

Marco Island Loop Trail Feasibility Study and Conceptual Design

Collier County, Florida

Trail Alternatives Evaluation Report August 2023

Prepared for:



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PROJECT CONTEXT

The purpose of this project is to support the Florida Department of Transportation (FDOT) District One, in partnership with the City of Marco Island, Collier County, and Collier Metropolitan Planning Organization (MPO), to evaluate the feasibility of a shared use path (SUP) along State Road (S.R.) 951 (Collier Boulevard) and County Road (C.R.) 92 (San Marco Road). The project will identify viable design concepts for implementation that will complete the Marco Island Loop. The terminology “trail” has been retained in certain instances as previous studies and investigations utilized the term. The MPO’s 2019 Bike-Ped Master Plan identifies the corridor as part of its Shared-Use Nonmotorized (SUN) Trail and Spine Trail Network. It is also identified as a Land Trail Opportunity Trail/Corridor on the Florida Greenways & Trails System and will connect the City of Marco Island Bike Path Master Plan and the Naples Pathways Coalition Paradise Coast Trail Vision. This feasibility study will determine the need for a subsequent PD&E Study based on the potential project effects, right-of-way requirements, and in consideration of the potential use of federal funds for future project phases.

The project includes two study corridors and will generally evaluate the feasibility of a shared use path to be implemented on either side of the roadway. The first corridor is along S.R. 951 from the Judge Jolley Bridge to United States (U.S.) 41. The second corridor is along C.R. 92 from Goodland Road to U.S. 41. Together, these segments will close the pedestrian and bicycle loop connecting the City of Marco Island with U.S. 41. The project location is shown in **Figure 1**.

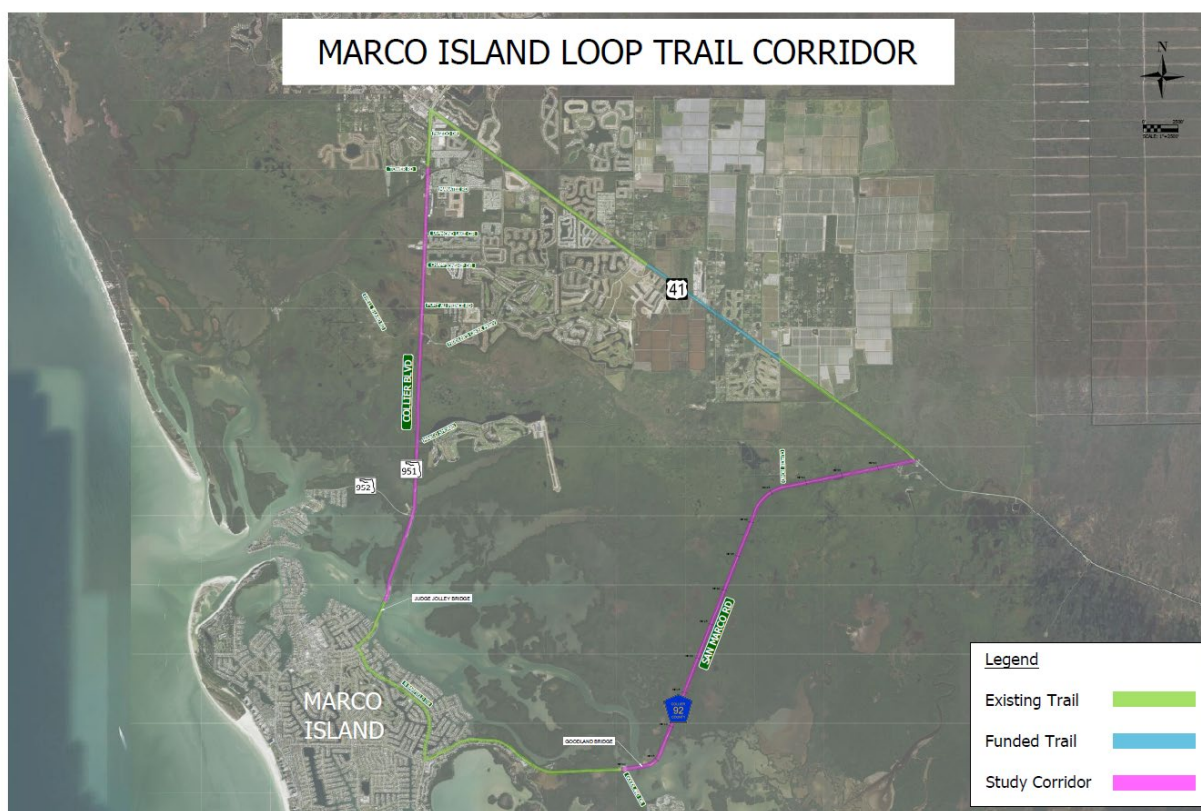


Figure 1: Location Map

Purpose and Need

The purpose of the project is to enhance the regional bicycle and pedestrian network connecting the City of Marco Island to the Shared-Use Nonmotorized (SUN) Trail facility along U.S. 41. Additionally, the project will improve bicycle and pedestrian safety in the study corridors.

The need for the project is based on the following criteria:

Safety:

Improve safety conditions

Safety plays an important role in deciding to utilize a facility. Along S.R. 951, the majority of the study corridor has no sidewalks, so nonmotorized vehicular travel must utilize the shoulder or share the travel lanes where the posted speed ranges from 35 MPH to 55 MPH. Along C.R. 92, the roadway has no sidewalks or paved shoulders along a roadway posted at 55 MPH. Research has shown that dedicated, protected bike infrastructure (such as off-street trails, buffered bike lanes, and cycle tracks) offers users

safety from cars through separation in the right-of-way. (Fiol et al., February 2022, <https://www.urban.org/urban-wire/why-us-cities-are-investing-safer-more-connected-cycling-infrastructure>).

System linkage:

Improve bicycle and pedestrian connectivity

The proposed project aligns with the goals of the City of Marco Island and Collier County to “provide a safe comprehensive bicycle and pedestrian network that promotes and encourages community use and enjoyment” (Collier MPO Bicycle/Pedestrian Master Plan’s Vision). The project would create a connected multimodal transportation system that links the existing network in the City of Marco Island to the statewide SUN Trail network along U.S. 41.

Social and economic demand:

Enhance mobility choices and provide social benefits through outdoor recreation

The Florida Department of Environmental Protection (FDEP) Division of Recreation and Parks oversees the Florida Greenways and Trails System (FGTS). Studies demonstrate that outdoor recreation delivers personal and social benefits on which healthy, happy communities thrive (FGTS Plan 2019-2023). These study corridors have been identified as a Land Trail Opportunity Trail/Corridor in the plan. Shared use path benefits identified in the plan include economic development, opportunities to support active lifestyles and improve overall health, and increased transportation choices.

FDOT District One will continue to coordinate with the City of Marco Island and Collier MPO to ensure that the project promotes consistency with local government comprehensive and transportation plans.

Planning Process

This document represents the culmination of a twelve-month planning effort which included research and analysis, field work, stakeholder input, and public outreach. The project was organized into the following five tasks:

- Task 1: Project Start Up
- Task 2: Research and Analysis / Existing Conditions
- Task 3: Alternative Assessment

- Task 4: Development of Draft Trail Alternatives Evaluation Report
- Task 5: Final Trail Alternatives Evaluation Report

An Existing Conditions Report was developed for Task 2 and is provided in **Appendix A**. As part of the planning process, the public engagement consisted of two main components:

- Pop-up Events:
 - Jerry Adams Chili Cook-Off - November 12, 2022
 - Marco Island Farmers Market - December 7, 2022
- Online Questionnaire

These components are discussed in later sections.

FEASIBLE ALTERNATIVES

Through the process of the Feasibility Study, the different alternatives and uses took into consideration compatibility with planning efforts for the state, county, and local levels while meeting current design standards. Throughout the existing conditions assessment and stakeholder and public engagement, several alternatives were evaluated for the multimodal improvements along S.R. 951 and C.R. 92. Feasible alternatives were identified based on their consistency with the project purpose and need, as well as the roadway characteristics, operational conditions, safety concerns, and physical constraints documented in the Existing Conditions Report. These factors, as well as input from project stakeholders, provide the baseline from which potential alternatives were considered.

This section will briefly outline each of the evaluated alternatives that will move forward for consideration, in addition to other considerations. A preferred alternative will not be selected as part of this Feasibility Study. However, should the project move forward into a Project Development and Environment (PD&E) Phase, all alternatives should be further assessed utilizing more refined data, and a preferred alternative should be selected.

Corridor Segments

The two corridors within the study, S.R. 951 (Collier Boulevard) and C.R. 92 (San Marco Road), are unique and differ in physical characteristics and right-of-way availability. While S.R. 951 is a four-lane divided highway with a raised, curbed median and outside flush shoulders, C.R. 92 is an undivided, two-lane roadway with no paved outside shoulders. Current zoning and future land use designations within the study corridors are primarily conservation lands and residential for S.R. 951 and conservation lands for C.R. 92.

Based on physical conditions, adjacent land use, and available right-of-way along the length of S.R. 951, the corridor has been separated into four segments that are further discussed in the Alternative Analysis section:

Segment 1 – Judge Jolley Bridge to Capri Boulevard

Segment 2 – Capri Boulevard to Marco Shores/Mainsail Drive

Segment 3 – Marco Shores/Mainsail Drive to Fiddlers Creek Parkway

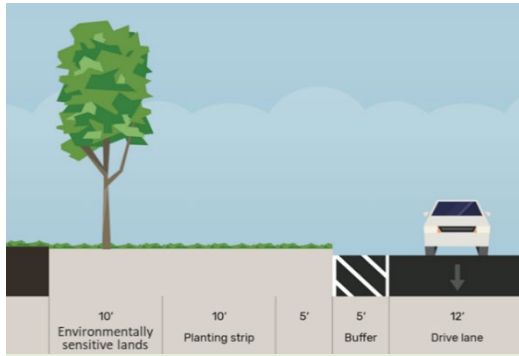
Segment 4 – Fiddlers Creek Parkway to Henderson Creek Drive

C.R. 92 will be analyzed as a whole corridor.

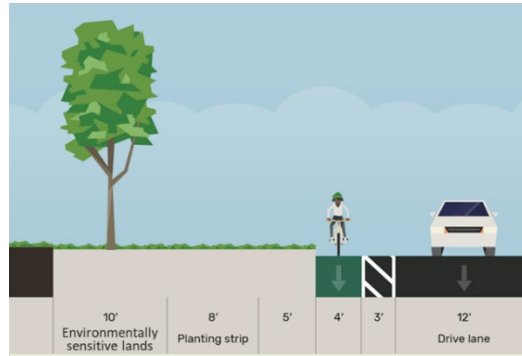
S.R. 951 (Collier Boulevard) – Shared Use Path Design Alternatives

Multiple design concepts were developed and presented to the public through an online survey. Each concept provided varying approaches to the different modes of transportation that meet current design standards, providing facilities for pedestrians and bicyclists while minimizing impacts to environmentally sensitive lands. The following alternatives are graphically depicted in the following figures.

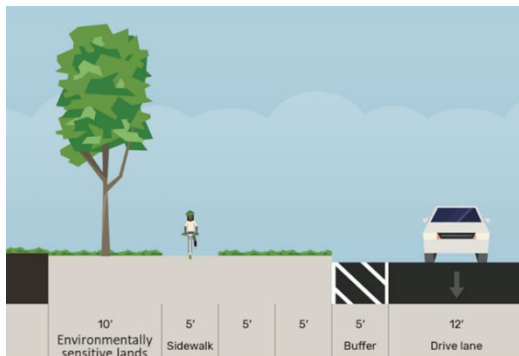
- 1) No Build – Bicyclists are accommodated on existing 5'-paved shoulders and no facilities are provided for pedestrians.
- 2) 7' Buffered Bike Lane – Bicyclists are accommodated on a widened shoulder with a 7' buffered bike lane, and no facilities are provided for pedestrians.
- 3) 5' Sidewalk – Bicyclists are accommodated on existing 5'-paved shoulders and a 5' sidewalk, offset 5' from the shoulder point (15' from the edge of travel lane), is provided for pedestrians.
- 4) 10' SUP – Bicyclists are accommodated on existing paved shoulders and a 10' SUP, offset 5' from the shoulder point (15' from the edge of travel lane), is provided for pedestrians and bicyclists.
- 5) 10' SUP and 7' Buffered Bike Lane – Bicyclists are accommodated on a widened shoulder with a 7' buffered bike lane, and a 10' SUP, offset 5' from the shoulder point (15' from the edge of travel lane), is provided for pedestrians and bicyclists.
- 6) 7' Buffered Bike Lane (no widening) – Bicyclists are accommodated on a 7' buffered bike lane created by reducing the travel lane widths to 11'. No facilities are provided for pedestrians.
- 7) 10' SUP and 7' Buffered Bike Lane (no widening) – Bicyclists are accommodated on a 7' buffered bike lane created by reducing the travel lane widths to 11'. A 10' SUP, offset 5' from the shoulder point (15' from the edge of travel lane), is provided for pedestrians and bicyclists.



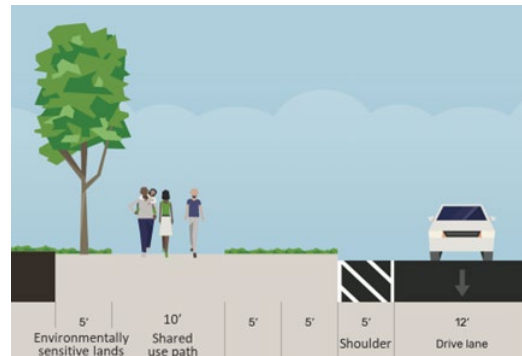
Alternative 1



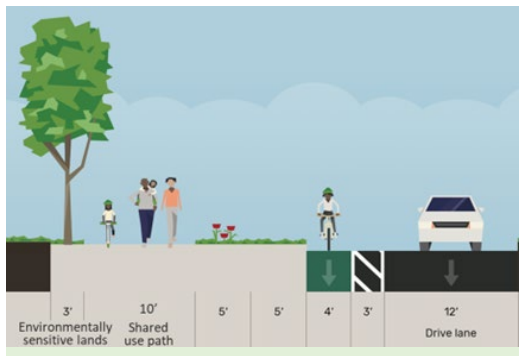
Alternative 2



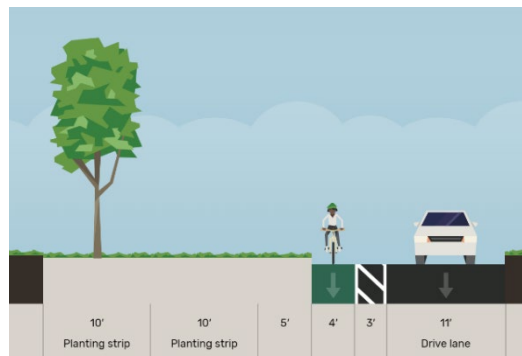
Alternative 3



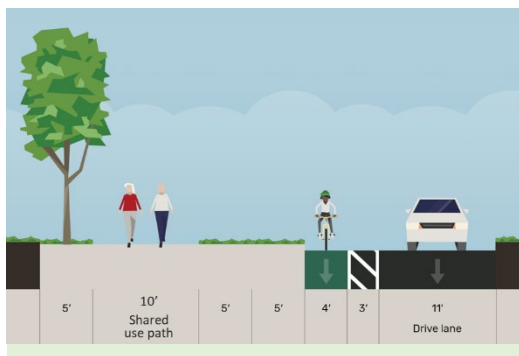
Alternative 4



Alternative 5



Alternative 6



Alternative 7

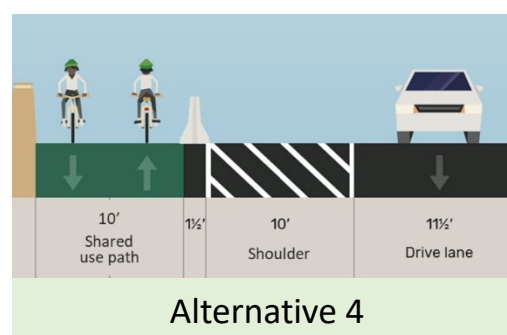
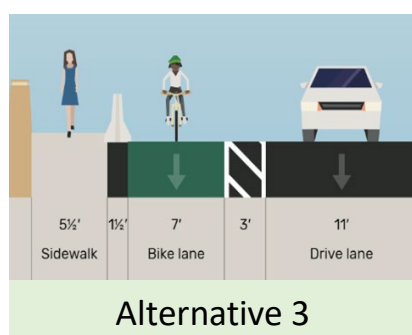
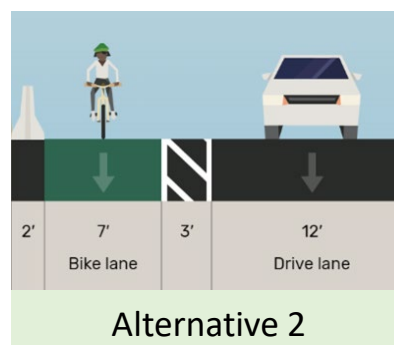
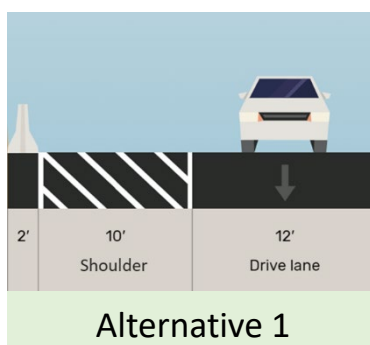
Note: Graphics were created utilizing Streetmix (<https://Streetmix.net>)

S.R. 951 (Collier Boulevard) – Bridge Alternatives

S.R. 951 Bridge over Mcllvane Bay and S.R. 951 Bridge over Mcllvane Creek

Located between Capri Boulevard and Marco Shores/Mainsail Drive, these bridges have a clear roadway width of 90'. Four alternatives were created for these bridges:

- 1) No Build – Bicyclists are accommodated on existing 10' bridge deck shoulders and no facilities are provided for pedestrians.
- 2) Buffered Bike Lane – Bicyclists are accommodated on a designated 7' buffered bike lane and no facilities are provided for pedestrians.
- 3) Barrier Separated Sidewalk – Bicyclists are accommodated on a designated 7' buffered bike lane and a barrier separated sidewalk is provided for pedestrians. The median would be reconstructed on the bridge deck and reduced in width.
- 4) Barrier Separated SUP – Bicyclists are accommodated on a designated 7' buffered bike lane and a barrier separated SUP is provided for pedestrians and bicyclists. The median would be reconstructed on the bridge deck and reduced in width.

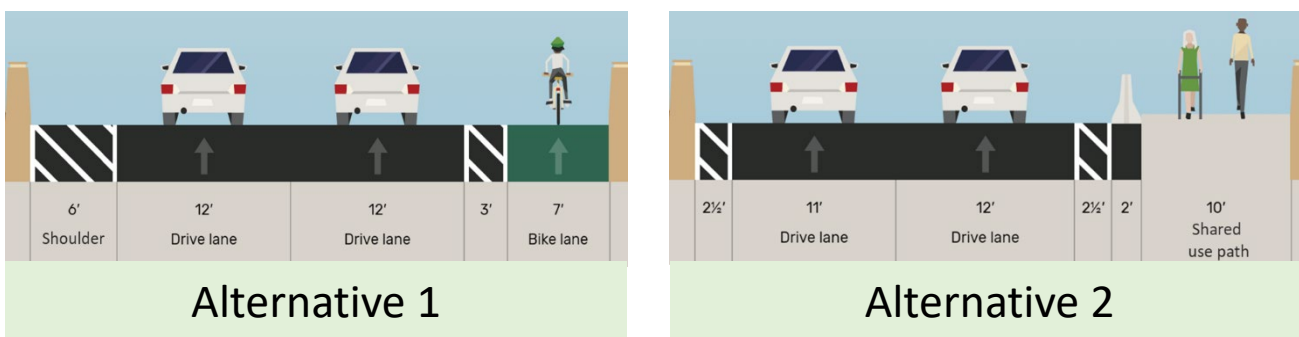


Note: Graphics were created utilizing Streetmix (<https://Streetmix.net>)

NB and SB S.R. 951 over Henderson Creek

Located between Fiddlers Creek Parkway and Henderson Creek Drive, this structure consists of twin bridges having a clear roadway width of 40'. Two alternatives were created for these bridges.

- 1) No Build – Bicyclists are accommodated on existing 10'-bridge deck shoulders and no facilities are provided for pedestrians.
- 2) Barrier Separated SUP – A barrier separated SUP is provided for pedestrians and bicyclists. Access to and from the SUP would be provided prior to the bridge.



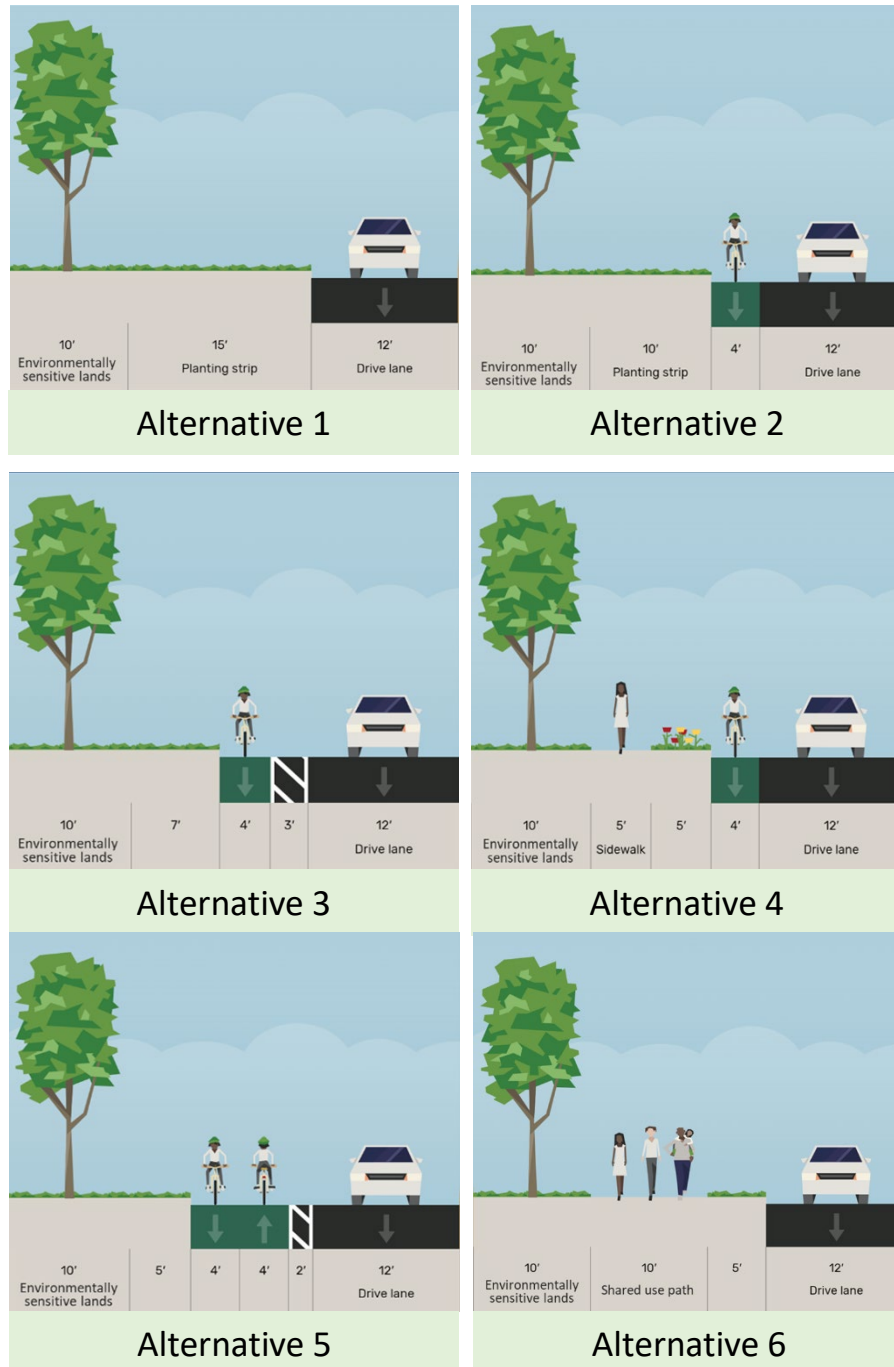
Note: Graphics were created utilizing Streetmix (<https://Streetmix.net>)

C.R. 92 (San Marco Road) – Shared Use Path Design Alternatives

Six alternatives were developed for C.R. 92. These alternatives would be constructed on the West side of the roadway just in front of the existing power poles.

- 1) No Build – Bicyclists utilize the existing travel lanes, and no facilities are provided for pedestrians.
- 2) Paved Shoulder Bike Lanes – A 4' paved shoulder would be constructed abutting the travel lanes and no facilities are provided for pedestrians.
- 3) 7' Buffered Bike Lane – Bicyclists are accommodated on a newly constructed 7' buffered bike lane and no facilities are provided for pedestrians.
- 4) Paved Shoulder Bike Lanes and Sidewalk – A 4' paved shoulder would be constructed abutting the travel lanes and a 5' sidewalk, offset 5' from the edge of travel lane is provided for pedestrians.

- 5) Adjacent Asphalt Path – A 10' paved path would be constructed abutting the westbound travel lane providing a 2' buffer and 8' path. A similar treatment was constructed by Collier County in 2021 along Goodland Drive.
- 6) 10' SUP – Bicyclists utilize the existing travel lanes, and a 10' SUP, offset 5' from the edge of travel lane, is provided for pedestrians and bicyclists.



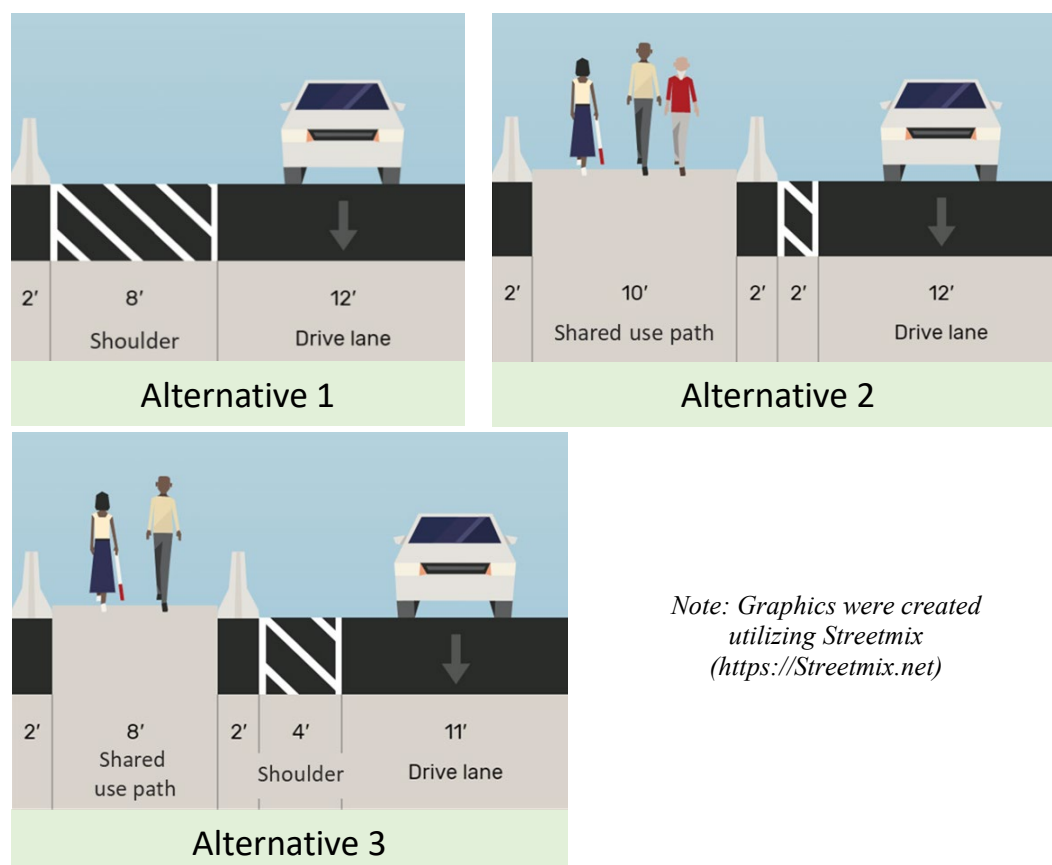
Note: Graphics were created utilizing Streetmix (<https://Streetmix.net>)

C.R. 92 (San Marco Road) – Bridge Alternatives

C.R. 92 over Drainage Canal (Bridge No. 034128)

This bridge has a clear roadway width of 40'. Three alternatives were created for this bridge:

- 1) No Build – Bicyclists utilize the existing travel lanes prior to the bridge where they can be accommodated on existing 8'-bridge deck shoulders and no facilities are provided for pedestrians.
- 2) Barrier Separated 10' SUP – A barrier separated SUP is provided for pedestrians and bicyclists. The remaining bridge deck width would accommodate two 12' lanes with 2'-outside shoulders.
- 3) Barrier Separated 8' SUP – A barrier separated SUP is provided for pedestrians and bicyclists. The remaining bridge deck width would accommodate two 11' lanes with 4' outside shoulders.



*Note: Graphics were created
utilizing Streetmix
(<https://Streetmix.net>)*

Goodland Bridge

This bridge has a clear roadway width of 42'. The three previous alternatives were utilized for this bridge with the additional width applied to the outside shoulders.

- 1) No Build – Bicyclists utilize the existing travel lanes prior to the bridge where they can be accommodated on existing 10'-bridge deck shoulders and no facilities are provided for pedestrians.
- 2) Barrier Separated 10' SUP – A barrier separated SUP is provided for pedestrians and bicyclists. The remaining bridge deck width would accommodate two 12' lanes with 4'-outside shoulders.
- 3) Barrier Separated 8' SUP – A barrier separated SUP is provided for pedestrians and bicyclists. The remaining bridge deck width would accommodate two 11' lanes with 6'-outside shoulders.

Public Engagement

Since 1994, when the Collier Metropolitan Planning Organization (MPO) developed its first Comprehensive Pathways Plan, Collier County and the individual jurisdictions in Collier County in conjunction with the MPO have strived to “develop a first-class bicycle and pedestrian network throughout Collier County.” The MPO’s Plan was updated in 2006, 2012, and 2019 and supplemented with a Bicycle and Pedestrian Safety Study in 2013. Each of these updates included a public outreach component and was used to help develop the public engagement and online survey for this project.

For this study, the public engagement consisted of two main components:

- Pop-up Events:
 - Jerry Adams Chili Cook-Off - November 12, 2022
 - Marco Island Farmers Market - December 7, 2022
- Online Questionnaire - November 11, 2022 to January 16, 2023

The online questionnaire received 230 responses through the website and an additional 34 responses were completed at the Farmers Market. At the events, post card handouts were distributed which provided a brief project description, project location map, and project website. Following the first event at the Jerry Adams Chili Cook-Off, email notifications were sent to the City of Marco Island Chambers of Commerce, City of Marco

Island, Collier Area Transit, adjacent Home Owner Associations within the study area, and local schools providing project information and the survey link.

The survey questions were a combination of multiple choice and short answer questions. Some of the multiple-choice questions allowed for a non-prescribed answer. In general, most respondents answered all of the multiple-choice questions and about half provided responses to the short answer questions.

Survey Results – General background

Almost 75% of the survey participants identified that they frequently (2-7 days per week) walk and almost 2 out of 3 participants frequently bike. Participants identified pleasure and exercise as the top two reasons for walking and biking. The top three responses for considerations impacting one's decision to walk and bike were safety, volume of vehicular traffic and speed of vehicular traffic.

Survey Results – Desirable Multimodal Improvements

When participants were asked about their preferred multimodal improvements for the corridors, the following received the highest percentage of responses:

- S.R. 951 – 10' SUP (Alternative 4) and 10' SUP and 7' Buffered Bike Lane (Alternative 5)
- S.R. 951 Bridges – Barrier Separated Sidewalk (Alternative 3) and Barrier Separated SUP (Alternative 4)
- C.R. 92 – Paved Shoulder Bike Lanes and Sidewalk (Alternative 4), Adjacent Asphalt Path (Alternative 5), and 10' SUP (Alternative 6)
- C.R. 92 Bridge – Barrier Separated 10' SUP (Alternative 2) and Barrier Separated 8' SUP (Alternative 3)

Survey Results – Qualitative Responses

Survey participants were asked to identify any opportunities, challenges, and desired features or trail elements. Below are the top responses for each:

- Opportunities – Safety and separated facilities
- Challenges – Right-of-way, land availability, and environmental constraints; cost; safety; and separated vehicle facilities

- Trail elements and features – More space/wider path, separated vehicle facilities, amenities such as shade, benches, water fountains, restrooms etc.

A detailed summary of the public engagement can be found in **Appendix B**.

Speed Management

Speed management is a critical element of the Safe System Approach, which is a guiding paradigm adopted by the U.S. DOT to address roadway safety. Studies clearly show that higher speeds result in greater impact at the time of a crash, which leads to more severe injuries and fatalities. This is especially concerning for more vulnerable road users, such as motorcyclists, bicyclists, and pedestrians. To support efforts in speed management, Federal Highway Administration (FHWA), through its Proven Safety Countermeasure Initiatives program, promotes the implementation of several proven speed management countermeasures including variable speed limit systems, speed safety cameras, and setting appropriate speed limits for all road users. FDOT further identifies speed management techniques in chapter 202 of the FDOT Design Manual (FDM). From Table 202.3.1 Strategies to Achieve Desired Operating Speed, for context classifications C3R and C3C, the following strategies are appropriate for a target speed of 40-45 mph: Roundabout, Lane Narrowing, Horizontal Deflection, Speed Feedback Signs, Rectangular Rapid Flashing Beacons and Pedestrian Hybrid Beacons.

Utilities

Utility Coordination

The preliminary utility coordination and investigation effort was conducted through written and verbal communications with the existing utility owners. A Sunshine State 811 of the Florida Design Ticket System listing of existing utility owners was acquired on February 15, 2023. (Appendix A).

Initially, verbal and written communication was made to all utility's owners outlining the investigation effort along with the project limits. The list of Utility Agency Owners (UAO) known to operate utilities within the project corridor is shown in **Table 1**.

Table 1: Utility Contact Information

UTILITY AGENCY	UTILITY CONTACT NAME	UTILITY CONTACT PHONE	UTILITY CONTACT EMAIL
COLLIER COUNTY TRAFFIC OPERATIONS	PAM WILSON	239-252-8260	pamela.wilson@colliercountyfl.gov
COLLIER COUNTY BCC ROAD MAINTENANCE	JOHN FURLONG	239-252-8924 Ext: 2782	john.furlong@colliercountyfl.gov
MARCO ISLAND UTILITIES	MICHAEL EHLEN	239-389-5186	mehlen@cityofmarcoisland.com
CENTURYLINK	BILL MC CLOUD	850-599-1444	william.mccloud@lumen.com
COLLIER COUNTY STAKE & LOCATES	STEPHEN SARABIA	239-252-5924	Stephen.Sarabia@colliercountyfl.gov
COMCAST	CHAD EVENER	941-356-1564	chad_evener@cable.comcast.com
FLORIDA POWER & LIGHT	JOEL BRAY	386-586-6403	joel.bray@fpl.com
HOTWIRE COMMUNICATIONS	WALTER DAVILA	954-699-0900	walter.sancho-davila@hotwirecommunication.com
LEE COUNTY ELECTRIC CO-OP	TOM BAILEY	239-656-2414	tom.bailey@lcec.net
CROWN CASTLE NG	FIBERDIG TEAM	888-632-0931 Ext: 2	fiber.dig@crowncastle.com
SUMMIT BROADBAND	MICHELLE DANIEL	407-996-1183	
TECO PEOPLES GAS- FT MYERS	JOAN DOMNING	JOAN DOMNING	joan.domning@tecoenergy.com
CENTURYLINK (LUMENS)	NETWORK RELATIONS	877-366-8344 Ext: 2	relocations@lumen.com

For the report’s preparation, utility owners were provided aerials depicting the project limits along S.R. 951 and C.R. 92. Using these aerial plans as a base map, each utility owner was asked to indicate their existing and proposed utilities as well as any easements that may affect their reimbursement rights for potential relocations of their facilities. In response, most utility owners replied via written communications. The utility owners provided the requested information concerning their facilities using either the utility plans or reference documentation (i.e., “As Built” or GIS maps). “Marked” Plans or reference documentation received from the Utility Agency Owners is outlined below.

Existing Utility Facilities Description

Responses from the UAOs are provided in **Appendix C**.

Collier County Traffic Operations – No response.

Collier County BCC Road Maintenance – No response.

Marco Islands Utilities – No response.

Centurylink – No response.

Collier County Stakes and Locates (Water/Sewer)

For the S.R. 951 corridor, a 12" PVC water main on the north side of Capri Boulevard intersects S.R. 951. The water main is located along the west side of S.R. 951 for approximately 400' before crossing to the median of S.R. 951. The water main continues in the location until Marco Shores, where it shifts to the east side of the corridor.

At Port Au Prince Road, a 10" PVC water main joins the 12" PVC water main on the east side. Also, a 4" PVC sewer main on the north side of Port Au Prince Road intersects an 8" DIP sewer main along the east side of the corridor. The two water mains and sewer main continue north on the east side of the corridor to Manatee Road.

At Manatee Road, a 10" AC water main, 20" PVC water main and 16" PVC water main intersect the two water mains from the south. A 20" PVC water main continues north on the east side of the corridor. A 10" PVC sewer main intersects the 12" PVC sewer main. The 12" PVC sewer main continues north on the east side of the corridor.

At the bridge, just north of Riverwood Road, the 20" PVC water main switches to a 20" DP water main. The water main and sewer main continue north to the intersection of U.S.41. Connections to the water mains are located at the following side roads:

- Marco Shores
- Fiddlers Creek Parkway
- Port Au Prince Road
- Championship Drive
- Diamond Lake Circle
- Manatee Road
- Tower Road
- Henderson Creek Drive
- Eagle Creek Drive

Connections to the sewer main are located at the following side roads:

- Port Au Prince Road
- Championship Drive
- Diamond Lake Circle
- Manatee Road
- Tower Road
- Henderson Creek Drive

For the C.R. 92 corridor, a 6” PVC sewer main is located on the east side of C.R. 92 from the U.S. 41 intersection for approximately 1,000’ south, where it ties to a private sewer main for the Collier-Seminole State Park. An 8” water main owned by Collier-Seminole State Park is located on the west side of C.R. 92 from the U.S. 41 intersection for approximately 1,050’ south before crossing C.R. 92 and entering Collier-Seminole State Park.

Comcast – No response.

Florida Power and Light – No response.

Hotwire Communications

No facilities email received February 17, 2023, from Walter Sancho-Davila.

Lee County Electric Co-op

Along S.R. 951, from Judge Jolly bridge to U.S. 41, there is a transmission line on the west side of the corridor.

Along C.R. 92, south of Goodland Dr, there are primary and secondary overhead facilities on the west side of C.R. 92. Along Goodland Drive, there is a primary overhead facility along the south side, crossing C.R. 92 to connect the facilities on the west side of C.R. 92.

Along C.R. 92, at the bridge, the primary facility is underground. After the bridge, the primary underground facility crosses C.R. 92 to the east side of the road. The facility then becomes a primary overhead facility. The overheard facility crosses back to the west side of C.R. 92.

From north of the bridge to U.S. 41, the primary overhead facility is on the west side of the corridor. Near the intersection of U.S. 41, primary and secondary overhead facilities cross C.R. 92 to the east side to provide power to the Collier-

Seminole State Park campsites. At the intersection, a primary overhead facility connects to the businesses in the southeast quadrant of the intersection.

Crown Castle NG

There are no facilities along S.R. 951 or C.R. 92. There are underground conduits along U.S. 41 at the intersections with S.R. 951 and C.R. 92.

Summit Broadband – No response.

TECO Peoples Gas – Ft. Myers – No response.

Centurylink (Lumens)

Along S.R. 951, from Capri Boulevard to Championship Drive, there is an underground fiber route along the west side of the corridor. Between Championship Drive and U.S. 41, the underground fiber route is along the east side of the corridor. There are crossings at side roads along the corridor.

Along C.R. 92, from Goodland Drive to north of the bridge, there are underground local copper and fiber routes on the east side of the corridor. From north of the bridge to U.S. 41, there is an underground fiber route along the west side of the corridor. Between Curcie Road and U.S. 41, there is an underground local copper route along the east side of the roadway. The copper route crosses C.R. 92 and connects to Collier-Seminole State Park.

Trail Amenities

Essential for the success of the two trail segments, S.R. 951 and C.R. 92, both as stand-alone facilities and as part of the overall Marco Island loop, will be providing a safe, comfortable, and accessible environment. Both the segments would provide recreational opportunities as well as access to parks and recreational facilities. The S.R. 951 segment will also likely be used for access to jobs, shops, and services that encourages people to use the trail for work commutes, recreation, and social interaction. Some of the trail design elements that should be considered during evaluation of the design concepts include the following:

Trailheads

The development of trails should include consideration for trailheads. Fortunately, there are several opportunities along the trail alignments that have the potential to serve

as trailheads: The Isle of Capri Paddlecraft Park is adjacent to S.R. 951 on the northwest corner of S.R. 951 and Capri Boulevard. This park includes parking, picnic pavilions, and restrooms. It also has a 6' concrete walkway leading to the northeast side of S.R. 951. Margood Harbor Park is located about a mile south of C.R. 92, west of the Goodland Bridge off Goodland Drive. Park amenities include parking, picnic areas, and restrooms. Access to the park would be along Goodland Drive and Pear Tree Avenue.

If these parks are to serve as trailheads, consideration should be given to providing trail-user specific enhancements. These would include bike parking, repair stations, trail maps, and trail courtesy information. Information regarding hydration and protection from sun/heat-related ailments should be included as well. Vending machines that provide trail user-friendly items such as patch kits, bike lights, CO₂ canisters, sunscreen and first aid kits could be provided.

Wayfinding

Wayfinding should be included along the trail segments. Wayfinding should include directions to trailheads or parks. From trailhead or parks, wayfinding provides directional information to the City of Marco Island, the existing Marco Island Loop Trail on S.R. 951, and the intersection of C.R. 92 and U.S. 41. Relative distances marked on the wayfinding should be to the first commercial location providing access to snacks and beverages (e.g., S.R. 951 and Bald Eagle Drive, and C.R. 92 and Barfield Drive).

Transit Stops

The transit stops at S.R. 951 and Manatee Road already include covered benches and bicycle parking. These could be enhanced with transit schedules, or real-time bus arrival information.

Signal Enhancements

On S.R. 951, if the trail is located on the west side of S.R. 951, signalized intersections should be enhanced to provide pedestrian/trail features to access the west side of the roadway. This should include lighting the crosswalks to improve trail user visibility in the crosswalks.

Midblock Crossings

At locations where potential destinations for trail users exist, midblock crossings should be considered.

Lighting

In locations where lighting is not an environmental issue, trail lighting should be considered. If overhead lighting is inappropriate, the potential for path level lighting should be evaluated.

Mile Marker Symbols

Pavement markings, or more likely stickers, identifying trail mile points should be included along the trail. These should have specific location information that can be used to inform emergency services of the exact location of the marker.

Shade

Both of the trail segments are along roadways with very little shade. The potential for providing pull-outs to access covered benches should be considered when installing these trail segments. To enhance and keep with the natural surroundings along C.R. 92 it is advised that providing shade for trail users should be accomplished through landscaping and natural tree canopies then through built structures.

Call Boxes

While cell phones have become ubiquitous, call boxes can provide immediate notification of emergency situation and provide location data to first responders.

Trash Receptacles

Placing trash receptacles along the trail can help reduce litter along the trail and roadway. There are existing opportunities to include trash receptacles at existing transit stops, however trash receptacles should be located at trail heads and where vending machines are located.

Technology Considerations

Trail Counts

Technology can be used to provide data on trail users and to enhance the trail users' experience. Count stations should be considered along both trail segments. These count stations could include in-pavement sensors and eco-counters. Near traffic signals, it may be possible to tie these count stations into the existing traffic signal monitoring system and/or use video detection to count trail users.

Mile Marker Information

QR codes could be included on the mile markers to provide immediate access to trail maps, park locations and hours of service, safety advice, transit information, etc.

ALTERNATIVE ANALYSIS

This feasibility study is intended to reflect the general stakeholder desires to continue the planning and future implementation of a shared use path network. Through public engagement, a general understanding of the stakeholders' goals and desires for implementation were ascertained. Each of the design concepts was evaluated for their consistency with the project purpose and need, stakeholders' and public desires, adjacent land use, physical constraints and available right-of-way.

Of the alternatives considered, some do not meet the purpose and need to provide system linkage, improving both bicycle and pedestrian connectivity. These alternatives are included in particular for the bridge structures, as limited options are available if no bridge widening is taken into consideration. They are presented to help provide comparisons for alternatives that do meet the system linkage criteria.

Corridor Segments

The purpose of the corridor segmentation for S.R. 951 was not to limit the alternatives analyzed per segment, but to limit the overall environmental impacts. Our alternatives which limit the construction of a sidewalk or SUP to one side of the roadway was based on the adjacent land use, physical constraints and available right-of-way. With a limited ability to expand development along the corridor, new pedestrian generators and destinations are unlikely. So, future and current access to the roadway right-of-way is limited to the existing side street connections. We have limited our design options to a single pedestrian facility on one side of the roadway which should sufficiently accommodate the expected demand generated by the current and future population.

Segment 1 – Judge Jolley Bridge to Capri Boulevard

Through this segment, the east side of the roadway is dominated by the Collier Boulevard Boating Park. The Flotilla Passage connecting East Marco Bay to McIlvane Bay limits the available real estate needed to construct pedestrian facilities. Through this segment, pedestrian facilities were only considered for the west side of the corridor.

Segment 2 – Capri Boulevard to Marco Shores/Mainsail Drive

Through this segment, Capri Boulevard connects to S.R. 951 on the west side and Marco Shores/Mainsail Drive connects on the east side. A short stretch of existing

sidewalk just north of Capri Boulevard and on the west side of the roadway connects to the Isle of Capri Paddlecraft Park. This segment also contains two bridges (S.R. 951 over McIlvane Bay and McIlvane Creek). Through the southern portions of the segment, the Flotilla Passage abuts the roadway, but is further offset than the segment to the south. There seems to be sufficient space to construct pedestrian features without impacting the existing shoring. With the park on the west side of the corridor, expanding the pedestrian facilities on the west side of the corridor provides some benefit as it eliminates the need for residents of the Isle of Capri would not be required to cross S.R. 951 to access the facilities. An additional benefit of this location would not require the additional costs needed to adjust the existing guardrail that provides protection to the canal. These factors suggest prioritizing an alternative with pedestrian facilities on the west side of the corridor. However, there are no identified issues with locating pedestrian facilities on the east side of the corridor. Both alternatives should move forward into the next phase of planning.

Segment 3 – Marco Shores/Mainsail Drive to Fiddlers Creek Parkway

Fiddlers Creek Parkway connects to S.R. 951 from the east side. This segment has conservation lands adjacent to both sides of the corridor. Of note are the above ground utilities i.e., electrical transmission and distribution lines running on the west side of the roadway. Other than the utilities, both sides of the corridor seem equal and uniform. Two factors would play into the determination of the placement of pedestrian facilities: location of the utilities and location of the subdivisions. With the utilities on the west side, existing access to the poles would limit the total impacts to environmentally sensitive lands. Providing pedestrian facilities on the east side of the corridor would place the facilities closer to users and reduce the exposure of these vulnerable users by eliminating the need for crossing S.R. 951. Given the current data, both alternatives should move forward into the next phase of planning.

Segment 4 – Fiddlers Creek Parkway to Henderson Creek Drive

As the project moves north, the majority of the residential and commercial properties are located on the east side of the roadway. If the pedestrian facility were placed on the west side of the roadway, mid-block crossings would likely be required to access pedestrian facilities on the west side of the roadway, as the signals at Fiddlers Creek Parkway, Manatee Road, and Walmart entrance are generally spaced about a mile

apart. Due to the location of the pedestrian generators, predominantly on the east side of the corridor, pedestrian facilities were only considered for the east side of the corridor.

Sociocultural Resources

Trails are one of the most desired community amenities, they support current residents and promote visitors. Based on the information gathered for the Existing Conditions Report, there are minimal impacts to the sociocultural status within the corridors. This project would support community resources and land uses by providing multimodal mobility and accessibility. No relocations are anticipated for this project.

Utilities

Based on the agencies that commented and limited analysis of the preliminary existing utility locations indicates the proposed improvements will not impact any of the existing utility facilities. As there are no impacts to the utility facilities, there are no conflicts to be addressed and therefore, there are no utility relocation costs or right-of-way impacts. Additional analysis would be completed during future phases of the project.

Geotechnical and Contamination

Based on the information gathered for the Existing Conditions Report, there are minimal impacts due to geotechnical or contamination considerations within the corridors. From a soils perspective, both roadways appear to have been constructed by utilizing fill that was placed over historic mangrove swamp. There may be soil concerns due to high water and organic content as this could affect the construction and maintenance of slopes for the pedestrian facility and/or roadway widening. There is no physical evidence of this having any long term or maintenance issues with the roadway and this should be the same with future pedestrian facilities.

From a contamination viewpoint, the Racetrac located at 6170 Collier Boulevard is the only site located within the corridors. The site was redeveloped around 2013 and was previously a gas station as well. With the fairly recent redevelopment of the site, the risk of contamination impacting the project would be minimal. No accommodations for either the geotechnical or contamination considerations are included in the analysis.

Floodplains and Wetlands

Based on the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory and the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST), the Study Area is comprised of approximately 90% wetlands and surface waters. The majority (~80%) of these wetlands are estuarine (mangrove island and tidal flats), while the other ~10% are palustrine (freshwater, nontidal wetlands).

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the Study Area contains panels 12021C0612H, 12021C0615H, 12021C0827H, and 12021C0829H for S.R. 951 and panels 12021C0855H, 12021C0835H, and 12021C0842H for C.R. 92, all dated May 16, 2012. With the exception of high pockets of elevation, the majority of the Study Area falls within the 100-year floodplain, due to its proximity to the coast. Based on the Digital Flood Insurance Rate Map (DFIRM), updated December 2022, the flood zone designations for the Study Area are AE and VE. Zone AE corresponds to 1% annual chance floodplains and zone VE are coastal high hazard areas.

If impacts occur to mangroves, mitigation will be required. Both Little Pine Island Mitigation Bank and Corkscrew Regional Mitigation Bank provide credits within the Study Area. Little Pine Island Mitigation Bank is the recommended mitigation bank because of its proximity to the Study Area and is the only one of the two to provide mitigation credits for Forested Freshwater, Forested Saltwater, Herbaceous Freshwater/Brackish, and Herbaceous Saltwater systems. The cost per credit for forested estuarine wetlands is \$365,000 and \$235,000 for herbaceous estuarine wetlands, in effect April 1, 2023. Credits are sold per credit because the amount of credit needed will be determined by the quality of the wetland impacted, rather than solely on acres impacted.

Drainage and Permitting

Construction of pedestrian facilities will impact tidal floodplains but no floodplain mitigation will be required and, in this case, no permit is required. No attenuation would be required. If wetlands are impacted, then a standard Environmental Resource Permit (ERP) would be required. If swales and wetlands are impacted than a full ERP Individual permit would be required

S.R. 951 (Collier Boulevard) – Alternatives

Uniform alternatives were applied throughout the corridor. The design concepts were then evaluated for their consistency with the project purpose and need; support of project objectives; engineering constraints and considerations; public input; and the order of magnitude implementation costs, as described in greater detail below.

- 1) No Build – This alternative does not meet the desired purpose and need for the project of providing system linkage for pedestrian connectivity.
- 2) 7' Buffered Bike Lane – This alternative does not meet the desired purpose and need for the project of providing system linkage for pedestrian connectivity. It also had the second lowest positive response from the public survey, with the no-build as the lowest response.
- 3) 5' Sidewalk – The third S.R. 951 alternative provides system linkage for both pedestrians and bicyclists. However, no separation is provided between bicyclists and motor vehicles.
- 4) 10' SUP – The next S.R. 951 alternative provides system linkage for both pedestrians and bicyclists and provides two areas for bicyclists' use with separation provided between bicyclists and motor vehicles along the SUP.
- 5) 10' SUP and 7' Buffered Bike Lane – The next S.R. 951 alternative provides system linkage for both pedestrians and bicyclists. The shoulder would be widened by 2' to provide the buffered bike lanes. The section provides two areas for bicyclists' use with separation provided between bicyclists and motor vehicles along the SUP and improved buffered bike lanes. This alternative received the highest amount of public support.
- 6) 7' Buffered Bike Lane (no widening) – This alternative does not meet the desired purpose and need for the project of providing system linkage for pedestrian connectivity. This alternative was created after the online survey was made available to the public and therefore did not receive public input.
- 7) 10' SUP and 7' Buffered Bike Lane (no widening) – This variation of Alternative 5 requires no roadway widening and allows the shoulder to be widened by reducing the travel lane widths to 11'. With S.R. 951 considered a freight

corridor to the City of Marco Island, a minimum 12' outside lane would be required.

Depending on the alternatives above, a correlating bridge section would be utilized to accommodate the approach facilities for the bridges over McIlvane Bay and Creek. Alternatives 1, 2, and 6 would require no bridge work other than possible new pavement markings. Alternative 3 correlates to a structure with a barrier separated sidewalk. Alternatives 4, 5, and 7 match the bridge structure providing a 10' SUP that is barrier separated.

Only two alternatives were prepared for the Henderson Creek Bridge: no build and barrier separated SUP. Dependent on timing and funding, the FDOT is currently in the right-of-way phase for Financial Project Identification 435111-2 S.R. 951 from Manatee Road to Tower Road. The project is funded for right-of-way acquisition but is currently not funded for construction. If funds become available, then the planned letting date for this project is July 22, 2027. When construction occurs, the bridge will be widened over Henderson Creek to provide a sidewalk on the southbound bridge and a 10' SUP on the northbound bridge see Figure 2.

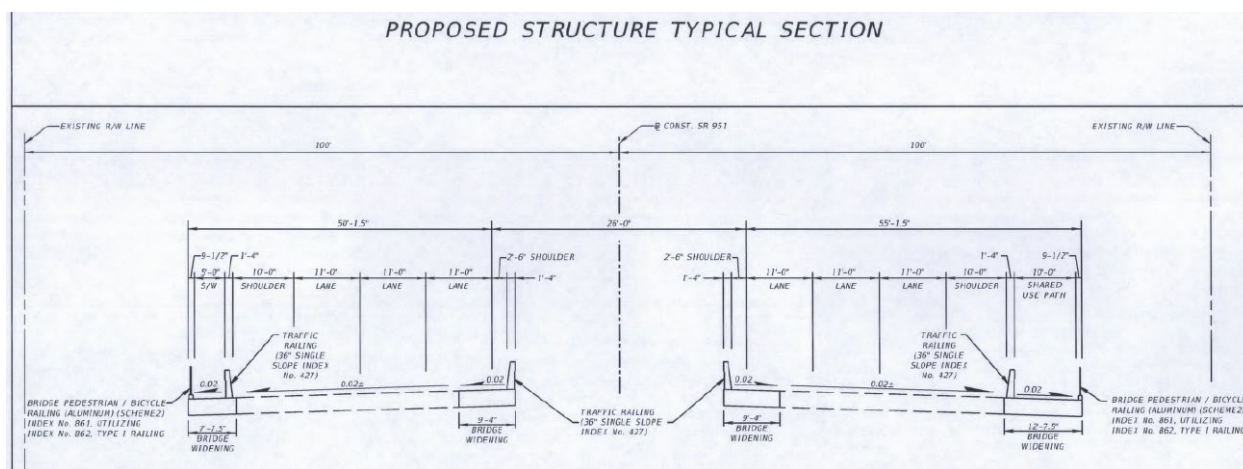


Figure 2: Proposed Typical Section for the Henderson Creek Bridge (FPID 435111-2)

C.R. 92 (San Marco Road) – Alternatives

As discussed previously under Corridor Segments for S.R. 951, the alternatives for C.R. 92 limits the construction of a sidewalk or SUP to one side of the roadway based on the adjacent land use, physical constraints and available right-of-way. With no

possibility for development along the corridor, demand for the facilities would come from the City of Marco Island and long-distance bike riders. We have limited our design options to a single pedestrian facility on one side of the roadway which should sufficiently accommodate the expected demand generated by the current and future population. The design concepts were then evaluated for their consistency with the project purpose and need; support of project objectives; engineering constraints and considerations; public input; and the order of magnitude implementation costs, as described in greater detail below.

- 1) No Build – This alternative does not meet the desired purpose and need for the project of providing system linkage for bicycle or pedestrian connectivity.
- 2) Paved Shoulder Bike Lanes – This alternative does not meet the desired purpose and need for the project of providing system linkage for pedestrian connectivity.
- 3) 7' Buffered Bike Lane – The next alternative does not meet the desired purpose and need for the project of providing system linkage for pedestrian connectivity.
- 4) Paved Shoulder Bike Lanes and Sidewalk – The fourth C.R. 92 alternative provides system linkage for both pedestrians and bicyclists. However, no separation is provided between bicyclists and motor vehicles. This alternative had the second highest response from the public.
- 5) Adjacent Asphalt Path – The next alternative does not meet the desired purpose and need for the project of providing system linkage for pedestrian connectivity. This alternative had the third highest response from the public but was very similar to the second highest (23.3% vs. 25.3%).
- 6) 10' SUP – The last C.R. 92 alternative provides system linkage for both pedestrians and bicyclists with separation provided between bicyclists and motor vehicles along the SUP. This alternative had the highest positive responses from the public.

Cost Estimates

Conceptual construction cost estimates were prepared for both build alternatives. The estimates were prepared using a similar approach to that of the FDOT Long Range

Estimating application and Cost per mile models and is presented only as a comparative analysis and does not represent the actual present day construction costs. Cost estimates are presented in **Tables 2 and 3**. The detailed cost estimation for the is provided in **Appendix D**.

Table 2: Cost Estimate for S.R. 951

S.R. 951							
	Jolley Bridge to Capri	Capri to Mainsail	Mainsail to Fiddler's Creek	Fiddler's Creek to U.S. 41	Wetland and Mangrove Mitigation	Structures	Total
No Build	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ 0.00
7' Buffered Bike Lane	\$130,580	\$109,780	\$166,403	\$352,451	\$0	\$0	\$ 759,214
5' Sidewalk	\$214,705	\$180,504	\$273,606	\$579,512	\$822,702	\$108,361	\$ 2,179,389
10' SUP	\$316,522	\$266,103	\$403,356	\$854,331	\$1,645,404	\$129,349	\$ 3,615,065
10' SUP + 7' Buffered Bike Lane	\$447,103	\$375,883	\$569,759	\$1,206,782	\$1,974,484	\$129,349	\$ 4,703,360
7' Buffered Bike Lane (No widening)	\$0	\$0	\$0	\$0	\$0	\$0	\$ 0.00
10' SUP + 7' Buffered Bike Lane (No widening)	\$316,522	\$532,206	\$806,712	\$854,331	\$1,645,404	\$129,349	\$ 4,284,524

Table 3: Cost Estimate for C.R. 92

C.R. 92			
Mileage	6.1	Structures	Total
No Build	\$ 0	\$ 0	\$ 0
Paved Shoulder Bike Lanes	\$ 1,292,518	\$ 0	\$ 1,292,518
7' Buffered Bike Lane	\$ 2,122,247	\$ 0	\$ 2,122,247
Paved Shoulder Bike Lanes + 5' Sidewalk	\$ 2,451,542	\$ 363,413	\$ 2,814,955
Adjacent Asphalt Path	\$ 1,476,027	\$ 363,413	\$ 1,839,439
10' SUP	\$ 1,708,661	\$ 363,413	\$ 2,072,074

Local Agency Coordination

Presentations were provided to the City of Marco Island, Collier County, and Collier MPO. The purpose of the presentations was to provide an update to the agencies and seek approval of the project documentation through a concurrence letter. Comments from each of the agencies are provided below.

City of Marco Island

May 22

Collier County

TBD

Collier MPO

BPAC May 16

TAC May 22

CAC May 22

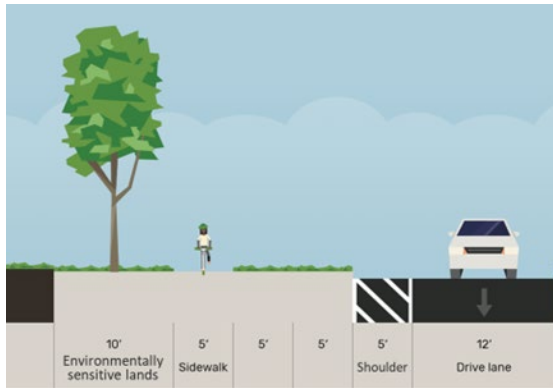
Board June 9

Recommendations

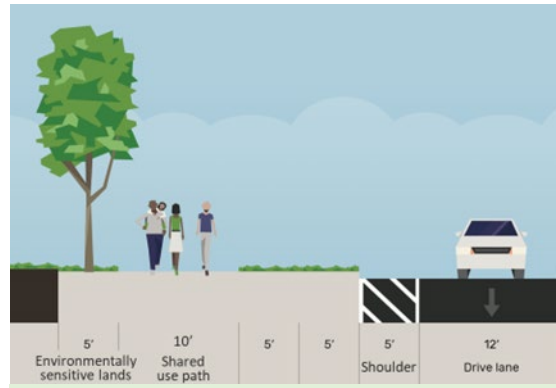
A qualitative analysis was conducted to determine the advantages and disadvantages of the alternatives. Each alternative was evaluated in relation to engineering, socioeconomic, environmental criteria, and various cost factors. A Comparative Alternative Evaluation matrix is presented in **Table 3**. The matrix is provided for comparisons only and does not represent a recommendation or a ranking of the alternatives.

No right-of-way requirements were identified as part of the study, but due to the expected impacts to the wetlands and mangroves within the right-of-way, it is anticipated that a PD&E Study will be required during the next phase of the project. Based on the available data and analysis, the following alternatives are recommended to be carried forward to the PD&E phase and depicted on the Concept Plans – **Appendix E**:

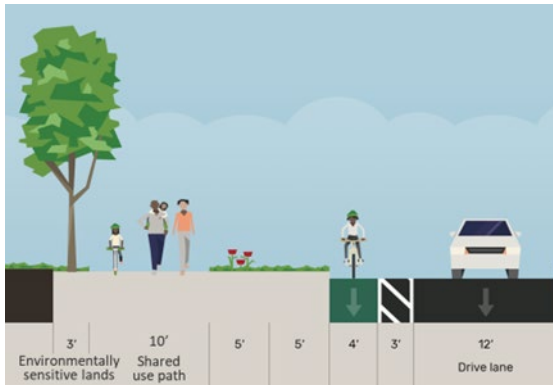
S.R. 951 Feasible Alternatives



Alternative 3



Alternative 4



Alternative 5

C.R. 92 Feasible Alternatives

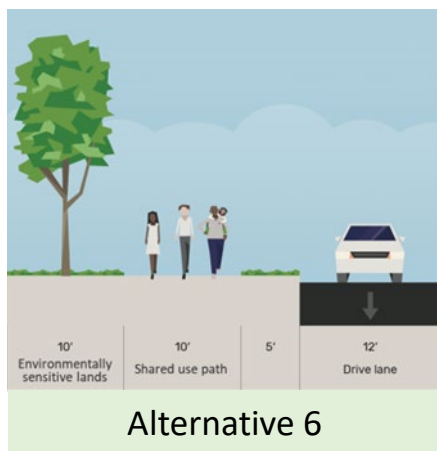
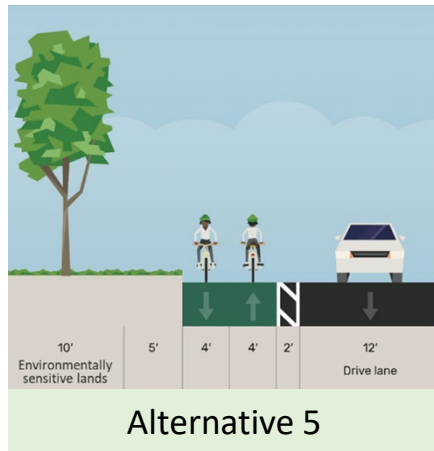
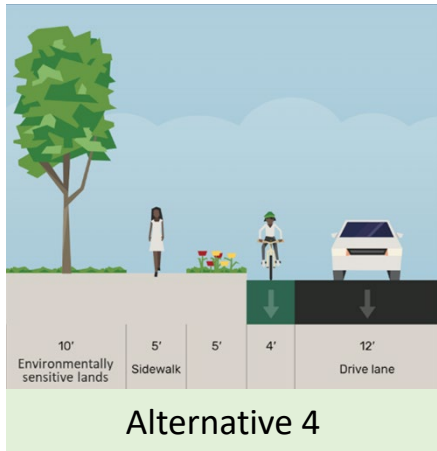


Table 4: Comparative Alternative Evaluation Matrix

Evaluation Criteria	No-Build Alternative	Build Alternatives										
		S.R. 951 (Collier Boulevard)						C.R. 92 (San Marco Road)				
		7' Buffered Bike Lane	5' Sidewalk	10' Trail	10' Trail + 7' Buffered Bike Lane	7' Buffered Bike Lane (No widening)	10' Trail + 7' Buffered Bike Lane (No widening)	Paved Shoulder Bike Lanes	7' Buffered Bike Lane	Paved Shoulder Bike Lanes + 5' Sidewalk	Adjacent Asphalt Path	10' Trail
Purpose and Need												
Safe Multimodal Access to Destinations (N/L/M/H)	N	L	M	H	H	L	H	L	L	M	L	H
Regional Bicycle and Pedestrian Connectivity (N/L/M/H)	N	L	L	M	H	L	H	L	L	M	L	M
Enhance Quality of Life and Support Economic Development (N/L/H)	N	L	L	H	H	L	H	L	L	H	L	H
Public Support Ranking (1 - high, 5-low)	-	4	3	2	1	4*	1*	5	4	2.5	2.5	1
Potential Natural/Cultural Environmental Effects												
Archaeological Sites Potentially Affected	0	0	0	0	0	0	0	0	0	0	0	0
Historical Sites Potentially Affected	0	0	0	0	0	0	0	0	0	0	0	0
Floodplains (acres) Impacted	0	0	3.98	7.96	9.56	0	7.96	0	0	0	0	0
Wetlands (acres) Impacted	0	0	3.98	7.96	9.56	0	7.96	0	0	0	0	0
Potential Physical Effects												
Utility Agency Owners impacted	0	0	0	0	0	0	0	0	0	0	0	0
Utility Relocations	0	0	0	0	0	0	0	0	0	0	0	0
Contamination Sites (M/H Levels Only)	0	0	0	0	0	0	0	0	0	0	0	0
Estimated Project Costs (per October 2021 LRE)												
Construction	\$0	\$ 759,000	\$ 1,357,000	\$ 1,970,000	\$ 2,729,000	\$ -	\$ 2,639,000	\$ 1,293,000	\$ 2,122,000	\$ 2,815,000	\$ 1,839,000	\$ 2,072,000
Design & Construction Engineering and Inspection (30% of Construction Cost)	\$0	\$ 228,000	\$ 407,000	\$ 591,000	\$ 819,000	\$ -	\$ 792,000	\$ 388,000	\$ 637,000	\$ 845,000	\$ 552,000	\$ 622,000
Wetland and Mangrove Mitigation	\$0	\$ -	\$ 823,000	\$ 1,645,000	\$ 1,974,000	\$ -	\$ 1,645,000	\$ -	\$ -	\$ -	\$ -	\$ -
Estimated Total Costs	\$0	\$ 987,000	\$ 2,587,000	\$ 4,206,000	\$ 5,522,000	\$ -	\$ 5,076,000	\$ 1,681,000	\$ 2,759,000	\$ 3,660,000	\$ 2,391,000	\$ 2,694,000

Note:

1. The construction costs shown do not reflect project unknowns and are only calculated based on the features present in the typical sections.
2. For Public Support Ranking, a "*" means that this typical section was either developed after the public input and the ranking is based upon the most comparable typical section.
3. No construction costs are associated to alternatives that identify no roadway widening, as these improvements can be implemented during the next RRR project for the roadway.
4. Safe Multimodal Access to Destinations: L-provides bike facilities adjacent to roadway M-provides bike facilities adjacent to roadways and separated pedestrian facilities H- provides separated pedestrian and bicycle facilities
5. Regional Bicycle and Pedestrian Connectivity: L-provides pedestrian or bicycle facilities M-provides both pedestrian and bicycle facilities H-provides separated bicycle and pedestrian facilities and adjacent bicycle facilities
6. Enhance Quality of Life and Support Economic Development: L-provides pedestrian or bicycle facilities H-provides both pedestrian and bicycle facilities