Visual Quality
Discipline Report

FPID: 208225-3-22-02
CLAY AND ST. JOHNS COUNTIES

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Table of Contents

Table of Contents .......................................................................................................................... i
List of Tables .................................................................................................................................. iii
List of Figures ................................................................................................................................. iii
Acronyms and Abbreviations Used in this Report ................................................................. iv
Glossary .......................................................................................................................................... v
Summary ......................................................................................................................................... vi
1. Introduction ............................................................................................................................ 1
   1.1 Study Objectives .................................................................................................................. 1
2. Project Description .................................................................................................................. 2
   2.1 Build Alternatives .............................................................................................................. 2
       2.1.1 Purple Alternative ....................................................................................................... 3
       2.1.2 Black Alternative .......................................................................................................... 4
       2.1.3 Pink 1 and Pink 2 Alternatives .................................................................................... 4
       2.1.4 Brown 1 and Brown 2 Alternatives ........................................................................... 5
       2.1.5 Green 1 and Green 2 Alternatives .............................................................................. 6
       2.1.6 Orange 1 and Orange 2 Alternatives ........................................................................ 6
       2.2 No Build Alternative ....................................................................................................... 7
3. Methodology ............................................................................................................................ 7
   3.1 Characteristics of Resource .............................................................................................. 7
   3.2 Regulations and Impact Criteria ...................................................................................... 10
   3.3 Study Approach .................................................................................................................. 11
4. Affected Environment ............................................................................................................. 13
   4.1 Description of Study Area ................................................................................................ 13
   4.2 Data Collection .................................................................................................................. 14
       4.2.1 St. Johns County ........................................................................................................ 14
           4.2.1.1 St. Johns County Comprehensive Plan ............................................................... 15
           4.2.1.2 William Bartram Scenic & Historic Highway Corridor Management Plan .. 17
       4.2.2 Clay County ............................................................................................................... 20
           4.2.2.1 Branan Field Corridor Master Development Plan ........................................... 20
           4.2.2.2 Lake Asbury Master Development Plan: .......................................................... 20
       4.3 Existing Conditions ......................................................................................................... 22
           1. Middleburg Area – Connection with SR 21 (Blanding)/Branan Field-Chaffee Road .................................................................................................................. 23
           2. Pier Station/Fairgrounds Area – Intersection with SR 16 ...................................... 24
3. Proposed River Crossing at Popo Point .............................................................. 24
4. Bayard Conservation Area .................................................................................. 24
5. St. Johns River at The Existing Shands Bridge ..................................................... 25
6. Intersection With SR 13 Near The Existing Shands Bridge, South of Orangedale ................................................................................................................. 25
7. Intersection with SR 13 near Popo Point River Crossing, South of Switzerland ......................................................................................................................... 25
8. Northern View of St Johns River From Existing Shands Bridge ......................... 26
9. Southern View of St Johns River From Existing Shands Bridge Location ........... 26

4.4. Affected Viewers & Sensitivity ........................................................................... 26

5. Project Effects ........................................................................................................ 29

5.1. Simulation Viewpoint Selection ........................................................................ 29
5.2. Visual Impacts of Alternatives .......................................................................... 29
5.2.1. Simulation Viewpoints – Visual Resource Change and Predicted Viewer Response ...................................................................................................................... 29

1. Middleburg Area – Connection with SR 21 (Blanding)/Branan Field-Chaffee Road ................................................................................................................................................................................... 29
2. Pier Station/Fairgrounds Area – Intersection with SR 16 ..................................... 30
3. Proposed River Crossing at Popo Point .............................................................. 30
4. Bayard Conservation Area .................................................................................. 31
5. St. Johns River at The Existing Shands Bridge ..................................................... 32
6. Intersection with SR 13 near Existing Shands Bridge, South of Orangedale ......................................................................................................................... 32
7. Intersection with SR 13 near Popo Point River Crossing, South of Switzerland ................................................................................................................................. 33
8. Northern View of St Johns River From New Bridge .......................................... 33
9. Southern View of St Johns River From New Bridge Location ............................ 34

5.3. No Build Alternative .......................................................................................... 34
5.4. Effects During Construction ............................................................................ 34
5.5. Indirect Effects .................................................................................................. 36
5.6. Effects Comparison of Alternatives .................................................................. 36

6. Measures to Avoid or Minimize Project Effects .................................................... 39

6.1. Design Measures .............................................................................................. 39
6.2. Avoidance Measures During Construction ..................................................... 41
6.3. Avoidance Measures During Operation .......................................................... 41
6.4. List of Measures to Consider ............................................................................ 41

7. Unavoidable Adverse Impacts .............................................................................. 41

8. References ............................................................................................................. 42
List of Tables

Table 1: Visual Effects Matrix ...................................................................................................37
Table 2: Representative Visual Effects Comparison of Alternatives Table .........................37

List of Figures

Figure 1: Project Alternatives .................................................................................................2
Figure 2: Parks and 4(f) Properties ..........................................................................................8
Figure 3: Landscape Features ..................................................................................................9
Figure 4: Study Approach .......................................................................................................13
Figure 5: Viewshed Map .........................................................................................................14
Figure 6: St Johns County Greenways, Blueways and Trails Plan ......................................15
Figure 7: William Bartram Scenic and Historic Highway Intrinsic Resources Map ..........19
Figure 8: Branan Field Corridor Master Development Plan ..............................................21
Figure 9: Lake Asbury Master Development Plan ...............................................................22
Figure 10: Viewpoint Locations .............................................................................................23
Figure 11: Representative Visual Effects Comparison of Alternatives Map ......................39
Figure 12: Representative Mitigation Measures, Viewpoint 6 .............................................40
## Acronyms and Abbreviations Used in this Report

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEQ</td>
<td>Council on Environmental Quality</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>DRI</td>
<td>Development of Regional Impact</td>
</tr>
<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
</tr>
<tr>
<td>FDOT</td>
<td>Florida Department of Transportation</td>
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<tr>
<td>FHWA</td>
<td>Federal Highway Administration</td>
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<tr>
<td>GIS</td>
<td>Geographic Information System</td>
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<tr>
<td>LDR</td>
<td>Land Development Regulations</td>
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<tr>
<td>NEPA</td>
<td>National Environmental Policy Act</td>
</tr>
<tr>
<td>NHPA</td>
<td>National Historic Preservation Act</td>
</tr>
<tr>
<td>NRHP</td>
<td>National Register of Historic Places</td>
</tr>
<tr>
<td>PD&amp;E</td>
<td>Project Development and Environment</td>
</tr>
<tr>
<td>ROW</td>
<td>Right of Way</td>
</tr>
<tr>
<td>SR</td>
<td>State Road</td>
</tr>
<tr>
<td>TPO</td>
<td>North Florida Transportation Planning Organization</td>
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Glossary

4(f) Properties – Includes land from a publicly owned park, recreational area, wildlife or waterfowl refuge, or land from a historic property on or eligible for inclusion in the National Register of Historic Places (NRHP or National Register). Section 4(f) of the Department of Transportation Act of 1966, 49 USC §303(c), requires that prior to the use of any 4(f) properties, it must be determined that there are no prudent and feasible alternatives which avoid such use and that the project includes all possible planning to minimize harm to such resources.

Intactness – The integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment (FHWA 1989).

Unity – The degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony of inter-compatibility between landscape elements (FHWA 1989).

Viewshed –

1. All the surface areas visible from an observer’s viewpoint (FHWA 1989).

2. Surface areas from which a critical object or viewpoint is seen (FHWA 1989).

Visual Impact – The degree of change in visual resources and viewer response to those resources caused by highway development and operations (FHWA 1989).

Visual Quality – While many factors contribute to a landscape’s visual quality, they can ultimately be grouped under three headings: Vividness, Intactness and Unity (FHWA 1989).

Vividness – The memorability of the visual impression received from the contrasting landscape elements as they combine to form a striking and distinctive visual pattern (FHWA 1989).
Summary

The proposed project would result in the construction of several miles of roadway, interchanges, a bridge spanning the St. Johns River and several smaller bridges at creeks as part of a beltway linking SR21/SR23 in Clay County and I-95 in St. Johns County in Florida. Several alternative routes are considered in the draft environmental impact statement, all of which result in visual resource impacts. Federal and local laws and regulations require consideration of visual impacts for this project.

Clay County and St. Johns County both contain a wealth of natural and cultural resources. The most prominent natural resource, the St. Johns River, provides the natural boundary between the counties. Several parks and conservation lands are located in the project study area. Neighborhoods range from new developments of regional impact to historic residential areas located throughout both counties. Many of the older, established neighborhoods in St. Johns County are traversed by the state designated William Bartram Scenic and Historic Highway. Several county-adopted plans and studies provide a wealth of information related to visual resources. A common thread in these plans is the resident’s appreciation of their quality of life, particularly scenic resources such as the St. Johns River, scenic roadways, rural ambiance and neighborhood character.

This assessment identified both sensitive and representative visual resources and used a systematic technique to evaluate the impacts to these resources. The assessment determined the degree of visual impact to specific resources and used that information to provide a broad comparison of the alternatives.

The northern bridge crossing alternatives were found to have more of a visual impact than the southern bridge crossing alternatives because of the introduction of a new bridge in this area where there currently is none. The southern alternatives were found to have a negative visual impact on the Bayard Conservation Area as they pass adjacent to the property. The northern alternatives had a greater visual impact on the SR13 crossing because of the undeveloped, scenic nature of the roadway in this area. The alternatives have varying degrees of visual impact on residential areas and major road crossings depending on the route.

Measures to avoid or minimize project effects are identified and proposed.
1. Introduction

The Florida Department of Transportation (FDOT) identified the need for an improved highway corridor and bridge crossing in the area of the St. Johns River between Clay and St. Johns Counties. The St. Johns River Crossing Project is an effort to decide what the best solution to address that need is, while trying to minimize the effect that solution might have on the communities and the environment in the two counties.

Three goals were established to guide the FDOT in developing potential solutions to existing transportation problems in the project area (further defined below):

- Provide additional capacity to improve current and future transportation network deficiencies
- Promote and support employment and economic development
- Improve emergency evacuation

These goals were then consolidated into a statement of purpose to be used to evaluate alternatives and identify the one that would best serve the area’s transportation needs:

To address population growth and resulting traffic by providing additional capacity that meets the area’s transportation, economic, employment and safety needs while avoiding, minimizing, and/or mitigating effects on the affected communities and the environment.

Rapid population growth in the project area has resulted in additional traffic and congestion on local roads, a situation that is expected to worsen in the future. Providing additional capacity to improve current and future transportation network deficiencies in the near term would help alleviate the congestion while providing access for residents to local employment centers, thus promoting and supporting economic development. Perhaps most important, an improved crossing of the St. Johns River would result in more efficient emergency evacuation, thus potentially saving lives.

1.1 Study Objectives

Visual impact is one of many factors considered in the evaluation of alternatives for a transportation project. Large highway projects such as the St Johns River Crossing Project have the potential to considerably alter the landscapes through which they pass. A careful, systematic assessment of potential visual effects provides a tool for decision makers that enable them to consider these effects in the planning and design of the alternatives. This assessment will be used to evaluate the potential visual effects of the proposed alternatives.
This visual impact assessment will provide a systematic evaluation of the potential effects on visual resources as they relate to the viewer by considering the views to and from the proposed highway. To determine the degree of visual impact, the assessment will:

- establish the visual environment;
- assess visual resources;
- identify viewer characteristics; and
- assess the resource change and associated viewer response.

Once the visual impacts are determined, this assessment will look at measures to avoid or minimize project effects (FHWA 1989).

2. Project Description

The St. Johns River Crossing Project is the development of a new limited-access highway corridor from Branan Field-Chaffee Road to I-95, including the construction of a new bridge over the St. Johns River. The project would look similar to existing highway facilities in the area including Interstate 10 and Interstate 295. The proposed right-of-way (ROW) width used during the alternatives analysis was 324 feet. The facility would consist of a combination of four, six or eight lanes depending on the traffic needs for each corridor, but still within 324-feet.

2.1. Build Alternatives

Along with the No Build Alternative, the alternatives examined in this analysis are: Purple, Black, Orange 1, Orange 2, Green 1, Green 2, Pink 1, Pink 2, Brown 1 and Brown 2. These ten alternatives are illustrated in Figure 1 and described below.
The first segment for all the alternatives starts at the intersection of Branan Field-Chaffee Road and SR 21 in Clay County and continues to the Black Creek crossing. This segment continues to a point just east of CR 739, where the first independent alternative alignment begins.

### 2.1.1. Purple Alternative

The Purple Alternative proceeds in a southeasterly direction away from Black Creek toward Green Cove Springs and crosses the St. Johns River at one of its narrower locations, proceeding into St. Johns County. The alternative continues in a northeasterly direction toward the proposed SR 9B/I-95 interchange near the St. Johns County/Duval County line. The Purple Alternative then turns towards the east, intersecting CR 2209 south of Race Track Road. The alternative continues to the northeast, connecting to I-95 at SR 9B.
Interchanges along the Purple Alternative would be provided in Clay County at SR 21, the proposed College Drive extension, and US 17. Interchanges in St. Johns County would be provided at Greenbriar Road, CR 2209, the planned Race Track Road Extension, and I-95.

The Purple Alternative uses a 4-lane roadway section from Branan Field-Chaffee Road to US 17. From US 17, the Purple Alternative crosses the river with a 6-lane bridge, continuing with a 6-lane roadway section until Racetrack Road in St. Johns County. From Racetrack Road, the alternative uses an 8-lane roadway section to its terminus at I-95.

2.1.2. Black Alternative

The Black Alternative is the same as the Purple Alternative, but with an additional segment that provides a direct connection to I-95 south of CR 210. The additional segment of the Black Alternative begins by splitting from the northern segment just south of Greenbriar Road and west of the proposed CR 244 in St. Johns County. The alternative continues east, paralleling Greenbriar Road to the south and then proceeds in a southeasterly direction, crossing CR 210 approximately ¼ mile south of the Greenbriar Road/CR 210 intersection. The Black Alternative continues southeasterly, crossing Trout Creek approximately 1 mile north of CR 16A. The alternative then turns east towards I-95, terminating approximately 3 miles south of CR 210 and 3 miles north of International Golf Parkway.

Interchanges along the Black Alternative would be provided in Clay County at SR 21, the proposed College Drive extension, and US 17. Interchanges in St. Johns County would be provided at Greenbriar Road, CR 2209, the planned Race Track Road Extension, and I-95 for the northern segment and at CR 210, CR 2209 and I-95 for the southern segment.

The Black Alternative uses a 4-lane roadway section from Branan Field-Chaffee Road to US 17 in Clay County. From US 17, the Black Alternative uses a 6-lane roadway section and crosses the river with a 6-lane bridge to the split east of the St. Johns River. After the split, the northern segment of the Black Alternative uses a 4-lane section to the CR 2209 interchange and a 6-lane section from CR 2209 to the terminus at I-95. After the split, the southern segment of the Black Alternative uses a 4-lane roadway section to the interchange with I-95.

2.1.3. Pink 1 and Pink 2 Alternatives

After crossing Black Creek, the Pink 1 Alternative turns south towards SR 16, paralleling the proposed College Drive extension on the east. The alternative intercepts a power line easement just south of the proposed CR 218 Bypass and then parallels it on its western side to its intersection with SR 16. The alternative continues to follow the power line on the west side south of SR 16, crossing CR 315. East of CR 315, the Pink
1 Alternative proceeds in a northeasterly direction, intersecting US 17 south of Green Cove Springs. After crossing US 17, the Pink 1 Alternative continues east toward the existing Shands Bridge, just east of the Reynolds Industrial Park. The Pink 1 Alternative then crosses the St. Johns River into St. Johns County, paralleling the existing Shands Bridge and SR 16 on the south. The alternative continues east, paralleling CR 16A to the south and intersecting the proposed CR 2209 roadway just west of I-95. The alternative continues east, terminating at I-95, approximately 2.5 miles north of the I-95/International Golf Parkway interchange.

Interchanges along the Pink 1 Alternative would be provided in Clay County at SR 21, CR 739, the proposed CR 218 Bypass, SR 16, and US 17. Interchanges in St. Johns County would be provided at CR 16A, CR 2209, and I-95.

The Pink 2 Alternative follows the same route as the Pink 1 Alternative with an exception in route location east of the Reynolds Industrial Park in Clay County. The Pink 2 Alternative parallels SR 16 on the north side continuing east towards the St. Johns River. The alternative crosses the St. Johns River parallel and to the south of the existing Shands Bridge, following the same route location as the Pink 1 Alternative.

The Pink 1 and 2 Alternatives use a 4-lane roadway section from Branan Field – Chaffee Road to the interchange with US 17 in Clay County and from CR-16A to I-95 in St. Johns County. The segment between US 17 and CR-16A uses a 6-lane roadway section.

2.1.4. Brown 1 and Brown 2 Alternatives

The Brown 1 Alternative follows the same route as the Pink 1 Alternative in Clay County to just east of the St. Johns River. The alternative then proceeds north towards the proposed SR 9B/I-95 interchange, intersecting with CR 210 just east of the CR 210/Greenbriar Road intersection. The Brown 1 Alternative continues north across CR 210 and turns east, intersecting the proposed CR 2209 roadway. As with the Purple Alternative, the Brown 1 Alternative connects to I-95 at SR 9B.

Interchanges along the Brown 1 Alternative would be provided in Clay County at SR 21, CR 739, the proposed CR 218 Bypass, SR 16, and US 17. Interchanges in St. Johns County would be provided at CR 16A, CR 210, CR 2209, the planned Race Track Road Extension, and I-95.

The Brown 2 Alternative follows the same route as the Brown 1 Alternative with an exception in route location east of the Reynolds Industrial Park in Clay County. The Brown 2 Alternative parallels SR 16 on the north side continuing east towards the St. Johns River. The alternative crosses the St. Johns River parallel and to the south of the existing Shands Bridge, following the same route location as the Brown 1 Alternative.
The Brown 1 and 2 Alternatives use a 4-lane roadway section from Branan Field – Chaffee Road to the interchange with US 17 in Clay County. From US 17, the alternatives transition to a 6-lane roadway and bridge section to the interchange with CR 16A in St. Johns County. From CR 16A, the Brown 1 and 2 Alternatives use a 4-lane roadway section to CR 2209. From CR 2209 to I-95 the alternatives use a 6-lane roadway section.

2.1.5. Green 1 and Green 2 Alternatives

The Green 1 Alternative follows the same route as both the Pink 1 and Brown 1 Alternatives to a point just south of SR 16 in Clay County. The alternative then takes an easterly course north of the Pink 1 and Brown 1 Alternatives. The Green 1 Alternative skirts the southern fringe of Green Cove Springs, intersecting US 17 near the existing SR 16 intersection. From this point to the Shands Bridge, the alternative collocates with SR 16. The new facility would reconstruct SR 16 and have parallel one-way frontage roads on either side, providing local access to the Reynolds Industrial Park and the development north of SR 16. At the western end of the Shands Bridge, the alternative assumes the same route as the Pink 1 Alternative across the St. Johns River, continuing to its terminus with I-95 in St. Johns County.

Interchanges along the Green 1 Alternative would be provided in Clay County at SR 21, CR 739, the proposed CR 218 Bypass, SR 16, and US 17. Interchanges in St. Johns County would be provided at CR 16A, CR 2209 and I-95.

The Green 2 Alternative follows the same route as the Green 1 Alternative with an exception in route location east of the Reynolds Industrial Park in Clay County. The Green 2 Alternative parallels SR 16 on the north side continuing east towards the St. Johns River. The alternative crosses the St. Johns River parallel and to the south of the existing Shands Bridge, following the same route location as the Green 1 Alternative.

The Green 1 and Green 2 Alternatives use a 4-lane roadway section from Branan Field – Chaffee Road to the interchange with US 17 in Clay County and from CR-16A to I-95 in St. Johns County. The segment between US 17 and CR-16A uses a 6-lane roadway section.

2.1.6. Orange 1 and Orange 2 Alternatives

The Orange 1 Alternative follows the same alignment as the Green 1 Alternative in Clay County and across the St. Johns River to a location just east of SR 13 in St. Johns County. The alternative then assumes the Brown 1 Alternative routing, heading north then east to the proposed SR 9B/I-95 interchange.

Interchanges along the Orange 1 Alternative would be provided in Clay County at SR 21, CR 739, the proposed CR 218 Bypass, SR 16, and US 17. Interchanges in St. Johns
County would be provided at CR 16A, CR 210, CR 2209, the planned Race Track Road Extension, and I-95.

The Orange 2 Alternative follows the same route as the Orange 1 Alternative with an exception in route location east of the Reynolds Industrial Park in Clay County. The Orange 2 Alternative parallels SR 16 on the north side continuing east towards the St. Johns River. The alternative crosses the St. Johns River parallel and to the south of the existing Shands Bridge, following the same route location as the Orange 1 Alternative.

The Orange 1 and Orange 2 Alternatives use a 4-lane roadway section from Branan Field – Chaffee Road to the interchange with US 17 in Clay County and from CR 210 to CR 2209 in St. Johns County. The alternatives use a 6-lane section between US 17 and CR 210 (including the bridge over the St. Johns River), and from CR 2209 to I-95.

2.2. No Build Alternative

Consistent with requirements of NEPA and FHWA guidelines, this analysis considers an alternative that assesses what would happen to the environment in the future if the proposed project were not built. This alternative, called the No Action or No Build Alternative, includes the routine maintenance improvements of the existing roads in the study area and the currently programmed, committed, and funded roadway projects as included in the TPO 2030 LRTP. While the No Build Alternative does not meet the project needs, it provides a baseline condition to compare and measure the effects of all the Build Alternatives.

3. Methodology

3.1. Characteristics of Resource

Given the length of the proposed alternatives and diversity of the area, a large number of distinct natural and built communities are traversed. Natural areas include the St. Johns River, creeks, forested areas and non-forested wetlands; undeveloped areas include pasture, rangeland and lands used for silviculture; and developed areas include recent large, low-density suburban residential developments as well as older more established residential communities.

Designated as an American Heritage River, the St Johns River is the most prominent natural feature along any of the alternatives. All of the alternatives will cross the river either at a location near the existing Shands Bridge or at a location further north (Figure 1). The bridge length for the crossing will vary depending on the alternative, but both crossing locations will span at least 2 miles of open water, offering scenic views of the river to the north and south.
Several creeks in both counties are also crossed by the alternatives with varying associations of forested wetlands. Undeveloped agricultural lands consist primarily of pine plantation and some pasture.

In Clay County, the Bayard Conservation Area is adjacent to eight of the alternatives. Several recreation areas such as fishing piers and boat ramps exist along the St Johns River (Figure 2).

Figure 2: Parks and 4(f) Properties

In St Johns County, the William Bartram Scenic and Historic Highway (SR 13), a state scenic highway, runs along the east bank of the St Johns River (Figure 3). All alternatives cross this scenic highway but no interchange is proposed at SR 13 for any of the Build Alternatives. Historical, archaeological, cultural, recreational and scenic resources abound along this stretch of SR 13. Large live oak canopies and views to the St Johns River are among the many natural scenic resources that make this vestige of “Old Florida” a valuable visual resource (Cornwell 2005).

A shift from rural to suburban development has been transforming the landscape of northeast Clay and northwest St Johns Counties over the last several years, with St Johns
County developing at a faster rate than Clay County. New residential development has been dominated by Developments of Regional Impact (DRIs), with mostly low-density residential and some commercial uses. All project alternatives pass through residential areas, much of which are parts of existing or proposed DRI projects. Several older, established neighborhoods and residential areas are also located along or near several of the alternatives. These established residential areas include Lake Asbury, Mahama Bluff, Pier Station and the City of Green Cove Springs in Clay County and Switzerland, Orangedale, Hardwood Landing and Elwood in St Johns County.

No schools are located immediately adjacent to any of the proposed alternatives.

The Jacksonville, Tampa and Key West Railroad in Clay County has been deemed eligible for listing on the National Register of Historic Places (NRHP) due to its local significance and association with early transportation developments in Clay County (Chambless, 2007). The runways at Lee Field (currently operated as Reynolds Industrial Park) have also been deemed eligible for the NRHP. While the historic value of these resources is recognized, potential impacts on these properties are being considered separately as part of a cultural resources survey conducted under Section 106 of the National Historic Preservation Act (NHPA), and are not considered visual resources for purposes of this study.

Figure 3: Landscape Features
3.2. Regulations and Impact Criteria

Federal laws and regulations concerning the visual impacts of highway projects began with the NHPA, requiring federal agencies to account for the proposed project effects on historic resources. Section 4(f) of the 1966 Department of Transportation Act restricted use of public parks, recreation, conservation and historic sites unless no feasible and prudent alternative exists. This act requires all possible planning to minimize harm to these Section 4(f) properties and may require visual resource mitigation in some cases (FHWA 1989).

The National Environmental Policy Act of 1969 (NEPA) requires federally supported projects to demonstrate that environmental considerations, including aesthetic impacts and visual quality, are given appropriate consideration in decision-making. In response to the NEPA directives, Section 109(h) of title 23, Code of Federal Regulations, was added to require consideration of aesthetic values in the project/environment balance. In 1978, the Department of Transportation introduced its Design, Arts and Architecture in its Transportation program. This program requires the consideration of design quality in environmental impact statements (EISs) for projects involving public use areas or sensitive locations. Also in 1978, the Council on Environmental Quality (CEQ) finalized implementation regulations related to NEPA procedures. These regulations encourage early scoping of significant environmental issues. They also require the EIS discussion to include the design value of the built environment, including urban quality, historic and cultural resources (FHWA 1989).

Florida law also provides direction to the Florida Department of Transportation (FDOT) for inclusion of aesthetics in all highway projects. It is the intent of the FDOT to provide road users and community road viewers with a transportation system that is pleasing to the senses and compatible with the community. Specific state legislation concerning visual impacts and aesthetics includes the following:

- **ss 334.044 (25) F.S. 1997, Department; powers and duties** – “To provide for the conservation of natural roadside growth and scenery and for the implementation and maintenance of roadside beautification programs.”

- **ss 336.045 (1) F.S. 1997, Uniform minimum standards for design, construction, and maintenance; advisory committees.** – “…the department shall consider design approaches which provide for the compatibility of such facilities with the surrounding natural or man-made environment; the safety and security of public spaces; and the appropriate aesthetics based upon scale, color, architectural style, materials used to construct the facilities and the landscape design and landscape materials around the facilities.”

- **ss 336.045 (6) F.S. 1997, Uniform minimum standards for design, construction, and maintenance; advisory committees.**– “If the governing body of a county or municipality has adopted a design element as part of its comprehensive plan…the
department shall consider such element during project development of transportation facilities.”

- ss 339.155 (2)(k) F.S. 1997, Transportation planning. – “In developing the Florida Transportation Plan, the Department shall consider...the total social, economic, energy, and environmental effects of transportation decisions on the community and region.”

The FDOT manual for Project Development and Environment (PD&E) studies outlines the process by which visual impacts are ascertained. The process stresses the importance of early identification of environmental concerns to effectively aid in highway planning and decision making (FDOT 1999). The assessment methodology used in this report is consistent with that process.

3.3. Study Approach

Planning documents such as comprehensive plans, sector plans and area plans for Clay and St Johns Counties were reviewed for information related to areas of scenic or aesthetic value or visual quality. The corridor management plan prepared for SR 13 (William Bartram Scenic and Historic Highway) by the Corridor Group and St. Johns County was reviewed for information related to visual quality at the two potential SR 13 crossing locations. Geographic information system (GIS) data, maps, aerial imagery and preliminary engineering drawings were used to determine the project footprint in relation to identified visual resources. The project team visited the corridor alternatives and various visually impacted sites several times to ground-truth map and aerial information and to obtain photographs from various viewpoints. Public comments from several community meetings and other public comment sources, including written letters and website comments, were also reviewed for information related to scenic value and visual quality. Data sources are discussed in more detail in section 4.2, Data Collection.

The Federal Highway Administration (FHWA) publication “Visual Impact Assessment for Highway Projects” (FHWA 1989) was used to establish the methodology for the visual assessment of the St. Johns River Crossing Project. This methodology outlines six steps to determine the probable visual impact of the proposed project.

The first step identifies the study area and project characteristics (Figure 4). This involves establishment of the baseline from which alternatives are compared. Geography, built environment, vegetation and water bodies are evaluated to establish the landscape type. Next, the project viewshed is determined. This identifies the views, both to and from the project limits that the project may affect. Viewsheds combined with the landscape unit define the visual assessment unit. Once the visual assessment unit is defined, pattern elements such as form, line, color and texture are evaluated to determine the project character in terms of dominance, scale, diversity and continuity.
The next step involves the evaluation of the affected environment in terms of visual quality. The concepts used to establish the visual quality for the project are:

- **Vividness**: “The memorability of the visual impression received from the contrasting landscape elements as they combine to form a striking and distinctive visual pattern” (FHWA 1989).

- **Intactness**: “The integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment” (FHWA 1989).

- **Unity**: “The degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony of inter-compatibility between landscape elements” (FHWA 1989).

In order to rate the various visual assessment units, a visual quality matrix *(Table 1)* was developed. The matrix numerically ranks the units based on the concepts of vividness, intactness and unity to determine the visual quality.

Viewer groups, their exposure to the project, and sensitivity are identified to determine viewer characteristics. It is important to include both views to and from the road when determining viewer groups. Viewer exposure will vary depending on the physical location of the viewer, the number of viewers and the duration of the view. Considerations of viewer sensitivity include viewer activity, viewer awareness and cultural awareness of the landscape.

The next two steps in the visual impact assessment process go hand in hand. The visual resource change and predicted viewer response combine to determine the overall visual impact of the project. The method for determining the visual resource change is the same as determining the quality of the visual assessment unit earlier in the process. The new elements added into the landscape and existing elements that are altered or removed are evaluated to determine the project’s compatibility with the original landscape’s visual character. The resulting visual quality is then ranked in the matrix and a comparison can be made against the original determination of visual quality. Photographic simulations are a valuable tool used to compare the landscape before and after the proposed project. Predicted viewer response is also determined in the same way as the viewer characteristics earlier in the process. Viewer characteristics are compared with the visual resource changes and an anticipated response is determined. It is important to determine anticipated viewer response at the various stages of the project (planning, location, design, construction and maintenance).

After the overall visual impact is determined, the final step in the process is to propose visual impact mitigation options. “By generalizing that high contrast is likely to adversely affect high visual quality, conflict areas can be identified” (FHWA 1989). By comparing
the numbers in the matrix for visual quality and visual impact, these high contrast areas can be identified and specific mitigation options explored. Mitigation measures should be explored for all stages of the project (planning, location, design, construction and maintenance).

Figure 4: Study Approach

4. Affected Environment

4.1. Description of Study Area

The study area for each alternative was based on the proposed right-of-way width (324’) and the visual resources affected by the proposed alternative (Figure 5). The viewshed is primarily adjacent to the right-of-way, as the landscape in northeast Florida is relatively flat; however, there are exceptions to this rule. As an example, roadways and creeks crossing the proposed alternatives at perpendicular angles offering views to and from the proposed roadway a significant distance away from the proposed right-of-way, and along the St. Johns River, where the views to and from existing and proposed bridge spans offer vistas for several miles in either direction. The reason for the vistas in these alternatives is the relative flatness of the topography, elevated bridge structures at the road and river crossings, and lack of trees or other objects that would obscure views.
4.2. Data Collection

GIS maps with aerial imagery were created for this project to locate the various visual resources as they relate to the overall project limits and individual alternatives. Preliminary engineering designs for the various road and bridge segments were used to determine the extent of construction within the right-of-way, both vertically and horizontally. This information was used to gauge the effects of the project on the identified visual resources. Photos and notes obtained on numerous site visits were used to confirm map information and get additional detailed information on existing conditions from the field.

In addition to mapping data, County comprehensive plans, County adopted master plans, corridor management plans and areas development plans were reviewed for information related to the project area. Information from those plans is summarized below.

4.2.1. St. Johns County

The St. Johns County Comprehensive Plan (St. Johns County, 2000) contains numerous goals, objectives and policies related to scenic resource protection and enhancement.
4.2.1.1. St. Johns County Comprehensive Plan

Greenway, Blueway & Trails Plan:

The St Johns County Greenway, Blueway & Trails Plan has been included in the comprehensive plan as Objective A.1.20 and specifically mentions “Scenic Edges” in policies A.1.20.3 and A.1.20.4. The master plan describes Scenic Edges as “…part of the greenway system. The primary purpose of scenic edges is to screen development and create natural edges between the development and the roadway through the use of native canopy trees, understory trees, bushes, shrubs, and ground cover. Scenic edges are also an integral part of the development edges and recreational trail system because they provide areas where trails and sidewalks can be located. …The average width of the scenic edges is 75 outside the road right-of-way but the specific width and extent will vary with the proposed development“ (St Johns County 2000).

Scenic edges are shown on the Greenway, Blueway and Trails Master Plan along several of the roadways that the proposed alternatives will cross, including; SR13, Roberts Road, Greenbriar Road, CR 210, and CR 16A (Figure 6).

Northwest Sector Plan:

The St Johns County Northwest Sector Overlay has been included in the comprehensive plan as Objective A.2.1 and specifically includes the following policies related to visual resources:

Policy A.2.1.3, Northwest Sector Development Edges and Recreational Trail System. This policy describes “Development Edges” and their function of providing “natural corridors, recreational opportunities, aesthetics and open spaces, maintain rural character and provide screening from roadways and adjacent development” (St Johns County 2000).

Policy A.2.1.4, Northwest Sector Scenic Edges. “Scenic Edges shall be provided to preserve the rural character and preserve and enhance scenic viewsheds, such as, scenic vistas, the St. Johns River, natural areas and agricultural areas within the Sector. The primary purpose of scenic edges is to screen development and designed in a way that creates a natural edge between development and the roadway through the use of a variety of native canopy trees, understory trees, bushes, shrubs and ground cover. Scenic edges are also an integral part of the development edges and recreational trail system that provide trails, sidewalks, and cart paths” (St Johns County 2000).
Figure 6: St Johns County Greenways, Blueways and Trails Plan
Transportation and Land Use, Objective B.1.6

Policy B.1.6.8, “The County shall require tree plantings, where practical, for both new and existing roads to provide screening, beauty, runoff, and reduction in summer heat. Existing trees, defined as Protected by the Land Development Code, shall be protected during road construction, improvement, and maintenance, as required by the Land Development Code” (St Johns County 2000).

Policy B.1.6.9, “The County shall support the aesthetic enhancement and environmental protection of existing and new roads by encouraging the use of native vegetation and maintaining natural ground cover, canopy and understory where new roads are constructed” (St Johns County 2000).

Policy B.1.6.10, “The County shall require that infrastructure improvements, construction and work within the right-of-way of designated scenic roads and highways shall be designed to protect the scenic character of the road” (St Johns County 2000).

Scenic Highway Designations, Objective E.2.4

“St. Johns County shall continue to support local, state and federal Scenic Highway designations which promote community pride, provide a positive community self image, provide a pleasant driving experience, preserves and protects unique scenic, historical, archaeological, cultural, recreational, aesthetic and environmentally significant resources” (St Johns County 2000).

Policy E.2.4.1, “The William Bartram Scenic Highway corridor shall be protected through the adoption of new Land Development Regulations (LDRs) and the implementation of development controls as established in Policy A.1.3.8 of the Future Land Use Element” (St Johns County 2000).

Policy E.2.4.2, “The Florida Legislature (Chapter 80-427, House Bill 987) and the St. Johns County Board of County Commissioners (Resolution 97-200) recognizes William Bartram Trail as a Scenic Highway whose historic heritage needs to be preserved and protected. Upon designation of the William Bartram Scenic Highway, as a FDOT Scenic Highway with an approved Corridor Management Plan, the County shall amend its comprehensive Plan and Land Development Regulations (LDRs) to incorporate the guidelines established in the Corridor Management Plan” (St Johns County 2000).

4.2.1.2. William Bartram Scenic & Historic Highway Corridor Management Plan

The William Bartram Scenic & Historic Highway Corridor Management Plan (CMP) and Florida Scenic Highway Designation Application were completed in
2005 (*Figure 7*). The plan reviews the history, establishes the vision and outlines the management techniques of the SR 13 corridor from Julington Creek to the intersection with SR 16 (Cornwell 2005). The plan mentions several transportation plans and studies that were on-going at the time of the CMP development, including the St Johns River Crossing PD&E study. According to the CMP, “The studies concluded that an intrusion of a new bridge into Fruit Cove or Switzerland would definitely change the physical character of the scenic highway.” The CMP also highlights the scenic resources found along the roadway, “paralleling the course of the historic St. Johns River, selected in a nationwide competition as an American Heritage River.” “The Scenic highway provides the traveler special vistas of the river, creeks, floodplains, swamp areas, wetlands, and high bluffs while following the winding course of the river. Centennial live oaks, bald cypress, and other native trees, as well as wild flowers and wildlife can be observed along the corridor”.

4.2.1.3. **William Bartram Scenic & Historic Highway Master Plan**

This plan was under development at the time of this report. This plan will be more specific that the Corridor Management Plan and will include specific improvements (such as wildflower planting), including improvements in the vicinity of the proposed SR 13 crossings.
Figure 7: William Bartram Scenic and Historic Highway Intrinsic Resources Map
4.2.2. Clay County

4.2.2.1. Branan Field Corridor Master Development Plan

The Branan Field Corridor Master Development Plan (Genesis Group, 1998) focuses on long-range planning related to transportation, land use and economic development issues (Figure 8). Although no specific directives related to visual quality or scenic resources are presented in the plan, public workshop participants did mention “quiet, country living, environmentally sensitive development and maintenance of rural lifestyle.” An intrinsic visual quality, though not specifically mentioned in these phrases, is associated with their connotation.

4.2.2.2. Lake Asbury Master Development Plan:

The Lake Asbury Master Development Plan (Prosser Hallock, 2001) considered land use, urban form, economic development, transportation, community facilities and natural resources in development of the long term community vision for the Lake Asbury area. Several sections of the plan mention visual resources (Figure 9):

- Community Vision item number 4: “New roadway corridors shall bypass existing developed areas, preserving the rural views along those major roads.”
- Lake Asbury Principle No. 3: Safeguard environmentally sensitive lands from development’s impacts.
- Lake Asbury Principle No. 4.: Utilize design to reduce automobile dependency and traffic congestion throughout the area.
  - Guideline 4.g: “Streets shall be designed and located in such a manner as to maintain and preserve natural topography, cover, significant landmarks, and trees; to minimize cut and fill; and to preserve and enhance views and vistas on or off the subject parcel.”
- Community comments:
  - “Trees, land, fresh air, rural atmosphere, ….small town community attitude….”
  - “…Country setting; Location and pristine beauty, lakes, remote; Aesthetically beautiful, great scenic area, quiet country living, …”
  - “Relative quietness and serenity and beauty of the area…”
Figure 8: Branan Field Corridor Master Development Plan
4.3. Existing Conditions

The viewpoints shown in Figure 10 and detailed in Table 1 were chosen to reflect both sensitive and representative areas that will be repeated throughout the various proposed alternatives. By gauging the visual impact to these areas, the different options can be evaluated based on the occurrence of these viewpoint types existing along each particular alternative.
1. Middleburg Area – Connection with SR 21 (Blanding)/Branan Field-Chaffee Road

- Baxley Hideaway is a relatively new neighborhood of moderately priced homes. The interchange with SR 21 for all of the alternatives will be just beyond the houses in the background.

- Existing visual quality for this area is rated as moderately low as this suburban neighborhood does not relate well to the surrounding landscape and lacks an overall sense of vividness and unity.
2. Pier Station/Fairgrounds Area – Intersection with SR 16

- SR 16 is a rural two-lane, east-west roadway in Clay County. All of the southern crossing alternatives (Pink 1 & 2, Orange 1 & 2, Green 1 & 2 and Brown 1 & 2) would cross this road between the Pier Station neighborhood to the west and the Clay County Fairgrounds to the east.

- Existing visual quality for this section of SR 16 is rated as moderately high because this tree-lined rural road relates well to the existing topography and is free from clutter and encroachments which enable users to experience a “scenic drive” ambiance.

3. Proposed River Crossing at Popo Point

- The northern river crossing alternatives (Purple and Black) propose to cross the St Johns River at a point north of Green Cove Springs in Clay County to a point in St. Johns County south of Switzerland, known as Popo Point. The crossing location in Clay County is characterized as suburban residential and the crossing location in St Johns County is characterized as rural residential/ undeveloped.

- Existing visual quality for this river view is rated as high for its unspoiled panoramic views of water and wooded shoreline with very little manmade encroachments visible from this distance.

4. Bayard Conservation Area

- The Bayard Conservation Area is a Section 4(f) property situated along the St. Johns River south of the existing Shands Bridge in Clay County. The Pink 1, Orange 1, Green 1 and Brown 1 Alternatives would impact this property in their approach to the new bridge crossing the river. The alternatives propose to acquire a portion of the property along SR 16.

- Existing visual quality for this area is rated as high because of the natural ambiance of the preserve setting and few manmade encroachments.
5. St. Johns River at The Existing Shands Bridge

- All of the southern crossing alternatives (Pink 1 & 2, Orange 1 & 2, Green 1 & 2 and Brown 1 & 2) would cross with a new bridge at this location.
- Existing visual quality for this river and bridge view is rated as moderately high for its panoramic water and wooded shoreline views. Although there is a significant manmade element that dominates the horizon, the span and repetitive columns help to unify the overall view.

6. Intersection With SR 13 Near The Existing Shands Bridge, South of Orangedale

- All of the southern crossing alternatives (Pink 1 & 2, Orange 1 & 2, Green 1 & 2 and Brown 1 & 2) propose to cross SR 13 at this intersection.
- Existing visual quality for this section of SR 13 is rated as moderately low because of the dominance of paving, visually random arrangement of signage and utilities and overall lack of a harmonious visual pattern.

7. Intersection with SR 13 near Popo Point River Crossing, South of Switzerland

- All of the northern crossing alternatives (Purple and Black) would be aligned to cross SR 13 in this vicinity.
- Existing visual quality for this section of SR 13 is rated as moderately high because this tree-lined rural road relates well to the existing topography and is relatively free from clutter and encroachments which enable users to experience a “scenic drive” ambiance.
8. Northern View of St Johns River From Existing Shands Bridge

- All of the southern crossing alternatives (Pink 1 & 2, Orange 1 & 2, Green 1 & 2 and Brown 1 & 2) propose to cross the river at this same location.

- Existing visual quality for this panoramic river view is rated as high for its unspoiled views of water and wooded shoreline with very little manmade encroachments visible from this distance.

9. Southern View of St Johns River From Existing Shands Bridge Location

- All of the southern crossing alternatives (Pink 1 & 2, Orange 1 & 2, Green 1 & 2 and Brown 1 & 2) propose to cross the river at this same location.

- Existing visual quality for this panoramic river view is rated as high for its unspoiled views of water and wooded shoreline with very little manmade encroachments visible from this distance.

4.4. Affected Viewers & Sensitivity

1. Middleburg Area – Connection with SR 21 (Blanding)/Branan Field-Chaffee

Residents in the neighborhoods adjacent to the interchange will have varying degrees of view to the new roadway. Residents directly adjacent to the proposed right-of-way and those with views down streets terminating at or near the new roadway will have the highest exposure. Motorists on existing SR 21 will have unobstructed views of the new roadway traveling from either direction.
Residents in this area will likely have high sensitivity to the visual changes associated with the new roadway because they currently enjoy a vegetative buffer around their neighborhood where the new roadway is proposed.

2. Pier Station/Fairgrounds Area – Intersection with SR 16
Motorists will have unobstructed views of the new roadway traveling in either direction. They will likely have a moderately high sensitivity because this stretch of SR 16 currently offers a very rural, scenic drive.

3. Proposed River Crossing at Popo Point
Residents with river frontage will have varying degrees of view and exposure depending on home orientation and nature and duration of outdoor activities. Boaters and fisherman will have varying degrees of view and exposure depending on direction of travel and nature and duration of outdoor activity. Shands Bridge motorists will have views looking north to the new bridge. Motorists using the new bridge will have a high degree of exposure to new panoramic river views.

Residents will likely have high sensitivity to the visual changes associated with the new roadway and bridge. Boaters and fisherman will have a varying degree of sensitivity depending on the orientation, but sensitivity will likely be high overall. Shands Bridge motorists will likely have a moderate degree of sensitivity because the new bridge will be several miles to the north and may not be completely visible depending on the weather. Motorists using the new bridge will likely have a moderate to high degree of sensitivity to the adjacent river and shoreline views.

4. Bayard Conservation Area

*Pink 1, Brown 1, Green 1, Orange 1:*

Trail users will have views of the new roadway upon entry into the conservation area and along limited areas of the trail adjacent or perpendicular to the new roadway. Motorists will have increased views into the conservation area because the new road will be elevated in this area.

Trail users are likely to have high sensitivity to visual change in this area as they are expecting a nature-based experience in the conservation area. Motorists are likely to have moderate sensitivity as there is an existing road there now.

*Pink 2, Brown 2, Green 2, Orange 2:*

The proposed alternatives will be located north of the existing SR 16 with adequate vegetative buffer to visually screen the new roadway from this viewpoint. Minimal improvements to SR 16 at this viewpoint will not be noticeable. There will be no change in view for motorists or trail users.
5. St. Johns River at Existing Shands Bridge
Residents with river frontage will have varying degrees of view and exposure depending on home orientation and nature and duration of outdoor activities. Boaters and fisherman will have varying degrees of view and exposure depending on direction of travel and nature and duration of outdoor activity.

Residents will likely have high sensitivity to the visual changes associated with the new roadway and bridge. Boaters and fisherman will have a varying degree of sensitivity depending on the orientation, but sensitivity will likely be high overall.

6. Intersection with SR 13 near Existing Shands Bridge, South of Orangedale
Residents in the neighborhoods adjacent to the right-of-way will have varying degrees of view to the new roadway and overpass. Residents directly adjacent to the proposed right-of-way and those with views down streets terminating at or near the new roadway will have the highest exposure. Motorists will have unobstructed views of the new roadway traveling in either direction.

The adjacent residents are likely to have a high level of sensitivity to visual changes to SR 13 in this area. Motorists will likely have a moderate to low level of sensitivity to changes as this is an existing highway intersection with moderately low visual quality.

7. Intersection with SR 13 near Popo Point River Crossing, South of Switzerland
Residents north of the overpass will have very limited views to the new roadway and overpass because existing trees screen the view. Motorists will have unobstructed views of the new roadway for varying distances traveling in either direction.

The surrounding residents are likely to have a high level of sensitivity to visual changes to SR 13 in this area. Motorists will likely have a high level of sensitivity to visual changes here because of the moderately high visual quality of the scenic highway in this area.

8. Northern View of St Johns River From Existing Shands Bridge
Motorists using the existing Shands Bridge currently enjoy panoramic views of the St Johns River and shoreline. The motorists will likely have a moderately high level of sensitivity to visual change because they expect to see these views when traveling on this bridge.

9. Southern View of St Johns River From Existing Shands Bridge Location
Motorists using the existing Shands Bridge currently enjoy panoramic views of the St Johns River and shoreline. The motorists will likely have a moderately high level of sensitivity to visual change because they expect to see these views when traveling on this bridge.
5. Project Effects

5.1. Simulation Viewpoint Selection

As mentioned in Section 4.3, the simulation viewpoints were chosen to reflect both sensitive and representative areas that will be repeated throughout the various alternatives. By gauging the visual impact to these areas, the different options can be evaluated based on the occurrence of these viewpoint types existing along each particular alternative. The Visual Quality Difference as calculated in the Visual Effects Matrix (Table 1) is shown in the corner of each simulation viewpoint. The simulation viewpoints are intended to illustrate general visual change from the existing conditions and are not based on any detailed engineering or design.

5.2. Visual Impacts of Alternatives

5.2.1. Simulation Viewpoints – Visual Resource Change and Predicted Viewer Response

1. Middleburg Area – Connection with SR 21 (Blanding)/Branan Field-Chaffee Road

- The addition of a highway and interchange ramp directly behind this neighborhood impacts several of the residents, particularly those adjacent to the new right-of-way and those with views to the new roadway (as seen in this photo). Trees would be removed and the interchange ramps would be required to be elevated for the overpass at SR 21.

- Visual quality for this viewpoint decreased from moderately low to low because of the further encroachment and further breakdown of visual unity. Residents are likely to perceive this roadway as an intrusion into their neighborhood because of its high visibility.
2. Pier Station/Fairgrounds Area – Intersection with SR 16

- The addition of an interchange would impact the driving experience by replacing the roadside tree canopy with a bridge structure and visually bisecting the vista down this rural stretch of highway.

- Visual quality for this viewpoint decreased from moderately high to moderately low because of the increased encroachment and disjoining effect it has on the existing view.

- Motorists are likely to have a moderately adverse reaction to this visually dividing element on the existing view.

3. Proposed River Crossing at Popo Point

- The introduction of a bridge to this portion of the St Johns River would have a large effect on the residents along the river with direct views of the new structure. Boaters and fisherman would also be affected to varying degrees depending on direction of travel and the nature of their activity. Motorists on the Shands Bridge would have views of the new bridge looking north.

- Visual quality for this viewpoint decreased from high to average because of the intrusion of a large structure spanning the river at this point. Residents would likely have an adverse reaction to this structure as it would replace water and shoreline as the dominant visual element as they view the river. Boaters and fisherman would likely have a moderately adverse reaction to the bridge because they would likely be moving through the area and would not have a fixed viewpoint. Motorists from the Shands Bridge would likely have minimally adverse reactions because they would view the structure from several miles south and it would appear as a distant span on the horizon. Motorists using the new bridge would likely have a positive reaction to the new panoramic views, particularly at the top of the span.
4. Bayard Conservation Area

**Pink 1, Brown 1, Green 1, Orange 1:**

- The introduction of a bridge adjacent to this conservation area would impact trail users because of the visual introduction of a large manmade structure into a conservation area. Tree removal would be necessary to construct the roadway as proposed. The loss of trees would impact the experience of the trail users.

- Visual quality for this viewpoint decreased from high to moderately low because of the visual encroachment and resulting breakdown of visual unity. Trail users would likely perceive the bridge as a visual intrusion into this natural conservation area. Although the structure would only be visible for a short time as one moved down the trail, users expect a nature-based experience within a conservation area. Motorists would likely benefit from the elevated roadway as they would enjoy better views into the conservation area.

**Pink 2, Brown 2, Green 2, Orange 2:**

- The proposed alternatives will be located north of the existing SR 16 with adequate vegetative buffer to visually screen the new roadway from this viewpoint. Minimal improvements to SR 16 at this viewpoint will not be noticeable. There will be no change in view for motorists or trail users.

- Visual quality for this viewpoint remains high.
5. St. Johns River at Existing Shands Bridge

- The replacement Shands Bridge will be approximately 20 feet higher than the current span and column spacing will likely be further apart.
- Although the higher span will result in a larger visual impact, there would be fewer columns to obstruct views under the bridge. Considering the above, visual quality did not change for this viewpoint because net view changes very little. The higher span is offset by greater column spacing. Consequently, residential, boater and fisherman response is likely to be minimal.

6. Intersection with SR 13 near Existing Shands Bridge, South of Orangedale

- As this intersection would be transformed into an overpass, the character of the roadway changed significantly. The elevated roadway to the left (toward the river) would be needed because access roads would travel under it. A large stand of trees would be removed for the construction of the elevated roadway left of the overpass.
- Visual quality for this viewpoint decreased from moderately low to low because of the vertical scale of the raised roadway and removal of a large quantity of trees. Interestingly, the continuity of the raised roadway in the background helps to unify the overall view. Residents would likely have moderately adverse reaction to this overpass, particularly the vertical scale of this roadway as compared to the existing intersection. Residents directly adjacent to the right-of-way would likely have adverse reaction to the roadway and overpass.
- Commuters using SR 13 may have moderate to low response to the new overpass, while visitors traveling the scenic highway route would likely have an adverse reaction to the roadway and overpass as they are expecting a scenic drive.
7. Intersection with SR 13 near Popo Point River Crossing, South of Switzerland

- The addition of an overpass in this section of SR 13 impacts the driving experience by replacing the roadside tree canopy and vista with a bridge structure. This has a visually dividing effect on this stretch of SR 13.
- Visual quality for this viewpoint decreased from moderately high to moderately low because of the increased encroachment and disjoining effect it has on the existing view and on the overall scenic drive experience in this area. There is currently a buffer of trees between residents and the proposed overpass, so residents may only have indirect views from the roadway. However, given the existing scenic character of the roadway, residents would likely have an adverse reaction to this overpass. Commuters using SR 13 may have moderate to low response to the new overpass, while visitors traveling the scenic highway route would likely have an adverse reaction to the roadway and overpass as they are expecting a scenic drive.

8. Northern View of St Johns River From New Bridge

- The view from the new bridge would be from a higher vantage point at the top of the span, offering motorists a better view of the surrounding landscape. However the shared-use path runs along the north side of the bridge; this path has a fence enclosure which will obscure motorist’s views to the north. The rapidly passing fence would likely blur to a light shading of the river view beyond.
- Visual quality for this viewpoint decreased from high to moderately low because of the obstructed view caused by the fencing.
- Motorists would likely have a moderately high adverse reaction to this view as the river and shoreline are less visible than from the current Shands Bridge.
9. Southern View of St Johns River From New Bridge Location

- The view from the new bridge would be from a higher vantage point at the top of the span, offering motorists a better view of the surrounding landscape.
- Visual quality for this panoramic river view remains rated high for retaining its unspoiled views of water and wooded shoreline with very little manmade encroachments.

5.3. No Build Alternative

This alternative includes the routine maintenance of the existing roads and the currently programmed, committed, and funded roadway improvements within the study area. There would be no visual effects resulting from the potential alignments and crossings under this alternative.

5.4. Effects During Construction

Roadway construction projects, particularly improvements or alterations to existing roadways, are never a convenient proposition. Although the vast majority of the proposed alternatives consist of new roadway footprints, there are several crossings of existing roadways and instances where the new roadway would run parallel with existing roads. The most noticeable visual effects during construction would be:

Vegetation Removal: The removal of vegetation, particularly trees, is a very noticeable visual change. This visual change is especially noticeable around already developed areas such as neighborhoods, public spaces such as parks and schools and existing roadway crossings. As discussed in Section 5.2, in many cases vegetation removal contributes significantly to the visual change associated with the construction and can greatly influence viewer response. Major roadway projects often require the removal of vegetation both within and outside of the right-of-way. Vegetation within the right-of-way may or may not be replaced or allowed to regenerate, depending on the compatibility with the proposed improvements. Similarly, vegetation removed outside of the right-of-way for roadway construction may be replaced or allowed to naturally regenerate depending on the location, purpose and condition of the pre-existing vegetation.
**Erosion Control:** Installation of silt fences, temporary sediment basins and other erosion control devices and equipment are visible for virtually the entire construction process. Although the devices and equipment are often unsightly, they are temporary and will no longer be visible once construction is complete.

**Demolition of Old Roadways and Bridges:** Construction of this project would require several interchanges, overpasses and bridges that would connect this project to existing roadways. Connection of the project to existing roadways almost always requires the reconfiguration of the roadway that the new road would connect to or cross. The reconfiguration and removal of existing roads and bridges requires demolition of paving and structural components.

These demolition operations would create both temporary and permanent visual change to the affected areas. Equipment, dust, debris and demolished material staging areas would likely be visible from adjacent properties and the roadway. The demolition of the Shands Bridge would likely take several months because of the care needed to protect water resources and new bridge components from demolition operations and debris.

**Maintenance of Traffic:** An important part of any roadway project is to minimize disruption of traffic flow through the project area. Temporary traffic routing is changed as needed throughout the project, often several times for larger projects. Changes in pavement type, temporary barriers, directional signage and other traffic control devices are viewed by motorists as they proceed through the work site. Sometimes traffic is detoured around the project area completely. Although several of these elements are unsightly, they are temporary and will no longer be visible once construction is complete.

**Construction Equipment and Staging/Stockpiling areas:** One of the most noticeable visual changes associated with construction is the presence of construction equipment and vehicles. Large equipment, such as cranes, is particularly noticeable. Stockpiling and materials staging can also have a large visual impact on adjacent properties and passing motorists. The location and extent of equipment and staging areas would vary greatly throughout the construction operations and as construction is completed these potentially large visual impacts will diminish.

**Construction of new roadways and bridges:** The sight of partially completed paving and bridge work could be in view for several months. Items such as scaffolding, exposed rebar and form-work would be likely to elicit a negative reaction from the viewer. Earthwork associated with the construction can also have a large visual effect for viewers. The presence of large earth moving equipment, erosion control measures and the appearance of bare-earth could be viewed as an eyesore by many viewers. The incomplete appearance of these views is temporary and will diminish as construction progresses.
5.5. Indirect Effects

**Real Estate:** Real estate can be affected by perceived or real concerns over visual quality associated with roadway construction. These effects can be both temporary and permanent. Concerns over access and undesirable views during construction and concern over the final built roadway may cause some to perceive residential property in close proximity to the construction activity as less desirable. Interchanges seem to be a magnet for commercial enterprise, so property adjacent to the proposed interchanges would likely be seen as more valuable from a commercial standpoint because of the enhanced visibility from the roadway.

**Tourism:** SR 13 (William Bartram Scenic and Historic Highway) tourism could be affected both during and after construction. Visitor numbers may temporarily decrease because of the visual and traffic inconveniences associated with the construction activities. Visitor numbers to the scenic highway may also decrease in the area associated with the crossing after construction because of the potential impact of the bridge structures to the character of the roadway.

5.6. Effects Comparison of Alternatives

Visual quality for this project is rated higher for views of natural areas such as unobstructed river views and roadways through undeveloped and scenic areas. Accordingly, the visual quality difference post-construction is predicted to be higher for these areas. The viewer sensitivity is also high for these areas as well as for recreation and residential areas. All of the alternatives cross the river, scenic rural roadways and residential areas. The Visual Effects Matrix *(Table 1)* calculated the visual quality difference based on the photo simulations of the viewpoints. The Representative Visual Effects Comparison of Alternatives *(Table 2)* determines the additive visual impact of each alternative *(Figure 11)*, considering views of the road. Because of the length and number of alternatives studied for this project, the comparison of alternatives is based on representative numbers from the visual impact matrix. These numbers are only intended to provide a broad comparison of the alternatives and are not based on exhaustive visual analysis of each alternative.
Table 1: Visual Effects Matrix

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<thead>
<tr>
<th>Viewpoint Description</th>
<th>Observer Viewpoint</th>
<th>Existing/Proposed</th>
<th>Land Use</th>
<th>Observer Position</th>
<th>Road Distance</th>
<th>Visual Quality Matrix</th>
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<td>Unity</td>
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<tr>
<td>Neighborhood @ Blowing/Branneen Field-Chafee Road Connection</td>
<td>E</td>
<td>SUB</td>
<td>S</td>
<td>F</td>
<td>2</td>
<td>Subdivision</td>
</tr>
<tr>
<td>Intersection with SR 16 in Clay County</td>
<td>E</td>
<td>TRA</td>
<td>N</td>
<td>M</td>
<td>4</td>
<td>Overpass</td>
</tr>
<tr>
<td>Proposed Northern Crossing @ Popp Point</td>
<td>E</td>
<td>REC</td>
<td>F</td>
<td>6</td>
<td>Scenic Wooded Trail</td>
<td>5</td>
</tr>
<tr>
<td>Bayard Conservation Area</td>
<td>E</td>
<td>TRA</td>
<td>N</td>
<td>6</td>
<td>Existing Bridge</td>
<td>6</td>
</tr>
<tr>
<td>Proposed Southern Crossing @ Existing Shands Bridge Location</td>
<td>E</td>
<td>TRA</td>
<td>N</td>
<td>6</td>
<td>Existing Bridge</td>
<td>6</td>
</tr>
<tr>
<td>Intersection with SR 13 @ Existing Shands Bridge Crossing</td>
<td>E</td>
<td>TRA</td>
<td>N</td>
<td>6</td>
<td>Suburban Intersection</td>
<td>3</td>
</tr>
<tr>
<td>Intersection with SR 13 @ Proposed (Northern Popp Point Crossing)</td>
<td>E</td>
<td>TRA</td>
<td>N</td>
<td>6</td>
<td>Overpass</td>
<td>3</td>
</tr>
<tr>
<td>From existing Shands Bridge crossing location, looking north</td>
<td>E</td>
<td>SUB</td>
<td>S</td>
<td>6</td>
<td>Panoramic River View</td>
<td>6</td>
</tr>
<tr>
<td>From existing Shands Bridge crossing location, looking south</td>
<td>E</td>
<td>SUB</td>
<td>S</td>
<td>6</td>
<td>Panoramic River View</td>
<td>6</td>
</tr>
</tbody>
</table>

Legend:
- **Urb** = Urban
- **SUB** = Suburban
- **IND** = Industrial
- **CO** = Commercial
- **IND = Institutional
- **REC = Recreational
- **TRA = Transportation

Adapted from FHWA Visual Quality Evaluation (FHWA 1989)
### Table 2: Representative Visual Effects Comparison of Alternatives Table

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Residential Neighborhoods</th>
<th>Major Road Crossing</th>
<th>River Crossing</th>
<th>Parks/Conservation Areas</th>
<th>S.R. 13 Crossing</th>
<th>Additive Visual Impact</th>
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</thead>
<tbody>
<tr>
<td>Pink 2</td>
<td>10 x -1.3=-13</td>
<td>9 x -2=-18</td>
<td>South = 0</td>
<td>0</td>
<td>South = -1.3</td>
<td>-32.3</td>
</tr>
<tr>
<td>Green 2</td>
<td>11 x -1.3=-14.3</td>
<td>9 x -2=-18</td>
<td>South = 0</td>
<td>0</td>
<td>South = -1.3</td>
<td>-33.6</td>
</tr>
<tr>
<td>Purple</td>
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<td>11 x -2=-22</td>
<td>North = -2</td>
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<td>-33.8</td>
</tr>
<tr>
<td>Pink 1</td>
<td>10 x -1.3=-13</td>
<td>9 x -2=-18</td>
<td>South = 0</td>
<td>1 @ -2.7</td>
<td>South = -1.3</td>
<td>-35.0</td>
</tr>
<tr>
<td>Green 1</td>
<td>11 x -1.3=-14.3</td>
<td>9 x -2=-18</td>
<td>South = 0</td>
<td>1 @ -2.7</td>
<td>South = -1.3</td>
<td>-36.3</td>
</tr>
<tr>
<td>Black</td>
<td>7 x -1.3=-9.1</td>
<td>12 x -2=-24</td>
<td>North = -2</td>
<td>0</td>
<td>North = -2</td>
<td>-37.1</td>
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<tr>
<td>Brown 2</td>
<td>10 x -1.3=-13</td>
<td>12 x -2=-24</td>
<td>South = 0</td>
<td>0</td>
<td>South = -1.3</td>
<td>-38.3</td>
</tr>
<tr>
<td>Orange 2</td>
<td>11 x -1.3=-14.3</td>
<td>12 x -2=-24</td>
<td>South = 0</td>
<td>0</td>
<td>South = -1.3</td>
<td>-39.6</td>
</tr>
<tr>
<td>Brown 1</td>
<td>10 x -1.3=-13</td>
<td>12 x -2=-24</td>
<td>South = 0</td>
<td>1 @ -2.7</td>
<td>South = -1.3</td>
<td>-41.0</td>
</tr>
<tr>
<td>Orange 1</td>
<td>11 x -1.3=-14.3</td>
<td>12 x -2=-24</td>
<td>South = 0</td>
<td>1 @ -2.7</td>
<td>South = -1.3</td>
<td>-42.3</td>
</tr>
</tbody>
</table>

A pre-project grouping (constructed project may split) of 5 or more homes (not vacant land zoned residential) adjacent to or having direct views of the completed project. Rating of -1.3 from Viewpoint 1 used for representative impact.

Major roadways including arterials and major collectors. Minor collectors, local roads, neighborhood streets, and the SR 13 crossing are not included. Rating of -2 used for representative impact.

Viewpoint 3 visual impact of -2 used for the northern crossing and viewpoint 5 visual impact of 0 used for representative impacts.

Viewpoint 4 visual impact of -2.7 used for representative impacts.

Viewpoint 7 visual impact of -2 for northern crossing and viewpoint 6 visual impact of -1.3 for southern crossing used for representative impacts.

The additive visual impact was calculated by adding the total number of occurrences under each category to get the final number. The lower the number, the greater the additive visual impact. Because of the length and number of alternatives studied for this project, the comparison of alternatives is based on representative numbers from the visual impact matrix. These numbers are only intended to provide a broad comparison of the alternatives and are not based on the detailed analysis of each individual alternative. Assumptions and criteria are described further under each category.
6. Measures to Avoid or Minimize Project Effects

6.1. Design Measures

As discussed in Section 5, there would be visual impacts associated with any of the proposed alternatives. There are several opportunities to incorporate elements into the design that could help to offset adverse effects.

General Design Measures:

- Selective Clearing – Clearing only the vegetation required to construct the project, particularly trees. This cannot be determined until detailed design plans are completed.

- Landscaping – Incorporation of trees and groundcover to add visual interest to the roadway, compliment existing roadside vegetation or screen undesirable elements. Landscaping is particularly effective around already developed areas and at crossings and interchanges.
Engineering or Architectural Features – The use of architectural features on bridges can dramatically change the character of the structure. Design elements such as arches, decorative columns and creative use of color and materials can turn a utilitarian structure into an amenity.

Signage – Decorative or informative signage can give the project a sense of place and heighten the awareness of adjacent community resources.

Lighting - Decorative lighting can enhance the character of the roadway. Lighting can also be used to accent certain architectural and landscape features at night.

Screening – Screening can be achieved with landscape materials or by using permanent construction materials such as metal and concrete walls. Walls are often used to screen sound from homes and businesses, but can also serve the purpose of a visual barrier. Design elements can be incorporated into screening walls to add visual interest and give the structure a sense of place. Landscaping can also be used to enhance permanent screen walls.

Figure 12: Representative Mitigation Measures

- Photo enhancement of a proposed Intersection

- Example design measures used to mitigate the visual effects of the overpass: water feature, landscaping and architectural features. The landscaping, arched span and gateway signage help to transform the overpass into a gateway.
6.2. Avoidance Measures During Construction
As mentioned in Section 5, roadway construction activities cause several visual disturbances to motorists and adjacent properties. Steps can be taken to lessen the impacts of these disturbances. For instance, location of equipment and material staging areas can be located out of sight from the roadway or screened from view. A clean and orderly work site can give the appearance of order to an otherwise visually chaotic atmosphere. Dust control will enhance visually clarity and further contribute to an orderly appearance of the construction activities.

6.3. Avoidance Measures During Operation
As with all FDOT roadways, a maintenance program would be followed for the new roadway. Depending on the level of improvements, the program may include: mowing, landscape maintenance, litter control, sweeping, ditch maintenance, graffiti control, as-needed and scheduled repairs and maintenance activities to the roadway, structures and appurtenances.

6.4. List of Measures to Consider
- Selective Clearing (To extent feasible considering construction footprint and sight line considerations)
- Landscaping – Roadside and interchange landscaping is intended to beautify and enhance the surrounding natural environment, screen undesirable views and buffer noise. Landscaping can reinforce the identity of the highway and enhance landmarks and natural features along the highway (FDOT 1995).
- Architectural Features, Upgrades to Bridge and Overpasses
- Accent Lighting for bridges and select landscape trees
- Signage on Bridges over SR 13, Bayard Trail
- Reserved Area for Corridor Signage/Kiosk on SR 13
- Attractive Traffic Calming Measures Along SR 13 at Crossing Location

7. Unavoidable Adverse Impacts
Under any of the Build Alternatives there would be unavoidable adverse impacts. Adverse visual impacts will affect the adjacent residents and roadway users for the duration of the construction. The intrusion of a bridge, roadway and associated interchanges and overpasses in several communities will be perceived as a negative visual impact to most of the adjacent residents and roadway users alike.

The goal of the above mentioned mitigation strategy is to lessen the adverse impacts and visually enhance the roadway as much as possible for motorists and adjacent communities.
8. References


St Johns County. 2000. *St. Johns County, Florida 2015 EAR Based Comprehensive Plan Amendment.* http://www.co.st-