

VALUE ENGINEERING WORKSHOP REPORT (DRAFT)
for:
Florida Department of Transportation



South Sumter Trail
FPN: #435471-1



November 16, 2018

Designed by:



VE WORKSHOP DATES:
October 29 – November 2, 2018

November 16, 2018

Mr. Ashraf A. Elmaghraby, M.Sc., P.E.
Consultant Project Management Supervisor / District Value Engineer
719 S. Woodland Blvd.
DeLand, FL 32720

**RE: Value Engineering Study Report (Draft)
South Sumter Trail
FPN: #435471-1**

Dear Mr. Elmaghraby,

Enclosed is the Draft Value Engineering Report for the above referenced project for distribution.

It's always an honor to apply the Value Engineering methodology to the impressive work of a quality firm such as TranSystems, Inc. and their Team. The details, time and hard work their personnel have accomplished on this project at this phase of the project were very evident as we analyzed and made recommendations for this project.

This study provides 49 (Forty Nine) Value Engineering Alternatives and Design Suggestions that should assist FDOT and end users in achieving their vision with increased quality and economy. It is important to note that some of these Value Engineering Alternatives/Design Suggestions are mutually exclusive of each other.

We personally want to thank you for giving the CSI team the opportunity to facilitate this Value Engineering project. We hope that our services and performance for the FDOT D5 on this project are meaningful and useful.

Please contact Ramesh Kalvakaalva if you have any questions or concerns regarding the results of the Value Engineering effort.

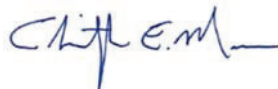
Sincerely,



Ramesh Kalvakaalva, PE, CVS
(SAVEI CVS No. 2011105000)
VE Facilitator/Project Manager
Phone No.: 770.312.2014
Email: Rameshk@civilservicesinc.com



Les Thomas, PE, CVS-Life
(SAVEI CVS No. 850901)
VE Co-Facilitator
Phone No.: 678.677.6420
Email: Les.civilservicesinc@gmail.com



Christopher E. Morse, PE
QA/QC Manager
Phone No.: 904.641.1834
Email: Cmorse@civilservicesinc.com

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Section 1

Executive Summary

INTRODUCTION

A VE Workshop was facilitated by CSI along with team members from FDOT District 5 in DeLand, Florida. This report details the Value Engineering workshop activities undertaken during the week of October 29 – November 2 2018. The subject of the study was **South Sumter Trail FPN: #435471-1**.

The first day of the workshop included presentations by the FDOT Project Manager, TranSystems, Inc., their design team, other stakeholders and then followed by a site visit. This was followed by the execution of the six-step Value Engineering (VE) Job Plan.

At the time of the VE study, the project documents being developed the TranSystems, Inc. team was reportedly at the 60% PD&E stage of completion. The construction cost estimate indicated that the selected alternate of the project would be delivered at a cost of approximately \$13.5 million and the current estimate of R/W costs (work in progress) approximates \$9.2 million.

The VE team was composed of staff members of FDOT District 5, HNTB, Inc. and KCA, Inc., with the team leadership provided by Ramesh Kalvakaalva PE, CVS, and Leslie Thomas, PE, CVS-Life of CSI.

In the results section of the report, the reader will find documentation of the ideas that were developed and presented on the last day of the workshop. These ideas represent opportunities to:

- Obtain the best return for construction dollars spent
- Assist in identifying the best approach for project delivery
- Reduce the risks associated with project delivery
- Minimize Life Cycle Costs for O & M and of ownership of the finished project
- Enhance the project outcome through recommendations and suggestions that, which may add cost to the project, would improve pedestrian access, provide innovative methods to complete construction and further optimize right of way utilization
- Reduce construction cost but doing so without compromising vital functions
- Some instances in which additional funds might be expended to avoid future, higher costs of ownership

These developed alternatives should be the subject of an implementation meeting, in the near future, in order to capitalize on the possibilities that these alternatives represent.

PROJECT DESCRIPTION

This Value Engineering study was directed at the project being administered by District 5 of the Florida Department of Transportation, consisting of South Sumter Connector Trail, from Good Neighbor Trail to James A Van Fleet Trail. The South Sumter Connector Trail is part of the 250-mile Florida Coast to Coast Trail, which will connect St. Petersburg on the west coast of the state with Titusville on the east coast. The segment being evaluated as part of this Project Development and Environment (PD&E) Study extends approximately 22 miles (in an east-west fashion) from the Withlacoochee State Forest Trail in eastern Hernando County to the Van Fleet Trail in eastern Sumter County (see Figure below). The trail would consist of a twelve foot (12') wide paved multi-use path, to be used by multiple modes of non-motorized transportation (including pedestrian & bicycle) that would provide recreational connectivity across the Florida peninsula.

NEED FOR THE PROJECT

The SUNTrail Network envisions connecting various parts of the state with non-motorized multi-use paths to enhance the recreational activities within communities, improve safety between various transportation modes, and indirectly create economic development opportunities. While the entire trail network is still under development, the foundational aspects of the system built upon work that had already been completed by local governments, in collaboration with FDOT. Two specific trails were immediately identified as a part of the SUNTrail System, the St. John's River to Sea Loop and the Coast to Coast (C2C) Connector Trail (figure below). The South Sumter Connector Trail would close an approximately 22 mile gap in the C2C Trail, which is a 250 mile trail that runs from St. Petersburg in Pinellas County to Titusville in Brevard County, which currently terminates at the Good Neighbor Trail and resumes at the Van Fleet Trail.

PURPOSE OF THE PROJECT

The purpose of this study is to close the existing 22 mile gap in the Coast to Coast Trail with a multi-use trail in accordance with SUNTrail standards. Identified as the South Sumter Connector Trail, this trail corridor would complete a critical connection between the recently completed sections of the Good Neighbor Trail (at its junction with the Withlacoochee State Trail) in Hernando County with the Van Fleet Trail near State Road (S.R.) 50 in Sumter County.

SUMMARY OF RESULTS

During the course of the VE workshop, the team developed 20 Design Alternatives and 29 Design Suggestions. In addition, 13 creative ideas were thoroughly explored and it was found that they were neither cost effective nor technically feasible. At the end of this section is the table entitled, "VALUE ENGINEERING STUDY – SUMMARY OF RESULTS". The cost results for the various alternatives may not be added together as some of the alternatives are mutually exclusive. One of the goals of the VE Team was to identify opportunities through which cost savings might be realized while indicating ways in which the resulting savings might be invested back into the project to realize added value. From reviewing the Summary of Results, it is estimated that approximately \$5 million in cost savings might be reasonable to expect from the implementation of these alternatives. However, the acceptance of such alternatives should be guided by the dictates of the agreements among the stakeholders, the cost to make the necessary changes in the design and, the effect of these changes on the project delivery schedule.

The reader is encouraged to read over the summary table then look at Section 3 of this report entitled, "STUDY RESULTS", for a detailed accounting as to how these alternatives were documented. The Design Suggestions can also be as important as the fully developed Alternatives and their consideration should be part of the action taken at the implementation meeting.

THE WAY FORWARD

The apparent results of a Value Engineering workshop can appear to be dramatic however, these results must be acted upon promptly as they may be quickly overtaken by the forward

progress of the engineering design. It is strongly recommended that the decision makers arrange a fairly immediate time for conducting a formal implementation meeting, to make a decision on each of the developed alternatives and the Design Suggestions. The results of that meeting should be converted into instructions to the design engineering team to move these potential actions into realities. This will make it possible to realize the maximum benefit from the VE workshop effort and expense.

Value Engineering Workshop: October 29 - November 2, 2018 - SUMMARY OF RESULTS

		VE Team Ranking	Cost Original Design	Cost Alternative	Initial Cost Reduction
VE ALTERNATIVES					
SEGMENT 1 (S1) SR 673					
S1-06	Install Hand Cranked Ferry To Cross River	5	\$0	\$58,500	(\$58,500)
S1-07	Construct Steel Truss Bridge To Retain Historic Significance	5	\$2,953,300	\$2,607,500	\$345,800
S1-08	Construct Suspension Bridge	5		See S1-07	
S1-09	Build Wood Bridge Across River	5		See S1-07	
S1-10	Provide Viewing Deck/Fishing Pier On Bridge	5	\$0	\$20,000	(\$20,000)
S1-18	Realign Trail Along CR 674/CR 654A	4	\$3,253,599	\$1,818,202	\$1,435,397
S1-19	Build Trail Combined With Ditch	5		See SA-21	
S1-20	Selectively Build Box Culvert/Trail/Ditch Combination	5	\$33,938	\$345,270	(\$311,332)
S1-21	Build 8' Path On One Side And 8' Path On Other Side In Future	4	\$16,586,746	\$12,440,060	\$4,146,686
SEGMENT 2 (S2) US 301					
S2-02	Construct Pedestrian Underpass, Including Railroad North Of CR 478	5	\$2,582,475	\$560,625	\$2,021,850
S2-03	Construct Pedestrian Underpass, Including Railroad South Of CR 478	5		See S2-02	
S2-04	Construct Elevated Crossing North Of CR 478	4		See S2-02	
S2-05	Install Signal In-lieu Of Elevated Structure	5		See S2-02	
SEGMENT 3 (S3) SR 478					
S3-01	Construct Roundabout At CR 478/ CR 471	5	\$0	\$2,125,000	(\$2,125,000)
S3-02	Provide Trail On Both Sides At Flea Market With Multiple Crossings	5	\$0	\$657,563	(\$657,563)
S3-03	Realign Trail to Avoid Downtown Webster But Spur Up to Flea Market	5	\$1,486,631	\$2,441,471	(\$954,840)
SEGMENT 4 (S4) SR 471					
S4-01	Build Curb And Gutter Rural Section To Avoid Ditch	4	\$1,030,000	\$853,565	\$176,435
S4-02	Eliminate On Street Parking To Enable Curb And Trail Shift	4	\$594,947	\$464,373	\$130,574
S4-03	Use Pavers In Urban Section (PaveDrain)	4	\$217,913	\$613,800	(\$395,887)
S4-04	Realign Trail Onto SR 721 South Of Webster To SR 50	5	\$3,062,189	\$2,636,885	\$425,304
SEGMENT ALL (SA) ALL SEGMENTS					
SA-04	Place Ditch Outside Trail With Trail Adjacent To Roadway	4	\$974,663	\$300,169	\$674,494
SA-08	Bifurcate Trail To 8' Each Along Narrow ROW	4	\$731,705	\$917,151	(\$185,446)
SA-09	Safety Edge For Both Trail And Road	4	\$0	\$0	\$0
SA-10	Selectively Install Guardrail To Reduce Ditch Section	4	\$974,663	\$306,469	\$668,194
SA-11	Use Reduced Width Ditch Bottoms	5	\$974,663	\$361,500	\$613,163
SA-13	Vary Trail Width Based On ROW (8' - 12')	5	\$1,319,038	\$656,125	\$662,913
SA-16	Purchase Easements In-lieu Of Fee Takings	5	\$10,860,760	\$9,775,120	\$1,085,640
SA-21	Build Double Ditch	5	\$927,000	\$270,000	\$657,000
SA-23	Reduce Swale Width And Build Trail In Swale Portion	5		See SA-21	

Value Engineering Workshop: October 29 - November 2, 2018 - SUMMARY OF RESULTS

		VE Team Ranking	Cost Original Design	Cost Alternative	Initial Cost Reduction
VE DESIGN SUGGESTIONS					
SEGMENT 1 (S1) SR 673					
S1-03	Cross River At Iron Bridge Location	DS			DESIGN SUGGESTION
S1-04	Cross River At SCL RR Location	See S1-03			See S1-03
S1-13	Construct Elevated Approaches At Withlacoochee Bridge To Avoid Floodplain Impacts	DS			DESIGN SUGGESTION
S1-14	Accommodate Trail Head With Boat Ramp At Iron Bridge Park	DS			DESIGN SUGGESTION
S1-15	Avoid Flood Plain Impacts Or Compensate With Cut Adjacent To Trail	DS			DESIGN SUGGESTION
S1-16	Compensate Within State Forest For Flood Plain Impacts	DS			See S1-15
S1-17	Cross CR 673 At CR 671 To Limit Parcels	DS			DESIGN SUGGESTION
S1-22	Change CR 673 Widening (Current) – Re-evaluate Adding Trail	DS			DESIGN SUGGESTION
S1-23	Install Warning Lights At Quarry Driveway Entrances	DS			DESIGN SUGGESTION
SEGMENT 2 (S2) US 301					
S2-06	Avoid Built-up Walls For Approach Support At Crossings	DS			DESIGN SUGGESTION
S2-07	Consider ABC Method For Structures	DS			DESIGN SUGGESTION
SEGMENT 3 (S3) SR 478					
S3-04	Build Switchbacks For Bridge Ramps	DS			DESIGN SUGGESTION
SEGMENT ALL (SA) ALL SEGMENTS					
SA-02	Realign Roadway To One Side And Trail On The Other	DS			DESIGN SUGGESTION
SA-05	Reuse Millings From CR RRR Projects For Trail	DS			DESIGN SUGGESTION
SA-06	Perform Option ROW Purchase Prior To Final Design	DS			DESIGN SUGGESTION
SA-15	Address Utility Conflicts Early	DS			DESIGN SUGGESTION
SA-18	Realign Trail Up To Webster / Back From SR 50	DS			DESIGN SUGGESTION
SA-19	Install Reflective/Solar Pavement	DS			DESIGN SUGGESTION
SA-22	Revisit ROW Proposed Vs ROW Actually Required For Facilities	DS			DESIGN SUGGESTION
SA-24	Provide For Emergency Vehicle Access In Forest Area	DS			DESIGN SUGGESTION

Value Engineering Workshop: October 29 - November 2, 2018 - SUMMARY OF RESULTS

		VE Team Ranking	Cost Original Design	Cost Alternative	Initial Cost Reduction
IDEAS NOT DEVELOPED					
SEGMENT 1 (S1) SR 673					
S1-01	Cross I-75 Along CR 673	2		NOT DEVELOPED	
S1-02	Parallel I-75 From CR 683 To CR 673	ABD		ALREADY BEING DONE	
S1-05	Follow CR 113/681 To US 301 As Alternative Alignment	1		NOT DEVELOPED	
S1-11	Construct Chair Lifts To Cross River	1		NOT DEVELOPED	
S1-12	Construct Zip-Line Across River	2		NOT DEVELOPED	
SEGMENT 2 (S2) US 301					
S2-01	Replace Culvert South Of CR 478 For Drainage And Trail Crossing	3		NOT DEVELOPED	
SEGMENT 3 (S3) SR 478					
SEGMENT 4 (S4) SR 471					
SEGMENT ALL (SA) ALL SEGMENTS					
SA-01	Realign Trail Using SR 50	2		NOT DEVELOPED	
SA-03	Redo Typical Section With Trail Next To Roadway Separated By Trees/Guardrail	1		NOT DEVELOPED	
SA-07	Construct Trail In Roadway Median	1		NOT DEVELOPED	
SA-12	Allow Roadway To Sheet Flow Over Trail	ABD		ALREADY BEING DONE	
SA-14	Use Permeable Pavement For Trail	2		NOT DEVELOPED	
SA-17	Obtain Early Agreement From DEP	ABD		NOT DEVELOPED	
SA-20	Eliminate Trail Along CR 673 And Realign To Go South Along US 301	2		NOT DEVELOPED	

Section 2

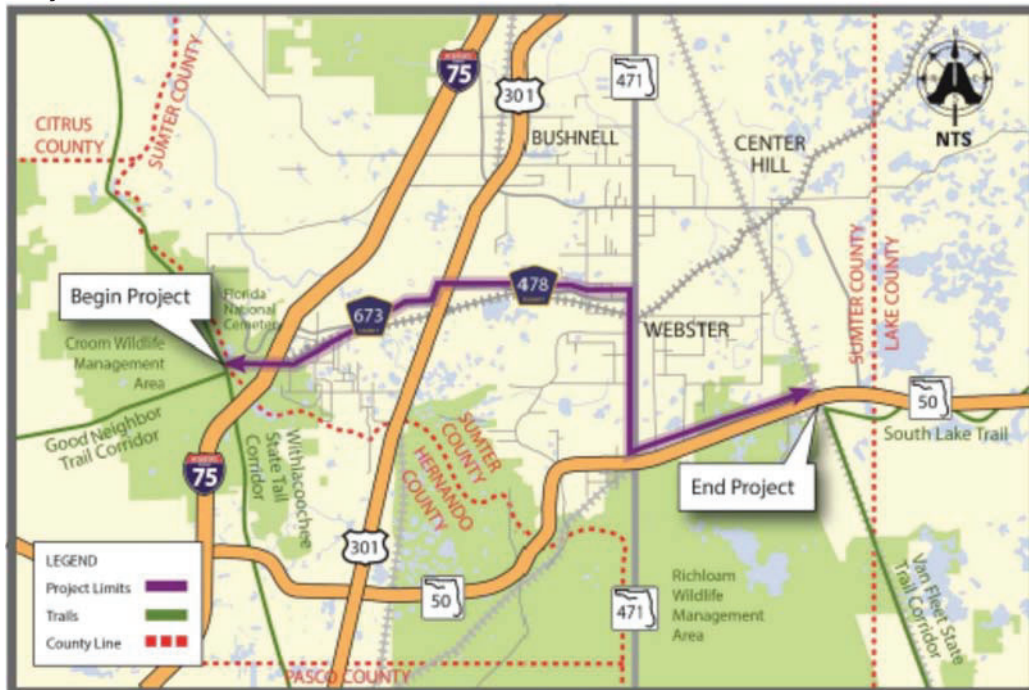
Project Description

PROJECT CHARACTERISTICS

(Reference: **South Sumter Connector Trail, from Good Neighbor Trail to James A Van Fleet Trail, Hernando & Sumter Counties Preliminary Engineering Report, October 2018, EDM No. 435471-1-22-01**)

This Value Engineering study was directed at the project being administered by District 5 of the Florida Department of Transportation, consisting of South Sumter Connector Trail, from Good Neighbor Trail to James A Van Fleet Trail. The South Sumter Connector Trail is part of the 250-mile Florida Coast to Coast Trail, which will connect St. Petersburg on the west coast of the state with Titusville on the east coast. The segment being evaluated as part of this Project Development and Environment (PD&E) Study extends approximately 22 miles (in an east-west fashion) from the Withlacoochee State Forest Trail in eastern Hernando County to the Van Fleet Trail in eastern Sumter County (see Figure below). The trail would consist of a twelve foot (12') wide paved multi-use path, to be used by multiple modes of non-motorized transportation (including pedestrian & bicycle) that would provide recreational connectivity across the Florida peninsula.

Project Location:



The trail would begin at the termination of the recently completed Good Neighbor Trail in Hernando County (at its junction with the Withlacoochee State Trail), across the Withlacoochee State Forest (WSF) and Withlacoochee River, under Interstate 75 (I-75), joining up to County Road (C.R.) 673 until its intersection with U.S. 301, then north until the intersection of C.R. 478, then east approximately 5 miles to S.R. 471 in the City of Webster. The trail would then turn south and follow along S.R. 471 to S.R. 50, turning east to link up with the Van Fleet Trail. As envisioned, the trail would be approximately 15.2 miles in length, significantly closing the gap that exists within the overall C2C Trail:

PURPOSE OF THE PROJECT

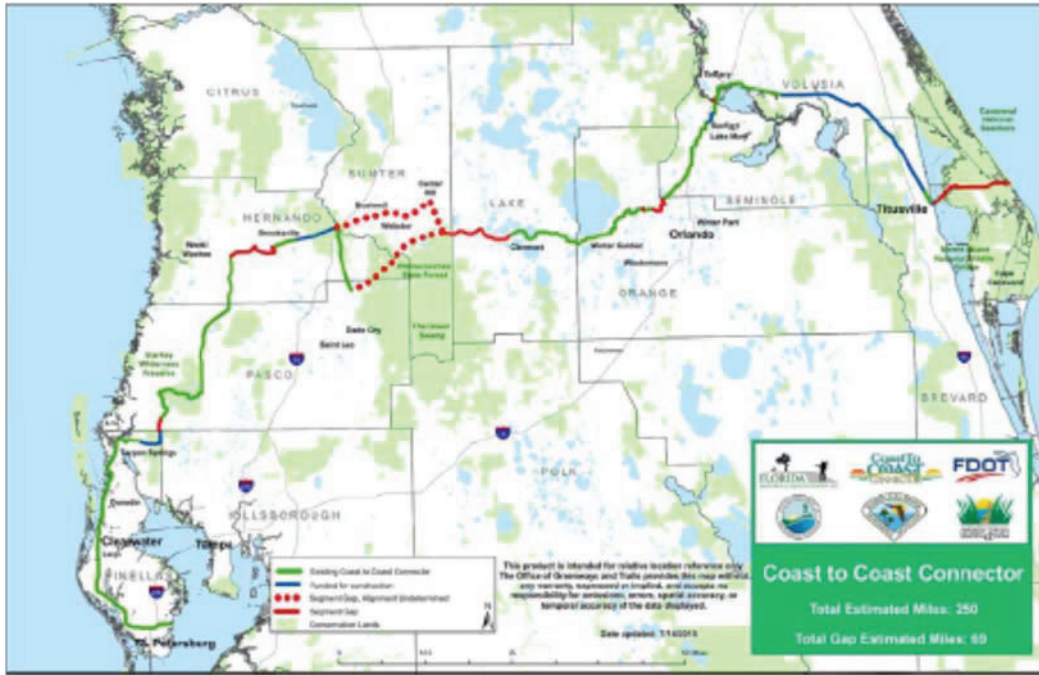
In 2014 and 2015, the Florida Legislature identified that the increasing demands continued to be placed on the state's transportation system by a growing economy, continued population growth, and increasing tourism brought significant challenges in providing additional capacity to the conventional transportation system. To be proactive in meeting these challenges, the Legislature recognized that enhanced accommodation of alternative travel modes to meet the needs of residents and visitors is in the best interests of the state, and that improving bicyclist and pedestrian safety for both residents and visitors remains a high priority. The Legislature (with support of the Governor) declared that the development of a non-motorized trail network will increase mobility and recreational alternatives for Florida's residents and visitors, enhance economic prosperity, enrich quality of life, enhance safety, and reflect responsible environmental stewardship. To that end, the Legislature directed the Florida Department of Transportation (FDOT) make use of its expertise in efficiently providing transportation projects to develop the Florida Shared-Use Non-motorized (SUN) Trail Network, consisting of a statewide network of non-motorized trails which allows non-motorized vehicles and pedestrians to access a variety of origins and destinations with limited exposure to motorized vehicles. To support this effort, the Florida SUNTrail Network would become a component of the Florida Greenways and Trails System established in Florida Statutes (F.S.) chapter 260. The statewide network consists of multiuse trails or shared-use paths physically separated from motor vehicle traffic and constructed with asphalt, concrete, or another hard surface which, by virtue of design, location, extent of connectivity or potential connectivity, and allowable uses, provides non-motorized transportation opportunities for bicyclists and pedestrians statewide between and within a wide range of points of origin and destinations, including, but not limited to, communities, conservation areas, state parks, beaches, and other natural or cultural attractions for a variety of trip purposes, including work, school, shopping, and other personal business, as well as social, recreational, and personal fitness purposes.

In 2016, FDOT commissioned a planning level study to identify potential corridors that could close the Sumter County gap shown in Figure 2. While there was strong support for closing this gap, the results of the planning study recommended that future efforts focused on using existing highway alignments as well as abandoned railroad corridors to complete this segment.

The purpose of this study is to close the existing 22 mile gap in the Coast to Coast Trail with a multi-use trail in accordance with SUNTrail standards. Identified as the South Sumter Connector Trail, this trail corridor would complete a critical connection between the recently completed sections of the Good Neighbor Trail (at its junction with the Withlacoochee State Trail) in Hernando County with the Van Fleet Trail near State Road (S.R.) 50 in Sumter County.

NEED FOR THE PROJECT

The SUNTrail Network envisions connecting various parts of the state with non-motorized multi-use paths to enhance the recreational activities within communities, improve safety between various transportation modes, and indirectly create economic development opportunities. While the entire trail network is still under development, the foundational aspects of the system built upon work that had already been completed by local governments, in collaboration with FDOT. Two specific trails were immediately identified as a part of the SUNTrail System, the St. John's River to Sea Loop and the Coast to Coast (C2C) Connector Trail (figure below). The South Sumter Connector Trail would close an approximately 22 mile gap in the C2C Trail, which is a 250 mile trail that runs from St. Petersburg in Pinellas County to Titusville in Brevard County, which currently terminates at the Good Neighbor Trail and resumes at the Van Fleet Trail.



COMMITMENTS

There are no known commitments at this stage of the project.

RIGHT of WAY

This trail project begins in the Withlacoochee Forest, and ends at the intersection of CR 471 and State Road 50 south of the town of Webster. The Right of Way (R/W) requirements can be segmented into five areas: Forest, CR 673, US 301, CR 478, and CR 471. In addition, there are intersection crossings at each of the roadways that will need to be considered. Based on the latest design alternatives and R/W estimates, the least expensive options are: Left on CR 673, Left on US 301, Right on CR 478, and Right on CR 471.

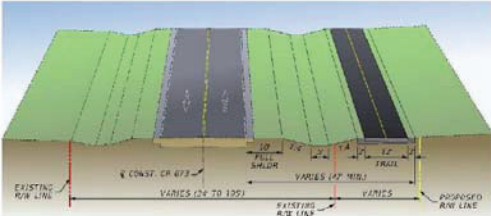
There are several areas of concern regarding the acquisition of R/W for this project. The primary consideration is that since the project is using Sun Trail funds eminent domain cannot be exercised for acquisitions. In addition, even though the acquisition sizes may be relatively small compared to most road projects, many of the rural roads in this planned corridor are as narrow as 55 feet with little room on either side. Most of the acquisitions currently identified will be relatively minor strip takings from the road frontage of rural acreage and rural residential land. There may not be large strip acquisitions on this project; however, obtaining cooperation from the landowners will be the most significant obstacle in obtaining the required Right of Way:

FM #4354711 Right of Way Cost Estimate Least Expensive Alternatives
Based on 3/27/18 Cost Estimates

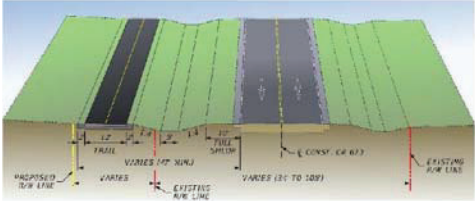
Segment	# of Parcels	Total Acreage to Be Acquired	Total Factored Costs
Forest	20	14.99 Acres	\$1,477,500
CR 673 (Left)	16	11.66 Acres	\$1,055,000
US 301 (Left)	10	1.49 Acres	\$600,000
CR 478 (Right)	61	10.73 Acres	\$3,867,500
CR 471 (Right)	36	4.732 Acres	\$2,160,000
TOTAL	143	43.60 Acres	\$9,160,000

DESIGNERS APPROACH

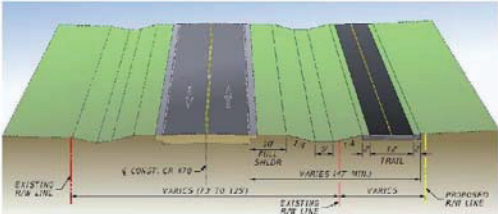
A detailed approach to the design is narrated in the Preliminary Engineering Report. Typical cross sections are shown below:



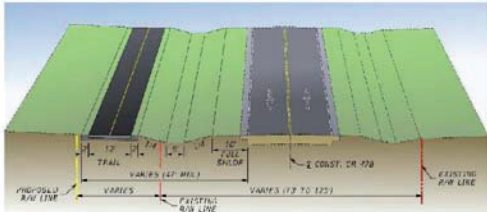
CR 673
Rural Section – Right
 Impacts 11.51 acres along 38 parcels



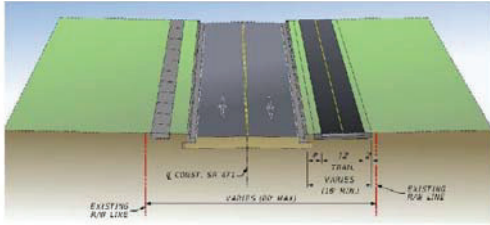
CR 673
Rural Section – Left
 Impacts 11.66 acres along 16 parcels



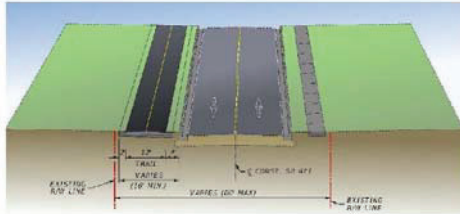
CR 478
Rural Section – Right
 Impacts 10.73 acres along 61 parcels



CR 478
Rural Section – Left
 Impacts 9.96 acres along 65 parcels



**SR 471 Urban Section –
Right**
Impacts 0 acres along 0 parcels



**SR 471 Urban Section –
Left**
Impacts 0 acres along 0 parcels

CONSTRUCTION AND RIGHT OF WAY COSTS

The project construction is expected to cost approximately \$13.5 million with Right of Way acquisition (work in progress) approximating an estimated \$9.2 million. The cost estimate, as developed by the designers, is for the PD&E stage of design as it continues to evolve.

VALUE ENGINEERING

The project subject to this Value Engineering Study is designated as **South Sumter Trail FPN: #435471-1**. The project length subject to this VE Study totals approximately 22 miles with the major component of the project being the construction of the multiuse trail.

Note: Slides developed by the design team that are intended to serve as generalized information about the project are included above and also in Appendix A.

Section 3

Study Results

RESULTS

The measurement of the success of a Value Engineering study can be performed in several important ways, mostly depending on the nature of the project under review. In this instance, the results of this study might have been expected to be rather limited due to the constraints, standards of practice and, experience gained from executing similar projects that indicated that the design was on target and achieved the expected goals. However, the VE team was able to identify some creative ideas that are being presented in this section of the report. The workshop resulted in full development of Value Engineering Recommendations (Alternatives) that offer opportunities for significant first cost savings, or value addition in some instances. These Recommendations were selected as being reasonable considerations for incorporation in the design. There were also Design Suggestions that offer measures to simplify construction and provide various means for reducing costs (in these cases the savings are hard to quantify) that may help improve the operational requirements for the finished project, and reduce the construction duration.

The reader will find enclosed a copy of the Summary of Results table that lists the results of the workshop. This table can serve as a “score sheet” for the formal implementation meeting. Following this summary table are documents developed by the VE team that offer the logic behind the developed alternatives and the design suggestions. These are complete with comparisons between the original design and the alternative, sketches, technical calculations, cost estimates and life cycle cost calculations (where applicable) for the original and alternative design components. These documents should be thoroughly evaluated as part of the implementation discussions. The order in which the alternatives are presented is as follows:

***S1 – Segment 1 – SR 673 S2 – Segment 2 – US 301 S3 – Segment 3 – SR 478
S4 – Segment 4 – SR 471 SA – All Segments***

The cost estimates that are a part of the developed alternatives are intended as general indicators of the cost results should the alternatives be accepted as they are written. Some of the alternatives are mutually exclusive. As a result, it is expected that the identified cost impacts cannot be added and taken as the final, total cost conclusion for the VE workshop. The Value Engineering Team members utilized the rough order of magnitude costs and quantities from the design documents provided by the Design Team wherever possible and used nationwide averages where appropriate (from experience). This was done to make sure that comparisons between original and alternative costs were handled consistently and fairly. When the VE team deviated from this practice by providing their own unit costs or referenced the historic data from the FDOT historic cost records, mostly for alternative materials, it has been clearly noted in the cost calculations that accompany the developed alternatives. Likewise, if there was an uncertainty in using either unit costs or quantities in the supplied estimates, these deviations were clearly annotated in the VE Team's documentation.

If the alternatives and design suggestions are approached in a positive manner, the best results can be obtained from this workshop by reviewing the alternatives with an eye to how best to make use of the alternative in question. Before rejection of a Design Alternative or Design Suggestion, the reviewers should first ask, “if we take this idea and change it to do _____, then we can accept it.” This is a positive approach. If the alternative is unacceptable, then a reason or reasons should be clearly recorded for its rejection. The ideas may be mutually exclusive of others being considered. In these instances the cost impact should reside with the alternative that is finally accepted. Some Design Suggestions are self-explanatory by their titles and did not warrant an elaboration.



Value Engineering Workshop: October 29 - November 2, 2018 - SUMMARY OF RESULTS

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S1-21	Build 8' Path On One Side And 8' Path On Other Side In Future	4	\$16,586,746	\$12,440,060	\$4,146,686
SEGMENT 2 (S2) US 301					
S2-02	Construct Pedestrian Underpass, Including Railroad North Of CR 478	5	\$2,582,475	\$560,625	\$2,021,850
S2-03	Construct Pedestrian Underpass, Including Railroad South Of CR 478	5		See S2-02	
S2-04	Construct Elevated Crossing North Of CR 478	4		See S2-02	
S2-05	Install Signal In-lieu Of Elevated Structure	5		See S2-02	
SEGMENT 3 (S3) SR 478					
S3-01	Construct Roundabout At CR 478/ CR 471	5	\$0	\$2,125,000	(\$2,125,000)
S3-02	Provide Trail On Both Sides At Flea Market With Multiple Crossings	5	\$0	\$657,563	(\$657,563)
S3-03	Realign Trail to Avoid Downtown Webster But Spur Up to Flea Market	5	\$1,486,631	\$2,441,471	(\$954,840)
SEGMENT 4 (S4) SR 471					
S4-01	Build Curb And Gutter Rural Section To Avoid Ditch	4	\$1,030,000	\$853,565	\$176,435
S4-02	Eliminate On Street Parking To Enable Curb And Trail Shift	4	\$594,947	\$464,373	\$130,574
S4-03	Use Pavers In Urban Section (PaveDrain)	4	\$217,913	\$613,800	(\$395,887)
S4-04	Realign Trail Onto SR 721 South Of Webster To SR 50	5	\$3,062,189	\$2,636,885	\$425,304
SEGMENT ALL (SA) ALL SEGMENTS					
SA-04	Place Ditch Outside Trail With Trail Adjacent To Roadway	4	\$974,663	\$300,169	\$674,494
SA-08	Bifurcate Trail To 8' Each Along Narrow ROW	4	\$731,705	\$917,151	(\$185,446)
SA-09	Safety Edge For Both Trail And Road	4	\$0	\$0	\$0
SA-10	Selectively Install Guardrail To Reduce Ditch Section	4	\$974,663	\$306,469	\$668,194
SA-11	Use Reduced Width Ditch Bottoms	5	\$974,663	\$361,500	\$613,163
SA-13	Vary Trail Width Based On ROW (8' – 12')	5	\$1,319,038	\$656,125	\$662,913
SA-16	Purchase Easements In-lieu Of Fee Takings	5	\$10,860,760	\$9,775,120	\$1,085,640
SA-21	Build Double Ditch	5	\$927,000	\$270,000	\$657,000
SA-23	Reduce Swale Width And Build Trail In Swale Portion	5		See SA-21	

Value Engineering Workshop: October 29 - November 2, 2018 - SUMMARY OF RESULTS

		VE Team Ranking	Cost Original Design	Cost Alternative	Initial Cost Reduction
VE DESIGN SUGGESTIONS					
SEGMENT 1 (S1) SR 673					
S1-03	Cross River At Iron Bridge Location	DS			DESIGN SUGGESTION
S1-04	Cross River At SCL RR Location	See S1-03			See S1-03
S1-13	Construct Elevated Approaches At Withlacoochee Bridge To Avoid Floodplain Impacts	DS			DESIGN SUGGESTION
S1-14	Accommodate Trail Head With Boat Ramp At Iron Bridge Park	DS			DESIGN SUGGESTION
S1-15	Avoid Flood Plain Impacts Or Compensate With Cut Adjacent To Trail	DS			DESIGN SUGGESTION
S1-16	Compensate Within State Forest For Flood Plain Impacts	DS			See S1-15
S1-17	Cross CR 673 At CR 671 To Limit Parcels	DS			DESIGN SUGGESTION
S1-22	Change CR 673 Widening (Current) – Re-evaluate Adding Trail	DS			DESIGN SUGGESTION
S1-23	Install Warning Lights At Quarry Driveway Entrances	DS			DESIGN SUGGESTION
SEGMENT 2 (S2) US 301					
S2-06	Avoid Built-up Walls For Approach Support At Crossings	DS			DESIGN SUGGESTION
S2-07	Consider ABC Method For Structures	DS			DESIGN SUGGESTION
SEGMENT 3 (S3) SR 478					
S3-04	Build Switchbacks For Bridge Ramps	DS			DESIGN SUGGESTION
SEGMENT ALL (SA) ALL SEGMENTS					
SA-02	Realign Roadway To One Side And Trail On The Other	DS			DESIGN SUGGESTION
SA-05	Reuse Millings From CR RRR Projects For Trail	DS			DESIGN SUGGESTION
SA-06	Perform Option ROW Purchase Prior To Final Design	DS			DESIGN SUGGESTION
SA-15	Address Utility Conflicts Early	DS			DESIGN SUGGESTION
SA-18	Realign Trail Up To Webster / Back From SR 50	DS			DESIGN SUGGESTION
SA-19	Install Reflective/Solar Pavement	DS			DESIGN SUGGESTION
SA-22	Revisit ROW Proposed Vs ROW Actually Required For Facilities	DS			DESIGN SUGGESTION
SA-24	Provide For Emergency Vehicle Access In Forest Area	DS			DESIGN SUGGESTION

VE ALTERNATIVES

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-06
DESCRIPTION:	Install Hand Cranked Ferry To Cross River	SHEET NO.: 1 of 4

ORIGINAL DESIGN:

The original design calls for crossing Withlacoochee. A bridge crossing is implied.

ALTERNATIVE:

The alternative design suggests installing a hand-cranked ferry to convey trail users across the river. (Other names, cable ferry, rope ferry)

OPPORTUNITIES:

- **REDUCES INITIAL COST BY ELIMINATING BRIDGE CONSTRUCTION**
- **OFFERS A UNIQUE EXPERIENCE TO USERS, POSSIBLY WOULD ATTRACT CURIOUS OUTDOOR TRAVELERS**
- **HAS HISTORIC TRANSPORTATION VALUE**
- **VERY LOW ENVIRONMENTAL IMPACT**
- **OPPORTUNITY FOR COMMITMENT BY MANAGING AGENCY**
- **ALIGNS WITH NATURAL AND HISTORIC MISSION OF AREA (CROOM)**

RISKS:

- **IRRATIONAL FEAR ON THE PART OF MANAGEMENT**
- **IT MAY NEVER HAVE BEEN DONE IN A SIMILAR SETTING, WOULD BE AN INNOVATION**
- **PROBABLY REQUIRES A MARINE CONSTRUCTION DESIGN**
- **THOROUGH VETTING NEEDED TO MANAGE APPROPRIATELY**

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

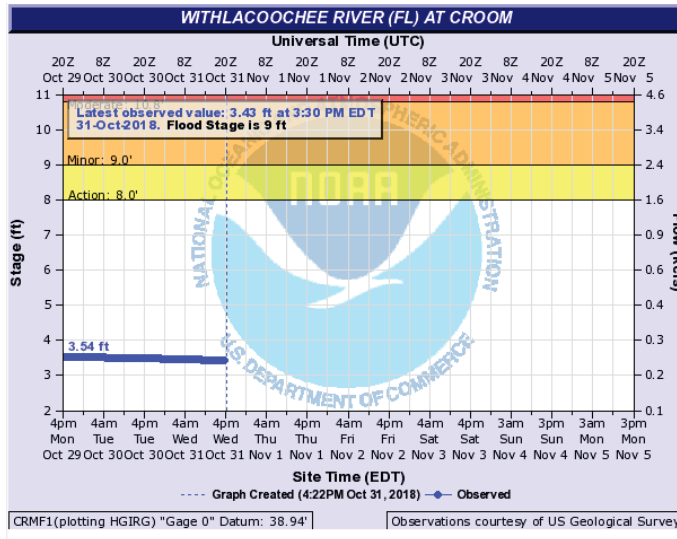
This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 0	\$	\$ 0
ALTERNATIVE	\$ 58,500	\$	\$ 58,500
VALUE ADDITION	(\$ 58,500)	\$	(\$ 58,500)

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-06
DESCRIPTION:	Install Hand Cranked Ferry To Cross River	SHEET NO.: 2 of 4

TECHNICAL DISCUSSION:



As seen in this clip taken from the gauge at Croom, the Withlacoochee is a shallow stream. The depth range is wide, with flood stages over 11'. Accordingly, a flat bottom or pontoon ferry would be most adaptable to a wide range of water depths.

Ferries were common throughout Florida for a century or more prior to the introduction of motor vehicles. Even then, there were car ferries at locations where bridges could not be built or where traffic was so slight that the cost of a bridge could not be justified.

Ferries traditionally carried foot passengers, horses, cattle, sheep, dogs, wagons and draft animals across water barriers. Ferries in general were an inexpensive, reliable means of moving cargo and people in route to other places.

A ferry on the SunTrail at the Withlacoochee would need to be simple, robust, well-designed and essentially fool-proof. It would need to have a surface that would support bicycles and horses. Recommended size of ferry platform would be 12' x 20', a size that would accommodate a service truck or small emergency vehicle. Essentially the ferry would be tethered between stabilizing cables anchored on the west and east banks. A crank and winch apparatus on the side of the boat operated as a fetch and retrieve mechanism moves the ferry itself from bank to bank. Touch-down points would need to be stabilized so that passengers would land on a firm footing. The ferry itself would require retaining edges suitable for passenger safety. In addition, usefulness would rely on hand operated capstan belay and retrieve cabling to recall the ferry when passengers arrive at the shore opposing where the ferry is located.

A primitive ferry on a rural trail is an appealing feature for active recreational users. For the time being, until a bridge can be funded, designed and constructed, a primitive ferry can serve as a link between trail segments on each side of the Withlacoochee River. Depending on the popularity of the feature, the option exists to retain the ferry for users after a bridge is in place. Meanwhile the ferry can be a prototype for other similar trail situations where the desire exists to cross a water body between two trails. Agency oversight would be needed to keep an eye on ferry functionality, to observe design concerns, or to evaluate improvement options.

Use of a manually powered ferry could be achieved in a relatively short period of time. Interim use is a pragmatic approach to getting the trail links connected. Could be a Phase I interim opportunity.

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-06
DESCRIPTION:	Install Hand Cranked Ferry To Cross River	SHEET NO.: 3 of 4

ORIGINAL DESIGN:

NONE. SHORT-TERM ACCOMMODATION IS NON-EXISTENT. LONG TERM PLAN IS FOR A BRIDGE SPANNING THE RIVER AND FLOOD PLAIN.

ALTERNATIVE:



Ferries can be rope, cable or chain-guided. This is a small chain ferry in the Netherlands.

See: <https://www.hupi.org/HPeJ/0022/HumanPoweredChainFerries.pdf>



This image is of the hand operated cable ferry on the Oklawaha River, taken around 1906. Note the horse and buggy loaded on the deck. Ferry appears to be about 8' wide and 15' long.



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: S1-06		
DESCRIPTION:	Install Hand Cranked Ferry To Cross River				SHEET NO. 4 of 4		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Construct 2 200 sf concrete landing pads, reinforced	EA			\$ -	400	10	\$ 4,000
Cable or chain	LF			\$ -	200	5	\$ 900
Capstan winches,	EA			\$ -	2	1,200	\$ 2,400
Pontoon boat w. deck	EA			\$ -	1	25,000	\$ 25,000
Stantions	EA			\$ -	4	1,500	\$ 6,000
Misc. auxiliary equipment	LS			\$ -	1	7,500	\$ 7,500
Kiosks, CST	EA			\$ -	2	500	\$ 1,000
				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
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				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
Sub-total				\$ -			\$ 46,800
Mark-up at 25.00%				\$ -			\$ 11,700
TOTAL				\$ -			\$ 58,500
Cost Avoidance / (Value Addition):							(\$58,500)

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-07
DESCRIPTION:	Construct Steel Truss Bridge To Retain Historic Significance	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for construction of a prestressed concrete beam bridge with span arrangements ranging from 3 to 5 spans of 125ft each.

ALTERNATIVE:

The alternative examines construction of a signature type steel truss structure over the Withlacoochee River to mimic the appearance of the historic bridge

OPPORTUNITIES:

- RESTORE APPEARANCE OF HISTORIC BRIDGE CROSSING
- OPPORTUNITY TO PROVIDE HISTORICAL MARKERS/SIGNAGE
- REDUCE SUBSTRUCTURE ELEMENTS PLACED WITHIN THE WATERWAY BY UTILIZING LONGER SPAN(S)
- INCREASE SAFETY BY PROVIDING A REDUNDANT STRUCTURE

RISKS:

- ADDITIONAL MAINTENANCE EFFORT
- SPECIALTY CONTRACTOR MAY BE REQUIRED

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 2,953,300	\$	\$ 2,953,300
ALTERNATIVE	\$ 2,607,500	\$	\$ 2,607,500
SAVINGS	\$ 345,800	\$	\$ 345,800

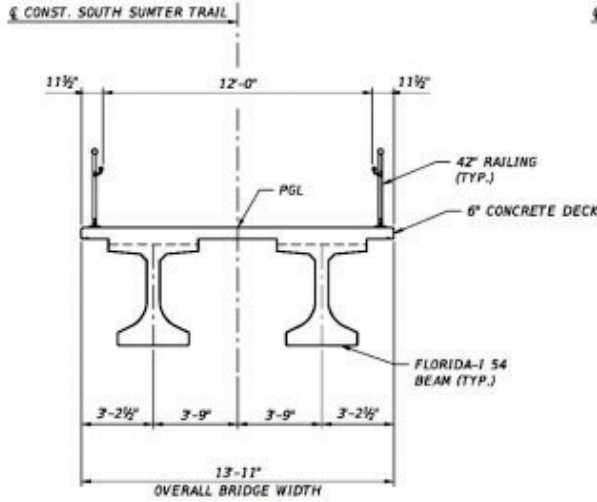
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-07
DESCRIPTION:	Construct Steel Truss Bridge To Retain Historic Significance	SHEET NO.: 2 of 5
<p>TECHNICAL DISCUSSION:</p> <p>Multiple variations of this alternative were discussed and considered. A technical summary of each variation, including the preferred alternative, is included below.</p> <p>Preferred Alternative S1-07 – Construct Steel Truss Bridge to Retain Historic Significance:</p> <p>The preferred alternative is to construct a steel truss bridge over the Withlacoochee River. There are several pre-fabricated steel truss bridge options such as those offered by Contech which would achieve the desired outcome of this alternative. The goal of the alternative is to recreate the appearance of the historic Iron Bridge crossing and provide an opportunity to relate the new structure to the history of the location. Prefabricated steel truss bridges are customizable to the geometric constraints of the project. For this particular location, clear width and height of the structure should allow for pedestrian and equestrian users. The stability and optics of a steel truss span are favorable for an equestrian crossing. A span length of approximately 160ft will be able to clear the river without having substructure elements in the river. The final skew of the crossing could impact the required length to span the river. These span lengths are easily achievable with prefabricated steel truss options.</p> <p>Alternative Variation S1-08 – Construct Suspension Bridge Across River:</p> <p>This alternative variation is to construct a suspension bridge over the Withlacoochee River. The goal of the alternative is to create a visually appealing signature structure at the river crossing. For this particular location, clear width and height of the structure should allow for pedestrian and equestrian users. The stability and optics of a suspension bridge are perceived to be unfavorable for an equestrian crossing. A span length of approximately 160ft will be able to clear the river without having substructure elements in the river. The final skew of the crossing could impact the required length to span the river. These span lengths are easily achievable with suspension bridge options.</p> <p>Alternative Variation S1-09- Construct Timber Bridge Across River:</p> <p>This alternative variation is to construct a timber bridge over the Withlacoochee River. The goal of the alternative is to create a visually appealing signature structure at the river crossing. For this particular location, clear width and height of the structure should allow for pedestrian and equestrian users. The stability and optics of a timber bridge are favorable for an equestrian crossing. A span length of approximately 160ft will be able to clear the river without having substructure elements in the river. These span lengths may be difficult to achieve with a timber structure.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-07
DESCRIPTION:	Construct Steel Truss Bridge To Retain Historic Significance	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-07
DESCRIPTION:	Construct Steel Truss Bridge To Retain Historic Significance	SHEET NO.: 4 of 5
<p>ASSUMPTIONS:</p> <ol style="list-style-type: none"> 1) Unit costs for the original design are based on \$280/SF, 625FT length, and 13.5FT width as is documented in the LRE. 2) For the cost of the proposed alternative, the signature span was assumed to be 175FT and the remaining (625-175) 450FT was assumed to be the same as the LRE. For the 175FT prefabricated steel truss span, a unit cost of \$2200/LF was used based on an approximation from Contech. <p>QUANTITIES:</p> <p>ORIGINAL DESIGN:</p> <ol style="list-style-type: none"> 1) Area of river crossing bridge = 625FT x 13.5FT ≈ 8,438SF 2) Cost of original design = 8,438SF x \$280.SF = \$2,362,640 <p>ALTERNATIVE:</p> <ol style="list-style-type: none"> 1) Area of prestressed beam bridge = (625FT – 175FT) x 13.5FT = 6,075SF 2) Length of steel truss span = 175FT 3) Unfactored cost of alternative = (6,075SF x \$280/SF) + (175FT x \$2200/LF) = \$2,086,000 		

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-10
DESCRIPTION:	Provide Viewing Deck/Fishing Pier On Bridge	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for no amenities along the river crossing bridge.

ALTERNATIVE:

The alternative design suggests adding outlook and fishing overhang locations along river crossing bridge.

OPPORTUNITIES:

- **PROVIDE REST AREA FOR USERS TO ENJOY THE SCENIC SURROUNDINGS**
- **ATTRACT USERS BY PROVIDING A FISHING LOCATION**

RISKS:

- **UNIQUE STRUCTURE GEOMETRY REQUIRES CUSTOM DESIGN & FABRICATION ELEMENTS**
- **POTENTIAL SAFETY CONCERNS BETWEEN FISHING ABOVE AND RIVER USERS BELOW**

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 0	\$	\$ 0
ALTERNATIVE	\$ 20,000	\$	\$ 20,000
VALUE ADDITION	(\$ 20,000)	\$	(\$ 20,000)

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-10
DESCRIPTION:	Provide Viewing Deck/Fishing Pier On Bridge	SHEET NO.: 2 of 5

TECHNICAL DISCUSSION:

This alternative provides overhang locations along the river crossing bridge for resting, enjoying the scenic surroundings, and fishing in the Withlacoochee River. Overhang construction can be achieved in several ways with the most likely solution being extended transverse floor beams with reinforced concrete slab.

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-10
DESCRIPTION:	Provide Viewing Deck/Fishing Pier On Bridge	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-10
DESCRIPTION:	Provide Viewing Deck/Fishing Pier On Bridge	SHEET NO.: 4 of 5
<p>ASSUMPTIONS:</p> <ol style="list-style-type: none"> 1) The additional cost resulting from the increased design and construction efforts is difficult to quantify but for this analysis, additional construction costs will be assumed to equal material costs. 2) Only Additional materials will be quantified. It is assumed there will be two overhangs along each edge of the bridge and the outlook areas will be roughly 5ft x 20ft for a total square footage of 100SF/overhang. 3) Unit cost of bridge concrete will be \$800/CY per FDOT Structures Design Guidelines 9.2.2. <p>QUANTITIES:</p> <p>ORIGINAL DESIGN:</p> <ol style="list-style-type: none"> 1) The original design has no cost associated with this alternative. <p>ALTERNATIVE:</p> <ol style="list-style-type: none"> 1) Additional concrete required: 4 overhangs x 100SF/overhang x 0.667ft thickness \approx 270CF \approx 10CY 2) Cost of concrete: \$800/CY x 10CY = \$8,000 3) Additional construction effort = material cost = \$8,000 4) Total unfactored cost of alternative = \$16,000 		



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: S1-10		
DESCRIPTION:	Provide Viewing Deck/Fishing Pier On Bridge				SHEET NO. 5 of 5		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Overhang Materials	CY			\$ -	10	\$800	\$ 8,000
Overhang Effort	CY			\$ -	10	\$ 800.00	\$ 8,000
				\$ -			\$ -
				\$ -			\$ -
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				\$ -			\$ -
				\$ -			\$ -
Sub-total				\$ -			\$ 16,000
Mark-up at 25.00%				\$ -			\$ 4,000
TOTAL				\$ -			\$ 20,000
Cost Avoidance / (Value Addition):							(\$20,000)

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-18		
DESCRIPTION:	Realign Trail Along CR 674/CR 654A	SHEET NO.: 1 of 5		
ORIGINAL DESIGN: The original design calls for the trail to follow along CR 673 to US 301 then cross to follow CR 478 west.				
ALTERNATIVE: The alternative design suggests turning left from CR 673 to travel north on CR 674 then make a right on to CR 654A. Follow CR 654A across US 301 into CR 478.				
OPPORTUNITIES:	RISKS:			
<ul style="list-style-type: none"> • REDUCES THE HAZARDS OF CROSSING US 301 AT CR 673 • ELIMINATE ROW ACQUISITION FROM CHURCHES • MORE SCENIC ROUTE FROM CYCLISTS • ELIMINATES RIDING ALONGSIDE THE RAIL 	<ul style="list-style-type: none"> • 4-6 PARCEL IMPACTS ON CR 654A • MULTIPLE PARCELS IMPACTED ALONG CR 674 			
CATEGORIES:				
<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	Other
VE RESOLUTION:				
<u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u>				
This VE recommendation				
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST	
COST SUMMARY	\$ 3,253,599	\$	\$ 3,253,599	
ALTERNATIVE	\$ 1,818,202	\$	\$ 1,818,202	
SAVING	\$ 1,435,396	\$	\$ 1,435,396	

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-18
DESCRIPTION:	Realign Trail Along CR 674/CR 654A	SHEET NO.: 2 of 5

TECHNICAL DISCUSSION:

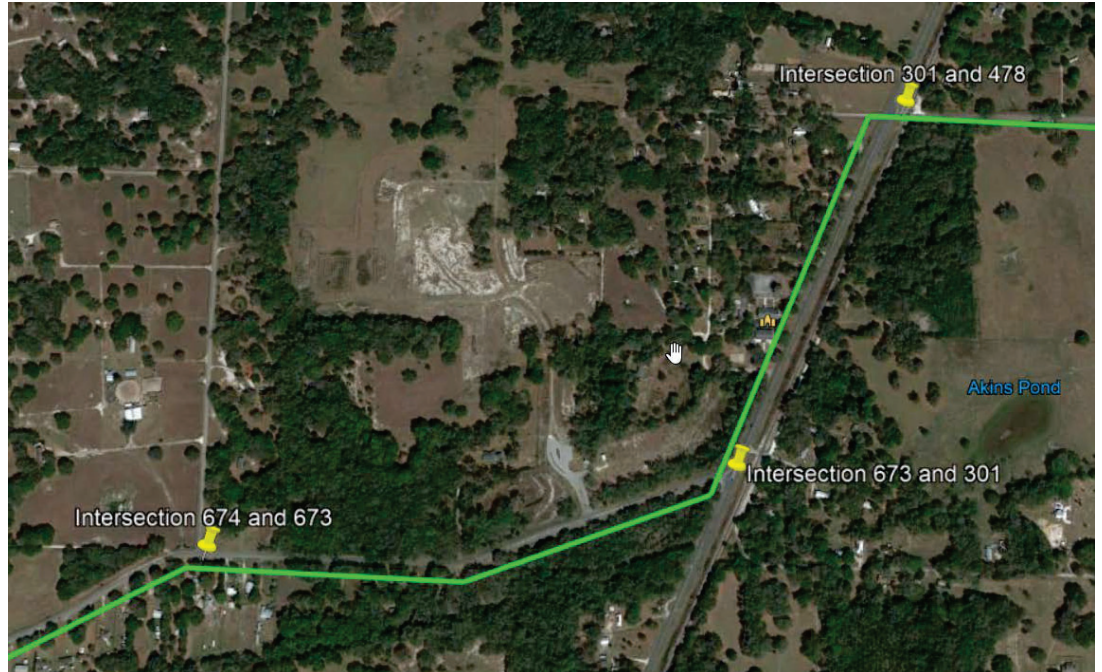
This alternative moves cyclists from the proposed alignment (CR 673 to US 301 to CR 478) to avoid US 301. To implement the alignment suggested by the VE Team the trail would start on the proposed alignment then go north at the intersection of CR 673 and CR 674, this path is continued for approximately 0.5 miles north where it will continue west to meet CR 654A. Right of way would need to be acquired along CR 674 but can limited based on the recommended typical section. Currently, CR 654 A does not directly intersect with CR 674 so parcels would need to be purchased to complete the trail. The anticipated impacts along CR 654A are 4 parcels located along the north side of the alignment and 6 parcels located on the south. The parcels along the original alignment proposed purchasing right of way from church properties verses this suggestion proposed acquiring land from home owners. This alternative alignment directly connects to CR 478 allowing the user to cross US 301 but not travel along it.

The VE Team considered this idea to increase the safety and operation of the trail. By following this alignment, the cyclist and pedestrians would be no longer be traveling with the high-speed traffic along US 301. Further this allows a clear line of sight to cross both US 301 and the active rail line. This gives users a clear location to cross US 301 because it is a continual straight line traveling East from CR 654 A rather than the sharp turn from US 301 to CR 478 that was originally proposed.

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-18
DESCRIPTION:	Realign Trail Along CR 674/CR 654A	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-18
DESCRIPTION:	Realign Trail Along CR 674/CR 654A	SHEET NO.: 4 of 5

ASSUMPTIONS:

- 1) Original cost extracted from LRE provided to the VE Team
- 2) All other cost pulled from Basis of Estimates

QUANTITIES:

ORIGINAL DESIGN:

- 1) All RW cost were adjust for the area that pertained to this portion of the design.
- 2) **Basis of estimates were applied to the given dimensions and right of way acreage found in the typical sections provided to the VE team.**

ALTERNATIVE:

- 1) Acreage of right of way is based on the values of right away given to the team.
- 2) Right of way areas that were not provided to the team were determined by the reviewing the parcel with FDOT Right of way Department.
- 3) Selective clearing and gurbing based on the POTENTIAL of needing to protect trees within the right of way.
- 4) All dimensions that were not provided were measured using Google Earth.

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-20
DESCRIPTION:	Selectively Build Box Culvert/Trail/Ditch Combination	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for a ditch outside the trail through the rural sections.

ALTERNATIVE:

The alternative design suggests to convey ditch flows with a culvert, and place trail on top of this culvert in select areas.

OPPORTUNITIES:

- **REDUCED RIGHT OF WAY REQUIREMENTS.**
- **AVOIDS RW TAKE IF SELLER IS NOT WILLING.**
- **ALLOWS ALIGNMENT TO CONTINUE IF RW CANNOT BE ACQUIRED.**

RISKS:

- **NOT SUITABLE FOR ENTIRE CORRIDOR.**
- **REQUIRES ADDITIONAL DETAILS IN PLANS.**
- **ADDITIONAL MATERIAL COST.**

CATEGORIES:

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 33,938	\$	\$ 33,938
ALTERNATIVE	\$ 345,270	\$	\$ 345,270
VALUE ADDITION	(\$ 311,332)	\$	(\$ 311,332)

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-20
DESCRIPTION:	Selectively Build Box Culvert/Trail/Ditch Combination	SHEET NO.: 2 of 5

TECHNICAL DISCUSSION:

In areas where the planned alignment is interrupted by an unwilling seller, it would be possible to use a box culvert (2' high by 4' wide) to convey the ditch flow and have the trail run on top of the culvert. This would eliminate the need for right of way and allow the trail to continue past the unwilling seller's property. An example property is shown in the illustrations and used to analyze potential impacts and savings.

Illustration

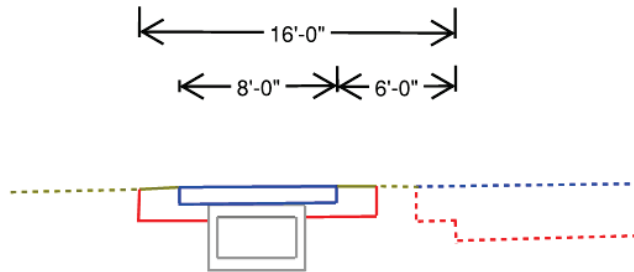
PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-20
DESCRIPTION:	Selectively Build Box Culvert/Trail/Ditch Combination	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



Showing 17' of Right of Way from edge of travel lane, with a 39' take for 335' across the property.

ALTERNATIVE:



Trail can ride on top of culvert and fit within the available space. Suggest 5' transition on either side of the property that is avoided.

Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-20
DESCRIPTION:	Selectively Build Box Culvert/Trail/Ditch Combination	SHEET NO.: 4 of 5
<p>ASSUMPTIONS:</p> <ul style="list-style-type: none"> 1) Right of Way cost per acre: \$90,500 2) Culvert (class II concrete) per cy: \$408 3) Excavation difference is ignored. 4) Per application analysis. <p>QUANTITIES:</p> <p>ORIGINAL DESIGN:</p> <ul style="list-style-type: none"> 1) 39' Right of way take for 335' = 0.3 acres <p>ALTERNATIVE:</p> <ul style="list-style-type: none"> 1) 345' LF of concrete box culvert by 53sqft of concrete per LF = 677cy. 2) No right of way take. 		

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-21
DESCRIPTION:	Build 8' Path On One Side And 8' Path On Other Side In Future	SHEET NO.: 1 of 4

ORIGINAL DESIGN:

The original design calls for multiuse path built to current SunTrail standard 12' preferred designs, 10' alternative where necessary

ALTERNATIVE:

The alternative design suggests constructing an 8' path along one side of road for bi-directional use as an interim connecting link in the system. Develop design in anticipation of returning to construct a second 8' path on other side. Result will function as paired unidirectional side paths.

OPPORTUNITIES:

- **REDUCED INITIAL COST**
- **ASSESSMENT OF DEMAND AND OTHER NEEDS**
- **SIMPLIFIES ADDRESSING INITIAL RIGHT OF WAY ISSUES**
- **EASES FUNDING**
- **REQUIRES CHAMPION TO SCHEDULE AND CARRY OUT PHASE II PROGRAMMING**

RISKS:

- **LOSS OF PROJECT MOMENTUM**

CATEGORIES:

Safety	<input checked="" type="checkbox"/> Operations	Environment	<input checked="" type="checkbox"/> Construction	Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 16,586,746	\$	\$ 16,586,746
ALTERNATIVE	\$ 12,440,060	\$	\$ 12,440,060
SAVINGS	\$ 4,146,686	\$	\$ 4,146,686

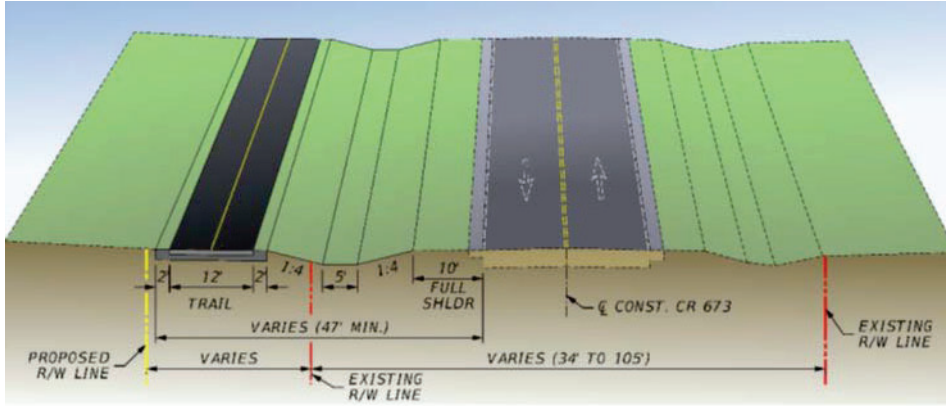
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-21
DESCRIPTION:	Build 8' Path On One Side And 8' Path On Other Side In Future	SHEET NO.: 2 of 4
<p>TECHNICAL DISCUSSION:</p> <p>This Phased approach allows earlier scheduling for a shorter-term activity. The resulting unidirectional side paths are operationally safer for riders. It is some cyclists preference to use side paths. Side path design is fairly advanced so there are advantages in improved design that can be deployed.</p> <p>One iteration of dedicated bicycle routes includes construction of side paths along public roads. Typically side paths are intended as unidirectional facilities where all users travel in the same direction parallel to the adjoining travel lane. Side paths may be slightly elevated behind a raised ribbon curbing.</p> <p>This recommendation is to build the project in two phases. The first phase would be an 8' side path that for a time would serve as a bi-directional facility. At a later (defined) date, as Phase II a second side path would be built along the other side of the roadway. The result would be two parallel cycling paths (tracks), serving opposite directions.</p> <p>A major safety issue with bidirectional side paths along a road is conflict points at intersections where cyclists approaching from the downstream direction are not noticed by drivers. Where side paths are wider, oncoming cyclists are exposed to a wider crossing location where vehicles are likely to dwell on the path and impede crossing cyclists. A narrower side path where cyclists are traveling in the same direction as main stream traffic is somewhat less likely to result in intersection conflicts.</p> <p>Phased construction may cost somewhat more due to need for additional mobilization.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SI-21
DESCRIPTION:	Build 8' Path On One Side And 8' Path On Other Side In Future	SHEET NO.: 3 of 4

ORIGINAL DESIGN:



ALTERNATIVE:



Phase I

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S2-02
DESCRIPTION:	Construct Pedestrian Underpass, Including Railroad North Of CR 478	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for the construction of a pedestrian overpass at the intersection of SR301 and CR478.

ALTERNATIVE:

The alternative design suggests construction of an underpass structure which crosses both SR301 and the CSX rail line. The structure will be located on the north side of CR478.

OPPORTUNITIES:

- **ELIMINATES THE NEED FOR A LARGE HELIX OR SWITCH-BACK STRUCTURE TO ACHIEVE THE 23.5FT CLEARANCE OVER THE CSX RAIL LINE**
- **IMPROVES SIGHT DISTANCE CONCERNS AT THIS BUSY INTERSECTION**
- **RESULTS IN LESS DISRUPTION OF ACCESS TO ADJACENT PROPERTIES WHICH MAY BE NEGATIVELY IMPACTED BY A HELIX OR SWITCH-BACK STRUCTURE**
- **MORE VISUALLY APPEALING THAN AN OVERHEAD STRUCTURE**
- **REDUCED MAINTENANCE EFFORTS**
- **REDUCED CONSTRUCTION TIME**

RISKS:

- **DRAINAGE CHALLENGES OF A DEPRESSED STRUCTURE**
- **SAFETY ISSUES ARISING FROM ENCLOSED AND OUT-OF-SIGHT TRAIL**

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 2,582,475	\$	\$ 2,582,475
ALTERNATIVE	\$ 560,625	\$	\$ 560,625
SAVINGS	\$ 2,021,850	\$	\$ 2,021,850

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S2-02
DESCRIPTION:	Construct Pedestrian Underpass, Including Railroad North Of CR 478	SHEET NO.: 2 of 5

TECHNICAL DISCUSSION:

Multiple variations of this alternative were discussed and considered. A technical summary of each variation, including the preferred alternative, is included below.

Preferred Alternative S2-02 – Construct Pedestrian Underpass, Including Railroad North of CR 478:

The preferred alternative is to construct a pedestrian underpass North of CR 478. This underpass structure will cross both SR 301 and the CSX railroad. The underpass structure will likely conform to FDOT standards for concrete box culverts, however, some pre-cast concrete companies such as Contech may offer more aesthetically appealing structures which would also work if so desired. The structure will need to be designed to carry loads from overburden, highway live-loading, and rail live-loading. An overall structure width less than 20ft is desirable to avoid being classified as a bridge. Additional advantages of this alternative are the options for accelerated bridge construction which should be especially appealing for the crossing of the railroad. Drainage related to this structure will be a challenge to overcome as it will be a localized low point at which water will accumulate.

Alternative Variation S2-03 – Construct Pedestrian Underpass, Including Railroad South of CR 478:

This alternative variation is to construct a pedestrian underpass South of CR 478. This underpass structure will cross both SR 301 and the CSX railroad. The underpass structure will likely conform to FDOT standards for concrete box culverts, however, some pre-cast concrete companies such as Contech may offer more aesthetically appealing structures which would also work if so desired. The structure will need to be designed to carry loads from overburden, highway live-loading, and rail live-loading. An overall structure width less than 20ft is desirable to avoid being classified as a bridge. Additional advantages of this alternative are the options for accelerated bridge construction which should be especially appealing for the crossing of the railroad. Drainage related to this structure will be a challenge to overcome as it is already a localized low point which has a drainage box culvert crossing.

Alternative Variation S2-04 – Construct Elevated Crossing North of CR 478:

This alternative variation is to construct a pedestrian overpass North of CR 478. This overpass structure will cross both SR 301 and the CSX railroad. The overpass structure is currently proposed as a prestressed concrete girder bridge, however, some pre-fabricated options such as Contech offer more aesthetically appealing structures which would also work if so desired. An advantage to this alternative is the more favorable drainage conditions. Drawbacks of this alternative include construction of large helix or switch-back structures required to access the crossing, reduced sight distances, reduced access to adjacent properties, the large vertical clearance requirements of the railroad, and railroad closure durations during bridge construction.

Alternative Variation S2-05 – Install Traffic Signal In-Lieu of Elevated Structure:

This alternative variation is to construct a signalized intersection at SR 301 and CR 478. Advantages of this alternative are the avoidance of constructing any crossing structures and the related challenges. Disadvantages of this alternative are obtaining signal warrants, stopping traffic on higher speed facilities, and reduced safety of at grade pedestrian crossings.

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S2-02
DESCRIPTION:	Construct Pedestrian Underpass, Including Railroad North Of CR 478	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S2-02
DESCRIPTION:	Construct Pedestrian Underpass, Including Railroad North Of CR 478	SHEET NO.: 4 of 5

ASSUMPTIONS:

- 1) The only bridge costs included in the LRE are for the bridge over the Withlacoochee River.
- 2) Costs of land acquisition is the same for both alternatives as the overpass will require helix or switch-back structures while the underpass will require ramps leading down to the crossing.
- 3) Unit cost of proposed prestressed concrete beam bridge = \$105/SF low end to \$145/SF per FDOT Structures Design Guidelines 9.2.3. A unit cost of \$135/SF will be used for this analysis based on the tall substructure required to cross the railroad and the difficulties resulting from a rural location and railroad crossing. The proposed out-to-out width is 14ft per the PER which results in a unit cost of \$1890/LF. This unit cost will be applied to the main span(s) only.
- 4) Unit cost of the proposed flat slab switchback structures will be \$135/SF per FDOT Structures Design Guidelines 9.2.3. The proposed out-to-out width is 14ft per the PER which results in a unit cost of \$1890/LF.
- 5) The length of the switch-back structures is calculated based on the 23.5ft height requirement over the railroad and a maximum grade of 1V:12H per ADA requirements. Additionally, a 6ft length of landing will be included after each 20ft segment of ramp.
- 6) Unit cost of alternative underpass structure will be \$975/CY for box culvert concrete based on FDOT Structures Design Guidelines 9.2.1. Assuming a 12ft x 12ft opening and 1ft thick slab, floor, and walls, a unit volume of (14ft x 14ft) – (12ft x 12ft) = 52CF/LF ≈ 2.0CY/LF will be used. This results in a unit cost of \$1950/LF.
- 7) A premium factor of 1.15 will be applied to the construction cost of the underpass to account for potential ABC methods such as jack-and-bore or perfricated span under the railroad.

QUANTITIES:

ORIGINAL DESIGN:

- 1) Two Main Spans = 2spans x 125ft/span x \$1890/ft = \$472,500
- 2) Switch-back length = 23.5ft vertical x 12ft horizontal/1ft vertical = 282ft horizontal
282ft horizontal / 20ft sections = 15 sections = 14 landings
14 landings x 6ft horizontal/landing = 84ft horizontal
2 ramps x (282ft horizontal + 84ft horizontal)/ramp x \$1890/ft horizontal
= \$1,383,480
- 3) Main Span Substructure = 3 elements @ 23.5ft height ≈ 75ft
- 4) Switch-Back Substructure = 15 elements/ramp x 2 ramps x 15ft avg. height = 450ft
- 5) Substructure Cost Assuming \$400/LF: 525LF x \$400/LF = \$210,000
- 6) Unfactored Total Cost = \$472,500 + \$1,383,480 + \$210,000 = \$2,065,980

ALTERNATIVE:

- 1) Cost of underpass structure = 200LF x \$1950/LF = \$390,000
- 2) Added premium for construction methods = 15% x \$390,000 = \$58,500
- 3) Unfactored Total Cost = \$448,500

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-01	
DESCRIPTION:	Construct Roundabout At CR 478/ CR 471	SHEET NO.: 1 of 5	
ORIGINAL DESIGN: The original design calls for keeping the intersection as is.			
ALTERNATIVE: The alternative design suggests construction of a roundabout at the intersection of CR478/CR471.			
OPPORTUNITIES: <ul style="list-style-type: none"> • WILL ENHANCE SAFETY AT THE INTERSECTION • WILL SERVE TO CALM TRAFFIC 		RISKS: <ul style="list-style-type: none"> • ADDITIONAL COST 	
CATEGORIES:			
<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	
		<input checked="" type="checkbox"/> Construction	
<input type="checkbox"/> Other			
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation			
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 0	\$	\$ 0
ALTERNATIVE	\$ 2,125,000	\$	\$ 2,125,000
VALUE ADDITION	(\$ 2,125,000)	\$	(\$ 2,125,000)

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-01
DESCRIPTION:	Construct Roundabout At CR 478/ CR 471	SHEET NO.: 2 of 5

TECHNICAL DISCUSSION

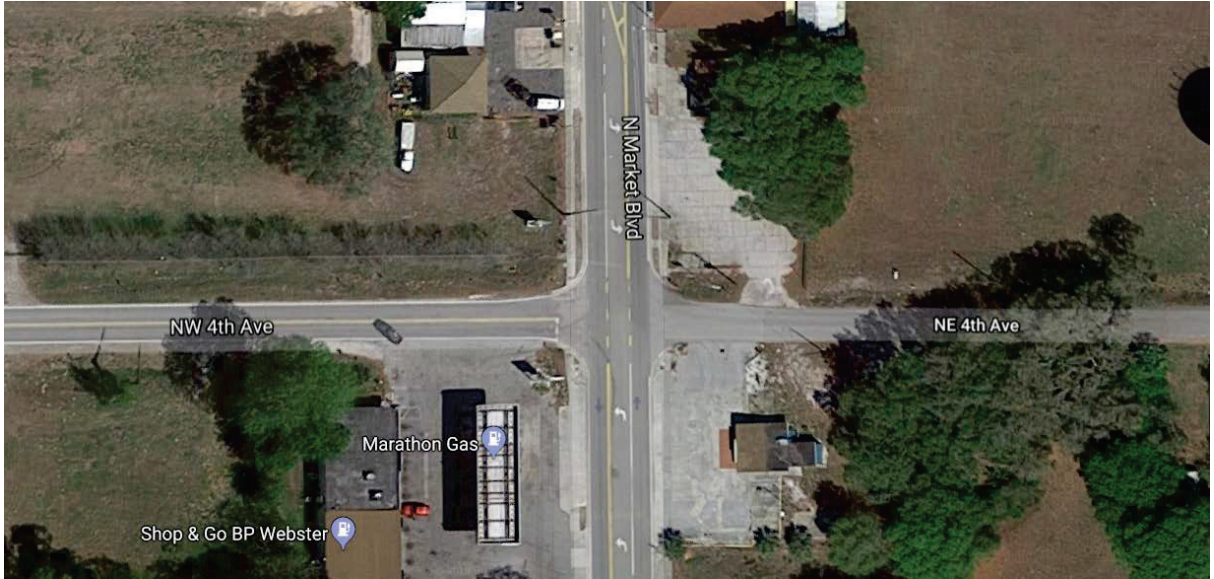
This alternative will provide a safer, more efficient intersection. It is also more aesthetically appealing than the existing intersection.

The VE team feels that this roundabout intersection will enhance the project introducing an element of safety at the intersection of CR478 and CR471.

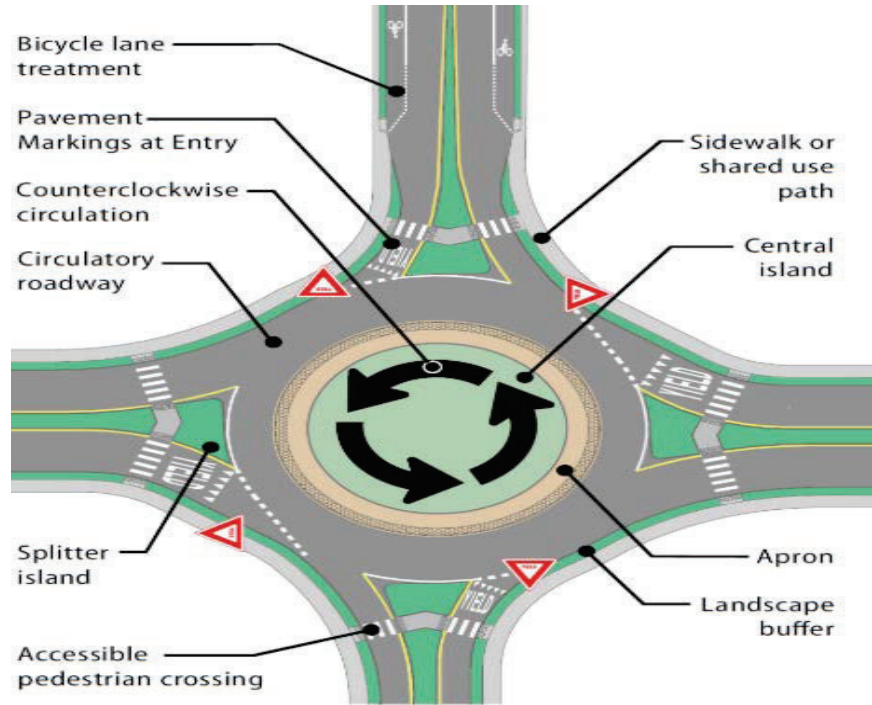
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-01
DESCRIPTION:	Construct Roundabout At CR 478/ CR 471	SHEET NO.: 3 of 5

ORIGINAL DESIGN: THE ORIGINAL DESIGN DOES NOT INCLUDE A ROUNDABOUT.



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-01
DESCRIPTION:	Construct Roundabout At CR 478/ CR 471	SHEET NO.: 4 of 5

ASSUMPTIONS:

- 1) Unit costs for the roundabout intersection is \$1.7 million

QUANTITIES:

ORIGINAL DESIGN:

- 1) Not included

ALTERNATIVE:

- 1) Construct single lane roundabout with truck apron.



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: S3-01		
DESCRIPTION:	Construct Roundabout At CR 478/ CR 471				SHEET NO. 5 of 5		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Single-lane roudabout	LS	0	\$1,700,000		1	\$1,700,000	\$ 1,700,000
				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
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				\$ -			\$ -
				\$ -			\$ -
Sub-total				\$ -			\$ 1,700,000
Mark-up at 25.00%				\$ -			\$ 425,000
TOTAL				\$ -			\$ 2,125,000
Cost Avoidance / (Value Addition):							(\$2,125,000)

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-02
DESCRIPTION:	Provide Trail On Both Sides At Flea Market With Multiple Crossings	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for Paved trail on the south side of SR478.

ALTERNATIVE:

The alternative design suggests providing the trail on both sides of the road at the location of the Webster flea market.

OPPORTUNITIES:

- **MAKES THE FLEA MARKET MORE ACCESSIBLE TO THE USERS OF THE TRAIL**
- **IMPROVED SAFETY**

RISKS:

- **ADDITIONAL COST**

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 0	\$	\$ 0
ALTERNATIVE	\$ 657,563	\$	\$ 657,563
VALUE ADDITION	(\$ 657,563)	\$	(\$ 657,563)

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-02
DESCRIPTION:	Provide Trail On Both Sides At Flea Market With Multiple Crossings	SHEET NO.: 2 of 5

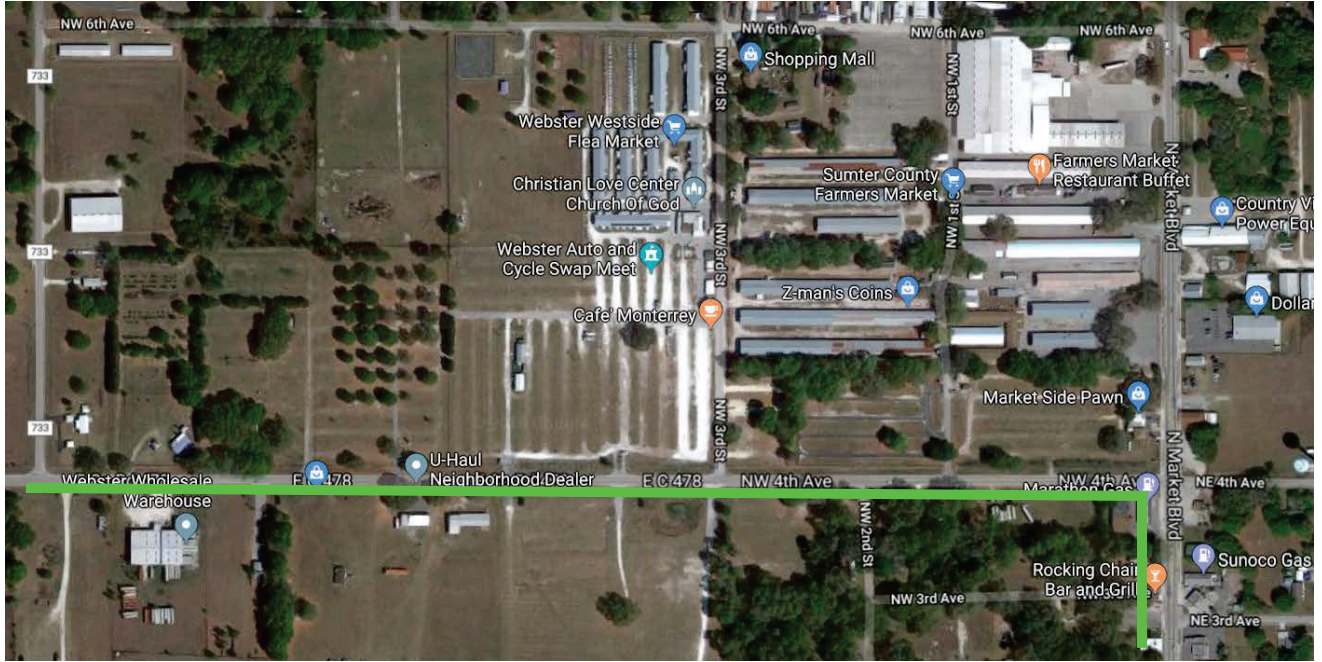
TECHNICAL DISCUSSION:

This alternative provides the users of the Trail an easier and safer access to the grounds of the flea market. An element of cost is introduced if a bridge structure is needed.

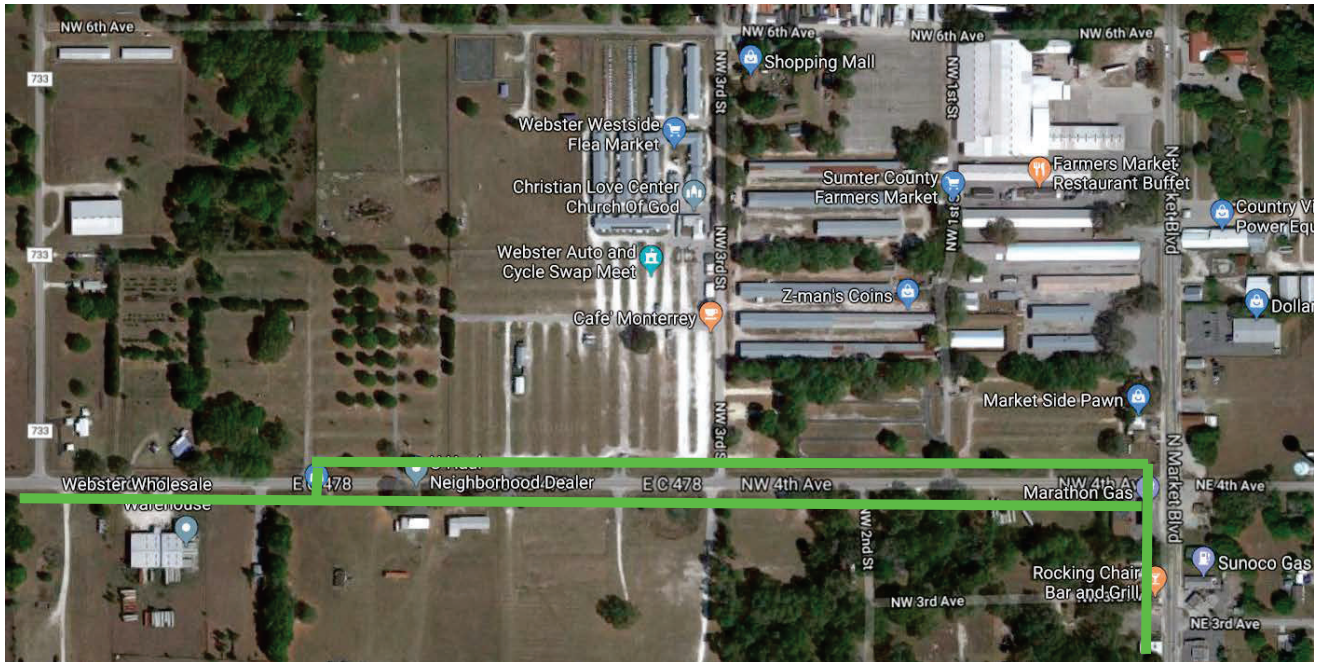
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: 03-02
DESCRIPTION:	Provide Trail On Both Sides At Flea Market With Multiple Crossings.	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-02
DESCRIPTION:	Provide Trail On Both Sides At Flea Market With Multiple Crossings	SHEET NO.: 4 of 5
<p>ASSUMPTIONS:</p> <p>1) LRE Unit costs, for land acquisition, parallel trail pavement, with special markings and striping, with up to 5 intermediate crossings between the parallel trails, are used.</p> <p>QUANTITIES:</p> <p>ORIGINAL DESIGN: DOES NOT INCLUDE THIS PARALLEL ROUTE</p> <p>ALTERNATIVE:</p> <p>1) Length of parallel trail is 2,100 lf, and it will be 12' wide = 2,800 sy</p>		



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: S3-02		
DESCRIPTION:	Provide Trail On Both Sides At Flea Market With Multiple Crossings				SHEET NO. 5 of 5		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
ROW	Acres	0	\$585,000	\$ -	0.77	\$585,000	\$ 450,450
Trail pavement	SY	0	\$27	\$ -	2800	\$27	\$ 75,600
				\$ -			\$ -
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				\$ -			\$ -
Sub-total				\$ -			\$ 526,050
Mark-up at 25.00%				\$ -			\$ 131,513
TOTAL				\$ -			\$ 657,563
Cost Avoidance / (Value Addition):							(\$657,563)

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-03
DESCRIPTION:	Realign Trail To Avoid Downtown Webster But Spur Up To The Flea Market	SHEET NO.: 1 of 6

ORIGINAL DESIGN:

The original design calls for a route that proceeds along CR 478 to the intersection of SR 471 then proceeds south on SR 471 to the end of the project at SR 50.

ALTERNATIVE:

The alternative design suggests maintaining the route up to the Flea Market just west of the intersection with SR 471. However, the main line of the trail would continue by heading south on CR 747, east on CR 740, south on CR 743, and east on CR 478A to connect with SR 471 south of Webster.

OPPORTUNITIES:

- THIS ALTERNATIVE ELIMINATES RIGHT OF WAY ACQUISITIONS IN THE COMMERCIALIZED SECTION OF WEBSTER STARTING AT THE INTERSECTION OF CR 478 AND SR 471. THESE ACQUISITIONS WOULD BE MORE LIKELY TO BE UNWILLING TO SELL.
- REDUCES CONFLICTS WITH UTILITIES ALONG THE WEST SIDE OF SR 471 SOUTH OF THE INTERSECTION WITH CR 478.
- A MORE RURAL AND AESTHETIC ROUTE.
- A SAFER ROUTE WITH LESS VEHICLE TRAFFIC.
- ELIMINATES POTENTIAL PEDESTRIAN AND BICYCLE CONFLICTS AT THE ENTRANCES TO THE FLEA MARKET.

RISKS:

- ELIMINATES THE TRAIL THROUGH THE MAIN PART OF WEBSTER WHICH WAS PREFERRED BY THE TOWN.
- THE EXISTING RIGHT OF WAY ALONG THE ALTERNATE ROADS MAY BE MORE NARROW OVERALL THAN THE ORIGINAL DESIGN.
- THE ALTERNATIVE IS APPROXIMATELY 5,927 FEET LONGER RESULTING IN A DEFINITE INCREASE IN CONSTRUCTION COSTS AND POSSIBLE INCREASES IN RIGHT OF WAY COSTS.

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	Environment	Construction	<input checked="" type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 1,486,631	\$	\$ 1,486,631
ALTERNATIVE	\$ 2,441,471	\$	\$ 2,441,471
VALUE ADDITION	(\$ 954,840)	\$	(\$ 954,840)

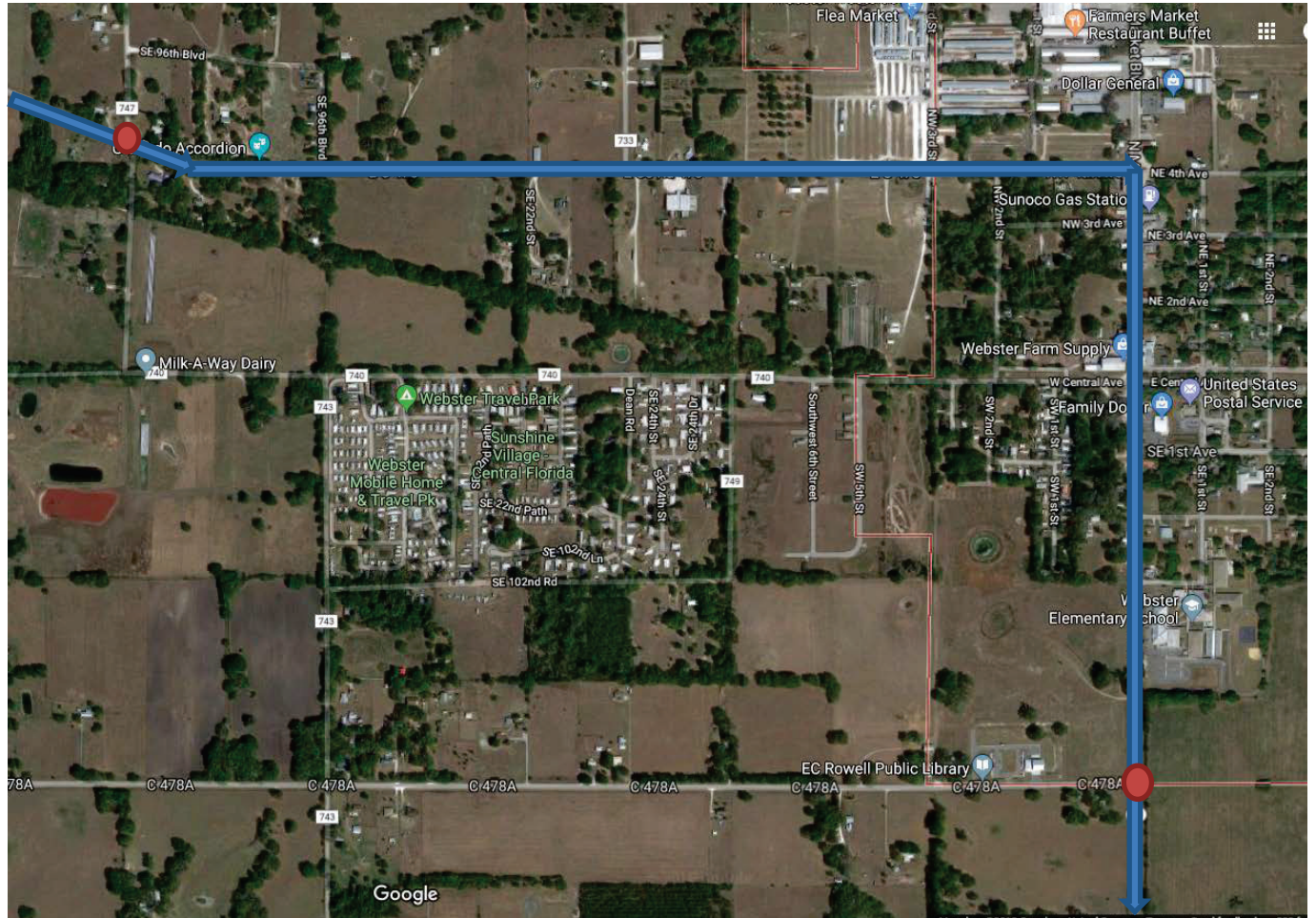
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-03
DESCRIPTION:	Realign Trail To Avoid Downtown Webster But Spur Up To The Flea Market	SHEET NO.: 2 of 6
<p>TECHNICAL DISCUSSION:</p> <p>This alternative involves a route that would bypass the commercial section of the town of Webster. The proposed alternative would provide a spur that would reach as far as the Webster Flea Market, but not proceed to the intersection of CR 478 and SR 471. The proposed alternative would proceed with a mainline down CR 747 from CR 478 then east on CR 740, then south on CR 743, then east on CR 478A to connect to SR 471 just south of the School.</p> <p>The original alternative would cover a length of approximately 9,228 linear feet to go from CR 747 to the intersection of SR 471 and CR 478A. The proposed alternative would require approximately 15,155 linear feet. This would result in an increase of 5,927 linear feet in construction costs.</p> <p>Additional costs for Right of Way are not possible to calculate without knowledge of road widths and design requirements along the proposed route. However, it should be noted that even though there are more parcels and a longer route it would avoid potentially costly commercial properties in the Original design.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-03
DESCRIPTION:	Realign Trail To Avoid Downtown Webster But Spur Up To Flea Market	SHEET NO.: 3 of 6

ORIGINAL DESIGN:

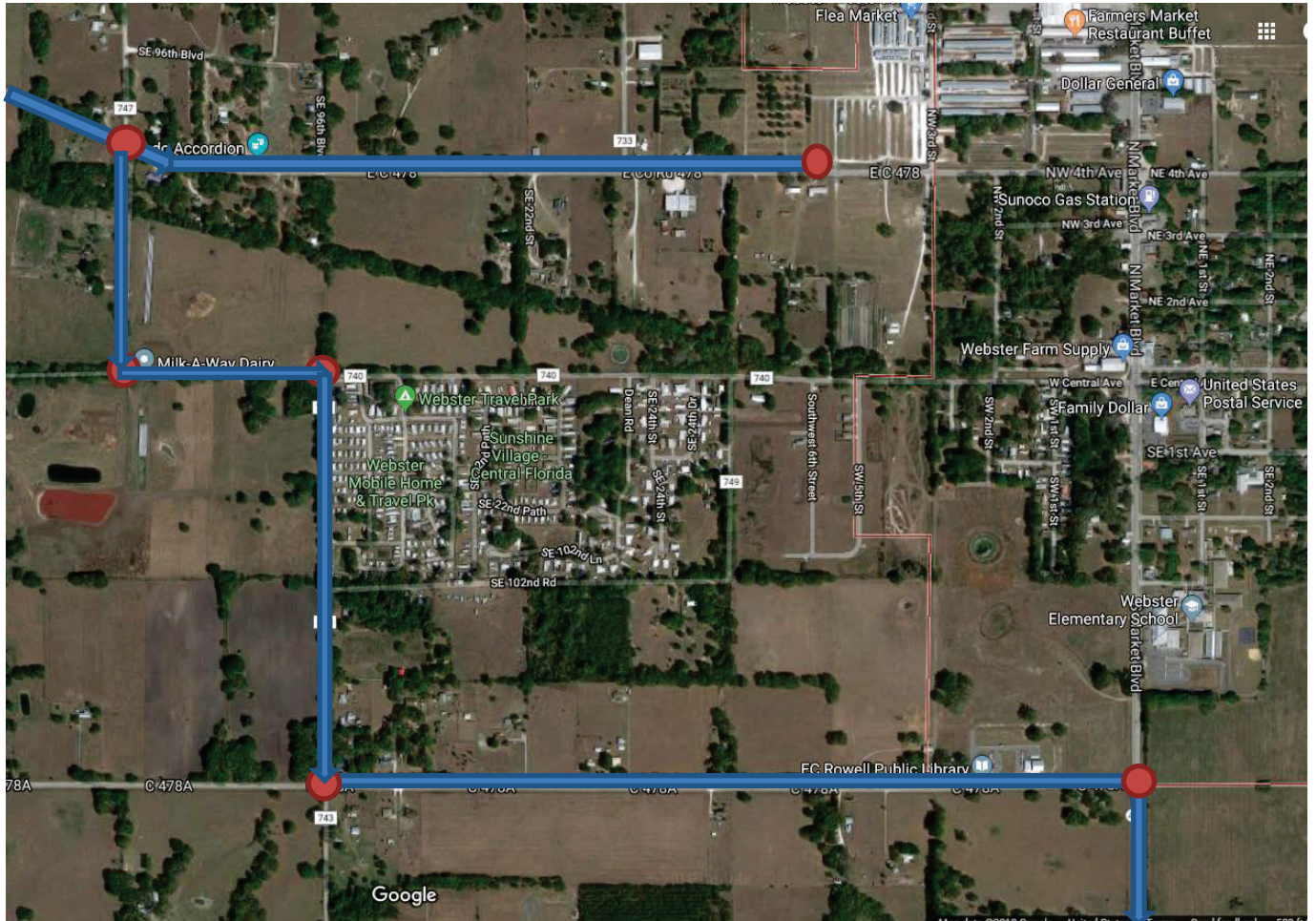


LENGTH: 9,228 FEET BETWEEN CR 747 AND CR 478A INTERSECTION

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-03
DESCRIPTION:	Realign Trail To Avoid Downtown Webster But Spur Up To Flea Market	SHEET NO.: 4 of 6

ALTERNATIVE:



Length: 15,155 feet between CR 747 Intersection with CR 478 and CR 478A Intersection with SR 471 plus Spur from CR 747 to the Webster Flea Market.

Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-03
DESCRIPTION:	Realign Trail To Avoid Downtown Webster But Spur Up To The Flea Market	SHEET NO.: 5 of 6

ASSUMPTIONS:

- 1) Original cost for construction of the trail are included in the LRE report:

Calculations:

Total Construction Cost \$13,269,397

Length of Project: 19.5 miles

102,960 Linear Feet (19.5 X 5,280)

Construction Cost Per Linear Foot:

\$13,269,397 / 102,960 feet = **\$128.88/Linear Foot**

The cost will be calculated for each alternative route using a rate of \$128.88 per linear foot.

QUANTITIES:

ORIGINAL DESIGN:

- 1) 9,228 Linear Feet scaled from aerial map using Mapwise program

ALTERNATIVE:

- 1) 15,155 Linear Feet scaled from aerial map using Mapwise program



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: S3-03		
DESCRIPTION:	Realign Trail To Avoid Downtown Webster But Spur Up To The Flea Market				SHEET NO. 6 of 6		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Trail Construction	LF	9,228	\$129	\$ 1,189,305			\$ -
Trail Construction	LF			\$ -	15155	\$ 128.88	\$ 1,953,176
				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
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				\$ -			\$ -
Sub-total				\$ 1,189,305			\$ 1,953,176
Mark-up at 25.00%				\$ 297,326			\$ 488,294
TOTAL				\$ 1,486,631			\$ 2,441,471
Cost Avoidance / (Value Addition):							(\$954,840)

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-01
DESCRIPTION:	Build Curb And Gutter Rural Section To Avoid Ditch	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design proposes to maintain the rural typical section on SR 471 with the trail outside the ditch.

ALTERNATIVE:

The alternative design suggests using a curb and gutter section on the side with the trail to be able to place the trail closer to the roadway and avoid ditch impacts.

OPPORTUNITIES:

- **REDUCED RW REQUIREMENTS.**
- **PROPOSED STORM SEWER IS ON A STATE ROAD (ENSURED MAINTENANCE ACCESS)**

RISKS:

- **ADDITIONAL CONSTRUCTION COST.**
- **HIGHER MAINTENANCE.**

CATEGORIES:

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 1,030,000	\$	\$ 1,030,000
ALTERNATIVE	\$ 853,565	\$	\$ 853,565
SAVINGS	\$ 176,435	\$	\$ 176,435

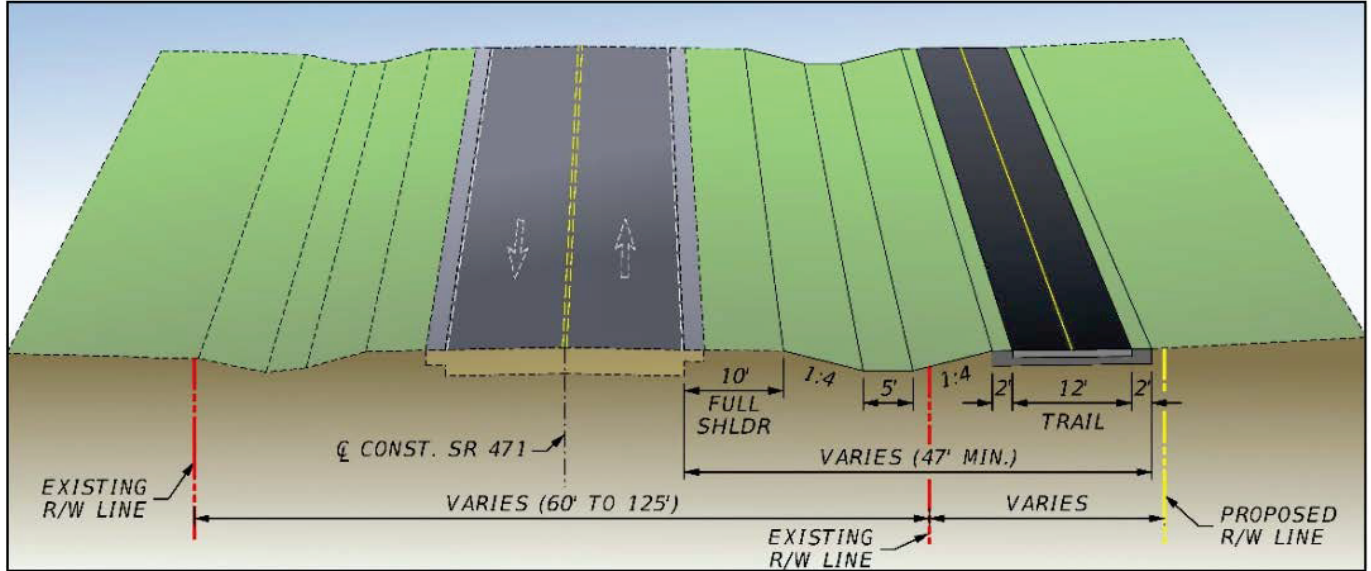
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-01
DESCRIPTION:	Build Curb And Gutter Rural Section To Avoid Ditch	SHEET NO.: 2 of 5
<p>TECHNICAL DISCUSSION:</p> <p>The rural typical section requires a further setback for the trail along SR 471. There are also large existing drainage features (offsite ditches) along this section that would be impacted if the trail was put between the road and ditch. Placing the trail on the outside of the ditch as shown in the typical section requires a larger RW strip take. Using a curb, the trail can be brought closer to the road and will fit with less impact to existing drainage. It will be necessary to place curb inlets to drain the system.</p>		

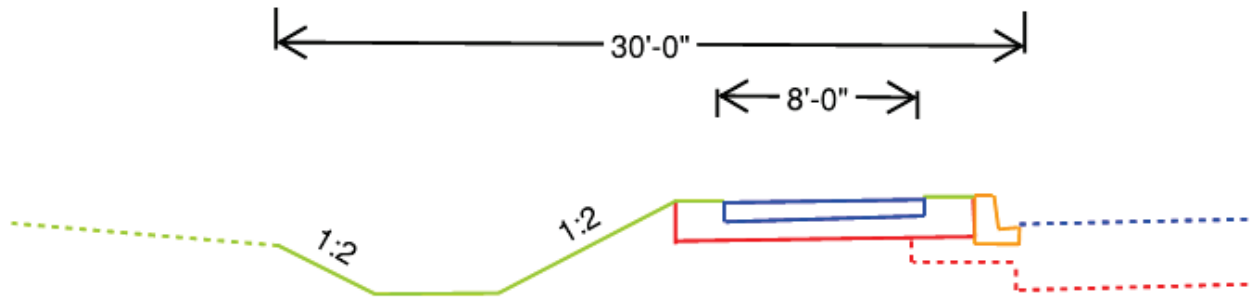
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-01
DESCRIPTION:	Build Curb And Gutter Rural Section To Avoid Ditch	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-01
DESCRIPTION:	Build Curb And Gutter Rural Section To Avoid Ditch	SHEET NO.: 4 of 5

ASSUMPTIONS:

- 1) Right of Way per acre: \$400,000
- 2) Curb per lineal foot: \$16.87
- 3) Type 3 Curb inlets each: \$4,700
- 4) 24" drainage pipe per lineal foot: \$72.78
- 5) Analysis is per mile.

QUANTITIES:

ORIGINAL DESIGN:

- 1) 18 feet of RW * 1 mile = 2.2ac

ALTERNATIVE:

- 1) No RW impact
- 2) 5280 LF of pipe
- 3) 5280 LF of curb (only curb one side)
- 4) 17 Inlets per mile

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-02	
DESCRIPTION:	Eliminate On Street Parking To Enable Curb And Trail Shift	SHEET NO.: 1 of 5	
ORIGINAL DESIGN: The original design calls for the trail to follow along CR 471 on either side of the roadway.			
ALTERNATIVE: The alternative design suggests eliminating the on-street parking along CR 471 to shift the curb and trail in that additional space.			
OPPORTUNITIES: <ul style="list-style-type: none">• REDUCED RIGHT OF WAY	RISKS: <ul style="list-style-type: none">• REMOVAL OF ON-STREET PARKING• INCREASE CONSTRUCTION COSTS		
CATEGORIES:			
<input checked="" type="checkbox"/> Safety	<input type="checkbox"/> Operations	<input type="checkbox"/> Environment	
<input checked="" type="checkbox"/> Construction	<input checked="" type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation			
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 594,947	\$	\$ 594,947
ALTERNATIVE	\$ 464,373	\$	\$ 464,373
SAVINGS	\$ 130,574	\$	\$ 130,574

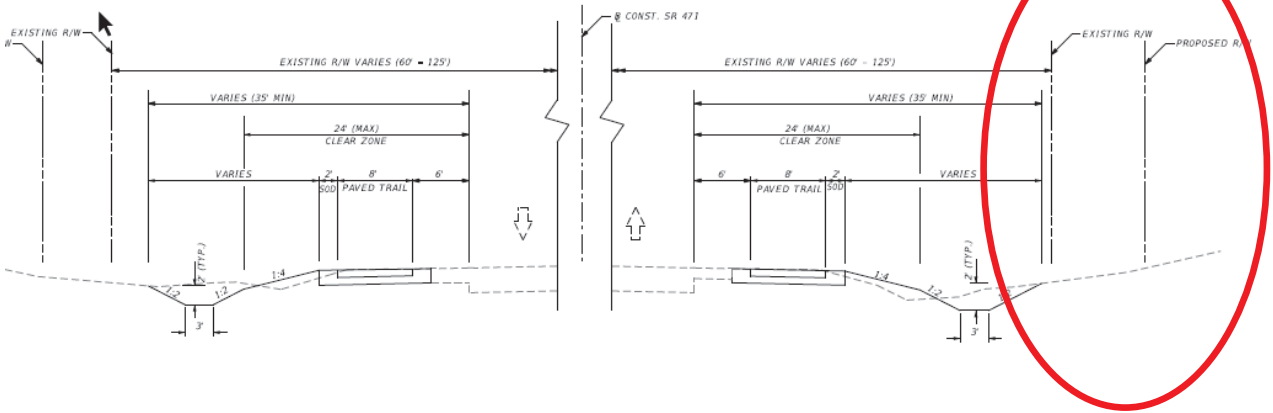
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-02
DESCRIPTION:	Eliminate On Street Parking To Enable Curb And Trail Shift	SHEET NO.: 2 of 5
<p>TECHNICAL DISCUSSION:</p> <p>This alternative will eliminate the on-street parking in Downtown Webster to increase the space within the right-of-way to complete the trail project. By moving the curb in 8' (currently the striped pavement and on-street parking) the trail will in-turn move an additional 8' providing portions of the roadway in which no right of way would need to be acquired.</p> <p>The VE Team observed no usage of the on-street parking during the field review and which allowed the team to make the presumption the space would be receive more activity if it was used to complete this gap in the Coast to Coast trail. To complete this suggestion the trail would serve as both a sidewalk and trail for the people of Webster.</p>		

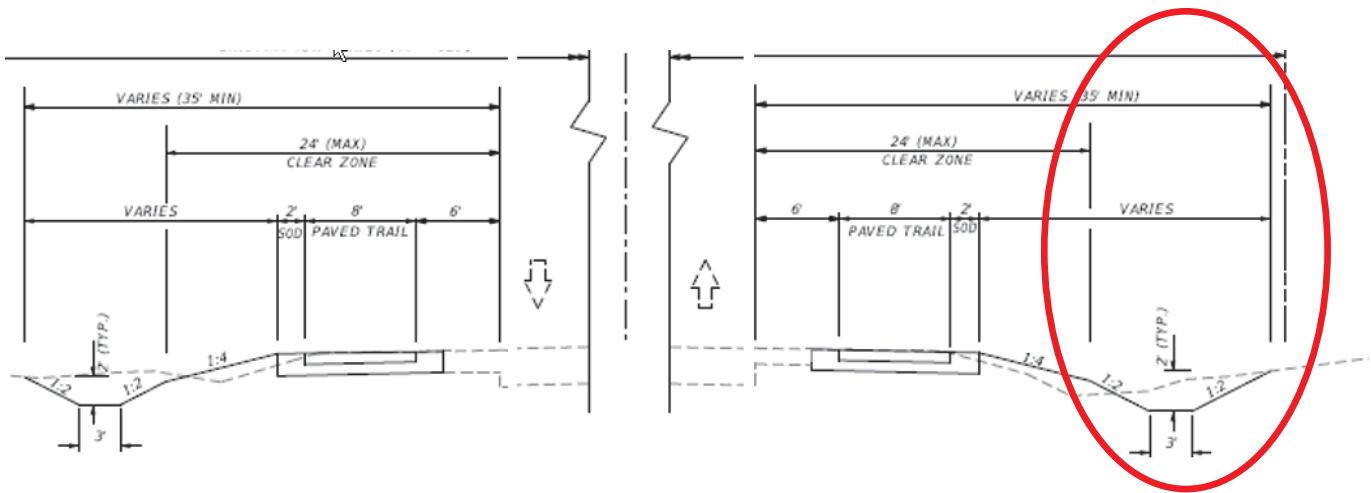
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-02
DESCRIPTION:	Eliminate On Street Parking To Enable Curb And Trail Shift	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-02
DESCRIPTION:	Eliminate On Street Parking To Enable Curb And Trail Shift	SHEET NO.: 4 of 5
<p>ASSUMPTIONS:</p> <ul style="list-style-type: none"> 1) Original cost extracted from LRE provided to the VE Team 2) All other cost pulled from Basis of Estimates <p>QUANTITIES:</p> <p>ORIGINAL DESIGN:</p> <ul style="list-style-type: none"> 1) All RW cost were adjust for the area that pertained to this portion of the design. 2) Basis of estimates were applied to the given dimensions and right of way acreage found in the typical sections provided to the VE team. <p>ALTERNATIVE:</p> <ul style="list-style-type: none"> 1) Acreage of right of way is based on the values of right away given to the team. 2) Selective clearing and grubbing based on the POTENTIAL of needing to protect trees within the right of way. 3) All dimensions that were not provided were measured using Google Earth. 4) Inlet type and quantity were determined using Google Earth. 5) Number of driveway impacts were determined using Google Earth. 6) Acre for Right of way quantities was determined through engineering judgement based on the location and length as well as parcel distribution. 		

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-03
DESCRIPTION:	Use Pavers In Urban Section (PaveDrain)	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for an asphalt trail in the urban section of 471.

ALTERNATIVE:

The alternative design suggests using a permeable paver system to aide in reducing the runoff from the trail.

OPPORTUNITIES:

- **REDUCED RUNOFF FROM TRAIL.**
- **AVOIDS POTENTIAL RESIZING OF EXISTING STORM SEWER SYSTEM.**
- **AESTHETIC ENHANCEMENT.**

RISKS:

- **ADDITIONAL COST.**
- **HIGHER MAINTENANCE.**

CATEGORIES:

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 217,913	\$	\$ 217,913
ALTERNATIVE	\$ 613,800	\$	\$ 613,800
VALUE ADDITION	(\$ 395,887)	\$	(\$ 395,887)

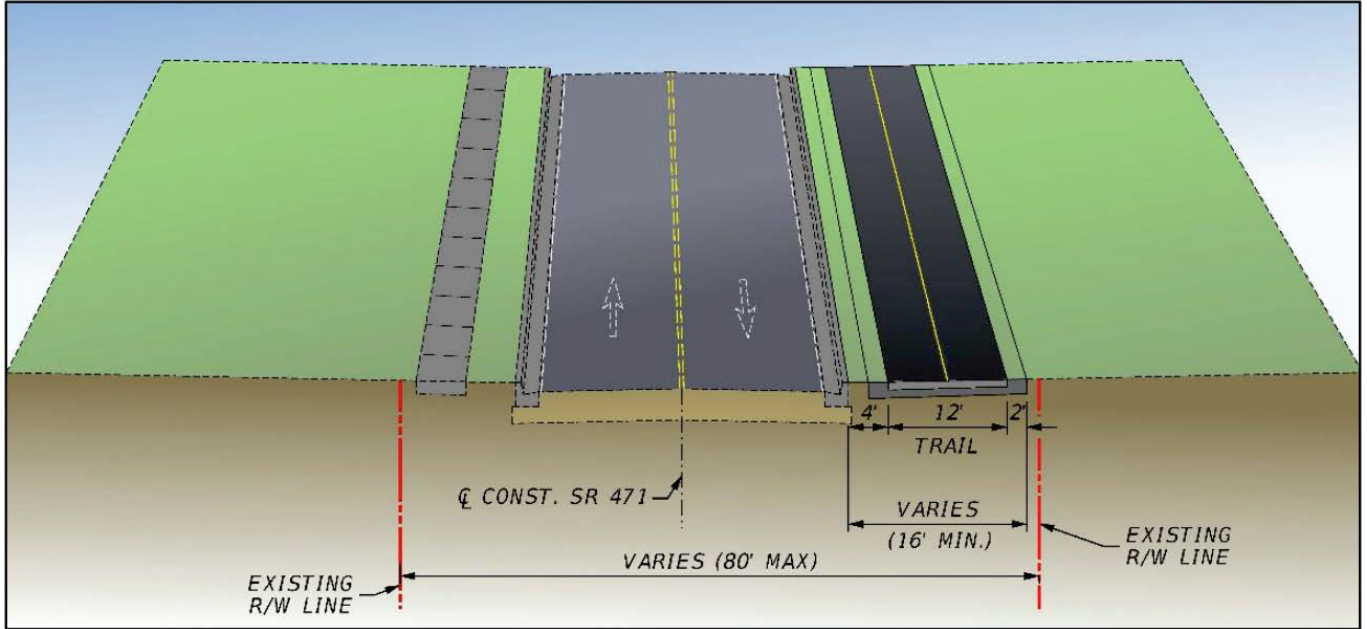
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-03
DESCRIPTION:	Use Pavers In Urban Section (PaveDrain)	SHEET NO.: 2 of 5
<p>TECHNICAL DISCUSSION:</p> <p>The asphalt trail will add impervious area. This will increase the runoff volume and flow rate received by the existing storm sewer system. This may require upsizing some of the existing infrastructure.</p> <p>Permeable pavement systems can reduce the runoff rate and would avoid having to upsize the existing system. The PaveDrain system is an example of a permeable pavement system that can achieve infiltration and also provides aesthetic enhancement to the area.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-03
DESCRIPTION:	Use Pavers In Urban Section (PaveDrain)	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-03
DESCRIPTION:	Use Pavers In Urban Section (PaveDrain)	SHEET NO.: 4 of 5
<p>ASSUMPTIONS:</p> <ul style="list-style-type: none"> 1) Unit costs for the asphalt trail per mile: \$268,200 2) Unit cost for PaveDrain installed per sqft: \$12.00 3) Same Right of Way <p>QUANTITIES:</p> <p>ORIGINAL DESIGN:</p> <ul style="list-style-type: none"> 1) Trail length 3,410 LF = 0.65 miles <p>ALTERNATIVE:</p> <ul style="list-style-type: none"> 1) Area of pavers = 40,920 sqft 		

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-04
DESCRIPTION:	Realign Trail Onto SR 721 South Of Webster To SR 50	SHEET NO.: 1 of 6

ORIGINAL DESIGN:

The original design calls for a route that proceeds south on SR 471 to the intersection with SR 50, which is a commercialized signaled intersection.

ALTERNATIVE:

The alternative design suggests heading east on CR 721 prior to the intersection with SR 50 then making the intersection with SR 50 at the CR 721 intersection, which is a more rural intersection.

OPPORTUNITIES:

- **ELIMINATE SAFETY HAZARDS FOR TRAIL USERS AT THE SR 50 INTERSECTION CAUSED BY HEAVIER CAR AND TRUCK TRAFFIC AT THE PROPOSED ROUNDABOUT**
- **A SLIGHTLY SHORTER ROUTE WITH LESS CONSTRUCTION COSTS**

RISKS:

- **TRAIL USERS MAY WANT COMMERCIAL FACILITIES TO USE THAT ARE PROVIDED AT THE SR 50/SR 471 INTERSECTION.**
- **THE SEGMENT FROM SR 50 TO THE INTERSECTION WITH CR 721 IS ALREADY BEING DESIGNED TO PROVIDE A TRAIL**

CATEGORIES:

<input checked="" type="checkbox"/>	Safety	<input type="checkbox"/>	Operations	<input type="checkbox"/>	Environment	<input checked="" type="checkbox"/>	Construction	<input type="checkbox"/>	Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 3,062,189	\$	\$ 3,062,189
ALTERNATIVE	\$ 2,636,885	\$	\$ 2,636,885
SAVINGS	\$ 425,304	\$	\$ 425,304

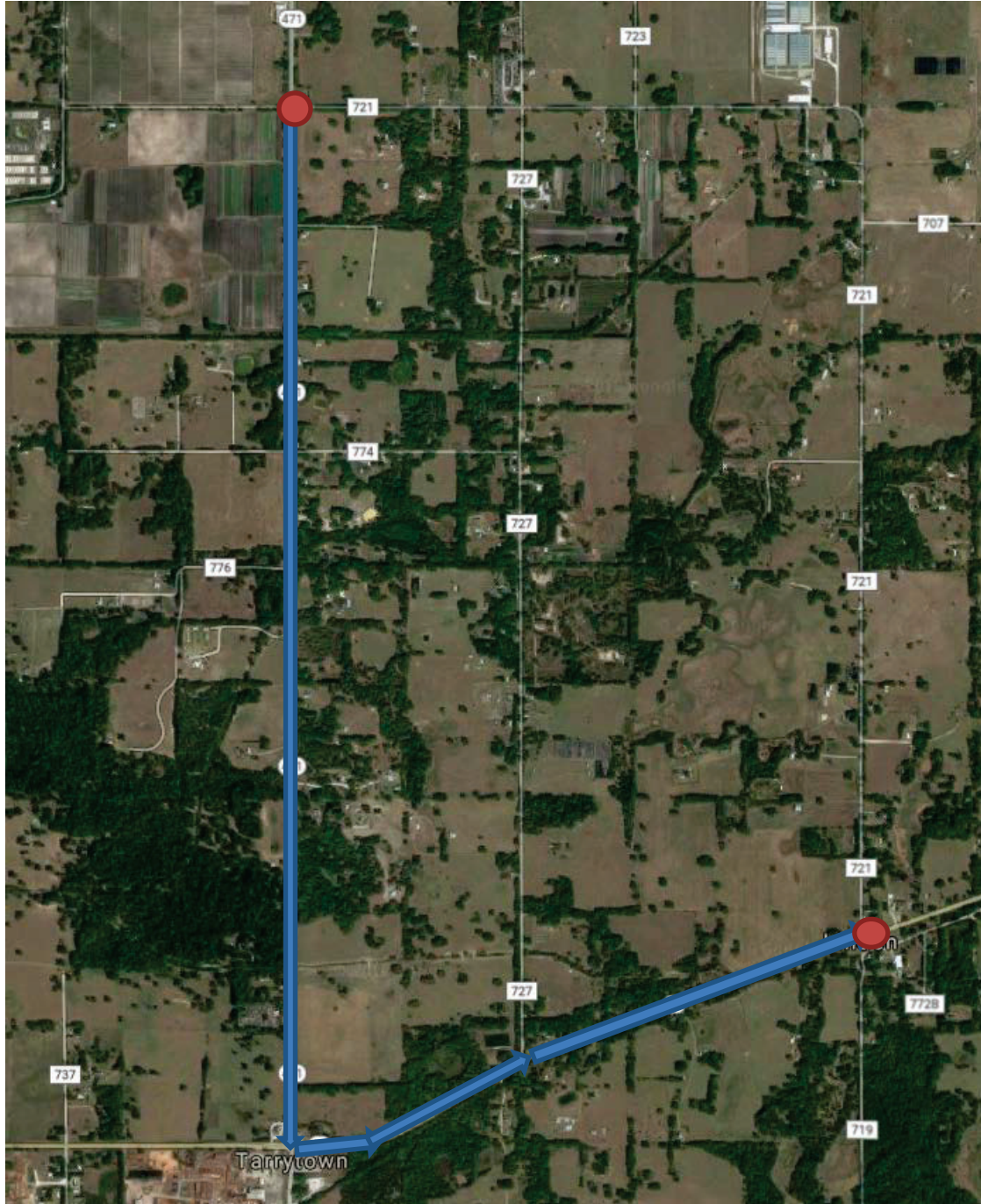
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-04
DESCRIPTION:	Realign Trail Onto SR 721 South Of Webster To SR 50	SHEET NO.: 2 of 6
<p>TECHNICAL DISCUSSION:</p> <p>This alternative involves a route that would bypass the commercial intersection at SR 50 and SR 471. The proposed alternative would route the trail along SR 721, which intersects SR 50 east of the planned intersection. This would be a slightly shorter route, and would provide a rural intersection for connecting trail users to SR 50.</p> <p>The original route would cover a length of approximately 3.6 miles to go from the intersection of SR 471 to the intersection of SR 50 and CR 721. The proposed alternative would require approximately 3.1 miles for the same locations. This would result in a reduction of .5 miles (2,640 linear feet) in construction costs.</p> <p>Additional costs for Right of Way are not possible to calculate without knowledge of road widths and design requirements along the proposed route.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-04
DESCRIPTION:	Realign Trail Onto SR 721 South Of Webster To SR 50	SHEET NO.: 3 of 6

ORIGINAL DESIGN:

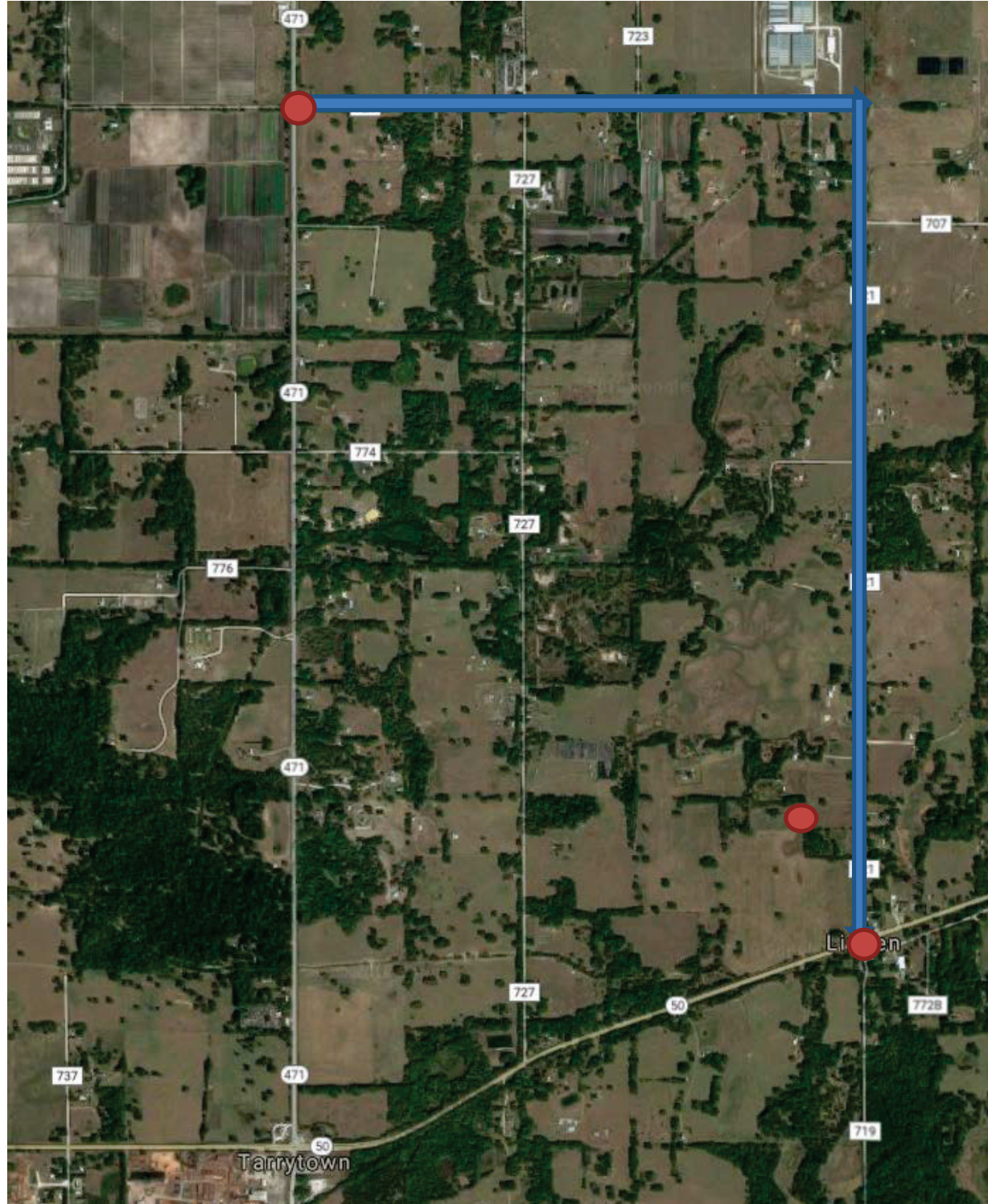


LENGTH: APPROXIMATELY 3.6 MILES

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-04
DESCRIPTION:	Realign Trail Onto SR 721 South Of Webster To SR 50	SHEET NO.: 4 of 6

ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S4-04
DESCRIPTION:	Realign Trail Onto SR 721 South Of Webster To SR 50	SHEET NO.: 5 of 6

ASSUMPTIONS:

- 1) Original costs for construction of the trail are included in the LRE report.

Calculations:

Total Construction Cost \$13,269,397

Length of Project: 19.5 miles

102,960 Linear Feet (19.5 X 5,280)

Construction Cost Per Linear Foot:

\$13,269,397 / 102,960 feet = **\$128.88/Linear Foot**

The cost will be calculated for each alternative route using a rate of \$128.88 per linear foot.

QUANTITIES:

ORIGINAL DESIGN:

- 1) 3.6 miles (19,008 linear feet) scaled from aerial map using Mapwise program
3.6 X 5,280 = 19,008 LF

ALTERNATIVE:

- 1) 3.1 miles (16,368 linear feet) scaled from aerial map using Mapwise program
3.1 X 5,280 = 16,368 LF



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: S4-04		
DESCRIPTION:	Realign Trail Onto SR 721 South Of Webster To SR 50				SHEET NO. 6 of 6		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Trail Construction	LF	19,008	\$128.88	\$ 2,449,751			\$ -
Trail Construction	LF			\$ -	16368	\$ 128.88	\$ 2,109,508
				\$ -			\$ -
				\$ -			\$ -
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				\$ -			\$ -
Sub-total				\$ 2,449,751			\$ 2,109,508
Mark-up at 25.00%				\$ 612,438			\$ 527,377
TOTAL				\$ 3,062,189			\$ 2,636,885
Cost Avoidance / (Value Addition):							\$425,304

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-04	
DESCRIPTION:	Place Ditch Outside Trail With Trail Adjacent To Roadway	SHEET NO.: 1 of 5	
ORIGINAL DESIGN: The original design calls for the drainage ditch to be placed between the road and the trail in rural sections.			
ALTERNATIVE: The alternative design suggests to shift the ditch outside the trail, and utilize a reduced ditch section.			
OPPORTUNITIES: <ul style="list-style-type: none"> • REDUCED RW REQUIREMENTS • ELIMINATES NEED TO CROSS TRAIL WITH OUTFALL PIPES • SIMPLIFIES MAINTENANCE OF TRAIL (NO NEED TO CROSS DITCH) 		RISKS: <ul style="list-style-type: none"> • TRAIL CLOSER TO ROADWAY (WILL NEED TO MEET MINIMUM OFFSETS STILL) 	
CATEGORIES:			
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment	
		<input checked="" type="checkbox"/> Construction	
<input type="checkbox"/> Other			
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation			
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 974,663	\$	\$ 974,663
ALTERNATIVE	\$ 300,169	\$	\$ 300,169
SAVINGS	\$ 674,494	\$	\$ 674,494

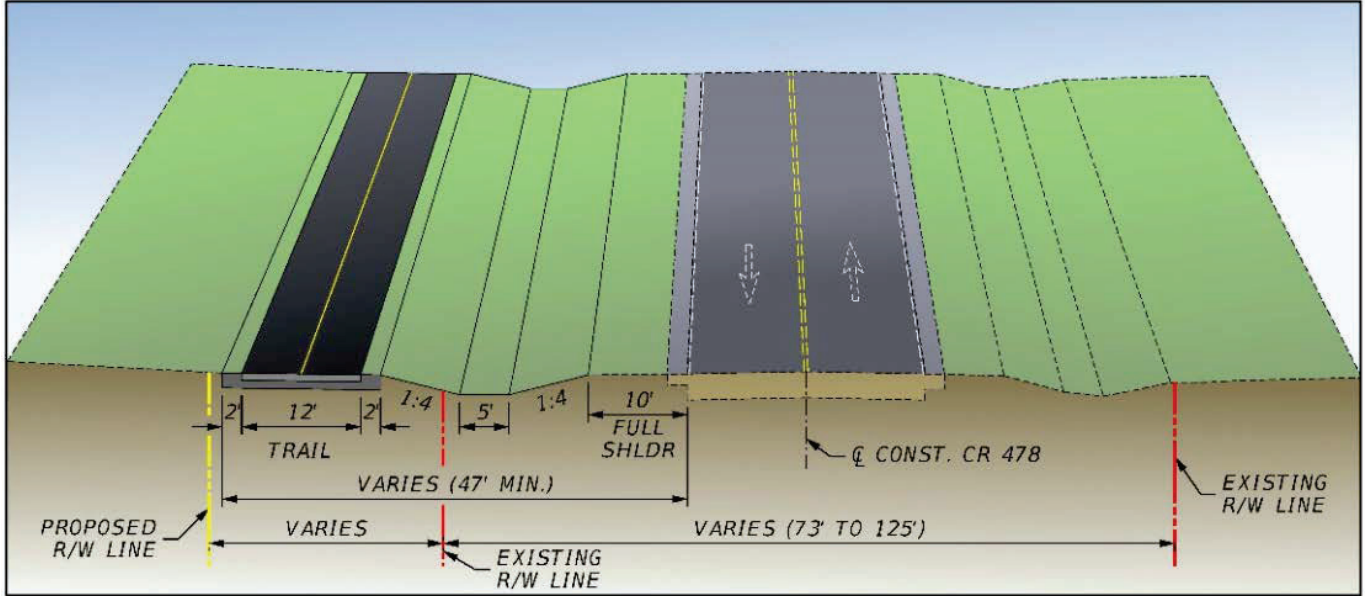
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-04
DESCRIPTION:	Place Ditch Outside Trail With Trail Adjacent To Roadway	SHEET NO.: 2 of 5
<p>TECHNICAL DISCUSSION:</p> <p>The current typical sections show a ditch between the roadway and the trail. The alternative to place the ditch outside the trail has several advantages. Since the ditch will be moved further from the roadway, the side slopes may be exempt from criteria requiring them to be recoverable. A 2:1 side slope for the ditches can be used to reduce the required RW width. In some areas this may aide in avoiding RW takes, and in other areas the reduced take may make negotiations with willing sellers easier. There will also be a reduction in the required earthwork.</p>		

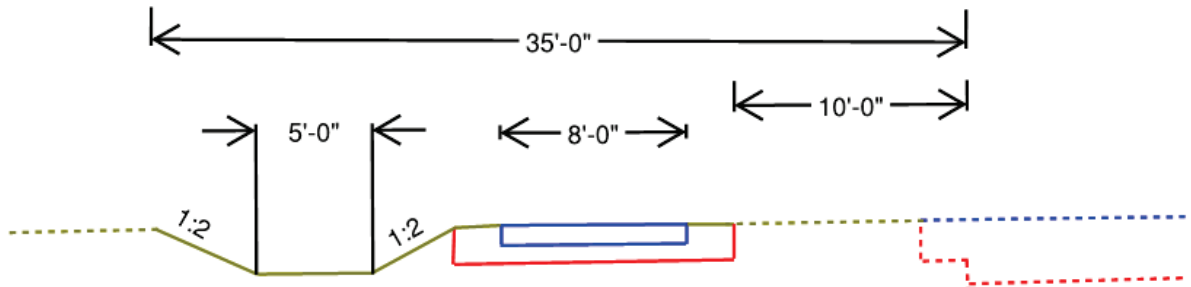
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-04
DESCRIPTION:	Place Ditch Outside Trail With Trail Adjacent To Roadway	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-04
DESCRIPTION:	Place Ditch Outside Trail With Trail Adjacent To Roadway	SHEET NO.: 4 of 5
<p>ASSUMPTIONS:</p> <ul style="list-style-type: none"> 1) Right of Way cost per acre: \$360,000 2) Excavation unit cost per cubic yard: \$7.50 3) Analyzed as a per-mile comparison <p>QUANTITIES:</p> <p>ORIGINAL DESIGN:</p> <ul style="list-style-type: none"> 1) 47' required minus 30' of RW from EOP = 17' impact * 1 mile = 2.06ac 2) Ditch cross sectional area of 26sqft * 1 mile = 5084cy <p>ALTERNATIVE:</p> <ul style="list-style-type: none"> 1) 35' required minus 30' of RW from EOP = 5' impact * 1 mile = 0.61ac 2) Ditch cross sectional area of 14sqft * 1 mile = 2738cy 		

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-08
DESCRIPTION:	Bifurcate Trail To 8' Each Along Narrow ROW	SHEET NO.: 1 of 4

ORIGINAL DESIGN:

The original design contemplates using a single paved surface to carry bi-directional traffic along one side of a roadway.

ALTERNATIVE:

The alternative design employs the option of using unidirectional segments at places where rights of way are especially constrained. Design would identify places where trail users could transition across the road (likely at a logical intersection location, a legal crosswalk) and the trail would continue as a unidirectional side path.

OPPORTUNITIES:

- **REDUCED RIGHT OF WAY IMPACTS**
- **MORE VARIETY FOR USERS**
- **MAINTENANCE OF TOTAL WIDTH AVAILABILITY**
- **POTENTIAL FOR MORE USEABLE TRAIL WIDTHS**
- **OVERCOMES PROBLEMS ASSOCIATED WITH LIMITED RIGHTS OF WAY ON SWALE DRAINAGE**

RISKS:

- **DESIGN COST INCREASE**
- **FRONT END EVALUATION FOR DESIGN EFFORT**
- **EXPOSURE TO POTENTIAL CONFLICTS DUE TO USERS CROSSING ROADWAY. NOTE: ROADWAYS PRIMARILY AFFECTED ARE LOW-VOLUME ROADWAY WITH ~45MPH POSTED SPEEDS**

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 731,705	\$	\$ 731,705
ALTERNATIVE	\$ 917,151	\$	\$ 917,151
VALUE ADDITION	(\$ 185,446)	\$	(\$ 185,446)

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-08
DESCRIPTION:	Bifurcate Trail To 8' Each Along Narrow ROW	SHEET NO.: 2 of 4

TECHNICAL DISCUSSION:

The alternative design employs the option of using unidirectional segments at places where rights of way are especially constrained. Design would identify places where trail users could transition across the road (likely at a logical intersection location, a legal crosswalk) and the trail would continue as a unidirectional sidepath.

One common design for cycling facilities is use of side paths along roadways. Typically, a side path functions as a one-way or unidirectional lane that is separated from the roadway, either as a slightly elevated facility or separated by a buffer distance from the main line. There are certain safety benefits to having bikes operate in the same direction as auto travel. Principally, drivers are looking upstream for oncoming vehicles. When a cyclist is approaching from the upstream direction (the left), a driver is more likely to note that the cyclist is there than when the cyclist is coming from the right. By separating cyclists on side paths, one of the main causes of cycling crashes is dramatically lowered.

A drawback for separate providing side paths would be an increase in the number of driveway intersections resulting from having two sides of the main line that are opened up for trail crossings.

When rights of way are tight, using narrowed paths can reduce the need for additional land while still retaining adequate though separated facilities.

Under this scenario, paths would be 8' wide, each with a 2' shoulder and recovery area and a 2' clear zone.

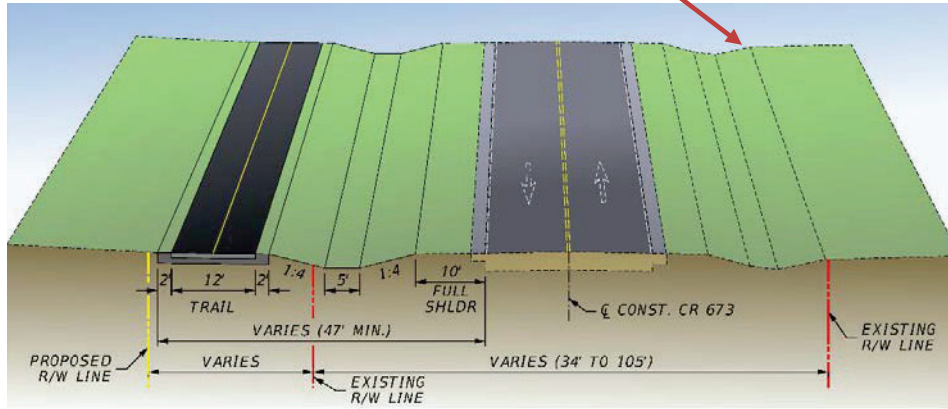
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-08
DESCRIPTION:	Bifurcate Trail To 8' Each Along Narrow ROW	SHEET NO.: 3 of 4

ORIGINAL DESIGN: TYPICAL ON

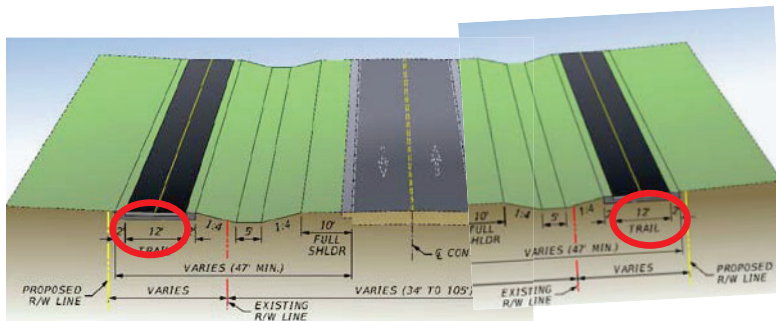
COUNTY ROAD SECTION

Note tight existing right of way



ALTERNATIVE:

INTERMITTENTLY USED 8' SIDE PATHS WOULD OPERATE AS EASTBOUND AND WESTBOUND PATHS WITHIN THE EXISTING RIGHT OF WAY. POSITION COULD BE OUTSIDE OR INSIDE SWALE DEPENDING ON AVAILABILITY OF DIRT.





COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: SA-08		
DESCRIPTION:	Bifurcate Trail To 8' Each Along Narrow ROW				SHEET NO. 4 of 4		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Earthwork component, + 25%	XY	1	\$152,417	\$ 152,417	1.25	\$152,417	\$ 190,521
Roadway component+25%		1	\$351,569	\$ 351,569	1.25	\$ 351,569.00	\$ 439,461
Shoulder component, +25%		1	\$34,421	\$ 34,421	1.25	\$ 34,421.00	\$ 43,026
Drainage component, +25%		1	\$45,877	\$ 45,877	1.25	\$ 45,877.00	\$ 57,346
Signing component		4	\$270	\$ 1,080	10	\$ 270.00	\$ 2,700
Crosswalk markings, est 75 for 3 marked crosswalks	LF			\$ -	75	\$ 8.88	\$ 666
				\$ -			\$ -
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				\$ -			\$ -
Sub-total				\$ 585,364			\$ 733,721
Mark-up at 25.00%				\$ 146,341			\$ 183,430
TOTAL				\$ 731,705			\$ 917,151
Cost Avoidance / (Value Addition):							(\$185,446)

Bifurcate portions of trail to address narrower right of way, est. cost to separate portions at 25% of total trail segment length, 3 marked intersections. Estimate for 1 segment, I-75 to CR 683, 9.874 LF

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-09
DESCRIPTION:	Safety Edge For Both Trail And Road	SHEET NO.: 1 of 4

ORIGINAL DESIGN:

The original design does not specify asphalt edge treatment.

ALTERNATIVE:

The alternative design suggests that pavement should include safety edge treatment.

OPPORTUNITIES:

- **REDUCED LANE DEPARTURE EVENTS**
- **HELPS TO ELIMINATE PAVEMENT DROP OFF**
- **HELPS TO PROTECT PAVEMENT EDGES FROM SHOULDER WEAR**
- https://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/brochure/
- **VERY LOW OR NO ADDITIONAL COST (SHOE TO FORM EDGE IS AVAILABLE THROUGH T2)**

RISKS:

- **UNFAMILIAR TO SOME CONTRACTORS**

CATEGORIES:

<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 0	\$	\$ 0
ALTERNATIVE	\$ 0	\$	\$ 0
SAVINGS	\$ 0	\$	\$ 0

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-09
DESCRIPTION:	Safety Edge For Both Trail And Road	SHEET NO.: 2 of 4

TECHNICAL DISCUSSION:

This treatment is recommended for rural safety countermeasures by FHWA safety offices.

FROM FHWA WEBSITE DISCUSSION:

The Safety Edge is an effective solution to reduce pavement edge-related crashes, by shaping the edge of the pavement to 30 degrees using a commercially available device (called a shoe) that can be attached to the paver. The asphalt is extruded under the shoe, resulting in a durable edge that resists edge raveling. Research has shown this 30-degree shape allows drivers to re-enter the roadway safely.

After paving with the Safety Edge, the adjacent material should be regraded flush with the top of the pavement. This is considered the best practice, and provides the safest pavement edge. The difference is that when the edge becomes exposed, this shape can be more safely traversed than a vertical edge.

Sharp, steep pavement edge drop-offs can contribute to crashes.

- The Safety Edge can help decrease highway fatalities and serious injuries on our Nation’s highways.
- Because the Safety Edge provides an additional level of consolidation on the edge, edge raveling is decreased. This contributes to longer pavement life.
- The Safety Edge involves minimal time and cost to implement. Typically, less than 1 percent additional asphalt is needed. The Safety Edge shoe, which creates the edge, can be installed on existing equipment.
- The Safety Edge also can be installed on Portland Cement concrete pavements.
- Best practice is to maintain a flush edge, so that no drop-off exists. The Safety Edge reduces the risk of drop-offs when maintenance forces cannot keep up with erosion or tire wear.
- Vertical and near vertical pavement edge dropoffs have been a factor in a substantial percentage of severe crashes in which vehicles leave the road, particularly on rural roads with unpaved shoulders. The Safety Edge reduces this problem, providing a safer transition back to the road.
- The Safety Edge is a safer design for motorcyclists and bicyclists, as well as motorists.

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-09
DESCRIPTION:	Safety Edge For Both Trail And Road	SHEET NO.: 3 of 4

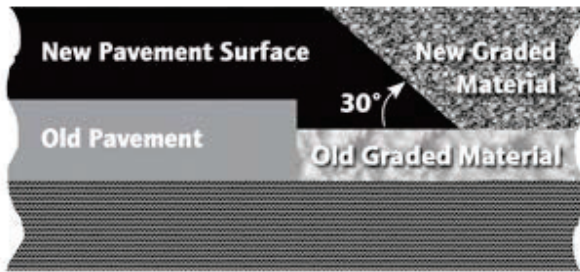
ORIGINAL DESIGN:

NO SPECIFIED PAVEMENT EDGE



ALTERNATIVE:

SAFETY EDGE FOR ASPHALT TRAIL





COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.:	SA-09				
DESCRIPTION:	Safety Edge For Both Trail And Road	SHEET NO.	4 of 4				
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
No extra charge for Alternate	XY			\$ -			\$ -
since the minor amount of exc				\$ -			\$ -
Asphalt is obtained during the				\$ -			\$ -
shaping operations of the				\$ -			\$ -
finished pavement.				\$ -			\$ -
				\$ -			\$ -
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				\$ -			\$ -
				\$ -			\$ -
				\$ -			\$ -
Sub-total				\$ -			\$ -
Mark-up at 25.00%				\$ -			\$ -
TOTAL				\$ -			\$ -
Cost Avoidance / (Value Addition):							\$0

Safety edge is a low or no cost finish treatment (per FHWA)

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-10
DESCRIPTION:	Selectively Install Guardrail To Reduce Ditch Section	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for shallow ditch side slopes where ditch is adjacent to roadway.

ALTERNATIVE:

The alternative design suggests to install guardrail and use steeper ditch side slopes to reduce ditch width.

OPPORTUNITIES:

- **REDUCED RIGHT OF WAY REQUIREMENTS.**
- **REDUCED EXCAVATION.**
- **POSSIBLE TO AVOID SOME PROPERTY OWNERS ENTIRELY.**

RISKS:

- **ADDITIONAL COST OF GUARDRAIL.**
- **ACCESS AND MAINTAINABILITY.**

CATEGORIES:

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 974,663	\$	\$ 974,663
ALTERNATIVE	\$ 306,469	\$	\$ 306,469
SAVINGS	\$ 668,194	\$	\$ 668,194

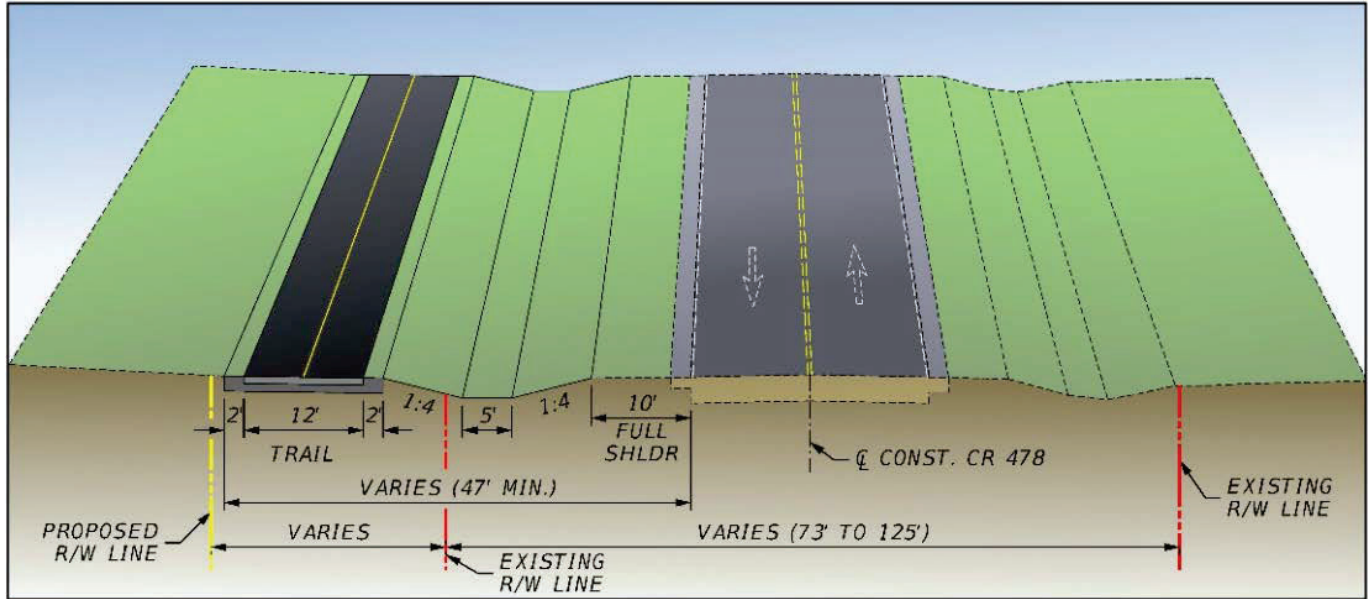
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-10
DESCRIPTION:	Selectively Install Guardrail To Reduce Ditch Section	SHEET NO.: 2 of 5
<p>TECHNICAL DISCUSSION:</p> <p>1:4 ditch side slopes are preferable along roadways for vehicle recoverability within the clear zone. Behind a guard rail, steeper slopes are permissible. A 1:2 slope behind a guard rail could be used on the ditch between the trail and road, or reconstruction of the existing ditch on the opposite side of the road from the trail in combination with shifting the roadway to avoid impacts to a property owner on the trail side.</p>		

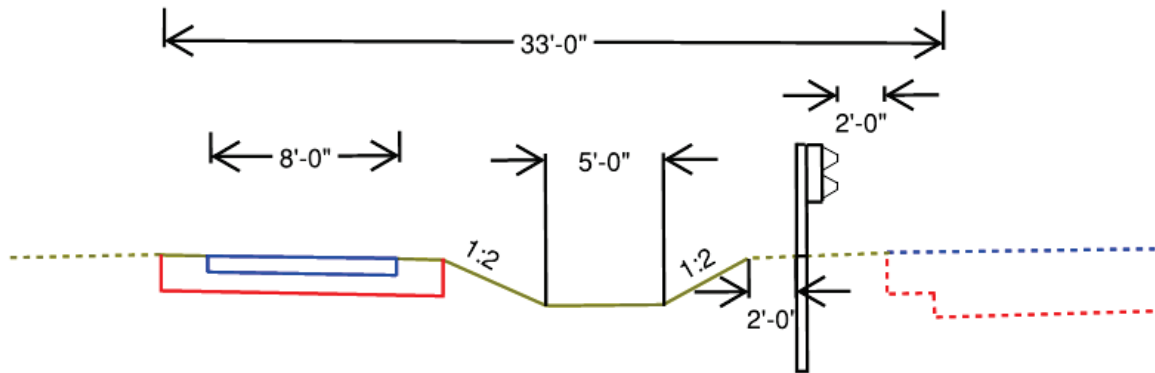
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-10
DESCRIPTION:	Selectively Install Guardrail To Reduce Ditch Section	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-10
DESCRIPTION:	Selectively Install Guardrail To Reduce Ditch Section	SHEET NO.: 4 of 5

ASSUMPTIONS:

- 1) Right of Way cost per acre: \$360,000
- 2) Excavation unit cost per cubic yard: \$7.50
- 3) Guardrail unit cost per lineal foot: \$18.00
- 4) Analyzed as a per-mile comparison

QUANTITIES:

ORIGINAL DESIGN:

- 1) 47' required minus 30' of RW from EOP = 17' impact * 1 mile = 2.06ac
- 2) Ditch cross sectional area of 26sqft * 1 mile = 5084cy

ALTERNATIVE:

- 1) 33' required minus 30' of RW from EOP = 3' impact * 1 mile = 0.36ac
- 2) Ditch cross sectional area of 14sqft * 1 mile = 2738cy
- 3) Guardrail 1 mile = 5280lf

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-11
DESCRIPTION:	Use Reduced Width Ditch Bottoms	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for 5' ditch bottoms.

ALTERNATIVE:

The alternative design suggests to use smaller ditch bottoms and "V" ditches to reduce ditch width.

OPPORTUNITIES:

- **REDUCED RIGHT OF WAY REQUIREMENTS**
- **REDUCED EXCAVATION COST**

RISKS:

- **HARDER TO MAINTAIN.**
- **REDUCED HYDRAULIC CAPACITY.**
- **ADDITIONAL PLAN DETAILS.**

CATEGORIES:

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 974,663	\$	\$ 974,663
ALTERNATIVE	\$ 361,500	\$	\$ 361,500
SAVINGS	\$ 613,163	\$	\$ 613,163

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-11
DESCRIPTION:	Use Reduced Width Ditch Bottoms	SHEET NO.: 2 of 5

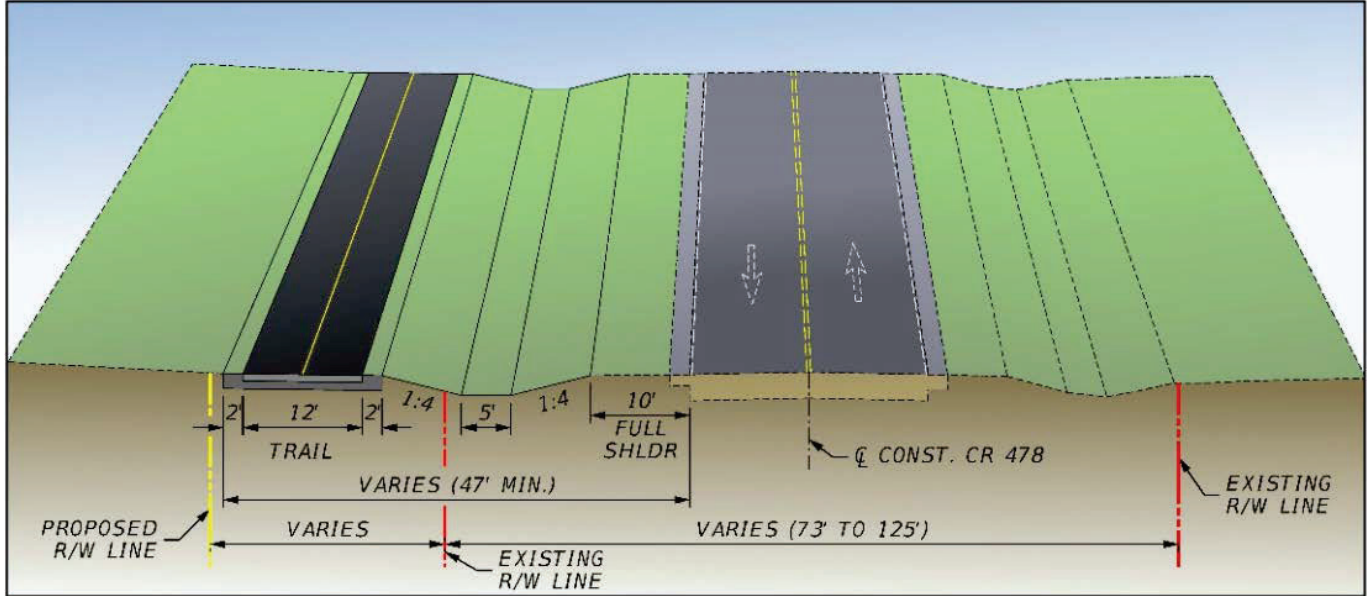
TECHNICAL DISCUSSION:

The 5' ditch bottoms shown in the design are preferred for maintainability and ensured conveyance on SR facilities. Since the trail is an off-network facility, it should be permissible to get an exception and utilize "V" bottoms to reduce the right of way needs for the project. This could help make strip takes easier to negotiate with willing sellers.

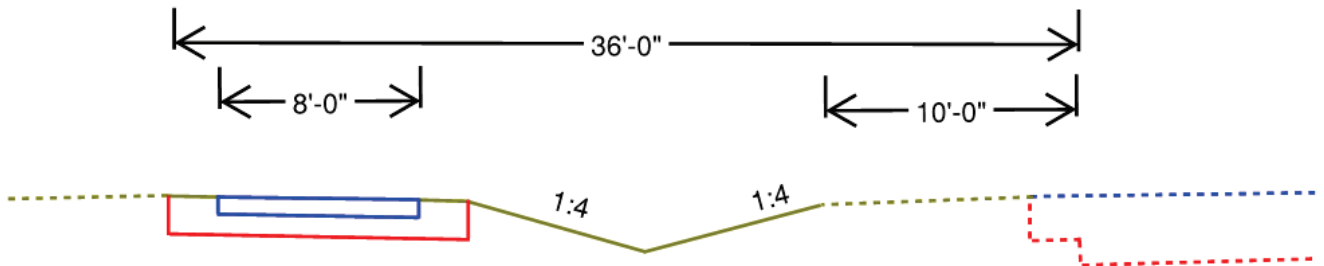
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-11
DESCRIPTION:	Use Reduced Width Ditch Bottoms	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-11
DESCRIPTION:	Use Reduced Width Ditch Bottoms	SHEET NO.: 4 of 5

ASSUMPTIONS:

- 1) Right of Way cost per acre: \$360,000
- 2) Excavation unit cost per cubic yard: \$7.50
- 3) Analyzed as a per-mile comparison

QUANTITIES:

ORIGINAL DESIGN:

- 1) 47' required minus 30' of RW from EOP = 17' impact * 1 mile = 2.06ac
- 2) Ditch cross sectional area of 26sqft * 1 mile = 5084cy

ALTERNATIVE:

- 1) 36' required minus 30' of RW from EOP = 6' impact * 1 mile = 0.73ac
- 2) Ditch cross sectional area of 18sqft * 1 mile = 3520cy

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-13
DESCRIPTION:	Vary Trail Width Based On ROW (8' – 12')	SHEET NO.: 1 of 4

ORIGINAL DESIGN:

The original design calls for use of 12' trail width, the standard width preferred for SunTrail facilities. Design standard allows for 10' width in constrained areas (usually in urban settings). See FDM 224.4 with regard to SunTrail facilities

ALTERNATIVE:

Vary the trail width based on available ROW, 8'-12'.

NOTE: POTENTIAL SAVINGS FROM REDUCED NEED FOR ADDITIONAL RIGHTS OF WAY.

OPPORTUNITIES:

- **REDUCED ADDITIONAL RIGHT OF WAY ACQUISITION**
- **OFFERS SOME FLEXIBILITY WITH REGARD TO DRAINAGE, UTILITY IMPACTS OR LIMITED RIGHT OF WAY**
- **MAY REDUCE CONSTRUCTION COSTS SLIGHTLY BECAUSE LESS MATERIAL IS NEEDED**

RISKS:

- **OVER-RIDES THE PREFERRED STANDARDS FOR THE SUNTRAIL NETWORK**
- **MAY RESTRICT TRAIL CAPACITY**
- **CREATES SOME OPERATIONAL ISSUES FOR GROUPS OF CYCLISTS**
- **REQUIRES APPROVAL OF CHIEF PLANNER**
- **UNDER SOME CIRCUMSTANCES MAY RESTRICT EMERGENCY ACCESS**

CATEGORIES:

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 1,319,038	\$	\$ 1,319,038
ALTERNATIVE	\$ 656,125	\$	\$ 656,125
SAVINGS	\$ 662,913	\$	\$ 662,913

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-13
DESCRIPTION:	Vary Trail Width Based On ROW (8' – 12')	SHEET NO.: 2 of 4

TECHNICAL DISCUSSION:

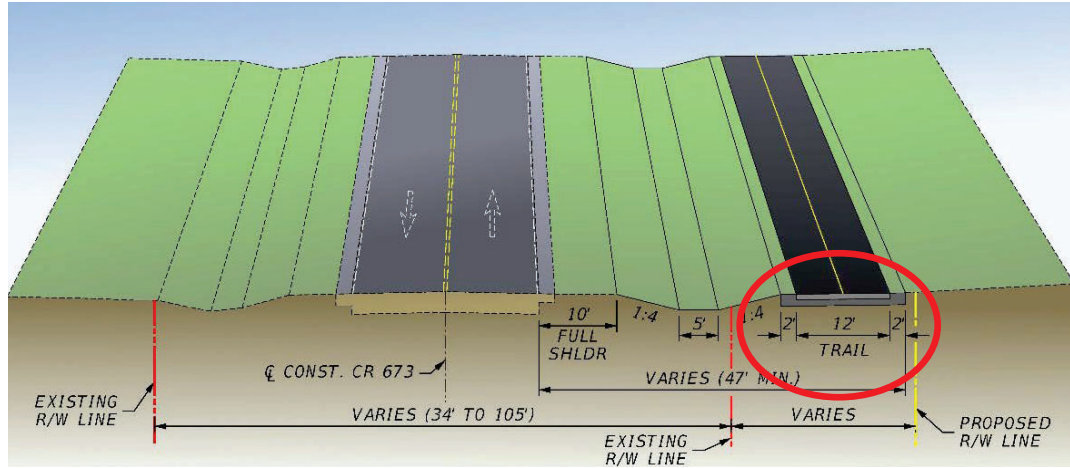
Two segments of the project include routes along County Roads, CR 673, west of US 301, and CR 478, between US 301 and SR 471. County Road segment rights of way are uneven offering limited opportunities to fit a preferred 12' paved path within the corridor. Opportunities for ROW acquisition may be available and should be exercised to achieve the preferred trail width. Some tight ROW may not be overcome and alternative design opportunities should be open for use.

At locations where 12' can be fitted in an existing ROW or an augmented ROW, that would be the preferred option. At other places where drainage or options to expand the right of way are not available the ability to adjust paved surface should be an option for the designer. Transitions from 12' to a minimum width of 8' should be allowed after consultation with the Chief Planner based on conditions.

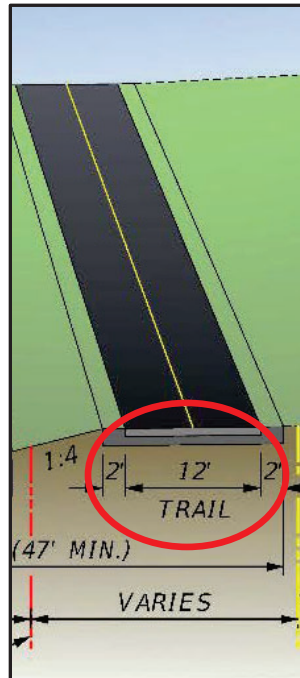
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-13
DESCRIPTION:	Vary Trail Width Based On ROW (8' – 12')	SHEET NO.: 3 of 4

ORIGINAL DESIGN:



ALTERNATIVE:



**Trail width options in order of preference:
11', 10', 9', 8' (min)**



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: SA-13		
DESCRIPTION:	Vary Trail Width Based On ROW (8' – 12')				SHEET NO. 4 of 4		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
ROW, along, L side CR 673	Acres	12	\$90,500	\$ 1,055,230	5.8	\$90,500	\$ 524,900
				\$ -			\$ -
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				\$ -			\$ -
Sub-total				\$ 1,055,230			\$ 524,900
Mark-up at 25.00%				\$ 263,808			\$ 131,225
TOTAL				\$ 1,319,038			\$ 656,125
Cost Avoidance / (Value Addition):							\$662,913

Offers flexibility in design in response to right-of-way circumstances. May reduce some need for right of way. Sample is for conceptual reduction on CR 673 segment Not intended to completely avoid additional right of way purchases.

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-16
DESCRIPTION:	Purchase Easements In-lieu Of Fee Takings	SHEET NO.: 1 of 5

ORIGINAL DESIGN:

The original design calls for fee acquisitions to purchase the additional right of way needed for the trail.

ALTERNATIVE:

The alternative design recommends using permanent easements instead of fee acquisitions.

OPPORTUNITIES:

- **REDUCE RIGHT OF WAY COSTS.**
- **AN EASEMENT MAY BE EASIER TO NEGOTIATE FROM A LESS THAN WILLING SELLER.**
- **COMMERCIAL PROPERTIES IN WEBSTER WOULD MAINTAIN SETBACK REQUIREMENTS FOR CURRENT AND FUTURE DEVELOPMENT.**

RISKS:

- **SOME OWNERS MAY NOT PREFER AN EASEMENT DUE TO POTENTIAL LIABILITY.**

CATEGORIES:

<input type="checkbox"/>	Safety	<input type="checkbox"/>	Operations	<input type="checkbox"/>	Environment	<input type="checkbox"/>	Construction	<input checked="" type="checkbox"/>	Other
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VE RESOLUTION:

ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS

This VE recommendation

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$ 10,860,760	\$	\$ 10,860,760
ALTERNATIVE	\$ 9,775,120	\$	\$ 9,775,120
SAVINGS	\$ 1,085,640	\$	\$ 1,085,640

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-16
DESCRIPTION:	Purchase Easements In-lieu Of Fee Takings	SHEET NO.: 2 of 5

TECHNICAL DISCUSSION:

This alternative would change the Right of Way Acquisitions from fee takings to permanent easements. Usually, a permanent easement in this type of situation would encumber approximately 90% of the property rights. Therefore, this should result in a cost savings of 10% for the Right of Way acquisitions.

Since a permanent easement leaves the underlying ownership in the hands of the property owner it may be more acceptable to some rural property owners. In addition, a commercial property owner such as the convenience store at the southwest corner of CR 478 and SR 471 would lose setback requirements for canopies and pump islands with a fee taking, which may cause significant severance damages. An easement may preserve the setback requirements on all properties.

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-16
DESCRIPTION:	Purchase Easements In-lieu Of Fee Takings	SHEET NO.: 3 of 5

ORIGINAL DESIGN:

AVERAGE COST PER ACRE:
 $\$18,320,000 / 73.55 \text{ ACRES} =$
\$249,100

FM #4354711 - Special Estimate			
Date: 3/27/18			
Segment	# of Parcels	Total Acreage to be Acquired	Total Factored Costs
Forest	20	14.99	\$1,477,500
Left CR 673	16	11.66	\$1,055,000
Right CR 673	38	11.51	\$2,280,000
Left US 301	10	1.49	\$600,000
Right US 301	CSX - No take identified		\$0
Left CR 478	65	9.96	\$3,900,000
Right CR 478	61	10.73	\$3,867,500
Left CR 471	40	8.48	\$2,980,000
Right CR 471	36	4.732	\$2,160,000
TOTALS	286	73.55	\$18,320,000

ALTERNATIVE:

AVERAGE COST PER ACRE:
 $\$16,489,000 / 73.55 =$
\$224,200

FM #4354711 - Special Estimate			
Date: 3/27/18			
Segment	# of Parcels	Total Acreage to be Acquired	Total Factored Costs
Forest	20	14.99	\$1,330,000
Left CR 673	16	11.66	\$950,000
Right CR 673	38	11.51	\$2,052,000
Left US 301	10	1.49	\$540,000
Right US 301	CSX - No take identified		\$0
Left CR 478	65	9.96	\$3,510,000
Right CR 478	61	10.73	\$3,481,000
Left CR 471	40	8.48	\$2,682,000
Right CR 471	36	4.732	\$1,944,000
TOTALS	286	73.55	\$16,489,000

Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-16
DESCRIPTION:	Purchase Easements In-lieu Of Fee Takings	SHEET NO.: 4 of 5

ASSUMPTIONS:

- Using the most recent Right of Way Cost Estimate data an average cost per acre was estimated. The total savings is calculated using the least expensive alternative for each segment comparing the cost as a fee taking and as an easement acquisition.

QUANTITIES:

ORIGINAL DESIGN:

1) Forest	14.99 acres	\$1,477,500
2) Left CR 673	11.66 acres	\$1,055,000
3) Left US 301	1.49 acres	\$600,000
4) Right CR 478	10.73 acres	\$3,867,500
5) <u>Right CR 471</u>	<u>4.732 acres</u>	<u>\$2,160,000</u>
6) TOTAL	43.6 Acres	\$9,160,000

ALTERNATIVE:

1) Forest	14.99 acres	\$1,477,500
2) Left CR 673	11.66 acres	\$1,055,000
3) Left US 301	1.49 acres	\$600,000
4) Right CR 478	10.73 acres	\$3,867,500
5) <u>Right CR 471</u>	<u>4.732 acres</u>	<u>\$2,160,000</u>
6) TOTAL	43.6 Acres	\$8,245,000



COST WORKSHEET

PROJECT:	South Sumter Trail FPN #: 435471-1				ALTERNATIVE NO.: SA-16		
DESCRIPTION:	Purchase Easements In-lieu Of Fee Takings				SHEET NO. 5 of 5		
CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Right of Way	AC	43.6	\$249,100	\$ 10,860,760			\$ -
Right of Way	AC			\$ -	43.6	\$ 224,200	\$ 9,775,120
				\$ -			\$ -
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				\$ -			\$ -
Sub-total				\$ 10,860,760			\$ 9,775,120
Mark-up at 0.00%				\$ -			\$ -
TOTAL				\$ 10,860,760			\$ 9,775,120
Cost Avoidance / (Value Addition):							\$1,085,640

Value Analysis Alternative

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-21	
DESCRIPTION:	Build Double Ditch	SHEET NO.: 1 of 5	
ORIGINAL DESIGN: The original design calls for the trail to be placed outside the ditch.			
ALTERNATIVE: The alternative design suggests to create a stepped ditch section and allow flow to flood the trail in major storm events.			
OPPORTUNITIES: <ul style="list-style-type: none"> • REDUCED RIGHT OF WAY REQUIREMENTS. • IMPROVED HYDRAULICS FOR MAJOR EVENTS. • INNOVATIVE USE OF TRAIL AREA. 		RISKS: <ul style="list-style-type: none"> • HIGHER MAINTENANCE. • MAY REQUIRE DIFFERENT PAVEMENT DESIGN FOR TRAIL. 	
CATEGORIES:			
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment	
		<input checked="" type="checkbox"/> Construction	
<input type="checkbox"/> Other			
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation			
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
COST SUMMARY	\$927,000 Per Mile	\$	\$927,000 Per Mile
ALTERNATIVE	\$270,000 Per Mile	\$	\$270,000 Per Mile
SAVINGS	\$657,000 Per Mile	\$	\$657,000 Per Mile

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-21
DESCRIPTION:	Build Double Ditch	SHEET NO.: 2 of 5

TECHNICAL DISCUSSION:

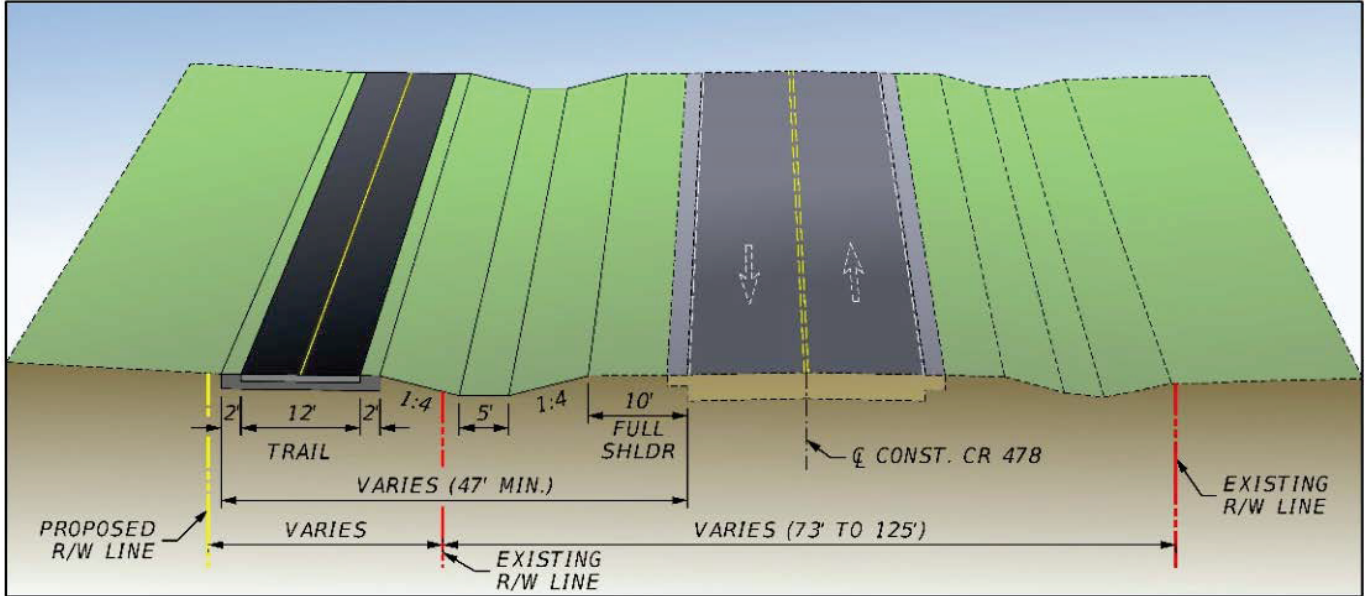
The original design calls for the trail to be placed outside the ditch. The ditches will be designed for the 10yr storm for roadway and trail runoff, and in the cases that offsite flow is conveyed the ditches should be designed for the 25yr event. This situation results in a large area set aside for events that have a 10% and 4% chance of occurring in any given year. The trail is unlikely to be in use during such events, and therefore an opportunity exists to utilize trail area to convey flow.

The alternative proposes to design a small ditch section capable of conveying the mean annual and 3yr storm events, and then to place the trail in the ditch above this elevation. See the illustration for more information.

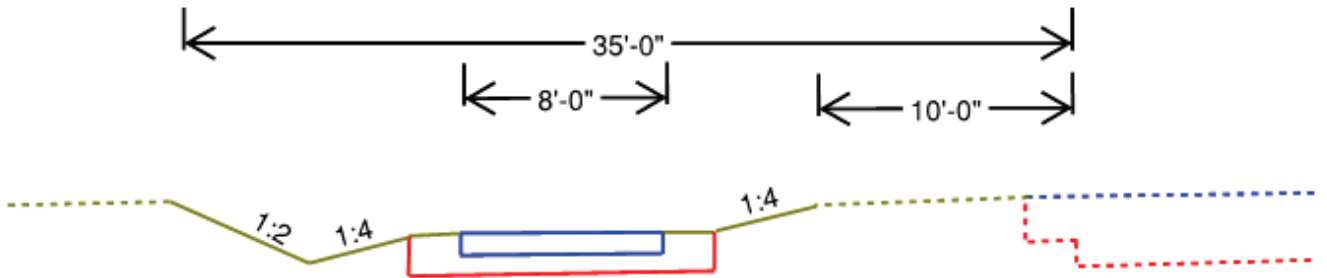
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-21
DESCRIPTION:	Build Double Ditch	SHEET NO.: 3 of 5

ORIGINAL DESIGN:



ALTERNATIVE:



Item Calculations

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-21
DESCRIPTION:	Build Double Ditch	SHEET NO.: 4 of 5

ASSUMPTIONS:

- 1) Right of Way cost per acre: \$360,000
- 2) Excavation is the same (same cross sectional area)
- 3) Analyzed as a per-mile comparison

QUANTITIES:

ORIGINAL DESIGN:

- 1) 47' required minus 30' of RW from EOP = 17' impact * 1 mile = 2.06ac

ALTERNATIVE:

- 1) 35' required minus 30' of RW from EOP = 5' impact * 1 mile = 0.6ac

DESIGN SUGGESTIONS

(SELECTED)

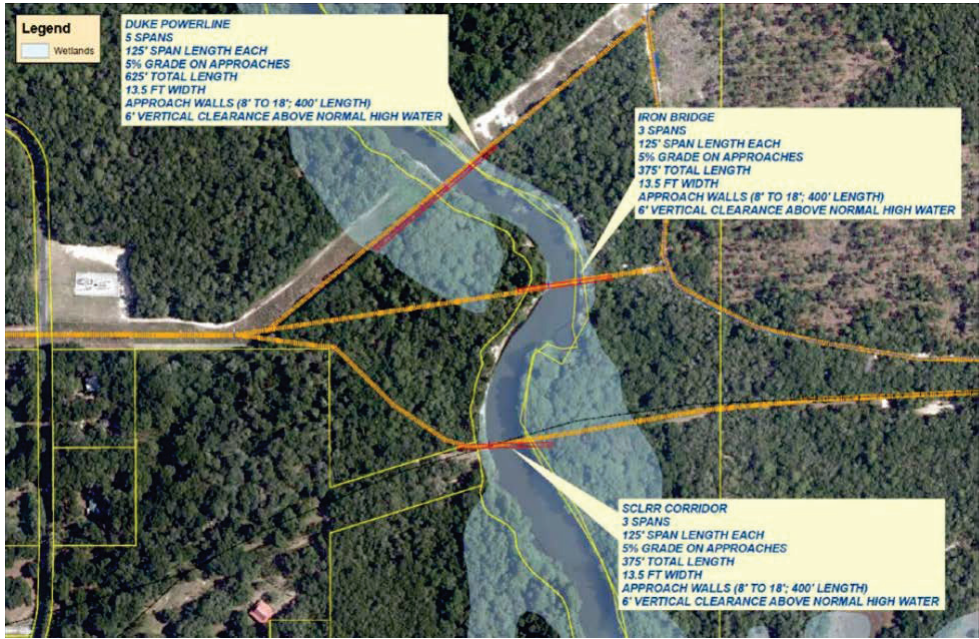
Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-03
DESCRIPTION:	Cross River At Iron Bridge Location	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design suggests three potential site locations for crossing the Withlacoochee River, Duke Energy utility corridor, Iron Bridge, and SCLRR sites.		
ALTERNATIVE: The alternative design recommends crossing the Withlacoochee River at the Iron Bridge location.		
OPPORTUNITIES:	RISKS:	
<ul style="list-style-type: none"> • AVOIDS THE DUKE ENERGY UTILITY CORRIDOR WHICH IS DESIRABLE FOR SECURITY REASONS • ALLOWS FOR A SHORTER STRUCTURE THAN WHAT IS REQUIRED AT THE DUKE ENERGY CROSSING • LOCATION IS CONVENIENTLY LOCATED TO THE EXISTING ROADWAY ACCESS POINT FOR POTENTIAL TRAILHEAD USE • ABILITY TO DISPLAY/FEATURE THE HISTORICAL SIGNIFICANCE OF THE PREVIOUS BRIDGE • PREVIOUS USE OF THIS ALIGNMENT WILL RESULT IN LESS DISTURBANCE OF THE NATURAL SURROUNDINGS • LANDING OF BRIDGE ON THE WEST SIDE OF THE RIVER POTENTIALLY HAS FEWER CONFLICTS WITH PROPERTY OWNERS THAN THE SCLRR SITE 	<ul style="list-style-type: none"> • MINIMIZING IMPACTS TO POTENTIALLY HISTORIC SITE OF IRON BRIDGE • WILL REQUIRE MORE LAND CLEARING THAN THE DUKE ENERGY UTILITY CORRIDOR AND THE SCLRR SITE 	
CATEGORIES:		
<input type="checkbox"/> Safety	<input type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment
		<input checked="" type="checkbox"/> Construction
<input type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

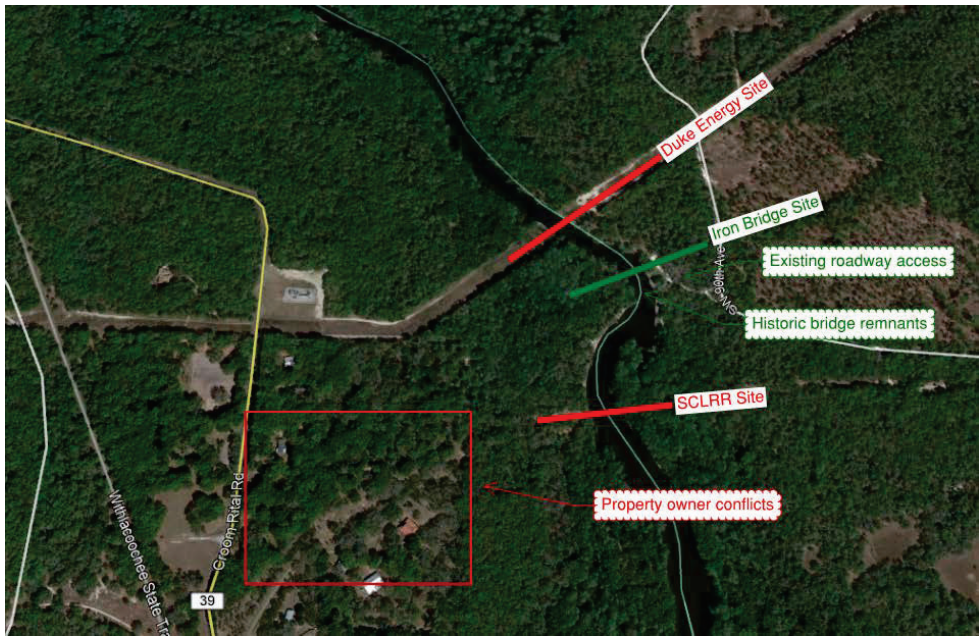
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-03
DESCRIPTION:	Cross River At Iron Bridge Location	SHEET NO.: 2 of 2

ORIGINAL DESIGN:



ALTERNATIVE:



Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-13
DESCRIPTION:	Construct Elevated Approaches At Withlacoochee Bridge To Avoid Floodplain Impacts	SHEET NO.: 1 of 3
ORIGINAL DESIGN: The original design does not currently specify the design of bridge approaches for the bridge over the Withlacoochee River.		
ALTERNATIVE: The alternative design suggests specifying column supported approaches.		
OPPORTUNITIES: <ul style="list-style-type: none"> • REDUCED ENCROACHMENT IN FLOODWAY • AVOIDS CREATING HYDRAULIC CONSTRICTION AT THE CROSSING • IMPROVED AESTHETICS. • REDUCED DISTURBANCE OF LAND 		RISKS: <ul style="list-style-type: none"> • ADDITIONAL COST COMPARED TO EARTHEN EMBANKMENTS FOR APPROACHES • LONGER CONSTRUCTION TIME
CATEGORIES:		
<input type="checkbox"/> Safety	<input type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Construction
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Other
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-13
DESCRIPTION:	Construct Elevated Approaches At Withlacoochee Bridge To Avoid Floodplain Impacts	SHEET NO.: 2 of 3
<p>TECHNICAL DISCUSSION:</p> <p>During the field review, the VE team noted high water marks on several trees near Iron Bridge Park indicating that much of the area submerges during flood events. The USGS gage in the area also recorded peak elevations during Hurricane Irma that corroborated the water marks and indicates much of the area functions as a floodplain. If earthen approaches are used for the bridge, these will act as an encroachment into the floodplain, impede views of the surrounding area, and cause a constriction at the crossing.</p> <p>Use of column supported approaches will allow flow to pass during high water events and avoid blocking views of the area.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-13
DESCRIPTION:	Construct Elevated Approaches At Withlacoochee Bridge To Avoid Floodplain Impacts	SHEET NO.: 3 of 3

ORIGINAL DESIGN:



Embankments encroach into floodway and reduce flow area through the crossing during high water events. Embankments also disrupt sight lines and obstruct views of the area.

ALTERNATIVE:



The elevated approaches allow flood stages to pass unimpeded and do not interrupt views of the area.

Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-14
DESCRIPTION:	Accommodate Trail Head With Boat Ramp At Iron Bridge Park	SHEET NO.: 1 of 3
ORIGINAL DESIGN: The original design did not include a boat ramp or Trail Head at Iron Bridge Park.		
ALTERNATIVE: The alternative design suggests adding a boat ramp to access the river, providing an additional feature to attract potential users of the trail.		
OPPORTUNITIES: <ul style="list-style-type: none"> • WILL MAKE THE PROJECT MORE ATTRACTIVE TO THE PUBLIC • INVITE TOURISTS • POTENTIAL FOR FUTURE PARK DEVELOPMENT 		RISKS: <ul style="list-style-type: none"> • ADDITIONAL COST
CATEGORIES:		
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment
		<input checked="" type="checkbox"/> Construction
<input type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-14
DESCRIPTION:	Accommodate Trail Head With Boat Ramp At Iron Bridge Park	SHEET NO.: 2 of 3
<p>TECHNICAL DISCUSSION:</p> <p>At present, there is a natural, unpaved slope leading to the river that is being used as a boat ramp. The suggestion is to provide a concrete slab ramp at the site to enhance the safety of boat launching into the river. Additionally, enhancing this area as a Trail Head would have immense economic and tourism benefits.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-14
DESCRIPTION:	Accommodate Trail Head With Boat Ramp At Iron Bridge Park	SHEET NO.: 3 of 3

ORIGINAL DESIGN:



ALTERNATIVE:



Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-15
DESCRIPTION:	Avoid Flood Plain Impacts Or Compensate With Cut Adjacent To Trail	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design does not specify the method for dealing with floodplain impacts.		
ALTERNATIVE: The alternative design suggests to compensate adjacent to the trail with cut, or to create floodplain compensation in state forest land for any impacts in connected floodplains.		
OPPORTUNITIES: <ul style="list-style-type: none"> • REDUCED RW OUTSIDE STATE FOREST LIMITS. 	RISKS: <ul style="list-style-type: none"> • MAY NOT APPLY TO ALL AREAS OF FLOODPLAIN IMPACT. 	
CATEGORIES:		
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment
<input type="checkbox"/> Construction	<input type="checkbox"/> Other	
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

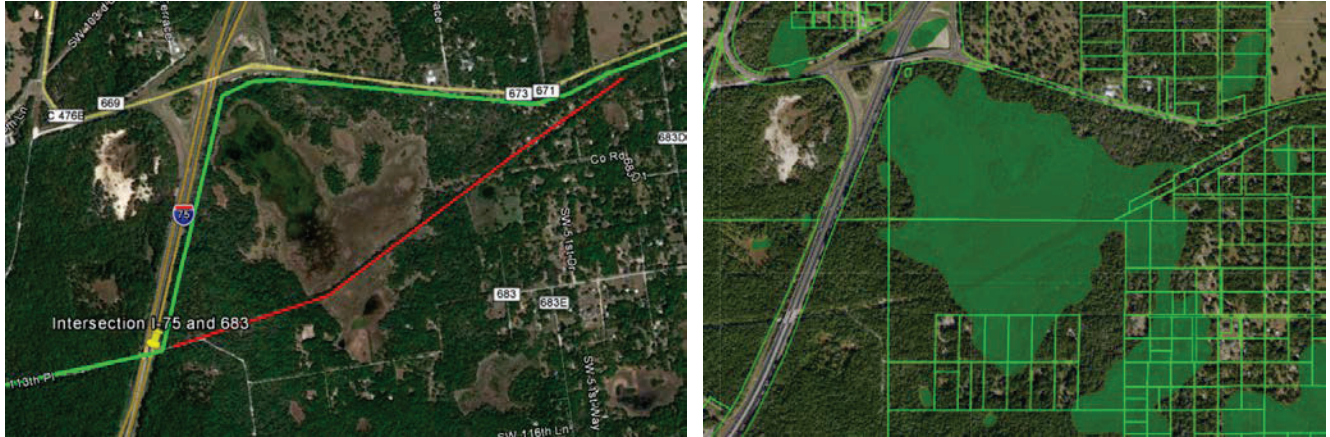
Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-15
DESCRIPTION:	Avoid Flood Plain Impacts Or Compensate With Cut Adjacent To Trail	SHEET NO.: 2 of 5
<p>TECHNICAL DISCUSSION:</p> <p>The project alignment is near a floodplain area near where it crosses I-75. It is suggested to compensate any floodplain fill necessary to construct the trail with cut immediately adjacent to the trail. It is also suggested to compensate for any floodplain fill on land that has to be acquired from a private owner with cut in the State Forrest property. This would reduce the width of RW needed across the private property.</p>		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-15
DESCRIPTION:	Avoid Flood Plain Impacts Or Compensate With Cut Adjacent To Trail	SHEET NO.: 3 of 5

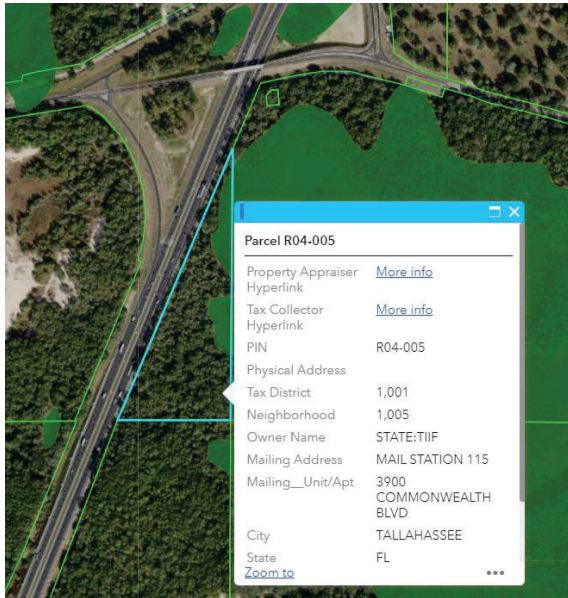
ORIGINAL DESIGN:



Trail alignment options shown as green and red lines in the map on the left.

Floodplain locations shown in green in the map to the right.

ALTERNATIVE:



Highlighted parcel is owned by the forest, and is hydraulically connected to the floodplain that will be impacted as the trail crosses the private property. This makes it a good site for compensation.

Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-17
DESCRIPTION:	Cross CR 673 at CR 671 to Limit Parcels	SHEET NO.: 1 of 1
ORIGINAL DESIGN: The original design calls for alternatives between the Right Side (South), and the Left Side (North) for the trail location.		
ALTERNATIVE: The alternative suggests selecting the Left side option by creating a crossing from the Right side at the intersection with CR 671.		
OPPORTUNITIES: <ul style="list-style-type: none"> REDUCED NUMBER OF PARCEL IMPACTS. REDUCED RIGHT OF WAY COSTS. BASED ON A PREVIOUS R/W COST ESTIMATE THE SAVINGS WOULD BE \$1,225,000 (54%), AND IT WOULD REDUCE THE NUMBER OF PARCELS FROM 38 TO 16 ALONG THIS SEGMENT 		RISKS: <ul style="list-style-type: none"> ADDS A ROAD CROSSING WHICH MAY BE A SAFETY ISSUE ROAD CROSSING CONSTRUCTION COST WOULD BE MINIMAL
CATEGORIES:		
<input checked="" type="checkbox"/>	Safety	<input type="checkbox"/> Operations
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Environment
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Construction
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Other
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

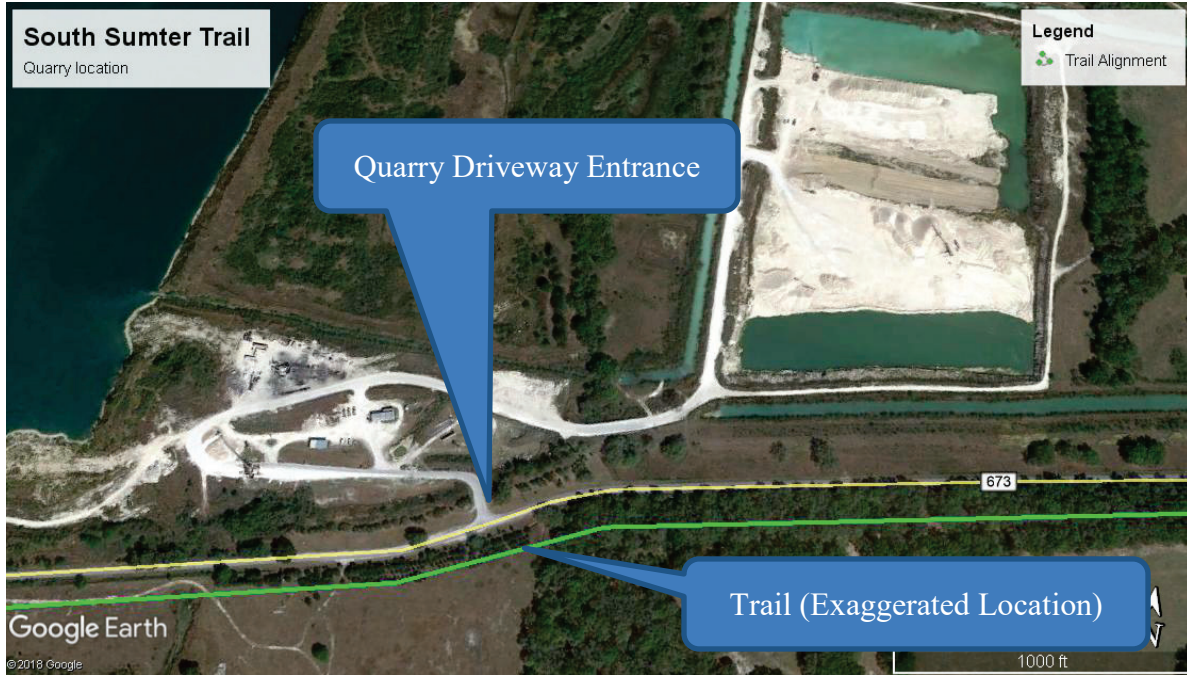
Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-23
DESCRIPTION:	Install Warning Lights At Quarry Driveway Entrances	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design calls for the trail to cross the driveway of the sand mine.		
ALTERNATIVE: The design suggestion is to place warning lights and signs along the trail to warn the trail users that trucks will be crossing.		
OPPORTUNITIES: <ul style="list-style-type: none">• TO HELP THE TRAIL USERS GET SAFELY BY THE DRIVEWAY WHERE LARGE TRUCKS WILL BE CROSSING	RISKS: <ul style="list-style-type: none">• ADDED COST OF SIGNS AND LIGHTS	
CATEGORIES:		
<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	Environment
		<input checked="" type="checkbox"/> Construction
Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S1-23
DESCRIPTION:	Install Warning Lights At Quarry Driveway Entrances	SHEET NO.: 2 of 5

ORIGINAL DESIGN:



ALTERNATIVE: PLACE WARNING LIGHTS



Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S2-06
DESCRIPTION:	Avoid Built-up Walls For Approach Support At Crossings	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design calls for retaining walls along the approaches to the pedestrian bridges. The heights of the walls range from 8ft to 18ft while the length of walls is approximately 400ft.		
ALTERNATIVE: The alternative design suggests use of open span approaches.		
OPPORTUNITIES: <ul style="list-style-type: none"> • IMPROVED SAFETY FROM INCREASED VISIBILITY • DECREASED IMPACTS TO THE NATURAL ENVIRONMENT 		RISKS: <ul style="list-style-type: none"> • CONSTRUCTION DURATION IS LIKELY LONGER WITH OPEN SPAN APPROACHES
CATEGORIES:		
<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment
		<input checked="" type="checkbox"/> Construction
<input type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

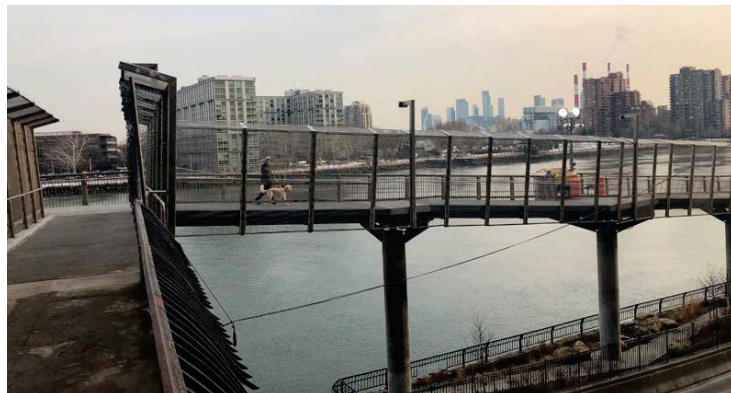
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S2-06
DESCRIPTION:	Avoid Built-up Walls For Approach Support At Crossings	SHEET NO.: 2 of 2

ORIGINAL DESIGN:



ALTERNATIVE:



Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S2-07
DESCRIPTION:	Consider ABC Method For Structures	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design does not specify any construction methods for the bridge crossings.		
ALTERNATIVE: The alternative design recommends using Accelerated Bridge Construction (ABC) methods for constructing the crossing structures. In particular, the crossing of the Railroad parallel to 301 will benefit from ABC methods.		
OPPORTUNITIES: <ul style="list-style-type: none"> • REDUCED CLOSURE TIME OF ROADS AND RAILROADS • REDUCED OVERALL CONSTRUCTION TIME • INCREASE SAFETY BY REDUCING WORK ZONE DURATIONS 		RISKS: <ul style="list-style-type: none"> • LIMITED SOURCES OF PROCUREMENT • SPECIALTY CONTRACTORS MAY BE REQUIRED
CATEGORIES:		
<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	Environment
		<input checked="" type="checkbox"/> Construction
Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Illustration

PROJECT:	<p align="center">South Sumter Trail FPN #: 435471-1</p>	<p>ALTERNATIVE NO.: S2-07</p>
DESCRIPTION:	<p>Consider ABC Method For Structures</p>	<p>SHEET NO.: 2 of 2</p>

ORIGINAL DESIGN:



ALTERNATIVE:



Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-04
DESCRIPTION:	Build Switchbacks For Bridge Ramps	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design calls for bridge crossings and during the presentations it was commented that a helix ramp was another idea for the ramping the elevation to cross the roadways.		
ALTERNATIVE: The alternative design suggests “switch backs” for bridge ramps.		
OPPORTUNITIES: <ul style="list-style-type: none"> • BETTER AESTHETICS TO MATCH ENVIRONMENT • INCREASE CONSTRUCTABILITY • ADA COMPLIANT • BETTER CONTROL OF SPEED (TRAVELING UP OR DOWN) 		RISKS: <ul style="list-style-type: none"> • REQUIRES MORE LAND
CATEGORIES:		
<input checked="" type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment
<input checked="" type="checkbox"/> Construction	<input type="checkbox"/> Other	
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: S3-04
DESCRIPTION:	Build Switchbacks For Bridge Ramps	SHEET NO.: 2 of 2

ORIGINAL DESIGN:



ALTERNATIVE:



Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-02
DESCRIPTION:	Realign Roadway To One Side And Trail On The Other	SHEET NO.: 1 of 1
ORIGINAL DESIGN: The original design calls for the road to stay at the current location and the trail to follow along either side of the roadway based on the allowable room given by right of way.		
ALTERNATIVE: The alternative design suggests reconstructing the road to back up to the right of way line to provide significant room on the opposite of the road to implement the trail within the right of way lines.		
OPPORTUNITIES: <ul style="list-style-type: none">• ELIMINATES RIGHT OF WAY COSTS• IMPROVES THE CONDITIONS OF THE COUNTY ROADS	RISKS: <ul style="list-style-type: none">• COMPLETE RECONSTRUCTION• EXTENDS THE LIFE OF THE PROJECT	
CATEGORIES:		
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment
<input checked="" type="checkbox"/> Construction		<input checked="" type="checkbox"/> Other
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-05
DESCRIPTION:	Reuse Millings From CR RRR Projects For Trail	SHEET NO.: 1 of 1
ORIGINAL DESIGN: The original design calls for new construction of Superpave Asphaltic Concrete to be use for the trail rideable surface.		
ALTERNATIVE: The alternative design suggests the reuse of the millings from a nearby County Road to pave the proposed trail.		
OPPORTUNITIES: <ul style="list-style-type: none"> • REDUCED COST • RECYCLED MATERIALS 		RISKS: <ul style="list-style-type: none"> • DEPENDENT ON RRR PROJECT NEAR TRAIL LOCATION • BASED ON CONTRACT, MILLS <u>MAY</u> BELONG TO CONTRACTOR
CATEGORIES:		
<input type="checkbox"/> Safety	<input type="checkbox"/> Operations	<input checked="" type="checkbox"/> Environment
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Construction
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Other
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-06
DESCRIPTION:	Perform Option ROW Purchase Prior To Final Design	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design calls for funding and starting Right of Way Acquisition after design is complete using standard acquisition procedures.		
ALTERNATIVE: The alternative suggests starting Right of Way Acquisition early using Option agreements instead of Deeds. If Acquisition Agents can start negotiating for an option to purchase at a later date when complete R/W funding is available it would allow the design to modified based on willing and unwilling sellers. This is critical on any Trail project with SunTrail Funds since eminent domain acquisitions are not permitted.		
OPPORTUNITIES: <ul style="list-style-type: none">• IF IMPLEMENTED EARLY, IT WILL ALLOW THE DESIGN OF THE PROJECT TO CONFORM CLOSELY TO LOCATIONS WHERE WILLING SELLERS ARE LOCATED.		RISKS: <ul style="list-style-type: none">• DIFFICULTIES IN ATTAINING FUNDING.• UNCERTAINTY IN USING OPTION AGREEMENTS INSTEAD OF DEEDS.
CATEGORIES:		
<input type="checkbox"/> Safety	<input type="checkbox"/> Operations	<input type="checkbox"/> Environment
<input type="checkbox"/> Construction	<input checked="" type="checkbox"/> Other	
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-15
DESCRIPTION:	Address Utility Conflicts Early	SHEET NO.: 1 of 1
ORIGINAL DESIGN: The original design identifies 13 existing utilities and anticipated impacts. Exact locations of existing utilities and the extent of impacts will be determined during the final design phase of the project.		
ALTERNATIVE: The alternative design suggests coordinating early utility conflict to prevent any project delays in design.		
OPPORTUNITIES: <ul style="list-style-type: none"> • IMPROVE COMMUNICATION WITH UTILITIES COMPANIES • IDENTIFY EASEMENT AND PERMITTED UTILITIES • PROVIDE THE DESIGN TEAM WITH GOOD INFORMATION FOR NEGOTIATION • PREVENT DELAYS IN CONSTRUCTION 		RISKS: <ul style="list-style-type: none"> • EARLY COMMITMENT MIGHT BE AN ISSUE • UTILITY CONTACT PERSONNEL MAY CHANGE
CATEGORIES:		
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment
		<input checked="" type="checkbox"/> Construction
<input type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

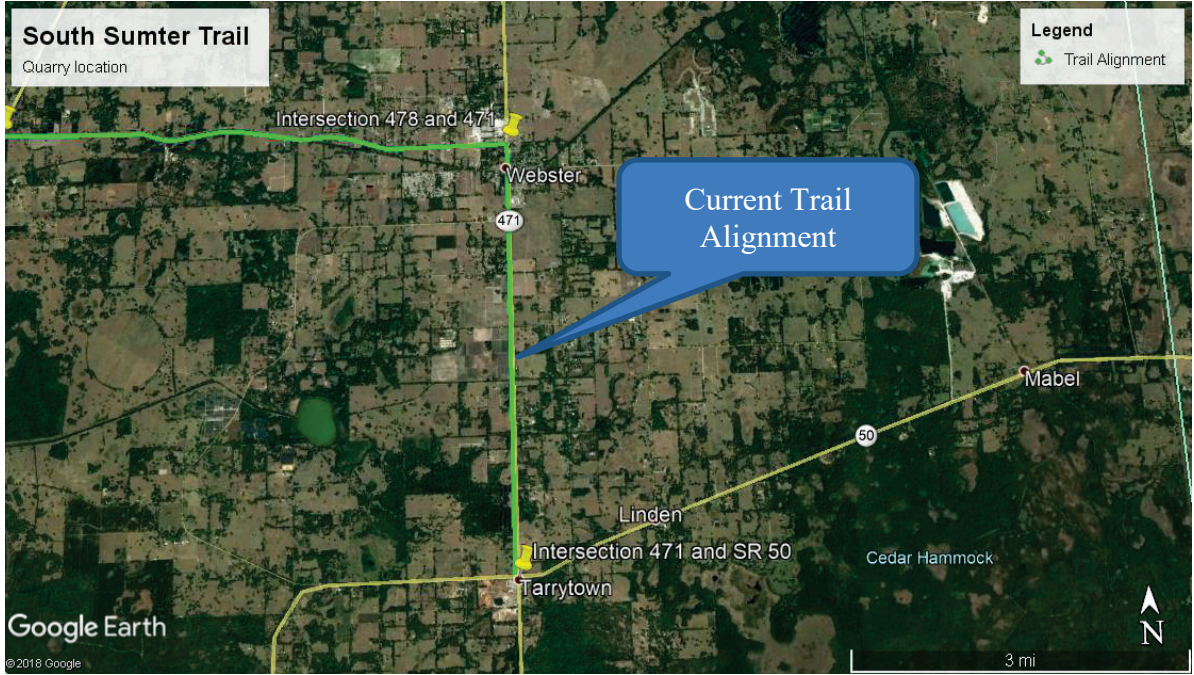
Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-18
DESCRIPTION:	Realign Trail Up to Webster / Back From SR 50	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design calls for the trail alignment along County Road 478 into the City of Webster where it connects to State Road 471 and heads south along the roadway to State Road 50, ultimately providing a connection to the Van Fleet Trail.		
ALTERNATIVE: The alternative design suggests realigning Trail up to Webster back from SR-50.		
OPPORTUNITIES:	RISKS:	
<ul style="list-style-type: none"> • PROVIDES A CONVENIENT PATH FOR PEDESTRIAN AND TRAILERS TO THE VAN FLEET TRAIL. • REDUCES CONFLICT WITH SR-471 AND TYPICAL SECTIONS • REMOVES THE POTENTIAL ROUNDABOUT AT SR 471 AND SR 50. 	<ul style="list-style-type: none"> • PROPERTY ACQUISITION WOULD BE NEEDED IN THE AREA • INCREASE TRAIL CONNECTION • POTENTIAL IMPACT TO THE FOREST AND SPECIES 	
CATEGORIES:		
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment
		<input checked="" type="checkbox"/> Construction
<input type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

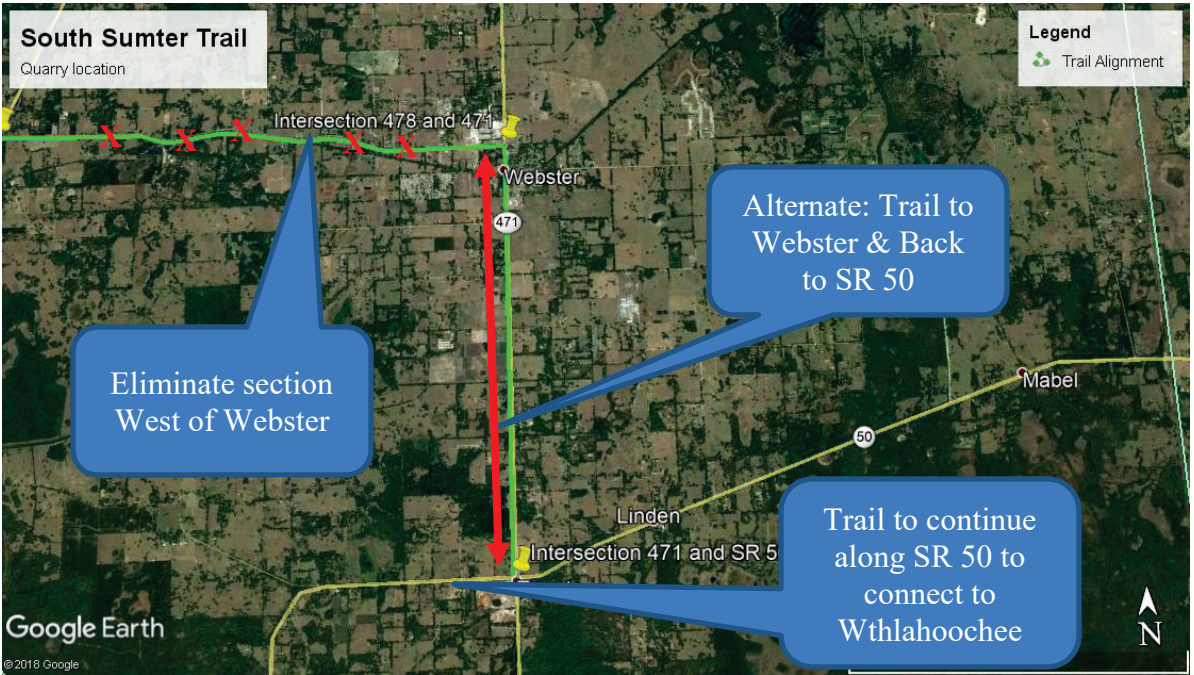
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-18
DESCRIPTION:	Realign Trail Up to Webster / Back From SR 50	SHEET NO.: 2 of 2

ORIGINAL DESIGN:



ALTERNATIVE:



Value Analysis Design Suggestion

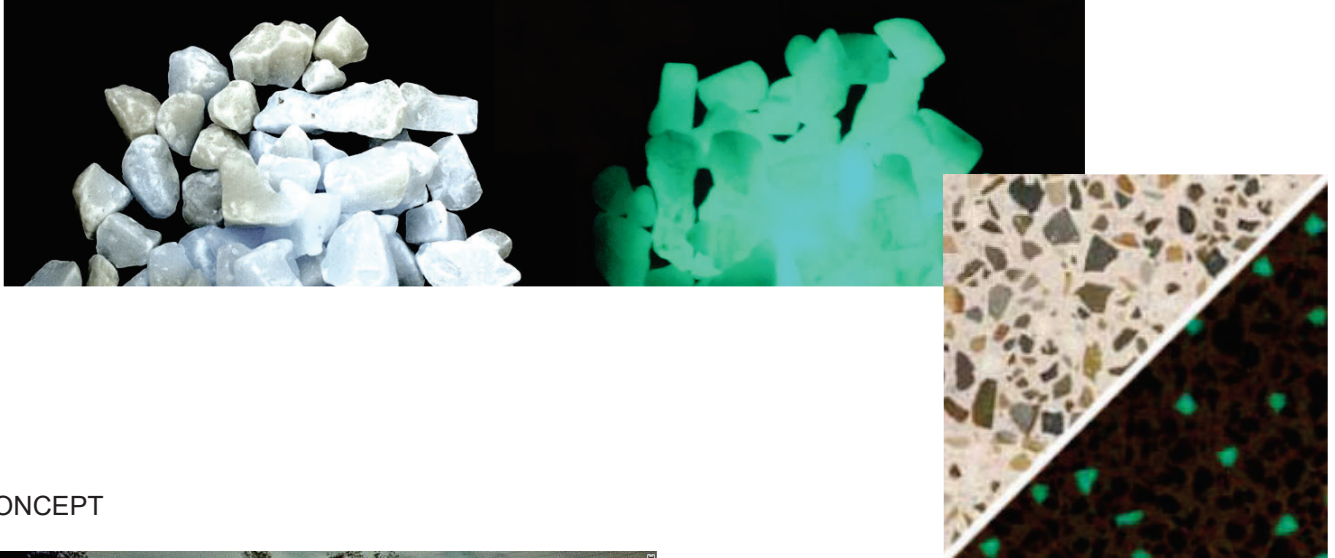
PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-19
DESCRIPTION:	Install Reflective/Solar Pavement	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design calls for a 12 foot wide multi-use trail that runs the length of the bridge with no lighting other than optional LED strip lighting on the rear face of the barrier adjacent to the multi-use trail.		
ALTERNATIVE: The alternate suggestion incorporates luminous features along the multiuse trail that serve as aesthetic design features in the day and functional lighting at night.		
OPPORTUNITIES: <ul style="list-style-type: none"> • PROVIDES LIGHTING WITHOUT THE EXPENSE OF POWER CONSUMPTION • ENHANCED USER SAFETY • MAINTENANCE FREE • ACCOMPLISHES THE AESTHETIC GOAL OF INCORPORATING "ELEGANCE" • MAY SERVE AS AN USEFUL LONG TERM TEST TO EVALUATE SCALABILITY FOR FUTURE PROJECTS • EXPANDS USEFUL HOURS BEYOND DAYLIGHT ONLY 		RISKS: <ul style="list-style-type: none"> • INCREASED COST
CATEGORIES:		
<input checked="" type="checkbox"/>	Safety	<input checked="" type="checkbox"/> Operations
		Environment
		<input checked="" type="checkbox"/> Construction
		Other
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Technical Discussion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-19
DESCRIPTION:	Install Reflective/Solar Pavement	SHEET NO.: 2 of 2

TECHNICAL DISCUSSION:

Design Suggestion:



CONCEPT



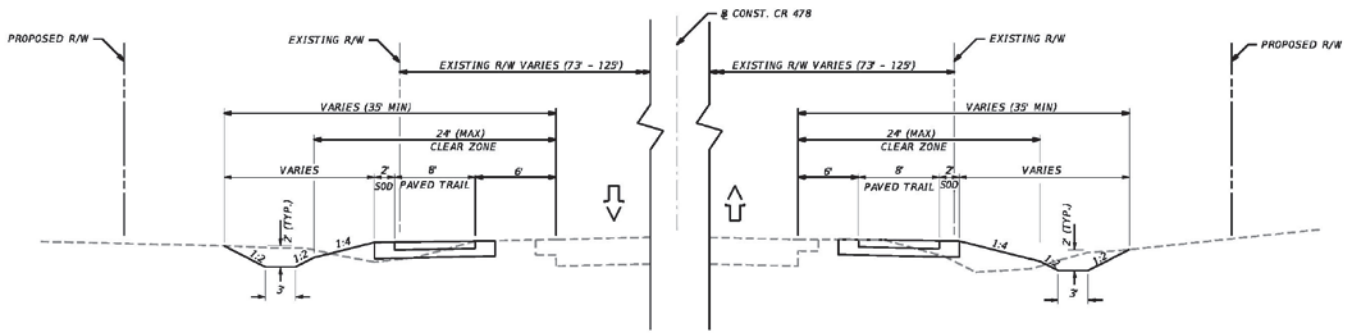
Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-22
DESCRIPTION:	Revisit ROW Proposed VS ROW Actually Required for Facilities	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design calls for ROW acquisition which includes additional land for construction purposes.		
ALTERNATIVE: The alternative design suggests acquiring ROW actually needed and a temporary ROW for construction activities		
OPPORTUNITIES: <ul style="list-style-type: none"> • REDUCES INITIAL PROJECT COST • REDUCES LAND TO BE MAINTAINED 		RISKS: <ul style="list-style-type: none"> • NONE APPARENT
CATEGORIES:		
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment
		<input checked="" type="checkbox"/> Construction
<input type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

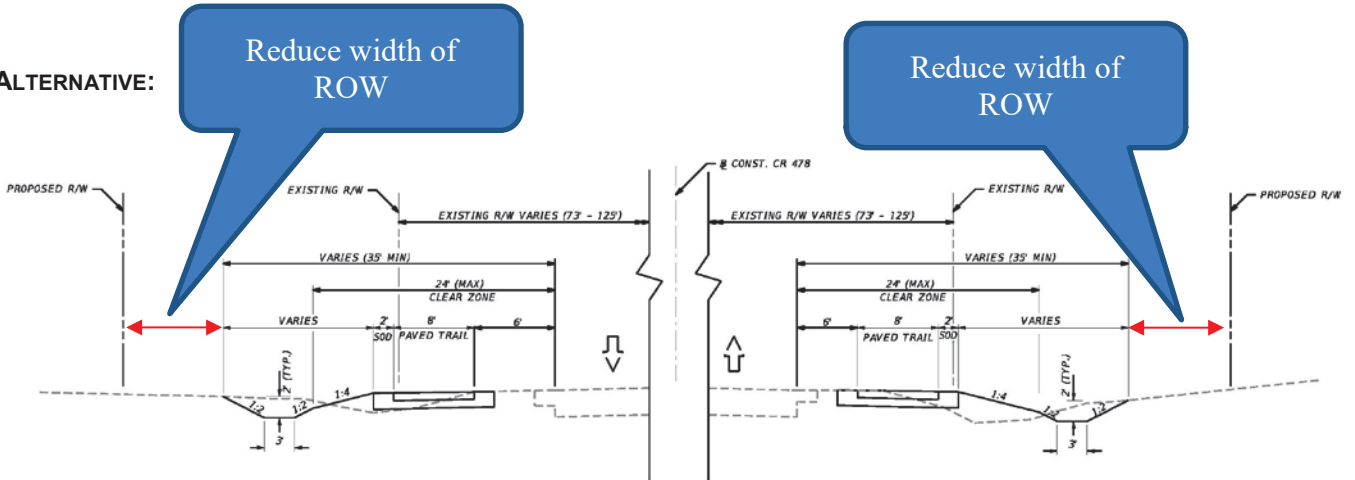
Illustration

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-22
DESCRIPTION:	Revisit ROW Proposed VS ROW Actually Required for Facilities	SHEET NO.: 2 of 2

ORIGINAL DESIGN:



ALTERNATIVE:



Value Analysis Design Suggestion

PROJECT:	South Sumter Trail FPN #: 435471-1	ALTERNATIVE NO.: SA-24
DESCRIPTION:	Provide for Emergency Vehicle Access In Forest Area	SHEET NO.: 1 of 2
ORIGINAL DESIGN: The original design mentions maneuverability of emergency response vehicles in a confined trail corridor maybe an issue.		
ALTERNATIVE: The alternative design suggests providing access to emergency vehicle in forest area to increase response time in case of emergencies.		
OPPORTUNITIES: <ul style="list-style-type: none">• INCREASE RESPONSE TIME TO EMERGENCIES		RISKS: <ul style="list-style-type: none">• DECREASE TRAILERS OR PEDESTRIAN SAFETY• INCREASE UNLAWFUL ACCESS TO OTHER VEHICLES• POTENTIAL ACCIDENT WITH FOREST SPECIES OF ANIMALS
CATEGORIES:		
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Operations	<input type="checkbox"/> Environment
		<input checked="" type="checkbox"/> Construction
<input type="checkbox"/> Other		
VE RESOLUTION: <u>ACCEPTED/NOT ACCEPTED/PENDING FURTHER ANALYSIS</u> This VE recommendation		

Section 4

Value Engineering Process

THE VALUE ENGINEERING TEAM

The VE team was composed of staff members of FDOT District 5, HNTB, Inc. and KCA, Inc., with the team leadership provided by Ramesh Kalvakaalva PE, CVS, and Leslie Thomas, PE, CVS-Life, of CSI.

Name	Discipline	Organization
Ramesh Kalvakaalva	Team Leader	CSI
Les Thomas	Co-Facilitator	CSI
Karen Madrid	Construction/Operations	FDOT D5 (Leesburg)
Steve Johnston	Drainage	KCA
Victor Rivera	Geotechnical	FDOT D5
Jude Jean-Francois	Project Management	FDOT D5
Frank Kelch	Project Administrator	FDOT D5
Mark Meeks	Right of Way	Present Value
Celine Bounds	Roadway Design	FDOT D5
Juan Rivera	Roadway Design	FDOT D5
Kyle Ervin	Structures	HNTB
Joan Carter	Traffic Operations	FDOT D5

THE SIX-STEP VALUE ENGINEERING JOB PLAN

The Value Engineering team followed the six step Value Engineering job plan as promulgated by SAVE International. This six step job plan included the following:

- I. Information Phase**
 - II. Function Analysis Phase**
 - III. Speculation/Creative Phase**
 - IV. Evaluation Phase**
 - V. Development Phase**
 - VI. Presentation Phase**
- **Information Phase** – during this phase of the team’s work, the team received a briefing from the design team and representatives of the FDOT District 5. This briefing included discussions of the design intent behind the project, the cost concerns, and was followed by a general discussion and Q & A session for all the participants. Following the presentation the team took time to visit the project site and noted the potential high cost items and challenges that should be carefully reviewed during the course of the workshop. The VE team leader also made it clear that it was not the full intent of the study to cut costs for the project – that there is a great significance to be attached to alternatives that add value to the project, even if the alternative adds cost to the project. The sign-in sheet for the attendance during this phase can be found at the end of the section.
 - **Function Analysis Phase** – during this phase the team reviewed the project from the simplest perspective by asking questions such as, “What is the project supposed to do?”, and “How is it supposed to accomplish this purpose?”. In the Value Engineering vernacular the answers to these questions are cast in the form of active verbs and

measurable nouns. These verb/noun pairs form the basis of the function analysis that distinguishes a Value Engineering effort from a potentially damaging cost cutting exercise. As will be seen later, the team performed a random function analysis which was then developed into Function Analysis System Technique (FAST) diagram by the Team Leader. This diagram is used to identify the key functions in the project. These key functions form the basis for purpose and need for the project. The FAST diagram is included at the end of this section.

- **Creative/Brainstorming Phase** – The VE team performed a brainstorming session to identify ideas that might help meet the team objectives for the workshop:
 - Reduce the construction and life cycle costs without reducing the quality and functionality of the currently planned project.
 - Meet project constraints such as challenges with the soil conditions, constructability, accessibility, project phasing, funding, etc.
 - Adherence to FDOT and AASHTO/FHWA design guidelines.
 - Reduce the construction duration.
 - Respect environmental, local community and other accepted constraints.
 - Clarify and help mitigate risks and take advantage of opportunities for the project.

This brainstorming session initially identified numerous ideas that were then evaluated in the next phase. The reader will find the creative ideas worksheets enclosed. These same worksheets were also used to record the results of the Judgment or Evaluation Phase.

- **Judgment or Evaluation Phase** – Once the team identified the various creative ideas, it was necessary to decide which alternatives should be carried forward for further consideration. This is the work of the Judgment or Evaluation Phase. The team reflected back to the project constraints and objectives shared with the team by the project delivery team members in their briefing at the kick-off meeting. From that guidance the VE team settled on the following values to make the decisions on the merit of each of the ideas:
 - Ability to implement the alternative (is it workable and doable).
 - Does the idea support the environmental objectives for the project?
 - Construction cost savings.
 - Does the idea add value to the project?
 - Will the idea help to reduce the construction duration?
 - Does the idea respect the several constraints for the project?

Based on these and other measurement yardsticks, the VE team evaluated the alternatives and graded them using the following factor:

Evaluation Factors: The VE team used the performance metrics perspectives to decide on whether the alternatives should be carried forward. With each of the approximately 69 (Sixty Nine) creative ideas, the VE team rated them as follows:

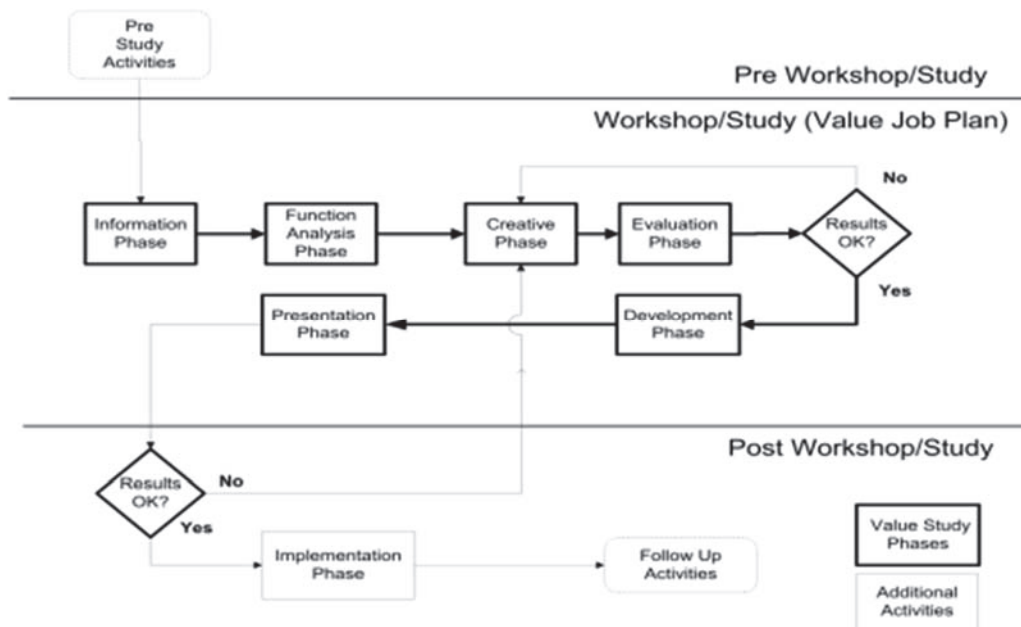
5	Excellent Idea
4	Good Idea
3	Marginal but it may offer some interest in the event there are budget problems.

2 and 1	Not to be carried forward
ABD	Already Being Done
DS	Design Suggestion

The complete list of Creative Ideas along with ratings is included at the end of this section.

- Development Phase** – This phase calls for a thorough documentation of the alternatives to be carried forward. The worksheets provide a description of the changes to be made from the original design, sketches are prepared, Rough Order of Magnitude cost estimates, calculations, and technical discussions are provided. All of these are intended to assist the decision makers in deciding on the merits of the alternatives. Some of the ideas are documented in the form of Design Suggestions, which is a less detailed manner of providing guidance and suggestions for aspects of the project as it moves forward to construction.
- Presentation Phase** – As noted earlier, the team made a final, informal presentation on the last day of the workshop. This presentation was designed to inform the project delivery team and stakeholders as to the initial findings of the VE workshop. This written report is intended to formalize those findings. The sign-in sheet for the attendance during this phase can be found at the end of the section.

The following flow chart that represents the work done prior to, during, and after the VE workshop is completed on site:



Value Engineering Job Plan (Source: SAVE International)

STUDY AGENDA

The agenda for this VE workshop follows this narrative. There is a need to explain some of the activities that occurred during the workshop but are not identified in the agenda since the

agenda was prepared prior to the start of the study.

On Monday, October 29, the VE Team performed a site visit of the project subsequent to the presentation by the design team. On Tuesday morning, October 30, and Wednesday morning, October 31 the Design Team personnel provided answers to questions that surfaced during the VE team’s work sessions. The VE team was also provided with slides, photos and narratives that helped the team gain a better grasp on the history and design objectives for the project. The mid-point review with the designers was held on Wednesday, October 31.

AGENDA
VALUE ENGINEERING WORKSHOP: October 29 – November 2, 2018
South Sumter Trail
FPN #: 435471-1

Sunday 28 October, 2018	VE Facilitators Travel to DeLand, FL	Location –DeLand
Monday 29 October, 2018		
8:00 am – 8:30 am	VE Team Assembles for Information Session	Sanborn Center
8:30 am – 10:30 am	Designers Presentation	VE and Project Delivery Team, Designers
11:00 am – 12:00 PM	Q&A Session & Travel to Site	VE and Project Delivery Team; Designers
12:00 pm – 1:00 pm	Lunch	
1:00 pm – 3:30 pm	VE Team Information Phase / Site Review	VE and Project Delivery Team; Designers
3:30 pm – 5:00 pm	VE Team Information Phase / Site Review Discussions	VE Team
Tuesday 30 October, 2018		
8:00 am – 10:00 pm	Function/Cost Analysis Phase	VE Team
10:00 am – 12:00 pm	VE Team Creative Phase	VE Team
12:00 pm – 1:00 pm	Lunch	
1:00 pm – 2:30 pm	VE Team Creative/Evaluation Phase	VE Team
2:30 pm – 5:00 pm	VE Team Evaluation Phase / Development of Alternatives	VE Team
Wednesday 31 October, 2018		
8:00 am – 5:00 pm	Development of Alternatives	VE Team
10:00 am – 11:00 am	Informal Progress Review	VE Team and Project Delivery Team Leadership
Thursday 1 November, 2018		
8:00 am – 2:30 pm	Development of Alternatives	VE Team
2:30 PM – 5:00 PM	Preparation for Presentation	VE Team

Friday 2 November, 2018		
8:00 am – 11:00 am	Brief Presentation of Findings	FDOT D5 HQ, DeLand
11:00 am – 5:00 pm	Draft VE Report Preparation	VE Team Leaders

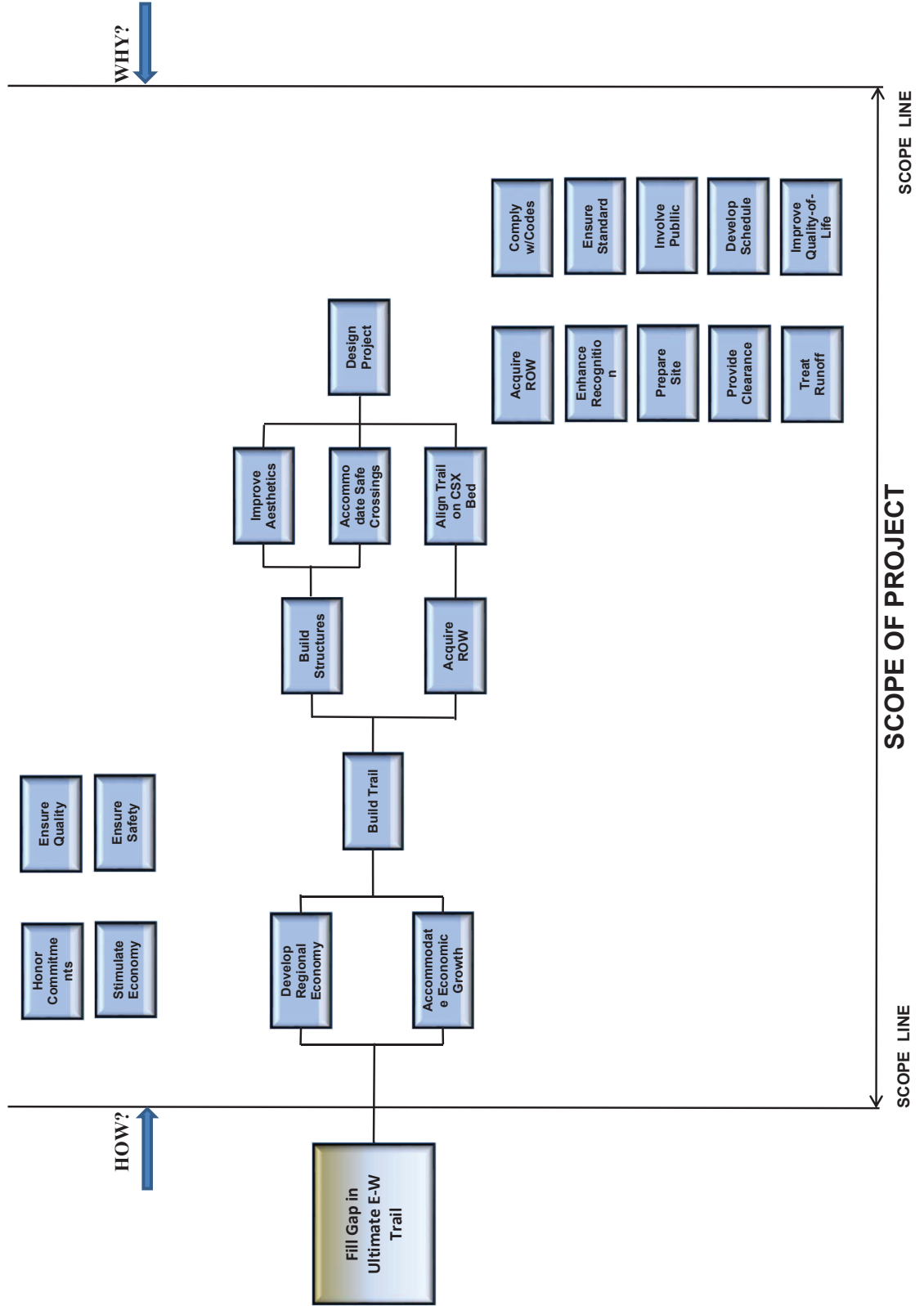
CONSTRUCTION COST ESTIMATE

Since the project was in the PD&E phase and still evolving, costs were of near the Rough Order of Magnitude. The design presented to the VE Team was used as the Baseline for comparison. Below is a summary of the cost estimate (the Detailed LRE for the project can be found in the PD&E documents that are under development by the Designers). Where applicable, the VE Team made an attempt to itemize components of the Value Engineering Ideas to provide a Rough Order of Magnitude savings in costs or Value Addition keeping along the same levels of estimation for consistency.

In general, the Right of Way (R/W) requirements can be segmented into five areas: Forest, CR 673, US 301, CR 478, and CR 471. In addition, there are intersection crossings at each of the roadways that will need to be considered. Based on the latest design alternatives and R/W estimates, the least expensive options are: Left on CR 673, Left on US 301, Right on CR 478, and Right on CR 471. The project construction is expected to cost approximately \$13.5 million with an additional Right-of-Way cost estimated at \$9.2 million. The cost estimate, as developed by the designers, is for the PD&E stage of design as it continues to evolve.

Florida Department of Transportation
South Sumter Trail
FPN: #435471-1

Value Engineering Workshop: October 29 - November 2, 2018
FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST) DIAGRAM





Florida Department of Transportation
Value Engineering Study of:
South Sumter Trail
FPN #: 435471-1

ATTENDANCE SHEET – INFORMATION PHASE – DESIGNERS PRESENTATION MEETING
 October 29, 2019

NAME	ORGANIZATION & TITLE	EMAIL	TELEPHONE #
Ashraf A. Elmaghraby	FDOT D5, VE Administrator	Ashraf.Elmaghraby@dot.state.fl.us	386-943-5645
Tyler Burgett	FDOT D5, Consultant Project Manager	Tyler.Burgett@dot.state.fl.us	386-943-5439
Ramesh Kalvakaalva	CSI; PM/VE Facilitator	Rameshk@civilservicesinc.com	770-312-2014
Leslie M. Thomas	CSI; VE Co-Facilitator	Les.Civilservicesinc@gmail.com	678-677-6420
Kyle Ervin	HNTB - Streets	Kervin@HNTB.com	314-544-6613
Steve Johnston	KCA - DRAINAGE	Steve.Johnston@KCAENG.com	407-427-7307
Victor M. Rivera	DOT	Victor.Rivera@dot.state.fl.us	386-744-3522
Juan M. Rivera	FDOT - Roadway Design	Juan-m.rivera@dot.state.fl.us	386-943-5516
Celine Bounds	FDOT - Roadway Design	Celine.Bounds@dot.state.fl.us	386-943-5399
FRANK KELCH	FDOT PROJECT ADMINISTRATOR	FRANK.KELCH@DOT.STATE.FL.US	352-459-9931 CE11
Mark Meeks	Present Value Services - R/Us	Mark@PresentValueServices.com	386-785-8046
Jude Jean-Francois	FDOT - Project Management	Jude.Jean-Francois@dot.state.fl.us	386-943-8187
Jean Carter	FDOT - TR. Ops	Jean.Carter@dot.state.fl.us	386-943-5335
Heather Grubert	FDOT	heather.grubert@dot.state.fl.us	386-943-5540
Alice Giudiani	FDOT	Alice.Giudiani@dot.state.fl.us	386-943-5247
Julia Holt-Hansen	FDOT In-House	julia.holt-hansen@dot.state.fl.us	386-943-5058
Heather Garcia	FDOT-PMO	heather.garcia@dot.state.fl.us	888-943-5077
Lorena Cusick	FDOT PM	Lorena.cusick@dot.state.fl.us	386-943-5392
Kevin Thibault	Trans Systems	Kevin.Thibault@transystems.com	407-275-2924



Florida Department of Transportation
 Value Engineering Study of:
 South Sumter Trail
 FPN #: 435471-1

ATTENDANCE SHEET – MID-POINT REVIEW

October 31, 2018

NAME	ORGANIZATION & TITLE	EMAIL	TELEPHONE #
Ashraf A. Elmaghraby	FDOT D5, VE Administrator	Ashraf.Elmaghraby@dot.state.fl.us	386-943-5645
Tyler Burgett	FDOT D5, Consultant Project Manager	Ttyler.Burgett@dot.state.fl.us	386-943-5439
Ramesh Kalvakaalva	CSI; PM/VE Facilitator	Rameshk@civilservicesinc.com	770-312-2014
Leslie M. Thomas	CSI; VE Co-Facilitator	Les.Civilservicesinc@gmail.com	678-677-6420
Jude Sean-Francois	FDOT, Project Management	Jude.Sean-Francois@dot.state.fl.us	386-943-5884
FRANK KELCH	FDOT, PROJECT ADMINISTRATOR	FRANK.KELCH@DOT.STATE.FL.US	386-326-7716
Steve Johnston	KCA Drainage	Steve.Johnston@KCAENG.COM	407-426-7307
Jean Carter	FDOT TO	jean.carter@dot.state.fl.us	386-943-5335
Celine Bounds	FDOT - ROADWAY DESIGN	Celine.Bounds@dot.state.fl.us	(386)943-5399
Kyle Ervin	HNTB - Structures	Kervin@HNTB.COM	407-805-0355
Victor Rivera	DOT - Geotechnical	Victor.Rivera@dot.state.fl.us	386-740-3522
Kevin Thibault	TransSystems	K5Thibault@transysystems.com	850 363 4257
Mark Meeks	CVS - R/W	mark@preceptvalceeservices.com	(886)785-8046
Fach Sullivan	FDOT - Proj. Man.	Facharyo.Sullivan@dot.state.fl.us	386 943 5725
Lorena Cueck	FDOT PM	Lorena.Cueck@dot.state.fl.us	386-943-5392

Initials	Last Name	First Name	Representing	E-Mail
	Adkins	Jack	FDOT - Right of Way	Jack.Adkins@dot.state.fl.us
<i>MJB</i>	Bizzio	Mario	FDOT - Design	Mario.Bizzio@dot.state.fl.us
<i>LB</i>	Bobo	Loreen	FDOT - Director of Transportation Development	Loreen.Bobo@dot.state.fl.us
	Borchik	George	FDOT - Roadway	George.Borchik@dot.state.fl.us
<i>SB</i>	Buck	Steven	FDOT - Roadway	Steven.Buck@dot.state.fl.us
	Byerly	Michael	FDOT - Geotechnical	Michael.Byerly@dot.state.fl.us
	Cheney	John	FDOT - Surveying & Mapping	John.Cheney@dot.state.fl.us
<i>JK</i>	Cicerello	Jeffrey	FDOT - Roadway	Jeffrey.Cicerello@dot.state.fl.us
	Elmaghraby	Ashraf	FDOT - VE and Project Management	Ashraf.Elmaghraby@dot.state.fl.us
	Garcia	Mark	FDOT - Materials & Research	Mark.Garcia@dot.state.fl.us
	Hatfield	John	FDOT - District Maintenance	John.Hatfield@dot.state.fl.us
<i>PH</i>	Hickson	Ferrell	FDOT - Drainage	Ferrell.Hickson@dot.state.fl.us
	Hyman	Alan	FDOT - Director of Operations	Alan.Hyman@dot.state.fl.us
<i>NI</i>	Isaac	Naziru	FDOT - Roadway	Naziru.Isaac@dot.state.fl.us
<i>KE</i>	Kestory	Ed	FDOT - Structures Maintenance	Ed.Kestory@dot.state.fl.us
	Lyon	Casey	FDOT - Environmental / Permitting	Casey.Lyon@dot.state.fl.us
	McPhail	Michael	FDOT - Right of Way	Michael.McPhail@dot.state.fl.us
	Meade	Ron	FDOT - Deland Maintenance	Ron.Meade@dot.state.fl.us

Subject : Value Engineering Final Presentation to FDOT Management

Initials	Last Name	First Name	Representing	E-Mail
	Nester	Staci	FDOT - Utilities	Staci.Nester@dot.state.fl.us
<i>SPH</i>	Phillips	Suzanne	FDOT - Project Management	Suzanne.Phillips@dot.state.fl.us
<i>MS</i>	Shannon	Mike	FDOT - Secretary	Mike.Shannon@dot.state.fl.us
<i>GS</i>	Skofronick	Gary	FDOT - Structures	Gary.Skofronick@dot.state.fl.us
<i>KS</i>	Snyder	Karen	FDOT - Drainage	Karen.Snyder@dot.state.fl.us
	Stanger	Brian	FDOT - Modal Development	Brian.Stanger@dot.state.fl.us
	Stettner	Alison	FDOT - PD&E	Alison.Stettner@dot.state.fl.us
<i>JA</i>	Stroz	Jim	FDOT - Traffic Operations	Jim.Stroz@dot.state.fl.us
	Tyler	John	FDOT - Construction	John.Tyler@dot.state.fl.us
X	DABSON	CHRIS	" " STRUCTURES	CHRIS.DABSON@ " "
X	Sullivan	Fach	" " Proj. Man.	Fachery.Sullivan@dot.state.fl.us
X	Garcia	Heather	FDOT - PLEMO	heather.garcia@dot. . .
X	Hoffman	Julia	FDOT - PLEMO	julia.hoffman@dot.state.fl.us
X	ANWAMED	Ayman	FDOT - Design	Ayman.anwamed@dot.state.fl.us
X	Fosterelli	Jesse DAH	FDOT - Project Management	Joseph.Fosterelli@dot.state.fl.us
X	Cucek	Lorena	FDOT PLEMO PM	Lorena.cucek@ . . .
X	KO	Jeongsu	FDOT Geotech	Jeongsu.KO@ " "
X	McGehee	Mary	FDOT PLEMO	Mary.mcgehee@dot. . .

APPENDIX A

PRESENTATION OF VALUE ENGINEERING FINDINGS



Value Engineering Workshop

October 29 – November 2, 2018

South Sumter Trail
FPN #: 435471-1



Value Engineering SIX STEP JOB PLAN

- * INFORMATION PHASE
- * FUNCTION ANALYSIS PHASE
- * CREATIVE PHASE
- * EVALUATION PHASE
- * DEVELOPMENT PHASE
- * PRESENTATION PHASE

INFORMATION PHASE

- * PROJECT IS AT 60% COMPLETION OF PD&E
- * NEXT PUBLIC MEETING IN NOVEMBER
- * ALTERNATIVES STUDY HAS BEEN PERFORMED
- * NARROW RIGHT OF WAY(S)
- * COUNTY MAINTAINANCE

INFORMATION PHASE



South Sumter Connector Trail PD&E
Sumter & Hernando Counties
Project Development & Environment
(PD&E) Study

PURPOSE

- Close the existing 22 mile gap in the Coast to Coast Trail with a multi-use trail in accordance with SUN Trail standards.

NEED

- Need is based on a combination of system linkage and economic development

Slide 5

INFORMATION PHASE



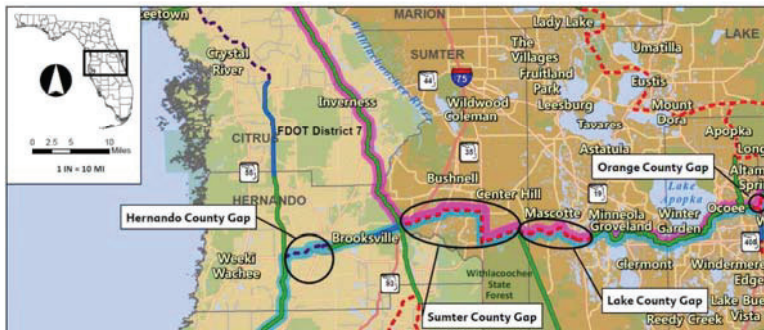
SHARED-USE NONMOTORIZED (SUN) TRAIL NETWORK

- Initiated through Governor/legislative support
- **\$25M** annual funding commitment
- Coast to Coast (C2C) Trail identified in December 2015 as the **first** SUN regional trail
 - 250 miles connecting St. Petersburg to Titusville
- Operation & maintenance by entities other than FDOT
- Local/private funding of amenities & maintenance
- **22-mile gap** in SUN Trail is the South Sumter Connector Trail
 - Through Sumter and Hernando Counties

Slide 6

INFORMATION PHASE

COAST-TO-COAST TRAIL



Adjacent projects = Good Neighbor Trail (Nov. 2018 open), S. Lake Trail

Slide 7

INFORMATION PHASE

KEY SUN TRAIL PROJECT POLICIES/CONSTRAINTS



- FDOT will not exercise eminent domain for R/W acquisition
- F.S. 339.81 explicitly prohibits the use of SUN Trail funding for the following elements (partial list):
 - Trailheads, parking areas
 - Benches, kiosks, pavilions, landscaping, trash receptacles
 - Water fountains, irrigation, restrooms
 - Sidewalks, nature trails, loop trails

} *Local Sponsor Opportunities*

Slide 13

INFORMATION PHASE

PROJECT LOCATION MAP



Slide 14

INFORMATION PHASE



South Sumter Connector Trail PD&E
Sumter & Hernando Counties
Project Development & Environment
(PD&E) Study

TRAIL ALIGNMENT & DESIGN

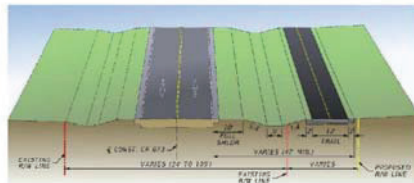
- Trail location along existing roadways
 - Sumter County maintenance
 - Right of Way considerations
- 12-foot wide trail preferred – complement rural/urban area
- Left vs. Right side of roadway
- Required horizontal clearance from adjacent roadway
- Accommodation for drainage
 - Address potential drainage impacts to adjacent private property
 - Slope of ditch (4H:1V to 3H:1V)
 - Width of ditch bottom (5 feet)

Slide 17

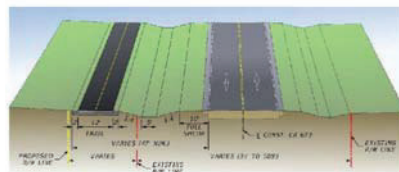
INFORMATION PHASE



South Sumter Connector Trail PD&E
Sumter & Hernando Counties
Project Development & Environment
(PD&E) Study



**CR 673
Rural Section – Right**
Impacts 11.51 acres along 38 parcels



**CR 673
Rural Section – Left**
Impacts 11.66 acres along 16 parcels

Slide 22

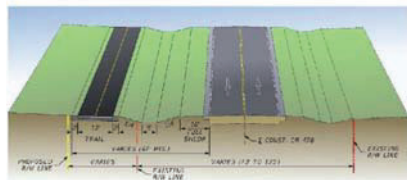
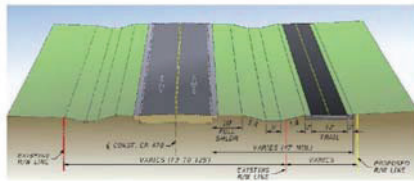
INFORMATION PHASE



**Alternative
Bridge Concepts
US 301**

Slide 23

INFORMATION PHASE

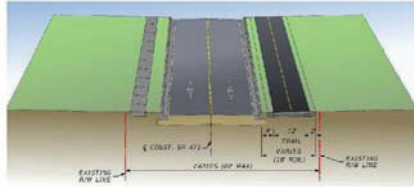


Slide 25

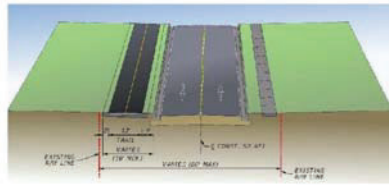
INFORMATION PHASE



South Sumter Connector Trail PD&E
Sumter & Hernando Counties
Project Development & Environment
(PD&E) Study



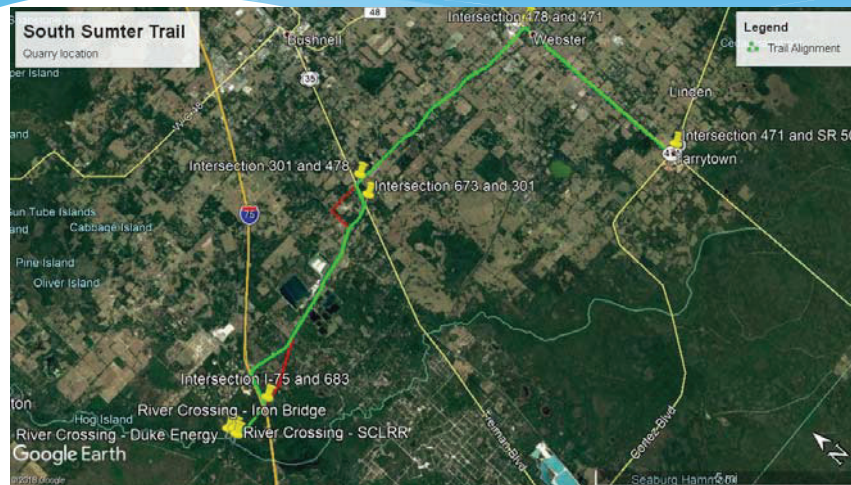
**SR 471 Urban Section –
Right**
Impacts 0 acres along 0 parcels



**SR 471 Urban Section –
Left**
Impacts 0 acres along 0 parcels

Slide 26

INFORMATION PHASE



INFORMATION PHASE

SITE VISIT – Monday, October 29, 2019



INFORMATION PHASE

* COST ESTIMATE (LRE IS DYNAMIC– BASELINE AS OF MONDAY, OCTOBER 29, 2018)

* LRE: \$13,500,000

* R/W Costs \$9,160,000

FUNCTION ANALYSIS PHASE

- * PRIMARY FUNCTIONS OF THE PROJECT
 - * COMPLETE SUNTRAIL (22 MILE GAP)
 - * ATTRACT TOURISTS
 - * CONNECT WEBSTER
 - * OVERCOME ROW CHALLENGES
 - * INCORPORATE SAFETY

FUNCTION ANALYSIS PHASE



CREATIVE PHASE

- * BRAINSTORMING SESSION
- * THINK “OUTSIDE THE BOX”
- * IGNORED CONSTRAINTS
- * LISTED 62 CREATIVE IDEAS
- * BASED ON INFORMATION PROVIDED

EVALUATION PHASE

- * CAN IT BE DONE?
- * IS IT APPLICABLE TO THE PROJECT?
- * DOES IT COMPLY WITH STANDARDS?
- * ANY ADVERSE IMPACTS?
- * IS IT BENEFICIAL TO THE PROJECT?
- * RANKING ON A SCALE OF 1-5
- * DESIGN SUGGESTION WHEN NOT QUANTIFIABLE BUT BENEFICIAL TO THE PROJECT
- * STUDY RESULTS:
 - * 29 ALTERNATIVES (INCLUDING MUTUALLY EXCLUSIVE IDEAS)
 - * 20 DESIGN SUGGESTIONS

DEVELOPMENT PHASE

- * TOTAL EXPECTED SAVINGS FROM MUTUALLY EXCLUSIVE IDEAS:
 - * About \$5 Million based on future implementation meeting
 - * Includes Value Additions

PRESENTATION PHASE

- * SUMMARY OF RESULTS

PLEASE REFER HANDOUTS

VE RECOMMENDATION S1-06

* Original Design

The original design calls for crossing Withlacoochee. A bridge crossing is implied.



Advantages:

- REDUCES INITIAL COST BY ELIMINATING BRIDGE CONSTRUCTION
- OFFERS A UNIQUE EXPERIENCE TO USERS, POSSIBLY WOULD ATTRACT CURIOUS OUTDOOR TRAVELERS
- HAS HISTORIC TRANSPORTATION VALUE
- VERY LOW ENVIRONMENTAL IMPACT
- OPPORTUNITY FOR COMMITMENT BY MANAGING AGENCY
- ALIGNS WITH NATURAL AND HISTORIC MISSION OF AREA (CROOM)

* VE Recommendation

The alternative design suggests installing a hand-cranked ferry to convey trail users across the river. (Other names, cable ferry, rope ferry)



Disadvantages:

IRRATIONAL FEAR ON THE PART OF MANAGEMENT IT MAY NEVER HAVE BEEN DONE IN A SIMILAR SETTING, WOULD BE AN INNOVATION
PROBABLY REQUIRES A MARINE CONSTRUCTION DESIGN
THOROUGH VETTING NEEDED TO MANAGE APPROPRIATELY

- VALUE ADDITION: \$58,500

VE RECOMMENDATION S1-07

* Original Design

Construction of a prestressed concrete beam bridge over the Withlacoochee River.



Advantages:

- RESTORE APPEARANCE OF HISTORIC BRIDGE CROSSING
- OPPORTUNITY TO PROVIDE HISTORICAL MARKERS/SIGNAGE
- REDUCE SUBSTRUCTURE ELEMENTS PLACED WITHIN THE WATERWAY BY UTILIZING LONGER SPAN(S)
- INCREASE SAFETY BY PROVIDING A REDUNDANT STRUCTURE

* VE Recommendation

Construct steel truss bridge over Withlacoochee River to retain historic significance



Disadvantages:

- ADDITIONAL MAINTENANCE EFFORT
- SPECIALTY CONTRACTOR MAY BE REQUIRED
- POTENTIAL SAVINGS: \$345,800

VE RECOMMENDATION S1-10

* Original Design

Does not specify amenities along the river crossing bridge.



Advantages:

- PROVIDE REST AREA FOR USERS TO ENJOY THE SCENIC SURROUNDINGS
- ATTRACT USERS BY PROVIDING A FISHING LOCATION

* VE Recommendation

* Provides viewing deck/fishing overhangs on river crossing bridge.



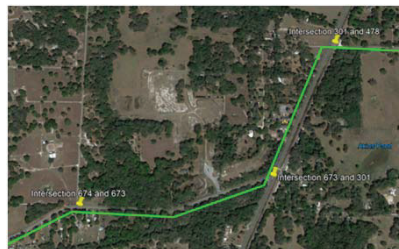
Disadvantages:

- UNIQUE STRUCTURE GEOMETRY REQUIRES CUSTOM DESIGN & FABRICATION ELEMENTS
- POTENTIAL SAFETY CONCERNS BETWEEN FISHING ABOVE AND RIVER USERS BELOW
- VALUE ADDITION: (\$20,000)

VE RECOMMENDATION S1-18

* Original Design

Trail to follow along CR 673 to US 301 then cross to follow CR 478 west.

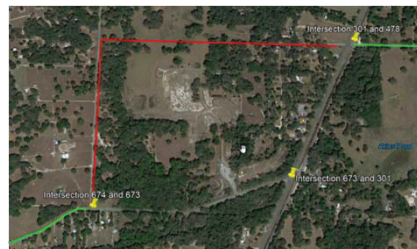


Advantages:

- REDUCED THE HAZARDS OF CROSSING US 301 AT CR 673
- ELIMINATE ROW ACQUISITION FROM CHURCHES
- MORE SCENIC ROUTE FROM CYCLISTS
- ELIMINATES RIDING ALONGSIDE THE RAIL

* VE Recommendation

* Suggests turning left from CR 673 to travel north on CR 674 then make a right on to CR 654A. Follow CR 654A across US 301 into CR 478.



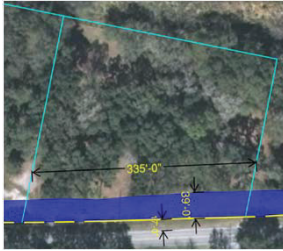
Disadvantages:

- 4-6 PARCEL IMPACTS ON CR 654A (ONE BEING AN RV PARK)
- MULTIPLE PARCELS IMPACTED ALONG CR 674
- POTENTIAL SAVINGS : \$1,435,396

VE RECOMMENDATION S1-20

* Original Design

Use ditches between the road and trail to convey runoff. Negotiate with willing sellers to acquire corridor.

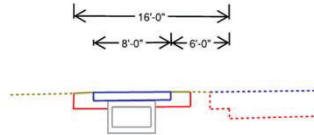


Advantages:

- REDUCED RIGHT OF WAY REQUIREMENTS.
- AVOIDS RW TAKE IF SELLER IS NOT WILLING.
- ALLOWS ALIGNMENT TO CONTINUE IF RW CANNOT BE ACQUIRED.

* VE Recommendation

In locations where sellers are not open to negotiation, convey flow with a box culvert and shift trail on top of the culvert. Fit both within the existing right of way.



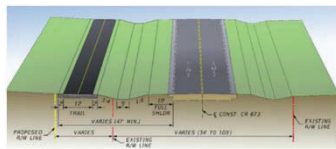
Disadvantages:

- NOT SUITABLE FOR ENTIRE CORRIDOR.
- REQUIRES ADDITIONAL DETAILS IN PLANS.
- ADDITIONAL MATERIAL COST.
- **VALUE ADDITION: (311,333)**

VE RECOMMENDATION S1-21

* Original Design

The original design calls for multiuse path built to current SunTrail standard 12' preferred designs, 10' alternative where necessary



Advantages:

- REDUCED INITIAL COST
- ASSESSMENT OF DEMAND AND OTHER NEEDS
- SIMPLIFIES ADDRESSING INITIAL RIGHT OF WAY ISSUES
- EASES FUNDING
- REQUIRES CHAMPION TO SCHEDULE AND CARRY OUT PHASE II PROGRAMMING

* VE Recommendation

Build an 8' path on one side (Phase I) and a second 8' path on the other side in the future (Phase II): Phased construction plan



Disadvantages:

- LOSS OF PROJECT MOMENTUM
- **POTENTIAL SAVINGS: \$ 4,146,687**
- (Phase I savings.)
- Deferred costs for Phase II will be increased.

VE RECOMMENDATION S2-02

* Original Design

Construction of a pedestrian overpass at the intersection of SR301 and CR478 spanning SR301 and CSX railroad with helix or switch-back approaches.



* VE Recommendation

* Construct pedestrian underpass spanning SR301 and CSX railroad north of CR 478

Advantages:

- ELIMINATES THE NEED FOR A LARGE HELIX OR SWITCH-BACK STRUCTURE TO ACHIEVE THE 23.5FT CLEARANCE OVER THE CSX RAIL LINE
- IMPROVES SIGHT DISTANCE CONCERNS AT THIS BUSY INTERSECTION
- RESULTS IN LESS DISRUPTION OF ACCESS TO ADJACENT PROPERTIES WHICH MAY BE NEGATIVELY IMPACTED BY A HELIX OR SWITCH-BACK STRUCTURE
- MORE VISUALLY APPEALING THAN AN OVERHEAD STRUCTURE
- REDUCED MAINTENANCE EFFORTS
- REDUCED CONSTRUCTION TIME

Disadvantages:

- DRAINAGE CHALLENGES OF A DEPRESSED STRUCTURE
- SAFETY ISSUES ARISING FROM ENCLOSED AND OUT-OF-SIGHT TRAIL
- POTENTIAL SAVINGS \$2,021,850

VE RECOMMENDATION S3-01

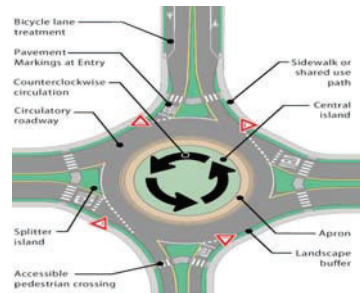
* Original Design

The original design calls for keeping the intersection as is.



* VE Recommendation

* The alternative design suggests construction of a roundabout at the intersection of CR478/CR471



Advantages:

- WILL ENHANCE SAFETY AT THE INTERSECTION
- WILL SERVE TO CALM TRAFFIC

Disadvantages:

- ADDITIONAL COST
- VALUE ADDITION: (\$ 2,125,000)

VE RECOMMENDATION S3-02

* Original Design

The original design calls for Paved trail on the south side of SR478



Advantages:

- MAKES THE FLEA MARKET MORE ACCESSIBLE TO THE USERS OF THE TRAIL
- IMPROVED SAFETY

* VE Recommendation

The alternative design suggests providing the trail on both sides of the road at the location of the Webster flea market



Disadvantages:

- ADDITIONAL COST
- VALUE ADDITION: (\$ 657,563)

VE RECOMMENDATION S3-03

* Original Design

The original design calls for a route that proceeds along CR 478 to the intersection of SR 471 then proceeds south on SR 471 to the end of the project at SR 50.



Length: 3,422 feet between CR 478 and CR 478A intersection

Advantages:

- This alternative eliminates Right of Way Acquisitions in the commercialized section of Webster.
- Reduces conflicts with utilities along the west side of SR 471 south of the CR 478 intersection..
- Provides a more rural and aesthetic route.
- Provides a safer route with less vehicle traffic.
- It eliminates potential pedestrian and bicycles conflicts at the entrances to the Flea Market.

* VE Recommendation

The alternative design suggests maintaining the route up to the Flea Market just west of the intersection with SR 471. However, the main line of the trail would continue by heading south on CR 747, east on CR 740, south on CR 743, and east on CR 478A to connect with SR 471 south of Webster.



Length: 16,522 feet between CR 247 intersection with CR 478 and CR 478A intersection with SR 471 plus 1,947 feet CR 478 to the Webster Flea Market

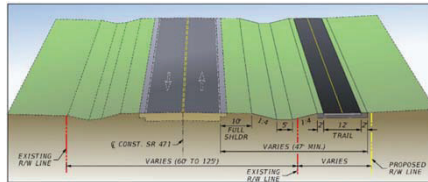
Disadvantages:

- Eliminates the Trail through the main part of Webster which was preferred by the Town.
- The existing Right of Way along the alternative route may be more narrow overall.
- The Alternative is approximately 5,927 feet longer resulting in definite increase in construction costs and possible increase in Right of Way costs.
- VALUE ADDITION: (\$954,840)

VE RECOMMENDATION S4-01

* Original Design

Maintain the rural typical section on SR 471 with the trail outside the ditch.

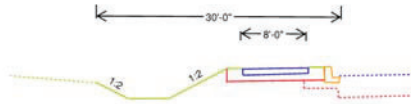


Advantages:

- REDUCED RW REQUIREMENTS.
- PROPOSED STORM SEWER IS ON A STATE ROAD (ENSURED MAINTENANCE ACCESS)

* VE Recommendation

Use a curb and gutter section on the side with the trail to be able to place the trail closer to the roadway and avoid ditch impacts.



Disadvantages:

- ADDITIONAL CONSTRUCTION COST.
- HIGHER MAINTENANCE.
- COST SAVINGS: \$176,435

VE RECOMMENDATION S4-02

* Original Design

The original design calls for the trail to follow along CR 471 on either side of the roadway.

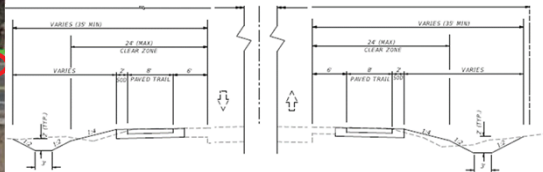


Advantages:

- REDUCED RIGHT OF WAY

* VE Recommendation

The alternative design suggests eliminating the on-street parking along CR 471 to shift the curb and trail in that additional space.



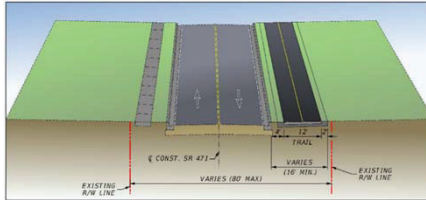
Disadvantages:

- REMOVAL OF ON-STREET PARKING
- INCREASE CONSTRUCTION COSTS
- POTENTIAL SAVINGS : \$130,574

VE RECOMMENDATION S4-03

* Original Design

Construct an asphalt trail in the urban section of 471.



Advantages:

- REDUCED RUNOFF FROM TRAIL.
- AVOIDS POTENTIAL RESIZING OF EXISTING STORM SEWER SYSTEM.
- AESTHETIC ENHANCEMENT.

* VE Recommendation

Use a permeable paver system to aide in reducing the runoff from the trail.



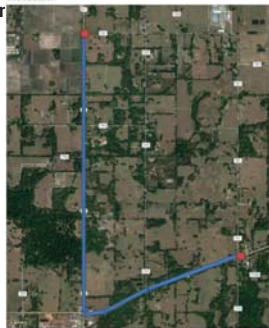
Disadvantages:

- ADDITIONAL COST.
- HIGHER MAINTENANCE.
- VALUE ADDITION: \$(395,888)

VE RECOMMENDATION S4-04

* Original Design

The original design calls for a route that proceeds south on SR 471 to the intersection with SR 50, which is a commercialized signaled intersection.

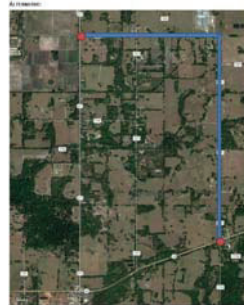


Advantages:

- Eliminate Safety hazards for trail users at the SR 50 intersection caused by heavier car and truck traffic at the proposed roundabout.
- A slightly shorter route with less construction costs

* VE Recommendation

The alternative design suggests heading east on CR 721 prior to the intersection with SR 50 then making the intersections with SR 50 at the CR 721 intersection, which is a more rural intersection.



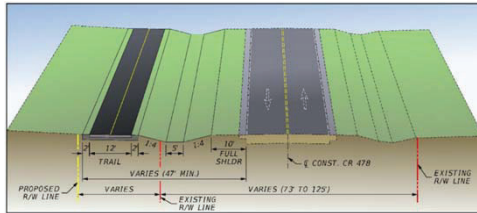
Disadvantages:

- Trail users may want commercial facilities to use that are provided at the SR50/SR 471 intersection.
- The segment from SR 50 to the intersection with CR 721 is already being designed to provide a trail.
- POTENTIAL SAVINGS: \$425,304

VE RECOMMENDATION SA-04

* Original Design

Construct drainage ditch between the road and the trail in rural sections.

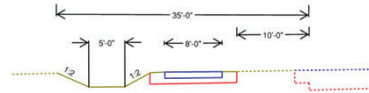


Advantages:

- REDUCED RW REQUIREMENTS
- ELIMINATES NEED TO CROSS TRAIL WITH OUTFALL PIPES
- SIMPLIFIES MAINTENANCE OF TRAIL (NO NEED TO CROSS DITCH)

* VE Recommendation

Shift the ditch outside the trail, and utilize a reduced ditch section.



Disadvantages:

- TRAIL CLOSER TO ROADWAY (WILL NEED TO MEET MINIMUM OFFSETS STILL)
- COST SAVINGS: \$674,494 Per Mile

VE RECOMMENDATION SA-08

* Original Design

The original design contemplates using a single paved surface to carry bi-directional traffic along one side of a roadway.

Note tight existing right of way

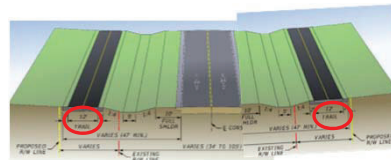


Advantages:

- REDUCED RIGHT OF WAY IMPACTS
- MORE VARIETY FOR USERS
- MAINTENANCE OF TOTAL WIDTH AVAILABILITY
- POTENTIAL FOR MORE USEABLE TRAIL WIDTHS
- OVERCOMES PROBLEMS ASSOCIATED WITH LIMITED RIGHTS OF WAY ON SWALE DRAINAGE

* VE Recommendation

The alternative design employs the option of using unidirectional segments at places where rights of way are especially constrained. Design would identify places where trail users could transition across the road (likely at a logical intersection location, a legal crosswalk) and the trail would continue as a unidirectional side path.



Disadvantages:

- DESIGN COST INCREASE
- FRONT END EVALUATION FOR DESIGN EFFORT
- EXPOSURE TO POTENTIAL CONFLICTS DUE TO USERS CROSSING ROADWAY. NOTE: ROADWAYS PRIMARILY AFFECTED ARE LOW-VOLUME ROADWAY WITH ~45MPH POSTED SPEEDS

- VALUE ADDITION: (\$ 185,446)

VE RECOMMENDATION SA-09

* Original Design

The original design does not specify asphalt edge treatment.

NO SPECIFIED PAVEMENT EDGE

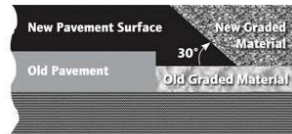


Advantages:

- REDUCED LANE DEPARTURE EVENTS
- HELPS TO ELIMINATE PAVEMENT DROP OFF
- HELPS TO PROTECT PAVEMENT EDGES FROM SHOULDER WEAR
- https://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/brochure/
- VERY LOW OR NO ADDITIONAL COST (SHOE TO FORM EDGE IS AVAILABLE THROUGH T2)

* VE Recommendation

The alternative design suggests that pavement should include safety edge treatment.



SAFETY EDGE FOR ASPHALT TRAIL

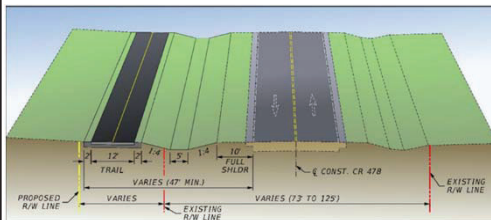
Disadvantages:

- UNFAMILIAR TO SOME CONTRACTORS
- COST SAVINGS: \$0

VE RECOMMENDATION SA-10

* Original Design

Shallow ditch side slopes where ditch is adjacent to roadway.

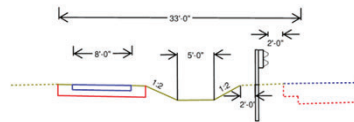


Advantages:

- REDUCED RIGHT OF WAY REQUIREMENTS.
- REDUCED EXCAVATION.
- POSSIBLE TO AVOID SOME PROPERTY OWNERS ENTIRELY.

* VE Recommendation

Selectively install guardrail and use steeper ditch side slopes to reduce ditch width.

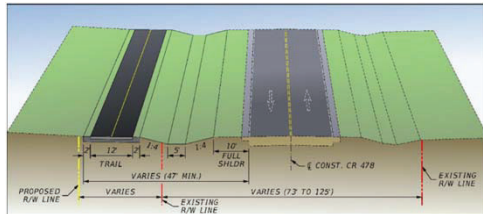


Disadvantages:

- ADDITIONAL COST OF GUARDRAIL.
- ACCESS AND MAINTAINABILITY.
- COST SAVINGS: \$668,194 Per Mile

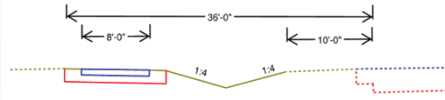
VE RECOMMENDATION SA-11

*** Original Design**
5' ditch bottoms.



*** VE Recommendation**

Use smaller ditch bottoms and "V" ditches to reduce ditch width.



Advantages:

- REDUCED RIGHT OF WAY REQUIREMENTS
- REDUCED EXCAVATION COST

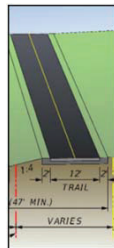
Disadvantages:

- HARDER TO MAINTAIN.
- REDUCED HYDRAULIC CAPACITY.
- ADDITIONAL PLAN DETAILS.
- COST SAVINGS: \$613,163 Per Mile

VE RECOMMENDATION SA 13

*** Original Design**

The original design calls for use of 12' trail width, the standard width preferred for SunTrail facilities. Design standard allows for 10' width in constrained areas (usually in urban settings). See FDM 224.4 with regard to SunTrail facilities



*** VE Recommendation**

Vary the trail width based on available ROW, 8'-12'

Note: Cost saving estimate was performed on CR 673L segment, ROW need reduction of 1/3 was used as sample.

Trail width options in order of preference:

11', 10', 9', 8' (min)

Advantages:

- REDUCED ADDITIONAL RIGHT OF WAY ACQUISITION
- OFFERS SOME FLEXIBILITY WITH REGARD TO DRAINAGE, UTILITY IMPACTS OR LIMITED RIGHT OF WAY
- MAY REDUCE CONSTRUCTION COSTS SLIGHTLY BECAUSE LESS MATERIAL IS NEEDED

Disadvantages:

- OVER-RIDES THE PREFERRED STANDARDS FOR THE SUNTRAIL NETWORK
- MAY RESTRICT TRAIL CAPACITY
- CREATES SOME OPERATIONAL ISSUES FOR GROUPS OF CYCLISTS
- REQUIRES APPROVAL OF CHIEF PLANNER
- UNDER SOME CIRCUMSTANCES MAY RESTRICT EMERGENCY ACCESS
- POTENTIAL SAVINGS / \$ 662,913

VE RECOMMENDATION SA-16

* Original Design

The original design calls for fee acquisitions to purchase the additional right of way needed for the trail.

ORIGINAL DESIGN

FM #4354711 - Special Estimate			
Date: 3/27/18			
Segment	# of Parcels	Total Acreage to be Acquired	Total Factored Costs
Forest	20	14.99	\$1,477,500
Left CR 673	16	11.66	\$1,055,000
Right CR 673	38	11.51	\$2,280,000
Left US 301	10	1.49	\$600,000
Right US 301	CSX - No take identified		\$0
Left CR 478	65	9.96	\$3,900,000
Right CR 478	61	10.73	\$3,867,500
Left CR 471	40	8.48	\$2,980,000
Right CR 471	36	4.732	\$2,160,000
TOTALS	286	73.55	\$18,320,000

AVERAGE COST PER ACRE: \$249,300 / 73.55 ACRES = \$3388

Advantages:

- Reduce Right of Way Costs
- An easement may be easier to negotiate from a less than willing seller.
- Commercial properties in Webster would maintain setback requirements for current and future development.

* VE Recommendation

The alternative design recommends using permanent easements instead of fee acquisitions.

ALTERNATIVE

FM #4354711 - Special Estimate			
Date: 3/27/18			
Segment	# of Parcels	Total Acreage to be Acquired	Total Factored Costs
Forest	20	14.99	\$1,330,000
Left CR 673	16	11.66	\$950,000
Right CR 673	38	11.51	\$2,052,000
Left US 301	10	1.49	\$540,000
Right US 301	CSX - No take identified		\$0
Left CR 478	65	9.96	\$3,510,000
Right CR 478	61	10.73	\$3,481,000
Left CR 471	40	8.48	\$2,682,000
Right CR 471	36	4.732	\$1,944,000
TOTALS	286	73.55	\$16,489,000

AVERAGE COST PER ACRE: \$16,489,000 / 73.55 = \$224200

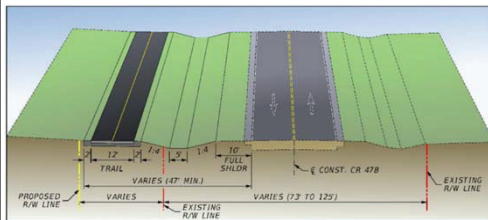
Disadvantages:

- Some owners may not prefer an easement due to potential liability.
- POTENTIAL SAVINGS: \$1,085,640

VE RECOMMENDATION SA-21

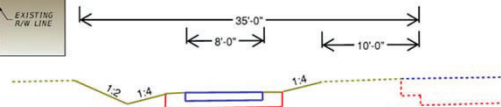
* Original Design

Place trail outside the ditch.



* VE Recommendation

Create a stepped ditch section and allow flow to flood the trail in major storm events.



Advantages:

- REDUCED RIGHT OF WAY REQUIREMENTS.
- IMPROVED HYDRAULICS FOR MAJOR EVENTS.
- INNOVATIVE USE OF TRAIL AREA.

Disadvantages:

- HIGHER MAINTENANCE.
- MAY REQUIRE DIFFERENT PAVEMENT DESIGN FOR TRAIL.
- COST SAVINGS: \$657,000 Per Mile

DESIGN SUGGESTIONS

SEGMENT 1 (S1) SR 673

- S1-03 Cross River At Iron Bridge Location
- S1-04 Cross River At SCL RR Location
- S1-13 Construct Elevated Approaches At Withlacoochee Bridge To Avoid Floodplain Impacts
- S1-14 Accommodate Trail Head With Boat Ramp At Iron Bridge Park
- S1-15 Avoid Flood Plain Impacts Or Compensate With Cut Adjacent To Trail
- S1-16 Compensate Within State Forest For Flood Plain Impacts
- S1-17 Cross CR 673 At CR 671 To Limit Parcels
- S1-22 Change CR 673 Widening (Current) – Re-evaluate Adding Trail
- S1-23 Install Warning Lights At Quarry Driveway Entrances

SEGMENT 2 (S2) US 301

- S2-06 Avoid Built-up Walls For Approach Support At Crossings
- S2-07 Consider ABC Method For Structures

SEGMENT 3 (S3) SR 478

- S3-04 Build Switchbacks For Bridge Ramps

SEGMENT ALL (SA) ALL SEGMENTS

- SA-02 Realign Roadway To One Side And Trail On The Other
- SA-05 Reuse Millings From CR RRR Projects For Trail
- SA-06 Perform Option ROW Purchase Prior To Final Design
- SA-15 Address Utility Conflicts Early
- SA-18 Realign Trail Up To Webster / Back From SR 50
- SA-19 Install Reflective/Solar Pavement
- SA-22 Revisit ROW Proposed Vs ROW Actually Required For Facilities
- SA-24 Provide For Emergency Vehicle Access In Forest Area

VE DESIGN SUGGESTION SA-06

* Original Design

The original design calls for funding and starting Right of Way Acquisition after design is complete using standard acquisition procedures.

Advantages:

- IF IMPLEMENTED EARLY, IT WILL ALLOW THE DESIGN OF THE PROJECT TO CONFORM CLOSELY TO LOCATIONS WHERE WILLING SELLERS ARE LOCATED..

* VE Recommendation

The alternative suggests starting Right of Way Acquisition early using Option agreements instead of Deeds. If Acquisition Agents can start negotiating for an option to purchase at a later date when complete R/W funding is available it would allow the design to be modified based on willing and unwilling sellers. This is critical on any Trail project with SunTrail Funds since eminent domain acquisitions are not permitted.

Disadvantages:

- DIFFICULTIES IN ATTAINING FUNDING.
- UNCERTAINTY IN USING OPTION AGREEMENTS INSTEAD OF DEEDS

**THANK YOU!
ANY QUESTIONS?**

