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# **PRELIMINARY ENGINEERING REPORT**

Starke Railroad Overpass  
Project Development and Environment (PD&E) Study  
Bradford County, Florida  
Financial Management Number: 436558-1-22-01  
June 2016



# PRELIMINARY ENGINEERING REPORT

Florida Department of Transportation

**Financial Project ID:** 436558-1-22-01

This preliminary engineering report contains detailed engineering information that fulfills the purpose and need for the Starke Railroad Overpass Project Development & Environment Study in Bradford County, Florida.

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# **1. SUMMARY OF PROJECT**

A Project Development and Environment (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. This Preliminary Engineering Report (PER) contains detailed engineering information that fulfills the purpose and need for the Starke Railroad Overpass Project in Bradford County, Florida. This report is intended to summarize planning, engineering analysis, environmental assessment and public involvement completed during the Starke Railroad Overpass PD&E study.

## **1.1 Purpose and Need**

The purpose of this study is to provide motorists a means to cross blocked railroad crossings along the CSX S-line, improve safety, and provide emergency responders a reliable response time when a train is blocking the at-grade crossings in Starke.

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 historical growth trends. 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.

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.

## **1.2 Study Area**

The limits of the project study is bounded by SE 144<sup>th</sup> 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.



### **1.3 Commitments and Recommendations**

To be completed after the Public Hearing.

### **1.4 Description of the Proposed Action**

The proposed project will provide an east-west railroad overpass at SR 100. The project will utilize one-way frontage roads on both the north and south sides of the overpass bridge to provide local access to existing businesses and residences. The bridge will utilize aesthetics treatments in order to have a positive impact on its historic context.

## 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 Volumes and Characteristics

Traffic volumes, characteristics, and capacity analyses are fully documented in the *Feasibility Report* available under separate cover.

### 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 144<sup>th</sup> 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.

**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 *Feasibility Study*.

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%

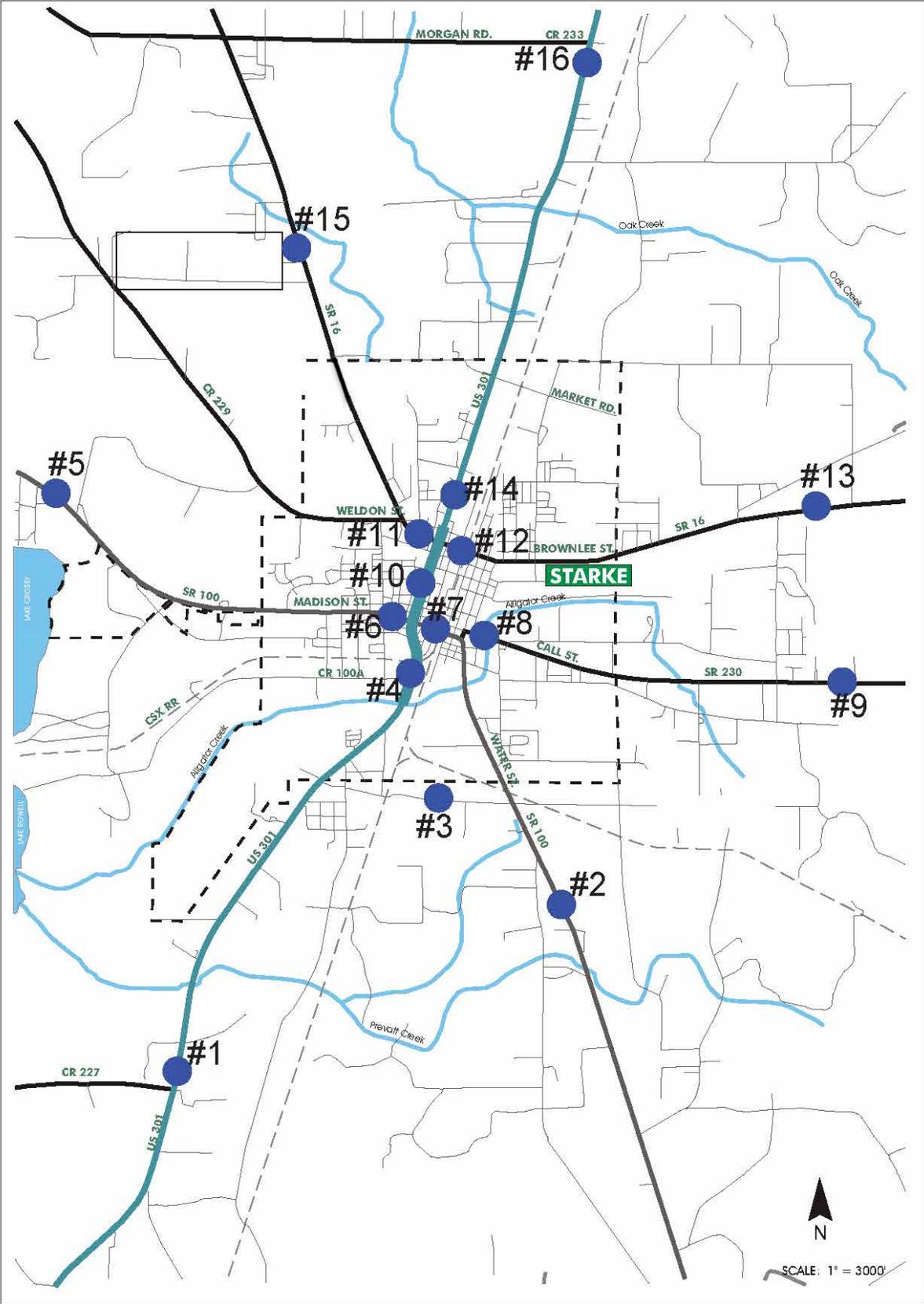


Figure 2: Bluetooth Collection Locations

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 21<sup>st</sup> Avenue, the major trip was SR 100 east of SW 64<sup>th</sup> 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 21 <sup>st</sup> Avenue (2)	US 301, South of SE 21 <sup>st</sup> Avenue (1)	2%
	SR 100, East of SW 64 <sup>th</sup> Avenue (5)	28%
	SR 16, North of NW 179 <sup>th</sup> Street (15)	11%
	US 301, South of CR 233 (16)	11%
	SR 16, East of NE 12 <sup>th</sup> Avenue (13)	2%
	Call Street, East of NE 6 <sup>th</sup> Lane (9)	3%
SR 230, East of NE 6 <sup>th</sup> Lane(9)	US 301, South of SE 21 <sup>st</sup> Avenue (1)	35%
	SR 100, East of SW 64 <sup>th</sup> Avenue (5)	18%
	SR 16, North of NW 179 <sup>th</sup> Street (15)	2%
	US 301, South of CR 233 (16)	3%
	SR 16, East of NE 12 <sup>th</sup> Avenue (13)	6%
	SR 100, South of SE 21 <sup>st</sup> Avenue (2)	7%
SR 16, East of 12 <sup>th</sup> Avenue (13)	US 301, South of SE 21 <sup>st</sup> Avenue (1)	34%
	SR 100, East of SW 64 <sup>th</sup> Avenue (5)	12%
	SR 16, North of NW 179 <sup>th</sup> Street (15)	4%
	US 301, South of CR 233 (16)	9%
	Call Street, East of NE 6 <sup>th</sup> Lane (9)	3%
	SR 100, South of SE 21 <sup>st</sup> Avenue (2)	5%

## 2.4 Population Projections

Population data from US Census and population projections published by the Bureau of Economic and Business Research (BEBR) at the University of Florida was collected. 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%.

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%

## 2.5 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.

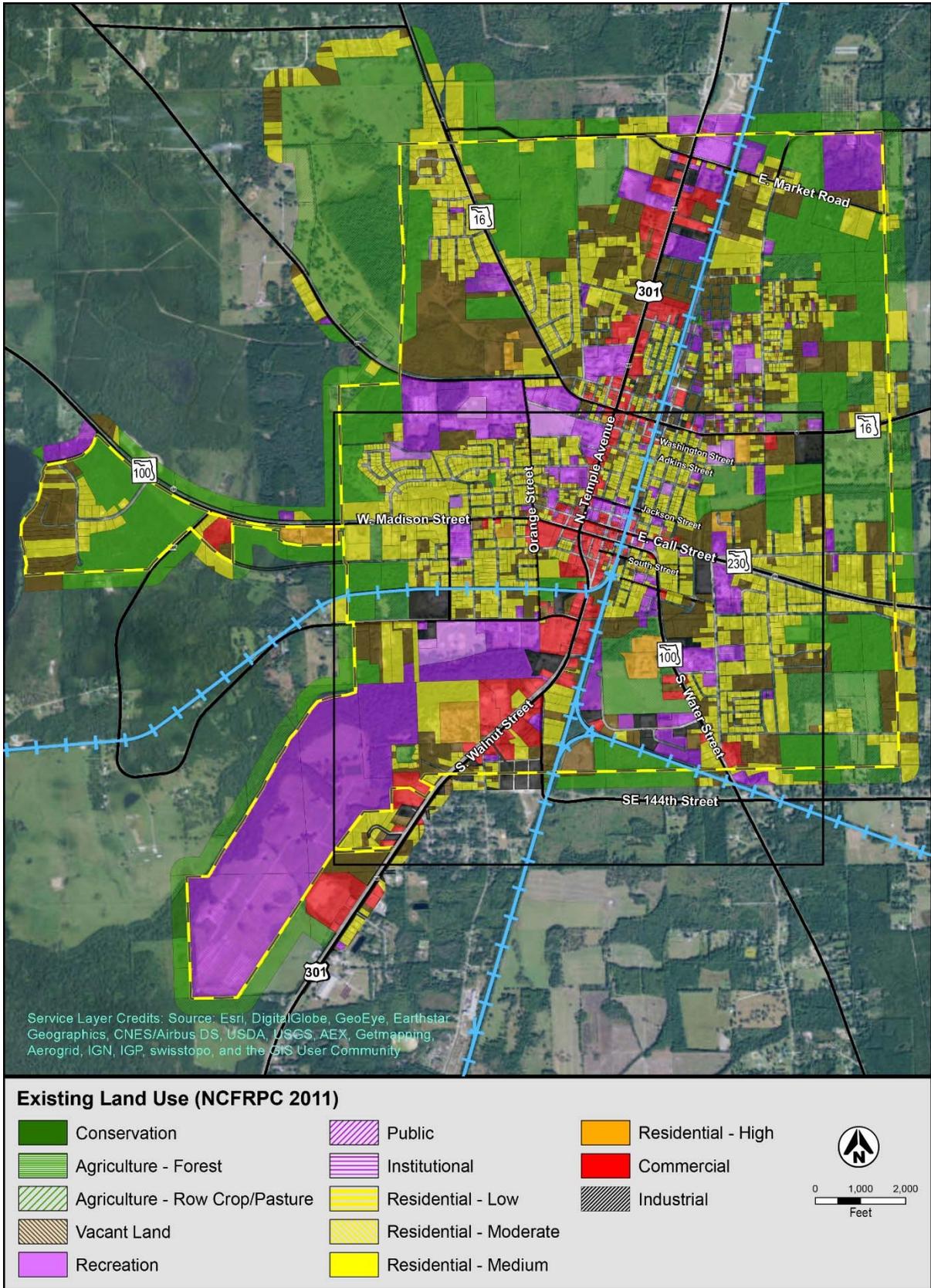


Figure 3: Existing Land Use, City of Starke, Bradford County Florida

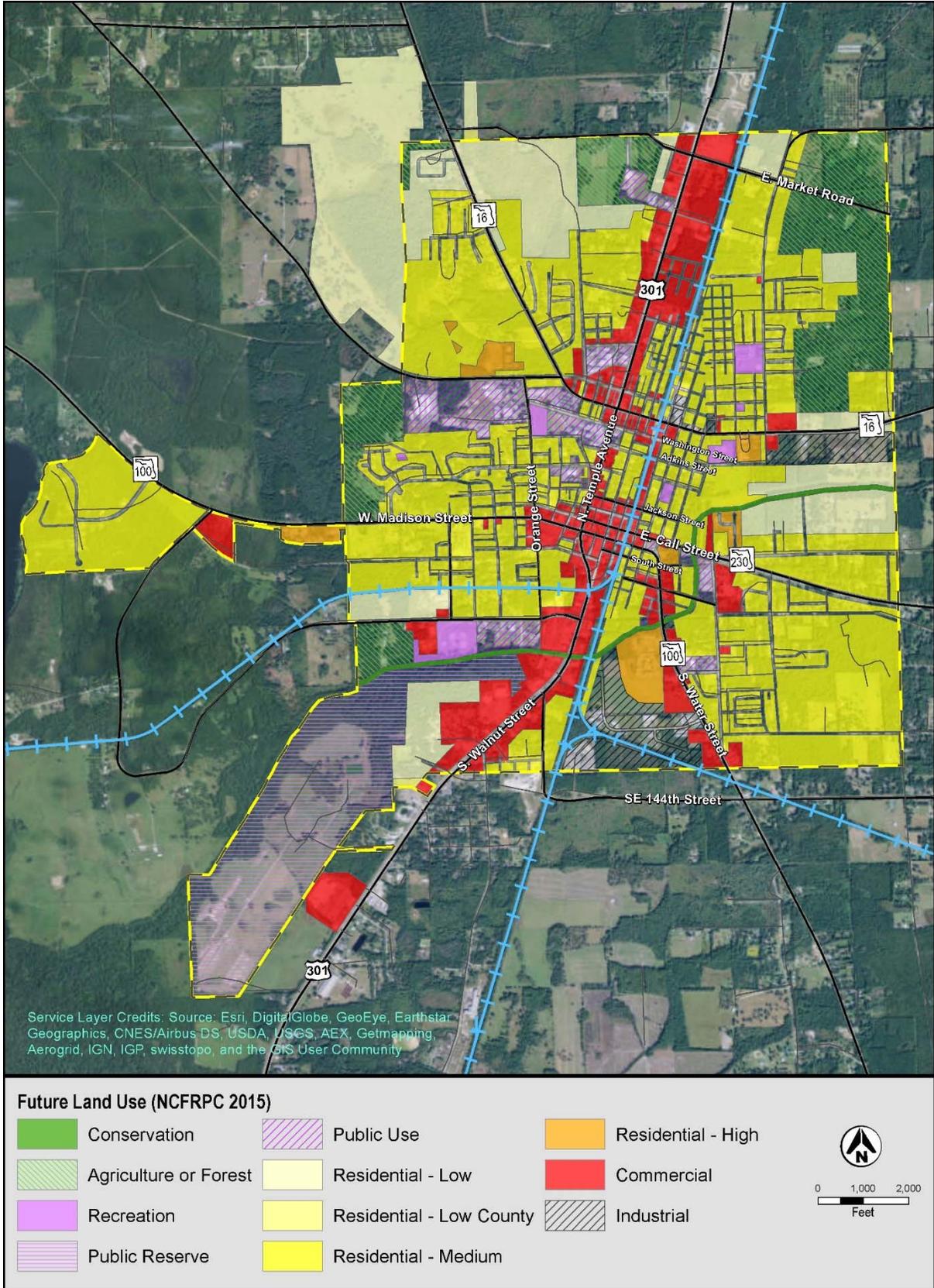


Figure 4: Future Land Use, City of Starke, Bradford County Florida

## **2.6 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.

## **2.7 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.

## **2.8 US 301 Starke Alternate Truck Route**

The US 301 Alternate Truck Route is scheduled to begin construction in the fall 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. PLANNING/FEASIBILITY PHASE**

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 Transportation System Management and Operations**

Transportation system management and operation improvements are routinely considered to address identified project needs. The transportation system management and operation improvements seek to optimize the efficiency of the current transportation systems by implementing low-cost strategies such as:

- Adding turning and auxiliary lanes and converting High Occupancy Vehicle (HOV) lanes to reversible lanes
- Optimizing traffic signals (improves overall operation), including signalization coordination
- Improving interchange termini
- Milling and resurfacing to extend pavement life
- Improving roadway signage and pavement markings
- Implementing traffic management strategies
- Enhancing pedestrian facilities

These improvements will not fulfill the primary identified need for the project to provide an east-west railroad overpass. Therefore, transportation system management and operation improvements do not represent a viable alternative for this project.

#### **3.3 Build Alternatives**

##### *3.3.1 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. 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 144<sup>th</sup> 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 144<sup>th</sup> 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 144<sup>th</sup> Avenue, SE 144<sup>th</sup> Avenue, SR 100, SR16 and north of SR 16.

### 3.3.2 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 6. The initial concepts are shown in Figure 5 and are discussed below.

#### SE 144th Avenue

SE 144<sup>th</sup> Avenue was an unimproved roadway and has recently been paved by the county. In 2015, SE 144<sup>th</sup> 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 144<sup>th</sup> Avenue alternative. Similarly the intersection of SR 100 and SE 144<sup>th</sup> 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

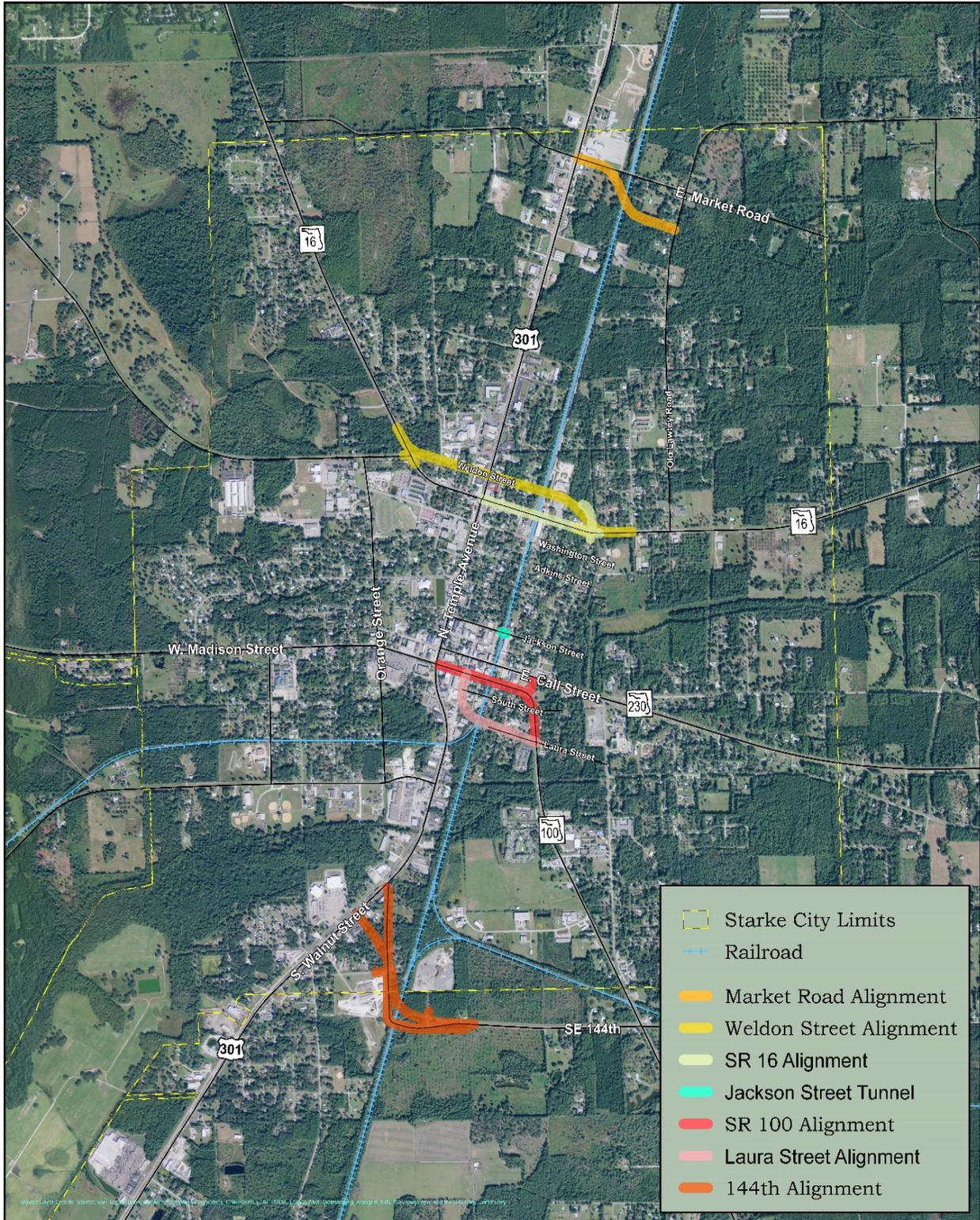
As part of this project a technical memorandum was completed to investigate the feasibility of tunneling under the CSX railroad along Jackson Street in Starke. As part of this effort, contractors were engaged to gain an understanding of the construction methods and costs. Two types of construction methods 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 144<sup>th</sup> Street
- SR 100
- Weldon Street



*Starke Railroad Overpass Study*  
 Alternatives  
 Starke, Florida  
 January 1, 2016

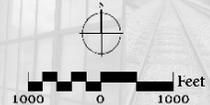


Figure 5: Tier I Alternatives, City of Starke, Bradford County, Florida

### 3.3.3 Tier Two

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

#### SE 144<sup>th</sup> 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 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.

### *3.3.4 Tier Three*

The SR 100 and SE 144<sup>th</sup> Avenue alternatives were presented to the public at the August 17, 2015 meeting. 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. Minor revisions were made to the concepts from what was shown at the August 2015 public meeting and these revised concepts were again presented to the public on January 4, 2016.

### *3.3.5 Aesthetics*

#### **SR 100**

The 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 one 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 144<sup>th</sup> Avenue

The location of the proposed 144<sup>th</sup> 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.

### **3.4 Recommended Build Alternative**

Based on the feedback from the public meeting held on January 4, 2016, the SR 100 alternative is recommended as the build alternative. The comments provided at the meeting showed an overwhelming support for the SR 100 alternative. In addition, the city commission voted 5-0 in support of the SR 100 alternative at their meeting held on January 19, 2016. Also, the county commission voted 5-0 in support of the SR 100 alternative at their meeting on January 21, 2016.

The SR 100 alternative has the most benefit for a grade separated east-west railroad overpass over the CSX S-line. SR 100 serves the highest traffic demand of all locations. This will provide the greatest overall benefit to the traveling public by reducing the travel delay experienced by motorists. In addition, SR 100 is centrally located and serves both regional and local traffic. SR 100 also provides the most direct access to the fire department and for emergency services to access the hospital which will decrease emergency response times.



Figure 6: SR 100 Aesthetics

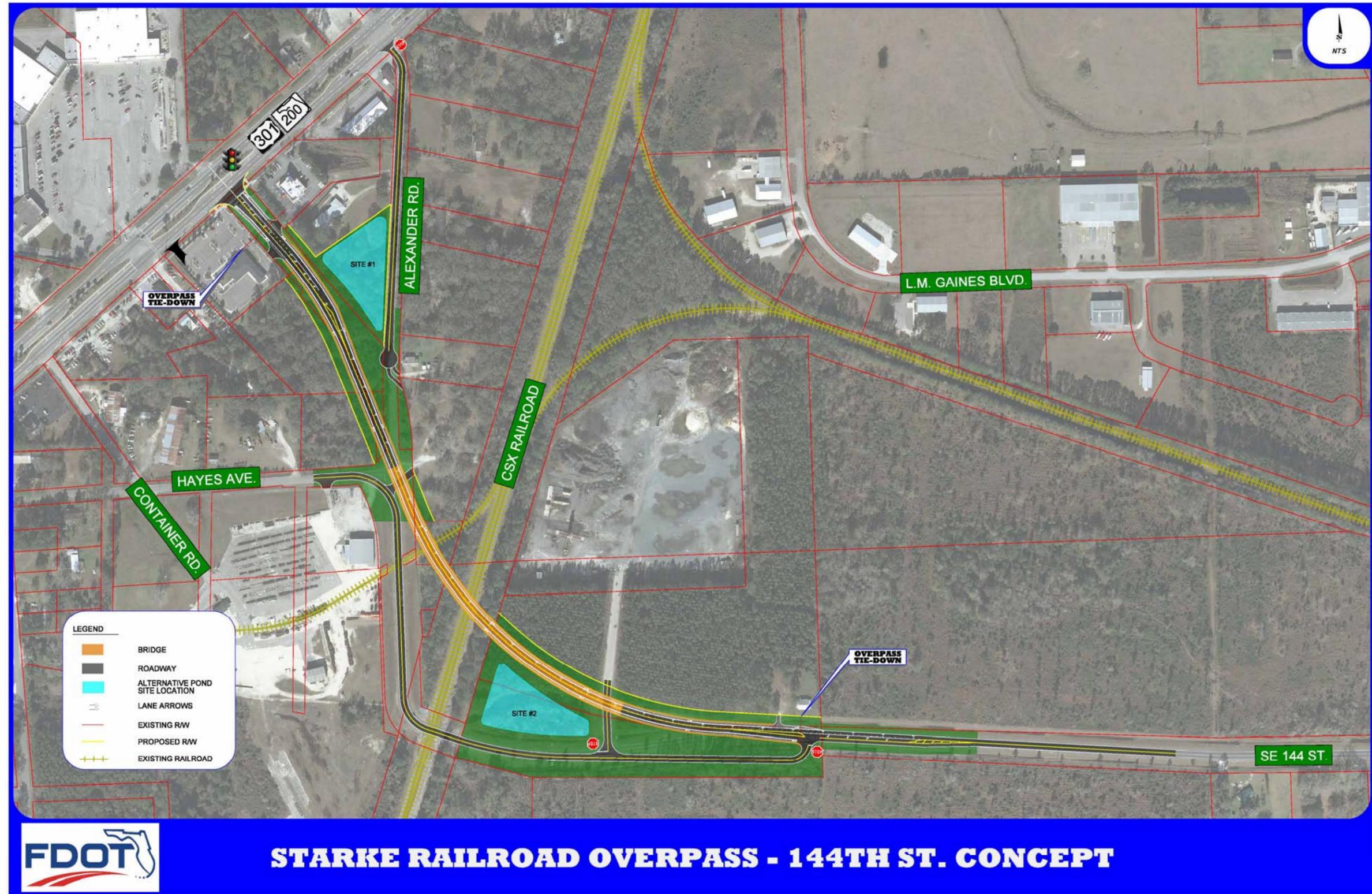


Figure 7: Southeast 144<sup>th</sup> Avenue Concept

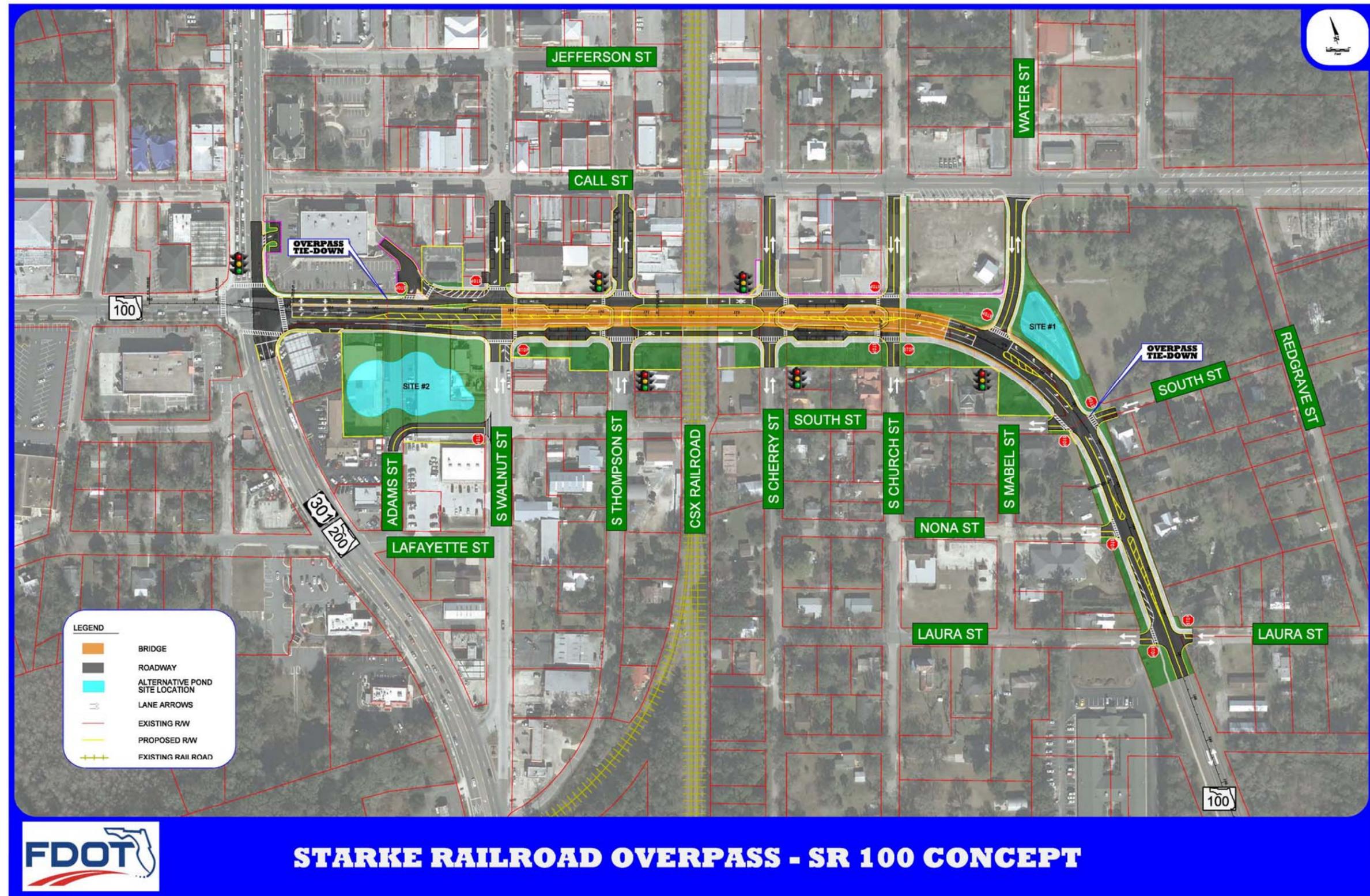


Figure 8: SR 100 Alternative

#### **4. PROJECT DESIGN STANDARDS**

The design criteria used for this project are based on design parameters outlines in FDOT's Roadway Plans Preparation Manual, 2016 edition.

## 5. PROPOSED ALTERNATIVE

As mentioned previously the SR 100 alternative is the recommended build alternative. The alternative is shown in Figure 8 above.

### 5.1 Costs

The costs for the SR 100 concept are shown in the table below. The total project cost for the SR 100 concept is \$32.1 million.

**Table 6: Cost Matrix (Millions)**

	SR 100
Engineering	\$4.8
Right-of-way	\$10.3
Construction	\$17.0
<b>Total Cost</b>	<b>\$32.1</b>

### 5.2 Schedule

The project is schedule to go to construction in 2020. The right-of-way phase is funded for fiscal year 2018. The design team is currently under contract. No design work will occur until after the public hearing.

### 5.3 Design Variances and Exceptions

To be completed after the public hearing.

### 5.4 Right-of-Way

Right-of-way acquisition will be required as part of this project. It is anticipated that 21 parcels will be impacted as part of this project. Also, 13 relocations will be needed including 14 commercial and five residential properties. The anticipated cost is \$10.3 million.

### 5.5 Railroad Closures

In discussions with CSX it was determined that in order to provide a grade separated crossing at SR 100 and maintain the frontage roads on both the north and south side of the overpass, two existing railroad crossings will need to be closed in Starke. Looking at the existing crossings in Starke, FDOT recommended the closure of the existing railroad crossings at South and Adkins Street. The reason for the selection of these two crossings is because they are located within residential areas and have both have crossings located one block away. A public meeting for the closure of these crossings will be held concurrently with the public hearing to seek input from the public.

### 5.6 Value Engineering

A value engineering study was held on February 1-5, 2016. The team generated 28 ideas during the study. Five recommendations are being considered for further investigation. This information is contained under separate cover. As part of the recommendations, roundabouts are being considered at the intersections of Thompson and Cherry Streets instead of the signalized

intersections. The roundabouts will be presented at the public hearing so that the public can provide public comments. In addition a recommendation was made to move the connection at Water Street further to the east. This realigned connection will provide a connection to St. Clair Street. The shift to the east is needed to provide a better connection at SR 100. These details will be further analyzed during the design phase.

## **5.7 Drainage**

Detailed drainage analysis including a pond siting report will be conducted during the design phase.

## **5.8 Utilities**

Existing utilities within the project area consist of Comcast, Century Link, FGT, FPL, Clay Electric, and City water, sewer and electric. Further coordination with utility agencies/owners will take place during the design phase of the project.

## **5.9 Traffic**

Detailed traffic analysis is included in the *Feasibility Study* that was completed for this project.

## **5.10 Environmental Impacts**

### *5.10.1 Noise*

The impact analysis described in this report adhere to State of Florida requirements contained in Chapter 335.17, Florida Statutes, FDOT's Project Development and Environment Manual – Part II, Chapter 17 (revised May 24, 2011, and FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook (May 5, 2015). The analysis is fully documented in the project's Noise Study Report (June 2016) and is available under separate cover.

The noise impact analysis identified one impacted noise-sensitive receptor throughout the study corridor. This site is the front entrance to the Bible Baptist Church on SR 100, an FHWA Noise Abatement Category (NAC) Activity Category C - institutional land use. The impact analysis projected that the proposed project will increase noise levels an average of 1.4 dB(A) throughout the study corridor, with the greatest increases occurring at the Church.

FDOT requirements stipulate that noise barriers must achieve at least 5.0 dB(A) in noise reduction at a minimum of *two* impacted sites. Accessibility to adjacent properties on non-limited access roadways such as SR 100 must be given consideration since the placement of a noise barrier may block ingress and egress to these properties. However, openings in noise barriers for driveway connections or intersecting streets destroy their effectiveness. According to the American Association of State Highway Transportation Officials (AASHTO), "Noise barriers are ineffective in situations where there are numerous intersecting streets or where openings for access to driveways must be provided." This is the circumstance with providing a noise barrier behind the north sidewalk in front of the Church. Consequently, a barrier was evaluated on the overpass structure in front of the Church. This barrier failed to attain the minimum 5.0 dB(A) noise reduction requirement; thus, abatement for this impact is not feasible.

Based on the noise analysis performed to date, there appears to be no apparent solutions available to mitigate the noise impacts at one impacted site, Bible Baptist Church.

#### *5.10.2 Air Quality*

The project is located in Bradford County, a county designated as being in attainment for the following Clean Air Act: National Ambient Air Quality Standards (NAAQS): ozone, nitrogen dioxide, particulate matter (2.5 microns in size and 10 microns in size), sulfur dioxide, carbon monoxide (CO), and lead. Because the County is in attainment, the Clean Air Act conformity requirements do not apply to the project.

The CO Florida 2012 model was run using the default receptors located 10 to 150 feet from the edge of the intersecting roadways. These distances are representative of the worst-case air receptors throughout the study corridor and were deemed suitable for use in this analysis. Results from the screening test indicate that the highest project-related CO 1-hour and CO 8-hour levels are not predicted to meet or exceed the NAAQS for this pollutant under either alternative. As such, the project passes the screening model for the No-Build Alternative and the Build Alternative. No further air quality impact analysis is required.

#### *5.10.3 Wetlands and Wildlife*

A desktop analysis and field evaluation were conducted for this project. The project area follows the SR100 corridor within the urbanized area of the City of Starke, traversing long-established commercial, institutional and medium-density residential land uses. No wetlands or natural habitats exist within the project area, and no bald eagle nests are located within 660 feet of the project area. No Threatened, Endangered or Candidate species are known to occur within the project corridor, nor is there suitable habitat for any listed species known to occur in Bradford County. Based upon this information, the project will have no wetland impacts and no effects on bald eagles or any Threatened, Endangered or Candidate species.

#### *5.10.4 Contamination Sites*

A *Level 1 Contamination Screening Evaluation Report* (CSER) was prepared for this project to identify and evaluate known or potential contamination problems, present recommendations, and discuss possible impacts to the proposed roadway improvements. The report identified 47 potential contamination sources within the ¼ mile buffer of the project. Further investigation will be needed as the project progresses.

#### *5.10.5 Cultural Resources*

A *Phase I Cultural Resource Assessment Survey* (CRAS) has been conducted as part of this project. The Area of Potential Effect (APE) includes the alignment through the southern portion of downtown Starke along SR 100. The SR 100 Existing Alignment APE was defined to include the existing and proposed right-of-way for the alternative alignment for the railroad overpass and was extended to the back or side property lines of parcels adjacent to the alignment or a distance of no more than 100 meters (330 feet) from the proposed right-of-way. The archaeological survey was conducted within the proposed construction area (i.e., the existing and proposed road rights-of-way), and the architectural survey included the entire APE. Due to the presence of buried electrical

utilities along the SR 100 Existing Alignment, subsurface archaeological testing was not possible in the project area. A pedestrian survey and surface inspection was used to document the project area and identify any archaeological sites. Based on the heavily disturbed nature of the soils, there is no potential for intact archaeological sites to be located within the right-of-way. No further archaeological survey in support of the proposed railroad overpass project.

The architectural survey resulted in the identification of 37 historic resources within the APE, including 28 previously recorded historic resources and nine newly recorded resources. The previously recorded resources include 26 historic buildings, one linear resource group, and one historic district. The newly recorded historic resources include eight historic buildings and one historic resource group. Of these, two historic districts (8BF00057 and 8BF00797) and one linear resource group (8BF00165) are recommended individually eligible for the NRHP. The Call Street Historic District (8BF00057) is already listed in the NRHP and, based on the results of the current survey, continues to meet the criteria for listing. One newly recorded historic resource group, the J. M. Johns Addition Historic District (8BF00797), is recommended eligible for listing in the NRHP. In addition, the segment of the NRHP-Listed Florida Railroad Corridor Resource Group (8BF00165) that runs through the APE is recommended eligible for listing in the NRHP.

Twelve resources were determined not to be individually eligible, but are recommended eligible as contributors to historic resource groups or districts; two resources (8BF00031 and 8BF00688) are recommended eligible as contributors to the Call Street Historic District (8BF00057); one resource (8BF00291) is eligible as a contributor to the Florida Railroad Corridor Resource Group (8BF00165); and nine resources (8BF00262, 8BF00263, 8BF00266, 8BF00270, 8BF00271, 8BF00273, 8BF00276, 8BF00277, and 8BF00283) are eligible as contributors to the J. M. Johns Addition Historic District (8BF00797). The remaining 22 resources lack the architectural distinction and significant historical association necessary to be considered for listing in the NRHP either individually, or as contributors to a resource group or district.

As this study continues, FDOT is committed to working with the Division of Historical Resources to mitigate impacts to historic resources.

## **6. 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.

### **6.1 Public Meetings**

#### *6.1.1 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 144<sup>th</sup> Avenue, two options at SR 100, Laura Street, Weldon Street and Market Road. The feedback received showed support for the SE 144<sup>th</sup> 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.

#### *6.1.2 Alternatives Meetings*

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 144<sup>th</sup> Avenue alternative and the SR 100 location.

A second public alternatives meeting was held on January 4, 2016. The SE 144<sup>th</sup> Avenue concept and the SR-100 concept were presented at this meeting along with project updates since the last meeting. Doors opened at 4:30 p.m. and a presentation was given at 6:30 p.m. along with an opportunity for the public to provide comments. There were 73 people in attendance for the meeting and the feedback received was in support of the SR 100 alternative.

### **6.2 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, March 3, 2016 and March 30, 2016
- City Commission – June 9, 2015, June 16, 2015, August 4, 2015, August 18, 2015 and March 15, 2016
- County Commission – February 4, 2015
- Chamber of Commerce – June 9, 2015 and August 4, 2015

### **6.3 Public Hearing**

The public hearing for this project is scheduled for June 28, 2016. Doors will open at 4:30 and a formal presentation will be held at 6:30 followed by a public comment period. This report will be updated after the hearing and before any final decisions are made.