



Florida Department of Transportation

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ERIK FENNIMAN
INTERIM SECRETARY

Value Engineering Final Resolution Memorandum

Date: December 20, 2018

To: David Graeber, Project Manager

From: Ashraf Elmaghraby, D5 Value Engineering Administrator

CC: Mike Shannon, Alan Human, Loreen Bobo, John Tyler, Mario Bizzio, Jack Adkins, Suzanne Phillips, Gary Skofronick, Jeremy Dilmore, Mark Garcia, John Hatfield, Ed Kestory, Brian Stanger, Michael Byerly, Alison Stettner, Philip Maggio Karen Snyder, Jim Stroz, Heather Garcia, Ayman Mohamed, Staci Nester, Michael McPhail, Jeongsoo Ko, Steven Buck, Jeffrey Cicerello, Ferrell Hickson, Naziru Isaac, Kevin Thibault, Tyler Burgett, Ramesh Kalvakaalva, Leslie Thomas, Zach Sullivan, Kyle Ervin, Steve Johnston, Victor Rivera, Juan Rivera, Celine Bounds, Frank Kelch, Mark Meeks, Jude Jean-Francois, Joan Carter, Julia Holthansen, Kevin Marquez

Value Engineering Study

Financial Project ID#	435471-1
County	Hernando and Sumter Counties
State Road	S.R. 50 and S.R. 471
Limits	Good Neighbor Trail in Hernando County (at its junction with the Withlacoochee State Trail) to S.R. 50 in Sumter County

This memorandum is in response to the subject Value Engineering (VE) review conducted during the week of October 29 through November 2, 2018. The purpose of this memorandum is to document the responses to the subject recommendations.

Recommendation S1-06: Install Hand Cranked Ferry to Cross River

Value Addition: (\$58,500)

Response: Not Accepted

The proposed project design for the trail calls for crossing the Withlacoochee River via a new bridge crossing in one of three alternate locations. Because of shallow depth of the river with a wide depth range, the VE team explored a small hand cranked ferry that could support pedestrians, bicycles, or a small emergency vehicle. This would be reminiscent of the historic ferry crossing of the Withlacoochee in this region. The use of this ferry would rely on hand operated capstan belay and retrieving cable. The cable may pose debris snag hazards causing damage / loss of cable and/or ferry and increasing maintenance demands. While this option reduces cost by eliminating bridge construction and environmental impact, this option would require marine construction design, and there are user safety concerns as well as potential safety issues to recreational craft using the river and impacting the cable. Because of the capstan belay, if the ferry is docked at opposite side of river when needed, it can take a while to retrieve the ferry for use. In addition, it would be difficult to manage or monitor trail user's proper use of the ferry, ensuring safe operation and appropriate load/weight limits. There also could possibly be American with Disabilities Act (ADA) issues. The VE Team suggested this recommendation be considered as a temporary crossing measure until a bridge can be funded,



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designed, and constructed. The VE Team cost estimate did not include consideration of landing structures that can accommodate a large vertical water elevation variation or that can be safely operated or automatically closed for inappropriate water elevations. For the safety concerns by users, potential inconvenience of the ferry docked on the opposite side, and potential cost differential, this recommendation is not accepted.

Recommendation S1-07: Construct Steel Truss Bridge to Retain Historic Significance

Potential Cost Savings: \$345,800

Response: Accept

The VE team evaluated three bridge structure-type alternatives (S1-07, S1-08, and S1-09) for the Withlacoochee River crossing, which could be implemented on any of the three alternative crossing locations:

S1-07 - Construct Steel Truss Bridge to Retain Historic Significance

S1-08 - Construct Suspension Bridge

S1-09 - Build Wood Bridge Across River

All three structure type alternatives provide the opportunity to span the river without having substructure elements in the river. This aspect substantially reduces the environmental impacts of a river crossing. The Iron Bridge crossing location appears to be favored by stakeholders.

The S1-07 option, a steel truss bridge, at this location could recreate the appearance of the previous historic structure. A prefabricated steel truss can easily achieve the necessary clear spans. Uncoated weathering steel will greatly reduce maintenance requirements and enhance aesthetic consistency with the surroundings. A through truss pedestrian structure typically requires less superstructure depth below the path surface than a prestressed beam and deck system, thereby decreasing the approach ramp lengths. The cost of this alternative was estimated at a unit cost of \$2,200/LF for a 175 foot prefabricated steel truss span. A steel truss bridge at the Iron Bridge location could save project costs of \$345,800. For these reasons, the steel truss option is more favorable compared to S1-08 and S1-09 (further discussed below). The S1-08 option to construct a suspension bridge instead of the proposed prestressed concrete beam bridge, aims at creating a more visually appealing option. However, this option is unfavorable for an equestrian crossing, and the final skew could impact the required length to span the river. This approach is feasible but unnecessarily complex and expensive, and not necessarily appropriate aesthetically. The S1-07 version above is preferred. For these reasons, this alternative is rejected.

The S1-09 option to construct a timber bridge instead of the proposed prestressed concrete beam bridge, aims to create a visually appealing option that should allow for pedestrian and equestrian users. This approach is impractical for clear spans necessary to keep substructures out of the river and requires significant maintenance due to lower material durability. It is also subject to fire damage and vandalism. The span length of 160 feet to clear the river may be difficult to achieve with a timber structure. The S1-07 version above is preferred, and this alternative is not accepted.



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Recommendation S1-10: Provide Viewing Deck/Fishing Pier on Bridge

Value Addition: (\$20,000)

Response: Not Accepted

The current design for the bridge crossing the Withlacoochee River offers no design option for an overhang locations for recreation. Overhangs on the bridge could be used for resting, fishing, and enjoying the surroundings which can be constructed by extending the transverse floor beams. An overhang option could attract new trail users by providing a fishing location, but the unique structure will require custom design elements. The profile would need to be low enough to accommodate fishing. It may not be feasible within a steel truss bridge span due to the geometry of the truss members interfering with access to areas outside of the truss envelope.

This alternative warrants further analysis. If the proposed bridge structure remains, implementation of a viewing deck/fishing pier is a relatively simple addition to the design. This deck will add approximately \$20,000 to project cost. However, since Recommendation S1-07 above is implemented, creation of a viewing deck/fishing pier on a Steel Truss bridge is a more complex design option.

Recommendation S1-18: Realign Trail Along CR 674/CR 654A

Potential Cost Savings: \$1,435,397

Response: Not Accepted

Recommendation S1-18 analyzes the potential to realign the trail from following CR 673 to travel north to CR 674, and then right on to CR 654A to then cross US 301 rather than following along US 301. This alternative has the benefit of moving the trail away from US 301 to less traveled roadways which could be perceived as safer and more scenic path for bicyclists and pedestrians. It allows for a clearer line of sight to cross US 301 and the railroad tracks. It avoids purchasing potential right of way from a church (depending on the alternative) but does require purchasing additional right of way from private property owners.

While this recommendation has positive considerations, the roadway alignments selected for the trail connection have been studied and approved through several years of feasibility analysis conducted by FDOT in conjunction with the Florida Department of Environmental Protection (FDEP) and Sumter County. A 2016 planning level study, led by FDOT, identified the potential corridors as well as abandoned railroad corridors to complete this segment.

Impacts to utilities would need to be evaluated. Likely impacts could include power poles, pull boxes and telephone pedestals, as is found on current proposed alignment. The VE study estimates that implementation of this alternative reduces project costs by approximately \$1,435,000, however this estimated savings appears to not take into account all of the potential right of way impacts relative of this design alternative, and therefore this alternative is rejected.

Recommendation S1-20: Selectively Build Box Culvert/Trail/Ditch Combination

Value Addition: (\$311,332)

Response: Not Accepted

The proposed trail typical section calls for the trail to be placed adjacent to the ditch and meets all FDOT standard criteria. This recommendation suggests reducing the trail width to 8' and placing stormwater conveyance in a box culvert, under the trail. In an effort to reduce parcel impacts, the project team has examined the use of minimum design criteria in various areas to reduce the width of the typical section. However, it was determined that use of minimum design



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criteria was not an acceptable approach for the trail and could be inconsistent with the remainder of the SunTrail across the State. It could be difficult to daylight box culvert. Also, this alternative could pose higher maintenance requirements. Ditch and/or structures would still be required to accommodate offsite flows into the right of way. It is important to note, however, that if the same hydraulic function can be achieved with one or more elliptical RCP, it may be significantly less expensive. Although this alternative may reduce utility impacts depending on the final design dimensions of the culvert, for all of the other reasons mentioned above this alternative is rejected.

Recommendation S1-21: Build 8' Path on One Side and 8' Path on Other Side in Future

Potential Cost Savings: \$4,146,686

Response: Not Accepted

Currently, the proposed Sumter Trail width is designed to match the SunTrail preferred 12 foot standards, with a 10 foot alternative where necessary. Recommendation S1-21 suggests constructing an 8 foot path for interim use on one side of the roadways, with a second 8 foot path to be constructed later in the future. In an effort to reduce parcel impacts, the project team has examined the use of minimum design criteria in various areas to reduce the width of the typical section or eliminate ROW acquisition needs. In addition, it does not benefit the Department to fund a duplicative effort nor to impact property owners on both sides of the road corridors. The estimated 'savings' does not mention significant future cost for completion of the dual-path system from the second design and construction phase. When second trail is constructed, this will likely cause additional utility impacts above the proposed concept. This recommendation is not accepted.

Recommendation S2-02: Construct Pedestrian Underpass, Including Railroad North of CR 478

Potential Cost Savings: \$2,021,850

Response: Not Accepted

The proposed project design calls for the construction of a pedestrian/trail overpass at the intersection of US 301 and CR 478. The alternative design suggests construction of an underpass structure which crosses beneath both US 301 and the CSX rail line. For Alternative S2-02, the underpass will be located on the north side of CR 478. The use of an underpass was determined to be less desirable because they typically have more safety and security issues for bicyclists and pedestrians; as well as requiring additional maintenance in the form of pumps to avoid flooding or ponding during rain events. It is more important to note that the entire underpass is located in a floodplain. The approaches to the underpass would also likely conflict with the box culvert crossing of US 301 south of CR 478. This alternative will have significant utility impacts, as well as railroad related utility impacts.

Linear approach ramps on retained fill or bridge spans would eliminate the ROW concerns posed by switchback or helix ramps and would adequately serve the trail users. Local access at the beginning/end of the main spans could be accomplished with stairs if necessary, requiring minimal or no added ROW. Jack-and-bore may be the only feasible underpass construction method to avoid impacting track functionality. A premium factor of 1.15 may be significantly underestimated for this specialty construction process of a relatively large box culvert structure. In order to avoid impacting track functionality during construction, additional clearance between the track and the jack-and-bore structure may be necessary, further increasing the crossing depth, ramp lengths, and drainage challenges. Significant challenges



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are likely to be encountered in obtaining CSX permits to construct a facility of this type under their tracks. Maintenance of drainage systems and lighting must be considered, along with cost of lighting power source. Public safety (actual and perceived) must be explored through the public involvement process. Some facilities of this type include 24 hour lighting or gates that are locked at night. The photo provided as an example of a culvert style underpass is traversing through a raised embankment section which does not pose the same challenges in terms of approaches and drainage. It is with all these issues that this alternative is rejected.

Multiple variations of this alternative were discussed and considered by the VE Team as S2-03, S2-04, & S2-05. Below are responses to each of those alternatives:

S2-03 - Construct Pedestrian Underpass, Including Railroad South of CR 478
Similar to S2-02, this alternative is rejected.

S2-04: Construct Elevated Crossing North of CR 478

The alternative design suggests construction of large helix or switch-back structure. While this design may reduce the number of parcels impacted, it would require more acreage on the parcels it does impact. Other drawbacks on this option could include reduced access to adjacent properties, large vertical clearance requirements for the railroad, railroad closure during construction, and reduced sight distances. Therefore, this alternative is rejected.

S2-05: Install Signal In-lieu of Elevated Structure

The alternative design suggests construction of a signalized intersection while keeping the trail crossing US 301 at-grade. While the advantages are related to the construction period only, the disadvantages include stopping traffic on higher speed facilities, reduced safety of at-grade pedestrian crossings, and obtaining signal warrants. Despite a large cost savings that may be realized with this option, the signalized crossing does not improve the trail project as proposed, and this recommendation is not accepted.

Recommendation S3-01: Conduct Roundabout at CR 478 / SR 471

Value Addition: (\$2,125,000)

Response: Not Accepted

The proposed project design calls for a potential trail crossing of CR 478 at SR 471 without modifying that intersection. The alternative design suggests constructing a roundabout at this intersection to enhance safety and as a traffic calming measure. It has not yet been determined if the trail path will go on the north side or south side of CR 478 or on the west side or east side of SR 471. If the path goes on the south side of CR 478 and the west side of SR 471 then the path will not need to cross either of these roadways at this location. Alternatively, if the trail path goes on the north side of CR 478 and the east side of SR 471, then the path will need to cross the roadway twice.

While installation of a roundabout could achieve a traffic speed reduction in the area, which can lessen collision severity to vehicles, bicyclists, and pedestrians, it would require right of way acquisition of business parcels in the small City of Webster. In addition, the intent of this project is to provide for the trail, not to analyze or evaluate roadway/traffic improvements. As this option adds approximately \$2 million, and that it is the project team's desire to minimize modifications to existing roadways, this alternative has been rejected. This alternative will



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have additional utility impacts, as was not in original design.

To increase safety for trail users, a landscape buffer or strip should be included between the roadway and the shared-use path.

Recommendation S3-02: Provide Trail on Both Sides at Flea Market With Multiple Crossings

Value Addition: (\$657,563)

Response: Not Accepted

The proposed project design calls for paved trail on one side or the other of CR 478 between SR 471 and US 301. The alternative design suggests providing the trail on both sides of CR 478 in the vicinity of the Webster flea market. It has not yet been determined if the trail will go on the north side or south side of CR 478. If it goes on the south side there are existing stop signs on CR 478 so that should enable a safe bicycle or pedestrian crossing at that location.

Pedestrians already cross at that location to access the flea market. The alternative proposes another trail crossing of CR 478 at a location where there are no stop signs on CR 478 thus introducing a potential safety issue. This alternative will have additional utility impacts, as was not in original design. This alternative would increase the number of parcels and property owners impacted by requiring land on both sides of the road. Therefore, this alternative is rejected.

Recommendation S3-03: Realign Trail to Avoid Downtown Webster But Spur up to Flea Market

Value Addition: (\$954,840)

Response: Not Accepted

The proposed project 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. 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. One of the main purposes of the trail is to provide connectivity to local amenities so that people can walk or bicycle to places to conduct some of their daily errands as well as for recreational use. Also, stakeholders have expressed a desire for the trail to go through the City of Webster for this purpose. This alternative may reduce utility impacts within the downtown Webster section; however, actual impacts to utilities would need to be evaluated in new alignment. This alternative would also be costlier than what is proposed by the project. For these reasons this alternative is rejected.

Recommendation S4-01: Build Curb and Gutter Rural Section to Avoid Ditch

Potential Cost Savings: \$176,435

Response: Not Accepted

The proposed project design proposes to maintain the rural typical section on SR 471 with the trail outside the ditch. 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. In an effort to reduce parcel impacts, the project team examined the use of an urban (curb and gutter) typical section in various areas to reduce or eliminate ROW acquisition needs. Storm sewer would be required which is typically less efficient than ditches, harder to maintain, and could be difficult to daylight. Furthermore, it requires steeper grades than ditches which could further exacerbate this problem. As a benefit, this section includes a ditch outside of the trail



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which could facilitate accommodation of offsite drainage flowing into the ROW. This alternative may reduce utility impacts; however, actual impacts to utilities would need to be evaluated. This approach would move the trail immediately adjacent to the roadway which could make the experience of the trail user less enjoyable. In addition, use of an urban typical section requires additional maintenance in the form of a close drainage system, the burden of which would fall on the local governments maintaining the roadway. For these reasons this alternative is rejected.

Recommendation S4-02: Eliminate On Street Parking to Enable Curb and Trail Shift

Potential Cost Savings: \$130,574

Response: Not Accepted

The proposed project design calls for the trail to follow along SR 471 on either side of the roadway. The alternative design suggests eliminating the on-street parking along SR 471 to shift the curb and trail in that additional space. On street parking is only provided in the immediate downtown area of Webster. The trail would return to its proposed design south of Webster making the trail width variable in this area. This recommendation would move the trail closer to the traffic on SR 471 potentially diminishing the user experience. This alternative would reduce the allowable spread in the curb and gutter section which could result in additional inlets being required. It may reduce utility impacts; however, actual impacts to utilities would need to be evaluated. It may be beneficial to maintain a separate sidewalk in this portion of Webster as pedestrian traffic in this area may be heavier than in the surrounding areas and townspeople may not be used to sharing their "sidewalk" with bicyclists. For these reasons this alternative is not accepted.

Recommendation S4-04: Realign Trail onto CR 721 South of Webster to SR 50

Potential Cost Savings: \$425,304

Response: Not Accepted

The proposed project design calls for a route that proceeds south on SR 471 to the intersection with SR 50. 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. This alternative is a slightly shorter route and the intersection of SR 50 and CR 721 is less busy and more rural than the intersection of SR 50 and SR 471, which may be safer for pedestrians and bicyclist. This alternative may reduce utility impacts; however, actual impacts to utilities would need to be evaluated.

While this recommendation has positive considerations, the roadway alignments selected for the trail connection have been studied and approved through several years of feasibility analysis conducted by FDOT in conjunction with the Florida Department of Environmental Protection (FDEP) and Sumter County. A 2016 planning level study, led by FDOT, identified the potential corridors as well as abandoned railroad corridors to complete this segment. In addition, the portion of SR 50 between CR 721 and SR 471 is presently being planned for the trail in the SR 50 project and would present a disconnect with a realigned South Sumter Trail. This alternative is rejected.



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Recommendation SA-04: Place Ditch Outside Trail with Trail Adjacent to Roadway

Potential Cost Savings: \$674,494

Response: Not Accepted

The proposed project design calls for the drainage ditch to be placed between the road and the trail in rural sections. The alternative design suggests to shift the ditch outside the trail, and utilize a reduced ditch section. This alternative relies upon an 8-foot wide trail. In an effort to reduce parcel impacts, the project team has examined the use of minimum design criteria in various areas to reduce the width of the typical section that could reduce or eliminate ROW acquisition needs. However, it was determined that use of minimum design criteria was not an acceptable approach for the trail and could be inconsistent with the remainder of the SunTrail across the state. This alternative is good for both onsite and offsite drainage flows but places the trail close to the roadway which could make the user experience less desirable. For these reasons this alternative is rejected.

Recommendation SA-08: Bifurcate Trail to 8' each Along Narrow ROW

Value Addition: (\$185,446)

Response: Not Accepted

The proposed project design proposes using a single paved surface 12 feet in width to carry bi-directional traffic along one side of a roadway. The alternative design employs the option of using unidirectional segments with an 8 foot wide trail 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. In an effort to reduce parcel impacts, the project team has examined the use of minimum design criteria in various areas to reduce the width of the typical section that could reduce or eliminate ROW acquisition needs. However, it was determined that use of minimum design criteria was not an acceptable approach for the trail and could be inconsistent with the remainder of the SunTrail across the state. In addition, it does not benefit the Department to fund a duplicative effort nor to impact property owners on both sides of the road corridors. There could also be safety concerns adding additional roadway crossings. For these reasons this alternative is rejected.

Recommendation SA-09: Safety Edge for Both Trail and Road

Potential Cost Savings: \$0

Response: Accepted

The proposed project design does not specify asphalt edge treatment. The alternative design suggests that pavement should include safety edge treatment. Safety edge treatment has the benefits of reducing lane departure events and protects pavement edges from shoulder wear and adds little or no additional cost to the project. For these reasons, this alternative is accepted.

Recommendation SA-10: Selectively Install Guardrail to Reduce Ditch Section

Potential Cost Savings: \$668,194

Response: Not Accepted

The proposed project design calls for shallow ditch side slopes where ditch is adjacent to roadway for vehicle recoverability within the clear zone. This alternative suggests to install guardrail and use steeper ditch side slopes to reduce ditch width. Behind a guard rail, steeper



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slopes are permissible. This alternative also calls for an 8 foot wide trail. In an effort to reduce parcel impacts, the project team has examined the use of minimum design criteria in various areas to reduce the width of the typical section that could further reduce or eliminate ROW acquisition needs. However, it was determined that use of minimum design criteria was not an acceptable approach for the trail and could be inconsistent with the remainder of the SunTrail across the State. Although this alternative may reduce utility impacts, actual impacts to utilities would need to be evaluated. It does introduce a roadway hazard (guardrail) where previously there was none. For these reasons, the alternative is not accepted.

Recommendation SA-11: Use Reduced Width Ditch Bottoms

Potential Cost Savings: \$613,163

Response: Not Accepted

The proposed project design call for 5 foot ditch bottoms where this alternatives calls for narrower ditch bottoms and “V” ditches to reduce ditch width and reduce right of way take. “V” ditches are harder to maintain and narrower ditches would have a reduced hydraulic capacity. There would be no room/depth to accommodate offsite pipes if needed and V-bottom ditches do not accommodate inlets.

This alternative also calls for an 8 foot wide trail. As mentioned previously, the proposed approach for implementation of the trail requires consistency with SunTrail criteria wherever possible. For these reasons this alternative is rejected.

Recommendation SA-13: Vary Trail Width Based on ROW (8'-12')

Potential Cost Savings: \$662,913

Response: Accepted

The proposed project design calls for a 12 foot trail width with 10 foot trail widths in constrained areas (usually in urban settings). This alternative calls for varying the trail width based on available right of way to between 8 feet and 12 feet. As a design solution, especially in constrained areas, this recommendation has value as it continues to further develop the project. In an effort to reduce parcel impacts, the project team has examined the use of minimum design criteria in various areas to reduce the width of the typical section that could reduce or eliminate ROW acquisition needs. As a corridor-wide reduction, this proposal would not be consistent with the SunTrail criteria, but the approach is on a case-by-case basis. The projected savings are purely from reducing the width of the trail.

Recommendation SA-16: Purchase Easements In-lieu of Fee Takings

Potential Cost Savings: \$1,085,640

Response: Accepted

This alternative recommends using permanent easements instead of fee acquisitions. This would reduce right of way costs and may be easier to negotiate from less willing sellers. The Design Team will need assess this alternative further during Design to determine if it should be incorporated on a case-by-case basis.



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12/20/2018 | 3:27 PM EST

Date