

APPENDIX **K**

Marco Island Loop Trail Feasibility Study and Conceptual Design

Marco Island Loop Trail Feasibility Study and Conceptual Design

Collier County, Florida

Trail Alternatives Evaluation Report November 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**.

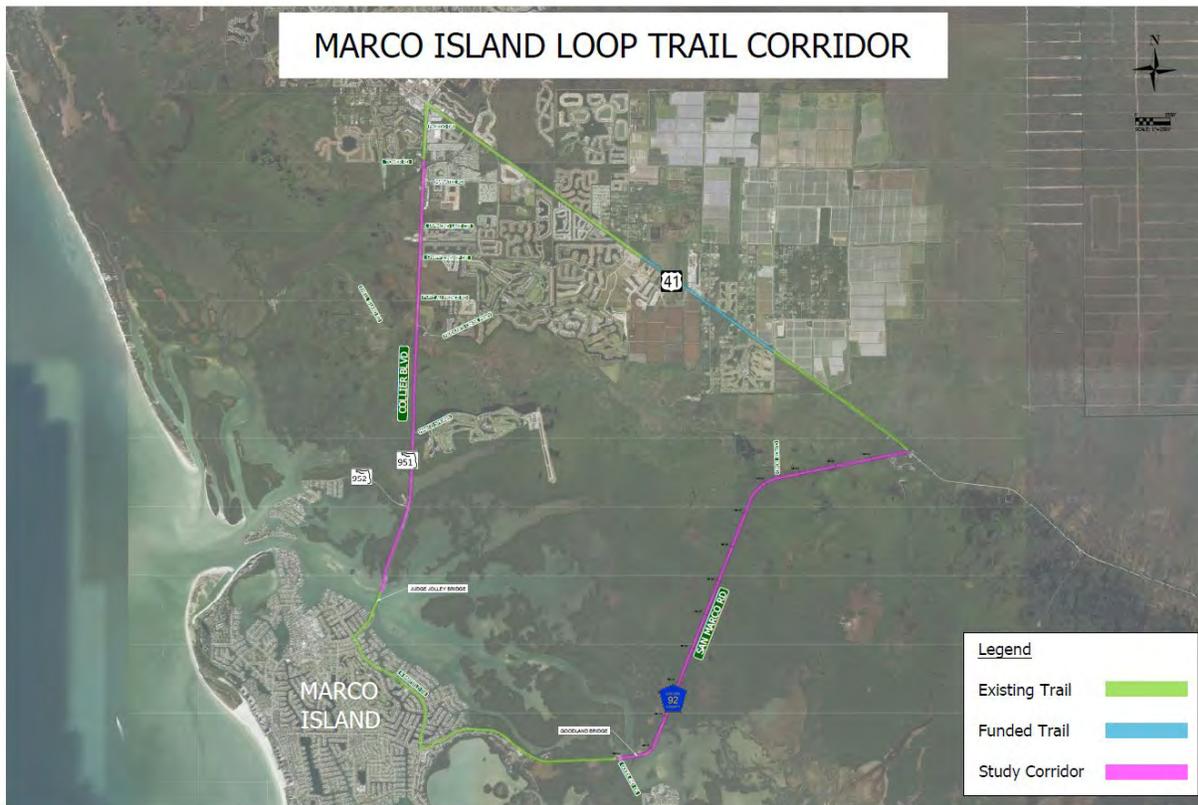


Figure 1: Location Map

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

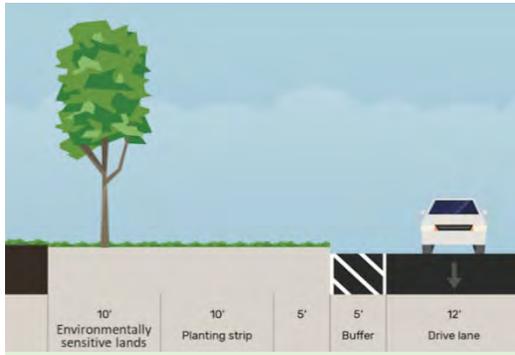
Segment 4 – Fiddlers Creek Parkway to Henderson Creek Drive

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.

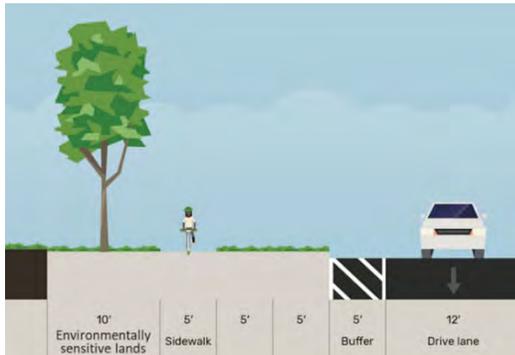
- 1) No Build – Bicyclists are accommodated on existing 5'-paved shoulders and no facilities are provided for pedestrians.
- 2) 7' Buffered Bike Lane – Bicyclists are accommodated on a widened shoulder with a 7' buffered bike lane, and no facilities are provided for pedestrians.
- 3) 5' Sidewalk – Bicyclists 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.



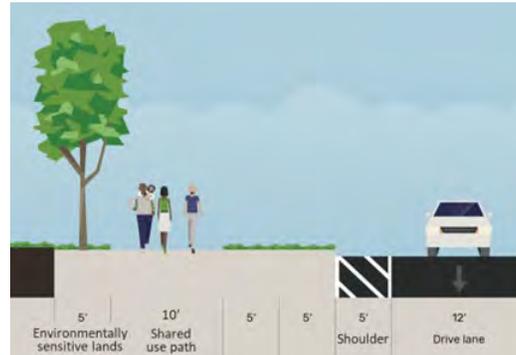
Alternative 1



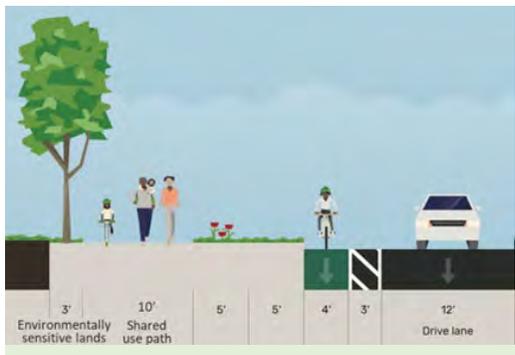
Alternative 2



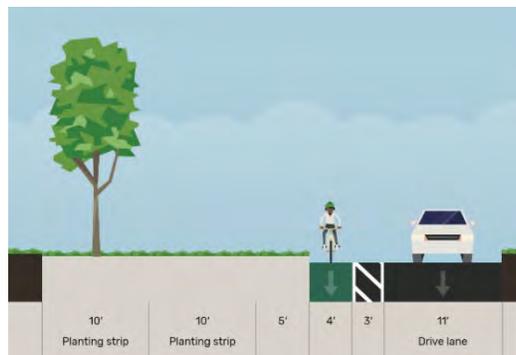
Alternative 3



Alternative 4



Alternative 5



Alternative 6



Alternative 7

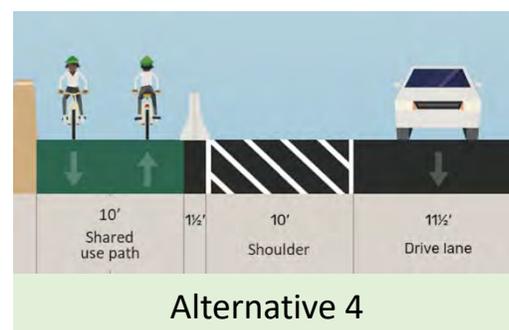
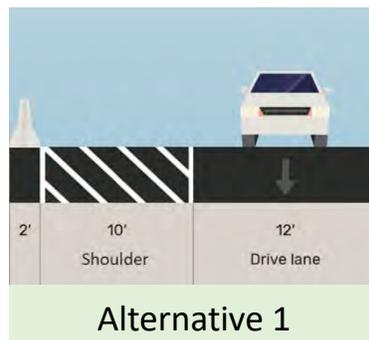
Note: Graphics were created utilizing Streetmix (<https://Streetmix.net>)

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

S.R. 951 Bridge over McIlvane Bay and S.R. 951 Bridge over McIlvane 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.



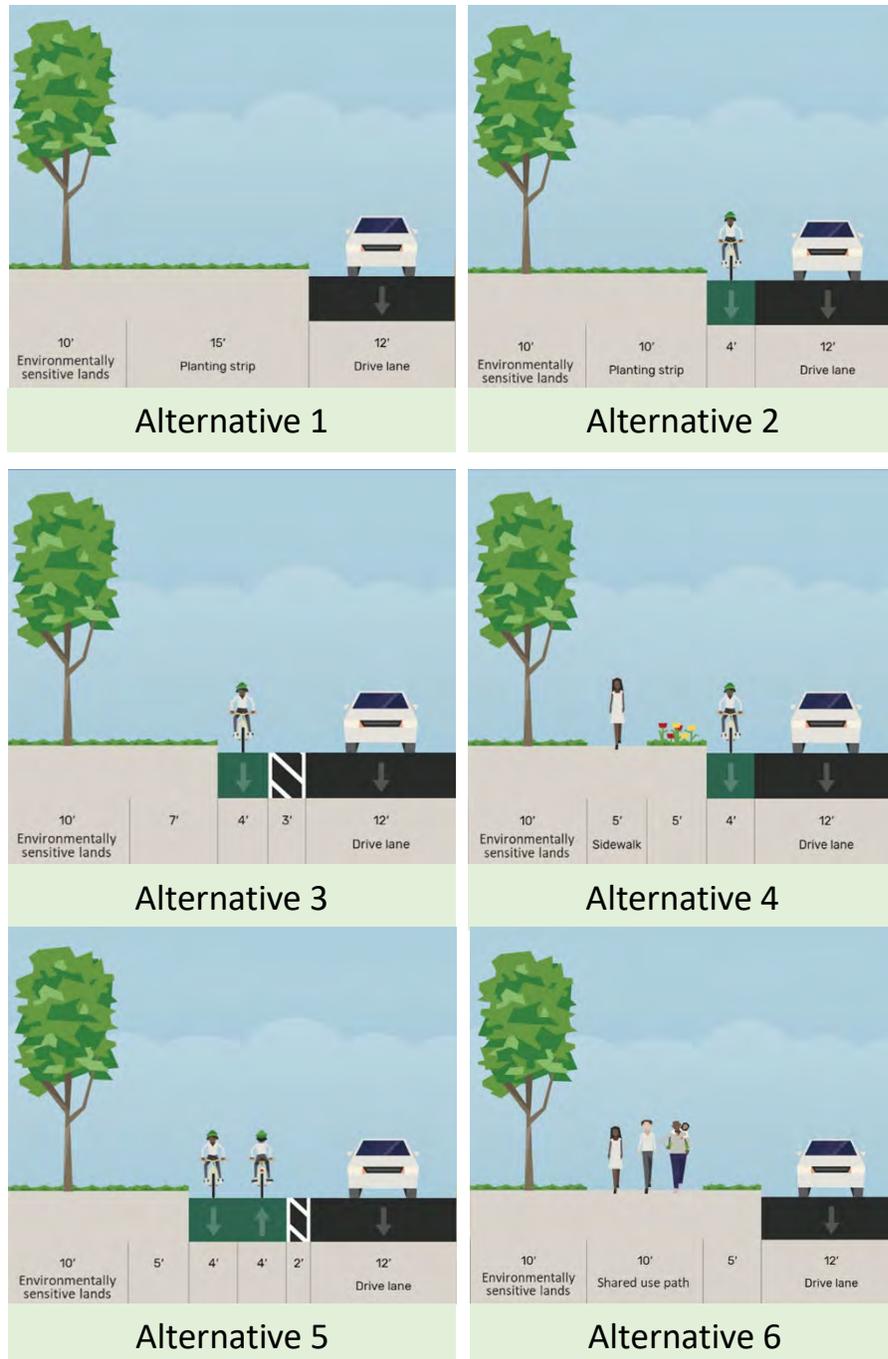
Note: Graphics were created utilizing Streetmix (<https://Streetmix.net>)

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

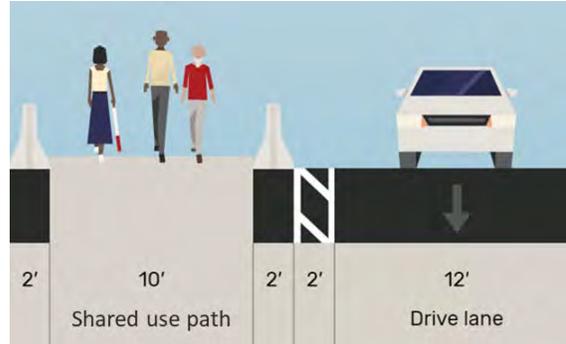
C.R. 92 over Drainage Canal (Bridge No. 034128)

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

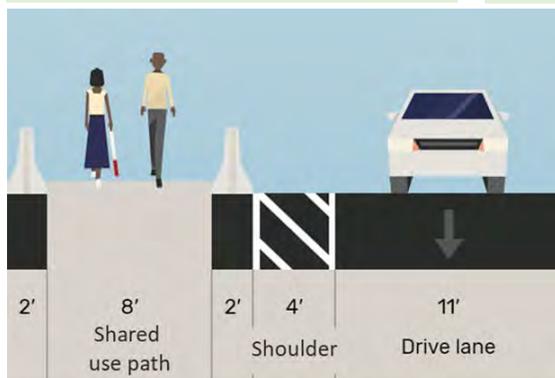
- 1) No Build – Bicyclists utilize the existing travel lanes prior to the bridge where they can be accommodated on existing 8'-bridge deck shoulders and no facilities are provided for pedestrians.
- 2) Barrier Separated 10' SUP – A barrier separated SUP is provided for pedestrians and bicyclists. The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



Alternative 1



Alternative 2



Alternative 3

*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 overhead 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.

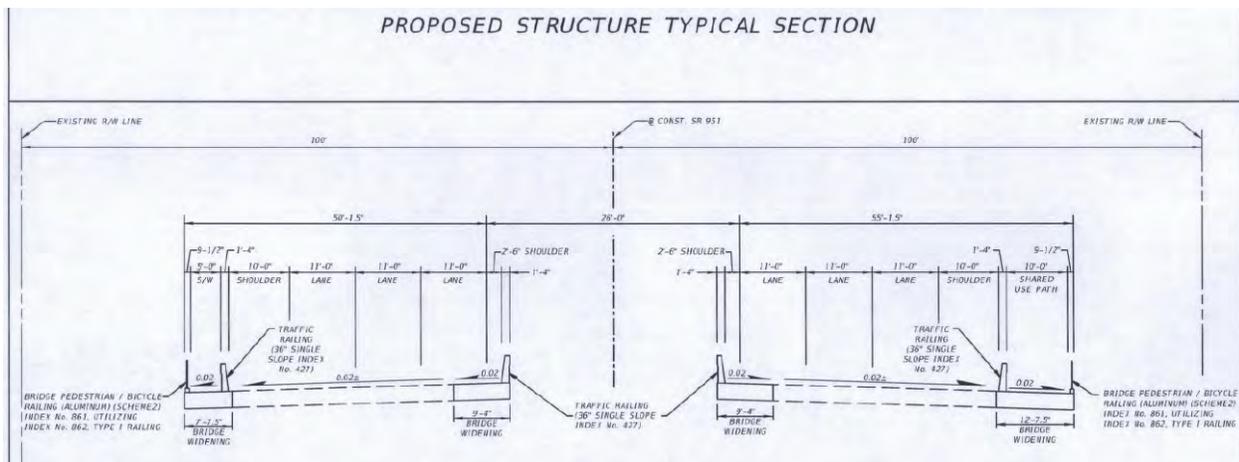


Figure 2: Proposed Typical Section for the Henderson Creek Bridge (FPID 435111-2)

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. Notes and comments from each of the agencies are provided below.

City of Marco Island

On May 22, 2023, the project was presented to the City Council of Marco Island. From the meeting, the Council posed the following questions:

- Would the project be a part of the SUN Trail?
- Would the trail provide amenities like shade structures?
- What type of surface would be used for the trail?

Comments from the Council included:

- Noted that the project would be a great addition to Marco Island
- Indicated that flooding often occurs during hightide
- The trail would provide lots of potential for business from competitive bike riders

A general consensus was reached for a letter of support to be provided by the council for this project. This letter was provided on September 20, 2023 and is attached as **Appendix E**.

Collier MPO

Bicycle & Pedestrian Advisory Committee (BPAC) – May 16, 2023. The project presentation was well received by the BPAC and most of the comments presented were related to expanding a facility to Everglades City as it was noted that long distance riders use the C.R. 92 corridor today. The BPAC was in general support of the project moving to the next stages.

Technical Advisory Committee (TAC) – May 22, 2023. It was noted that many of the TAC had not heard of the project. Follow-up questions queried if the facility would be within the right of way, where would funding come from, and what would be the implementation time frame?

Citizens Advisory Committee (CAC) – May 22, 2023. It was noted that many of the CAC had also not heard of the project, but it was indicated that there is a need for this kind of project. The CAC posed the following questions:

- Would the project be a part of the SUN Trail?
- What is the status of the trail gap on US 41? Who is funding the project?
- Were separated facilities proposed?
- Are bikes allowed to use the SUP?
- What is the timeframe for implementation?
- Would there be any restrictions on micromobility on the SUP?
- Has a decision been made at this time and when was the right time to send support?
- Has there been any opposition to the project?

Comments from the Council included:

- It was mentioned a letter that she heard was sent in opposition to development of the corridors due to lack of safety which she indicated was the point of the project, to look for ways to make the corridors safer for non-motorized users. This letter has been responded to and is included in the project documentation.
- Any of the recommended facilities would be a marvelous improvement.
- They liked the project overall as they identified it was way too dangerous along Collier Boulevard and improvements would be very attractive for longer rides.
- A request was made for audible devices at intersections and crossings be included in the report.

Collier MPO Board – June 9, 2023. The Board received the presentation and had an opportunity to ask questions and comment on the draft report and the next steps proposed by staff. The MPO Board requested additional information regarding the estimated costs for construction. A cost estimate was provided for each corridor alternative which was independently validated by Collier County and confirmed as appropriate planning level cost estimates. It was noted that the FDOT cost estimates did

not include design or construction engineering inspection (CEI), future maintenance, water treatment, mitigation or guard rail costs. On September 8, 2023, The MPO Board approved a resolution accepting FDOT’s Final Report on the Marco Island Loop Trail Feasibility Study and Conceptual Design and is attached as **Appendix F**.

Collier County

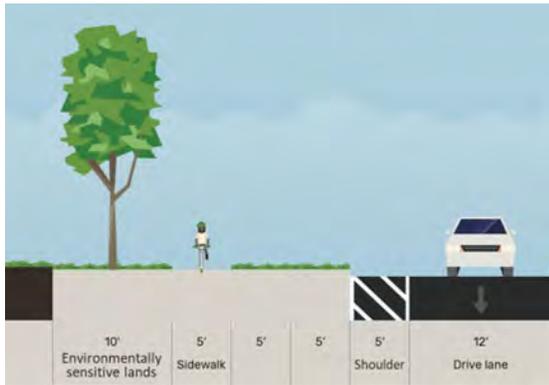
On September 26, 2023, the Collier County’s Board of County Commissioners approved, via the consent agenda, a recommendation to receive and accept the Marco Island Loop Trail Feasibility Study conducted by Florida Department of Transportation.

Recommendations

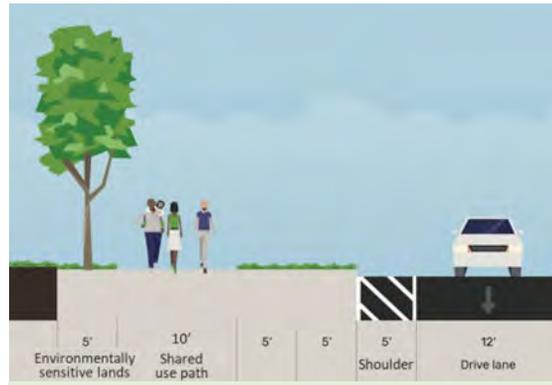
A qualitative analysis was conducted to determine the advantages and disadvantages of the alternatives. Each alternative was evaluated in relation to engineering, socioeconomic, environmental criteria, and various cost factors. A Comparative Alternative Evaluation matrix is presented in **Table 3**. 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

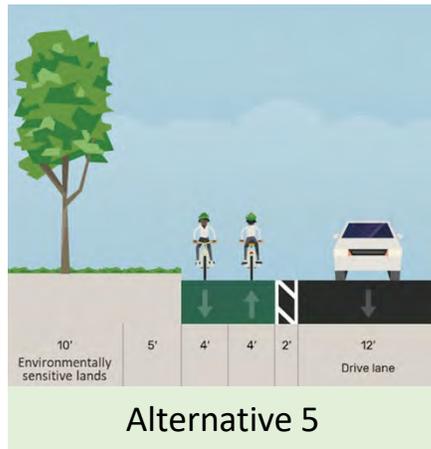


Table 4: Comparative Alternative Evaluation Matrix

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

Marco Island Loop Trail Feasibility Study and Conceptual Design

Collier County, Florida

Existing Conditions Report
August 2022 (Updated March 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 12' multi-use trail (shared use path) along State Road (S.R.) 951 (Collier Boulevard) and County Road (C.R.) 92 (San Marco Road) and determine a preferred design concept for implementation that will complete the Marco Island Loop. 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 Marco Island Bike Path Master Plan and the Naples Pathways Coalition Paradise Coast Trail Vision. This study will determine the need for a subsequent Project Development and Environment (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 12' multi-use trail 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 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 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 non-motor 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.

*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 (DEP) 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 as part of the plan. Trail 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 and Collier MPO to ensure that the project promotes consistency with local government comprehensive and transportation plans.

TRANSPORTATION

Major Roadways and Traffic Data

The two corridors within the study are S.R. 951 (Collier Boulevard) and C.R. 92 (San Marco Road). S.R. 951 is classified as an urban minor arterial. It is a four-lane divided highway with a raised, curbed median and outside flush shoulders. The posted speed limit ranges from 35 miles per hour (MPH) to 55 MPH. Data obtained from Florida Traffic Online estimated the Annual Average Daily Traffic (AADT) volume of 37,500; design hour factor (K factor) of 9; directional-distribution factor (D factor) of 55.1; and a 24-hour truck factor (T factor) of 7.7.

C.R. 92 is classified as a rural minor arterial. It is an undivided, two-lane roadway with no paved outside shoulders. The posted speed limit is 55 MPH. The estimated AADT is 3,800, K factor of 9, D factor of 56.7, and T factor of 4.7.

Intersections and Traffic Control

Signalized intersections along both corridors:

- S.R. 951 and Manatee Road (3-way intersection)
- S.R. 951 and Capri Boulevard / Boating Park (4-way intersection)
- S.R. 951 and Mainsail Drive (3-way intersection)
- S.R. 951 and Fiddlers Creek Parkway (3-way intersection)
- S.R. 951 and Naples Fire Rescue (Emergency signal)
- S.R. 951 and Manatee Road (3-way intersection)
- S.R. 951 and the Walmart Entrance (3-way intersection)
- S.R. 951 and U.S. 41 (Tamiami Trail) (4-way intersection)
- C.R. 92 and U.S. 41 (Tamiami Trail) (Flashing)

Stop controlled

- S.R. 951 and Shell Island Road
- S.R. 951 and Port Au Prince Road
- S.R. 951 and Championship Drive
- S.R. 951 and Silver Lakes Boulevard
- S.R. 951 and Shell Island Road

- S.R. 951 and Naples Outlet Collection Entrance
- S.R. 951 and Riverwood Road
- S.R. 951 and Tower Road
- S.R. 951 and Henderson Creek Drive
- S.R. 951 and Shell Island Road
- S.R. 951 and Eagle Creek Drive
- S.R. 951 and Shopping Center Entrance
- C.R. 92 and Curcie Road

Bicycle and Pedestrian Facilities

Marco Island has a planned network of bicycle and pedestrian facilities. As you exit the island on S.R. 951, the Jolley Bridge has wide shoulders and an 8-foot pathway on the northside of the bridge. As you continue north, the outside paved shoulders are sufficient in width to allow bicyclists use of the shoulders. Most right turn lanes provide keyhole bike lanes. Pedestrian facilities are only located in the northern end of the project area, from Tower Road to U.S. 41. On the east side of the roadway is a five-foot sidewalk and on the west side of the roadway is a ten-foot wide sidepath.

There are no bicycle or pedestrian facilities along C.R. 92 from the Goodland Bridge to U.S. 41. During the field visit (06/30/22), a runner, skater, and biker were observed utilizing the outside shoulder of the Goodland Bridge with no connecting facilities on the east side of the bridge.

Transit

While no transit improvements are to be included in this study, Collier Area Transit (CAT) has multiple transit stops along S.R. 951 as shown in **Figures 2, 3 and 4**. Two routes cover the entirety of S.R. 951: Route 21 Marco Island Circulator and Route 121 Immokalee to Marco Island Express. Four routes have stops at the Walmart Supercenter: Route 17 Rattlesnake to FSW, Route 21 Marco Island Circulator, Route 24 U.S. 41 East to Charlee Estates, and Route 121 Immokalee to Marco Island Express. Sidewalk and/or trails can provide the necessary link between transit stops or hubs and final destinations such as residences, offices, and retail areas offering that “last mile” connectivity.

Figure 2: Collier Area Transit System Map



Figure 3: Collier Area Transit - Route 21 Stops

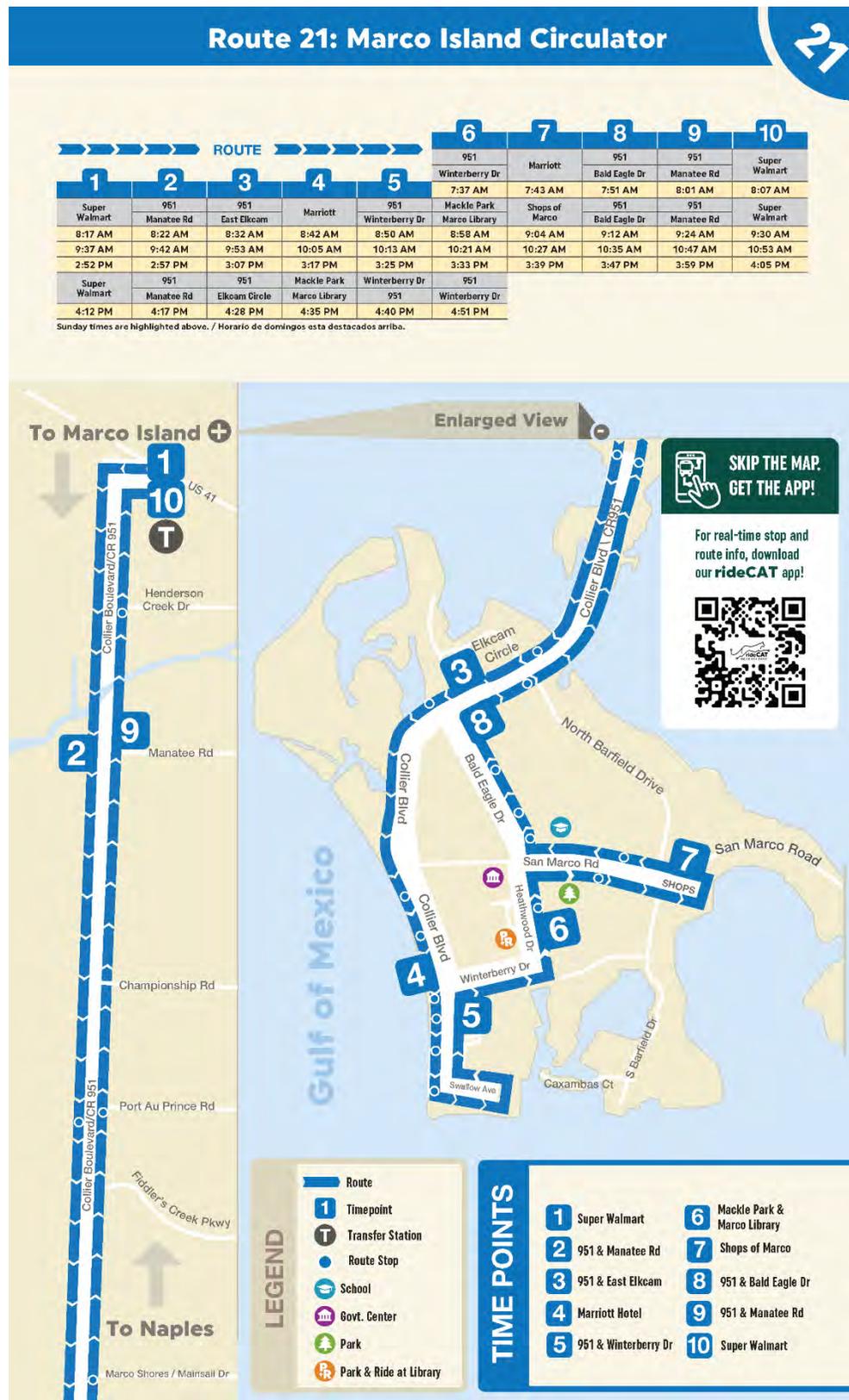


Figure 4: Collier Area Transit - Route 121 Stops



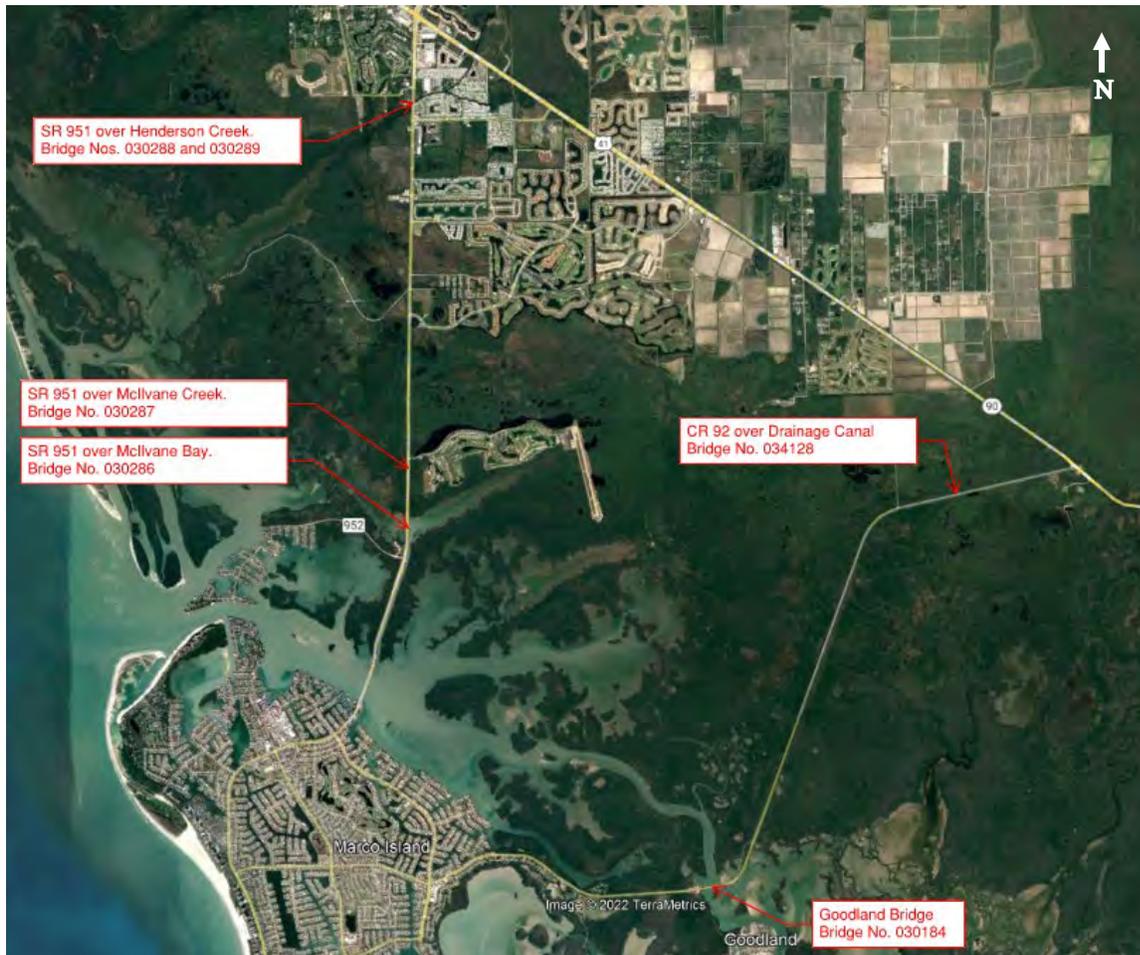
Existing Structures

There are six existing structures along the Marco Island Loop Pedestrian Trail study corridor. These structures are shown in **Table 1** and **Figure 5**.

Table 1: Existing Bridges

BRIDGE NAME	BRIDGE NUMBER	YEAR BUILT
NORTHBOUND (NB) AND SOUTHBOUND (SB) S.R. 951 OVER HENDERSON CREEK	032088/030289	1993/1992
S.R. 951 OVER MCILVANE CREEK	032087	1999
S.R. 951 OVER MCILVANE BAY	032086	1999
GOODLAND BRIDGE	030184	1975
C.R. 92 OVER DRAINAGE CANAL	034128	1992

Figure 5: Existing Bridge Locations



NB and SB S.R. 951 over Henderson Creek (Bridges 032088 & 032089)

These structures carry S.R. 951 over Henderson Creek and consists of twin bridges with three simple spans. Each span is approximately 43.33 ft in length and provide a total bridge length of 130 ft and 40 ft clear roadway widths. The vertical clearance above the high-water level of Henderson Creek is approximately 6.75 ft. The superstructure consists of prestressed-concrete American Association of State Highway and Transportation Officials (AASHTO) beams with a cast-in-place concrete deck. The substructure is founded on 18" prestressed-concrete piles.



Figure 6: S.R. 951 over Henderson Creek

S.R. 951 over McIlvane Creek (Bridge No. 030287)

This structure carries S.R. 951 over McIlvane Creek and consists of one simple span. The bridge has a total length of 40 ft and clear roadway width of 90 ft. The vertical clearance above the high-water level of McIlvane Bay is approximately 6.9 ft. The superstructure consists of prestressed-concrete AASHTO beams with a cast-in-place concrete deck. The substructure is founded on 24" prestressed-concrete piles. Bulkhead walls are located under the existing structure.



Figure 7: S.R. 951 over McIlvane Creek

S.R. 951 over McIlvane Bay (Bridge No. 030286)

This structure carries S.R. 951 over McIlvane Bay and consists of four simple spans. Each span is 50 ft in length and provides a total bridge length of 200 ft and 90 ft clear roadway width. The vertical clearance above the high-water level of McIlvane Bay is approximately 9.8 ft. The superstructure consists of prestressed-concrete AASHTO beams with a cast-in-place concrete deck. The substructure is founded on 24" prestressed-concrete piles. Bulkhead walls are located under the existing structure.



Figure 8: S.R. 951 over McIlvane Bay

Goodland Bridge (Bridge No. 030184)

This structure carries C.R. 92 over Goodland Bay and consists of 22 spans with varying lengths (varies from 70.0 ft to 116.17 ft). The total bridge length is approximately 1842 ft and 44 ft clear roadway width. The vertical clearance above the high-water level of Goodland Bay is approximately 55 ft at the centerline of the channel. The superstructure consists of prestressed-concrete AASHTO beams with a cast-in-place concrete deck. The substructure is founded on 18" and 24" prestressed-concrete piles.



Figure 9: Goodland Bridge

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

This structure carries C.R. 92 over Drainage Canal and consists of two simple spans. Each span is approximately 30 ft in length and provides a total bridge length of 60 ft and 40 ft clear roadway width. The vertical clearance above the high-water level of the drainage canal is approximately 3.45 ft. The superstructure consists of a cast-in-place concrete flat slab founded on 24" prestressed-concrete piles.

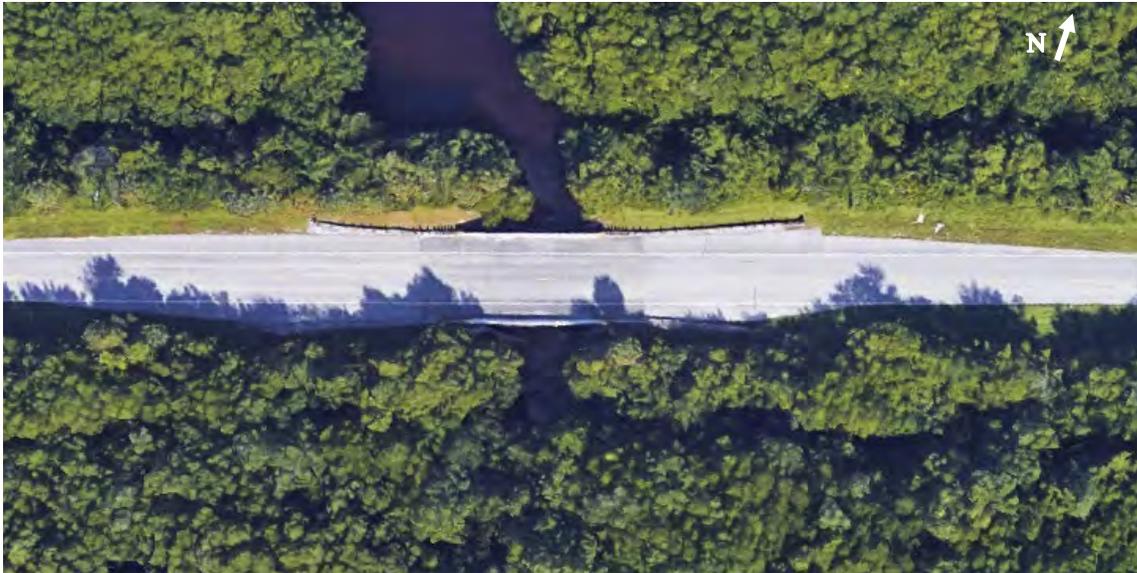


Figure 10: C.R. 92 over Drainage Canal

Bridge Conditions

Bridge inspection reports conducted in 2021 were obtained to evaluate the current bridge conditions. The following bridges were evaluated using a sufficiency rating which is indicative of bridge sufficiency to remain in service. The bridge rating results are presented in **Table 2**. All bridges except the Goodland Bridge have an Inventory Rating above 1.0 (36 tons).

Table 2: Bridge Rating Summary

BRIDGE NAME	BRIDGE NUMBER	SUFFICIENCY RATING	INVENTORY RATING (TONS)	INSPECTION DATE
NB S.R. 951 OVER HENDERSON CREEK	032088	98.0	40.6	04/06/2021
SB S.R. 951 OVER HENDERSON CREEK	032089	98.0	40.8	04/06/2021
S.R. 951 OVER McILVANE CREEK	032087	85.0	46.0	04/06/2021
S.R. 951 OVER McILVANE BAY	032086	85.0	51.5	04/06/2021
GOODLAND BRIDGE	031084	96.0	34.2	02/02/2021
C.R. 92 OVER DRAINAGE CANAL	034128	93.7	44.4	01/29/2021

CRASH STATISTICS AND SAFETY

Crash Summary for State Road 951

A five-year (2017-2022) Signal4 review of the crash data along S.R. 951 revealed 320 crashes, including seven serious injuries. The majority of the crashes were rear-end collisions (over 50%), followed by sideswipe, other, off road, and left turn crashes as identified in **Figure 11**.

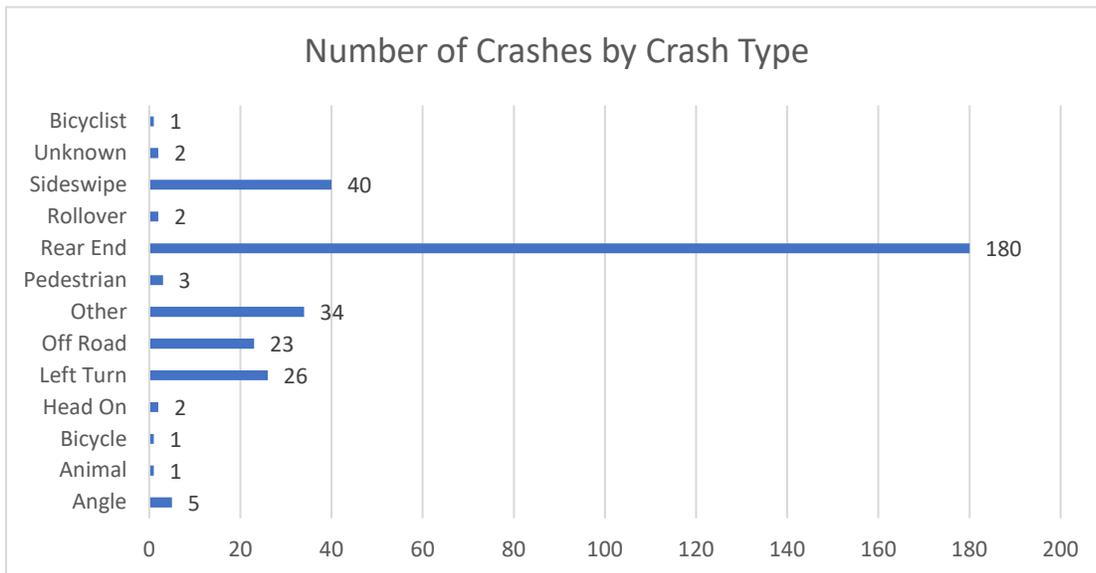
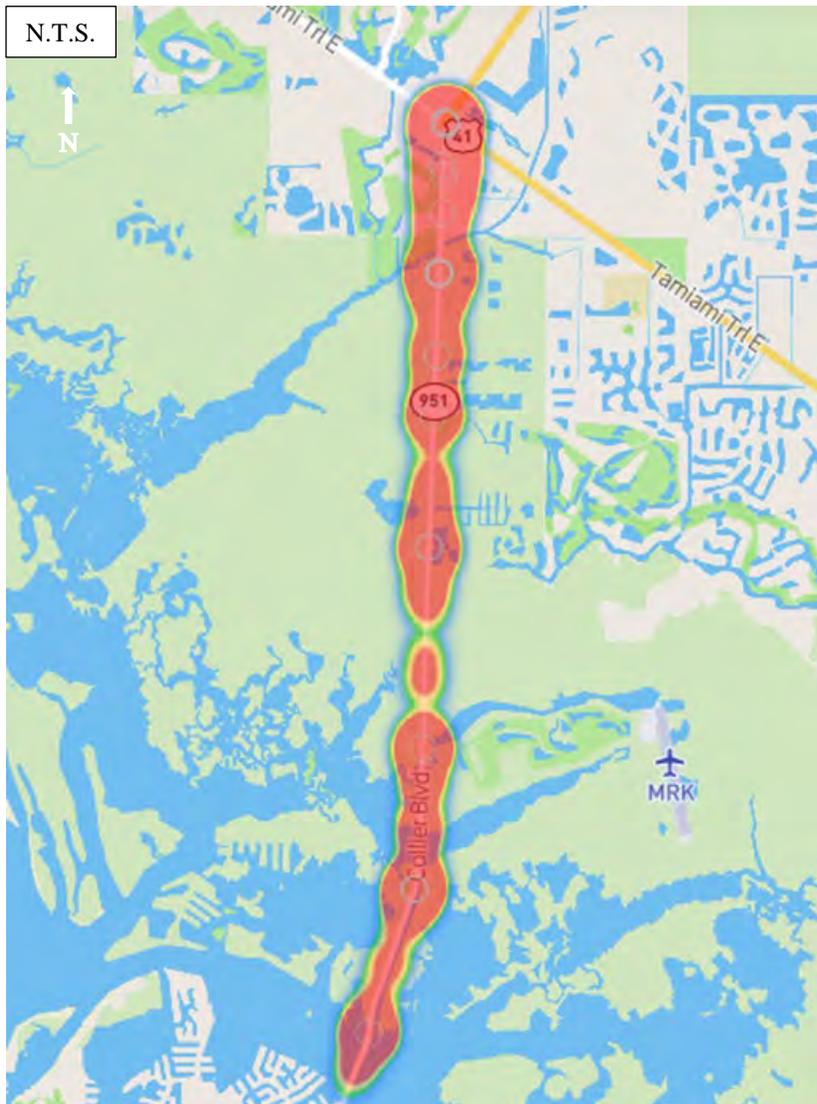


Figure 11: Number of Crashes by Crash Type for S.R. 951

Figure 12 shows a heat map of where crashes occurred along S.R. 951. The frequency of crashes seems evenly distributed along the corridor.

Figure 12: Heat Map of Crashes along S.R. 951



Of the 320 crashes, three involved bicyclist and four involved pedestrians, with no fatalities. Locations of these crashes are depicted in **Figure 13**.

Figure 13: Location of bicycle and pedestrian crashes



Crash Summary for County Road 92

A five-year (2017-2022) Signal4 review of the crash data along C.R. 92 revealed 11 crashes, including one fatality and one serious injury. No crashes were reported that involved pedestrians or bicyclists. **Figure 14** categorizes the crashes by crash type.

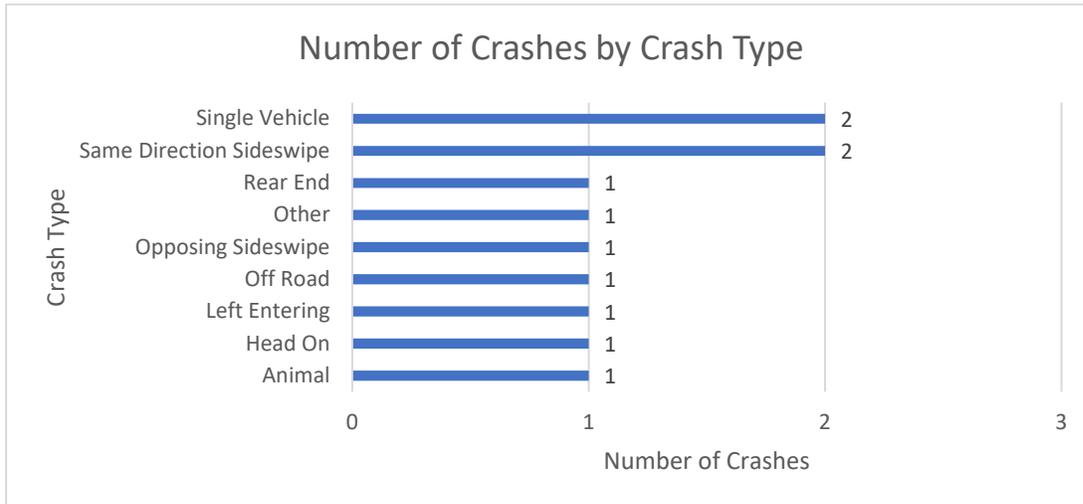


Figure 14: Number of Crashes by Crash Type for C.R. 92

LAND USE

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 as shown in **Figures 15 and 16. Tables 3 and 4** summarize the study areas in terms of both the current general zoning and future land use by corridor.

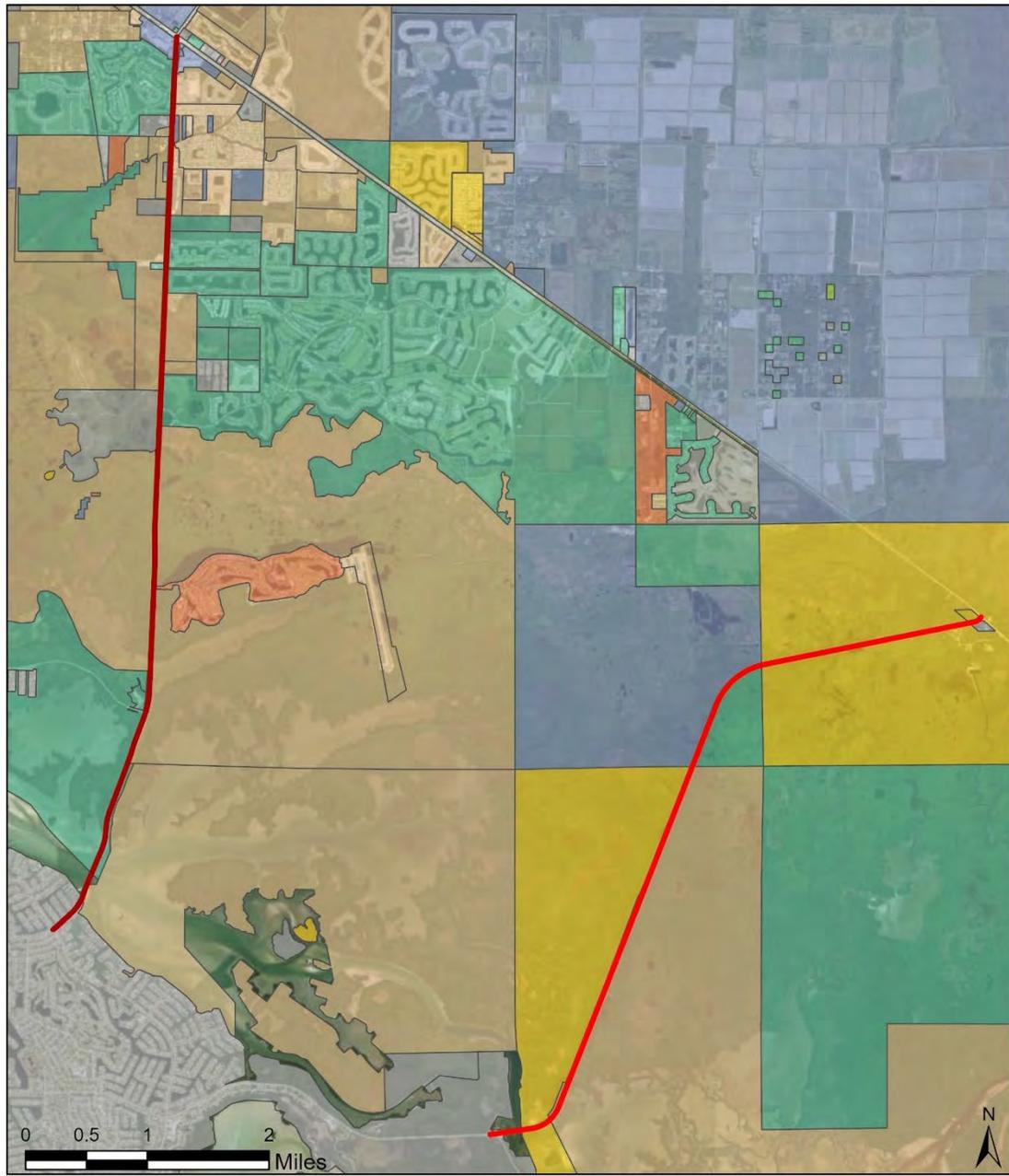
Table 3: General Zoning Summary

General Zoning		
Category	S.R. 951	C.R. 92
Residential	9.87%	3.07%
Agricultural	22.44%	8.83%
Commercial	2.98%	6.93%
Open Space	0.00%	50.11%
Planned Unit Development	53.05%	28.44%
Civic and Institutional	0.14%	0.00%
Undesignated (Water/Roadway)	11.52%	2.63%

Table 4: Future Land Use Summary

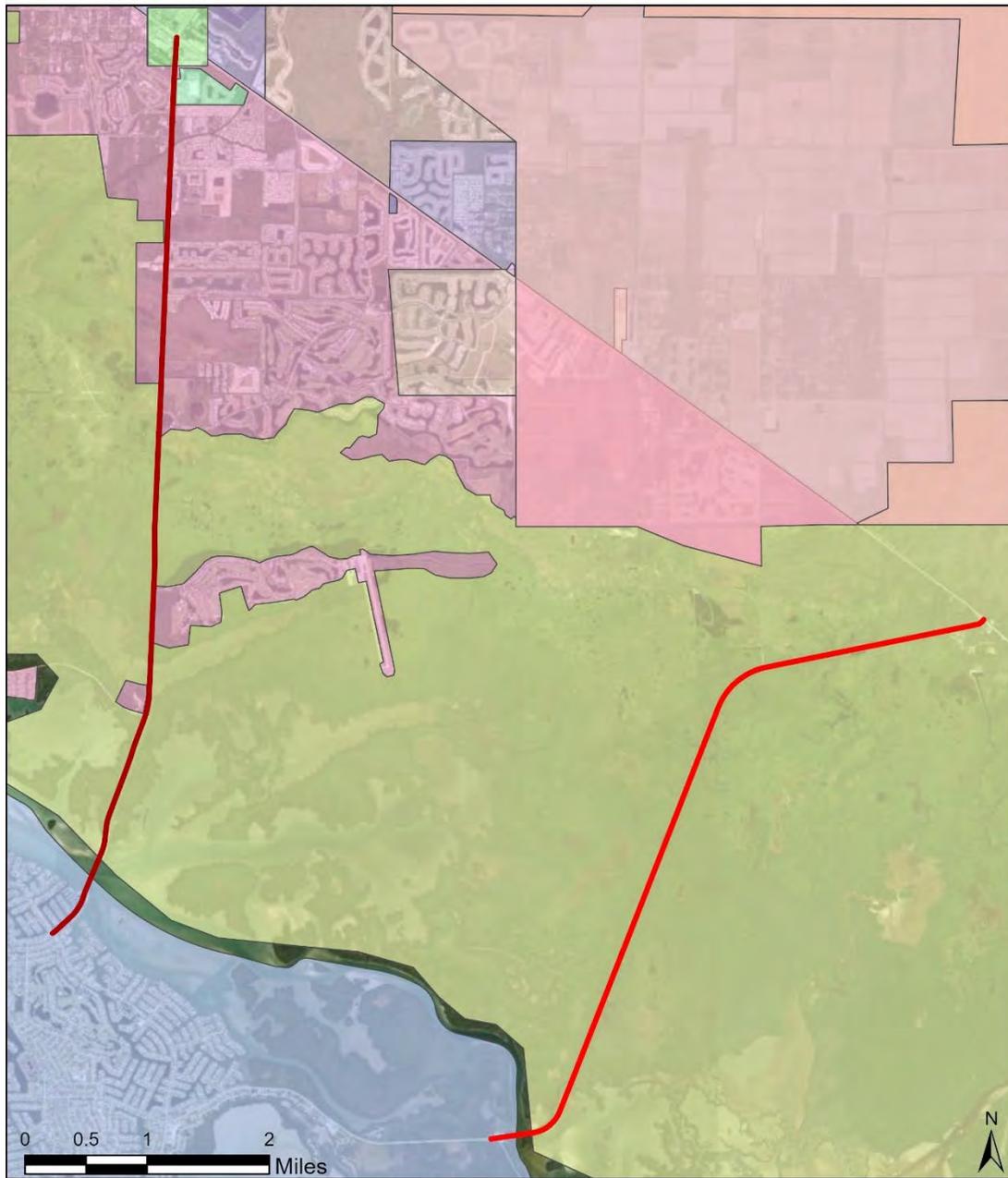
Future Land Use		
Category	S.R. 951	C.R. 92
Conservation Designation	45.58%	93.87%
Incorporated Area	8.43%	4.28%
Mixed Use Activity Center Subdistrict	4.02%	0.00%
Urban Coastal Fringe Subdistrict	38.40%	0.00%
Henderson Creek Mixed Use Subdistrict	1.40%	0.00%
Undesignated (Water/Roadway)	2.17%	1.86%

Figure 15: General Zoning Map



- | | | |
|-------------------------|-------------------|--------------------------|
| SR 951 | Commercial | Planned Unit Development |
| CR 92 | Incorporated Area | Residential |
| Agricultural | Industrial | |
| Civic and Institutional | Open Space | |

Figure 16: Future Land Use Map



- | | | |
|--|--|--------------------------------------|
| SR 951 | Estates Designation | RF-Sending |
| CR 92 | Greenway-Tamiami Trail East Commercial Subdistrict | Rural Industrial District |
| RF-Receiving | Henderson Creek Mixed Use Subdistrict | Urban Coastal Fringe Subdistrict |
| Agricultural / Rural Designation | Incorporated Area | Urban Residential Fringe Subdistrict |
| Conservation Designation | Mixed Use Activity Center Subdistrict | Urban Residential Subdistrict |
| East Tamiami Trail Commercial Infill Subdistrict | RF-Neutral | Vincian Mixed Use Subdistrict |

Roadway Context Classification

The context classification system broadly identifies the various built environments existing in Florida. Roadways will extend through a variety of context classifications ranging from C1-Natural to C3R-Suburban Residential to C6-Urban Core. S.R. 951 is classified as a C3R-Suburban Residential and C3C-Suburban Commercial. C.R. 92 would be considered as C1-Natural.

- C1-Natural: Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.
- C3R-Suburban Residential: Mostly residential uses within large blocks and a disconnected or sparse roadway network.
- C3C-Suburban Commercial: Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.

Property Ownership

The lands adjacent to S.R. 951 south of Fiddler's Creek Parkway is state-owned land (Trustees of the Internal Improvement Trust Fund (TIITF)) under the Rookery Bay National Estuarine Reserve. Up through Henderson Creek, Collier County owns some lands to the west as well. North of Henderson Creek, property ownership is mixed between residential and commercial uses. The lands adjacent to C.R. 92 is either state-owned land (TIITF) under the Rookery Bay National Estuarine Reserve or federal lands under the National Park Services.

Right of Way

Data from Collier County Property Appraiser's site indicates that the right of way width for S.R. 951 is approximately 200 feet and 140 feet for C.R. 92.

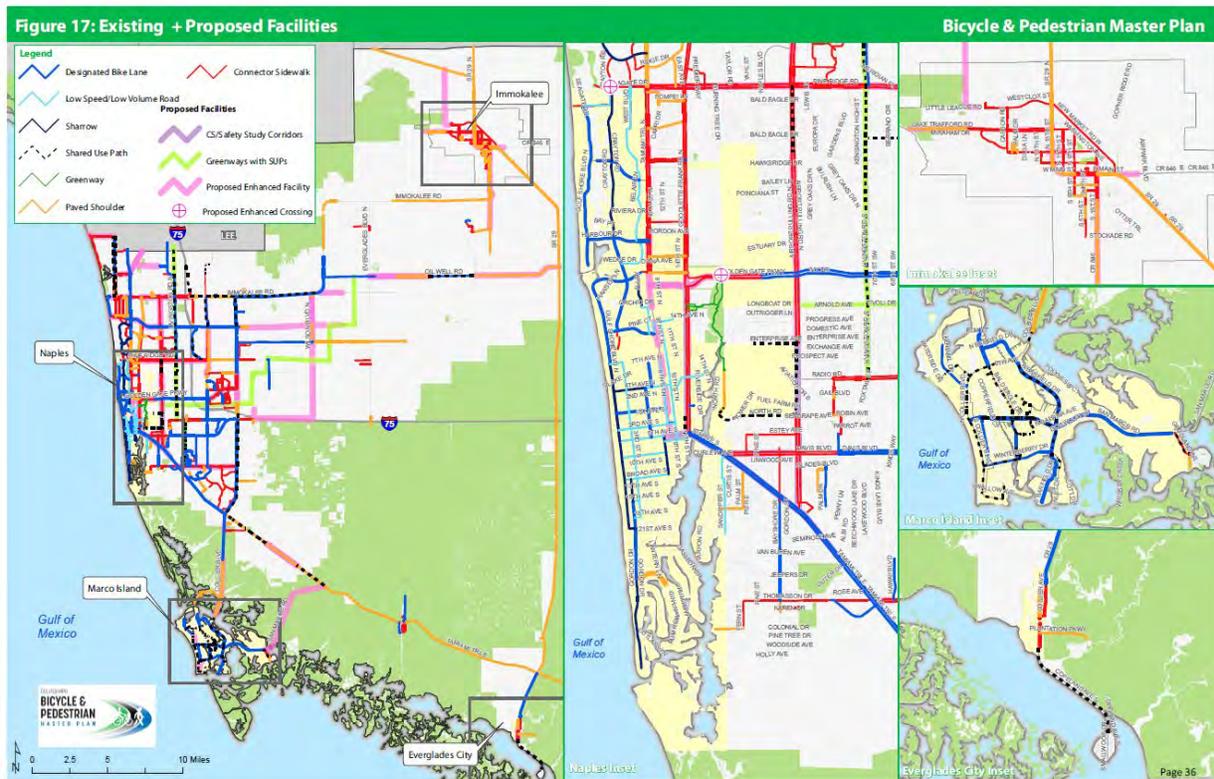
Community Plans

The study area will be influenced by a variety of planning documents that have goals and objectives that generally align with the intent of this study.

Collier MPO Bicycle & Pedestrian Master Plan

In 1994, the Collier MPO developed its first Comprehensive Pathways Plan, the precursor to what is now known as the Bicycle & Pedestrian Master Plan. The Plan was updated in 2006 and again updated in 2012 and 2019. The purpose of the 2019 Collier MPO Bicycle & Pedestrian Master Plan is “to build on prior efforts to develop a first-class bicycle and pedestrian network throughout Collier County. This Plan is not intended to duplicate or conflict with existing local plans and ongoing bicycle and pedestrian projects, but rather, to unify planning efforts and influence facility improvement priorities at the county level.” (See **Appendix A**) The Plan visually summarizes the MPO’s project priorities for major roadways in **Figure 17**.

Figure 17: Collier Metropolitan Planning Organization Project Priorities for Major Roadways



Marco Island Bike Path Master Plan

“The City of Marco Island has an approved bicycle and shared-use path master plan (map), which the City updates annually. The plan’s goal is to develop “bike lanes and way projects to allow both expert and novice riders to get around most parts of the city by bicycle.”” The current Bike Path Master Plan is provided in **Figure 18**.

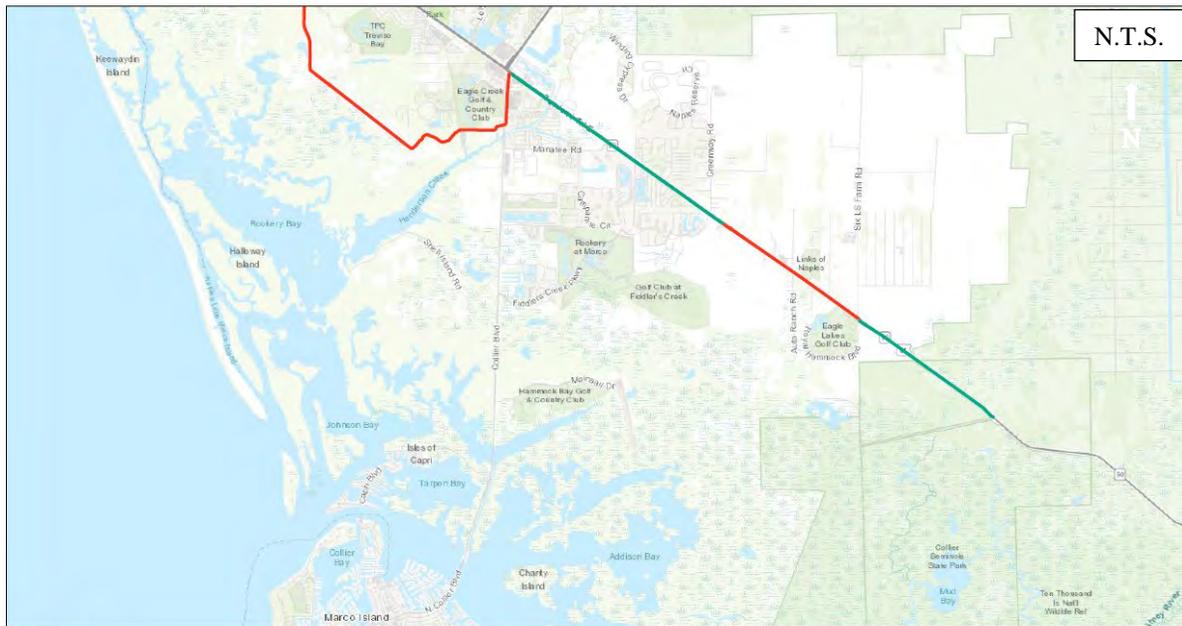
Figure 18: Marco Island Bike Path Master Plan (2022)



SUN Trail

“SUN Trail network is the statewide system of high-priority (strategic) paved trail corridors for bicyclists and pedestrians. Today, the SUN Trail network includes a combination of existing, planned, and conceptual multiple-use trails; it is a refined version of the Florida Greenways and Trails System (FGTS) Plan’s Land Trails Priority Network.” (FDOT Planning Office: www.fdot.gov/planning/systems/SUNTrail.shtm) **Figure 19** identifies the SUN Trail network alignments within the study area.

Figure 19: Identified SUN Trail Network Alignments



SOCIOCULTURAL

Demographics

A demographic analysis of the Census block groups surrounding the project's limits was conducted to understand the community characteristics of those communities most likely to use a proposed trail. The study area community includes 26 Census block groups with populations located within a half mile of the project limits (See **Table 5**):

Table 5: Study Area Census Block Groups:

STATE CODE	COUNTY CODE	CENSUS TRACT ID	CENSUS BLOCK GROUP
12	021	010802	1
12	021	010803	2
12	021	010803	3
12	021	010902	1
12	021	010902	2
12	021	010903	1
12	021	010903	2
12	021	010903	3
12	021	010904	1
12	021	010904	2
12	021	010905	1
12	021	010905	2
12	021	010905	3
12	021	010905	4
12	021	011001	1
12	021	011001	2
12	021	011002	1
12	021	011102	1
12	021	011102	3
12	021	011103	1
12	021	011103	2
12	021	011105	1
12	021	011105	2
12	021	011105	3
12	021	011106	1
12	021	011106	2

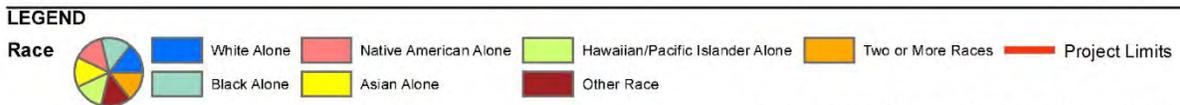
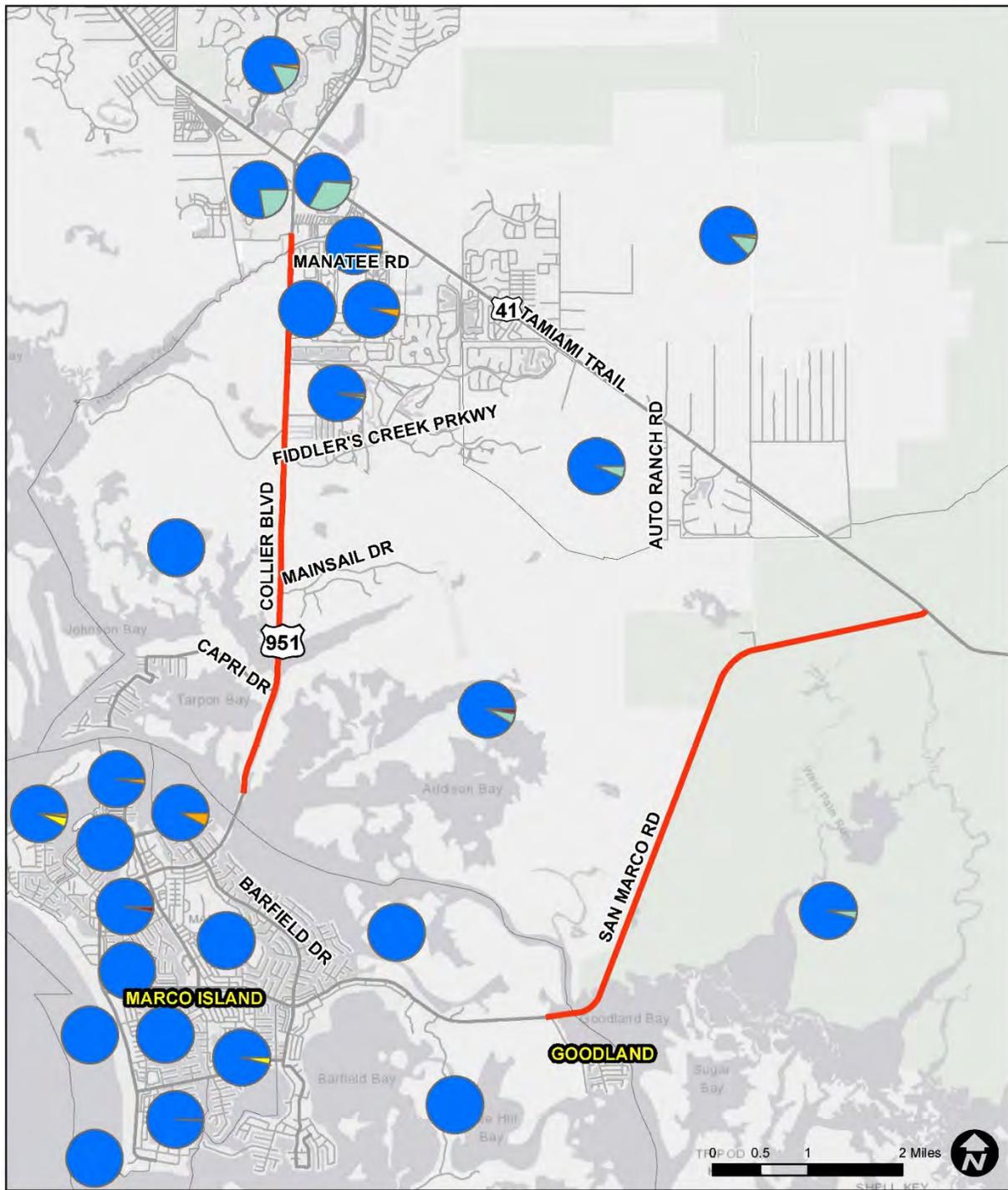
As shown in **Table 6**, approximately 45,290 people live in the study area community. This population has a median age of 64.3, which is older than Collier County's median age of 51.8 (**Figure 20**). The area is predominantly white alone (92%) followed by Black alone (7%) (**Figure 21**) Approximately 16% of the population in the study area community is Hispanic.

The median income in the study area community is \$69,770 a year, which is less than Collier County's \$76,025 median household income (**Figure 22**). The Census block groups with the lowest incomes in the study area community are in the Belle Meade area at the intersection of Collier Boulevard and Tamiami Trail. Approximately 38% of the study area community is employed (17,399 employed residents) (**Figure 23**). The study area community includes 393 zero vehicle households, or just under 2% of the total study area community households, which is lower than Collier County's 3% zero-vehicle households. The largest number is located east of U.S. 41 as shown in **Figure 24**, but the largest concentration of zero-vehicle households includes 31 households, or just over 7% of all households in the Census block group. This concentration of zero-vehicle households is located east of Collier Boulevard just south of Manatee Road.

Table 6: Summary Study Area Community Characteristics

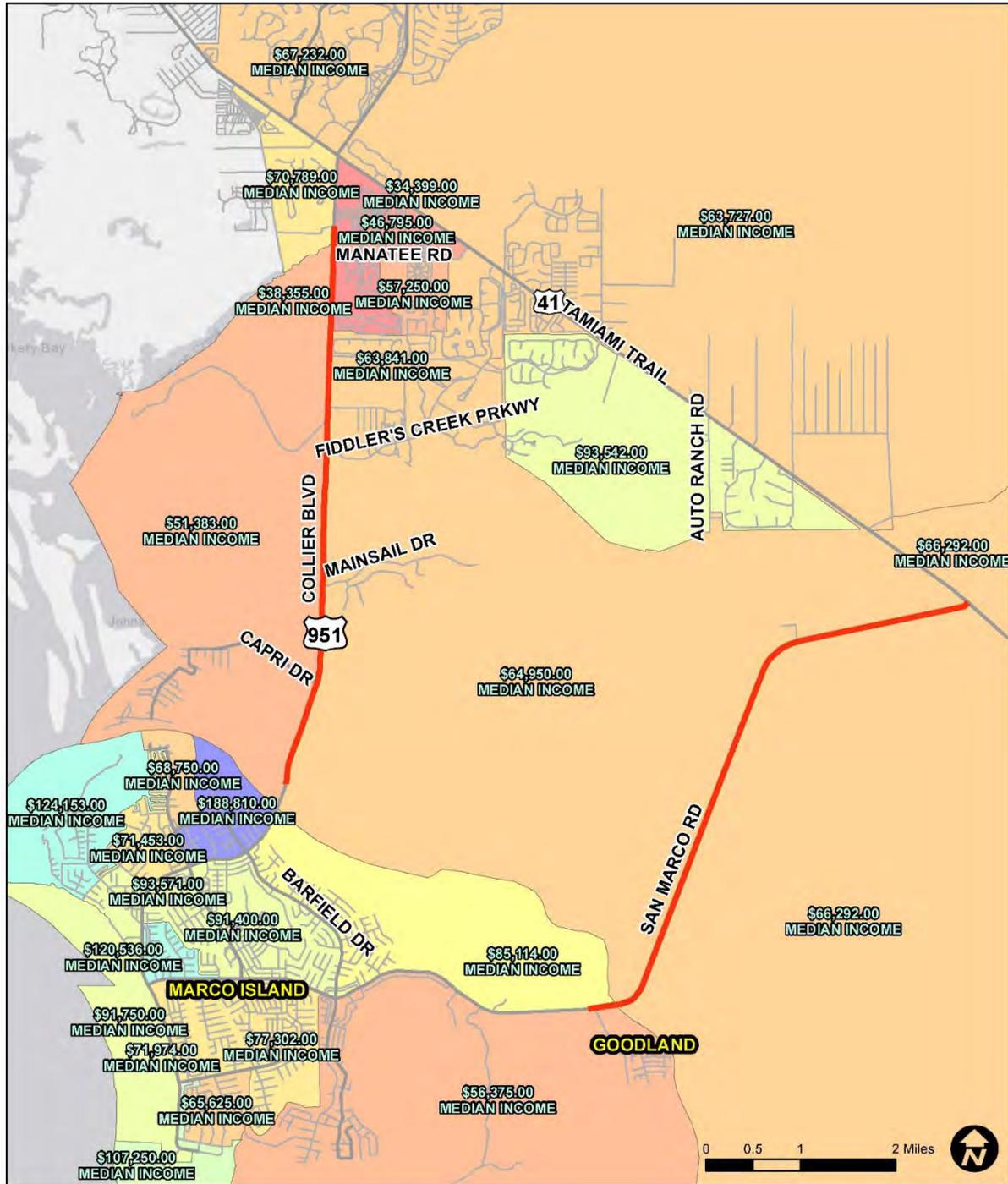
RACIAL & ETHNIC CHARACTERISTICS				GENERAL STATISTICS		
Study Area Community			Collier County	Study Area Community		Collier County
Asian & Pacific Islander	204	<1%	1%	Median Income	\$69,770	\$76,025
Black	2,961	7%	7%	Median Age	64.3	51.8
Hispanic*	7,085*	16%	28%	Zero-Vehicle Households	393 (2%)	255,507 (3%)
Native American	0	0%	0%	<i>Data based on the 2019 U.S. Census American Community Survey (ACS) Five-Year Estimates</i>		
Other Identity	656	<1%	2%			
White	41,469	92%	89%	<i>*Hispanic population data represents ethnicity, not race, as Hispanic people can be of any race.</i>		
Total	45,290	-	-			

Figure 21: Racial Composition



Source: American Community Survey 5-YR Estimates, 2019

Figure 22: Median Income



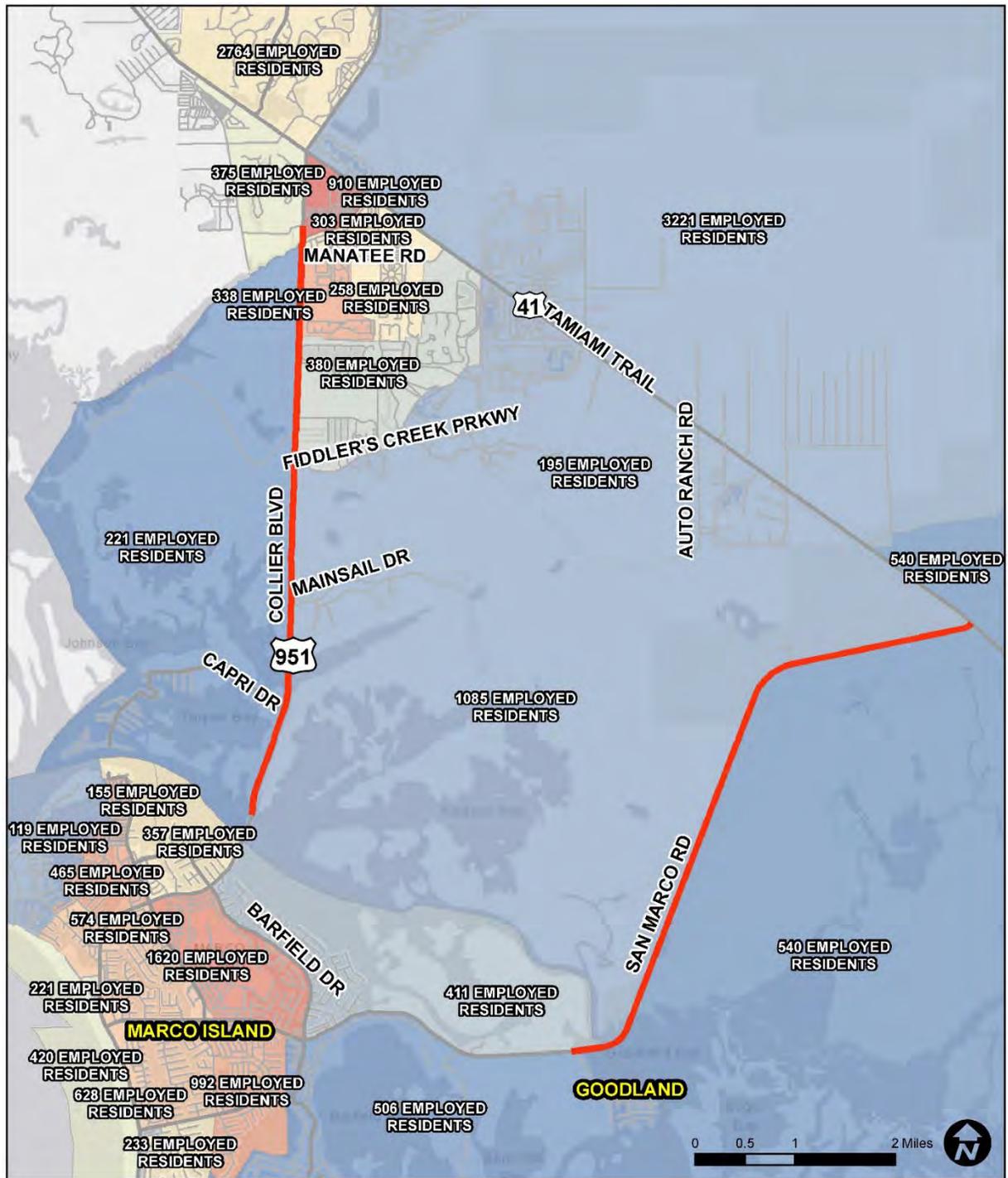
LEGEND

Median Household Income

\$34,399.00 - \$40,000.00	\$70,000.01 - \$80,000.00	\$110,000.01 - \$120,000.00	\$150,000.01 - \$160,000.00	Project Limits
\$40,000.01 - \$50,000.00	\$80,000.01 - \$90,000.00	\$120,000.01 - \$130,000.00	\$160,000.01 - \$170,000.00	
\$50,000.01 - \$60,000.00	\$90,000.01 - \$100,000.00	\$130,000.01 - \$140,000.00	\$170,000.01 - \$180,000.00	
\$60,000.01 - \$70,000.00	\$100,000.01 - \$110,000.00	\$140,000.01 - \$150,000.00	\$180,000.01 - \$190,000.00	

Source: American Community Survey 5-YR Estimates, 2019

Figure 23: Employment Density

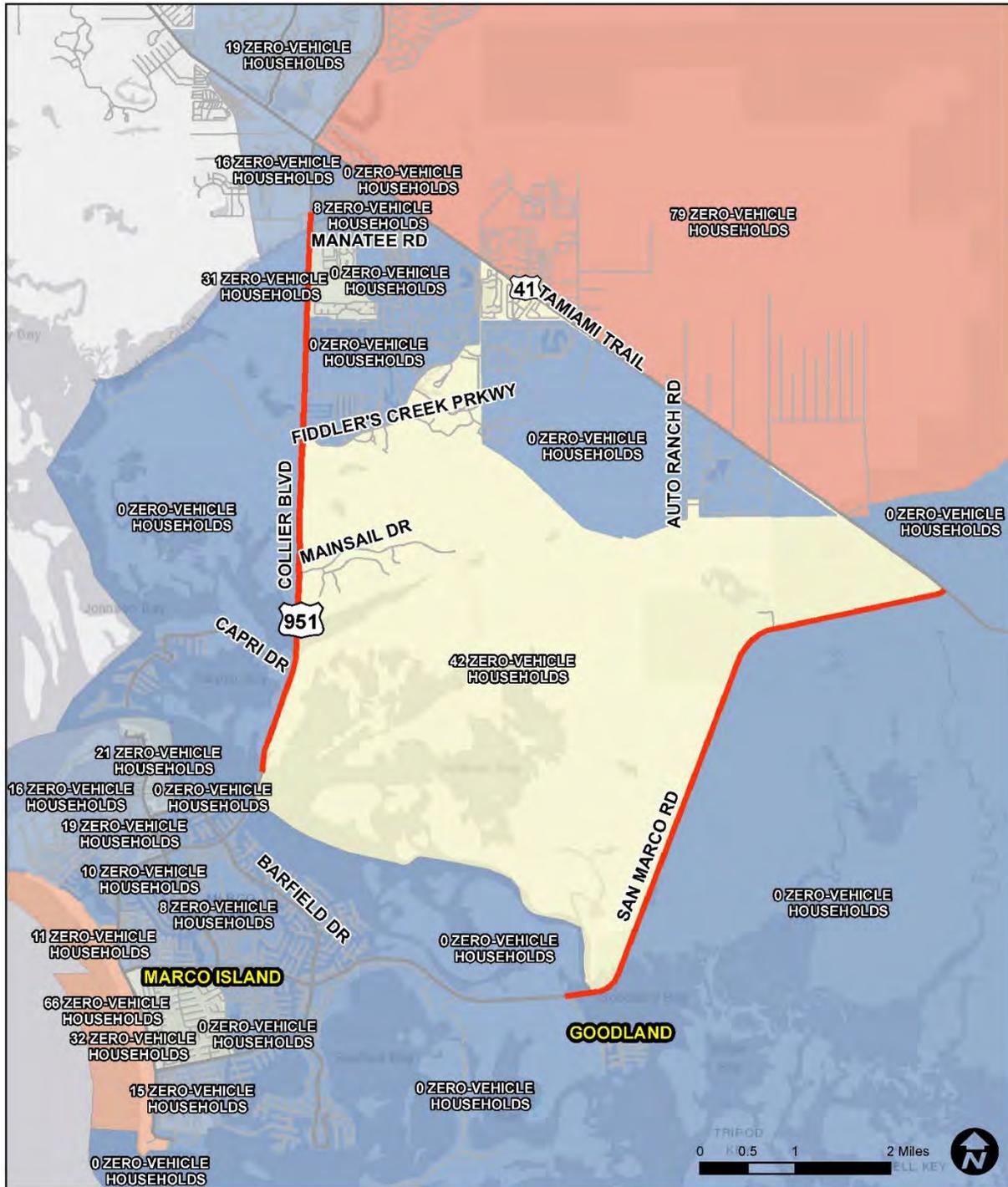


LEGEND

Employees per Acre	0.11 - 0.18	0.69 - 0.9	1.92 - 4.04
0 - 0.03	0.19 - 0.34	0.91 - 1.12	4.05 - 7.06
0.04 - 0.1	0.35 - 0.68	1.13 - 1.91	Project Limits

Source: American Community Survey 5-YR Estimates, 2019

Figure 24: Zero Vehicle Households



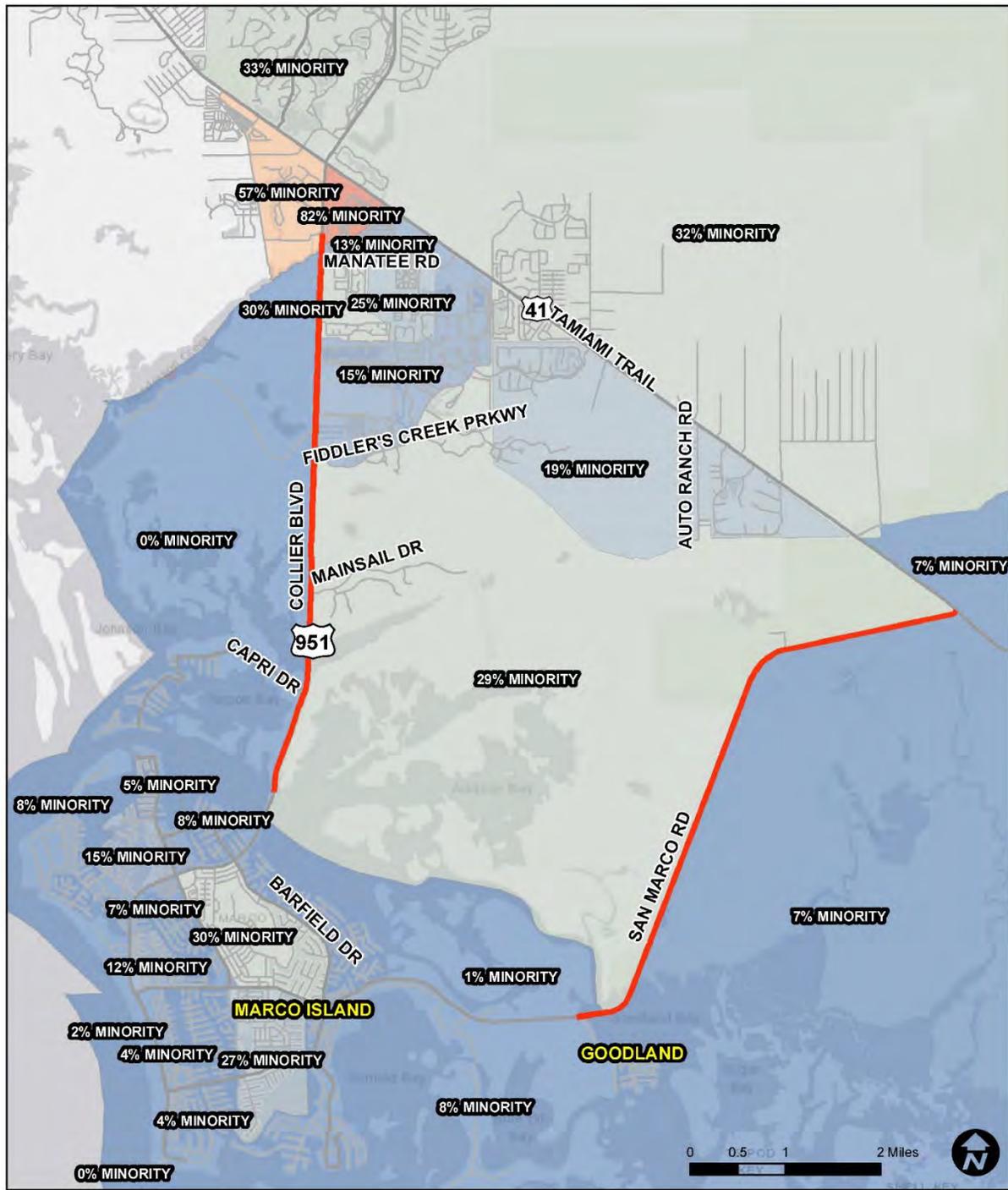
Source: American Community Survey 5-YR Estimates, 2019

Environmental Justice Considerations

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations, signed by the President on February 11, 1994, directs federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

A preliminary analysis of the study area community's demographics compared the minority and low-income populations to the demographics of Collier County. Collier County has a 37% minority population, and a 30% low-income population. As shown on **Figure 25** two Census block groups located at the intersection of Collier Boulevard and Tamiami Trail have minority populations (57% and 82%) much higher than the rest of Collier County's 37%. When comparing low-income populations, four Census block groups have low-income population concentrations much higher than the rest of Collier County's 30%. As shown in **Figure 26**, these Census blocks have low-income populations of 38%, 41%, 49%, and 57%, and are located at the intersection of Collier Boulevard and Tamiami Trail and at the intersection of Collier Boulevard and Manatee Road. Based on this demographic analysis, minority and low-income populations exist within the study area community, so disproportionately high and adverse effects to these populations should be minimized to the greatest extent practicable and permitted by law.

Figure 25: Minority Population

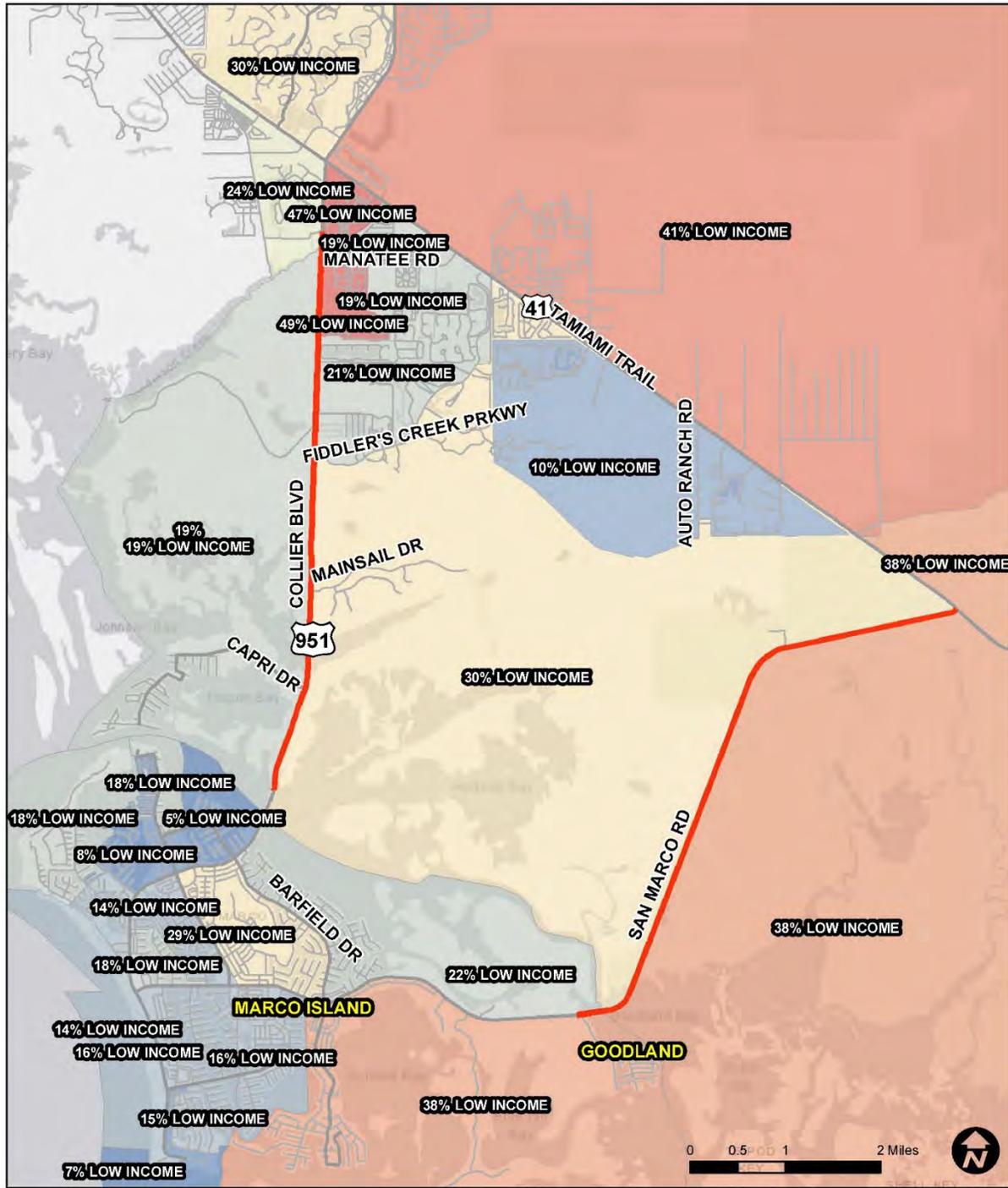


LEGEND
 Percent Minority Population

0% - 9%	19% - 28%	38% - 46%	56% - 65%	75% - 83%	Project Limits
10% - 18%	29% - 37%	47% - 55%	66% - 74%	84% - 92%	

Source: US Environmental Protection Agency EJSscreen, 2022

Figure 26: Low-Income Population



LEGEND
Percent Low Income Population

5% - 9%	14% - 18%	23% - 27%	32% - 35%	41% - 44%	Project Limits
10% - 13%	19% - 22%	28% - 31%	36% - 40%	45% - 49%	

Source: US Environmental Protection Agency EJScreen, 2022

ENVIRONMENT

Most land within the Study Area is sensitive environmental areas associated with several public lands with special designations. This section discusses the soils, species, wetlands, and surface waters within the Study Area. The following resources were consulted to obtain the best available data including the:

- Florida Department of Transportation (DOT) Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST),
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPac),
- National Oceanic and Atmospheric Administration (NOAA) National Endangered Species Act (ESA) Critical Habitat Mapper,
- NOAA Essential Fish Habitat Mapper,
- Florida Land Use, Cover and Forms Classification System (FLUCCS) Handbook (January 1999),
- Florida Natural Areas Inventory (FNAI) Biodiversity Matrix Mapper,
- Florida Fish and Wildlife Conservation Commission's (FFWCC) publication, Florida's Endangered and Threatened Species List (Updated June 2021), and
- Individual species profiles on the FFWCC Imperiled Species Website.

To assess the area in the FDOT EST, two Areas of Interest (AOI) were established by drawing a polyline from the centerline of S.R. 951 from the Judge Jolley Bridge to U.S. 41 and a second polyline along C.R. 92 from Goodland Road to U.S. 41. A 500-foot buffer from the centerline of each roadway was used to conduct the analysis.

Wetlands and Surface Waters

The National Wetlands Inventory classifies wetland boundaries and is maintained by the United States Fish and Wildlife Service (USFWS). Wetlands and surface waters constitute 90% of the Study Area. The majority are Estuarine wetlands (mangrove island and tidal flats) associated with Rookery Bay National Estuarine Research Reserve, Collier-Seminole State Park, Ten Thousand Islands National Wildlife Refuge, and Shell Island Preserve. The remaining wetlands account for Palustrine (freshwater, nontidal wetlands) and Riverine wetlands. Roadside ditches are also present in the urbanized

areas, some of which appear to directly connect to adjacent waterbodies. A more detailed review following the USFWS Classification Systems of Wetlands and Deepwater Habitats of the United States (Cowardin, et. Al 1979), the Florida Land Use, Cover and Form Classification System (FLUCCS), Chapter 62-340 Florida Administrative Code, the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (TR-10-20) will be needed to determine jurisdictional wetland boundaries. The wetlands identified in this report have not been formally approved by the SFWMD or the U. S. Army Corps of Engineers (USACOE).

Four open waterbodies are spanned by bridges within the Study Area. S.R.951 (N. Collier Parkway), spans East Marco Bay at the Judge S.S. Jolley Bridge. Near Marco Shores, the roadway spans an unnamed tributary of McIlvane Bay. Near U.S. 41, S.R. 951 spans Henderson Creek, which is tidally influenced and is a tributary to Rookery Bay. East of and parallel to S.R. 951 is Flotilla Passage. This passage connects East Marco Bay to the south and McIlvane Bay to the north. C.R. 92 is flanked by linear waterbodies that connect near Mud Bay at the northern end and Goodland Bay to the south. These canals are part of a Depression-era drainage and transportation system. A detailed categorization of the wetland and surface water land-use types found in the Study Area is presented in **Table 7**.

Table 7: Wetland Types with Florida Land Use, Cover and Forms Classification System (FLUCCS)

FLUCCS Code	Description	Percent of Study Area
S.R. 951 (Collier Boulevard)		
617	Mixed Wetland Hardwoods	2.0 %
641	Freshwater Marshes	0.09%
642	Saltwater Marshes	11.0 %
612	Mangrove Swamps	18.0%
625	Hydric Pine Flatwoods	3.0%
630	Wetland Forested Mixed	0.6%
619	Exotic Wetland Hardwoods	0.4%
617	Mixed Wetland Hardwoods	6.0%
C.R. 92 (San Marco Road)		
612	Mangrove Swamp	46.0%
651	Tidal Flats	1.0%
630	Wetland Forest Mixed	2.4%

Water Quality

A desktop review of the Florida Department of Environmental Protection's (FDEP) State's Verified List of Impaired Waters and the Clean Water Act (CWA) section 303 (d) List (June 2022) showed that there are seven impaired waterbodies within the Study Area. Best Management Practices (BMP) should be incorporated into the design and construction methods to reduce nutrient levels within the impaired waterbodies.

All waters of the state fall into one of five surface water classifications (62-305.400 F.A.C.) with specific criteria applicable to each class of water. In addition to water classification, water may be designated as an Outstanding Florida Water (OFW) per 62-302.700 F.A.C. An OFW is a water designated worthy of special protection because of its natural attributes. The Study Area includes three OFWs: Rookery Bay Aquatic Preserve, Rookery Bay National Estuarine Research Reserve, and Collier-Seminole State Park. The Rookery Bay National Estuarine Research Reserve and Rookery Bay Aquatic Preserve include open waters and mangrove swamp east and west of S.R. 951 and the same habitat types west and south of C.R. 92. Collier-Seminole State Park includes Mud Bay and associated mangrove swamps at the northeast portion of C.R. 92, near U.S. 41 (Tamiami Trail). The Cape Romano-Ten Thousand Islands Aquatic Preserve overlaps with the Collier-Seminole State Park but is not expected to be directly impacted. The design phase should include avoidance and minimization of impacts to the OFW's.

Floodplains

The Federal Emergency Management Agency (FEMA) developed a Flood Insurance Rate Map (FIRM) for the Study Areas. The relevant FIRM panel numbers for the S.R. 951 portion of the Study Area are dated May 16, 2012, and include panels 12021C0612H, 12021C0615H, 12021C0827H, and 12021C0829H. The relevant FIRM panel numbers for the C.R. 92 portion of the Study Area are dated May 16, 2012, and include panels 12021C0855H, 12021C0835H, and 12021C0842H. Due to the coastal location, nearly the entire Study Area is within the 100-year floodplain. Only small pockets of higher elevation are present. Flood zone designations for the Study Area are Zone AE and VE; areas identified as Zone "AE" are areas within the 100-year floodplain and Zone "VE" are coastal areas. Should the project require fill within the regulatory floodway, a

FEMA No-Rise Certification will be required to demonstrate no increase in the 100-year flood elevation because of the proposed fill. For these reasons, floodplain compensation will be required by the SFWMD.

Permitting Considerations

This Study Area is within the jurisdiction of the South Florida Water Management District (SFWMD). According to the South Florida Water Management District ePermitting Web App, several permits have been issued within the Study Area. Formal Wetland Determination applications have been requested for the waters at the Goodland Bridge (Permit # 11-03089-P) and S.S. Jolley Bridge (Permit #11-03073-P). Along S.R. 951, several permits are in the system for Formal Wetland Determination (Permit #11-100411-P) and Surface Water management (Permit #11-00528-S). No applications or permits are in the system along C.R. 92. If a trail project impacts a previously permitted stormwater management system, a separate modification of the associated permit would be required.

In general, trail projects are exempt from permitting pursuant to Rule 62.330.051 (10) of the Florida Administrative Code, as long as:

- They are not located in, on, or over wetlands or other surface waters,
- Have a width of eight feet or less for pedestrian paths and 14 feet or less for multi-use recreational paths, and
- Are not intended for use by motorized vehicles powered by internal combustion engines or electric-powered roadway vehicles, except when needed for maintenance or emergency purposes.

If a trail project would not qualify for an exemption due to wetland or other surface water impacts, an Individual Permit would be required. The Study Area includes wetlands and surface waters, 100-year floodplain, public lands, Critical Habitat, Essential Fish Habitat (EFH), and OFW's. Due to the prevalence of these resources, avoidance is likely not possible. As a result, permitting through the SFWMD for an Environmental Resource Permit is anticipated. The trail impervious area would still be exempt from the treatment and attenuation requirements; however, floodplain, conveyance, and wetland impacts would need to be addressed.

With OFW's present, special consideration will be needed during the design phase to compensate for any additional water draining into them, and any fill that could result

due to the design will need to consider floodplain compensation through the SFWMD permit application. Due to rule changes to 404 permitting, a preapplication meeting will be needed with the USACOE to determine if that agency has permitting authority or if it belongs to the Florida Department of Environmental Protection. Preapplication meetings will need to be coordinated with the agencies to assure appropriate information is provided in a timely manner.

There are two mitigation banks that provide credits within this area: Little Pine Island Mitigation Bank and Corkscrew Regional Mitigation Bank. Little Pine Island Mitigation Bank is the only one of the two that provides Forested Freshwater, Forested Saltwater, Herbaceous Freshwater/Brackish, and Herbaceous Saltwater, and is within close proximity to the Study Area. Since the Study Areas contains over 75% estuarine wetlands, the Little Pine Island Mitigation Bank would be the ideal selection.

Public lands near the Study Area could provide an additional opportunity for mitigation of unavoidable impacts. The first opportunity would be to develop a partnership with Collier County Parks and Recreation's to enhance Shell Island Preserve. This preserve has no public access and is considered a resource for protection. A second option would be to provide restoration efforts for Rookery Bay National Estuarine Research Reserve. Working with the local public land managers and owners would be ideal as the mitigation would stay within the same basin.

Section 4(f)

Section 4(f) refers to the U.S. Department of Transportation Act of 1966 which provided for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites during transportation project development. Public lands are a major land use in the Study Area. Parks, preserves and reserves make up approximately 85% of lands within the S.R. 951 corridor and 69% of the C.R. 92 corridor. **Tables 8 and 9** list the public lands and management information associated with these 4(f) resources.

Table 8: Public Lands adjacent to S.R. 951

Resource Name	Management Entity
Rookery Bay National Estuarine Research Reserve	Managed by FDEP and NOAA and includes two aquatic preserves: Rookery Bay Aquatic Preserve and Cape Romano-Ten Thousand Islands Aquatic Preserve.

Shell Island Preserve	Managed by Collier County and there is no public access at this preserve. This preserve is considered a resource protection/restoration preserve. This property should be investigated for a potential to conduct mitigation work that may be needed due to impacts for the construction of the trail.
Collier Boulevard Boating Park (S.R. 951 Boat Ramp)	This boat ramp is managed by Collier County Parks and Recreation and is a popular public water access boat ramp.
Isle of Capris Paddlecraft Park	This park is the only public access facility in Collier County designed exclusively for launching paddle crafts, non-motorized vessels such as canoes, kayaks, and paddleboards. It is managed by Collier County Parks & Recreation. This site could be an opportunity for educational kiosks for the trail users.

Table 9: Public Lands adjacent to C.R. 92

Resource Name	Management Entity
Rookery Bay National Estuarine Research Reserve	Managed by FDEP and NOAA. This includes two aquatic preserves: Rookery Bay Aquatic Preserve and Cape Romano-Ten Thousand Islands Aquatic Preserve.
Collier-Seminole State Park	The C.R. 92 intersects this park as the road curves toward and merges to U.S. 41. The Park is on both sides of the C.R. 92. It is managed by FDEP and could be a potential for a mitigation partnership due to impacts of construction of the trail.
Ten Thousand Islands National Wildlife Refuge	U.S. Fish and Wildlife Service lands and waters are managed for recreational activities.

Soils

A review of the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) Web Soil Survey descriptions identified 18 soil types within the Study Area, along with waters of the Gulf of Mexico and other waters attributed to bays and alcoves. Per the Florida Association of Environmental Soil Scientists 2007 Hydric Soils Handbook and the USDA NRCS soil survey, ten of the 18 soils types are hydric and could support anaerobic wetland conditions. Approximately 67% of the S.R. 951 corridor and approximately 75% of the C.R. 92 corridor consists of hydric soils. The soil characteristics are consistent with the location and habitat types found in the study area. Although a particular soil may be mapped as hydric, soil

disturbances such as fill can disrupt historic conditions. Both roadways appear to have been constructed by utilizing fill that was placed over historic mangrove swamp. The nature of the fill is not known. **Tables 10 and 11** summarize the soils and percentage of soil types for each corridor in the Study Area.

Table 10: Soil Types Found in S.R. 951 Corridor

Soil Number	Soil Name	Hydric	Percent
16	Oldsmar fine sand, 0 to 2 percent slopes	No	4%
32	Urban land, 0 to 2 percent slopes	N/A	1%
35	St. Augustine, organic substratum-Urban land complex, 0 to 2 percent slopes	No	6%
40	Durbin and Wulfert mucks, tidal complex, 0 to 1 percent slopes	Yes	42%
53	Estero and Peckish mucks, tidal, 0 to 1 percent slopes	Yes	9%
99	Water	N/A	0.4%
100	Waters of the Gulf of Mexico	N/A	11%
107	Durbin-Wulfert mucks, tidal-Urban land complex, 0 to 1 percent slopes	Yes	2%
108	Estero and Peckish mucks, tidal-Urban land complex, 0 to 1 percent slopes	Yes	2%
110	Brynwood fine sand-Urban land complex, 0 to 2 percent slopes	No	0.7%
113	Holopaw fine sand-Urban land complex, 0 to 2 percent slopes	Yes	5%
115	Holopaw-Basinger-Urban land complex, 0 to 2 percent slopes	Yes	1%
125	Oldsmar fine sand-Urban land complex, 0 to 2 percent slopes	No	10%
128	Pineda fine sand, limestone substratum-Urban land complex, 0 to 2 percent slopes	Yes	5%
132	Riviera, limestone substratum-Copeland fine sand-Urban land association, 0 to 2 percent slopes	Yes	1%

Table 11: Soil Types Found in C.R. 92 Corridor

Soil Number	Soil Name	Hydric	Percent
2	Holopaw fine sand, limestone substratum, 0 to 2 percent slopes	Yes	0.01%
7	Immokalee fine sand, 0 to 2 percent slopes	No	1%
20	Ft. Drum-Malabar, high association, 0 to 2 percent slopes	No	10%
30	St. Augustine, organic substratum-Urban land complex, 0 to 2 percent slopes	No	5%
40	Durbin and Wulfert mucks, tidal complex, 0 to 1 percent slopes	Yes	76%

100	Waters of the Gulf of Mexico	N/A	7%
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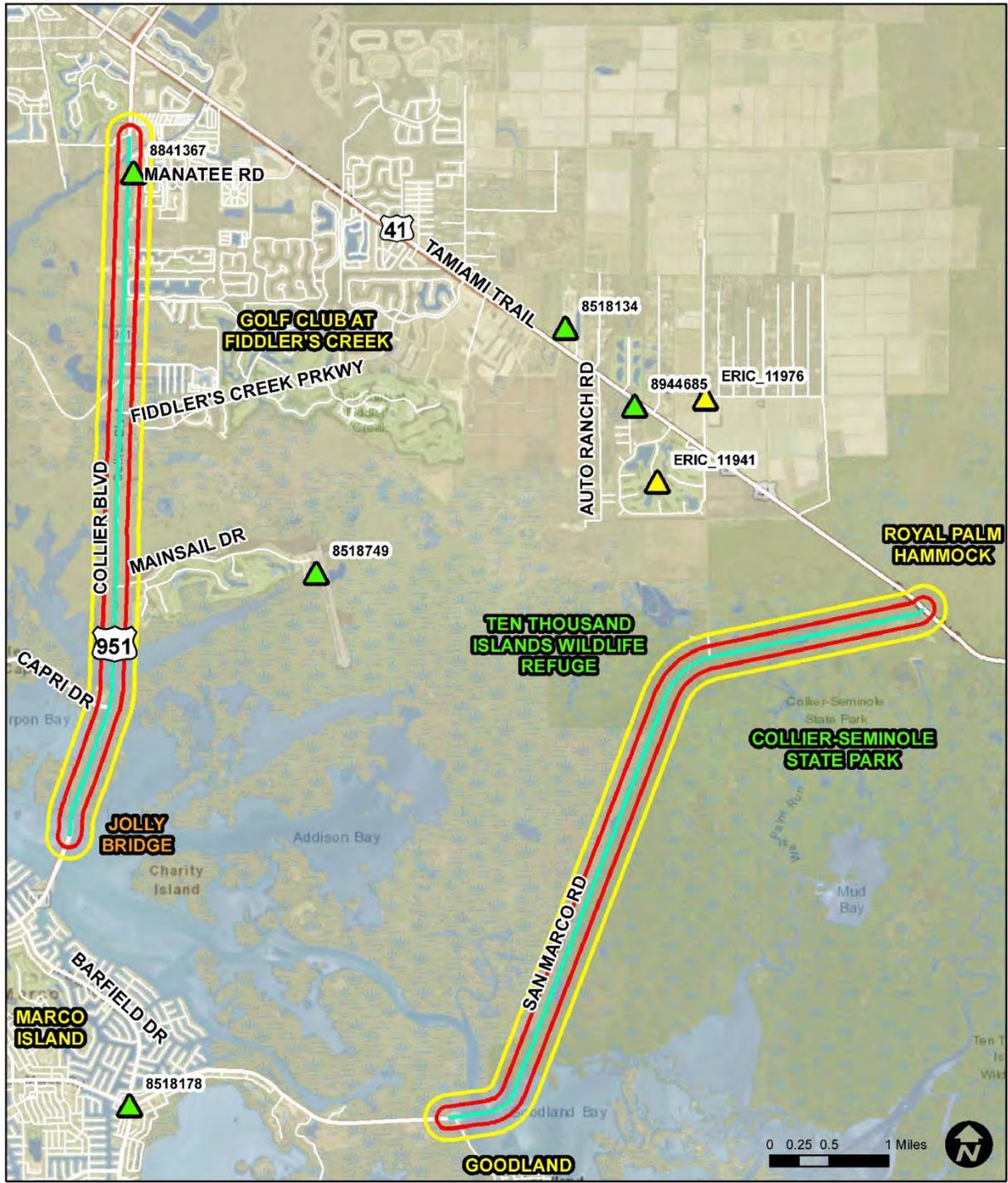
Potential Contamination Sites

Sites with potential contamination locations are shown in **Figure 27**. Twelve (12) potential contamination sites listed in **Table 12** were identified in the study area using the FDEP's Contamination Site Locator database. Only one (1) of the identified sites, is within the project limits. Racetrac #2358 is a gas station on the corner of Collier Boulevard and Manatee Road at 6170 Collier Boulevard. The site is currently shown as a pending petroleum cleanup site. Further review of this potential contamination site may be appropriate during future project phases.

Table 12: Potential Contamination Sites

FACILITY ID	FACILITY	ADDRESS	TYPE
8518134	Cemex-East Trail Ready Mix	15555 E Tamiami Trail, Naples, FL 34114	Petroleum
8518178	Kwik Stop	110 Barfield Drive S, Marco Island, FL 33937	Petroleum
8518273	Dash In Dash Out	1095 N Collier Boulevard, Marco Island, FL 34145	Petroleum
8518316	Uooligan Gas Station Inc.	861 Bald Eagle Drive, Marco Island, FL 34145	Petroleum
8518749	Collier County-Marco Island Exec. Airport	2003 Mainsail Drive, Naples, FL 34114	Petroleum
8731681	Rose Marina	951 Bald Eagle Drive, Marco, FL 34145	Petroleum
8841367	Racetrac #2358	6170 Collier Boulevard, Naples, FL 34114	Petroleum
8944685	Sunshine #184	17100 E Tamiami Trail, Naples, FL 34114	Petroleum
8945066	Pelican Pier Marina	1085 Bald Eagle Drive, Marco Island, FL 34145	Petroleum
ERIC_11941	Eagle Lakes Golf Club	18100 Royal Tree Parkway, Naples, FL 34114	Other Cleanup
ERIC_11976	Veins Diesel @ Sunny Grove	Six L's Farm Road & Sunny Grove Road, Naples, FL	Other Cleanup
ERIC_4287	Marco Island Cleaners	695 Bald Eagle Drive, Marco Island, FL 34145	Other Cleanup

Figure 27: Potential Contamination



LEGEND

FDEP-Identified Potential Contamination Sites

- ▲ Petroleum
- ▲ Other Cleanup
- 500 ft. Project Limits Buffer
- 1,000 ft. Project Limits Buffer
- Project Limits

Source: Florida Department of Environmental Protection Contamination Database, 2022

Protected Species

A desktop environmental analysis and general field review were conducted for the Study Area to determine the presence of federal and/or state-protected species and their suitable habitat following 50 Code of Federal Regulations (CFR) Part 402 of the Endangered Species Act of 1973, as amended, Chapters 5B-40: Preservation of Native Flora of Florida and 68A-27 Florida Administrative Code Rules Relating to Endangered or Threatened Species and Part 2, Chapter 16 – Protected Species and Habitat of the FDOT PD&E Manual. Literature reviews and agency database searches were conducted to document state and federally protected species presence, their habitat, and critical habitat occurring or potentially occurring within the Study Area.

Seventeen federally protected species, eleven state protected species and five protected, non-listed species were determined to be present or have a likelihood for utilization of habitats within or adjacent to the Study Area. **Table 13** lists protected species with the potential to occur and their likelihood to occur within the Study Area. Ranking of potentially occurring protected species was developed and each species was assigned a low, moderate, or high likelihood for occurrence within the Study Area.

Low – Species with a low likelihood of occurrence are defined as those that are known to occur in Collier County, but the preferred habitat is limited within the Study Area, or the species is rare, or no longer existent.

Moderate – Species with a moderate likelihood for occurrence are those species known to occur in Collier County, and for which suitable habitat is located within the Study Area, but no observations or positive indications exist to verify the species presence.

High – Species with a high likelihood for occurrence are suspected within the Study Area based on known ranges and existence of sufficient preferred habitat; are known to occur beyond the Study Area or have been previously observed or documented in the project vicinity.

A field review was conducted on June 30, 2022. No listed protected species were observed at that time. The species observed were: White Ibis (*Eudocimus albus*), Great egret (*Ardea alba*), European starling (*Sturnus vulgaris*), Curly-tailed lizard (*Leiocephalus eremitus*), Cuban anole (*Anolis sagrei*), Snowy egret (*Egretta thula*), and Eastern phoebe

(*Sayornis phoebe*). Species identified during this field review demonstrates utilization by wildlife within the Study Areas, with activity also observed in developed sections.

Table 13: Protected Species with Potential to Occur within the Study Area

Common Name	Scientific Name	Status ¹	Habitat Preference	Likelihood	Reasoning
Mammals					
West Indian Manatee	<i>Trichechus manatus</i>	FT	Coastal waters, rivers, and springs	High	Consultation Area, Critical Habitat, and suitable habitat
Florida Panther	<i>Puma concolor coryi</i>	FE	All habitat types but rely on forested areas with dense understory vegetation	High	Panther Focus Area and documented in Study Area
Florida Black Bear	<i>Ursus americanus floridanus</i>	NL	Mixed hardwood pine, cabbage palm hammock, upland oak scrub, and forested wetlands.	High	Within range and documented nearby
Florida Bonneted Bat	<i>Eumops floridanus</i>	FE	Semi-tropical forests with tropical hardwood, pineland and mangrove habitats and man-made areas like golf courses and neighborhoods	Moderate	Consultation Area and suitable habitat
Big Cypress Fox Squirrel	<i>Sciurus niger avicennia</i>	ST	Stands of cypress, slash pine savanna, mangrove swamps, tropical hardwood forests, live oak woods, coastal broadleaf evergreen hammocks, and suburban habitats	Moderate	Within range and suitable habitat
Birds					
American Oystercatcher	<i>Haematopus palliatus</i>	ST	Beaches, sand bars, spoil islands, shell rakes, salt marsh, and oyster reefs	Moderate	Within range and suitable habitat
Florida Burrowing Owl	<i>Athene cunicularia</i>	ST	Open habitat with little understory: prairies, golf courses, airports, pastures, agricultural fields, and vacant lots	Moderate	Within range and suitable habitat
Black Skimmer	<i>Rynchops niger</i>	ST	Coastal estuaries, beaches, and sandbars	Moderate	Within range and suitable habitat
Everglade Snail Kite	<i>Rosrhamus sociabilis plumbeus</i>	FE	Shallow freshwater marshes and shallow grassy shorelines of lakes	Low	Within range, near Consultation Area, but Little suitable habitat

Roseate Spoonbill	<i>Platalea ajaja</i>	ST	Coastal areas, mangrove, and spoil islands	Moderate	Documented nearby, suitable habitat, but range limited
Tricolored heron	<i>Egretta tricolor</i>	ST	Fresh and saltwater marshes, estuaries, mangrove swamps, lagoons, and river deltas	High	Within range, documented nearby and suitable habitat
Reddish Egret	<i>Egretta rufescens</i>	ST	Coastal areas, estuaries near mangroves and lagoons and spoil islands	High	Within range, documented nearby and suitable habitat
Little Blue Heron	<i>Egretta cearulea</i>	ST	Fresh, salt, and brackish water environments	High	Within range, documented nearby and suitable habitat
Least Tern	<i>Sternula antillarum</i>	ST	Estuaries and bays	Moderate	Within range and suitable habitat
Piping Plover	<i>Charadrius melodus</i>	FT	Sandy beaches, sand flats, and mud flats along coastal areas	High	Consultation Area and suitable habitat
Audubon's Crested Caracara	<i>Plyborus plancus audobonii</i>	FT	Open grasslands with a low density of herbaceous ground cover and sparse cabbage palms	Moderate	Consultation Area, documented in area, but little suitable habitat
Florida Scrub Jay	<i>Aphelocoma coerulescens</i>	FT	Restricted to Florida scrub dominated by scrub oaks rarely exceeding 7 feet and saw palmetto	Moderate	Consultation Area, documented nearby, but little suitable habitat
Wood Stork	<i>Mycteria americana</i>	FT	Marshes, floodplain lakes, swamps	High	Within range, documented nearby, and suitable Habitat
Red Knot	<i>Calidris canutus rufa</i>	FT	Shorelines including sandy beaches, estuaries, and inlets	High	Within Range, suitable habitat, and documented nearby
Red-cockaded Woodpecker	<i>Picoides borealis</i>	FT	Inhabit 90–100-year-old slash, long leaf, and loblolly pines	Moderate	Consultation Area, documented nearby, but little suitable habitat
Bald Eagle*	<i>Haliaeetus leucocephalus</i>	NL	Commonly coastal areas, bays, rivers, lakes, and other food sources. Forages near water. Nests in tall trees	Moderate	Documented nests within ½ mile
Eastern Black Rail	<i>Laterallus jamaicensis</i>	FT	Densely vegetated marshes, grassy marshes, and tidal areas	Moderate	Within range and suitable habitat, but no documented populations nearby
Osprey**	<i>Pandion haliaetus</i>	NL	Coasts, lakes, rivers, and swamps	High	Within range and suitable habitat

Reptiles					
American Crocodile	<i>Crocodylus acutus</i>	FT	Brackish and saltwater areas, ponds, coves, and creeks in mangrove swamps	High	Consultation Area and suitable habitat available
American Alligator	<i>Alligator mississippiensis</i>	SAT	Freshwater lakes and slow-moving rivers and their associated wetlands. Brackish water habitats. Rarely in saltwater	High	Within range and suitable habitat
Eastern Indigo Snake	<i>Drymarchon couperi</i>	FT	Range of habitats from scrub and sandhill to mesic flatwoods	Moderate	Consultation Area, documented in area, but little suitable habitat
Loggerhead Sea Turtle	<i>Caretta</i>	FT	Subtropical and temperate oceans	Low	Critical Habitat outside Study Area, no documented nesting
Hawksbill Sea Turtle	<i>Eretmochelys imbricate</i>	FE	Subtropical and temperate oceans, reefs in the Florida Keys and Atlantic Coast	Low	Nearest nesting beaches are in Tampa Bay and Florida Keys
Gopher Tortoise	<i>Gopherus poluphemus</i>	ST	Well-drained Sandy Soils of longleaf pine sandhills, xeric oak hammocks, scrub, pine flatwoods, dry prairies, and coastal dunes	Low	Within range, documented on Shell Island, but little suitable habitat
Green Sea Turtle	<i>Chelonia mydas</i>	FT	Open water, shallow flats and seagrass meadows and rock ledges, oyster bars and coral reefs	Low	Critical Habitat outside Study Area, no documented nesting
Fish					
Gulf Sturgeon	<i>Acipenser oxyrinchus desotoi</i>	FT	Brackish/salt water during fall and freshwater rivers in spring/ summer	High	Critical Habitat
Smalltooth Sawfish	<i>Pristis pectinata</i>	FE	Estuaries, river mouths and bays, especially red mangrove shorelines	High	Critical Habitat
Insects					
Bartram's hairstreak Butterfly	<i>Stymon acis bartrami</i>	FE	Prefers pine rockland	Low	Range limited, little suitable habitat

Florida Leafwing Butterfly	<i>Anaea troglodyte floridae</i>	FE	Prefers pine rockland	Low	Range limited, little suitable habitat
Miami Blue Butterfly	<i>Cyckargys thomasi bethunebakeri</i>	FE	Tropical hardwood hammocks, tropical pine Rocklands and beachside scrub.	Low	Exceedingly rare, current known populations only in Florida Keys

FE-Federally Endangered, FT- Federally Threatened, SE – State Endangered, ST – State Threatened, NL – Not Listed, & SAT – State Threatened Due to Similarity of Appearance

*Bald eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, along with the state bald eagle rule 68A-16.002, F.A.C.

**Osprey are protected under the U.S. Migratory Bird Treaty Act and State Rule Chapter 68A-4 and 68A-16, F.A.C.

Consultation Areas

The Study Area is within the USFWS Consultation Areas for the West Indian Manatee (*Trichechus manatus*), Florida Bonneted Bat (*Eumops floridanus*), Piping Plover (*Charadrius melodus*), Red-cockaded Woodpecker (*Picoides borealis*), Florida Scrub Jay (*Aphelocoma coerulescens*), and the American Crocodile (*Crocodylus acutus*). Suitable habitat exists for the West Indian Manatee, Florida Bonneted Bat, Piping Plover, and American Crocodile.

The Florida Panther (*Puma concolor coryi*) Consultation Area is north of U.S. 41 (Tamiami Trail). Three FDOT Florida Panther Vehicle Collision (PVC) Hot Spots are located on North Collier Boulevard due to vehicle collisions with this species that were documented in 2008, 2014, and 2015.

Critical Habitat

The Study Area was evaluated for the potential occurrence of Critical Habitat as defined by 17 CFR 35.1532. The USFWS and National Marine Fisheries Service (NMFS) are federal agencies that oversee the protection of Critical Habitat from adverse impacts to the biological or physical elements essential to the conservation of a listed species. Henderson Creek on the northern portion of S.R. 951 and Ten Thousand Island National Wildlife Refuge along the C.R. 92 corridor are classified as Critical Habitat for the West Indian Manatee by the USFWS. The Ten Thousand Islands/Everglades Unit is designated as Critical Habitat for the Smalltooth Sawfish by the NMFS. If impacts to Critical Habitat are anticipated, an effect determination will be needed as well as coordination with and concurrence from these agencies.

Essential Fish Habitat

NOAA Fisheries, also known as NMFS, is the federal agency charged with protecting EFH. The NMFS has designated EFH for Reef Fish, Sandbar Shark, Blacknose Shark, Coastal Migratory Pelagics, Red Drum Fishery, and Shrimp Fishery within the Study Area. If impacts to EFH are anticipated, an impact determination will be needed as well as coordination and concurrence from the NMFS.

Non-Listed Species with Potential to Occur

The Study Area is within the FFWCC South Bear Management Unit. Although the Florida Black Bear (*Ursus americanus floridanus*) is no longer a listed species, the Bear Conservation Rule still protects them. In 2021, 572 bear-related calls were received by the agency and several road kills have been reported in the Study Area.

Bald Eagles are protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act and the state bald eagle rule (68A-16-002, F.A.C.). There are several documented eagle nests in the area. The closest to the project areas are located at Tamiami Trail and C.R. 92 and another at S.R. 951 (Collier Blvd.) and Tower Road. Both are within a half mile of the Study Area.

Osprey are protected under the U.S. Migratory Bird Treaty Act and State Rule Chapter 68A-4 and 68A-16, F.A.C. This species frequents coastal habitats and often nests on infrastructure associated with roadways (lights and signposts).

It is illegal to kill bats in Florida in accordance with F.A.C. rule 68A-4.001 General Prohibitions. Bats are particularly vulnerable when they roost in man-made structures, like bridges. Protections for bats in structures are included in rule 68A-9.010 Taking Nuisance Wildlife. All bridges should be inspected for the presence of bats.

Protected Plants

The protected plants with the potential to be found within the Study Area include Banded Wild-Pine Air plant (*Tillandsia flexuosa*), Ghost Orchid (*Dendrophylax lindenii*), Fuzzy-Wuzzy Air Plant (*Tillandsia pruinosa*), and Golden Leather Fern (*Acrostichum aureum*).

Most of the anticipated impact to the Study Area is within maintained right of way, but some impacts outside this area may be unavoidable. The Banded Wild-Pine Air Plant prefers filtered sunlight with exposed habitat and prefers to grow on pinelands or scrub

and can occur in mangrove swamps. The Ghost Orchid prefers to grow on two host tree species, Pop Ash (*Fraxinus caroliniana*) and Pond Apple (*Annona glabra*). Pop Ash does not tolerate salty environments. Pond Apple could be present; any trees should be inspected for Ghost Orchid. The Fuzzy-Wuzzy Air Plant prefers to grow in freshwater wetlands on dead trees. The Golden Leather Fern does prefer mangrove swamps; however, the fringe habitat is dense with mature trees and open tidal shoreline is limited. The likelihood for this species to be present is unlikely along the Study Areas. In conclusion, for some of the species the habitat is appropriate; however, due to development and maintained right of ways the occurrence of these plant species is unlikely. **Table 14** lists the plant species with the potential to occur within the Study Area and their likelihood of occurrence.

Table 14: Plant Species Listed within the Study Areas

Common Name	Scientific Name	Status	Likelihood of Occurrence	Reasoning
Banded Wild-Pine	<i>Tillandsia flexuosa</i>	ST	Moderate	Prefers scrub or pinelands but can occur in mangroves
Ghost Orchid	<i>Dendrophylax lindenii</i>	SE	Moderate	Documented in the area near C.R. 92 and Tamiami Trail East
Fuzzy-Wuzzy Air Plant	<i>Tillandsia pruinosa</i>	SE	Low	Prefers freshwater habitats
Golden Leather Fern	<i>Acrostichum aureum</i>	ST	High	Prefers mangrove swamps
Florida Prairie-Clover	<i>Dalea carthagenensis floridana</i>	FE	Low	No salt tolerance, outside normal range, but vouchered specimen documented in Collier
Garber's Spurge	<i>Chamaesyce garberi</i>	FT	Moderate	Documented on barrier islands and in Collier Seminole State Park

Note: FE-Federally Endangered, FT- Federally Threatened, SE – State Endangered, ST – State Threatened

Cultural Resources

A desktop review of the Florida Geographic Library's State Historic Preservation Office (SHPO) database indicated nineteen (19) potentially historic structures are within a half mile of the project limits as listed in **Table 15** and shown in **Figure 28**. Of these twenty structures, seven (7) were identified as "ineligible" for listing in the National Register of Historic Places (NHRP) and twelve (12) have not been evaluated by SHPO.

One resource (CR00138) was identified as ‘potentially eligible’ for listing in the National Register of Historic Places.

Sites not evaluated by SHPO include seven (7) resources located inside Collier-Seminole State Park located in the southwest corner of the C.R. 92/U.S. 41 intersection. Resources inside the park include the Blockhouse (CR01089), the Barron Collier Memorial (CR01090), a shop (CR01517), the Myers Property (CR01518), a camp restroom (CR01519), a bathhouse (CR01520), and a recreation hall (CR01521). The other five resources not evaluated by SHPO are in the Goodland area. The resource listed as “potentially eligible” is the Bay City Walking Dredge, also located within Collier-Seminole State Park. The Bay City Walking Dredge is a National Historic Engineering Landmark. It was constructed in 1924 and used to build the Tamiami Trail Highway (U.S. 41) through the Everglades and Big Cypress Swamp. The Bay City Walking Dredge is the only “potentially eligible” resource identified.

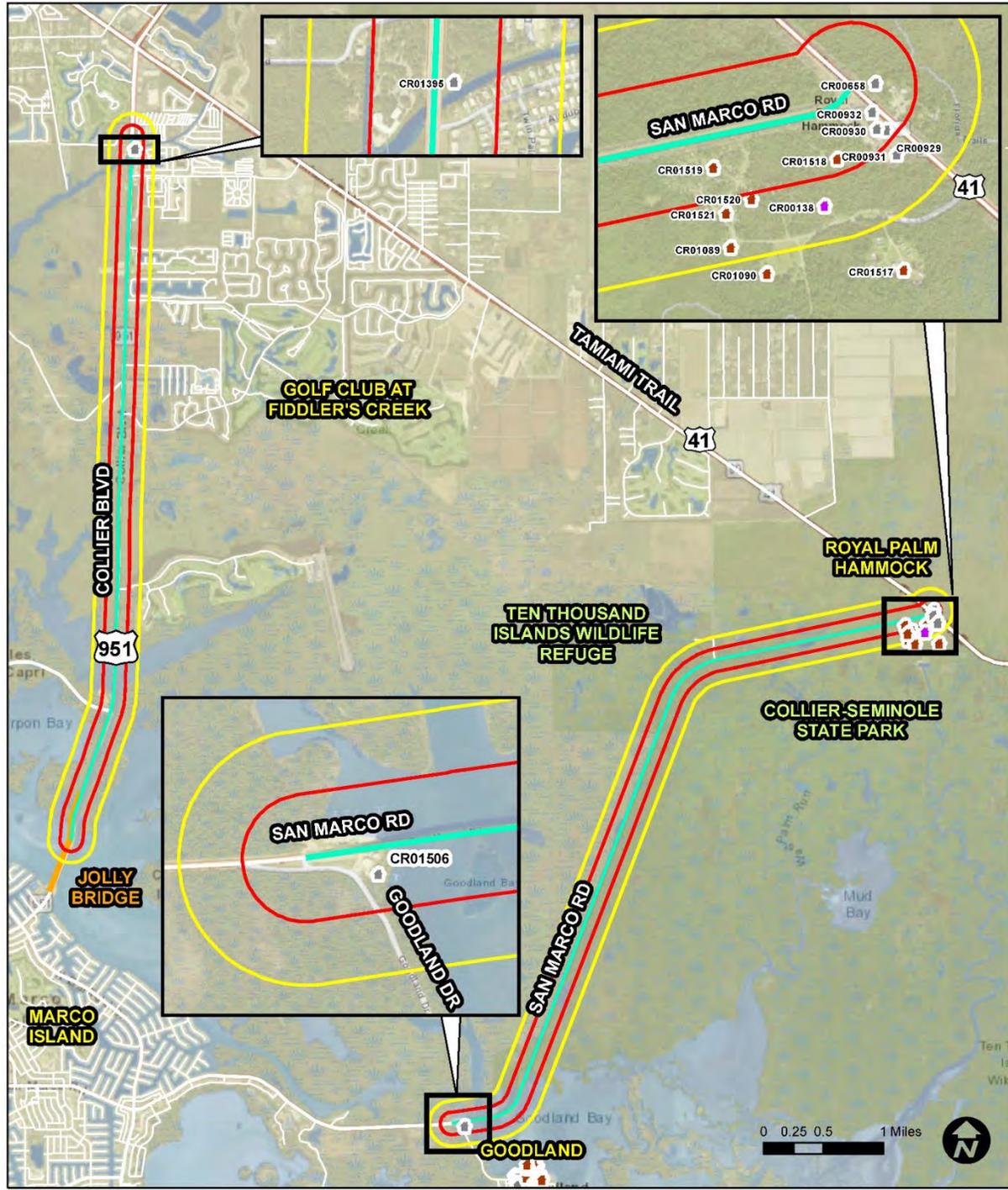
The only potential resource located within the project limits is the S.R. 951/Big Marco Pass Bridge (CR01301), also known as Jolly Bridge, which has not been evaluated by SHPO. None of the other resources identified in this section are within or directly adjacent to the project limits. All other identified potential resources are located well outside the existing right-of-way.

Table 15: Cultural Resources

SITE ID	SITENAME	ADDRESS	SHPO EVALUATION
CR01395	6360 COLLIER BLVD	6360 COLLIER BLVD	INELIGIBLE FOR NRHP
CR01506	10,000 ISLANDS FIELD RESEARCH STATION	2561 SAN MARCO RD	INELIGIBLE FOR NRHP
CR00658	ROYAL PALM HAMMOCK STATION	20018 TAMIAMI TRAL	INELIGIBLE FOR NRHP
CR00929	ROYAL PALM HAMMOCK CABIN	19830 TAMIAMI TRAL	INELIGIBLE FOR NRHP
CR00930	ROYAL PALM HAMMOCK MOTEL	19820 TAMIAMI TRAL	INELIGIBLE FOR NRHP
CR00932	ROYAL PALM HAMMOCK RESTAURANT	19800 TAMIAMI TRAIL	INELIGIBLE FOR NRHP
CR00931	ROYAL PALM HAMMOCK PUMPHOUSE	U.S. 41 AND C.R. 92	INELIGIBLE FOR NRHP
CR01089	THE BLOCKHOUSE	20200 TAMIAMI TRAL E	NOT EVALUATED BY SHPO
CR01090	BARRON COLLIER MEMORIAL	20200 TAMIAMI TRAL E	NOT EVALUATED BY SHPO
CR01517	SHOP	20200 TAMIAMI TRAL E	NOT EVALUATED BY SHPO
CR01518	MYERS PROPERTY	20200 TAMIAMI TRAL E	NOT EVALUATED BY SHPO
CR01519	CAMP RESTROOM	20200 TAMIAMI TRAL E	NOT EVALUATED BY SHPO
CR01520	BATHHOUSE	20200 TAMIAMI TRAL E	NOT EVALUATED BY SHPO
CR01521	RECREATION HALL	20200 TAMIAMI TRAL E	NOT EVALUATED BY SHPO
CR00140	MARCO LODGE	HARBOR PLACE	NOT EVALUATED BY SHPO
CR00623	SCOTT, ED HOUSE	333 BAYSHORE WAY	NOT EVALUATED BY SHPO

CR00624	217 BAYSHORE	217 BAYSHORE	NOT EVALUATED BY SHPO
CR00689	MARCO ISLAND MARINA	125 BAYSHORE WAY	NOT EVALUATED BY SHPO
CR01301	S.R. 951/BIG MARCO PASS BRIDGE	S.R. 951 (COLLIER BOULEVARD)	NOT EVALUATED BY SHPO
CR00138	WALKING DREDGE	20200 TAMIAMI TRAL E	POTENTIALLY ELIGIBLE FOR NRHP

Figure 28: Cultural Resources



LEGEND	
Project Limits	Potentially Historic Structures
500 ft. Project Limits Buffer	Ineligible for NRHP
1,000 ft. Project Limits Buffer	Not Evaluated by SHPO
Potentially Historic Bridges	Potentially Eligible for NRHP

Source: State Historic Preservation Office (SHPO), April 2022

CORRIDOR FIELD REVIEW

Project stakeholders were invited to participate in a corridor field review on Thursday, June 30, 2022. The eight participants observed travel conditions, land use characteristics, environmental features, and physical constraints in the study corridor. A summary of the field review is provided in **Appendix B**.