Water Street would be signalized due to concerns with sight distance.

3.2.5 Aesthetics

SR 100

The historic alignment of SR 100 traverses through historic Downtown Starke. As design alternatives were considered for the corridor, the SR 100 alignment through downtown necessitated a unique approach to maintain and enhance the economic vitality of the city. The historic city plan and timeless architecture created the opportunity to tie urban features found within downtown Starke to the proposed roadway improvements. As the alignment and footprint of the redesigned roadway is a key feature of the SR 100 plan, the roadway design approach focuses on maintaining existing street networks to maximize connectivity and enhance safety. As through traffic movements are proposed to be elevated on a bridge structure, the opportunity to redevelop historic East Madison Street below the bridge was realized. East Madison Street is proposed as a slow speed set of 1 way pairs to provide vehicular, bicycle and pedestrian connectivity to the city grid below the bridge. By separating the one way pairs, directly below the SR 100 bridge, a central linear park space could be developed for city events. It is envisioned that the resulting public space will enhance opportunities for proposed civic events such as the Bike Festival, Strawberry Festive and potentially a farmers markets. The public park space also offers the city economic redevelopment possibilities along East Madison Street frontage to respond to the grand park space. The park is designed with pedestrian aesthetic features which respond to the architectural patterns found in historic Downtown Starke. The revised footprint also reconnects the residential neighborhoods to the south with downtown in a safe and efficient manner. The elevation of the through traffic on an overhead bridge eliminates high volume traffic on grade and established a greener footprint for the city.

From an aesthetic perspective, the SR 100 alternative will have a major visual impact to the corridor and downtown Starke. By emphasizing and highlighting aesthetic treatments

to the retaining walls, barrier rails, beams and piers the structure can have a positive impact on its historic context. With the use of arches, finishes in brick and stone, and metal accents, the attention to detail will create a bridge that is more attractive. The space underneath the bridge will create a shaded pedestrian promenade with seating, lighting and appropriate landscape areas that will create connectivity to existing and proposed parks, farmers' markets, food kiosks and downtown businesses. Integrated into the pedestrian promenade approach will be accentuated intersections and crosswalks to surface streets with wide sidewalks ensuring a seamless pedestrian and vehicular linkage to the central business corridor along Call Street and the downtown residential neighborhood to the south. A conceptual option of aesthetics for the SR 100 is shown in Figure 6.

East Madison Street offers tremendous opportunities to develop streetscape features complimentary to the downtown aesthetics. Brick, street lights, signage, furnishings and additional parking within the corridor could offer economic redevelopment incentives for parcels along the frontage. With the development of East Madison Street, on street parking is offered in both directions to support downtown retail and civic needs.

Bicycle and pedestrian accommodations are proposed within the East Madison Street corridor to ensure a complete streets approach. Water features developed for retention and open space areas are proposed opportunities for sustainable landscape plantings. The resulting corridor solution will enhance the vibrant Call Street downtown area.

SE 144th Avenue

The location of the proposed 144th Street corridor is primarily south of the urban core and located in a relatively undeveloped location. The proposed project corridor traverses through undeveloped lands with limited development in the vicinity. The corridor does have some impacts to existing commercial, residential and industrial parcels at the US 301 connection. The roadway facility is proposed as an at-grade facility for the majority of the alignment. A bridge is proposed over the existing railroad tracks near the connection to US 301. Due to the location being in an undeveloped location, the impacts of the bridge to adjacent development are relatively minor. Aesthetically, FDOT proposes normal aesthetic treatment for the bridge and would not receive enhanced aesthetics due to location, cost and maintenance requirements.

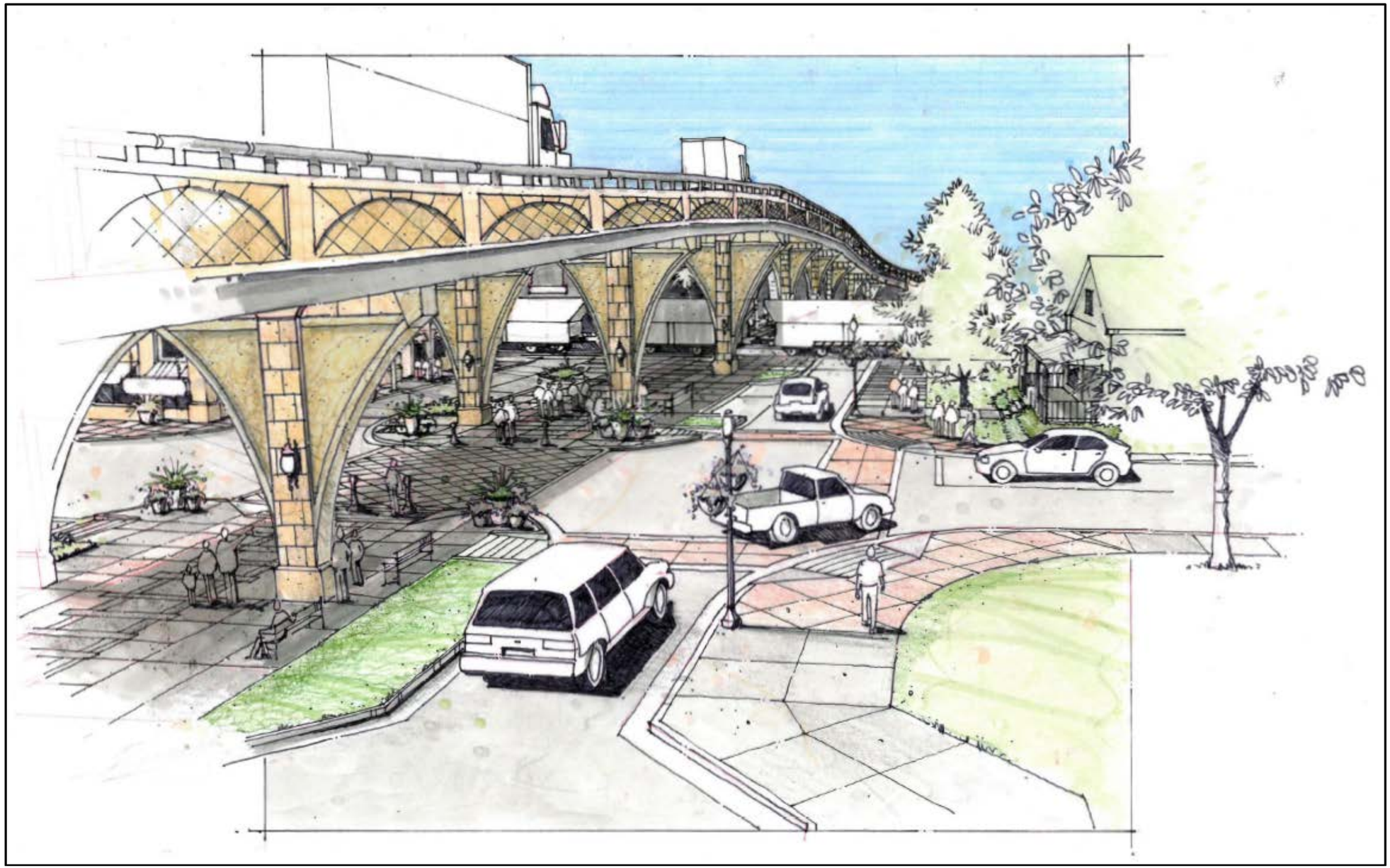

Figure 6: SR 100 Aesthetics

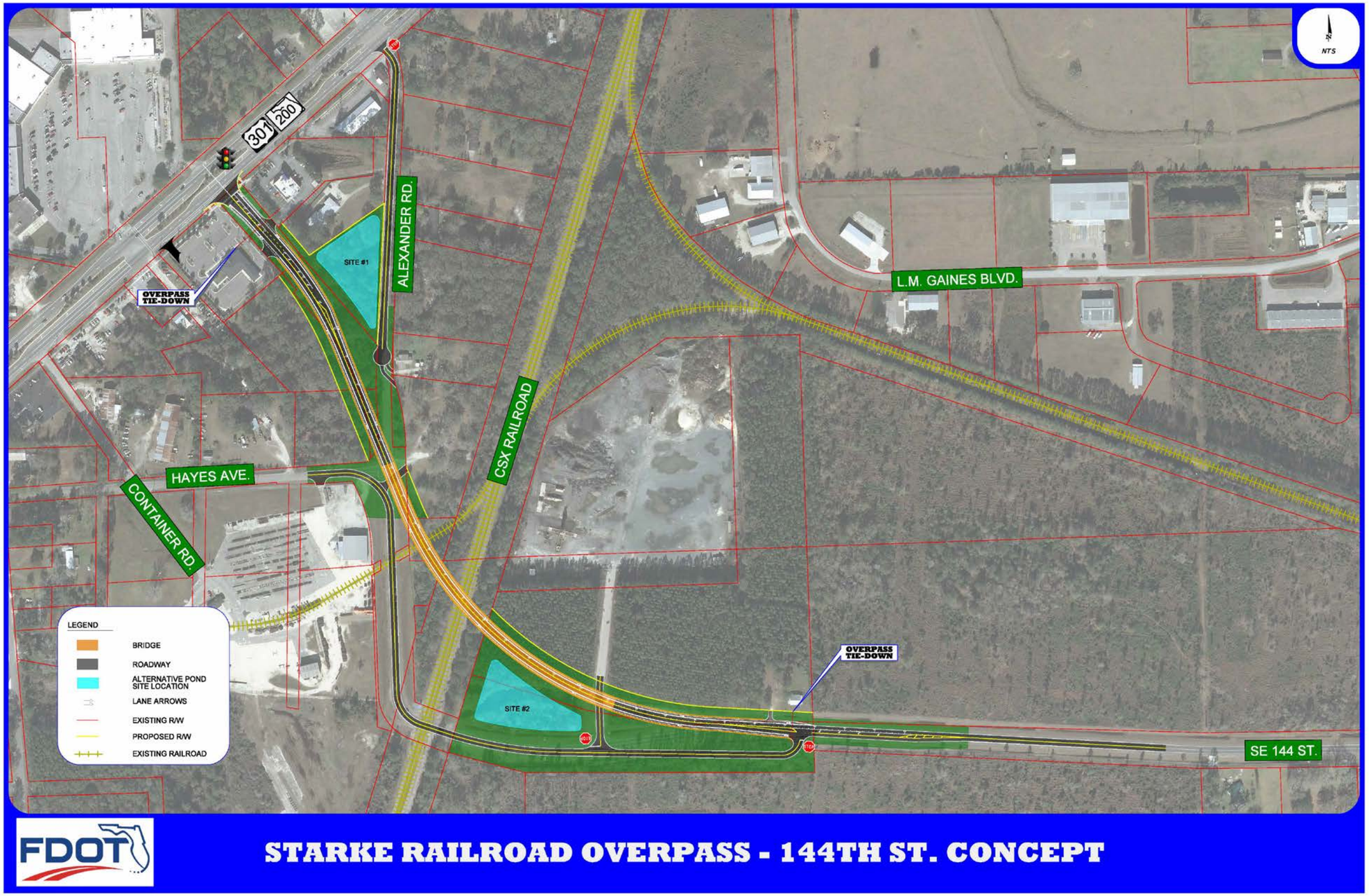

Figure 7: Southeast 144th Avenue Concept

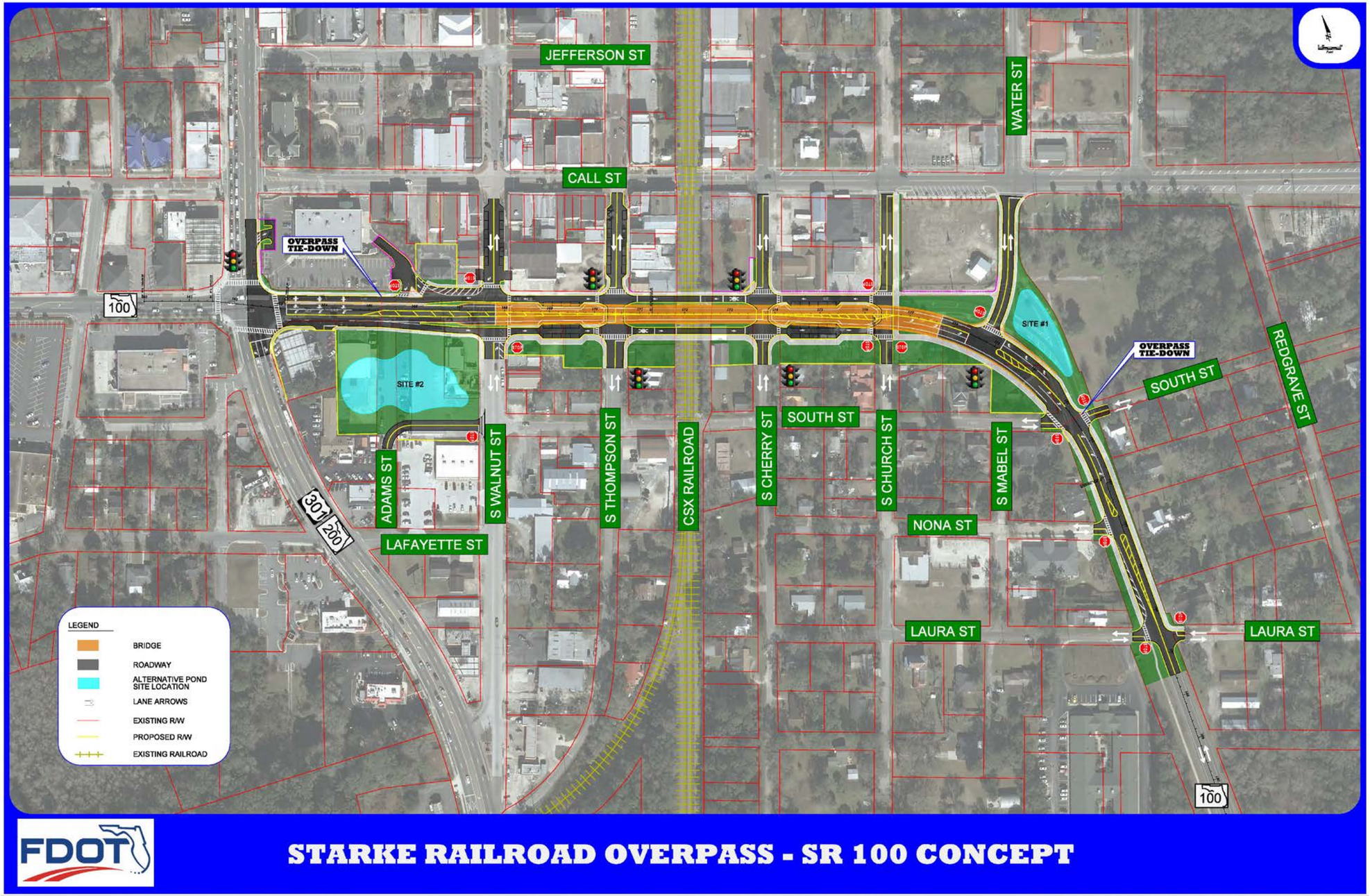

Figure 8: SR 100 Alternative

4. FUTURE YEAR TRAFFIC FORECAST

4.1 Introduction

The development of traffic projections for the study corridor requires the examination of several factors including:

- Historical growth on the corridor
- Proposed developments within the corridor vicinity
- Population projections
- Local traffic patterns
- Other traffic characteristics

Traffic is analyzed and reported generally as a Level of Service (LOS). LOS is a qualitative measure of congestion that describes operational conditions of traffic. LOS is used to analyze roadways by categorizing traffic flow and assigning quality levels of traffic based upon traffic volumes in relation to the roadways capacity. These measures are described using letters "A" through "F", with "A" being the best and "F" being the worst. Detailed traffic forecasts and analysis can be found in the *Technical Traffic Memorandum* in Appendix A.

4.2 Analysis Years

The following years were used for the study corridor. Opening year was estimated to be 2023 while the design year was estimated to be 2043.

4.3 Future Travel Demand

The development of traffic forecasts for study intersections included a review of the historical traffic growth along major study roadways, population estimates for Bradford County and Starke and a review of the future year model forecasts. Due to the specific conditions associated with any roadway, it is necessary to utilize the various methods in projecting future traffic forecasts (such as trends analysis, population estimates, Travel Demand Models and previous studies) for comparison purposes. The following sections discuss the various methodologies used in developing future travel demand for this study area.

4.4 Travel Demand Model

This effort included the comparison of no-build (no railroad overpass) model forecasts and forecasts using historic AADT traffic and growth trends (2004-2014). The no-build model includes the future US 301 Alternate Truck Route. The model results show the demand volumes on US 301 are expected to approximately double by year 2040 and approximately half of the traffic will utilize the US 301 Alternate Truck Route while half will utilize the existing US 301 corridor. Therefore, the 2043 volumes through town are expected to remain similar to existing volumes.

4.5 Historical Traffic Growth

Trend analysis, based on the historical count information obtained from the FDOT Traffic Information DVD, was performed for 10 count stations. Based on a review of the 10 sites, historical growth trends throughout Starke show a decrease in traffic over the past 10 years. These

trends are similar to statewide trends that are a result of the recession that was experienced in 2008. An increase in traffic has been noticed since 2011 along US 301.

4.6 Population Projections

In addition to the trends analysis, population from US Census and population projections published by the Bureau of Economic and Business Research (BEBR) at the University of Florida were used for comparison purposes. Table 4 shows the 2000 and 2010 Census Populations for Bradford County, City of Starke and the State of Florida.

Table 4: 2000 and 2010 Census Population Data

Year	Florida	Bradford	City of Starke
2000 (Population)	15,982,349	26,088	5,863
2010 (Population)	18,801,310	28,520	5,449
Annual Growth Rate	17.68%	9.32%	-7.06%

Based on the Census counts, Bradford County shows a growth of 9.32% between 2000 and 2010 Census, the City of Starke shows a decrease in population of 414 people which accounts to -7.06%.

Finally medium population projections for Bradford County were obtained from BEBR and analyzed to determine future traffic growth. Table 5 shows the project population of Bradford County from 2010 through 2040 as well as interpolated annual population and growth rate. Between 2010 through 2020 the population is anticipated to decrease by 0.03%, but will start increasing by 0.48% between 2020 and 2030 and 0.35% between 2030 and 2040. The population of Bradford County is projected to increase by 9% in the next 30 years.

Table 5: Population Projections for Bradford County

Year	Population Projections	Estimated Annual Growth Rate between previous period
2010	28,520	--
2020	28,446	-0.03%
2030	29,882	0.48%
2040	30,979	0.35%

4.7 Recommended Growth Rate

Looking at overall macro trends, the population of Bradford County is projected to grow by 9% in the next 30 years. The traffic counts along the project area are beginning to show a positive growth from 2011 onward. Given the amount of available land for development, the increasing population projections, a growth rate of 1% is reasonable and recommended for this study. The projected opening year 2023 and design year 2043 turning movement volumes based on this growth rate will be analyzed for the major intersections along the project study area. Build intersection turning movements based on the location of the railroad overpass and traffic characteristics observed in the study area. No-build and build intersection turning movement volumes along with the methodology can be found in the *Technical Traffic Memorandum* in Appendix A.

4.8 Alternatives

4.8.1 No-build

No-build Traffic Methodology and assumptions

Intersections where count data was available were set as control intersections and the volumes for the remaining intersections were developed and adjusted for differences. Movements at control intersections where the peak hour count data was zero were changed to 5 vehicles per hour if the movement was permitted. As mentioned above, a growth rate of 1% was applied to existing counts to develop volumes for the opening year and design year. All turning movement volumes can be found in the *Technical Traffic Memorandum* found in Appendix A.

No-build Opening Year 2023 Analysis

Traffic operations analyses were conducted for the no-build alternative for opening year 2023 conditions. The opening year 2023 intersections analyses for the no-build conditions show that the study intersections operate at acceptable LOS of D or better during AM and PM peak hours. Detailed traffic analysis results for all alternatives can be found in the *Technical Traffic Memorandum* found in Appendix A.

No-build Design Year 2043 Analysis

Traffic operations analyses were conducted for the no-build Alternative for design year 2043 conditions. The design year 2043 intersections analyses for the no-build conditions show that the study intersections operate at acceptable LOS of D or better during AM and PM peak hours.

4.8.2 SR 100 Alternative

SR 100 Traffic Methodology and Assumptions

The first step in developing traffic distribution due to project changes was to estimate the number of trips that will be diverted due to the overpass and redirected in the network. To predict the estimated number of peak-hour trips that would be attracted to utilize the overpass on SR 100, the O-D data was referenced. It was assumed that traffic on SR 16 headed towards south of SR 100 on US 301 will utilize Water Street and turn left on SR 100 to utilize the overpass. Similarly, in order to avoid the rail road crossing on SR16, northbound traffic on US 301 headed towards SR 16 will turn right at SR 100 to utilize the travel time savings because of the overpass. Under existing and build conditions, westbound left turns are not allowed from E Call Street onto US 301. Therefore traffic on Call Street headed south of SR 100 is already utilizing SR 100. Due to the close proximity of Call Street to SR 100, it is assumed that 50% of the northbound right and southbound left turning traffic at US 301/E Call Street intersection will turn at SR 100 to utilize the travel time savings from the overpass. A conservative approach was adopted to estimate the distribution of westbound traffic on SR 100. In reality, some of the westbound traffic will use South Street to access local business. However, for this analysis, it was assumed that the westbound traffic on SR 100 will turn right at Water Street to access local businesses. This approach was adopted to test the operational sensitivity of the E Call Street/Water Street intersection due to volumes changes.

Since the through access on Walnut Street will be cut off due to the project, traffic was distributed to Thompson Street, Cherry Street and Church Street. As a result, volumes on these streets will increase. As the traffic moves through the network, a shift of volume will also affect Adkins Street, Washington Street and Walnut Street. Since the O-D pair for eastbound traffic utilizing the overpass bridge on SR 100 was not available, it was assumed that 60% of the traffic will utilize the bridge due to its travel time savings.

The following intersections were signalized with the SR 100 alternative:

- SR 100 frontage roads and Thompson Street
- SR 100 frontage roads and Cherry Street
- SR 100 and Water Street

These three intersections have been assumed to be signalized during this phase of the project due to sight distance issues. As the project progresses and more detailed analysis will be conducted at these intersections to verify that this is the proper traffic control for these intersections.

SR 100 Opening Year 2023 Analysis

Traffic operations analyses were conducted for opening year 2023 conditions. The opening year 2023 intersections analyses for the SR 100 alternative show that the study intersections operate at acceptable LOS of D or better during AM and PM peak hours.

The intersections of SR 100 at Cherry Street, SR 100 at Thompson Street and SR 100 at Water Street were assumed to be signalized under the SR 100 alternative conditions. Significant reduction in delay was observed at the following intersections as compared to the no-build due to travel pattern changes:

- US 301 at W Pratt Street
- US 301 at Washington Street
- US 301 at Brownlee Street
- SR 100 at Church Street

The intersections of SR 100 at Thompson Street, SR 100 at Cherry Street and Call Street at Water Street experienced an increase in delay caused by the traffic diversion resulting from the proposed overpass. It should also be noted that there is no direct comparison of intersection delay at SR 100 at Thompson Street and SR 100 at Cherry Street due to the changes in intersection control and configuration. All the intersections will provide an acceptable LOS in 2023.

SR 100 Design Year 2043 Analysis

Traffic operations analyses were conducted for the design year 2043 conditions. The design year 2043 intersections analyses show that the study intersections operate at acceptable LOS of D or better during AM and PM peak hours except for Call Street at Water Street. As observed in opening year 2023 analyses, a reduction in delay was observed at the following intersections as compared to the no-build in design year 2043:

- US 301 at W Pratt Street
- US 301 at Washington Street
- US 301 at Brownlee Street
- SR 100 at Church Street

The intersections of US 301 at Pratt Street and SR 100 at Church Street also experienced an improvement in LOS due to the overpass and due to the changes in travel patterns through the system. The intersections of SR 100 at Thompson Street, SR 100 at Cherry Street and Call Street at Water Street experienced an increase in delay caused by the traffic diversion resulting from the proposed overpass. This is because traffic will divert to these intersections when the through access of Walnut Street is eliminated. The intersection of Call Street at Water Street will operate at LOS F. This intersection was analyzed as unsignalized and is expected to operate at acceptable LOS under signal control.

4.8.3 SE 144th Avenue

SE 144th Avenue Traffic Methodology and Assumptions

The number of trips diverted for the SE 144th alternative is very limited due to the location of the overpass. The SE 144th alternative does not have a significant impact on traffic distribution of the study intersections. It was assumed that approximately 30% of the traffic headed towards SR 16 and SR 100, west of US 301, will utilize the overpass on SE144th Street. Diverted traffic from SR 100 passing over the bridge on SE 144th Street will have to travel more than half a mile to complete the same movement. This alternative provides minimal travel time benefits and therefore a small percentage of diverted trips were assumed for this alternative.

Similarly, a reasonable percentage of diverted trips from SR 16 (AM 5%; PM 12%) and SR 100 (AM 8%; PM 12%) were assumed for southbound traffic headed towards south of SE 144th Street.

Opening Year 2023 SE 144th Avenue Analysis

Traffic operations analyses were conducted for Alternative 2 for opening year 2023 conditions. The opening year 2023 intersections analyses for the Alternative 2 conditions show that the study intersections operate at acceptable LOS of D or better during AM and PM peak hours. As stated in the methodology and assumptions, the shift in traffic due to the overpass on SE144th Street will be minimal because of its distance from SR 100. A minor shift of traffic from SR 100 to US 301 will slightly improve the LOS along SR 100 from Water Street to Walnut Street. Due to the distant location of the overpass bridge at SE 144th Street, the overpass bridge will be underutilized and traffic within Starke downtown will not see any travel time savings.

Design Year 2043 SE 144th Avenue Analysis

Traffic operations analyses were conducted for design year 2043 conditions. The design year 2043 intersection analyses shows that the study intersections operate at acceptable LOS of D or better during AM and PM peak hours. Due to the distant location of the overpass bridge at SE 144th Street, the overpass bridge will be underutilized and traffic

within downtown Starke downtown will not see any travel time savings in 2043.

4.9 Traffic Forecast and Analysis Summary

4.9.1 SR 100 Alternative

Based on the review of local traffic, there will be a shift in traffic patterns with the SR 100 alternative. Certain vehicle trips east of US 301 between SR 16 and SR 100 will utilize the SR 100 overpass to ensure that their travel times are reliable and no longer influenced by the possibility of being delayed by a train. This will result in travel time savings for motorists. Travel time savings will increase in the future years as the number of trains increase.

The results of the traffic analysis shows that several local intersections will experience a small increase in delay caused by the traffic diversion from the SR 100 alternative as a result of the proposed overpass. The increased delay is very minimal and will likely go unnoticed by the traveling public. All intersections except the US 301 and SR 100 intersection and the Call Street and Market Road intersection will operate at LOS C or better in 2023. These two intersections will operate at an acceptable LOS D in 2023.

The SR 100 alternative will slightly increase delay at the SR 100 and US 301 intersection; however, this intersection will still provide an acceptable LOS through the design year. This increase is due to the additional signal phase associated with the westbound frontage road as well as the increase in traffic at this location from the diversion of the other local roadways. The diversion of traffic to SR 100 will reduce the delay at the US 301 intersections with Pratt Street, Washington Street and SR 16.

All intersections will provide LOS C in 2043 except the US 301 and SR 100 intersection, Call Street and Water Street and also the intersection of SR 100 frontage roads at Thompson Street. The Call Street and Water Street intersection will operate at LOS F in 2043. This intersection will need to be signalized in order to provide acceptable operations by 2043. If a signal is provided it will result in LOS B in 2043. The remaining two intersections will provide an acceptable LOS D.

With the SR 100 alternative, three additional intersections have been assumed to be signalized in the future due to concerns with sight distance. Signalizing the intersections will need to be reviewed, if this alternative is selected, in the design phase once specific details on the bridge design are known. These intersections are: SR 100 frontage roads at Thompson Street, SR 100 frontage roads at Cherry Street and SR 100 at Water Street. All three of the intersections will provide acceptable traffic operations. Currently, Thompson Street is a one-way way limited to southbound traffic only. If the SR 100 alternative is selected, this street will be converted back to a two-way street between the SR 100 frontage roads and Call Street.

The location of the overpass bridge has a greater area of influence at SR 100 and therefore the return on investment due to reduced travel time and vehicle delay are higher. The SE 144th Avenue railroad crossing is located approximately 1.1 miles south of the SR 100 crossing and 1.65 miles south of SR 16. Since the SR 100 and SR 16 railroad crossings are only 0.55 miles apart, this allows traffic to easily divert if the motorists want to insure that they are provided with a reliable travel time. The local grid network between SR 100 and SR 16 provide motorists with several options to utilize to reach the SR 100 overpass.

4.9.2 SE 144th Avenue

Based on the data collected, the number of diverted trips that would utilize the overpass at SE 144th Avenue is very limited because of its location and the spacing between SR 100 and US 301. It was assumed that 30% of the traffic headed towards SR 16 and SR 100, west of US 301 will utilize the overpass on SE 144th Avenue. A reasonable percentage of trips were diverted from SR 16 (5% in the AM; 12% in the PM) and SR 100 (8% in the AM; 12% in the PM) with a destination on southbound US 301 was assumed to be traveling south of SE 144th Avenue.

The traffic analysis showed that all intersections analyzed provided similar if not improved LOS with the SE 144th Avenue alternative. This is anticipated due to the minor traffic diversion associated with this alternative. The only intersection that showed an increase in delay was the US 301 at SE 144th Avenue intersection. This intersection would provide an acceptable LOS through the design year.

5. PUBLIC INVOLVEMENT

An important component of this study is public involvement. As part of the study the Department held several meetings with local stakeholders to seek input and feedback in order to determine the best solution for the local community.

5.1 Public Meetings

5.1.1 Kickoff Meeting

On April 6, 2015 a project kickoff meeting was held. The meeting began at 4:30 p.m. at which time the public viewed the project maps and asked questions of the project team. At 6:30 p.m. there was a public comment period which allowed the stakeholders the opportunity to make public comment. In addition, there was a comment box that allowed people the option to make written comments as well. Seventy-three people attended the meeting. The purpose of this meeting was to engage the public and let local stakeholders know that the study was being conducted. Several concepts were presented as well as maps that allowed the local stakeholders an opportunity to sketch any concepts that we may have not studied or considered. The concepts that were presented included the SE 144th Avenue, two options at SR 100, Laura Street, Weldon Street and Market Road. The feedback received showed support for the SE 144th Avenue, SR 100, and Weldon Street. Also, we received several comments on the aesthetics and potential impacts to the local businesses and communities with the SR 100 options. Due to the comments we received regarding the aesthetics and potential business impacts regarding access, the project team focused on addressing these concerns at the SR 100 location.

5.1.2 Alternatives Meeting

A public alternatives meeting was held on August 17, 2015. There were 89 people in attendance for the meeting. Similar to the kickoff meeting the doors opened at 4:30 p.m. allowing the public to review the maps and ask the project team questions followed by a comment period at 6:30 p.m. There was also a presentation provided that gave an update on the project including the updated concepts, schedule, and revisions made based on public input. Based on the feedback received, the comments support was split between the SE 144th Avenue alternative and the SR 100 location.

5.2 Local Stakeholder Meetings

In addition to the public meetings, several meetings were held with local stakeholders as requested to provide an update on the project and receive additional input. Meeting or project updates were held with the following entities:

- Rotary Club – July 1, 2015
- Kiwanis Club – September 8, 2015
- City of Starke – August 4, 2015
- City Commission – June 9, 2015, June 16, 2015, August 4th 2015 and August 18, 2015
- County Commission – February 4, 2015
- Chamber of Commerce – June 9, 2015 and August 4, 2015

5.3 Future Meetings

A Public Alternatives Meeting is planned for January 4, 2016. The SE 144th Avenue concept and the SR-100 concept will be presented at this meeting along with project updates since the last meeting. Doors will open at 4:30 p.m. and at 6:30 p.m. a formal presentation will be made along with a public comment period.

6. RECOMMENDED ALTERNATIVE, COSTS AND SCHEDULE

6.1 Recommended Alternative

At this time there is no recommended alternative. Both the SE 144th Avenue and SR 100 alternatives are still under consideration. After the alternatives public meeting in January 2016, FDOT will request a resolution from both the City and County Commissions on which alternative they recommend. After receiving the resolutions, FDOT will make a recommendation on the preferred alternative and hold a public hearing to advise the public of the decision and seek public input.

6.2 Costs

The costs for both the SE 144th Alternative and the SR 100 concept are shown in the table below. The total project cost shows that the SE 144th Avenue alternative construction cost is $11.2 million more than the SR 100 concept while the right-of-way for the SR 100 alternative is $8.7 million additional. The difference in the costs is the fact that the SR-100 alternative impacts more business and residential properties than the SE 144th Avenue alternative. The SE 144th Avenue alternative requires approximately 2640 feet from tie-down point to tie-down point while the SR 100 alternative requires only 1620 feet between the tie-down points. The additional distance is needed at the SE 144th Avenue location due to the bridge being designed to rural roadway standards while the SR 100 alternative is designed to the urban design standards. In addition, the SE 144th Avenue alternative must overpass both the railroad spur and the CSX mainline tracks. The CSX right-of-way is 200 feet wide at this location. The proposed bridge over the railroad would need to be constructed on a curve and due to the coordination required to place any piers in CSX right-of-way, the cost estimate assumed that no piers were placed within the CSX right-of-way. This increases both the engineering and construction cost associated with the bridge.

Table 6: Cost Matrix (Millions)

	No-build	SE 144th Avenue	SR 100
Engineering	$0.0	$8.5	$4.8
Right-of-way	$0.0	$1.6	$10.3
Construction	$0.0	$28.2	$17.0
Total Cost	**$0.0**	**$38.3**	**$32.1**

6.3 Schedule

The project is schedule to go to construction in 2020. The right-of-way phase is funded for fiscal year 2018. Consultant acquisition is underway to get a design team under contract to begin the design effort. No design work will occur until a decision is made for the railroad overpass.