



S.R. 40 BLACK BEAR TRAIL CORRIDOR PLANNING STUDY REPORT



FPID # 436360-1
April 2019

Florida Department of Transportation
District Five
719 South Woodland Boulevard
DeLand, FL 32720-6834

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1. REPORT PURPOSE

This report documents the analysis of the proposed alternatives and planned future engineering for the State Road 40 (S.R. 40) Black Bear Trail Corridor from Levy Hammock Road to U.S. 17. These alternatives were evaluated by performing a review of existing conditions, researching technical standards, and producing an evaluation matrix. This report provides all analyses for the study area alternatives with next steps for public involvement and future reports.

2. INTRODUCTION

2.1. PROJECT DESCRIPTION

The Florida Department of Transportation (FDOT) District Five is conducting a Corridor Planning Study to assess alternative alignments for a multi-use trail along S.R. 40 from Levy Hammock Road to U.S. 17. The 27-mile study area includes Eastern Marion County, Northern Lake County, and Northwest Volusia County. The purposes of the study are to:

- Identify reasonable alternatives to carry forward a preferred trail alignment; and
- Establish a long-term plan to guide the development of the multi-use trail corridor which balances land use and transportation planning.

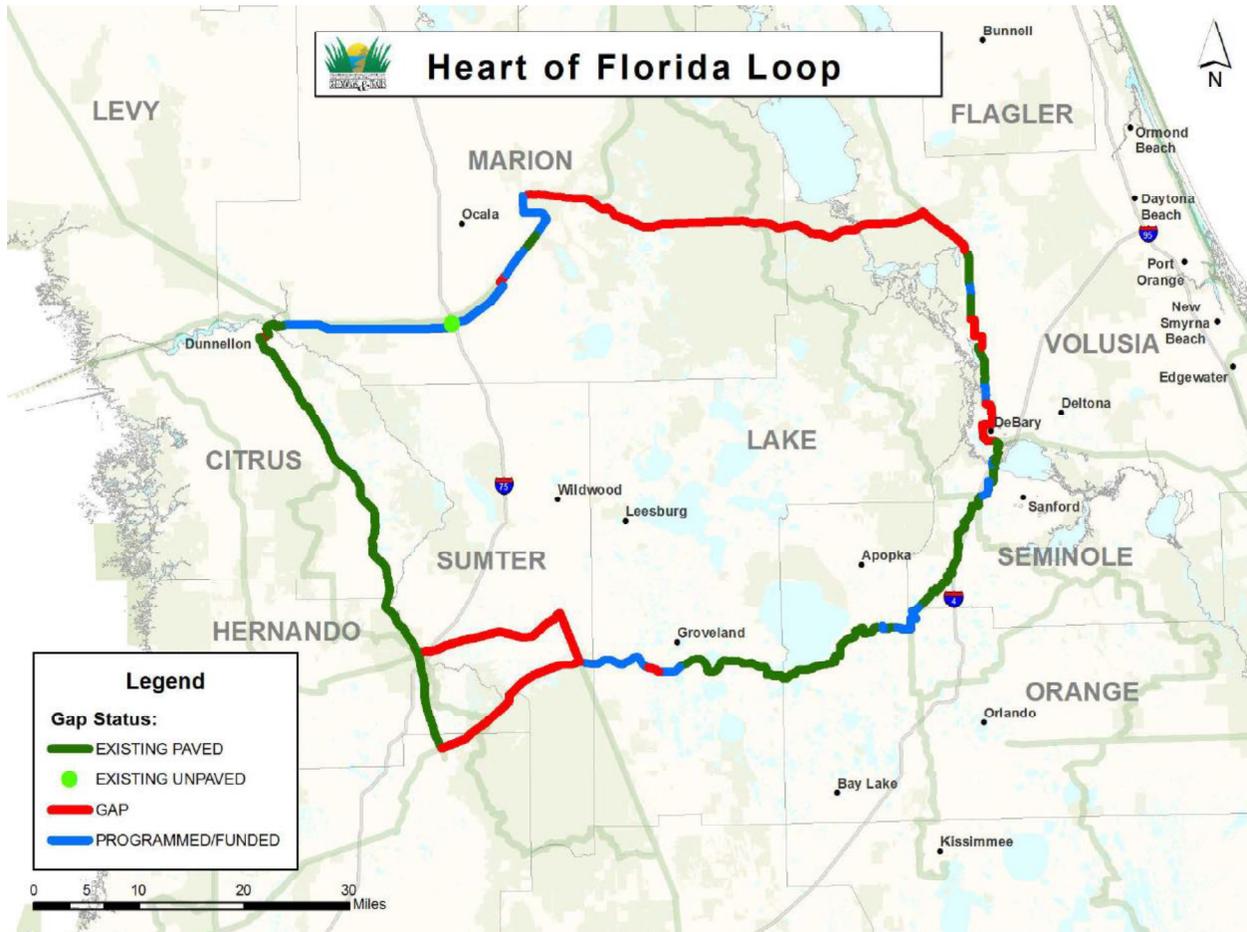
The S.R. 40 Black Bear Trail, also referred to as the Planned Black Bear Scenic Trail, is set to mostly fill the largest gap within the Heart of Florida Loop. As illustrated in Figure 1, the Heart of Florida Loop is a network of trails spanning ten Central Florida counties and encompassing 250 miles, linking existing trails. The trail would link the Ocala National Forest to the Lake George State Forest, through the local communities of Astor Park, Astor, Volusia, and Barberville, and provide connections to other trails in the area, such as the Florida National Scenic Trail. The potential trail corridor would create a new pathway for Florida residents and visitors to experience Central Florida.

2.2. STUDY AREA DESCRIPTION

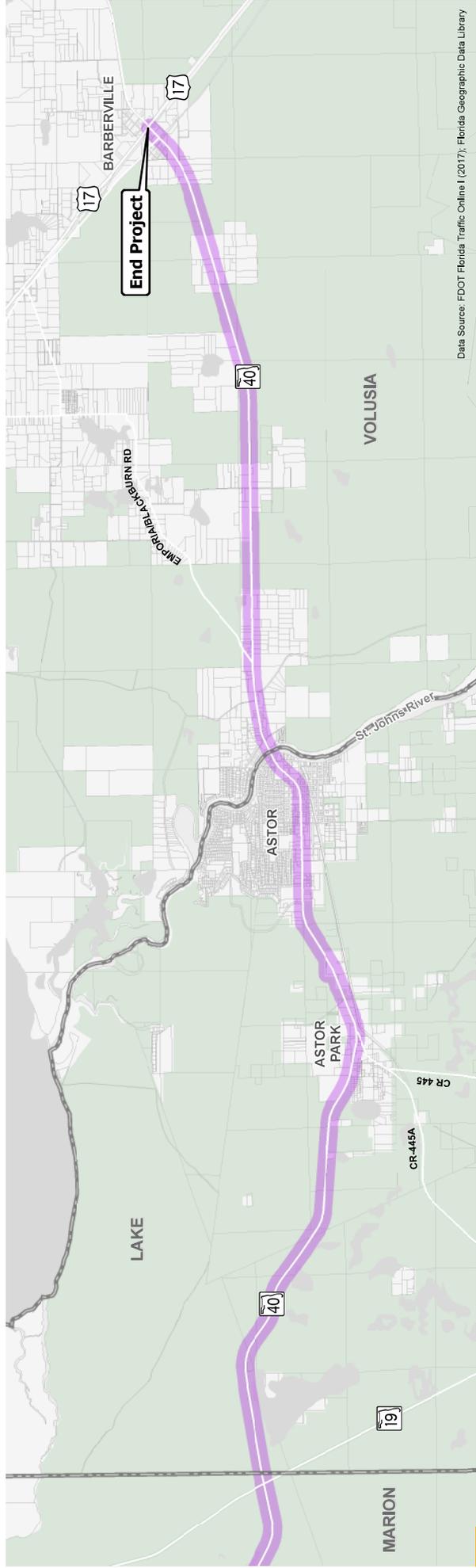
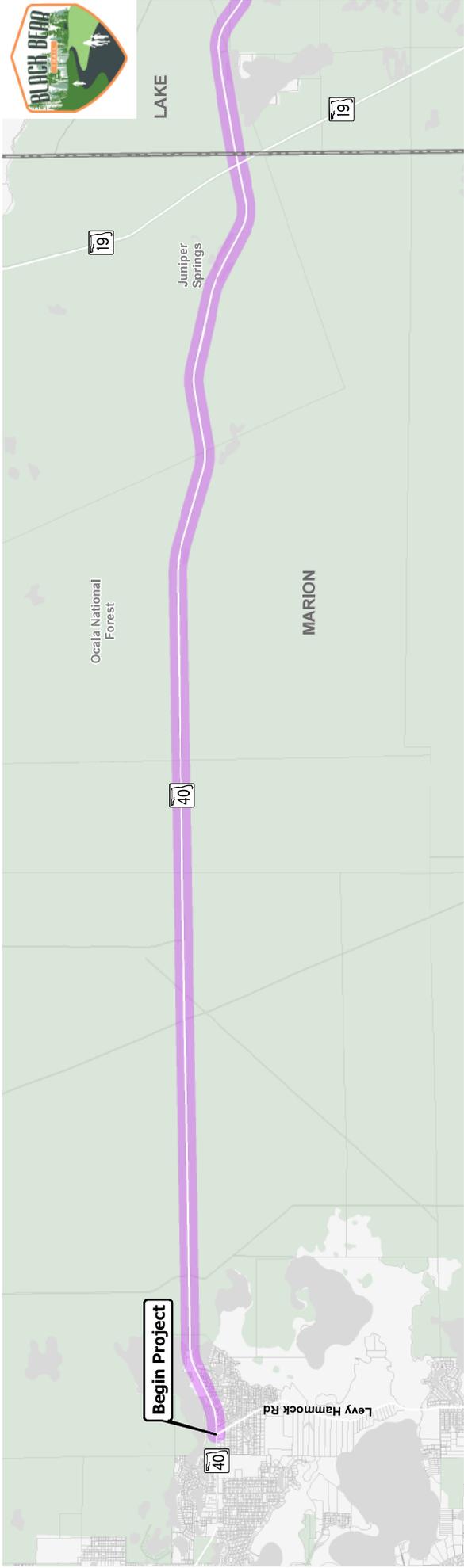
The study area is from Levy Hammock Road to U.S. 17 along S.R. 40. The trail intersects the communities of Silver Springs, Astor, Pierson, and Barberville as well as natural landmarks such as the Ocala National Forest and the St. Johns River. Figure 2 shows the project location.

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Figure 1 | Heart of Florida Loop



Source: Florida Department of Environmental Protection (FDEP) - Office of Greenways and Trails



Data Source: FDOT Florida Traffic Outline I (2017); Florida Geographic Data Library

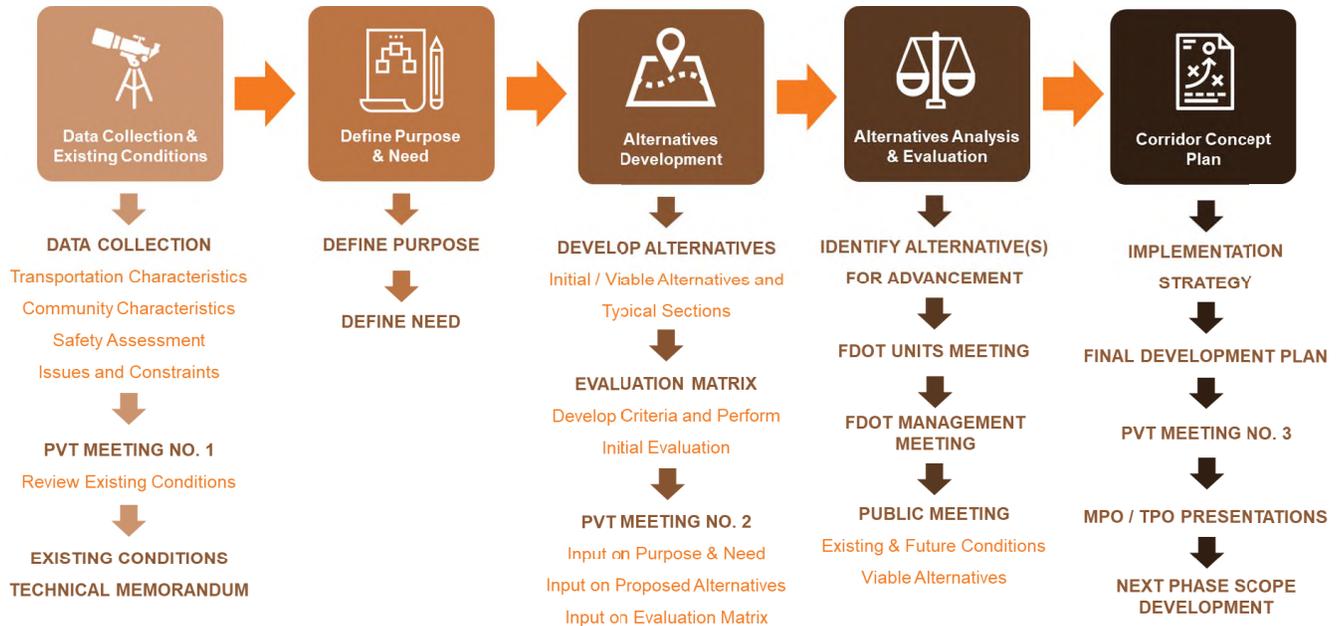
Project Location
SR 40 Black Bear Trail Corridor Planning Study
Figure 2



2.3. STUDY APPROACH

The study approach involved five steps including data collection and review of existing conditions, defining the purpose and need, development of alternatives, alternatives analysis and evaluation, and development of the corridor concept plan. Activities included in each step are shown in Figure 3. The study is currently in the corridor concept plan step which is documented in this report.

Figure 3 | Study Approach



*PVT = Project Visioning Team
 Source: HDR Inc.

3. PURPOSE AND NEED

3.1. PURPOSE

The purpose of this project is to provide a safe, comfortable, and accessible paved facility for bicyclists, pedestrians, and other non-motorized users of all ages and abilities between Levy Hammock Road and U.S. 17. The project will also connect gaps within the regional trail network.

3.2. NEED FOR IMPROVEMENT

The needs for this project stem from two primary factors, which include:

- Gaps in regional trail network; and a
- Lack of safe, comfortable, and accessible pedestrian and bicycle facilities.

Gaps in Regional Trail Network

The S.R. 40 Black Bear Trail, also referred to as the Planned Black Bear Scenic Trail, would fill the largest trail network gap in the Heart of Florida Loop. The Heart of Florida Loop is a network of trails encompassing 250 miles of paved trails in ten Central Florida counties. The S.R. 40 Black Bear Trail would also provide connections to several of the Ocala National Forest's hiking, bicycle, equestrian, and motorized use trails along with the Florida National Scenic Trail. The Florida National Scenic Trail is a 1,300 mile, non-motorized recreation trail that spans nearly the entire state of Florida.

Lack of Safe, Comfortable, and Accessible Pedestrian and Bicycle Facilities

Approximately six percent (6%) of the study area households do not own a vehicle. These households are dependent upon bicycle and pedestrian facilities to travel between destinations. There are no dedicated bicycle lanes or sidewalks along S.R. 40 within the study area. Bicyclists and pedestrians currently utilize the paved or unpaved shoulders to travel adjacent to motorized vehicles. S.R. 40 is predominantly a 55 mile per hour (mph) roadway with nine percent (9%) to sixteen percent (16%) truck traffic, and is designated as an Emerging Strategic Intermodal System (SIS) corridor. Of the bicycle and pedestrian facilities that are present on connecting roadways, there are limited Americans with Disabilities Act (ADA) compliant connections between residences, community features, and conservation areas.

4. TRAFFIC

4.1. EXISTING YEAR VOLUMES AND LEVEL OF SERVICE (LOS)

The S.R. 40 corridor is a two lane principal arterial in a rural area. The corridor is also considered by the FDOT as an Emerging SIS Corridor, which designates roadways that are of growing importance to the state economy. Part of this designation comes from the high volume of truck and commercial vehicle traffic on the corridor.

The S.R. 40 corridor traffic characteristics can be broken into various segments by county line, as shown in Figure 4. The first is in Marion County from Levy Hammock Road to S.R. 19, where Average Annual Daily Traffic (AADT) was approximately 4,900 vehicles. This means that on the average day, the road segment experiences that amount of vehicular traffic in both directions of travel combined. The second segment is in Lake County from S.R. 19 to Alco Road. The second segment has AADT counted in two locations. From S.R. 19 to County Road (C.R.) 445A, the AADT slightly decreased to approximately 4,700 vehicles in 2017. From C.R. 445A to Alco Road, the AADT experienced an increase back to 4,900 vehicles. The third segment in Volusia County from Alco Road to U.S. 17 ranges from 8,000 vehicles to 8,500 vehicles.

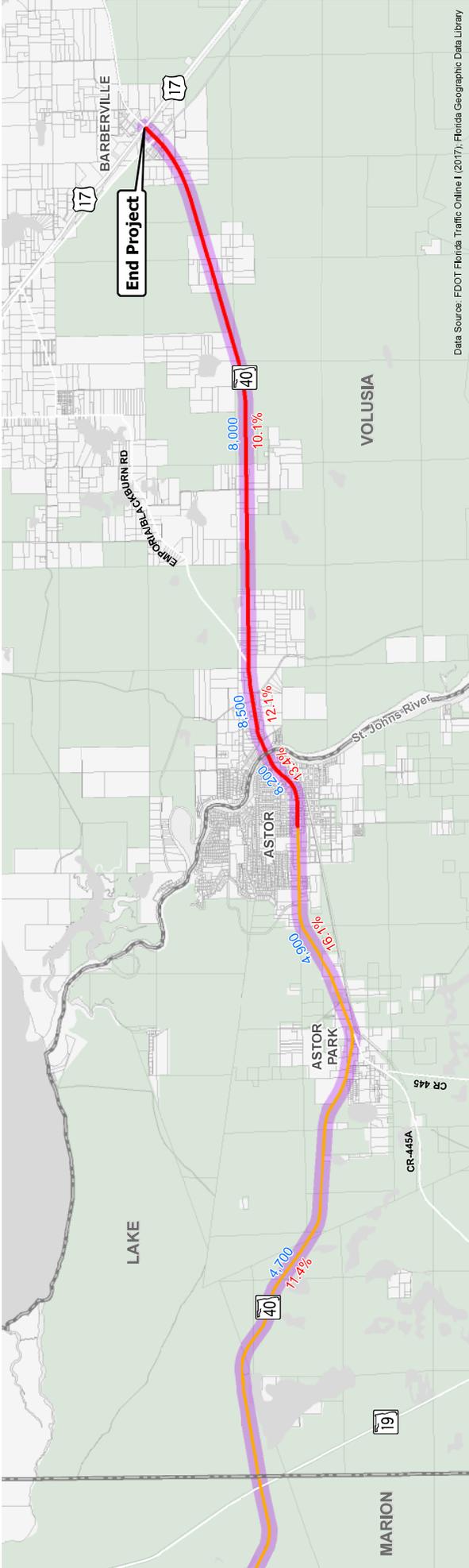
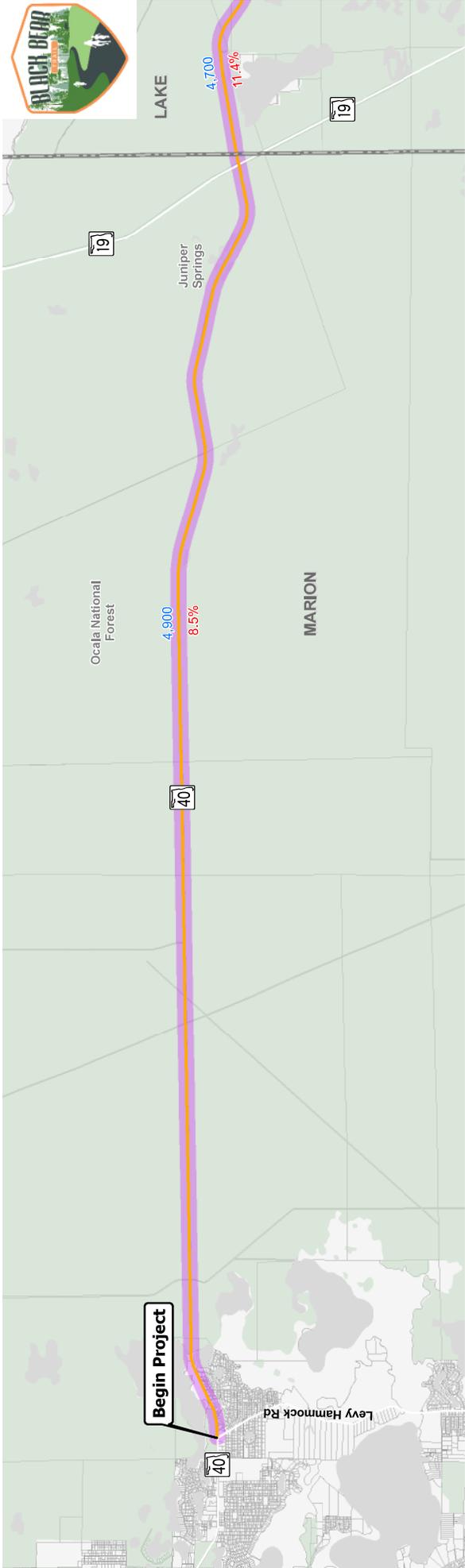
Pedestrian counts on S.R. 40 are available for the intersections with C.R. 3 and U.S. 17 (S.R. 15). The pedestrian counts at C.R. 3 are for a combined eight hours on a Tuesday in August 2013. During this data collection effort, one pedestrian was observed crossing east-west along S.R. 40 and no pedestrians were observed crossing north-south in either direction on C.R. 3. The pedestrian counts at U.S. 17 are for a combined eight hours on a Thursday in March 2016. Four pedestrians were observed crossing north-south along U.S. 17, and three pedestrians were observed crossing along S.R. 40 (east-west). No bicycle counts have been conducted along the corridor. During the field review, some cyclists were observed along S.R. 40, concentrated mostly along local streets in Astor.



Cyclist on S.R. 40



Cyclist on Local Streets in Astor



Data Source: FDOT Florida Traffic Online (2017); Florida Geographic Data Library

Project Location and Annual Average Daily Traffic (AADT) SR 40 Black Bear Trail Corridor Planning Study Figure 4

Legend

- Study Corridor(s)
- Conservation Area
- AAADT Count
- Truck Percentage

Scale

0 1 Miles



The Level of Service (LOS) measures the travel delay of vehicles and provides a “grade” based on the delay. As shown in Figure 5, an “A” grade represents free flowing traffic, while “F” is considered failing and highly congested. The LOS for S.R. 40 was obtained from the FDOT Roadway Characteristics Inventory (RCI). In 2017, the LOS was LOS B from Levy Hammock Road to S.R. 19. From S.R. 19 to U.S. 17, the roadway operates under LOS C, as illustrated in Figure 6.

Figure 5 | Level of Service Examples



A/B



C/D



E/F

Source: HDR Inc.

5. ALTERNATIVE ANALYSIS AND DEVELOPMENT

5.1. NO ACTION ALTERNATIVE

The No Action Alternative would result in no changes being made to the existing S.R. 40 study area. Under the No Action Alternative, S.R. 40 would remain as it exists today, and there would not be any bicycle nor pedestrian facilities developed. Bicyclists and pedestrians would continue to utilize the existing paved or unpaved shoulders of S.R. 40 to travel adjacent to vehicular traffic.

The primary advantage of the No Action Alternative is that there would be no environmental impacts from construction in conservation areas within the U.S. Department of Agriculture (USDA) Forest Service and Florida Forest Service lands. It does not require any capital, or expenditure of state/federal funds, and does not necessitate the acquisition of additional land or mitigation.

The disadvantages of the No Action Alternative are significant when compared to the Build Alternatives.

- Safety concerns with potential conflicts between high-speed vehicular traffic and pedestrians/cyclists traveling within close proximity.
- Lack of safe, comfortable, and accessible pedestrian and bicycle facilities within the area.
- A 27-mile gap within the regional trail network remains unresolved.

The No Action Alternative provides baseline information by which other project alternatives may be compared throughout the alternative selection process, which is further described in Section 5.5. The No Action Alternative will be carried forward throughout the project process, but could be eliminated because it does not fulfill the study's purpose and need.

5.2. TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATION (TSM&O) AND MULTI-MODAL ALTERNATIVES

Transportation Systems Management and Operations (TSM&O) alternatives are comprised of various improvement options and are usually generated to achieve the maximum use and energy efficiency of the existing facility. TSM&O alternatives include activities designed to optimize the performance and utilization of the existing infrastructure through implementation of systems, services, and projects to preserve the capacity and improve security, safety, and reliability of the roadway system.

Each of the proposed trail alternatives, as described in Section 5.5, are focused on providing safe, comfortable, and accessible bicycle and pedestrian facilities between Levy Hammock Road and U.S. 17. The proposed improvements constitute a TSM&O initiative. The proposed improvements also include multi-modal components, as each build alternative analyzes a corridor for bicyclists and pedestrians to travel between destinations within the study area and ties into existing transit routes where present.

5.3. DESIGN CRITERIA

The design of the S.R. 40 Black Bear Trail needs to follow all proper design elements for a trail with consideration given to the local area. Table 1 supplies the design guidance required for trail width, cross slope, grading, clearance, geometric restrictions, and offset from the vehicular travel way. All design standards are sourced from the 2018 FDOT Design Manual (FDM), which sets forth geometric and other design criteria, as well as procedures for FDOT projects.

Table 1 | Design Criteria

DESIGN ELEMENT	CRITERIA	SOURCE	
Widths			
<u>Two-Directional Shared Use Path</u>			
Range	10-14 ft	FDM, Section 224.4	
Standard	12 ft		
<u>Sun Trail Network Facilities</u>			
Less than 12 ft	Chief Planner's Approval Required		
<u>Sun Trail Network Facilities N/A</u>			
Limited R/W	10 ft		
Constrained Conditions	8 ft		
*Consider accommodation of emergency and maintenance vehicles/management of steep grades when selecting width of path. *FHWA's Shared Use Path Level of Service Calculator may be used as a guide in determining appropriate width.			
Cross Slopes			
Maximum Cross Slope (ADA Requirements)	2%		FDM, Section 224.5
Changing Slope Direction of Path	Use 75 ft distance to transition from -2% to 2% OR 2% to -2% *Consider potential for ponding water		
Longitudinal Grades			
Maximum Grade (ADA Requirements)	5%	FDM, Section 224.6	
Ramp	> 5%		
Max Ramp Slope	8.33% with a maximum rise of 30 inches with a level landing at least 60 inches in length		

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Table 1 | Design Criteria

DESIGN ELEMENT	CRITERIA		SOURCE
Ramp Maximum Grade	Grade (%)	Length (ft)	FDM, Table 224.6.1, *Refer to FDM 224.11 for controls on grade changes
	6	800	
	7	400	
	8	300	
	9	200	
	10	100	
	+11	50	
	1) When using a longer grade, consider adding 4 to 6 ft of additional width to path to allow a bicyclist to dismount and walk their bicycle. 2) Clear Distances and sight distances should be adjusted to accommodate longer grades.		
Horizontal Clearance			
Adjacent to both sides of path	4 ft	*including placement of signs	FDM, Section 224.7
Max Slope adjacent to both sides of path	1:6		
Graded Area Width	2 ft		
Restricted Conditions (bridge abutments, sign posts, fencing, railing)	Within 4ft of the edge of pavement; not less than 2 ft		
Vertical Clearance			
Bottom of lowest edge of an overhead obstruction to any portion of path under obstruction	10 ft		FDM, Section 224.8, *FDM 260.6 for bridge structure minimum clearance
Overhead Signs/ Other obstructions under constrained conditions	8 ft		
Accommodation of equestrians/maintenance and emergency vehicles;	12 ft		
Underpasses and tunnels;	*Existing elements that provide a minimum 8 ft vertical clearance are not required to be corrected to the clearances listed above.		
SUN Trail			

Table 1 | Design Criteria

DESIGN ELEMENT	CRITERIA		SOURCE	
Design Speed				
Longitudinal Grade ≤4%	18 mph		FDM, Section 224.9	
Longitudinal Grade > 4%	30 mph			
Minimum Radii				
Horizontal Curves	Design Speed	Cross Slope	Minimum Radius	FDM, Table 224.10.1
	18 mph	2%	74 ft	
	18 mph	-2%	86 ft	
	30 mph	2%	261 ft	
	30 mph	-2%	316 ft	
*For paths with two-way traffic use minimum radius given for cross slope of -2%				
Stopping Sight Distance				
Flat Grades	Design Speed	Grade		FDM, Table 224.10.2
	18 mph	134		
	30 mph	Use 18 mph Values		
	*Stopping Sight Distance based on an object height of 0.0 ft and eye height of 4.5 ft.			
*More information on calculating minimum stopping sight distances may be found in the <i>AASHTO Guide for the Development of Bicycle Facilities, 2012.</i>				
Vertical Alignment				
When S>L	$L = 2S \frac{900}{A}$		FDM, Section 224.11	
When S<L	$L = \frac{AS^2}{900}$			
L =Min. Length of Vertical Curve (ft.)				
A =Algebraic Grade Difference (%)				
S =Stopping Sight Distance (ft.)				

Table 1 | Design Criteria

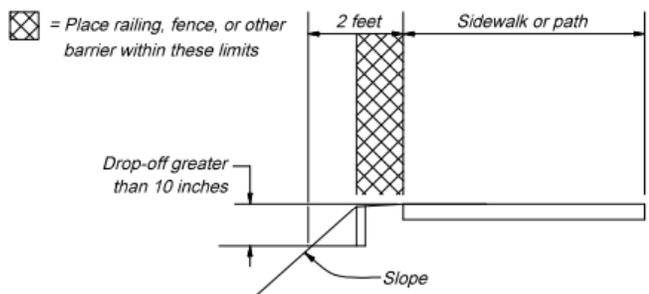
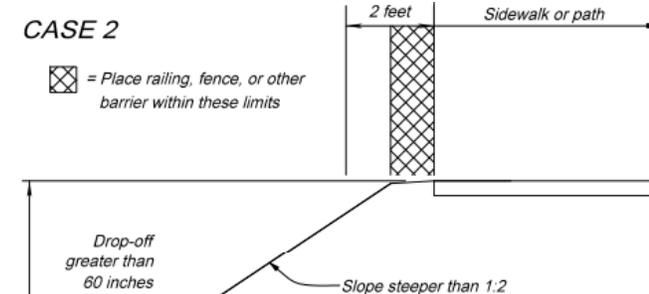
DESIGN ELEMENT	CRITERIA	SOURCE
Separation from Roadway		
Flush Shoulder w/speeds \leq 45 mph	Edge of path at least 5 ft from edge of paved shoulder	FDM, Section 224.12
Curbed Roadways w/speeds \leq 45 mph	Edge of path at least 4 ft from back of curb w/consideration of roadside obstructions (e.g. signs, light poles)	
Roadways w/speeds \geq 50 mph	Edge of path at least 5 ft from shoulder break	
Drop-off Hazards		
Shielding Severity Condition 1	<p>CASE 1</p> <p>☒ = Place railing, fence, or other barrier within these limits</p>  <p style="text-align: center;">A drop-off greater than 10 inches (or a slope resulting in a drop-off greater than 10 inches) that is closer than 2 feet from the edge of path or sidewalk should be considered a hazard and shielded.</p>	FDM, Figure 224.15.1
Shielding Severity Condition 2	<p>CASE 2</p> <p>☒ = Place railing, fence, or other barrier within these limits</p>  <p style="text-align: center;">A slope steeper than 1:2 that begins closer than 2 feet from the edge of path or sidewalk should be considered a hazard and shielded when the total drop-off is greater than 60 inches.</p>	

Table 1 | Design Criteria

DESIGN ELEMENT	CRITERIA	SOURCE
Shielding for Severity Conditions other than Cases 1 or 2	<ol style="list-style-type: none"> 1) The engineer should consult the District Bicycle/Pedestrian Coordinator or Trail Coordinator regarding pedestrian and cyclist traffic and their routes. 2) Installing fencing or railings are two ways to shield the drop-offs. Fencing is generally intended for use in rural areas along paths and trails. Railing is generally intended for urbanized areas, locations attaching to bridge rail or along concrete walkways. Pedestrian/Bicycle Railings (<i>Standard Plans, Index 515 Series</i>) are adequate for shielding all drop-offs but are generally intended for use on drop-offs greater than 60 inches. Pipe Guiderail (<i>Standard Plans, Index 515-070 and 515-080</i>) is adequate for shielding drop-offs which are 60 inches or less. 3) Along continuous sections where the drop-off varies above and below the 60-inch threshold, for uniformity the engineer may consider using only one of the railing types adequate for shielding all drop-offs. 4) Railing or fencing near intersections or driveways could obstruct the driver's line of sight. To reduce the need for railings, as a sidewalk or shared use path approaches an intersection, consider extending cross drains and side drains to minimize drop-offs. 5) The installation of fencing, railing, or pipe guardrail presents a hazard in and of itself. Evaluate whether or not the installation of these devices present a greater risk than the drop-off or other condition it is intended to shield. 	FDM, Section 224.15

Table 1 | Design Criteria

DESIGN ELEMENT	CRITERIA	SOURCE
Drainage	<p>Environmental Resource Permit (ERP) should be obtained if trail construction impacts are not exempt or above the permit thresholds for the water quantity, water quality, and wetlands.</p> <p>Storm water Pollution Prevention Plan (SWPPP) should be developed and submitted.</p>	<p>SJRWMD</p> <p>FDM, Drainage Design Guide</p> <p>National Pollutant Discharge Elimination System (NPDES)</p>

5.4. BUILD ALTERNATIVES

Three alternatives were identified for the multi-use path. The first alternative, Alternative A, begins at the intersection of Levy Hammock Road and S.R. 40 in Marion County on the northern side of S.R. 40 and heads east, following S.R. 40. Alternative A crosses to the southern side of the corridor in one location; the crossing is west of Alco Road in Astor, continuing over the Astor Bridge using the existing sidewalk on the south side, and then crossing back to the northern side of S.R. 40 before reaching Ronda Lane. Alternative A then continues through Volusia County along the north side of S.R. 40, and ends at the intersection of U.S. 17 and S.R. 40 in Barberville.

The second alternative, Alternative B, begins at the intersection of Levy Hammock Road and S.R. 40 in Marion County on the southern side of S.R. 40 and heads east, following S.R. 40. Alternative B crosses the Astor Bridge on the southern side as well, continuing into Volusia County from Lake County. Alternative B ends on the southern side of S.R. 40 at the intersection of U.S. 17 and S.R. 40 in Barberville.

As a result of the study's progression and stakeholder input, a third alternative, Alternative C, was developed. Alternative C begins at the intersection of Levy Hammock Road and S.R. 40, and travels east along the northern side of S.R. 40 until reaching the intersection of S.R. 19. At S.R. 19, Alternative C crosses to the south side of S.R. 40, and continues eastward on the south side of the road until reaching the intersection with U.S. 17.

Appendix A contains an overview presentation with the alternatives overlaid on aerial imagery. Concept plans for each alternative are contained in Appendix B.

5.4.1. TYPICAL SECTION(S)

The build alternatives consist of four typical sections, which are shown in Figure 7 to Figure 11. The typical sections were designed to accommodate constrained and unconstrained right-of-way locations. The sections of S.R. 40 that are not separated from adjacent land by a physical barrier (i.e. fence or wall) are classified as non-constrained areas. Constrained areas are separated from adjacent land by a physical barrier and limit the possibility of easements to accommodate drainage modifications.

Figure 7 | Typical Section 1 – Trail within Existing Right of Way / Easements



Figure 8 | Typical Section 2 – Trail in Separate Easement



Figure 9 | Typical Section 3 – Constrained Areas

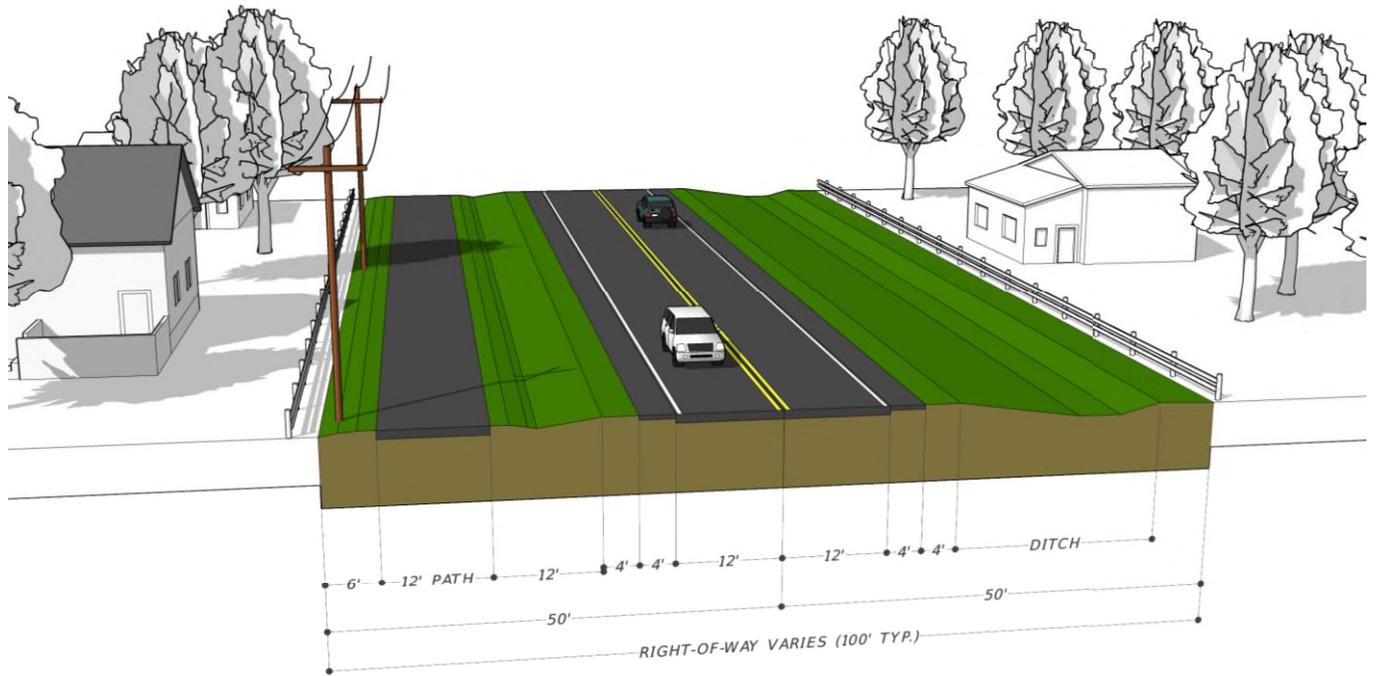


Figure 10 | Typical Section 4A – Very Constrained with Shoulder Gutter

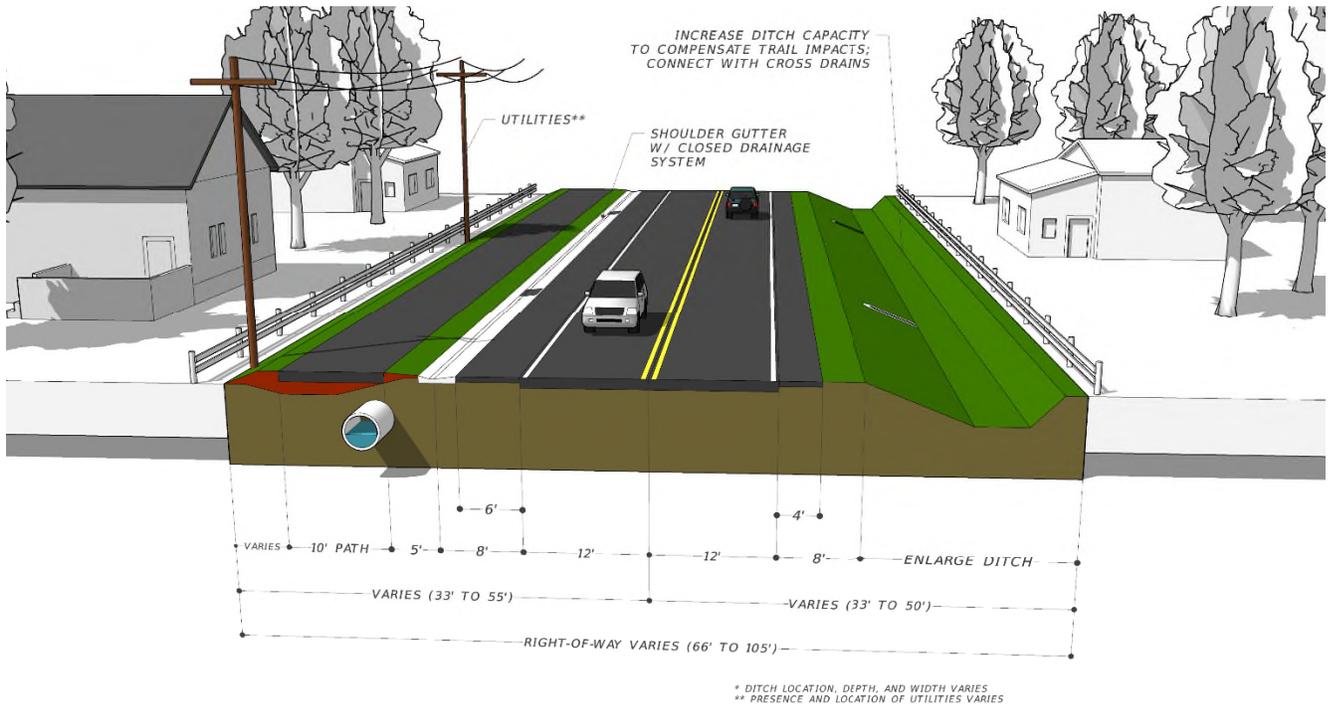
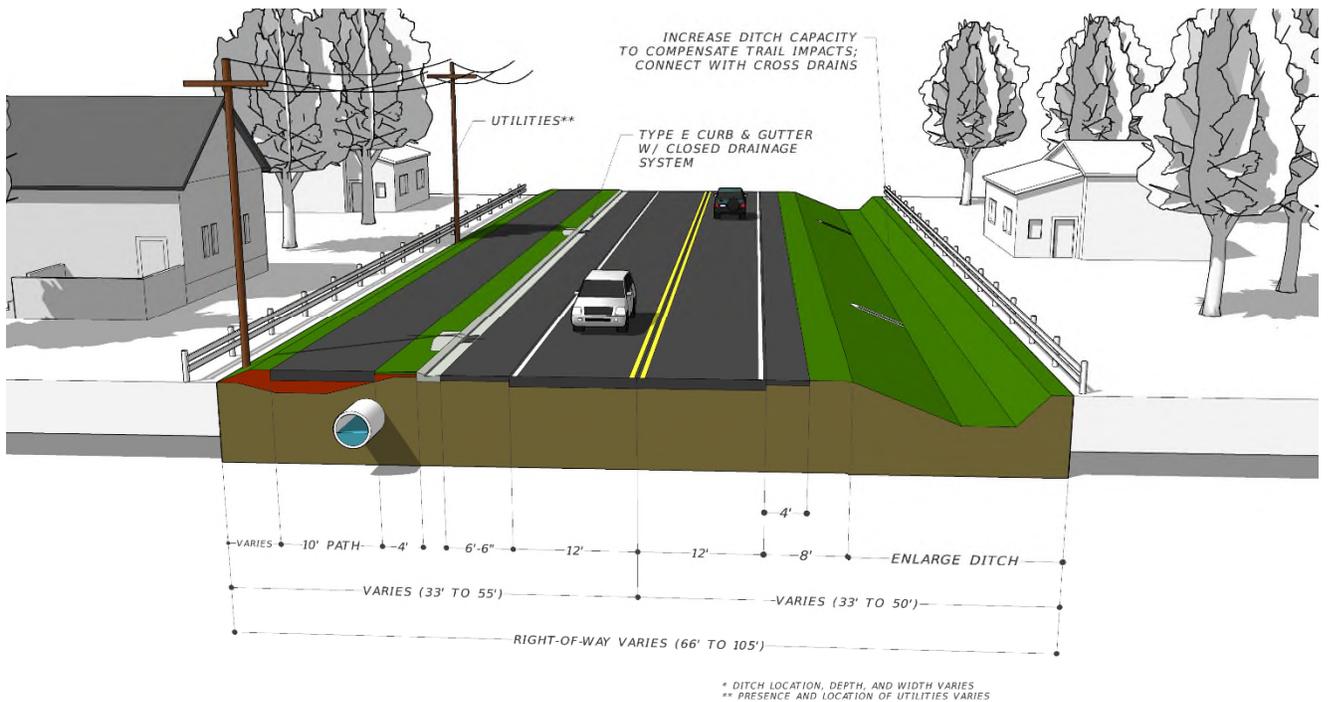


Figure 11 | Typical Section 4B – Very Constrained with Curb and Gutter



5.5. INITIAL ALTERNATIVES COMPARISON AND MATRIX

The themes for the evaluation criteria were developed based on the study's goals and objectives for the S.R. 40 Black Bear Trail Corridor from Levy Hammock Road to U.S. 17. These criteria address socioeconomic characteristics, cultural and natural resources, physical characteristics, trail experience, traffic operations and safety, and project cost estimates to capture the development of the project. In addition, the criterion examines the qualitative factors such as community support and the continual support from maintaining municipalities. The following comparative evaluation examines each criterion and summarizes the assessment conducted for each alternative. The evaluation process used these criteria to determine recommended corridors to be carried forward to the next phase of the project.

5.5.1. SOCIAL & ECONOMIC EVALUATION

5.5.1.1. Consistency with Local Plans

A review of local transportation plans was performed to demonstrate the consistency of this project with regional and local transportation planning efforts. A summary of the project's consistency is provided below, and the full analysis is documented in the S.R. 40 Black Bear Trail Corridor Planning Study: Existing Conditions Report.

The Florida Department of Environmental Protection (FDEP) Office of Greenways and Trails (OGT) supports this project based on the OGT 2018 Priority List. Additional support is found in the Lake~Sumter Metropolitan Planning Organization (Lake~Sumter MPO) Transportation Improvement Program 2017/2018 – 2021/2022 as part of the Bicycle/Pedestrian and Trails section (Lake~Sumter MPO, 2017/2018, p. 6-44). The Ocala/Marion Transportation Planning Organization (Ocala/Marion TPO) supports this project based on information provided in the Transportation Improvement Program 2017/2018 – 2021/2022 (Ocala/Marion TPO, 2017/2018, p. 4-11). Lastly, the River to Sea Transportation Planning Organization (R2CTPO) supports this project based on information provided in the Transportation Improvement Program 2017/2018 – 2021/2022 within the Bicycle, Pedestrian & Enhancement Projects section (R2CTPO, 2017/2018, p. 176).

While the Marion and Volusia County Comprehensive Plans do not specifically identify the S.R. 40 Black Bear Trail, the Lake County Trails Master Plan (2008) identified the S.R. 40 Black Bear Trail as a future project (Lake County, 2008). The Lake County 2030 Comprehensive Plan Planning Horizon 2030 also recommends adding non-invasive amenities to scenic roads, such as sidewalks and bike paths (Lake County, 2008).

5.5.1.2. Maintaining Agencies & Community Support

Support from the maintaining agencies and local communities are integral components to the success of a trail alternative. Each of the three maintaining agencies are in support of the S.R. 40 Black Bear Trail, and are in discussions with both FDOT and the USDA Forest Service to finalize maintenance agreements in the design phase. Their support for each alternative is shown in Table 2. The degrees of support (low/medium/high) were determined based on feedback and discussion from stakeholders and community representatives during the three Project Visioning Team meetings which are further described in Section 6.1 and in the Public Involvement Plan.

The S.R. 40 Black Bear Trail study area has a population of 1,200 people and over 475 households based on the 2016 American Community Survey (ACS) data. Support for the S.R. 40 Black Bear Trail Corridor by the community within the study area is analyzed for each alternative based on degree of support as shown in Table 2.

Table 2 | Maintaining Agencies & Community Support

	Alternative A	Alternative B	Alternative C
Maintaining Municipalities	Medium	High	Medium
Community Support	Medium	High	Medium

5.5.1.3. Property Impacts

The total number of parcels and acreage of impacts within the study area are identified in Table 3 for each alternative. No relocations are anticipated with any of the alternatives. The government-owned parcels are all Federal and State forest land. The private parcel takes occur near C.R. 3 where right-of-way is very constricted. Alternative A impacts two private parcels owned by Underhill Family Holdings LLLP. Alternative B impacts one private parcel owned by Underhill Family Holdings LLLP and one private parcel owned by The Pioneer Center.

The parcel impacts for Alternative B are potentially optional depending upon the typical section selected in each segment; however, using a constrained typical section throughout the corridor is not the preferred method of the project stakeholders.

Table 3 | Potential Property Impact(s)

	Alternative A	Alternative B	Alternative C
Total Parcel Impact(s)	14	18	17
<i>Private</i>	2	2	2
<i>Public / Government-Owned</i>	12	16	15
Total Acres of Impact(s)	21.5	35.2	32.7
<i>Private</i>	0.8	0.5	0.5
<i>Public / Government-Owned</i>	20.7	34.7	32.2

5.5.1.4. Community Facilities

The community services and social resources within the study area are displayed in the *Existing Conditions Report, Figure 27*, available under separate cover. A synopsis of the resources present within 0.25 mile of each alternative is shown in Table 4. The potential connectivity to social and cultural resources is similar for each alternative.

Table 4 | Summary of Social Resources in the Study Area by Alternative

	Alternative A	Alternative B	Alternative C
Schools	0	0	0
Churches / Religious Institutions	3	3	3
Fire and Police	3	3	3
Medical and Emergency Operation Facilities	1	1	1
Other Public Buildings and Facilities	2	2	2
Cemeteries	3	3	3
Parks and Boat Ramps	5	5	5
TOTAL	17	17	17

5.5.2. CULTURAL RESOURCES EVALUATION

5.5.2.1. Historic and Archaeological Resources

Section 106 of the National Historic Preservation Act (NHPA) requires that historic and archaeological resources be considered in project planning for federally funded or permitted projects. Cultural resources or historic properties, which include, “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP)”, have been identified within the study area using the Florida Division of Historic Resources Florida Master Site File. Obtained through the Florida Geographic Data Library (FGDL), these sites are shown in the *Existing Conditions Report, Figure 26* and summarized in the *Existing Conditions Report, Table 9*. A comparison of the number of properties containing known historic or archaeological resources within 200 feet of each trail alternative are summarized in Table 5.

Table 5 | Cultural Resources Alternatives Comparison

	Alternative A	Alternative B	Alternative C
State Historic Preservation Office Structures <i>Number / Eligible or Potentially Eligible for listing in NRHP</i>	19 / 4	16 / 4	15 / 3
State Historic Preservation Office Bridges <i>Number / Eligible or Potentially Eligible for listing in NRHP</i>	0 / 0	0 / 0	0 / 0
State Historic Preservation Office Cemeteries <i>Number / Eligible or Potentially Eligible for listing in NRHP</i>	2 / 2	2 / 2	2 / 2
State Historic Preservation Office Sites <i>Number / Eligible or Potentially Eligible for listing in NRHP</i>	1 / 1	0 / 0	0 / 0
Total <i>Number / Eligible or Potentially Eligible for listing in NRHP</i>	22 / 7	18 / 6	17 / 5

5.5.2.2. Section 4(f) Resources

Section 4(f) refers to a portion of the Department of Transportation Act of 1966, now known as 23 U.S.C. § 138 and 49 U.S.C. § 303, which “governs the use of publicly owned parks, recreation areas, wildlife and waterfowl refuges, and public or private historic sites for U.S. DOT transportation projects.” These resources are typically referred to as Section 4(f) resources or properties (*FDOT PD&E Manual 2019*).

The S.R. 40 Black Bear Trail is anticipated to have Section 4(f) impacts, due to the proximity of each of the trail alternatives to Ocala National Forest (USDA Forest Service). Historic sites are also located within a quarter mile of each trail alternative, as noted in Section 5.5.3.1 Historic and Archaeological Resources, which may incur *de minimis* impacts to the properties.

5.5.2.3. Recreation Areas

There are several public parks, boat ramps, and conservation lands located within 0.25 mile of the corridor, as listed below.

- Astor Boat Ramp #1; End of Pearl Street
- Astor Lions Community Park; 54905 Alco Road, Astor, FL 32102
- Butler Street Boat Ramp; Butler Street, Astor, FL 32102
- Lake George State Forest; 5458 U.S. 17, De Leon Springs, FL 32130
- Mill Dam Boat Ramp; FR 59, Silver Springs, FL 34488
- Ocala National Forest; 40929 S.R. 19, Umatilla, FL 32784
- Pearl Street Boat Ramp; Pearl St, Astor, FL 32102
- Wildcat Lake Park and Boat Ramp; S.R. 40, Astor, FL 32102

The S.R. 40 Black Bear Trail provides the opportunity to connect to other trails as is further discussed in Section 5.5.5.

5.5.3. NATURAL RESOURCES EVALUATION

5.5.3.1. Wetlands and Other Surface Waters

Wetlands are protected under Executive Order 11990, “Protection of Wetlands”. Within the study area, several rivers, creeks, and lakes have been located. The presence of surface waters increases the occurrence of wetlands. Desktop analysis of National Wetlands Inventory data and field visits were used to identify wetlands. Potential wetland impacts resulting from each alternative are compared in Table 6.

Table 6 | Wetland Impacts

	Alternative A	Alternative B	Alternative C
Acreage of Potential Wetland Impacts	1.4	0.5	3.0

Direct wetland impacts can be minimized through use of a gravity wall or similar drainage modification, and through use of boardwalks. Indirect impacts include introduction of potential pollutants, increased runoff, a higher probability of ponding, and fluctuating water level elevations as a result of the trail improvements. The severity of each impact should be considered. Any indirect impact should comply and align with any applicable ordinances or proposed conservation or developmental plans set forth by the St. Johns Water Management District, particularly in regards to the Ocklawaha and St. Johns basins.

5.5.3.2. Floodplains

Protection of floodplains is required by Executive Order 11988, "Floodplain Management", USDOT Order 5650.2, "Floodplain Management and Protection," and Federal-Aid Policy Guide 23 CFR 650A. Floodplains were identified using Federal Emergency Management Agency maps and geographic information system (GIS) data. The trail will cross numerous floodplains, particularly the segment between S.R. 19 and the St. Johns River. Most of the floodplains are designated as Zone A, which indicates a 100-year flood elevation is not determined. The floodplains associated with Halfmoon Lake and the St. Johns River are classified as Zone AE with a known flood elevation. A comparison of the floodplain impacts from each trail alternative are summarized in Table 7.

Table 7 | Floodplain Impacts

	Alternative A	Alternative B	Alternative C
Acreeage of Potential Floodplain Impacts	6.1	6.1	6.1

Sections of boardwalk or similar structure can be utilized in locations over floodplains to mitigate impacts.

5.5.3.3. Outstanding Florida Waters / Aquatic Preserves

The study has no involvement with Florida's aquatic preserves. Five water bodies within the study area have been classified by the U.S. Environmental Protection Agency (EPA) as Outstanding Florida Waters:

- Juniper Creek,
- Alexander Springs Creek,
- Lake Dexter,
- Lake Woodruff, and
- Lake Disston.

No impacts to the Outstanding Florida Waters are anticipated with any of the proposed build alternatives.

5.5.3.4. Wild and Scenic Rivers

There are no wild and scenic rivers present in the study area.

5.5.3.5. Wildlife and Habitat

Conservation lands within the Ocala National Forest and Lake George State Forest create a higher potential for occurrence of protected wildlife and plant species in the study area. Lake George, Lake Woodruff, and the St. Johns River are aquatic areas classified as critical habitats for the West Indian Manatee. Information regarding the primary wildlife and plant species are referenced in Table 8 and Table 9. Species were identified utilizing the Florida Geographic Data Library and their protection status was obtained from the Florida Fish & Wildlife Conservation Commission and the EPA. Additionally, consultation areas were identified within the project limits for the following species.

- Lake wales ridge plants (from western project limit to C.R. 445A)
- Red-cockaded woodpecker (entire study area)
- Sand skink (from western project limit to approximately one mile east of the S.R. 19 intersection)
- Florida scrub-jay (entire study area)
- Snail kite (from eastern project limit to approximately 1.5 miles west of S.R. 19 intersection)

Direct impacts to protected species are not known at this time. Habitat fragmentation is categorized as a low risk for all alternatives because the trail would extend an existing barrier rather than developing/clearing a new path through the forest.

Within the study area bald eagles have the potential to occur; several nests are located within the Ocala National Forest and surrounding areas (the *Existing Conditions Report, Figure 24*). These bald eagles are identified as a federally managed species by the Bald and Golden Eagle Protection Act. However, there is no intended direct impact to the nesting sites, as they are within a half-mile buffer of the study area.

Table 8 | Wildlife in Study Area

Wildlife Species Common Name	Scientific Name	Federal or State Listing	Protection Status
Atlantic sale marsh snake	<i>Nerodia clarkii</i>	Federal	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Federal	Managed
Blue purse-web spider	<i>Sphodros abboti</i>	-	-
Eastern indigo snake	<i>Drymarchon couperi</i>	Both	Threatened
Everglade snail kite	<i>Rostrhamus sociabilis</i>	Both	Endangered
Florida black bear	<i>Ursus americanus floridanus</i>	State	Managed

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Wildlife Species Common Name	Scientific Name	Federal or State Listing	Protection Status
Florida pine snake	<i>Pituophis melanoleucus</i>	State	Threatened
Florida scrub lizard	<i>Sceloporus woodi</i>	-	-
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	Both	Threatened
Gopher tortoise	<i>Gopherus polyphemus</i>	State	Threatened
Green sea turtle	<i>Chelonia mydas</i>	Federal	Threatened
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Federal	Endangered
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Federal	Endangered
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Federal	Endangered
Loggerhead sea turtle	<i>Caretta caretta</i>	Federal	Threatened
Long-tailed weasel	<i>Mustela frenata</i>	-	-
Piping plover	<i>Charadrius melodus</i>	Federal	Threatened
Red widow spider	<i>Latrodectus bishopi</i>	-	-
Red-cockaded woodpecker	<i>Picoides borealis</i>	Both	Endangered
Rosemary grasshopper	<i>Schistocerca ceratiola</i>	-	-
Sand pine scrub ataenius beetle	<i>Ataenius saramari</i>	-	-
Sand skink	<i>Neoseps reynoldsi</i>	Federal	Threatened
Short-tailed hawk	<i>Lampropeltis extenuata</i>	-	-
Snail kite	<i>Rostrhamus sociabilis</i>	Both	Endangered
Striped newt	<i>Notophthalmus perstriatus</i>	Federal	Managed
Swallow-tailed kite	<i>Elanoides forficatus</i>	-	-
West Indian manatee	<i>Trichechus manatus</i>	Federal	Threatened
Wood stork	<i>Mycteria americana</i>	Both	Threatened

Table 9 | Plant Species in Study Area

Plant Species	Scientific Name	Federal or State Listing	Protection Status
Ashe's savory	<i>Calamintha ashei</i>	-	-
Britton's beargrass	<i>Nolina brittoniana</i>	Federal	Endangered
Florida bonamia	<i>Bonamia grandiflora</i>	Federal	Threatened
Lewton's polygala	<i>Polygala lewtonii</i>	Federal	Endangered
Longspurred mint	<i>Dicerandra cornutissima</i>	Federal	Endangered

Plant Species	Scientific Name	Federal or State Listing	Protection Status
Okeechobee gourd	<i>Cucurbita okeechobeensis</i>	Federal	Endangered
Papery whitlow-wort	<i>Paronychia chartacea</i>	Federal	Threatened
Pigeon wings	<i>Clitoria ternatea</i>	Federal	Threatened
Pygmy fringe-tree	<i>Chionanthus pygmaeus</i>	Federal	Endangered
Rugel's pawpaw	<i>Deeringothamnus rugelii</i>	Federal	Endangered
Scrub plum	<i>Prunus geniculata</i>	Federal	Endangered
Scrub wild buckwheat	<i>Eriogonum longifolium</i>	Federal	Threatened
Wide-leaf warea	<i>Warea amplexifolia</i>	Federal	Endangered

5.5.3.6. Coastal Zone Consistency / Coastal Barrier Resources

According to, and administrated by the National Oceanic and Atmospheric Administration (NOAA), the National Coastal Zone Management Program is a voluntary partnership between the federal government and coastal states and territories that works to address some of today's more pressing coastal issues. Neither Lake nor Marion Counties are subject to the National Coastal Zone Management program. Volusia County is subject to the National Coastal Zone Management program, but the managed locations are outside of the study area.

5.5.4. PHYSICAL CHARACTERISTICS EVALUATION

5.5.4.1. Air Quality

Lake, Marion, and Volusia Counties are currently designated as being in attainment for the following Clean Air Act National Ambient Air Quality Standards (NAAQS): ozone, nitrogen oxide, particulate matter (2.5 microns in size and ten microns in size), sulfur dioxide, carbon monoxide, and lead.

5.5.4.2. Noise

There are no expected adverse noise impacts to the study area. Noise mitigation efforts are not anticipated.

5.5.4.3. Potential Contamination

EPA data helped to identify contaminated locations within the study area. *Existing Conditions Report S.R. 40, Table 10 and Figure 29* summarizes and identifies locations of 11 known contaminated sites within 500 feet of all alternatives. It was determined that six of these locations are pending or active petroleum cleanup locations through the FDEP. For each alternative, the degree of risk (low/medium/high) was determined based on the known criteria and proximity to potentially contaminated sites. All alternatives were determined to have a low potential for

contamination because they are not expected to have direct impacts to any contaminated facilities.

5.5.4.4. Utilities

Several utility services are located in the study area as summarized in *Table 6* in the *Existing Conditions Report S.R. 40*. The exact number of utilities impacted by each alternative has not yet been determined; however, based on the utilities location along the north versus south side of S.R. 40, it is expected that Alternative A would have a low impact and Alternatives B and C would have a medium impact.

5.5.4.5. Drainage

Proposed drainage conditions will be similar for all alternatives. Drainage modifications are discussed for the two types of right-of-way conditions: constrained and non-constrained.

5.5.4.5.1. Non-Constrained Drainage Modifications

The existing right-of-way in non-constrained areas along the S.R. 40 alignment is sufficiently wide to minimize the need for adjacent easements. When identifying potential easements, the presence of utilities and varying existence of roadside ditches should be considered. With or without easements, considerations should be made in regards to maintaining existing flow patterns.

Strategies for reducing offsite impacts from the trail improvements include the use of gravity wall or establishing a raised vegetative bank at the outer edge of the trail. These barriers will help channel the trail runoff via sheet flow towards the new or existing linear ditch and minimize direct flow offsite. To maintain existing offsite flow patterns towards the roadway, the embankment would become flush with the wetland or existing surface elevation and the offsite sheet flow may continue unimpeded across the trail towards the ditch. Ideally, these flow pattern accommodations should primarily use sheet flow to avoid erosion and ponding issues.

New or modified existing roadside ditches adjacent to the trail should be installed to maintain the overall existing flow pattern. Any existing side drains and cross drains should be extended, and new structures installed in conjunction with ditch modifications. All these modifications should accommodate the additional runoff resulting from the trail surface.

5.5.4.5.2. Constrained Drainage Modifications

Areas with constrained right-of-way may have existing ditches and utilities present along the proposed trail alignment. These existing ditches will be connected to a closed drainage system with cross drains, directing flow to the opposite existing roadside ditch. Existing ditches may require modification to accommodate the increased runoff volume. Alternatively, if the water table permits, use of French drains may be utilized.

5.5.4.5.3. Culvert modifications

In order to accommodate runoff from the paved trail along the S.R. 40 alignment, the crossing culverts under S.R. 40 are anticipated to be extended. In locations where culverts cannot be extended or modified, a new culvert will have to replace the existing culvert at these trail locations. Major culverts are located at Juniper Creek, Jumping Gully, Stone Pond Outfall, and two unnamed branches. The trail will also cross over the St. Johns River in Astor, no modification is anticipated at the bridge crossing.

5.5.4.6. Structures

The S.R. 40 Bridge over the St. Johns River (Bridge No. 110077), built in 1980, is the only existing structure located within the study area. The bridge extends 52 feet in width and consists of two ten-foot travel lanes, ten-foot outside shoulders with traffic railings along both sides of the structure, and a five-foot sidewalk on the right (south) side of the bridge. The NRHP indicated the bridge was exempt from Section 106 evaluation under the 2012 Program Comment for Common Post-1945 Concrete and Steel Bridges. All Alternatives are proposed to cross the S.R. 40 Bridge over the St. Johns River.

5.5.4.7. Hunting Areas

Hunting grounds provide access to trail users and wildlife but have the potential for conflict between the two. It is valuable to understand the interaction between trail users and the compatibility of hunting grounds and how it may interact with the S.R. 40 Black Bear Trail Corridor. Dog hunting (casting and catching from the easement area) is permitted within the Ocala Wildlife Management Area, and occurs along the entirety of S.R. 40, S.R. 19, C.R. 445A, C.R. 445, C.R. 42, and all roads within the Pipeline Unit of the Ocala Wildlife Management Area. The North Central Florida Dog Hunters Association was invited to the public meeting; however, no representatives attended.

The impact of the trail alternatives to existing hunting grounds adjacent to the trail is considered low for each alternative because the trail is visibly separated and not intended to lead users into hunting areas.

5.5.4.8. Forest Operations

Both the Ocala National Forest and Lake George State Forest permit logging on property. The forests may incur additional liability and/or expenses under a build alternative to ensure safe logging operations for the logging teams and trail users.

Lake George State Forest (Florida Forest Service) uses permanent clay roads to access paved haul routes at permanent junctions. Ocala National Forest, with the USDA Forest Service, conducts logging directly adjacent to State and County paved roads and builds temporary clay roads to connect to the paved roads; which may occur at any location along S.R. 40, C.R. 445, C.R. 445A, and S.R. 19 as long as the selected road provides safe ingress and egress.

Logging operations within the Ocala National Forest are anticipated to necessitate trail crossings, and USDA Forest Service noted that the trucks are loaded up to 90,000 lbs. Potential conflicts may arise between logging operations and trail users. Trail guards and/or law enforcement would be needed to prevent these conflicts, which can last up to two weeks at a time.

Trail users may create disruptions to the commercial logging operations (i.e. vandalism of logging equipment). Logging contractors have additional liability, as they are held liable for any potential injuries of visitors within the work area (visitors would include trail users). There are currently nine logging purchasers who work with the Ocala National Forest. The USDA Forest Service recommended including representatives from each of these companies as project stakeholders. Logging companies were invited to the public hearing; however, no representatives attended.

The USDA Forest Service indicated that fire along the trail corridor would create a maximum heat exposure of 3,000 BTU (British Thermal Unit) per square foot. Fire from the controlled burns may run up to the trail edge. Lake County recommended placing concrete curbs (ribbon curb) on the edges of the asphalt to protect the asphalt from melting.

The impact of the trail alternatives to forest operations is expected to be low because the trail will be visible and within the right-of-way.

5.5.5. TRAIL EXPERIENCE

5.5.5.1. Intersections/Midblock Crossings

The potential number of intersections/midblock crossings are identified for each alternative in Table 10. Alternative A proposes two midblock crossings in Astor in order to use the existing sidewalks on the bridge over the St. Johns River. Alternatives B and C do not propose any midblock crossings but have a non-signalized crossing at C.R. 445A. All alternatives have a signalized crossing at S.R. 19. Alternative C has two signalized crossings at S.R. 19 as it transitions from the north side to the south side of S.R. 40.

Table 10 | Intersection and Midblock Crossings

	Alternative A	Alternative B	Alternative C
Crossings at Non-Signalized/Midblock	0 / 2	1 / 0	1 / 0
Crossings at Signalized Intersections	1	1	2
Street/Driveway Crossings	39 / 42	27 / 59	27 / 49

5.5.5.2. Connections to Other Trails

Within the study area there are several well-known existing/planned trails. The trails listed and described in the *Existing Conditions Report S.R. 40, Section 4.16*, have the potential to be a connection to the S.R. 40 Black Bear Trail. The existing/planned trails in the study area include:

- Florida National Scenic Trail,
- Ocala Adventure Trail,
- Nature Trail at Juniper Springs,
- Heart of Florida Loop,
- Ocala National Forest Trail, and
- North Lake Trail.

Appendix F in the *Existing Conditions Report S.R. 40* illustrates detailed trail maps for each listed existing/planned trail.

Table 11 shows the connections to other trails by alternative. All alternatives would be able to connect to the Florida National Scenic Trail. Alternative A can potentially connect to Juniper Springs. Alternative B can potentially connect to North Lake Trail. Alternative C can potentially connect to Juniper Springs and North Lake Trail.

Table 11 | Trail Connections

	Alternative A	Alternative B	Alternative C
Florida National Scenic Trail	Yes	Yes	Yes
Juniper Springs	Yes	No	Yes
North Lake Trail	No	Yes	Yes
Total Trail Connections	2	2	3

5.5.5.3. Nearby Households and Businesses

Any household within a 0.25 mile radius from the S.R. 40 Black Bear Trail is accounted for and used to identify the number of nearby households for each alternative. The potential number of nearby households and businesses observed from the study are the same for each alternative as shown in Table 12.

Table 12 | Nearby Households and Businesses

	Alternative A	Alternative B	Alternative C
Nearby Households within 0.25 miles	476	476	476



5.5.6. TRAFFIC OPERATIONS AND SAFETY

5.5.6.1. Adjacent Roadway Traffic Volume

The S.R. 40 Black Bear Trail Corridor is a two-lane principal arterial in a rural area and is an Emerging SIS Corridor, meaning the roadway is growing in importance to the state economy. The traffic characteristics show a high volume of truck and commercial vehicular traffic on the corridor. The various characteristic segments are broken down in Figure 2 and described in Section 4.1. The adjacent weighted average AADT for each alternative is the same and is shown in Table 13.

Table 13 | Roadway Traffic

	Alternative A	Alternative B	Alternative C
Adjacent Roadway Traffic Volume (AADT) Weighted Average	5750	5750	5750
Levy Hammock Rd to Alco Road	4833	4833	4833
Alco Road to US 17	8233	8233	8233

5.5.6.2. Adjacent Roadway Speed Limit

The posted speed limit along S.R. 40 varies depending on the segment of the roadway. Speeds posted by roadway segment referenced in the *Existing Conditions Report S.R. 40, Figure 9* are used to analyze the adjacent roadway speed limit for each alternative, in miles per hour. The posted speed limit varies depending on the segment of the roadway. The following list denotes the posted speed by roadway segment.

- 55 MPH: Levy Hammock Road to Veterans Drive
- 45 MPH: Veterans Drive to Riley Pridgeon Road
- 55 MPH Riley Pridgeon Road to Lemmon Road
- 45 MPH: Lemmon Road to C.R. 3
- 40 MPH: C.R. 3 to U.S. 17

The adjacent speed limits and weighted speed limits are the same for each alternative and shown in Table 14.

Table 14 | Speed Limit

	Alternative A	Alternative B	Alternative C
Levy Hammock To Veterans Drive, Along SR 40	55 mph	55 mph	55 mph
Veterans Drive To Riley Pridgeon Rd, Along SR 40	45 mph	45 mph	45 mph
Riley Pridgeon Rd To Lemmon Rd, Along SR 40	55 mph	55 mph	55 mph
Lemmon Rd To CR 3, Along SR 40	45 mph	45 mph	45 mph
CR 3 To US 17, Along SR 40	40 mph	40 mph	40 mph

5.5.6.3. Trail Offset from Roadway

An appropriate trail offset from the roadway can prevent crashes on the S.R. 40 Black Bear Trail Corridor Roadway. Trail offset (reported in feet) is identified for each project alternative in Table 15.

Table 15 | Trail Offset

	Alternative A	Alternative B	Alternative C
Trail Offset from Roadway <i>(Average Offset in Feet from Edge of Travel)</i>	34	37	36

5.5.7. COST ESTIMATIONS

The estimated cost for the S.R. 40 Black Bear Trail Corridor is \$37.7 million (in 2018 dollars), which includes costs for construction, design, and CEI as shown in Table 16. Utility relocation, wetland mitigation, and right-of-way costs will be determined during the design phase. The construction cost estimate was prepared using FDOT’s Long Range Estimating (LRE) system and FDOT cost per mile. A copy of the LRE is included in Appendix C. Design and CEI costs were estimated as 15 percent of the construction cost.

Table 16 | Construction Cost Estimates

Item	Cost
Construction	\$29 Million
Design - 15%	\$4.35 Million
CEI - 15%	\$4.35 Million
Total	\$37.7 Million

5.5.8. TRAIL EVALUATION MATRIX

The following Trail Evaluation Matrix summarizes the impacts from the three alternatives outlined in this report. The preferable option for each category is highlighted where there are differences amongst the alternatives.

Table 17 | Trail Alternatives Evaluation Matrix

Evaluation Criteria	Trail Project Alternatives		
	Alternative A	Alternative B	Alternative C
Social & Economic			
Community Support <i>(Low/Medium/High)</i>	Medium	High	Medium
Consistent with Local Plans <i>(Yes/No)</i>	Yes	Yes	Yes
Support from Maintaining Municipalities <i>(Low/Medium/High)</i>	Medium	High	Medium
Connections to Community Facilities <i>(number of features within 0.25 mile radius)</i>	17	17	17
Cultural			
Risk of Impact to Archaeological Sites <i>(Low/Medium/High)</i>	Low	Low	Low
Risk of Impact to Historical Sites <i>(Low/Medium/High)</i>	Low	Low	Low
Natural			
Wetland Impacts <i>(Acreage of Impacts)</i>	1.4	0.5	0.5
Habitat Fragmentation Risk <i>(Low/Medium/High)</i>	Low	Low	Low
Floodplain Impacts <i>(Acreage of Impacts)</i>	6.1	6.1	6.1
Risk to Bald Eagle Nesting Sites <i>(Number of known sites within 1,000 feet)</i>	0	0	0
Risk to Outstanding Florida Waters / Aquatic Preserves <i>(Acreage of Impacts)</i>	Low	Low	Low
Right of Way Impact			
Private Parcels Impacted <i>(Number of Parcels)</i>	2	2	2
Acres of New Right of Way / Easements <i>(Acreage of Impacts)</i>	21.5	35.2	32.7
Number of Property Owners <i>(Government Owned / Privately Owned)</i>	5 / 2	5 / 2	5 / 2
Physical			
Risk to Impact Contamination Sites <i>(Known sites within 500 feet)</i>	11	11	11
Air Quality Risk	Low	Low	Low

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Evaluation Criteria	Trail Project Alternatives		
	Alternative A	Alternative B	Alternative C
<i>(Low/Medium/High)</i>			
Potential Bridge Crossings <i>(Number of New Bridge Structures *assuming utilization of existing St. Johns River Bridge)</i>	0*	0*	0*
Hunting Area Risk <i>(Low/Medium/High)</i>	Low	Low	Low
Level of Utility Impacts <i>(Low/Medium/High)</i>	Low	Medium	Medium
Forest Area Risk <i>(Low/Medium/High)</i>	Low	Low	Low
Level of Drainage Swale Impacts <i>(Low/Medium/High)</i>	Medium	Medium	Medium
Noise <i>(Low/Medium/High)</i>	Low	Low	Low
Trail Experience			
Crossings at Non-Signalized/Midblock Crossing <i>(Number of Crossings)</i>	0 / 2	1 / 0	1 / 0
Crossings at Signalized Intersections	1	1	2
Street/Driveway Crossings <i>(Number of Crossings)</i>	39 / 42	27 / 59	27 / 49
Connections to Other Trails <i>(Number of Connections within 0.25 mile radius)</i>	2	2	2
Nearby Households <i>(Number of Households within 0.5 mile radius)</i>	476	476	476
Population <i>(Total Population within 0.5 mile radius)</i>	1,208	1,208	1,208
Traffic Operations and Safety			
Adjacent Roadway Traffic Volume <i>(Average Annual Daily Traffic in Vehicles per Day)</i>	5,750	5,750	5,750
Adjacent Roadway Posted Speed Range / Weighted Average Speed Limit <i>(AADT, MPH)</i>	45 to 55 / 54	45 to 55 / 54	45 to 55 / 54
Trail Offset from Roadway <i>(Average Offset in Feet from Edge of Travel)</i>	34	37	36
Estimated Cost			
Construction	\$29 Million	\$29 Million	\$29 Million
Total Estimated Cost (includes construction, design, and CEI)	\$37.7 Million	\$37.7 Million	\$37.7 Million

5.6. SELECTED ALTERNATIVE(S)

Based on concept-level design, environmental impact analysis, and stakeholder input, all alternatives will be carried forward to the next phase. Next steps are described in Section 7.0.

5.6.1. PEL QUESTIONNAIRE

Federal Highway Administration's Planning and Environmental Linkage (PEL) Questionnaire is intended to ensure that planning information and decisions are properly documented to be consistent with the National Environmental Policy Act (NEPA). FDOT's Efficient Transportation Decision Making (ETDM) process is considered an equivalent approach to the FHWA's Planning and Environmental Linkage (PEL) Questionnaire. If the project progresses to a Project Development and Environment Study, then FDOT's ETDM will be utilized.

6. PUBLIC INVOLVEMENT

The public engagement process utilized to develop the recommended project alternative was comprised of three primary outreach strategies: 1) Project Visioning Team meetings, 2) Agency and Stakeholder meetings, and 3) Public meetings. As further described below, the level of public engagement methods, as well as detailed meeting summaries, can be found in the S.R. 40 Black Bear Trail Public Involvement Plan.

6.1. PROJECT VISIONING TEAM

To assist the project team in the development and assessment of potential alternatives, a Project Visioning Team (PVT) was assembled. The PVT is comprised of community leaders, business owners, agency representatives, and more. The first PVT meeting was on May 22, 2018, the second was held on September 6, 2018, and the third was held on February 14, 2019. The role of the PVT is to provide input on the trail concepts and developments, recommend alternatives to be advanced for further study, and share local knowledge and history. Further information regarding each PVT meeting is below:

6.1.1. PROJECT VISIONING TEAM MEETING #1

The purpose of the first PVT meeting held on May 22, 2018 was to provide an overview of the Black Bear Trail Project Development and Environment (PD&E) process and to obtain information regarding their ideas for a preferred alternative and insight on what the project team should consider in design. Discussions on existing geometric conditions included right-of-way variations, drainage elements, and utility locations helped the project team better understand the issues facing the construction of the corridor. The maintenance of the proposed trail was also discussed. PVT members disclosed that the Ocala National Forest was open to the idea of obtaining a permit within their jurisdiction with some requirements of the trail being met. All three of the counties involved, Marion County, Lake County, and Volusia County, expressed openness to discussions on trail maintenance as well. Further topics covered during the first PVT meeting included clarification on the procedure for developing the trail alignment, and any potential obstacles faced with developing alternatives given the available existing data and local knowledge shared.

6.1.2. PROJECT VISIONING TEAM MEETING #2

The purpose of the second PVT meeting held on September 6, 2018 was to provide refined alternatives with corresponding evaluations. PVT members discussed the evaluation criteria and supplemented the study team's research with local knowledge, particularly of hunting, logging, controlled burns, and concerns over mid-block crossings. Members also discussed more specific impacts to different cultural resources, and expressed opinions on the different alternatives and their connections to other local features. The final project logo was also revealed.

6.1.3. PROJECT VISIONING TEAM MEETING #3

The purpose of the third PVT meeting held on February 14, 2019 was to solicit comments on the study to prepare for the PD&E phase. FDOT staff shared the outcomes from the public meeting and alternatives evaluation. PVT members discussed specific issues related to trail connections with local resources, maintenance, drainage, landscaping, and crossings. Members indicated that

there are more advantages to locating the trail on the south side (Alternative B). Members also discussed next steps for the project.

6.2. AGENCY / STAKEHOLDER MEETINGS

Several agency and stakeholder meetings were also held throughout the course of the study. The meetings with each agency are outlined by date in Table 18. Detailed summaries of each are included as attachments to the S.R. 40 Black Bear Trail Public Involvement Plan.

Table 18 | Agency & Stakeholder Meeting Occurrences

Date	Organization
3/19/2018	St Johns River Utility
3/19/2018	U.S. Forest Service
5/9/2018	Florida Forest Service
3/13/2019	River to Sea Transportation Planning Organization (TPO) Bicycle and Pedestrian Advisory Committee
3/25/2019	U.S. Forest Service
3/25/2019	Florida Forest Service
3/27/2019	River to Sea TPO Governing Board
4/10/2019	Lake~Sumter Metropolitan Planning Organization (MPO) Community Advisory Board
4/10/2019	Lake~Sumter MPO Technical Advisory Committee
4/24/2019	Lake~Sumter MPO Governing Board

6.3. PUBLIC MEETING

The public meeting was held on January 24, 2019. Notification for the public meeting was mailed to over 2,200 properties within the Black Bear Trail project corridor as well as e-mailed to interested citizens and stakeholders. Notification was also provided to applicable governmental agencies and elected and appointed officials, as outlined within the Public Involvement Plan, available under separate cover. On January 3, 2019, the public meeting advertisement was published in the *Ocala Star-Banner*, *North Lake Outpost*, and *Daytona Beach News-Journal*. Additionally, to assure extensive outreach to low-income areas, public notifications were posted or made available at the following locations.

Lake George State Forest

5458 US Highway 17
De Leon Springs, FL 32130

US Post Office

1680 Railroad Avenue
Barberville, FL 32180

Pioneer Settlement for the Creative Arts

1776 Lightfoot Lane
Barberville, FL 32105

US Post Office

24433 State Road 40
Astor, FL 32102

Astor Chamber of Commerce & St. Johns River Utility

23939 State Road 40
Astor, FL 32102

US Post Office

15997 State Road 40
Silver Springs, FL 34488

Over 90 interested parties attended the public meeting. The public meeting was organized as an open house with a continuous looping PowerPoint presentation in a separate room. The purpose of the meeting was to present information regarding the two potential alternatives; an evaluation of these alternatives; and a preliminary evaluation of left vs. right side widening impacts for the entire project corridor.

7. NEXT STEPS

The S.R. 40 Black Bear Trail Project will move forward into a PD&E study in 2019 following the completion of this corridor planning study. Any impacts to the Ocala National Forest would trigger the need for NEPA studies, which would need to be scoped and developed in coordination with the Ocala National Forest Staff.