Beckett Bridge

Project Development & Environment (PD&E) Study

from **Chesapeake Drive** *to* **Forest Avenue**

Tarpon Springs, Pinellas County, FL

Pinellas County Project ID: PID 2161 • ETDM #: 13040

FDOT Financial Project ID: 424385-1-28-01

January 2016

Preliminary Engineering Report
Volume 1: Documentation

Prepared for:
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PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida and that I have supervised the preparation and approve the evaluation, findings, opinions, conclusions, and technical advice hereby reported for:

Project: Beckett Bridge Project Development and Environment Study
From Chesapeake Drive to Forest Avenue

Location: Tarpon Springs, Pinellas County, FL

Report: Preliminary Engineering Report

FDOT Financial Project ID No.: 424385-1-28-01
ETDM No.: 13040

Pinellas County Project No: PID 2161

This report includes a summary of data collection efforts, traffic analysis, alternative roadway and bridge analysis, discussion of preferred alternative, discussion of environmental impacts, and summary of conclusions. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgment and experience.

Name: James M. Phillips, III, P.E.

Florida PE Registration No.: 36885

Signature: _____

Date: 5/27/15

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LIST OF ACRONYMS

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway Transportation Officials
ABC	Accelerated Bridge Construction
ADA	Americans with Disabilities Act
AN	Advanced Notification
APE	Area of Potential Effect
BCC	Board of County Commissioners
BDR	Bridge Development Report
CAC	Citizens Advisory Committee
CEI	Construction Engineering and Inspection
CFR	Code of Federal Regulations
CID	Comprehensive Inventory Data
CIP	Capital Improvements Program
CRAS	Cultural Resource Assessment Survey
CRC	Cultural Resource Committee
CSER	Contamination Screening Evaluation Report
DOE	Determination of Eligibility
DOT Act	U.S. Department of Transportation Act of 1966
EFH	Essential Fish Habitat
ERI	Electrical Resistivity Imaging
ESBA	Endangered Species Biological Report
ETAT	Environmental Technical Advisory Team
ETDM	Efficient Transportation Decision Making
FAC	Freight Activity Center
F.A.C.	Florida Administrative Code
FDA	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDHR	Florida Department of Historic Resources
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FNAI	Florida Natural Areas Inventory
FR	Federal Register
F.S.	Florida Statute
FWC	Florida Fish and Wildlife Conservation Commission
FWS	U.S. Fish and Wildlife Service
FY	Fiscal Year
GMFMC	Gulf of Mexico Fishery Management Council
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
IMA	Important Manatee Area

LIST OF ACRONYMS (Continued)

LOS	Level of Service
LRFD	Load and Resistance Factor
LRTP	Long Range Transportation Plan
MHP	Mobile Home Park
MHW	Mean High Water
mph	Miles per Hour
MPO	Metropolitan Planning Organization
MSE	Mechanically Stabilized Earth
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OFW	Outstanding Florida Waters
PCDEM	Pinellas County Department of Environmental Management
pcf	Per Cubic Foot
PCPT	Pinellas County Public Transit
PER	Preliminary Engineering Report
PD&E	Project Development and Environment
PPM	Plans Preparation Manual (FDOT)
PSI	Professional Service Industries
PSTA	Pinellas Suncoast Transit Authority
SEI	Subsurface Evaluations, Inc.
SHPO	State Historic Preservation Officer
SPT	Standard Penetration Tests
STIP	State Transportation Improvement Program
SU	Single Unit Truck
SWFWMD	Southwest Florida Water Management District
TBRPM	Tampa Bay Regional Planning Model
TCC	Technical Coordinating Committee
TIP	Transportation Improvement Program
TSM	Transportation System Management
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	U.S. Coast Guard
USGS	U.S. Geological Survey
vpd	Vehicles per Day
WQIE	Water Quality Impact Evaluation

1.0 SUMMARY

Pinellas County conducted a PD&E Study for proposed improvements to the Beckett Bridge in Tarpon Springs, Pinellas County, FL, in coordination with the Florida Department of Transportation (FDOT) and the Federal Highway Administration (FHWA). A project location map is provided in **Figure 1-1**. The following alternatives were evaluated during the Study:

- No-Build
- No-Build with Removal of the Existing Bridge
- Rehabilitation of the Existing Bridge
- Replacement with a New Movable Bridge
- Replacement with a New Nigh-Level Fixed Bridge

This Preliminary Engineering Report contains detailed engineering information that fulfills the purpose and need for the proposed replacement of the Beckett Bridge, from Chesapeake Drive to Forest Avenue, City of Tarpon Springs, Pinellas County, Florida. The project numbers are as follows:

County PID	2161
ETDM	13040
FDOT Financial Mgmt.	424385-1-20-01

The report documents the development and evaluation of alternatives for the proposed improvements and summarizes the public involvement activities conducted during the PD&E study.

1.1 PROJECT COMMITMENTS

To minimize impacts to navigation and to comply with USCG requirements, the contractor will be required to coordinate any full or partial closures of the channel to marine traffic during construction with the USCG in Miami FL (telephone 305.415.6744) at least 60 days prior to the planned closing.

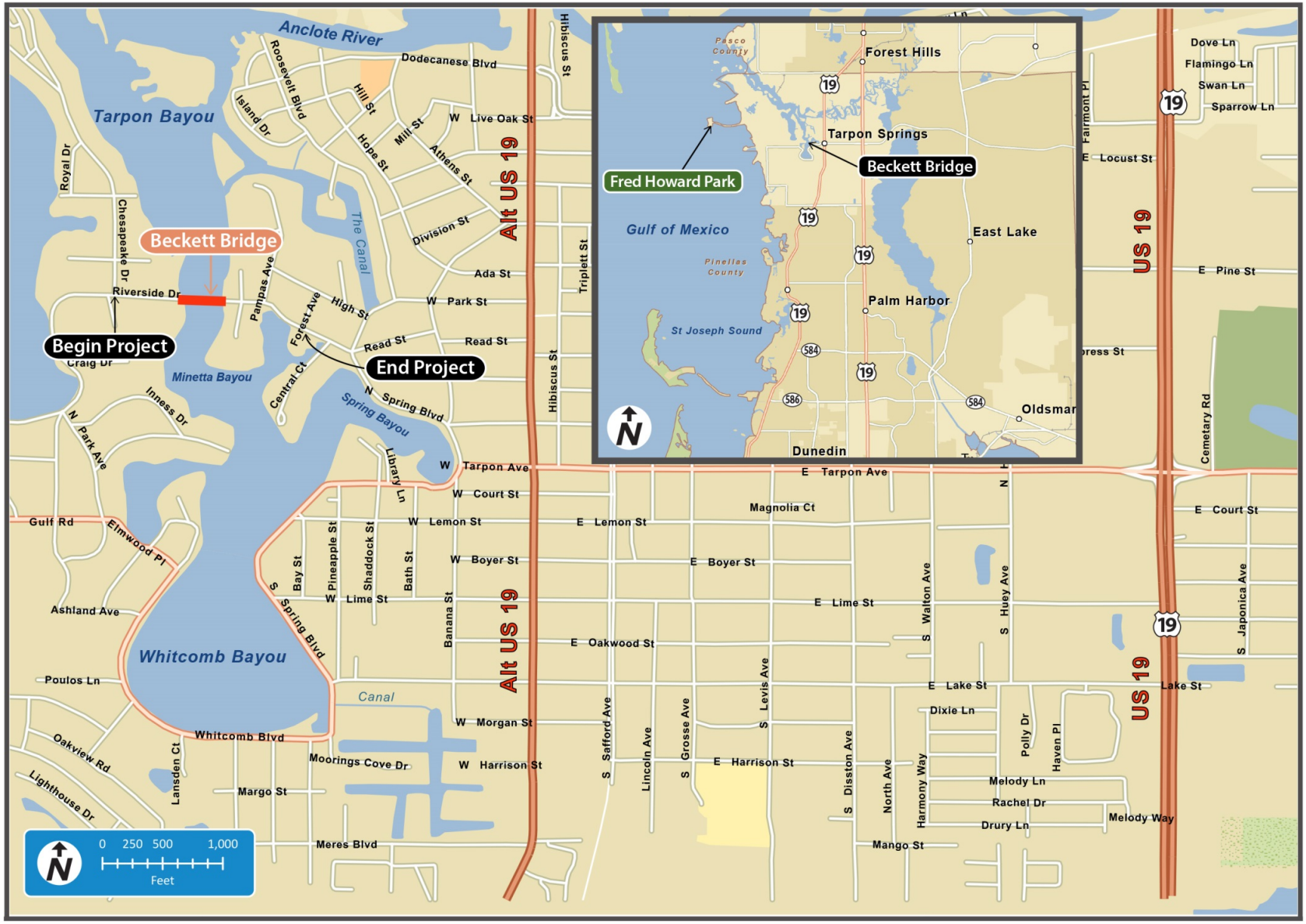


Figure 1-1 – Project Location

SHPO, FHWA, FDOT and Pinellas County signed a Section 106 Memorandum of Agreement (MOA) which specifies conditions required to mitigate for the adverse impacts resulting from demolition of the existing historic bridge on January 29, 2014. The MOA requires the Historic American Engineering Record (HAER) documentation of the bridge, which includes large-format photography, printing historic plans on archival paper, and preparing a written narrative. The MOA stipulates that the design of the new bridge will be a single-leaf, rolling lift bridge type of similar design and scale to the historic Beckett Bridge. Additional mitigation measures as described in the MOA are also required. A copy of the MOA is included in Appendix J of this document.

The Section 106 MOA also stipulates that Pinellas County will create an aesthetics committee consisting of representatives from the adjacent community, City of Tarpon Springs, Tarpon Springs Historical Society, FHWA, and Florida SHPO to serve in an advisory capacity regarding appropriate design elements for the replacement bridge that may be addressed during the development of the Project.

The National Marine Fisheries Service (NMFS) requested continued coordination at the conclusion of the PD&E Study and during the Design phase when more detailed compensatory mitigation proposals are developed. Accordingly, Pinellas County will coordinate potential wetland and essential fish habitat impacts and proposed mitigation with the NMFS during the design phase of the project.

Pinellas County will comply with the current version of the US Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC) approved "Standard Manatee Construction Conditions" during all in-water construction phases of the project. In addition, the County will coordinate with both agencies concerning site specific manatee protection measures to be implemented during construction.

Pinellas County will submit a blasting plan to USFWS and FWC for review and approval prior to construction if blasting is proposed for demolition. The plan will include the use of qualified observers and an aerial survey.

As requested by the FWC, Pinellas County will coordinate wetland impacts with the appropriate resource agencies and propose mitigation to offset any adverse impacts to listed species

habitat, if determined to be warranted.

If an active bald eagle nest is identified within the 660-foot buffer zone around the construction area, mitigation measures will be implemented to avoid disturbing the species, which may include control of the timing and location of construction activities and establishment of a buffer zone around active nesting sites.

Pinellas County will coordinate with FWC for the removal of the osprey nests on a utility pole within the construction area during the design and permitting phase of the project.

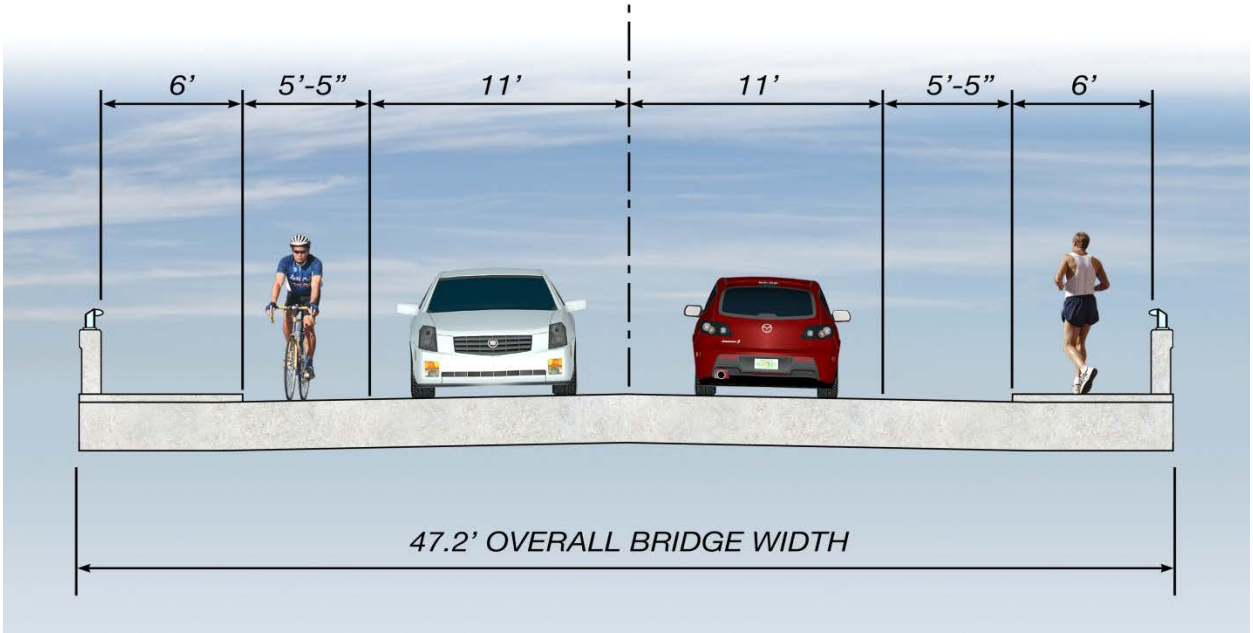
1.2 PROPOSED ACTION

The Recommended Alternative is replacement of the existing two-lane bascule Beckett Bridge with a new two-lane movable bridge. In accordance with the Section 106 Memorandum of Agreement, the design of the new bridge will be a single-leaf, rolling lift bridge type of similar design and scale of the historic Beckett Bridge. The proposed bridge would provide 7.8 feet of vertical clearance over the navigation channel at the fenders in the closed position. Unlimited vertical clearance will be provided in the open position for the width of the channel between the fenders. The horizontal clearance between the fenders will be 25 feet. The new bridge would be constructed within existing right-of-way, on approximately the same alignment as the existing bridge. The proposed bridge will be approximately 19 feet wider than the existing bridge.

No additional right-of-way will be required. No business or residential relocations will result from construction of the proposed improvements. The proposed bridge is likely to qualify for a General Permit from SWFWMD and treatment of stormwater runoff from the bridge would not be required. However, if treatment of stormwater is required, it is anticipated that compensatory, offsite treatment will be acceptable. Accordingly, acquisition of additional right-of-way is not anticipated to address water quality concerns.

The proposed bridge typical section for the replacement low-level movable bridge has a total out-to-out width of 47.2 feet as shown in **Figure 1-2**. The typical section includes two, 11-foot wide travel lanes with 5.5-foot shoulders that can function as undesignated bicycle lanes. Sidewalks, 6 feet wide, are proposed on both sides of the bridge.

The maximum proposed grade is five percent, which meets ADA requirements. Roadway reconstruction is limited to the bridge approaches. The approach roadway will return to existing grade at Pampas Avenue on the east side of the bridge. On the west side of the bridge, the approach roadway will return to existing grade just east of Chesapeake Drive. The approach roadway will be close enough to the existing grades at the driveways to the Bayshore Mobile Home Park, the Tarpon Springs Yacht Club and Venetian Court to allow connection of



these driveways with minimal re-grading.

Figure 1-2 – Proposed Movable Bridge Typical Section

Access to residential property driveways along Riverside Drive will still be accessible. Resurfacing (only) is proposed between Forest and Pampas Avenues. The proposed roadway profile would be approximately two feet higher than the existing roadway at the west end of the bridge, and approximately four feet higher at east end of the bridge.

Approximately 0.03 acre of wetlands will be impacted by the proposed replacement bridge. No perceptible noise impacts are anticipated.

2.0 LOCATION AND NEED

2.1 PROJECT DESCRIPTION

Pinellas County, in coordination with the Florida Department of Transportation (FDOT) District Seven, and the Federal Highway Administration (FHWA) is conducting a Project Development and Environment (PD&E) Study to evaluate alternatives to remove, rehabilitate or replace the existing Beckett Bridge (Bridge no. 154000) in Tarpon Springs, Pinellas County, Florida. The existing bridge was originally constructed in 1924 as a timber structure with a steel movable span. The fixed timber approach spans were replaced with concrete approach spans in 1956. The bridge has been determined to be eligible for listing in the National Register of Historic Places (NRHP). Eligibility is based on the bridge's contribution to early development of the area and because it is one of a few known, pre-1965, highway single-leaf rolling-lift bascule bridges remaining in Florida. Since 1956, major repairs were performed in 1979, 1998, and in 2011. Major rehabilitation or replacement of the bridge is needed to keep the bridge open and operating efficiently.

The project limits extend along Riverside Drive from Chesapeake Drive across Whitcomb Bayou to Forest Avenue, a distance of approximately 0.3 mile. The existing two-lane bridge connects areas west and north of the Bayou to downtown Tarpon Springs. The bridge is also located on a popular route for access to Fred Howard Park, a Pinellas County park located approximately 3.1 miles west on the Gulf of Mexico. Riverside Drive/North Spring Boulevard is an extension of Tarpon Avenue, which is a designated evacuation route. (See **Figure 2-1**, Project Location.) Beckett Bridge provides access to major north/south arterials including Alternate US 19 and US 19 for coastal residents during hurricane evacuation. The bridge also provides access for emergency vehicles, including police, ambulance and fire. Alternate routes (that do not require crossing of the Beckett Bridge) are available for travel to and from the areas mentioned above, and for emergency response.

Beckett Bridge is owned and operated by Pinellas County. A bridge tender is only present when required to open the drawbridge for a vessel, there are no full-time bridge tenders. U.S. Coast Guard (USCG) drawbridge opening regulations (33CFR117.341) states that "The draw of the Beckett Bridge, mile 0.5, at Tarpon Springs, Florida shall open on signal if at least two hours' notice is given."

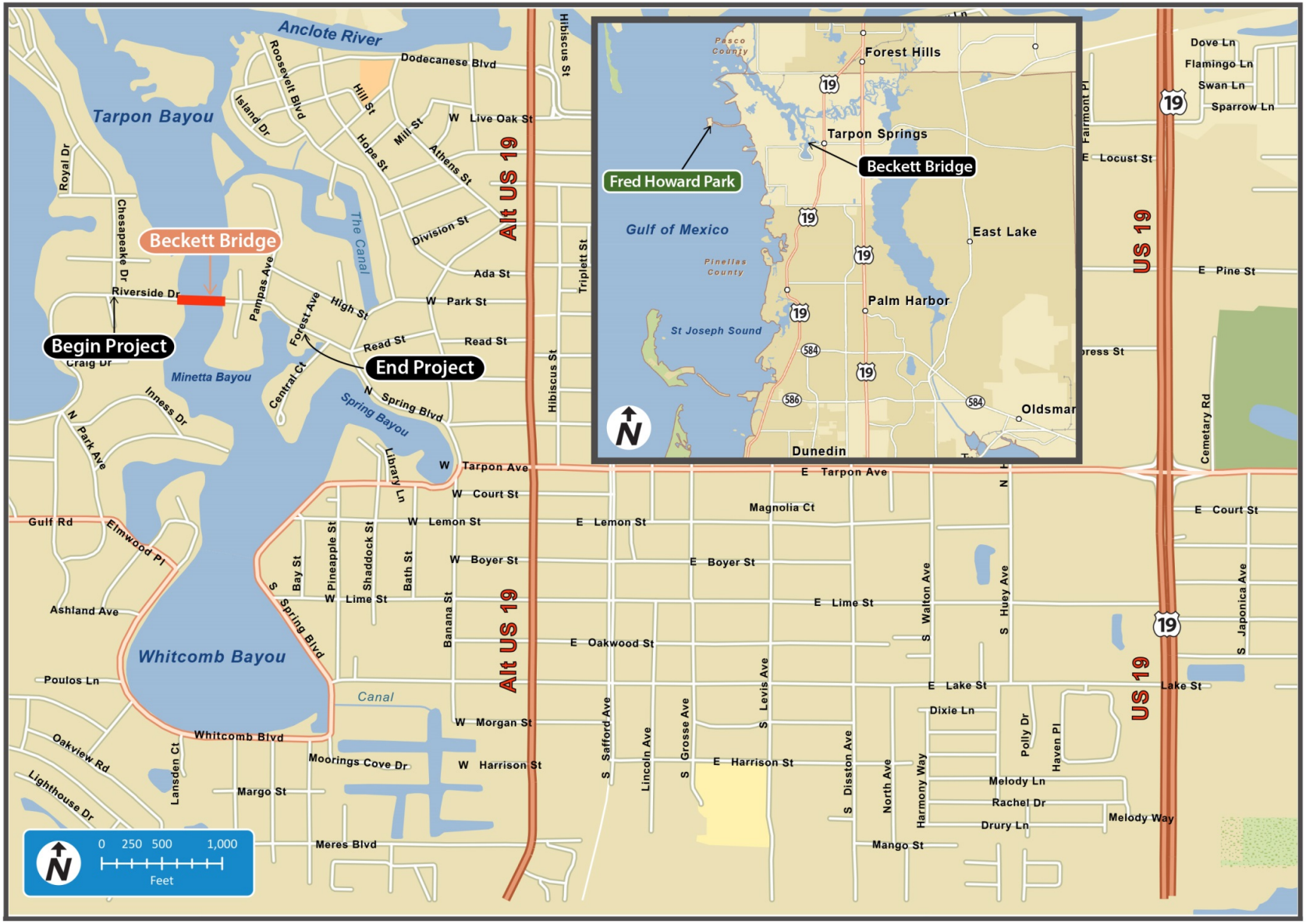


Figure 2-1 – Project Location

Beckett Bridge – Elevation View

Beckett Bridge – View from Roadway

Whitcomb Bayou connects to the Gulf of Mexico via the Anclote River to the north. Boats docked along Whitcomb, Spring and Minetta Bayous, and along artificial canals which connect to the southeastern portion of the Whitcomb Bayou, must pass the Beckett Bridge to access the Gulf of Mexico. The following alternatives were evaluated during the study:

- No-Build - Maintain Existing Bridge
- No-Build - Remove Existing Bridge (includes alternate routing of traffic)
- Rehabilitation of the Existing Bridge
- Replace with a new Movable Bridge
- Replace with a new Fixed Bridge

The "No-Build" alternative includes only routine maintenance to keep the bridge open to boaters and vehicular traffic until safety issues would require it to be closed. Evaluation of future improvements would occur at a later date. The "No Build with Removal of the Existing Bridge" would result in routine maintenance in the near future with the intent to demolish the bridge when it is no longer safe for traffic, with no plans to replace it with a new one. All bridge replacement alternatives considered will be constructed in approximately the same location as the existing bridge to minimize impacts. A USCG bridge permit will be required if a replacement bridge is selected as the Preferred Alternative. Accordingly, the USCG has requested to be a cooperating agency for this PD&E Study.

Alternate corridors for bridge location will not be evaluated due to the extent of development in the vicinity of the existing bridge. Capacity improvements will not be considered. The complete removal alternative will examine alternative traffic routes and potential impacts to the community and on traffic operations.

2.2 Purpose and Need for Improvements

According to recent (07/31/2012) FDOT inspection reports, the existing bridge has an overall Structure Inventory and Appraisal Sufficiency Rating of 44.9 out of 100. (Sufficiency ratings are a method of evaluating highway bridges by calculating a numeric value between 0 and 100, indicative of bridge sufficiency to remain in service). The bridge is considered functionally obsolete. This designation is based primarily on the substandard clear roadway width of only 20 feet and substandard roadway safety features. The existing typical section consists of one,

10-foot wide travel lane in each direction and 2-foot 2-inch-wide sidewalks separated by a curb on both sides of the bridge. (See **Figure 2-2**, Existing Bridge Typical Section.)

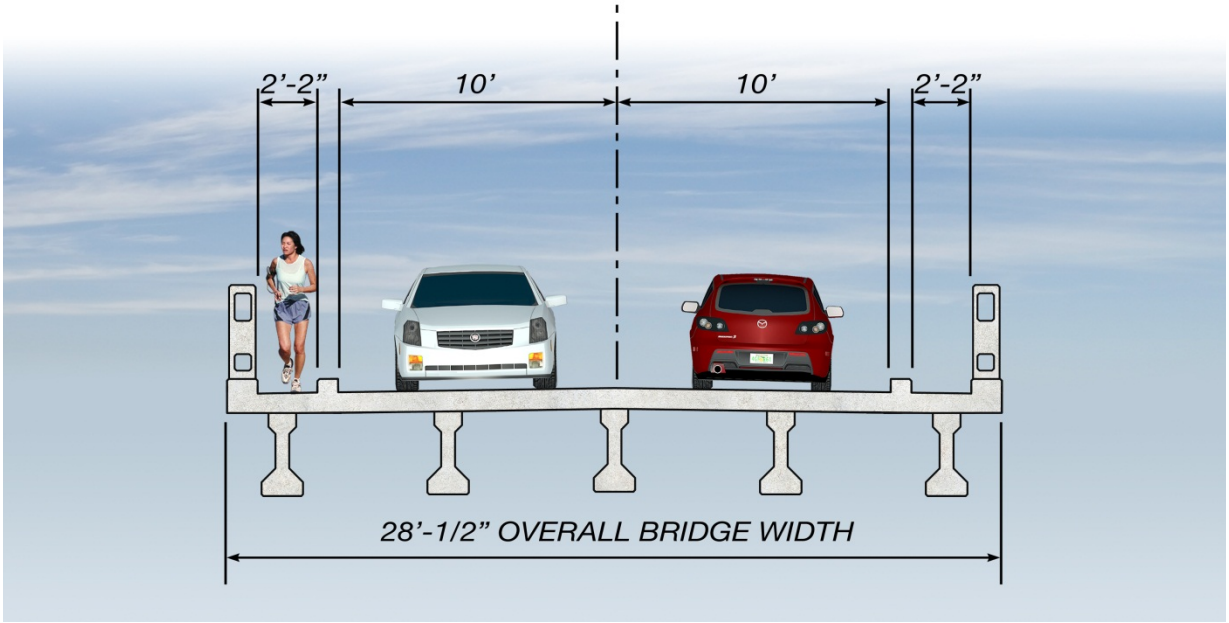


Figure 2-2 – Existing Bridge Typical Section

Minimum required lane and shoulder widths prescribed by the American Association of State Highway and Transportation Officials (AASHTO) are not met. The sidewalks on the bridge are narrow and do not meet current accessibility requirements established by the Americans with Disabilities Act (ADA). The bridge railings do not meet current standards for pedestrian safety or geometric and crash testing safety standards for vehicles. Approach guardrail and transitions and end treatments also do not meet current safety standards.

There are no official USCG navigational clearance guidelines for this waterway at this location. The existing vertical clearance at the fenders is six feet. The tip of the bascule leaf overhangs the fender with the leaf fully raised, limiting the clearance for a portion of the channel between the fenders. It is likely that unlimited vertical clearance was provided for the entire width of the channel when the bridge was originally constructed. The existing horizontal clearance between the fenders is 25 feet.

Bascule Leaf in Full Open Position

Bascule Leaf in Closed Position

Although the bridge is not considered Structurally Deficient, the bridge has a substandard load carrying capacity requiring weight restrictions. The bridge is currently posted for legal loads limited to 12-ton Single Unit Trucks and 15-ton Combination Trucks. Repairs in 1979 and 1988 included installation of crutch bents due to settlement and lateral stability concerns. Repairs in 2011 were performed to correct issues with the operating machinery and bascule leaf alignment.

FDOT District 7 completed the Program Screening Evaluation phase of the Efficient Transportation Decision Making (ETDM) process for this project. The ETDM Summary Report (ETDM Project Number 13040) was published on June 30, 2011 and is included in Appendix A of this report. The Advance Notification Package was mailed to the Florida State Clearinghouse on October 6, 2010. A copy of the package is also included in Appendix A.

2.3 CONSISTENCY WITH LOCAL TRANSPORTATION PLANS

The proposed project is a non-capacity bridge replacement. According, the Pinellas County 2035 Cost Feasible Long Range Transportation Plan (LRTP) was modified on June 11, 2014 to include information about the anticipated replacement of the Beckett Bridge and need for federal funding. The plan states the following:

"Many bridge projects do not increase the physical capacity of the transportation system, but rather serve as an in-kind replacement for what already exists. Some of these bridges are regionally significant, while others serve more of the local travel needs in Pinellas County. The following bridges in Pinellas County will soon be in need of replacement and federal funding will be sought to assist with the construction of new facilities:

- Beckett Bridge
- Dunedin Causeway
- San Martin Bridge"

Based on the Pinellas County 2035 LRTP and Transportation Element of the 2008 Comprehensive Plan, the current lane configuration for the project corridor is expected to remain two-lanes through 2035. Accordingly, replacement of the existing two-lane bridge with a new two-lane bridge is consistent with both plans. Rehabilitation, repair or replacement of the existing bridge is consistent with the goals and policies of Objective 1.10 of the Pinellas County 2035 LRTP which is to "Ensure the safe accommodation of motorized and non-

motorized traffic while reducing the incidence of vehicular conflicts with the county's major transportation corridors."

The Pinellas County Transportation Improvement Program (TIP) – Fiscal Year (FY) 2011/12 through 2015/16 indicated that $750,000 was funded for the PD&E phase of the project. The PD&E phase was also included in the Pinellas County Capital Improvements Program (CIP), the FDOT Work Program, and the FDOT FY 2011 State Transportation Improvement Program (STIP). Copies of the appropriate sections of the Pinellas County TIP and CIP, FDOT Work Program, and FDOT District 7 STIP are included in Appendix B.

2.4 MODAL INTERRELATIONSHIPS

Transit

The Pinellas Suncoast Transit Authority (PSTA) does not operate transit service within the project limits. According to the most recent (October 2011) PSTA System Map, Route 66 provides hourly service daily along Alt US 19. Partial service is provided along Martin Luther King Boulevard. The nearest transit stops are on PSTA Route 66 along Pinellas Avenue North at Orange Street and Cypress Street, approximately one-half mile from the bridge. At this time, PSTA has no plans to expand transit service to include the Spring Boulevard/Riverside Drive within the project limits. Pasco County Public Transit (PCPT) operates Route 18 north of Live Oak Street and Dodecanese Boulevard near the Tarpon Springs Sponge Docks, approximately 0.9 miles northeast of the bridge.

Freight

As indicated in the ETDM Program Summary Report, the 2008 Pinellas County Metropolitan Planning Organization (MPO) Goods Movement Study identifies the Northwest Tarpon Springs Industrial Area as a potential Regional Freight Activity Center (FAC). This area is located north of the Spring Boulevard/Riverside Drive and west of Alternate US 19 at Anclote Boulevard and Anclote Roads (see **Figure 2-3**). FACs are major generators of truck trip activity, which include long-haul trips extending beyond the region. Alternate US 19 (SR 595), Anclote Boulevard, Anclote Road, Live Oak Street and Tarpon Avenue are all unrestricted truck routes (as shown on the Pinellas County Truck Route Plan.) At this time the Beckett Bridge is currently posted for legal loads limited to 12-ton Single Unit Trucks and 15-ton Combination Trucks. If the bridge is rehabilitated or replaced, and the speed limit of 20 mph through the project area is increased and the speed bumps were removed, Spring Boulevard/Riverside Drive could improve access to these truck routes.

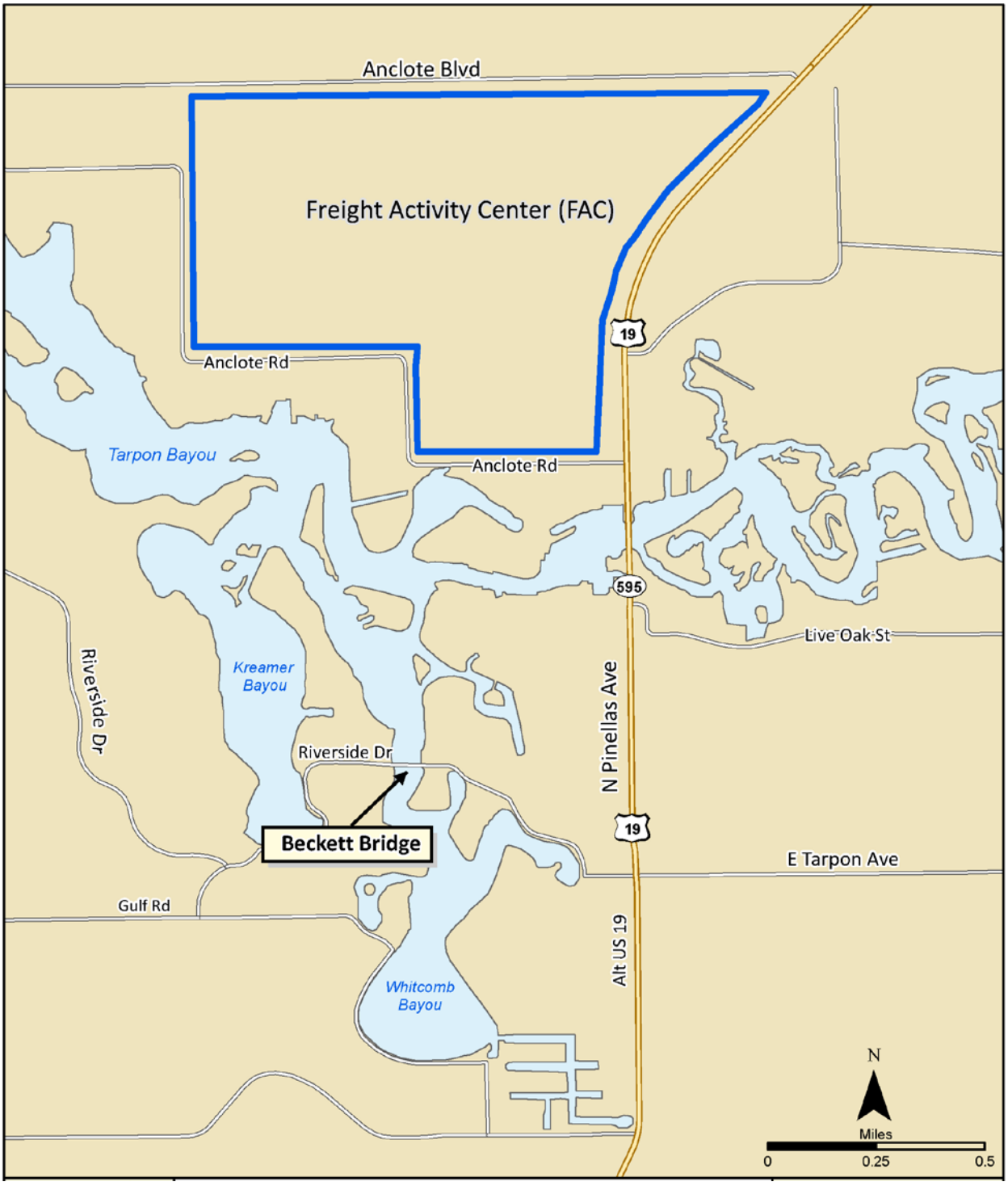


Figure 2-3 – Freight Activity Center (FAC) Location

School Transportation

Six public schools are located within three miles of the Beckett Bridge. The Beckett Bridge is currently load posted as follows: Single Unit Truck – 12 Tons, Combination Truck – 15 tons, and Truck and Trailer – 15 tons. School busses weigh on average 10-15 tons (empty) and have been prohibited from safely crossing the bridge. Accordingly, an alternate longer route is required. According to Mr. Mike Burke, Route and Safety Auditor for the Pinellas County School Board, if the bridge were rehabilitated or replaced school bus traffic would be re-routed to travel along Spring Boulevard/Riverside Drive and cross the Beckett Bridge. Approximately 15 to 20 school busses per day could potentially use the bridge. The detour results in additional costs for busses that service schools in the vicinity of the project.

Trails and Blueways

No officially designated county or regional trails cross the Beckett Bridge. However, the Pinellas Trail, a 37 mile long regional trail, extending from St. Petersburg to Tarpon Springs is located just east of the project. The Pinellas County Trailways Plan, included in the Pinellas County MPO 2035 LRTP, identifies three future recreational bicycle/pedestrian trails that will connect to the Pinellas Trail and continue west. These trails are not currently funded, but are included in the Planned Cost Feasible Trailways Projects. The locations of these trails are shown on **Figure 2-4**. The proposed Howard Park Trail will provide access to Howard Park from the Pinellas Trail via Riverside Drive/North Spring Boulevard, crossing the Beckett Bridge. The Whitcomb Bayou Trail and Meres trails will also connect to the Pinellas trail and extend west. Both trails provide alternate routes to Howard Park that do not include crossing the Beckett Bridge. Both of these trails are located along potential detour routes during construction.

According to Ms. Susan Miller, Bicycle and Pedestrian Planner at Pinellas County, there has been no engineering or other evaluation of these planned cost feasible trailways projects. The MPO 2035 LRTP identifies “Present Day Costs” for the proposed trailways. The estimated cost for the Howard Park Trail is $3.25M and is based on a standard per mile cost for construction of multi-use trails along existing roadways. The MPO is anticipating that improved facilities along these existing routes will be constructed as part of future roadway resurfacing or widening projects.

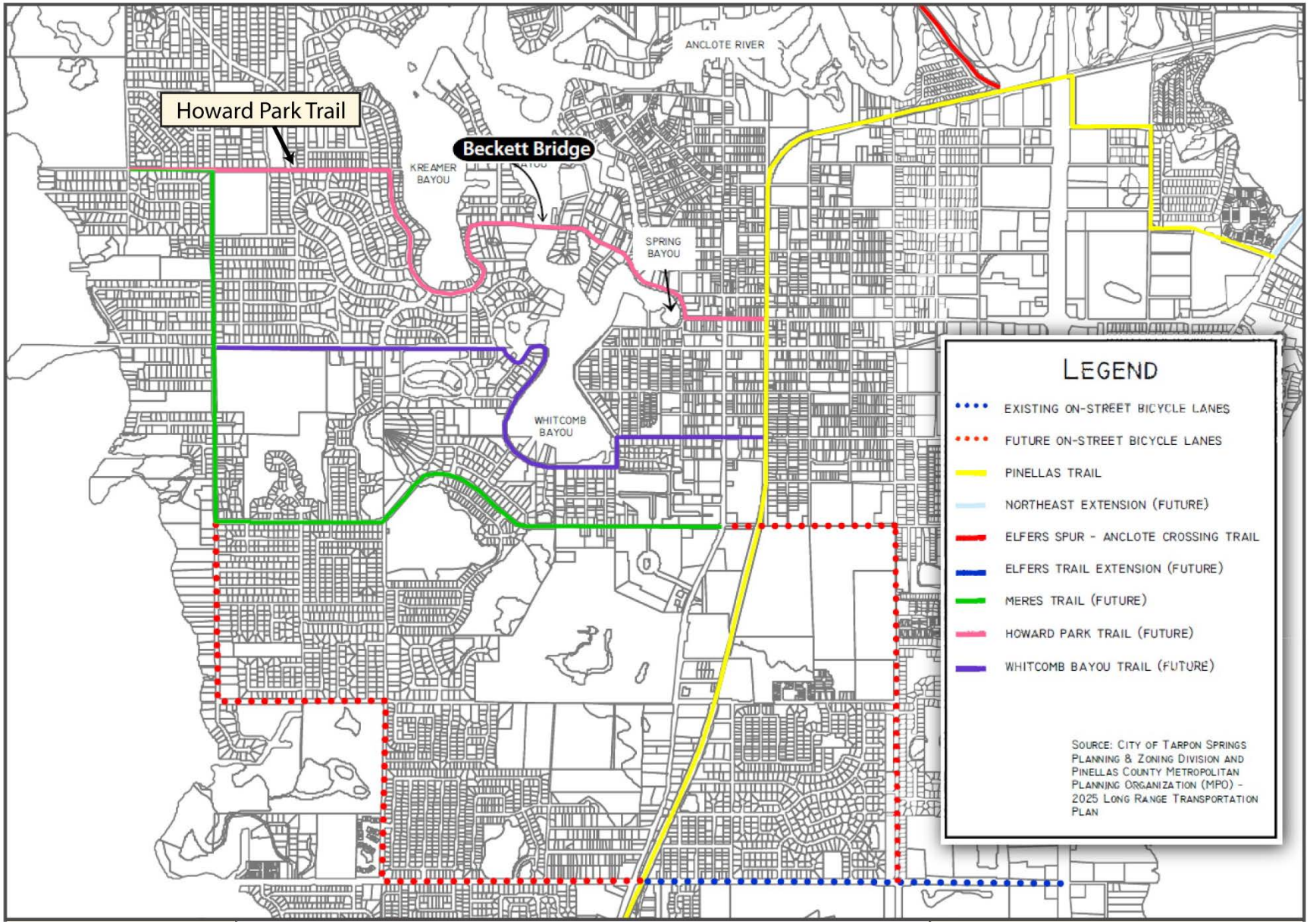


Figure 2-4 – Existing and Future Bicycle and Pedestrian Facilities

Marked and unmarked paddle trails are identified in the "Guide to Pinellas County Blueways," published by the Pinellas County Planning Department in April 2010. A map from this guide for trails in northern Pinellas County is provided in **Figure 2-5**. An unmarked trail begins in Spring Bayou at Craig Park, just south of the Beckett Bridge. The trail continues north through Whitcomb Bayou, passing under the Beckett Bridge continuing to the Anclote River and eventually to the Gulf of Mexico. The yearly Greek Orthodox Church Epiphany celebration is also held in Spring Bayou. In addition, paddlers visit this area to view manatees that seek warmer water in the winter.

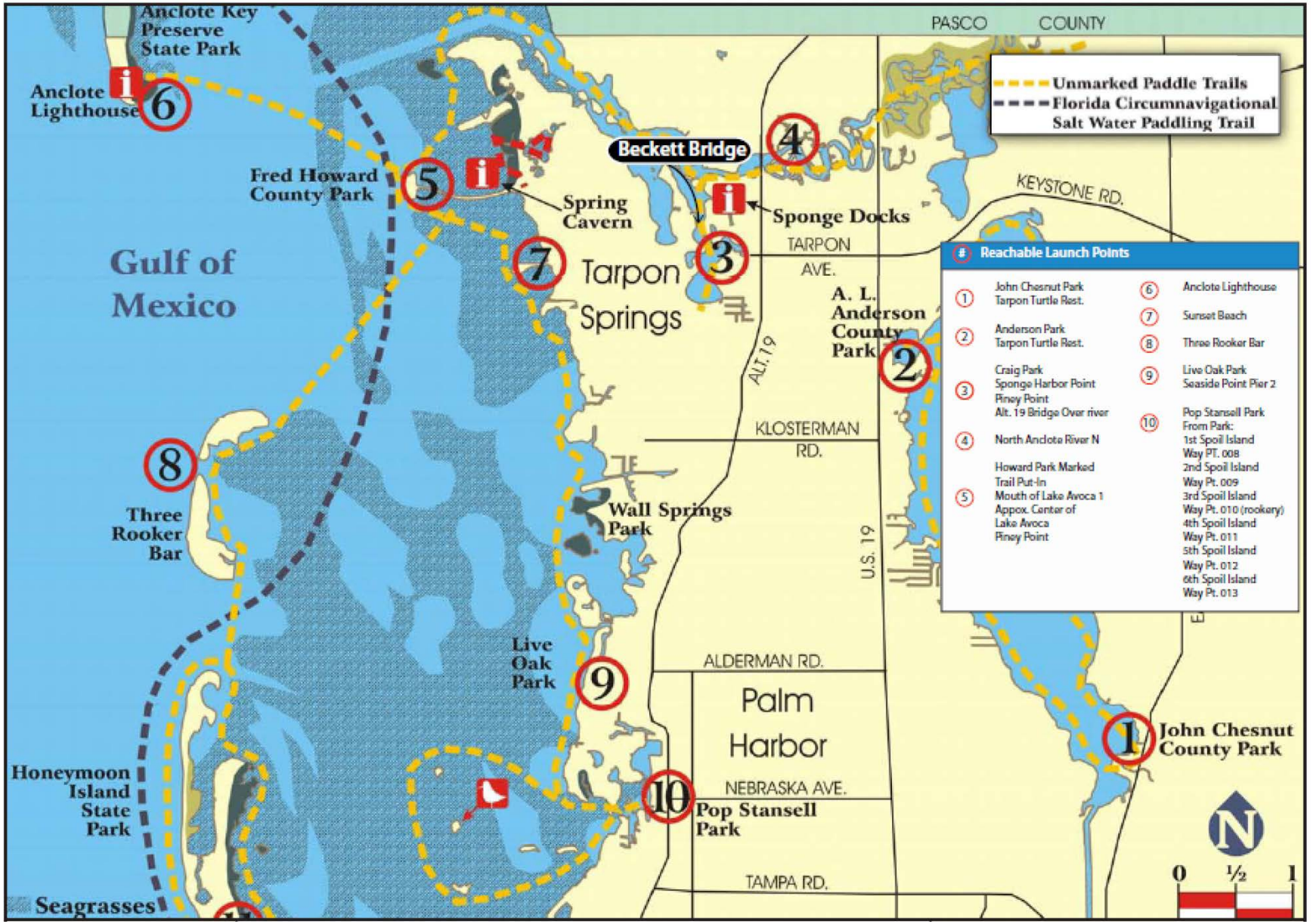


Figure 2-5 – Paddling Trails

3.0 EXISTING CONDITIONS

3.1 EXISTING ROADWAY CHARACTERISTICS

3.1.1 Functional Classification

According to the City of Tarpon Springs Comprehensive Plan and the Pinellas County Comprehensive Plan, the majority of the facilities located within the study area, including Riverside Drive/North Spring Boulevard and the Beckett Bridge from Chesapeake Drive across Whitcomb Bayou to Forest Avenue, are functionally classified as "collector" roadways. Only Alternate US 19 is functionally classified as a "minor arterial."

3.1.2 Roadway Sections

West of the bridge, the existing roadway section consists of two ten-foot travel lanes, with a four to five foot wide utility strip and four to four and a half foot wide sidewalk on the north side. There is no sidewalk on the south side of the roadway. The existing roadway section east of the bridge consists of two 11-foot wide travel lanes with outside shoulders of varying width. Some sections of discontinuous sidewalk do occur on both sides of the roadway. The sidewalks vary in width from four to five feet. Additional discussion concerning existing sidewalks on the roadway is provided in Section 3.1.3 Bicycle and Pedestrian Facilities.

3.1.3 Bicycle and Pedestrian Facilities

Sidewalks, approximately four to five-foot wide, are present on portions of the approach roadway within the project limits. West of the bridge, sidewalks are continuous on the north side of Riverside drive from the bridge extending west of Chesapeake Drive. No sidewalks occur on the south side of the roadway in this area. East of the bridge, continuous five-foot wide sidewalks are present on the north side of Riverside Drive between Pampas and Forest Avenue. A few sections of discontinuous sidewalk do occur on the south side of the roadway between the bridge and Pampas Avenue, and for a short distance just west of Forest Avenue.

Narrow sidewalks, approximately 2'2" in width (between the brush curb and the bridge railing), occur on both sides of the existing bridge. The sidewalks on the bridge are set behind a 9-inch wide, 9-inch tall brush curb, but are not separated from the travel lanes by a traffic barrier. Bicycle lanes are not currently provided on the roadway or bridge within the project limits. Bicyclists have been observed using the travel lanes and the narrow sidewalks.

3.1.4 Right-of-Way

Existing right-of-way varies between 37 feet and 50 feet within the project limits. The existing right-of-way is 40 feet wide from the bridge west to Chesapeake Drive. From the bridge east to Pampas Avenue the right-of-way is 50 feet wide. Between Pampas Avenue and Forest Avenue, the existing right-of-way varies from 37 feet to 43 feet wide. The roadway is approximately centered within the existing right-of-way. The existing bridge is approximately centered within a 50-foot wide Sovereign Submerged Land Easement. The width of the easement increases to 100 feet at the channel to accommodate the fender system.

3.1.5 Horizontal and Vertical Alignment

The existing horizontal alignment of Riverside Drive/Spring Boulevard through the project limits is curvilinear, encompassing four horizontal curve segments separated by connecting tangents. The western most section east of Chesapeake Drive follows a tangent alignment with a bearing of S 89º 10' 16" E. From Chesapeake Drive to the bridge there is a 28º 39' horizontal curve with a connecting tangent to the east on a bearing of S 84º 55' 16" E. The west approach to the bridge is on a 28º 39' horizontal curve that transitions to a tangent alignment across the bridge with a bearing S 89º 19' 12" E. The alignment east of the bridge transitions to a 34º 43' horizontal curve at Pampas Avenue. The tangent alignment east of Pampas Avenue transitions from a bearing of S 44º 05' 54" E to a 38º 12' horizontal curve to Forest Avenue. The tangent alignment east of Forest Avenue is on a bearing of S 64º 04' 20" E.

The existing vertical alignment within the project limits consists of a bridge profile with a crest near the center of the channel. The roadway profile grades along the bridge approaches and adjoining roadway segments range from a minimum of 0.20 percent to a maximum of 1.30 percent.

3.1.6 Drainage

The existing drainage system within the project limits is predominantly sheet flow along the Riverside Drive roadway to Whitcomb Bayou/Spring Bayou which outfall to the Anclote River. The existing Beckett Bridge discharges directly to the Whitcomb Bayou/ Spring Bayou via scuppers and at the bridge approaches. Currently no existing stormwater management facilities are located within or adjacent to the project limits.

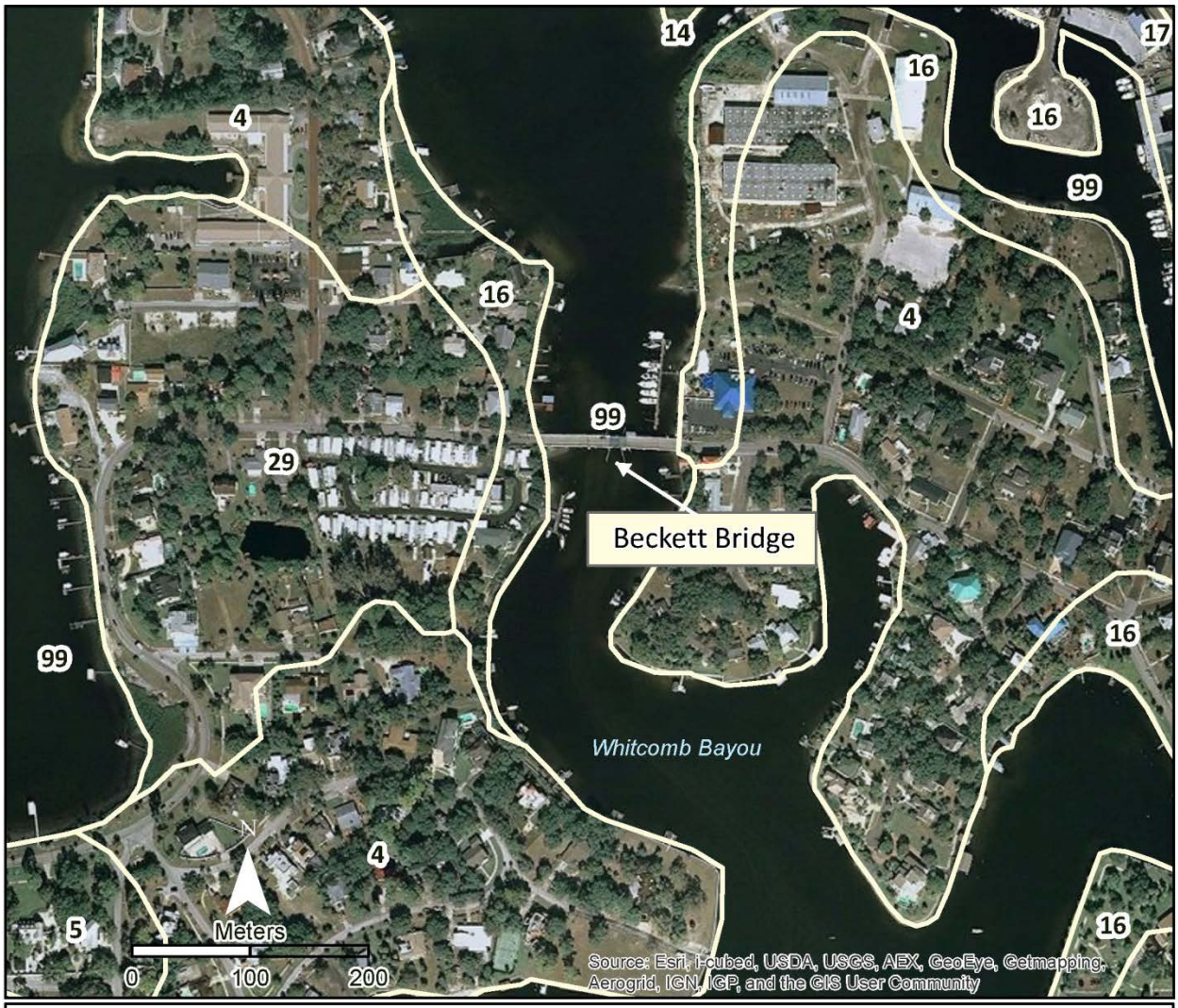
3.1.7 Geotechnical Conditions

3.1.7.1 Soils

Based on a review of the Pinellas County Soil Survey published by USDA Natural Resources Conservation Service (NRCS), it appears that there are three soil-mapping units noted within the project limits. A detailed soil survey map is shown in **Figure 3-1**. The general soil descriptions are presented in the sub-sections below, as described in the Web Soil Survey. **Table 3-1** summarizes information on the soil mapping units obtained from the Web Soil Survey.

Table 3-1 – Pinellas County USDA NRCS Soil Survey Information

USDA Map Unit and Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)	pH	Seasonal High Water Table	
		USCS	AASHTO			Depth (feet)	Months
(4) Astatula-Urban land	0-3	SP, SP-SM	A-3	20.0 - 49.9	4.5-6.5	---	Jan-Dec
	3-80	SP, SP-SM	A-3	20.0 - 49.9	4.5-6.5		
	---	---	---	0.0 - 0.0	---	---	Jan-Dec
(16) Matlacha-St. Augustine Urban land	0-42	SP, SP-SM	A-3	2.0 - 6.0	6.1-8.4	2.0-3.0	June-Oct
	42-80	SP, SP-SM	A-3	6.0 - 20.0	6.1-8.4		
	0-8	SP, SP-SM	A-3	6.0 - 20.0	6.1-8.4	1.5-3.0	June-Oct
	8-33	SP-SM	A-2-4	2.0 - 20.0	6.1-8.4		
	33-48	SP, SP-SM	A-3	6.0 - 20.0	6.1-8.4		
	48-63	SM, SP-SM	A-2-4	2.0 - 20.0	6.1-8.4		
	63-80	SP, SP-SM	A-3	6.0 - 20.0	6.1-8.4		
	---	---	---	0.0 - 0.0	---	---	Jan-Dec
(29) Tavares-Urban Land	0-5	SP, SP-SM	A-3	6.0 - 20.0	3.5-6.5	3.5->6.0	June-Dec
	5-80	SP, SP-SM	A-3	6.0 - 20.0	3.5-6.5		
	---	---	---	0.0 - 0.0	---	---	Jan-Dec



Legend

4 - Astatula Soils and Urban Land, 0 to 5% Slopes
5 - Astatula Soils and Urban Land, 5 to 12% Slopes
14 - Kesson Fine Sand, Very Frequently Flooded
16 - Matlacha and St. Augustine Soils and Urban Land
17 - Myakka Soils and Urban Land
29 - Tavares Soils and Urban Land
99 - Water

Figure 3-1 – USDA Soils Map

Astatula Soils and Urban Land (Unit 4)

The Astatula component makes up 50 percent of the map unit. Slopes are zero to five percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. This soil is not flooded or ponded. There is no zone of water saturation within a depth of 72 inches.

Matlacha and St. Augustine Soils and Urban Land (Unit 16)

The Matlacha component makes up 32 percent of the map unit. Slopes are zero to two percent. This component is on fills on ridges on marine terraces on coastal plains. The parent material consists of sandy mine spoil or earthy fill. This soil is not flooded or ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, and October.

The St. Augustine component makes up 32 percent of the map unit. Slopes are zero to two percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of sandy mine spoil or earthy fill. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during June, July, August, September, and October.

Tavares Soils and Urban Land (Unit 29)

The Tavares component makes up 50 percent of the map unit. Slopes are zero to five percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November, and December.

Riverside Drive, via the Beckett Bridge, crosses the Whitcomb Bayou/Minetta Branch of the Anclote River. Based on the USDA Soil Survey of Pinellas County, Florida, the seasonal high groundwater table ranges from about 1½ to greater than six feet below grade. Due to the proximity of the project to the river and Bayou it is anticipated that the water table is tidally influenced.

3.1.7.2 Geotechnical Bridge Considerations

A *Geotechnical Technical Memorandum* was prepared in April 2012 as part of this PD&E Study by Tierra, Inc. The memorandum was published separately and can be found in the County's project files. Additional detailed information can be found in this memorandum. This section

of the Preliminary Engineering Report (PER) summarizes the findings of that memorandum.

The Beckett Bridge is a multi-spanned bridge that has been reported to have experienced lateral movement and subsidence. The bridge approach spans were reconstructed in 1956 using reinforced concrete, however, the original bascule span remained. Structural repairs were performed between 1979 and 2011 including the installation of crutch bents.

Williams Earth Sciences provided a report dated November 10, 1994, which provided recommendations for the installation of crutch bents using H-Piles. During the 1994 study, Williams preformed three Standard Penetration Tests (SPT) borings; one was performed at the west abutment, one at the east abutment, and one was performed in the vicinity of the Bent 5, adjacent to the bascule. The two abutment borings were performed from land and the Bent 5 boring was performed from the bridge (as opposed to a barge over water). Two SPT borings were also performed by Professional Service Industries (PSI). These two borings were performed at Bent 6 from the bridge. One was performed in the westbound lane and the other was performed in the eastbound lane. The report for this study is attached as Appendix C.

An additional geotechnical study was completed in 2009 by Williams Earth Sciences which included an Electrical Resistivity Geophysical Report by Subsurface Evaluations, Inc. (SEI). The Williams report along with the SEI report is provided as Appendix C. Soil descriptions and discussion are summarized below.

During the 2009 study, Electrical Resistivity Imaging (ERI) was conducted. The purpose of the ERI testing was to determine the vertical extent and lateral continuity of soil layers and to identify possible karst hazards within the river along the sides of the bridge. The ERI testing was performed by SEI and their report, dated April 28, 2009, is included in Appendix C.

The results of the ERI testing indicated several features and anomalies within the vicinity of the bridge footprint. First, there appears to be an anomaly near Bent 6, with the center approximated just north of the bridge, as depicted on Figure 1 of the SEI report. In addition, there appears to be a shelf at about 20 to 40 feet in depth indicating a change in soil material and/or density, as indicated on Figure 1 of the 2009 report.

Boring B-1 (PSI) was performed very close to the ERI anomaly indicated at Bent 6. PSI Boring B-1 indicates that there is a dense grading to medium dense dark brown to brown fine sand with a trace of silt from the mud-line to about 10 feet below the mud-line, followed by a nine foot

thick layer of stiff dark gray sandy silt, from 10 to 19 feet below the mud-line. The silt layer was underlain by a relatively thin layer of hard limestone, from 19 to 24 feet below the mud-line. From 24 to 40 feet below the mud-line, a medium dense grading to very loose layer of brown sand with a trace of silt (SP-SM) was encountered. A second layer of hard limestone was present from 40 to 45 feet below the mud-line, followed by medium dense brown fine sand with a trace of silt (SP-SM) to the termination depth of the boring at about 57 feet below the mud-line.

Boring B-1 (PSI) and the ERI results correlate at Bent 6. In addition, this anomaly can be considered indicative of Karst conditions and potential weathering/ solutioning of the limestone. Boring B-2 was also performed at Bent 6, on the opposite side of the bridge (eastbound lane). This boring indicated somewhat similar soils to Boring B-1, however, there was no evidence of the stiff silt layer at 10 to 19 feet below the mud-line.

The borings conducted by Williams in the 1994 study indicated a soil stratigraphy that was quite dissimilar to the borings conducted at Bent 6 by PSI. These borings generally indicate a surficial layer of sands to silty sands or clayey soils, followed by very hard limestone to the full depth of the borings. There were a few minor variations in the subsurface soils, such as a thin layer of clay (CH) material in boring B-1 at a depth of 47 to 58 feet below the ground surface; a very loose shelly fine sand layer from 77 to 84 feet below the mud-line at boring B-2; and a possible void from 69 to 71 feet below the ground surface at boring B-3. The medium dense fine sand with a trace of silt soil was not encountered in the SPT borings conducted by Williams.

Encountering highly dissimilar soils in a relatively short distance indicates that this area potentially has localized karst features. The Anclote River area is known for variable subsurface conditions and karst features. The subsurface is characterized by a sand layer overlying shallow limestone. There is a lack of clay layering in this area and this condition can promote localized subsidence and raveling of the surficial soils into the karst limestone. Review of the ERI results indicates that the surficial karst solution features, or surficial relic sinkhole features, may be more prevalent near the center of the bridge. There also appears to be an apparent shelf, as indicated on ERI transects T3 and T4. Review of ERI transects T3, T4 and T5 indicate the possibility of a solution zone near to and below the bridge footprint that may be located in a southwest orientation. However, it should be noted that the bascule bridge footing and the piles may be providing interference of the ERI data and therefore additional geotechnical

exploration is warranted to verify subsurface conditions.

The Williams report indicates that there has been settlement and rotation of the bents and/or bascule pier. There are a number of potential causes for this, both structurally and geotechnically; however, from a geotechnical standpoint, the causes may be due to subsidence of the piles due to 1) active solutioning of the limestone, or 2) insufficient pile bearing both axially and laterally, or a combination of both. Another consideration is the age of the timber piles supporting the bascule pier, which are more than 85 years old. The timber piles could be in poor condition due to fatigue, rot or some other form of deterioration.

HP 14x73 crutch bent piles were installed in 1996. The 1996 plans indicate crutch bents at Bent 6 and Bent 7, and pier stabilizers for the bascule. The lengths of the crutch bent piles varied dramatically from tip elevations of about -30 to -200 feet. These lengths were taken from old facsimile correspondence between Williams and DSA.

There was a minimum tip elevation of -35 feet indicated on the plans; therefore, one of the piles did not achieve the minimum tip elevation in accordance with the plans. The piles were also supposedly preformed to an elevation of -27 feet, and the preformed hole was supposed to be grouted. The HP crutch bent piles were also planned to be jacketed using an epoxy mix from elevation -4 to +4 feet, at the splash zone of the piles. The 2007 Bridge Inspection Report, prepared by Volkert & Associates, Inc., states that the "jackets are in good condition with no washouts or exposed base pile".

3.1.8 Crash Data

Crash data was obtained from Pinellas County for the five-year period from 2005 to 2009. A summary of crashes occurring at six intersections, five within the project limits and one east of the project, are provided in **Table 3-2**. The location of these intersections is shown on **Figure 3-2**. A total of nine crashes occurred between 2005 and 2009. The highest number of crashes (three) occurred at the intersection of Spring Boulevard and Pampas Avenue within this time period.

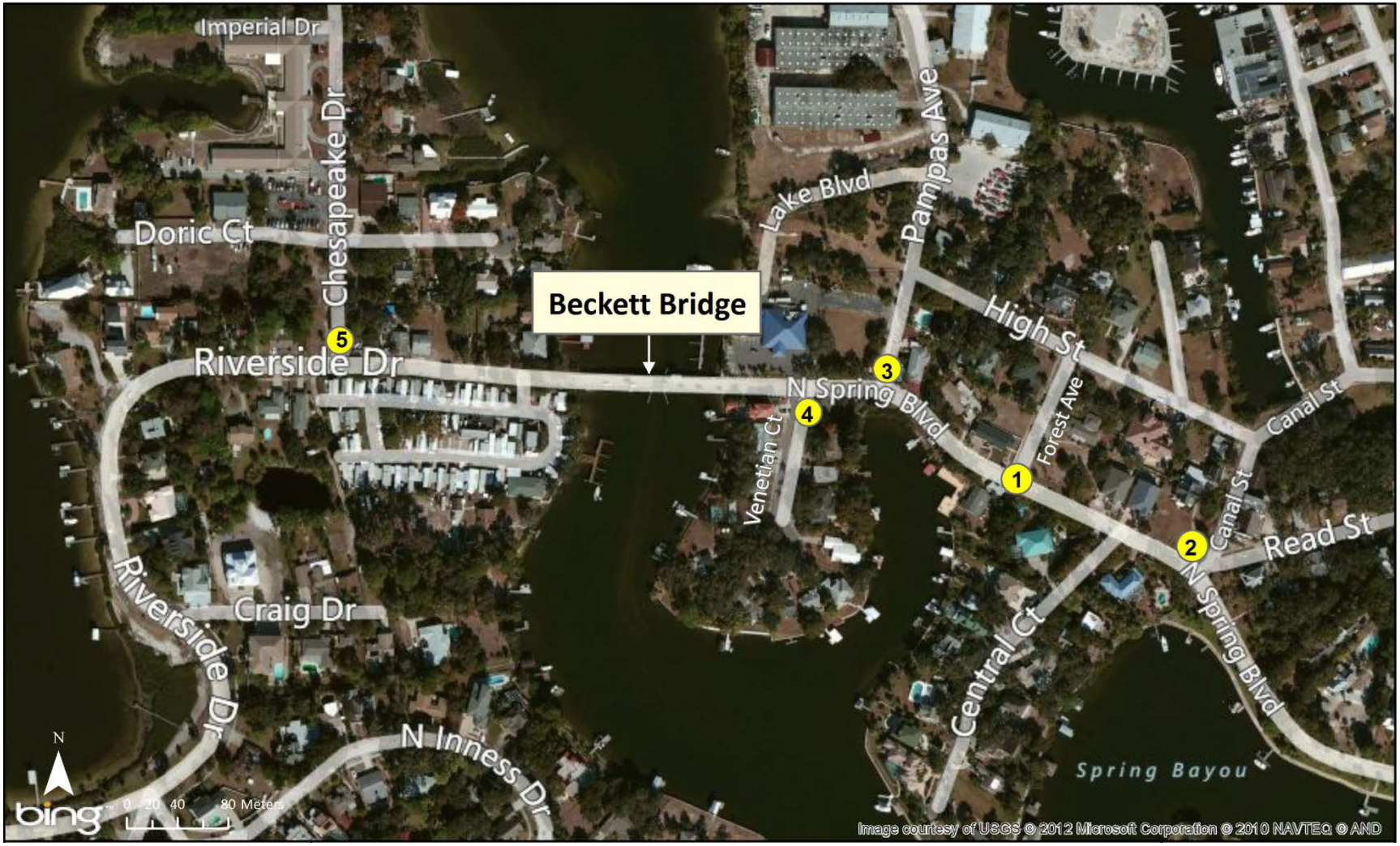


Figure 3-2 – Location of Crash Data Nodes

Table 3-2 – Intersection Crash Summary (2005 – 2009)

Intersections	Node	Year/Number of Crashes Year/Number of Crashes						Intersection Crash Rate Intersection Crash Rate	
		2005	2006	2007	2008	2009	Total	Project Crash Rate (Crashes/MEV)	Statewide Crash Rate (Crashes/MEV)
Spring Boulevard/ Forest Avenue	**1**					1	**1**	0.071	0.338
Spring Boulevard/ Canal Street	**2**				1		**1**	0.071	
Spring Boulevard/ Pampas Avenue	**3**	2		1			**3**	0.213	
Spring Boulevard/ Venetian Court	**4**				1		**1**	0.071	
Riverside Drive/ Chesapeake Drive	**5**			1	2		**3**	0.213	
Total **Total**		2 **2**	0 **0**	2 **2**	4 **4**	1 **1**	9 **9**		

Source: Pinellas County.

Table 3-3 shows the crash frequency by type of crash, crash frequency by severity, and comparison of the corridor crash rate with the statewide average for similar roadways. Of the nine crashes, one involved rear-end collisions, one was classified as a side swipe, and one involved collision with a fixed object (sign). The remaining four were classified as types other than those described above. Review of the accident reports indicate that these accidents involved a bicyclist losing control of a bicycle, a motorcyclist losing control of a motorcycle, and a driver falling asleep at the wheel and running off the road. The average crash rate for the Riverside Drive/Spring Boulevard corridor in the vicinity of the Beckett Bridge was 2.669. This crash rate is less than the statewide average of 3.243 for similar facilities.

3.1.9 Intersections and Signalization

There are no signalized intersections within the project limits. Four local roads intersect Riverside Drive/Spring Boulevard within the project limits. Chesapeake Drive intersects Riverside Drive west of the bridge. Venetian Court, Pampas Avenue and Forest Drive intersect Spring Boulevard east of the bridge.

Table 3-3 – Corridor Crash Summary (2005 – 2009)

Corridor			Frequency by Crash Type								Frequency by Crash Severity			Corridor Crash Rates	
Description	Functional Class	Length (Miles)		Total	Angle[1]	Over Turned	Rear End	Side Swipe	Head On	Collision with Other Object	All Other[2]	Fatality	Injury	Property Damage	Project Crash Rate (crashes/MVMT)	Statewide Average Rate[3] (crashes/MVMT)
Riverside Drive/Spring Boulevard	Urban Collector	0.24	5-Year	9	0	0	3	1	0	1	4	0	1	8	2.669	3.243
			Average	1.8	0.0	0.0	0.6	0.2	0.0	0.2	0.8	0.0	0.2	1.6		

Source: Pinellas County Traffic Records 2005 – 2009

[1] Includes left-turn and right-turn type crashes

[2] Includes all other crash types for which specific crash type is not listed

[3] Statewide average crash rate based on the five-year data from 2005 to 2009

MVMT = million vehicle miles traveled

3.1.10 Lighting

Existing lighting consists of standard cobra head luminaires mounted on steel poles or wood utility poles. West of the bridge, light fixtures are located on the south side of the roadway. East of the bridge, lighting is provided on the north side of the roadway. One steel light pole is attached to the bridge just west of the bascule span.

3.1.11 Utilities

Knology Broadband of Florida, Bright House Networks, Progress Energy Florida, Verizon, and the City of Tarpon Springs operate utilities within the project area. Knology Broadband has aerial coaxial cables entering the project area along Spring Boulevard on the east side of the bridge and along Riverside Drive on the west side of the bridge. These Knology cables are co-located on Progress Energy utility poles. Spurs of the aerial coaxial cables extend along Chesapeake Drive from Doric Court to the Bayshore Cove Mobile Park, and along Forest Avenue from North Spring Boulevard to High Street. In addition, a Knology broadband underground coaxial cable is located adjacent to the Tarpon Springs Yacht Club along the north side of Spring Boulevard.

City of Tarpon Springs wastewater force mains are located along Riverside Drive. A six inch force main is located on the south side of the bridge and a 12 inch force main is located on the north side of the bridge; however, these mains are located outside of the bridge fender system**.** A pump station is located on the north side of Riverside Drive at Chesapeake Drive. No other City utilities occur within the project limits.

3.2 EXISTING BRIDGE

3.2.1 Bridge Repair History

The Beckett Bridge was first constructed in 1924. It featured timber approach spans, a concrete bascule pier and steel draw span. All original foundations consisted of timber piling. Beckett Bridge connected east and west Tarpon Springs, carrying travelers over Whitcomb Bayou. Prior to construction of the bridge, the only available route for travel to the eastern side of Tarpon Springs from the west was Meres Boulevard or Whitcomb Boulevard, both located south of Whitcomb Bayou. The Beckett Bridge created a shorter travel route to both the eastern residential areas and the newly constructed Sunset Hills Country Club.

In 1955, the County deemed the Beckett Bridge unsafe and determined repairs to the original timber approach spans would not be feasible. Local newspaper articles indicate that a contract was let in 1956 to reconstruct the bridge. The reconstruction of the approach spans was completed in 1956 and retained the original concrete bascule pier, steel draw span and machinery. The remainder of the bridge was reconstructed with a concrete superstructure, supported on concrete bent caps, founded on concrete piles. Plans for the 1955 – 1956 reconstruction have not been located. The USCG has no record of a request for a bridge permit for these changes.

By 1995 differential settlement of the structure was evident. The settlement resulted in misalignment of the steel draw span, causing it to rub against the adjacent fixed concrete approach structure. Uneven wear on the machinery was noticeable. The County let a contract for a major rehabilitation of the bridge in 1996. The rehabilitation included the addition of steel crutch bents to stabilize the settlement, repair of the steel draw span and the concrete approach spans, refurbishment of the machinery, replacement of the electrical system, and construction of a new control house. Rehabilitation did not include bridge widening.

In 1997, the main machinery drive shafts failed during testing of the draw span subsequent to the 1996 repairs described above. The failure was attributed to bridge tender error when operating the bridge. Repairs to correct this problem were completed in December 1997. Subsequent to these repairs, wear on the machinery system due to the inherent misalignment of the draw span continued to develop. In 2011, the bridge became inoperable due to continued deterioration and misalignment, including development of an offset in the curb line between the bascule span and approach span. To correct this, another contract was let for additional bridge repairs that included modification of the curb and deck joints to compensate for misalignment, replacement of the span lock mechanisms, installation of a centering device, replacement of a pinion shaft and pinion bearing, and repair of the rack gears. Cleaning and painting of corroded structural steel was also performed.

3.2.2 Structure Type/Span Arrangement

The existing bridge is a 358’-6” long low-level bridge consisting of ten spans, including a 40’-3 ¾” long bascule span over Whitcomb Bayou. Horizontally, the bridge is aligned normal to the navigation channel within the bayou. Vertically, the bridge profile features a crest centered

approximately at the navigation channel. The approach span superstructure consists of a reinforced concrete deck supported by five AASHTO type beams. The sidewalk deck is cantilevered beyond the exterior beams. The superstructure is supported by pile bents consisting of reinforced concrete caps and driven prestressed concrete piles.

The bascule portion of the bridge consists of a steel single-leaf rolling lift span with a length of 31'-3" from centerline roll to leaf tip. The bascule span superstructure consists of a steel open grid deck supported by a framework of steel stringers, floorbeams and two main girders. The sidewalks on the bascule span cantilever outboard of the main girders and are supported with brackets. The leaf is balanced by a concrete counterweight at the tail of the leaf to reduce the power requirements needed to raise the bridge. A reinforced concrete bascule pier supports the bascule leaf at the center of roll. The tip of the leaf is supported by a pile bent when the bridge is in the lowered position. A control house, located at the northeast portion of the bascule span, contains the electrical equipment needed to operate the bridge.

The bascule leaf is a Scherzer rolling-lift type. The leaf and counterweight pivot about an axis that also moves horizontally as it rotates on curved tread plates attached to each bascule girder and supported on flat tracks located on the bascule pier. The leaf is driven by an electric motor coupled to bridge mounted drive machinery consisting of open spur gears. A pinion located at the center of roll of each bascule girder engages a horizontal flat rack, supported on the bascule pier, to actuate span motion. Vehicular traffic is controlled by traffic gates and traffic signals located on the bridge approach spans. Additionally, a barrier gate located on the west approach spans provides a physical deterrent to inhibit vehicles from approaching the deck opening when the span is in the open position.

The bridge intersects the navigation channel at a 90^{o} angle. Waterborne vessels are guided between the bascule piers by a fender system consisting of timber rub rails attached to driven timber piles. Navigation lights mounted to the fender system and the bascule leaf provides a warning indication. The channel has a minimum horizontal width of 25 feet between faces of fenders. When the bascule leaf is in the closed position there is approximately six feet of vertical clearance at the face of the east fender. When the bridge opens, the leaf rolls away from the channel and rotates to a 49 degree angle. The angle of opening is limited by physical constraints present in the geometric configuration of the counterweight, bascule pier, and

approach span. It is not known if these limitations are the result of original construction or subsequent reconstruction and/or repair. However, in this position the bridge provides unlimited vertical clearance only between the west fender and the tip of the span of approximately 14 feet. The rest of the channel is obstructed by the bascule span.

3.2.3 Current Condition and Year of Construction

General Condition: The description of the overall condition of the existing bridge is based on the FDOT Bridge Management System *Inspection/CID (Comprehensive Inventory Data) Reports* including Special-Other Bridge Report dated June 27, 2013, Special Movable Inspection Report dated July 31, 2012, and Regular NBI with Movable dated July 28, 2011. The bridge was constructed in 1924 and currently has a Structure Inventory and Appraisal Sufficiency Rating of 44.9 out of 100. The Health Index is 88.44.

The 2011, 2012 and 2013 Inspection Reports are provided in **Appendix D.** Pictures of bridge elements, including bridge machinery and electrical systems, which illustrate their current condition are included in the 2011 Addendum and 2012 Addendum.

The Sufficiency Rating is a method of evaluating highway bridge data by calculating factors to obtain a numeric value, which is indicative of bridge sufficiency to remain in service. The sufficiency rating includes the following applicable primary factors:

1. Structural Adequacy and Safety including:
    a. Superstructure Condition
    b. Substructure Condition
    c. Load Carrying Capacity
2. Serviceability and Functional Obsolescence including:
    a. Deck Condition
    b. Overall Structural Condition
    c. Roadway Geometry
    d. Traffic Volume
3. Essentiality for Public Use including:
    a. Traffic Volume

b. Detour Length

c. Probability of Bridge Closure

The overall condition of the bridge is consistent with the age and severe exposure conditions. The movable span of the bridge has been in service for 88 years. At the time of construction it was customary to design a bridge with an anticipated service life of 50 years. Although the bridge operates infrequently, functional and operational deficiencies have developed despite efforts to correct these deficiencies. There have been recurring misalignment issues at the joints of the approach spans, as well as at the joint between the bascule leaf and bascule rest pier. These misalignments have led to lack of continuity of the curb line and rubbing of the bascule leaf railing on the railing at the bascule leaf pier. The discontinuity of the curb has reportedly led to several tire punctures. Periodic attempts have been made to correct and/or arrest these alignment issues.

The most recent Bridge Inspection Report (November 2011) indicates that the overall condition rating of the deck is *Good*, the superstructure is considered *Satisfactory*, and the substructure is considered *Satisfactory*. The overall performance rating is *Good* but the bridge is classified as *Functionally Obsolete*. The bridge has reached a threshold at which deficiencies and deterioration are expected to accelerate. Specifically, conditions of concern include:

Misalignment and Settlement: While some remedial measures in the form of crutch bents and helper piles have been installed in an attempt to mitigate the long term settlement and associated misalignment of the structure, evidence of continued problems remains. Specifically, the bascule span continues to trend towards one side and the deck joints and curbs exhibit misalignment. It appears unlikely that correction of one deficiency or symptom would provide full resolution. A comprehensive rehabilitation would be required to correct the leaf misalignment and secure it from further abnormal movement. The corrective measures implemented in 2011 are expected to only provide a short term solution. In addition to the effects of settlement, the curved tread plates and flat track plates exhibit problems that contribute to the bascule span's overall misalignment issues.

Bascule Drive System: The condition of the drive system (i.e., machinery) is consistent with the age and misalignment of the structure. In general, the machinery, including the rack and pinion

teeth, pinion shafts, and bascule track and treads exhibits advanced wear and deterioration. The wear has advanced to the point where it is expected to accelerate. With worn gears there is more clearance (backlash) between meshing teeth. As the backlash increases, the wear to the teeth accelerates. In addition, the bascule tracks and treads are not properly aligned. This has resulted in uneven wear to these components and may be a contributing factor to the variations in load on the main rack and pinions. During the 2011 repairs, deficiencies in the design of the drive machinery were also identified. The current pinion shafts do not meet current design requirements established by AASHTO.

Span Locks: The forward span lock assemblies at the tip end of the bascule leaf were replaced in 2011 and are in good working condition.

Load Capacity: The bridge load capacity was determined in 1987. According to the load rating, the structure should be posted at or below the following: Single Unit Truck – 12 tons and Combination Trucks – 20 tons. The bridge is actually posted at both approaches as follows: Single Unit Truck – 12 Tons, Combination Truck – 15 tons, and Truck and Trailer – 15 tons.

Fender System: The 2011 bridge inspection report notes that marine borer activity is evident on several of the fender piles and lower wales. It is likely that this activity will cause the piles and wales to deteriorate near the waterline. Affected piles will need to be replaced.

Safety Considerations: There are several factors that contribute to the functional obsolescence of the existing bridge. The concrete post and beam bridge railings are substandard, as they do not meet current standards for roadside safety in terms of both geometry and impact resistance. Railings for new bridges are required to meet specific crash testing and geometric requirements outlined in *National Cooperative Highway Research Program (NCHRP) Report 350, Recommended Procedure for the Safety Performance Evaluation of Highway Features* which has been adopted by AASHTO and FDOT. The 9-inch curbs along the edge of travel lanes are generally considered a safety concern due to the propensity to launch errant vehicles. The approach guardrails, guardrail end treatments and transitions do not meet current design standards.

Wave Vulnerability: The existing bridge is low and susceptible to waves from a coastal storm event. According to the *Final Report, Design Storm Surge Hydrographs for the Florida Coast, D.*

Max Sheppard and William Miller Jr., September 2003, the 100-yr Storm Surge Elevation for the Anclote River is approximately 11.5 feet. The storm surge elevation at the bridge is anticipated to be similar to this elevation and the existing bridge low member elevations are below the storm surge elevation.

It is anticipated that wave heights at the bridge during a coastal storm event would not be substantial because of the lack of a significant fetch needed to develop wind-driven waves and the presence of topographical features, including numerous adjacent residential buildings and trees that reduce wind velocities at the surface of the water. Although the waves are not expected to be large, the existing bridge contains details that make it susceptible to damage from waves. Specifically, the beams introduce multiple vertical surfaces exposed to the waves that can yield large wave forces even when the waves are not large. The presence of diaphragms at each end of the spans creates conditions that can trap air and magnify vertical forces that act to lift the span. Because the simple-span superstructure is not anchored to the substructure, there are no lateral restraints to prevent the waves from pushing the superstructure off of the substructure. The pile bent substructures have limited capacity to resist lateral wave forces.

The existing Beckett Bridge is important for evacuation during a storm event. Although it is not considered a designated emergency evacuation route, it is considered an extension of Tarpon Avenue, which is a designated emergency evacuation route. Wave vulnerability during a storm event could impact the reliability of the existing bridge for evacuation.

3.2.4 Typical Section

The existing bridge typical section consists of one 10-foot wide through lane in each direction and 2'-2" sidewalks on both sides of the roadway. The sidewalks are level with the roadway surface and are separated from the travel lanes by 9-inch high by 9-inch wide curbs. Concrete post and beam railings 2'-8" high are located at the back of the sidewalk. Separate bicycle lanes are not provided; both bicyclist and pedestrians share the sidewalk. The overall existing bridge width is 28 feet (see **Figure 3-3**).

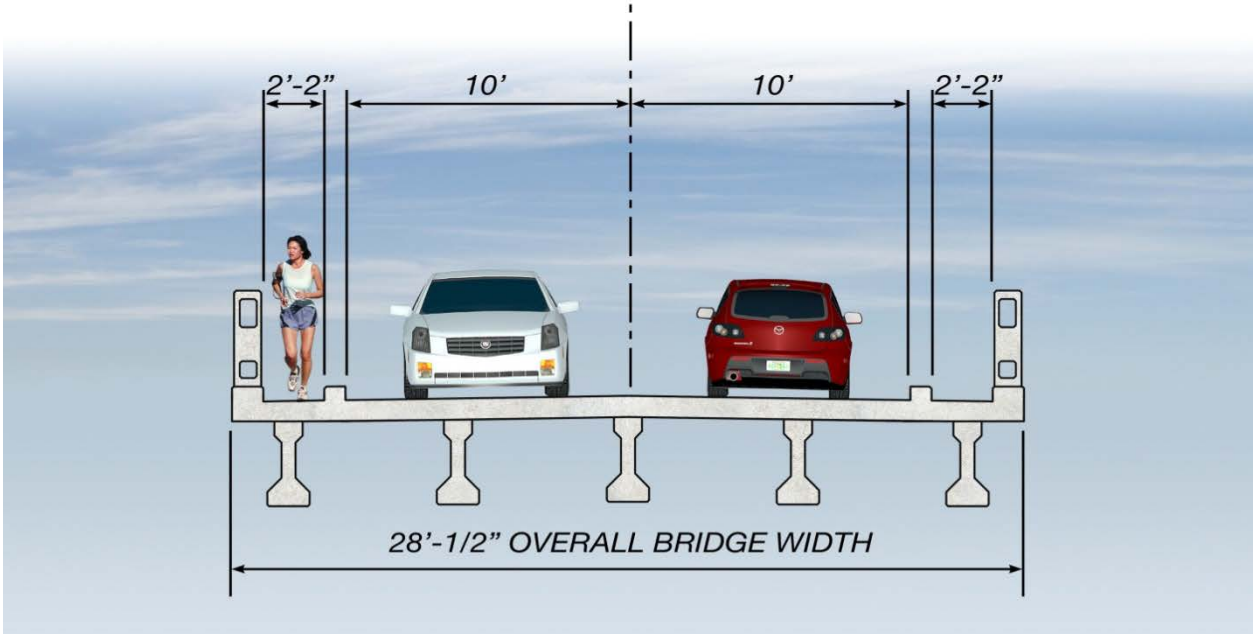


Figure 3-3 – Existing Bridge Typical Section

3.2.5 Horizontal and Vertical Alignment

The bridge is aligned horizontally at a 90° angle to the channel. Vertical curve information for the bridge is not known with certainty. The 1923 permit sketches for the original bridge indicate a +1.29% grade west of the bridge, a level section 100 feet long over the channel (offset to the west from the centerline of the channel), and a -0.71% grade east of the bridge. No information is available from the 1955 reconstruction to indicate if the approach grades were modified at that time. Survey information along the bridge is also inconclusive. The survey indicates a level section across the channel, but the approaches exhibit a varying grade. Some of this may be due to past settlement. However, a best fit vertical curve created to match the surveyed profile appears to meet current minimum design standards for stopping distance and headlight distance for the 35 mph design speed.

3.2.6 Bridge Openings

Pinellas County owns and operates the Beckett Bridge. The US Coast Guard regulations state that the bridge will open on demand with two hours advance notice. Pinellas County maintains records of bridge opening requests. The number of openings for each month in 2009 through 2012 are provided in **Table 3-4**.

Table 3-4 – Number of Bridge Openings 2009 – 2012

Month	2009	2010	2011	2012
January	1	1	1	2
February	1		2	
March	4	1	1	2
April	1	5	2	2
May		1	7	2
June	1	2	2	
July		2	1	4
August		2	1	
September	1	2		
October		2	1**	
November				1
December	1*	3	1	1*
TOTAL	**10**	**21**	**18**	**14**

* Opened for Holiday Boat Parade, Dec 12, 2009 from 7:00 – 9:30 pm and Dec 7, 2012
** Test Opening after Repairs

The bridge opened ten times in 2009, 21 times in 2010, 18 times in 2011 and 14 times in 2012. The highest number of openings occurred in March 2009 and July 2012 (four), April 2010 (five) and May 2011 (seven).

3.2.7 Channel Data

The existing bascule bridge crosses Whitcomb Bayou approximately perpendicular to the channel. Waterborne vessels are guided between the bascule piers by a fender system consisting of timber rub rails attached to driven timber piles. Navigation lights mounted to the fender system and the bascule leaf provides a warning indication. The channel has a minimum horizontal width of 25 feet between faces of fenders. When the bascule leaf is in the closed position there is approximately six feet of vertical clearance at the face of the east fender for the entire width of the channel. When the bridge opens, the leaf rolls away from the channel and rotates to a 49 degree angle. In this open position the bridge provides unlimited vertical only between the west fender and the tip of the span of approximately 14 feet. The remaining 11 feet of the channel is obstructed by the raised bascule span.

Bascule Leaf in Full Open Position – Unlimited Clearance Restricted

3.2.8 Ship Impact Data

The bridge, which crosses Whitcomb Bayou, is not required to be designed to resist vessel impact. The low member vertical clearance is six feet with the bascule span in the closed position. There is no evidence that the existing vertical clearances, in the restricted open and in the closed position, are insufficient for current marine usage, or that the type and number of vessels using the bayou will change dramatically in the future. There are no commercial marinas present in Whitcomb Bayou.

3.3 ENVIRONMENTAL CHARACTERISTICS

3.3.1 Existing and Future Land Use

Existing land use was determined by a field review of the project corridor and review of Existing Land Use maps (July 2007) published in the City of Tarpon Springs Comprehensive Plan. Land use in the area is predominantly residential. Bayshore Mobile Home Park (MHP) is located on the southwest corner of the bridge immediately adjacent to Riverside Drive. The Tarpon

Springs Yacht Club is located on the northeast side of the bridge. Two assisted living facilities, Serenity on the Bayou and Tarpon Bayou Center are located on Chesapeake Drive, just north of Riverside Drive. Stamas Yacht Repair and Restoration is located on Pampas Drive, north of Spring Boulevard. Existing land uses are shown in **Figure 3-4**.

No notable changes in future land use in the vicinity of the project are shown on the 2025 Future Land Use Map (Tarpon Springs Comprehensive Plan). The predominant land use in the vicinity will remain low to medium density residential. The area surrounding the Beckett Bridge is largely built out; accordingly, land for potential new development is limited. Future land uses as identified in the 2025 Comprehensive Plan are shown on **Figure 3-5**.

3.3.2 Community Resources/Emergency Services

Community resources, including those providing emergency services located within approximately 1.5 miles of the project include two fire stations, one police station, one hospital, five religious institutions, and five schools. In addition, the Pinellas County Health Department operates a health center within the City of Tarpon Springs, located approximately 1.2 miles from the Beckett Bridge. The location of these resources and services are provided in **Table 3-5** and on **Figure 3-6**.

The western boundary of the local Tarpon Springs Historic District is located just east of the project at Canal Street. The District, created in 1990, comprises a total land area of approximately 700 acres. The Tarpon Springs Heritage Museum is located in Craig Park south of the project on Whitcomb Bayou. Three City of Tarpon Springs parks, Rotary Park, Sissler Field and Craig Park occur in the project vicinity. Additional information about these cultural resources is provided in Section 3.4 of this report.

Figure 3-4 – City of Tarpon Springs Existing Land Use

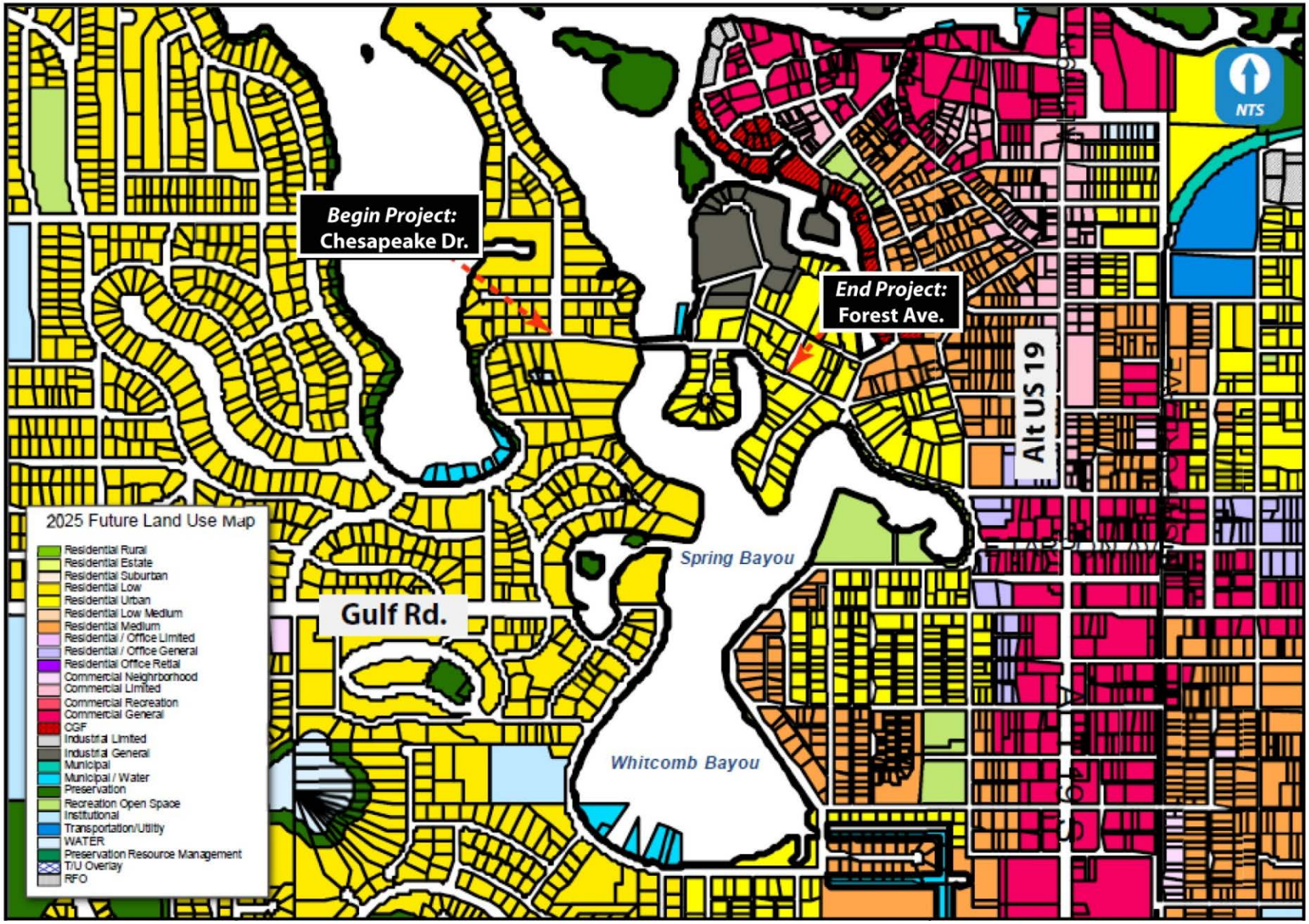


Figure 3-5 – City of Tarpon Springs Future Land Use

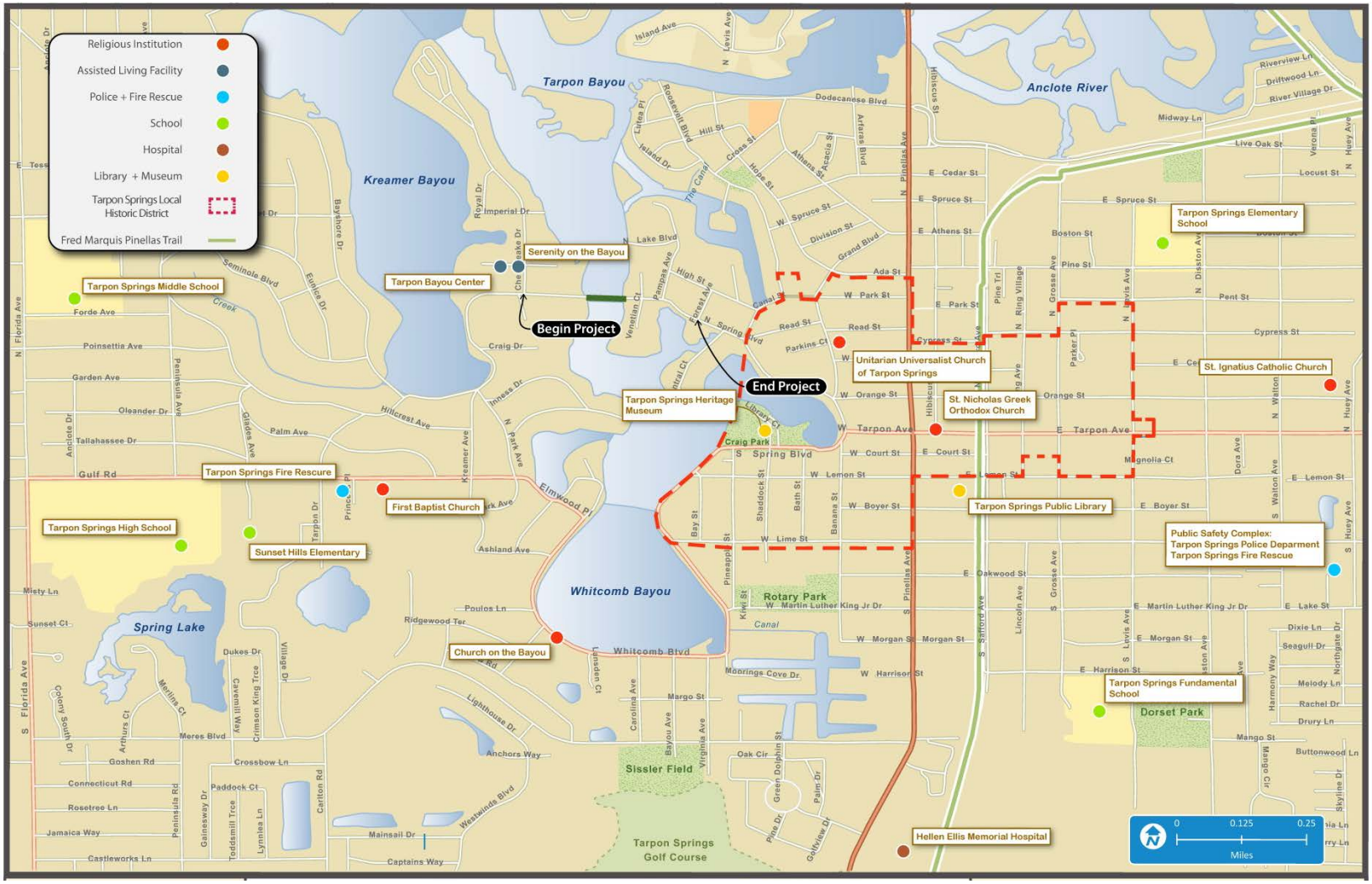


Figure 3-6 – Community Resources/Emergency Services

Table 3-5 – Location of Community Resources

Fire Department		Distance from Beckett Bridge (approximate)
Tarpon Springs Fire Rescue[1]	444 Huey Avenue South Tarpon Springs, FL 34689	1.3 miles
Tarpon Springs Fire Rescue #70	1025 Gulf Road Tarpon Springs, FL 34689	0.6 mile
Law Enforcement		
Tarpon Springs Police Department[1]	444 Huey Avenue South Tarpon Springs, FL 34689	1.3 miles
Hospitals		
Helen Ellis Memorial Hospital	1395 South Pinellas Avenue Tarpon Springs, FL 34689	1.2 miles
Religious Organizations		
St. Ignatius Catholic Church	715 E. Orange Street Tarpon Springs, FL 34689	1.3 miles
St. Nicholas Greek Orthodox Church	36 North Pinellas Avenue (Alt US 19) Tarpon Springs, FL 34689	0.6 mile
Unitarian Universal Church of Tarpon Springs	230 Grand Boulevard Tarpon Springs, FL 34689	0.4 mile
First Baptist Church	1021 Gulf Road Tarpon Springs, FL 34689	0.5 mile
Church on the Bayou	409 Whitcomb Boulevard Tarpon Springs, FL 34689	0.7 mile
Schools		
Tarpon Springs High School	1411 Gulf Road Tarpon Springs, FL 34689	0.8 mile
Tarpon Springs Middle School	501 North Florida Avenue Tarpon Springs, FL 34689	0.9 mile
Tarpon Springs Elementary School	555 E. Pine Street Tarpon Springs, FL 34689	1 mile
Sunset Hills Elementary School	1347 Gulf Road Tarpon Springs, FL 34689	0.8 mile
Tarpon Springs Fundamental School	400 E. Harrison Street Tarpon Springs, FL 34689	1.2 miles

[1] Tarpon Springs Police Department and Tarpon Springs Fire Rescue Share the Public Safety Facility.

3.3.3 Wetlands

In February 2012, environmental scientists familiar with Florida wetland communities conducted a field review of the project study area. The purpose of the review was to verify and/or refine preliminary wetland boundaries and classification codes established through in-office literature reviews and photo-interpretation.

In June 2012, environmental scientists familiar with seagrass beds conducted a field review to verify the presence/non-presence of seagrass beds within the project study area. During field investigations, each wetland within the project study area was visually inspected. Attention was given to identifying plant species composition for each wetland and adjacent upland habitats.

Exotic plant infestations and any other disturbances, such as soil subsidence, canals, power lines, etc. were noted.

Based on field data and in-house reviews, one surface water was identified within the project study area. This tidally-influenced, estuarine surface water is known as Whitcomb Bayou. Two wetland habitat types are included within the Whitcomb Bayou boundaries of the project study area. A detailed description of Whitcomb Bayou and the wetland habitat types are presented below, which includes the Florida Land Use, Cover and Forms Classification System (FLUCFCS) and U.S. Fish and Wildlife Service (FWS) wetland classifications, listings of dominant vegetation, bordering habitat types, size, connections to other wetlands, and observed wildlife utilization. The Land Use/Vegetative Cover Type Map (**Figure 3-7**) shows the land use/habitat types and approximate boundary of Whitcomb Bayou within the project study area. A Wetland Evaluation/Essential Fish Habitat (EFH) Technical Memorandum was prepared for this project and is published separately. Additional information can be found in this document.

Figure 3-7 – Land Use/Vegetative Cover

Surface Water (Whitcomb Bayou)
FLUCFCS: 540 (Bays and Estuaries)
FWS: E2UB3 (Estuarine, Intertidal, Unconsolidated Bottom, Mud)

Bays and estuaries are tidally influenced inlets or large bodies of water that extend from the ocean into the land mass of Florida. Within the project study area, this category includes 10.38 acres of Whitcomb Bayou. Whitcomb Bayou is part of the Anclote River Bayou complex. The Anclote River Bayou complex is a Class III Outstanding Florida Water in the Pinellas County Aquatic Preserve. Within the project area, the west and east shorelines of the bayou are hardened with vertical seawalls.

Bottom sediments within the project study area consist of unconsolidated mud. According to the Florida Fish and Wildlife Conservation Commission (FWC) (2010), the nearest documented seagrass beds are located approximately 200 feet north of the project study area. However, no seagrass or attached macro-algae were observed within the project study area during the June 2012 field review. No seagrass blades or macro algae branchlets were present within the rack line in or adjacent to the project study area.

During the field review, a number of wildlife species were observed utilizing Whitcomb Bayou within and adjacent to the project study area such as mullet (*Mugil* spp.) and sheepshead (*Archosargus probatocephalus*). Two osprey (*Pandion haliaetus*) nests were observed on the same utility pole on the east end of Beckett Bridge on the south side of North Spring Boulevard. At the time of the field review, the nest was occupied by a foraging osprey. Gulls (*Larus* spp.), pigeons (*Columba livia*), royal terns (*Sterna maxima*), and a great egret (*Ardea alba*) were observed outside of the project study area during the review.

Mangrove Swamps
FLUCFCS: 612
FWS: E2SS3 (Estuarine, Intertidal, Scrub-Shrub, Broad-Leaved Evergreen)

Mangrove swamps are typically coastal hardwood swamps where red mangrove (*Rhizophora mangle*) and/or black mangroves (*Avicennia germinans*) are pure or predominant. White mangroves (*Laguncularia racemosa*) are also typically found within these swamps. Within the project study area, mangrove stands are dominated by black mangrove, white mangrove, red mangrove, saltweed (*Philoxerus vermicularis*), and marsh elder (*Iva frutescens*). Mangroves were observed on the west end of Beckett Bridge, north and south of the existing roadway. In addition, mangroves and associated species were observed along Whitcomb Bayou on the

south side of North Spring Boulevard. The mangroves in this area are trimmed and maintained. Mangrove swamps comprise 0.12 acre of the total project study area.

Oyster Bars
FLUCFCS: 654
FWS: E2RF2 (Estuarine, Intertidal, Reef, Mollusk)

Barnacles (*Balanus* sp.) and oysters (*Crassostrea virginica*) were observed attached to the bridge pilings, seawall face, and pieces of debris on the bottom of the bayou. An accumulation of oysters was observed under the east and west ends of Beckett Bridge. Oyster bars comprise 0.17 acre of the total project study area.

Mitigation through Chapter 373.4137, Florida Statute (F.S.) (i.e., Senate Bill, 1986) is not available for this project because FDOT is not the applicant. A review of the available data from Florida Department of Environmental Protection (FDEP) and the water management districts indicates that the proposed project is not located within the service area of any permitted mitigation banks. For the reasons listed above, any unavoidable wetland impacts will have to be mitigated (if required) by creating, restoring, enhancing, or preserving wetlands on-site or off-site within the same drainage basin if there are no mitigation opportunities at the project site.

3.3.4 Water Quality

A Water Quality Impact Evaluation (WQIE) was prepared for this project in accordance with Part 2, Chapter 20 of the *FDOT PD&E Manual*. A copy of the WQIE is included in Appendix E. Whitcomb Bayou is located with the Pinellas County Aquatic Preserve, an Outstanding Florida Waters (OFW) according to the FDEP.

Whitcomb and Spring Bayous are embayments of the lower Anclote River and are included in the Anclote River Bayou complex watershed (EPA WBID 1440A) and the flows into the tidal segment of the Anclote River (EPA WBID 1440). These watersheds have been identified to be impaired for dissolved oxygen, nutrients, coliform and mercury in fish. During the field review, Whitcomb Bayou was mostly clear with a light sheen on the surface. Water quality in the Whitcomb Bayou (part of the Anclote River Watershed basin) is monitored and recorded by the Pinellas County Department of Environmental Management (PCDEM) Water Resources Department. A general review of the data from sampling station 01-05, which is located south

of Beckett Bridge near Whitcomb Boulevard between West Lake Street and Manatee Lane, indicates that salinity concentrations in the Whitcomb Bayou tend to average in the lower to mid-20 parts per thousand.

3.3.5 Wildlife and Habitat

The project study area was evaluated for potential occurrences of federal and state listed protected plant and animal species in accordance with Section 7 of the Endangered Species Act of 1973, as amended, and Chapters 5B-40 and 68A-27 of the Florida Administrative Code (F.A.C.). The evaluation included coordination with the FWS and the Florida Natural Areas Inventory (FNAI). The evaluation also included literature searches and field reviews to identify the potential occurrence of listed species and any designated critical habitat located within the project study area. An Endangered Species Biological Assessment (ESBA) has been prepared for this project in accordance with Part 2, Chapter 27 of the *FDOT PD&E Manual*. The ESBA is published separately for this project and includes more detailed information concerning wildlife and habitat.

The evaluation included coordination with the FWS, the National Marine Fisheries Service (NMFS), and the FWC through the FDOT's ETDM process. Verbal correspondence with FWC via a phone conversation was also conducted during this evaluation regarding potential impacts to the Florida manatee. Additionally, information was obtained from the FNAI. The evaluation also included literature searches and field reviews to identify the potential occurrence of listed species and any designated critical habitat located within the project study area.

Ten federal and/or state listed plant species and thirty-four federal and/or state listed animal species occur or have been historically documented in Pinellas County. Listed species with a potential to occur within the project study area were determined based on the habitat requirements of each species, presence of their preferred habitat within the project study area, their geographic range, and documented occurrences of the species within the vicinity of the project study area. Based on this analysis, one state listed plant species and twenty-one federally and/or state listed animal species have a potential to occur within the project study area. Each species with a potential to occur within the project study area is described below

3.3.5.1 Federal Listed Species

Fauna

Mammals

The **West Indian manatee** (*Trichechus manatus*) is listed as endangered by the FWS. The manatee is an herbivorous marine mammal found statewide in coastal or estuarine waters, rivers, and (occasionally) lakes, but is most common in waters of peninsular Florida. Sheltered coves are important for feeding, resting, and rearing of young. No manatees were observed during the field review of the project study area. However, the project study area is located in a FWS Consultation Area for the West Indian manatee. Based on the U.S. Army Corps of Engineers (USACE) 2011 Manatee Key, Whitcomb Bayou is designated as an Important Manatee Area (IMA) where increased densities of manatees occur due to the proximity of warm water discharges, freshwater discharges, natural springs and other habitat features that are attractive to manatees. Within this IMA, dredging is not allowed to occur between November 15 and March 31.

Birds

The **piping plover** (*Charadrius melodus*) is listed as threatened by the FWS. The piping plover utilizes sandy beaches for foraging and nesting, but also feeds in tidal mud and sand flats. According to FNAI, no individuals have been documented within one mile of the project study area. Even though foraging habitat is available within the project study area, no piping plovers were observed during the field review. However, the project study area is located in a FWS Consultation Area for the piping plover. Within the project study area, minimal impacts to wetland habitat utilized by the piping plover may occur as a result of construction activities along the shorelines of Whitcomb Bayou.

The **wood stork** (*Mycteria americana*) is listed as endangered by the FWS. This wading bird species is opportunistic and utilizes various habitats, including forested wetlands, freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures, and ditches. However, a specialized feeding technique commonly referred to as “groping” limits the wood stork to feeding in shallow water. Based on information provided by the FWS and FNAI, the project study area is located within the 15-mile core foraging area of eight active wood stork rookeries.

Reptiles

The **American alligator** (*Alligator mississippiensis*) is listed as threatened by the FWS and a species of special concern by the FWC. The FWS classifies this species as threatened because of its similar appearance to the threatened American crocodile (*Crocodylus acutus*). The American alligator is an opportunistic feeder and can be found in both freshwater and brackish environments, but their preferred habitat is freshwater lakes, slow moving rivers, and associated wetlands. According to FNAI, no alligators have been documented within one mile of the project study area and none were observed during the field review of the project study area.

The **green turtle** (*Chelonia mydas*) is listed as endangered by the FWS. This sea turtle occurs in estuarine and marine coastal and oceanic waters. Nesting occurs on coastal sand beaches, often near the dune line. Large juveniles and adults feed on seagrasses and algae. Hatchlings use offshore floating sargassum mats and juveniles frequent coastal bays, inlets, lagoons, and offshore worm reefs. According to FNAI, no green turtles have been documented within one mile of the project study area and none were observed during the field review.

The **eastern indigo snake** (*Drymarchon corais couperi*) is listed as threatened by the FWS. The eastern indigo snake can be found in a variety of habitats including swamps, wet prairies, xeric pinelands, and scrub areas. The eastern indigo snake commonly utilizes gopher tortoise burrows for shelter to escape hot or cold ambient temperatures within its range. According to FNAI, no eastern indigo snakes have been documented within one mile of the project study area and none were observed during the field review.

Fish

The **Gulf sturgeon** (*Acipenser oxyrinchus desotoi*) is listed as threatened by the FWS. The Gulf sturgeon is typically found in the Gulf of Mexico and associated near-shore marine, estuarine, and riverine habitat. According to FNAI, no individuals have been documented within one mile of the project study area and no individuals were observed during the field review of the project study area.

3.3.5.2 State Listed Species

Fauna

Wading birds including the **limpkin** (*Aramus guarauna*), **little blue heron** (*Egretta caerula*), **snowy egret** (*Egretta thula*), **tricolored heron** (*Egretta tricolor*), and **white ibis** (*Eudcimus albus*) have been documented within Pinellas County, but none have been documented within one mile of the project study area. All of these species are listed as a species of special concern by the FWC. While each species is distinct, wading birds are discussed collectively since they occupy similar habitats and generally have similar feeding patterns (i.e., waders). The populations of these species have been impacted by the destruction of wetlands for development and by the drainage of wetlands for flood control and agriculture. None of these listed wading birds were observed within the project study area during the field review and no wading bird rookeries are documented within one mile of the project study area.

The **snowy plover** (*Charadrius alexandrinus*) is listed as threatened by the FWC. The snowy plover utilizes dry, sandy beaches for foraging and nesting, but also feeds on tidal mud and sand flats along inlets and creeks. Even though foraging habitat is available within the project study area, no snowy plovers were observed during the field review and none have been documented within one mile of the project study area.

The **reddish egret** (*Egretta rufescens*) is listed as a species of special concern by the FWC. This wading bird species is almost exclusively found along the coast foraging in shallow saltwater habitats and marine tidal flats with sparse vegetation. FNAI reports indicate that the reddish egret has been documented in Pinellas County and habitat is present within the project study area. However, no individuals were observed during the field review and none have been documented within one mile of the project study area.

The **southeastern American kestrel** (*Falco sparverius paulus*) is listed as threatened by the FWC. This species typically nests in tree cavities that were excavated by woodpeckers. Kestrels prefer open habitats for foraging, such as pine savannas, pine flatwoods, farmlands, suburban golf courses and residential areas which provide enough cover to support small terrestrial prey animals. Some suitable foraging habitat is available within the project study area, but nesting habitat is minimal due to the lack of large, dead nesting trees. Based on information from FNAI,

the southeastern American kestrel has been documented within Pinellas County, but no individuals have been documented within one mile of the project study area. No kestrels were observed during the field review.

The **Florida sandhill crane** (*Grus canadensis pratensis*) is listed as threatened by the FWC. The sandhill crane is associated with shallow fresh water areas, pasture and open woods habitats. Habitats such as wet and dry prairies, marshes, and marshy lake margins are optimum for the sandhill crane. According to FNAI, no sandhill cranes have been documented within one mile of the project study area and none were observed during the field review.

The **American oystercatcher** (*Haematopus palliates*) is listed as a species of special concern by the FWC. This shorebird requires large areas of beach, sandbar, mud flat, and shellfish beds for foraging. Sparsely vegetated, sandy areas are generally used for nesting, but they will also use beach wrack and marsh grass. According to FNAI reports, the project study area is within the geographic range of the American oystercatcher and suitable habitat is present. However, no individuals have been documented by FNAI within one mile of the project study area and no individuals were observed during the field review.

The **brown pelican** (*Pelecanus occidentalis*) is listed as a species of special concern by the FWC. The brown pelican's preferred foraging habitat is primarily coastal estuarine waters and can be frequently found resting on near-shore sandbars. This species tends to nest in trees on small coastal islands, but some ground nesting has been documented. Based on information from FNAI, the brown pelican has been documented within one mile of the project study area; however, none were observed during the field review of the project study area.

The **roseate spoonbill** (*Platalea niger*) is listed as a species of special concern by the FWC. This species is typically found foraging along tidal mudflats and coastal beaches and roosting in mangrove swamps. However, roseate spoonbills are occasionally found in forested freshwater swamps and herbaceous freshwater marshes. Based on information from FNAI, the roseate spoonbill has not been documented within one mile of the project study area and none were observed during the field review

The **black skimmer** (*Rynchops niger*) is listed as a species of special concern by the FWC. This species typically forages in coastal and inland waters, including beaches, bays, estuaries, tidal

creeks, large lakes, phosphate pits, and flooded agricultural fields. Nests are primarily found on sandy beaches, small coastal islands, and dredge spoil islands. According to FNAI, the black skimmer has been documented in Pinellas County, but not within one mile of the project study area. No individuals were observed during the field review of the project study area.

The **least tern** (*Sterna antillarum*) is listed as threatened by the FWC. The preferred nesting habitat for this species is sparsely vegetated coastal beaches above the high tide line. The least tern forages in near-shore open water habitats by diving into the water after prey items. Based on information received from FNAI, the least tern has been documented within Pinellas County, but not within one mile of the project study area and no individuals were observed during the field review.

Flora

A review of state-listed plants that have been documented within Pinellas County and their potential habitats was performed prior to the field visit. One state-listed plant species with habitat available within the project study area is described below.

The **golden leather fern** (*Acrostichum aureum*) is listed as threatened by the Florida Department of Agriculture and Consumer Services (FDA). This species is a member of the fern (*Pteridaceae*) family and is typically found in tropical hardwood hammocks, as well as fresh and brackish water marshes. While limited suitable habitat for this species is available within the project study area, no leather ferns were observed during the field review. In addition, FNAI does not have any recorded documentations of this species within one mile of the project study area.

Other Species of Concern

Although the **bald eagle** (*Haliaeetus leucephalus*) is no longer state-or federally-listed, it is still federally-protected by the Bald and Golden Eagle Protection Act in accordance with 16 United States Code (U.S.C.) 668. It is also state-protected by Chapter 68A-16.002, F.A.C., and the FWC Bald Eagle Management Plan (2008). The bald eagle typically uses riparian habitat associated with coastal areas, lake shorelines, and river banks for foraging. The nests are generally located near bodies of water that provide a dependable food source. According to FWC's online bald

eagle nest locator, there are no active bald eagle nests documented within one mile of the project study area. No bald eagles or nests were observed within the project study area during the field review.

During the field reviews, two **osprey** nests were observed on the east side of Beckett Bridge on the south side of North Spring Boulevard. Both nests were supported by the same utility pole and may be used by the same osprey. An osprey was present within one nest at the time of the February 2012 field inspection and empty oyster shells and fish remains were visible on the ground directly below the nest.

The osprey is state-listed as a species of special concern in Monroe County only. However, it is still federally-protected by the U.S. Migratory Bird Treaty Act (16 U.S.C. 703-712) and state protected by Chapter 68A of the F.A.C. Authorization is required from the FWC to take any osprey nest while federal permits are only required for the taking of "active" nests. "Inactive" nests may normally be taken and may be determined as inactive by the absence of any egg or dependent (i.e., flightless) young in the nest. While nesting typically occurs in December and may extend into late February, the nest may remain active throughout the summer months. Requests from the FWC for removal of active nests are only issued if the nest presents a safety hazard for the birds or humans. Active nest removal permits are issued with less frequency on a case-by-case basis.

Critical Habitat and Consultation Areas

The project study area was also evaluated for the potential occurrence of Critical Habitat as defined by 17 Code of Federal Regulations (CFR) 35.1532, but no designated Critical Habitat was identified within the project study area.

The project study area is located within a designated FWS consultation area and IMA for the West Indian manatee. The project study area is located within a designated FWS consultation area for the piping plover. Potential impacts to piping plover habitat will be coordinated with the FWS, FWC, and the Southwest Florida Water Management District (SWFWMD) during the design and permitting phases of this project.

The project study area is located within a designated FWS consultation area for the Florida scrub jay (*Aphelocoma coeruluscens*). Based on a review of available sources referenced in Section 2.0 of this technical memorandum and field reviews, no scrub jay habitat is available within the project study area and no populations have been reported or observed. Therefore, no further scrub jay consultation with FWS should be required for this project.

3.3.6 Floodplains

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), Panel 19 of Map Number 12103C00196 (September 2003), the Beckett Bridge and immediate vicinity are located within the 100 year floodplain in designated Zone AE. The Base Flood Elevation established for Minnetta Bayou/Spring Bayou is elevation 10 feet which is associated with coastal tidal surge conditions. Detailed information about floodplains within the project area is also discussed in the *Locations Hydraulic Report* published separately for this project.

3.3.7 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act required each regional Fishery Management Council to amend their existing fishery management plans to identify and describe EFH for each species under management. EFH is defined by the Act as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Whitcomb Bayou is within the Gulf of Mexico Fishery Management Council's (GMFMC) area of jurisdiction, which extends from the coasts of Texas, Louisiana, Mississippi, Alabama, and west Florida to Key West. GMFMC's limits of jurisdiction also extend seaward to the limit of the Exclusive Economic Zone (200 nautical miles from the baseline of the territorial sea.

The GMFMC separates EFH into estuarine and marine components. For the estuarine category, EFH includes estuarine emergent wetlands (saltmarsh and brackish marsh), mangrove wetlands, submerged aquatic vegetation (seagrass), algal flats, mud, sand, shell, and rock substrates, and estuarine water column. The marine category includes the water column, vegetated bottoms, non-vegetated bottoms, live bottoms, coral reefs, geologic features, and Continental shelf features (GMFMC, 2010).

The GMFMC manages 55 species for the Gulf of Mexico area. Of these 55 species, the GMFMC has identified and described EFH for 26 representative managed species. Species accounts of each of the 26 representative managed species were reviewed to assess the potential occurrence of these species within the project study area during any stage of their life cycle. Table 4 lists each of these species and its potential to occur in the project limits. Of the 26 representative fish, shrimp, and crab species listed by the GMFMC, one is considered to have a high potential to occur within the project limits, the gray snapper (*Lutjanus griseus*). The remaining 25 representative species and the coral complex are considered to have a low to no potential to occur within the project limits.

A Wetland Evaluation/Essential Fish Habitat Technical Memorandum was prepared for this project and is published separately. Additional information can be found in this document.

3.3.8 Contamination

A Contamination Screening Evaluation has been conducted as required by FDOT's PD&E Manual, Part 2, Chapter 22 (revised January 17th, 2008) and in accordance with the FHWA Technical Advisory T 6640.8a (dated October 30th, 1987). The results of this evaluation were published separately in a Contamination Screening Evaluation Report (CSER). Refer to this report for additional information.

Consistent with the guidance provided by FDOT and FHWA, and based on environmental records searches, land use surveys, field surveys and other screening methodologies cited within the PD&E manual, eight potential contamination sites were identified within the vicinity of the project corridor. The location of these sites is shown on **Figure 3-8** and described in **Table 3-6**. Of the eight sites, six were identified as "No" contamination risk, one was identified as "Low" contamination risk, and one was identified as "Medium" contamination risk. Accordingly, no further evaluation of these sites is recommended during the design phase of the project unless changes are made to the project design that could potentially change the location or alignment of the bridge.

Figure 3-8 – Potentially Contaminated Sites

Table 3-6 – Potentially Contaminated Sites within the Project Limits

Map ID	Site Name	Site Address	Risk Rating
01	Stamas Yacht, Inc.	300 Pampas Ave.	Medium
02	Ericson Marine	435 Roosevelt Blvd.	No
03	N/A	Roosevelt Blvd. and Canal St.	No
04	N/A	200 High St.	No
05	Beckett Bridge (fender system)	Riverside Dr.	Low
06	City of Tarpon Springs Sewage Pumping Station (1 of 2)	Doric Ct.	No
07	City of Tarpon Springs Sewage Pumping Station (2 of 2)	Riverside Dr. and Chesapeake Dr.	No
08	Tarpon Springs Yacht Club	350 N Spring Blvd.	No

The "Low" risk site corresponds to the piles of the fender system immediately adjacent to the Beckett Bridge which could contain creosote and/or arsenic as preservatives. Should some or all of these piles require removal or disturbance during the construction period, they should be evaluated beforehand to verify the presence or absence of these substances. If these substances are present, precautions should be taken by the contractor to help prevent the leaching of creosote into the waterway or the generation of arsenic-containing dust.

The "Medium" risk site (i.e., the Stamas facility) presents a contamination potential based on current and historical environmental records, however, it is not anticipated that this facility will be impacted as part of the current project design. Should project design elements change such that implementation would require FDOT to acquire, engage or otherwise alter this property, it is recommended that further assessment be conducted.

3.4 CULTURAL RESOURCES

3.4.1 Historic and Archaeological Sites

A *Cultural Resource Assessment Survey (CRAS)* was conducted for this study. The results are documented in the CRAS report, published separately. The recommendations in the CRAS were approved by FHWA on March 13, 2013. SHPO concurred with the findings of the CRAS on April 11, 2013. The concurrence letter is included in Appendix F. The objective of this survey was to identify cultural resources within or adjacent to the Area of Potential Effect (APE) and assess their eligibility for listing in the NRHP according to the criteria set forth in 36 CFR Section 60.4.

This assessment was designed and implemented to comply with Section 106 of the *National Historic Preservation Act of 1966* (NHPA) (Public Law 89-655, as amended), as implemented by 36 CFR 800 (*Protection of Historic Properties*, effective January 2001); Chapter 267, F.S.; Section 4(f) of the *Department of Transportation Act of 1966* (DOT Act), as amended (49 U.S.C. 303); and the minimum field methods, data analysis, and reporting standards embodied in the Florida Department of Historic Resources (FDHR) *Historic Preservation Compliance Review Program* (November 1990), *Cultural Resource Management Standards and Operational Manual* (February 2003), and Chapter 1A-46 (*Archaeological and Historical Report Standards and Guidelines*), F.A.C. In addition, this report was prepared in conformity with standards set forth in Part 2, Chapter 12 (*Archaeological and Historic Resources*) FDOT *Project Development and Environment Manual* (revised, January 1999).

All work conforms to professional guidelines set forth in the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* [48 Federal Register (FR) 44716, as amended and annotated]. Principal investigators meet the minimum qualifications for archaeology, history, architecture, architectural history, or historic architecture contained in 36 CFR 61 (*Procedures for Approved State and Local Historic Preservation Programs*, Professional Qualifications Standards). Archaeological investigations were conducted under the direction of James Pepe, M.A., RPA. Historic resource investigations were conducted under the direction of Amy Groover Streelman, M.H.P.

The APE was determined by evaluating the improvements that may be implemented as part of the bridge construction. The improvements under consideration may range from rehabilitation of the existing bridge to the construction of a 28 foot high fixed bridge. The determination also considered the surrounding character of the area and the existing facilities found throughout the corridor. Additionally, a detour would be required for removal of the existing bridge, rehabilitation or replacement alternatives. The proposed detour plan was considered when determining the limits of the APE. The proposed APE for historic and archaeological resources is shown on **Figures 3-9 and 3-10**. The APE was reviewed and approved by FHWA and State Historic Preservation Officer (SHPO) by letter dated March 27, 2012, which is included in **Appendix F**.

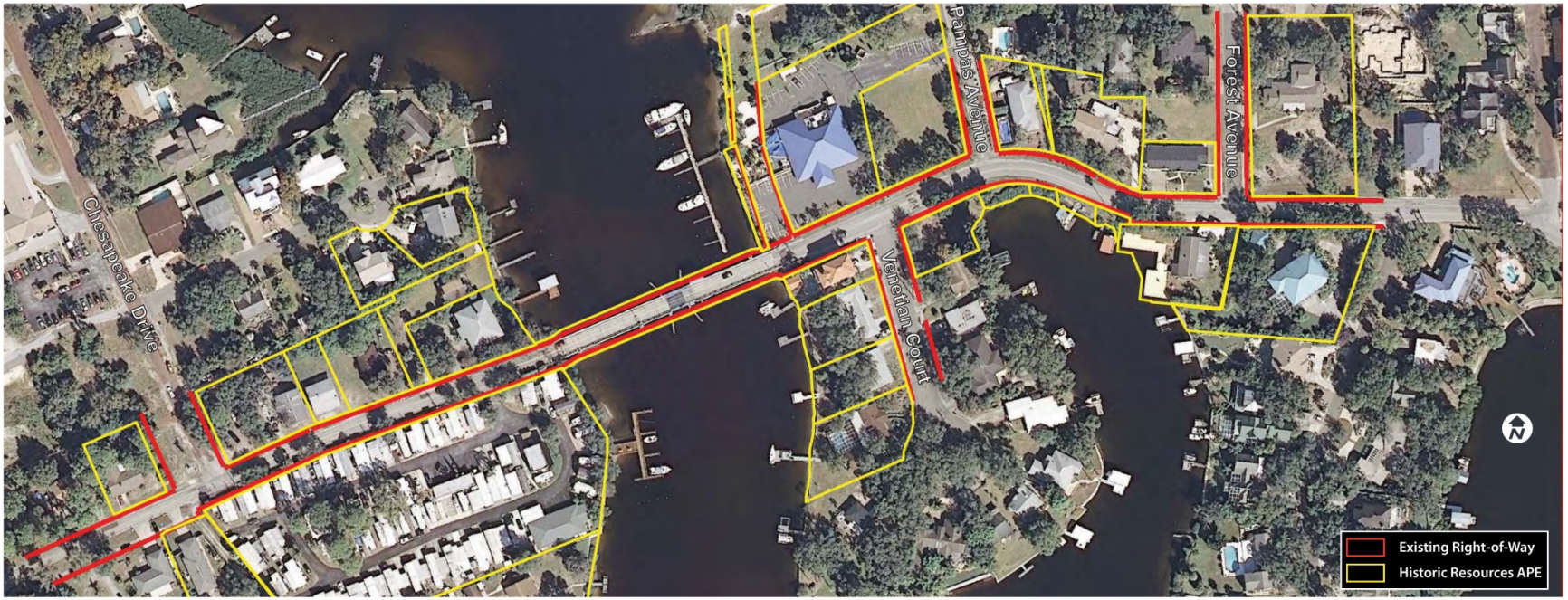


Figure 3-9 – Proposed Historic Resources Area of Potential Effect (APE)

Figure 3-10 – Proposed Archaeological Resources Area of Potential Effect (APE)

The APE for historic resources includes any historic properties adjacent to the current roadway and any new proposed right of way acquisitions beginning at Chesapeake Drive and ending at Forest Avenue. This APE provides appropriate coverage for the alternatives related directly to Beckett Bridge PD&E project. In regard to the mid-level fixed bridge alternative that is being studied, the APE includes properties along the riverfront that can physically be seen from a from a reasonable distance in order to address any viewshed/visual effects. This APE extends two to four parcels on either side of the current bridge location on both sides of the bayou.

The goal of this cultural resource survey was to locate and document evidence of historic or prehistoric occupation or use within the APE (archaeological or historic sites, historic structures, or archaeological occurrences [isolated artifact finds]), and to evaluate these for their potential eligibility for listing on the NRHP. The research strategy was composed of background investigation, a historical document search, and field survey. The background investigation involved a perusal of relevant archaeological literature, producing a summary of previous archaeological work undertaken near the project area.

This survey resulted in the identification of 16 newly recorded historic resources within the APE including one bridge (8PI12017) and 15 buildings (8PI12043-8PI12055, 8PI12068, 8PI2069) (**Table 3-7**). One of these newly recorded historic resources, Beckett Bridge (8PI12017), was determined to be eligible for listing in the NRHP by FHWA and SHPO. The remaining resources (8PI12043-8PI12055, 8PI12068, 8PI12069) are considered ineligible for listing in the NRHP as individual historic resources or as contributing resources to a historic district.

Determination of Eligibility (DOE) forms were prepared for the Beckett Bridge (8P112017) and submitted to the FHWA in August 2012. The purpose of this early coordination, prior to submitting the CRAS, was to obtain early input from FHWA and the SHPO on the potential eligibility of the bridge for the NRHP. The DOE concluded that the Beckett Bridge was eligible for listing in the NRHP. Both FHWA and SHPO concurred with this determination in September and October 2012, respectively. The Letter from FDOT to FHWA dated August 24, 2012 which includes FHWA and SHPO concurrence is included in Appendix F.

Table 3-7 – Historic Resources Identified within the Project APE

FMSF #	Site Name / Address	Style	Const. Date	National Register Status
8PI12017	Beckett Bridge Riverside Drive/Spring Boulevard	Bascule Bridge	1924	Determined Eligible
8PI12069	435 Doric Court	Masonry Vernacular	c. 1947	Ineligible
8PI12068	425 Doric Court	Frame Vernacular	c. 1954	Ineligible
8PI12043	438 Riverside Drive	Craftsman	c. 1925	Ineligible
8PI12044	434 Riverside Drive	Frame Vernacular	c. 1929	Ineligible
8PI12045	412 Riverside Drive	Masonry Vernacular	c. 1946	Ineligible
8PI12046	403 Riverside Drive	Mission	c. 1949	Ineligible
8PI12047	438 Craig Drive	Frame Vernacular	c. 1940	Ineligible
8PI12048	Tarpon Springs Yacht Club/350 North Spring Boulevard	Masonry Vernacular	1954	Ineligible
8PI12049	6 Venetian Court	Ranch	c. 1952	Ineligible
8PI12050	8 Venetian Court	Ranch	c. 1954	Ineligible
8PI12051	12 Venetian Court	Masonry Vernacular	c. 1953	Ineligible
8PI12052	101 Pampas Avenue	Masonry Vernacular	c. 1954	Ineligible
8PI12053	330 North Spring Avenue	Masonry Vernacular	c. 1956	Ineligible
8PI12054	302 North Spring Boulevard	Masonry Vernacular	c. 1950	Ineligible
8PI12055	301 North Spring Boulevard	Frame Vernacular	c. 1953	Ineligible

No archaeological sites were newly identified within or adjacent to the project corridor during the current survey and no previously recorded archaeological sites were located within the archaeological APE.

In addition to the CRAS, a Cultural Resource Reconnaissance Survey was performed to provide preliminary cultural resource information for a proposed detour route of Beckett Bridge outside the established APE. One previously recorded historic resource was identified that is NRHP-listed and six previously recorded historic resources were identified that are considered individually eligible for inclusion in the NRHP. These resources were evaluated in the Historic Resources Survey of Tarpon Springs, conducted in July 2009 by Janus Research for the City of Tarpon Springs. Some of these resources are located in the Beckett Bridge proposed detour route.

These seven previously identified resources include the NRHP-listed Tarpon Springs Historic District (8PI1712), the Edward Newton Knapp House (8PI238), the William T. Fleming House (8PI1617), the George Clemson House (8PI1619), the George Clemson Auxiliary (8PI1620), the Marshall H. Alworth House (8PI1621) and the Bigelow Cottage (8PI1625). The six individually eligible buildings are part of the National Register-listed Tarpon Springs Historic District (8PI1712). Only one new property along this route was identified as potentially NRHP–eligible during the reconnaissance survey and is located at 115 North Park Avenue.

3.4.1.1 8PI12017 (Beckett Bridge)

The Beckett Bridge is located in Township 27 South, Range 15 East, and Sections 11 and 12 of [U.S. Geological Survey (USGS) Quadrangle Tarpon Springs 1973, Photorevised 1987], in Pinellas County, Florida. The bridge is a steel, single-leaf, under-deck counterweight, Scherzer rolling-lift (bascule) bridge, approximately 360 feet long and about 28 feet wide. It carries Riverside Drive/North Spring Boulevard over Whitcomb Bayou in Tarpon Springs, Florida.

The existing typical section of the bridge consists of two 10-foot wide travel lanes and 2'2" sidewalks and concrete railing on both sides. Nine approach spans and one main span are present. The main bridge span is a steel structure with an open steel grid deck. Railings flank the bridge approaches and the bascule span; these are simple concrete rails with concrete posts on the approach spans and steel rails and posts on the main span. Concrete piers support the prestressed concrete girder spans of this bridge. A galvanized pipe staircase with handrails leads to the bridge substructure from a utilitarian bridge tender's station that consists of a simple one-story rectangular building with a steel shed roof and Plexiglas windows. This structure is located on the north side of the bridge.

Beckett Bridge was originally built in 1924 and called the Chilito Street Bridge until it was renamed in 1948 for Edward H. Beckett to honor him for his 34 years of service as a County Commissioner (Freedman 1948). The original bridge was of wood construction with a concrete pier and a steel drawbridge span. The bridge was the shortest way of connecting east and west Tarpon Springs. In 1956, the Beckett Bridge was almost entirely reconstructed after Pinellas County decided repairs to the original wooden structure would be wasteful (Twitty 1955). The new structure utilized the original steel bascule, draw, and machinery for operation, but the wooden approach spans were replaced with new concrete spans, spanning 350 feet (n.a. 1956). The 1956 plans have not been located.

Since the major alterations to the bridge in 1956, the Beckett Bridge underwent repairs again in 1996. The rehabilitation repairs included the addition of steel crutch bents to stabilize settlement, repair of the steel draw span as well as the concrete approach spans, refurbishment of the machinery, replacement of the electrical system, and construction of the tender station. The tender station is a non-historic alteration because it was built after the historic period in 1996; it is considered a non-contributing element to the historic bridge. The traffic and barrier gates were also added during the 1996 repairs.

In 1997, the main machinery drive shafts failed during testing of the draw span subsequent to the 1996 repairs. Repairs were completed in December 1997. Recent repairs in 2011 were performed to correct issues with the operating machinery and the movable bridge span.

The Beckett Bridge remains one of seven pre-1965 single-leaf bascule bridges in Florida. It is considered eligible for listing in the National Register under Criterion A for its contributions to the patterns of development and transportation in the State, as well as Criterion C for its distinct engineering.

3.4.2 Recreation Areas/Potential Section 4(f) Properties

Section 4(f) lands include publicly owned parks, recreation areas, wildlife and waterfowl refuges; properties that represent multiple public land use holdings; and historical and archaeological sites (regardless of ownership). Section 4(f) of the DOT Act [Title 49, U.S.C., Section 1653(f)] was enacted to encourage preservation of Section 4(f) lands.

Potential Section 4(f) resources identified during the ETDM screening process include historical or archaeological sites located within the project corridor and the Pinellas County Aquatic Preserve (OFWs). The Beckett Bridge is considered eligible for listing in the NRHP (See Section 3.4.1 Historic and Archaeological Sites).

The ETDM metadata also identifies areas of statewide greenways critical and low priority linkages, low priority paddling trails, and high and low priority multi-use trails that could be associated with the proposed project. These FDEP designations contain all of the largest areas of ecological and natural resource landscapes and the linkages necessary to link them together in a statewide system. There are no existing FDEP, County or Regional officially designated, marked or signed greenways or trails within, along or perpendicular to the project study limits.

However, the Pinellas Trail, a 37 mile long regional trail, extending from St. Petersburg to Tarpon Springs is located approximately 0.7 mile east of the Bridge. The Pinellas County Trailways Plan, included in the Pinellas County MPO 2025 LRTP, identifies three future recreational bicycle/pedestrian trails that will connect to the Pinellas Trail and continue west. (The locations of these trails are shown on Figure 2-4.) The proposed Howard Park Trail will provide access to Howard Park from the Pinellas Trail via Riverside Drive/North Spring Boulevard, crossing the Beckett Bridge.

An unmarked paddling trail beginning at Craig Park, south of the bridge is identified in the "Guide to Pinellas County Blueways," published by the Pinellas County Planning Department in April 2010. (A map from this guide for trails in northern Pinellas County is provided in Figure 2-5.) The unmarked trail continues north through Whitcomb Bayou, passing under the Beckett Bridge continuing to the Anclote River and eventually to the Gulf of Mexico.

4.0 DESIGN CRITERIA

4.1 BRIDGE

4.1.1 Channel Clearance Requirements

The proposed bridge will provide horizontal and vertical navigation clearances that are, at a minimum, equal to those of the existing bridge. The existing horizontal clearance is approximately 25 feet between fenders. The vertical clearance for the existing movable span in the closed position is approximately 6 feet. The maximum vertical clearance for the movable bridge in the fixed position which avoids impacts to adjacent right-of-way is 7.5 feet. Discussions with the USCG indicated that a bridge with at least 6 feet of vertical clearance would be permittable.

A waterway survey of waterfront property owners on Whitcomb Bayou was conducted to determine the number and types of boats that would need to pass under the bridge to reach deeper water. The results showed that six sailboats requiring 14-38 feet of vertical clearance were owned by waterfront property owners in the Bayou. Based on this information and discussions with the USCG, a fixed bridge alternative was developed which provided the maximum vertical clearance practical to provide access to these vessels. The maximum vertical clearance that could be obtained without impacting the intersections at the western and eastern limits of the project (Riverside Drive with Chesapeake Drive and Forest Avenue) was determined to be 28 feet.

In summary, these clearances used to develop alternatives include:

1. 25 ft. horizontal between fenders.
2. 28 ft. vertical clearance above mean high water (MHW) between fenders for a fixed span.
3. 7.8 ft. vertical clearance above MHW between fenders for a movable span bridge with the movable span in the closed position.
4. Unrestricted vertical clearance in the channel for a movable span in the open position.

4.1.2 Design Method

Replacement Bridge

The replacement bridge will be designed for a 75 year service life. Concrete may include additives as well as having additional cover over reinforcing steel for increased corrosion protection.

Substructure Elements

Substructure elements, including precast and cast-in-place concrete piles, footings, caps, and columns will be designed for dead load, live load, wind load, etc. in accordance the Load and Resistance Factor (LRFD) method.

Superstructure Elements

Superstructure elements, including prestressed and cast-in-place deck slab, beams, and barrier rails will be designed for dead load, live load, and crash resistance in accordance with the LRFD method.

Bascule Span Superstructure

Structural steel (main girders, floor beams, stringers, bracing, etc.) for the bascule span superstructure will be designed for dead load, live load, and wind load in accordance with the LRFD method.

Bascule Span Electrical and Mechanical

The bascule span machinery and electrical control system will be designed in accordance with the LRFD method. The design will be based on 3,000 (open and close) operation cycles over the proposed 75-yr service life.

4.1.3 Design Loads and Load Factors

Live Load

HL-93 Design Vehicular Live Loading, including design truck or design tandem and design lane load, per *AASHTO LRFD Bridge Design Specifications, 6th Edition – 2012,* Section 3.6, shall be used. The load results from the HL-93 Design Vehicular Live Loading envelopes the load results for all LRFD Design Live Loads. The movable span shall also be designed for HL-93 Design Vehicular Live Loading when the span locks are not engaged for a Strength II Load Combinations, per *FDOT Structures Design Guidelines*, Section 8.4.

Wind Loads

Section 2.4 of the *FDOT Structures Design Guidelines* shall be used to determine the wind on structure loads for the bridge design. A Basic Wind Speed (V) of 130 mph as per Table 2.4.1-2 shall be used.

Wave Loads

In accordance with the *FDOT Structures Design Guidelines*, Section 2.5, the level of importance classification for the proposed bridge is recommended to be "Critical." This recommendation is based on a combination of factors including projected traffic volumes, route impacts on local residents and businesses, and use of this facility as an evacuation and emergency response route. This classification requires that the replacement bridge be designed to resist wave forces at the Extreme Event Limit State with a performance level of "Repairable Damage." Using thisdesign criteria, the bridge would be designed to survive a 100-year storm event but may experience some damage that would require minimal repair before bridge is returned to service. The use of "Sacrificial Spans" that would require replacement after a 100-year storm event is not recommended.

According to the *Final Report, Design Storm Surge Hydrographs for the Florida Coast, D. Max Sheppard and William Miller Jr., September 2003*, the 100-yr Storm Surge Elevation for the Anclote River is approximately 11.5 feet. The storm surge elevation at the bridge is anticipated to be similar to this elevation. Portions of the superstructure will be below the wave crest elevation. Accordingly, wave forces need to be considered in the design of the bridge. However, it is anticipated that wave heights and corresponding force at the bridge would not be substantial because of the lack of a significant fetch needed to develop wind-driven waves. Furthermore, the presence of topographical features, including numerous adjacent residential buildings and trees, reduce wind velocities at the surface of the water with lower corresponding wave heights.

As the superstructure for the movable bridge alternative will be below the storm surge elevation, it will be subject to waves and thus will be required to be designed to resist the design wave loads. Accordingly, the movable bridge alternative may require wave force-mitigation measures such as a shallow slab type superstructure. The superstructure for the fixed bridge alternatives is anticipated to be above the maximum wave crests and thus it will

not be necessary to design these spans for the wave loads.

During final design, a Coastal Engineer will be required to perform a wave analysis to determine the anticipated wave heights and corresponding wave design loads. A Level I Analysis per *AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms* will yield conservative design wave loads.

Seismic Loads

The superstructure spans will be supported on elastomeric bearings. Therefore, the bridge will be categorized as "exempt" for seismic loads per *FDOT Structures Design Guidelines* Section 2.3. The minimum bearing support dimensions only need to be satisfied as required by *AASHTO Bridge Design Guidelines*, Section 4.7.4.4 for seismic adequacy.

Vehicular Collision Loads

Traffic railing (barriers) on the fixed spans will be in accordance with NCHRP Report 350 Performance Level TL-4 (AASHTO Level PL-2), including crash testing. Traffic railing on the movable span may be constructed of structural steel, and if so, will be designed as an equivalent to a crash tested TL-4 railing, including similar geometry and strength.

4.1.4 Movable Span Operation Requirements

The movable span will be a single-leaf bascule. The movable span drive machinery may be either an electro-mechanical or hydraulic system.

Time of Operation

The normal operating cycle from fully closed to fully opened, or fully open to fully closed, will be a maximum of 60 seconds. The 60 seconds will include a zero to ten second acceleration period and a zero to five second period deceleration, creep speed and seating. This operating cycle will apply for wind loads defined in AASHTO.

Redundancy

Primary span drive components including motors, brakes, reducers, driver machinery, pump/motor groups, hydraulic cylinders, and valving will be designed for redundancy such that one component or system can be removed from service for repair or replacement without disabling the bridge for opening under maximum constant velocity torque wind loads per

AASHTO.

Service Duty

The design life for reducers, bearings and other similar mechanical components will be 50 years. The design life for cylinder seals, hydraulic pumps, and other hydraulic seals will be 20 years.

Electrical Service

Electrical service will be 480 volts 3 phase, "wye" for motor loads.

Bridge Control System

Bridge control and operation will be by way of a relay logic with bypass capability.

4.1.5 Environmental Classification

The following environmental classifications apply:

- Superstructure: Corrosive (Extremely Aggressive)
- Substructure: Corrosive (Extremely Aggressive)
- Location: Coastal (Saltwater)

4.2 ROADWAY

Roadway design criteria are summarized in Table 4-1 below. Conceptual plans have been developed using the current editions of the documents listed below. If the project proceeds to the Design phase, the editions current at that time will be used for final design of the proposed improvements.

4.2.1 Vertical Clearance over Roadways

The minimum vertical clearance used to develop alternatives for the bridge structure overpasses is 14.5 feet from the bottom of the structure member to the crown (or high point) of the roadway travel way underpass. This clearance height is consistent with AASHTO required minimum criteria.

Table 4-1 – Roadway Design Criteria

Control / Design Element	Existing Roadway Elements	Minimum Design Controls & Standards	Documentation & References
Traffic Volumes [Annual Average Daily Traffic (AADT)] **Design Year**	9,700 2038	*9,700 vehicles per day (vpd)*	Design Traffic Technical Memorandum (URS, April 2012 prepared for this PD&E Study)
Functional Classification: Riverside Drive/ N Spring Blvd	**Rural** Collector	**Urban** Collector	City of Tarpon Springs and Pinellas County Comprehensive Plans
Design Speed Collector Roadway	20 & 30 miles per hour (mph) (Posted)	**35** mph* (Greenbook) >30 mph** (AASHTO) 35-50 mph*** (FDOT) ***Use 35 mph****	*Greenbook, Table 3-1 ** AASHTO, Chapter 6 ***FDOT PPM, Table 1.9.1
Design Vehicle Single Unit Truck (SU) 8' wide x 30' long Conventional School Bus (S-Bus36) 8' wide x 35.8' long Recreational Vehicle (MH/B) 8' wide x 53' long per AASHTO and Greenbook.	N/A	SU* (Greenbook) SU-30,SU-40, S-BUS36, MH-B** (AASHTO) WB-62 FL*** (FDOT) ***Use SU, S-BUS36, MH-B design vehicles****	*Greenbook, Table 3-2 **AASHTO, Table 2-1b ***FDOT PPM, Sec. 1.12
Minimum Width of Travel Lane	10 ft.	11 ft.* (Greenbook) 10-12 ft** (AASHTO) 11 ft.*** (FDOT) ***Use 11 ft.****	*Greenbook, Table 3-7 **AASHTO, Chapter 6 ***FDOT PPM, Table 2.1.1
Bicycle Lane	N/A	4.0 ft.* (Greenbook) Varies (2ft. min.) ** (AASHTO) 4.0 ft.*** (FDOT) ***Use 4 ft.****	*Greenbook, Ch. 3, sec. C.10.b **AASHTO, Chapter 2 (Pg. 2-81) ***FDOT PPM, Table 2.1.2
Sidewalk	4-5 ft.	4 ft.* Min. (Greenbook) 5 ft. ** (AASHTO) (ADA) 5 ft. (On Bridge)*** (FDOT) ***Use 5 ft. min. sidewalk****	*Greenbook, Ch. 3, Sec. C.7.d. **AASHTO, Chapter 6 ***FDOT PPM, Figure 2.0.4
Shared Use Path (S.U.P.)	N/A	10 ft. (2-way only)* (Greenbook) N/A ** (AASHTO) 6 ft. (1-way),10 ft.(2-way)*** FDOT ***N/A****	*Greenbook, Ch. 9, sec. C.2 **AASHTO Bicycle Handbook ***FDOT PPM, Sec. 8.6.2
Shoulder Width (Outside)	No Shoulder	8' * (Greenbook) 8' ** (AASHTO) 16" (raised sidewalk), 8' min. long bridge*** (FDOT) ***N/A****	*Greenbook, Table 3-8 **AASHTO, Exhibit 6-5. Ch. 6 ***FDOT PPM, Fig. 2.03, 2.04

Control / Design Element	Existing Roadway Elements	Minimum Design Controls & Standards	Documentation & References
Shoulder Width (Inside) Distance from travel lane to longitudinal barrier. For FDOT Plans Preparation Manual (PPM) and Greenbook, median shoulder only applies to multi-lane highways.	None	6' * (Greenbook) 4' ** (AASHTO) 2'-6" with raised median / 6' flush shoulder*** (FDOT) ***N/A***	*Greenbook, Table 3-9 **AASHTO, Chapter 6, ***FDOT PPM, Fig. 2.0.4
Breakdown Vehicle Width on Travel Lane This is the width of the travel lane that can be used to accommodate a "break down" situation for a narrow shoulder.	N/A	[1' to 4'] encroachment onto travel lane is allowed for a narrow shoulder** (AASHTO) ***N/A****	**AASHTO, Chapter 4, "Width of Shoulders" Section 4.4.2
Cross Slope	Not Available	1.5% to 4%* (Greenbook) 1.5% to 3%** (AASHTO) 2% from crown*** (FDOT) ***Use 2% Cross Slope****	*Greenbook, Chapter 3, C.7.B.2 **AASHTO, Chapter 6, pg. 6-13 ***FDOT PPM, Figure 2.1.1
Roadside Slopes Anything steeper than 1:3 will need to be shielded per all references.	Not Available	1:4 or flatter* (Greenbook) 1:3 or flatter** (AASHTO) 1:2, not flatter than 1:6*** (FDOT) ***N/A****	*Greenbook, Ch. 3, sec. C.7.f.2 **AASHTO, Ch. 4, pg. 6-13 ***FDOT PPM, Table 2.1.1
Clear Zone Based on Design Speed.	N/A	10' (Rural), 4' (Urban)* (Greenbook) 14' (Rural), 1.5' back of face of curb (Urban)** 18' (Rural), 4' (Urban but not < 2.5')***(FDOT)) ***Use 4'****	*Greenbook, Table 3-12 **AASHTO Roadside Guideline Chapter 3 and Chapter 10 ***FDOT PPM, Chapter 4
Border Width Based on Design Speed.	Not Available	N/A * (Greenbook) 8 ft.** (AASHTO) 33' Rural, 12' Urban, 10' w/bike lane*** (FDOT) ***Use 8 ft.****	*Greenbook, N/A **AASHTO, Chapter 8 ***FDOT PPM, Table 2.5.1, 2.5.2
Drop-Off Hazard For Vehicles and Cyclists on Road	N/A	Hazard when less than 22 ft. from traveled way, steeper than 1:3 slope and 6 ft. or greater drop.*** (FDOT) ***Identify Hazards less than 22'/ steeper than 1/3 > 6' drop *****	***FDOT PPM 2012, Section 4.2.2

Control / Design Element	Existing Roadway Elements	Minimum Design Controls & Standards	Documentation & References
Drop-Off Hazard For Pedestrians on Sidewalk	N/A	Case I: When Drop-off is > 10" and within 2 ft. of Back-of-Sidewalk. Case II: When Total Drop-off is > 60" and slope steeper than 1:2 and begins within 2 ft. of Back-of-Sidewalk *** (FDOT) ***Identify Hazards that meet Case I or II******	***FDOT PPM 2012 Figure 8.8.1
Maximum Grade Based on Design Speed of 35 mph.	1.3 % max.	9% * (Greenbook) 9% ** (AASHTO) 9% *** (FDOT PPM) 5% **** (ADA) ***Use 5% maximum grade****	*Greenbook, Table 3-4 **AASHTO, Exhibit 6-8 ***FDOT PPM, Tables 2.6.1 ****ADA
Minimum Grade	0.2 % min.	0.3%* (Greenbook) 0.3%** (AASHTO) 0.3 %*** (FDOT) ***Maintain 0.3% minimum grade****	*Greenbook Chapter 6, C.5.b **AASHTO Chapter 6, Pg 3-119 ***FDOT PPM, Table 2.6.4
Maximum change in grade w/out using vertical curve Based on Design Speed of 35 mph.	N/A	0.9%* (Greenbook) N/A ** (AASHTO) 0.9%*** (FDOT) ***Use 0.9%****	*Greenbook, Table 3-5 **N/A (AASHTO) ***FDOT PPM, Table 2.6.2
Minimum Length of Crest Vertical Curve Based on K-value. Based on Design Speed of 35 mph.	360' existing	K=47 but not L < 105* (Greenbook) K=29** (AASHTO) K=47 but not L < 105*** (FDOT) ***Use k=47 for minimum length*****	*Greenbook, Table 3-6 **AASHTO, Table 3-34 ***FDOT PPM, Table 2.8.5
Minimum Length of Sag Vertical Curve Based on K-value. Based on Design Speed of 35 mph.	N/A	K=49 but not L < 105* (Greenbook) K=49** (AASHTO) K=49*** (FDOT) ***Use k=49 for minimum length*****	*Greenbook, Table 3-6 **AASHTO, Table 3-36 ***FDOT PPM, Table 2.8.6
Maximum Degree of Curvature Without Superelevation Based on Normal Cross Slope = -0.02. Based on Design Speed of 35 mph.	4 existing Curves: 28° - 1st curve 28° - 2nd curve 34° - 3rd curve 38° - 4th curve	N/A* (Greenbook) R=510'** (AASHTO) 5°*** (FDOT) ***Maintain existing degree of curvature****	*Greenbook, N/A **AASHTO, Table 3-13 ***FDOT PPM, Table 2.8.4

Control / Design Element	Existing Roadway Elements	Minimum Design Controls & Standards	Documentation & References
Minimum Length of Horizontal Curve Based on Design Speed.	4 existing Curves: 14.84' – 1st curve 15.36' - 2nd curve 130' - 3rd curve 52.29' - 4th curve	N/A* (Greenbook) 500'** (AASHTO) 525' but not < 400'*** (FDOT) ***Maintain existing length of curve***	*Greenbook, N/A **AASHTO, Ch. 3 Sec 3.3.13 ***FDOT PPM, Table 2.8.2a
Maximum Deflection without a Horizontal Curve Based on Design Speed of 35 mph.	N/A	2° *** (FDOT) ***Use 2 degrees ******	***FDOT PPM, Table 2.8.1a
Traffic Control Through Work Zones (Minimum Regulatory Speed) FDOT states that the Regulatory Speed should never be below the minimum statutory speed for this facility. See "Design Speed". AASHTO follows Manual on Uniform Traffic Control Devices (MUTCD) criteria.		20 mph & 30 mph Posted*** (FDOT) Existing Roadway Regulatory Speeds**** (MUTCD) ***Use 20 mph & 30 mph posted speeds ******	***FDOT Design Standards, Index 600 ****MUTCD, Chapter 6C
Traffic Control Through Work Zones (Clear Zone Width for Work Zones)		14' or 4' behind face of curb and gutter *** *(FDOT)* ***Use 14' or 4' behind face of curb and gutter ******	***FDOT Design Standards, Index 600
Traffic Control Through Work Zones (Minimum Radii for Normal Cross Slope) Based on Design Speed.		610' *** (FDOT) ***Use 610' ******	***FDOT Design Standards, Index 600
Traffic Control Through Work Zones (Minimum Lane Widths)		10' *** (FDOT) ***Use 10' ******	***FDOT Design Standards, Index 600

References:

2013 FDOT Plans Preparation Manual
2013 FDOT Design Standards
2011 AASHTO "A Policy on Geometric Design of Highways and Streets"
2011 FDOT "Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways" (Green Book)
2011 AASHTO Roadside Design Guide
2009 Manual on Traffic Control Devices

Note: The latest adopted versions of all references will be used in final design.

5.0 TRAFFIC

A *Design Traffic Technical Memorandum* was prepared in accordance with the FDOT *Design Traffic Handbook (Topic No. 525-030-120)*). Detailed information concerning the methodology employed for this traffic study can be found in this report, published separately from the PER. Traffic for the following years was analyzed:

- Existing Year 2012
- Opening Year 2018
- Design Year 2038

The Study area encompassed Riverside Drive/North Spring Boulevard including the Beckett Bridge from Chesapeake Drive, across Whitcomb Bayou to Forest Avenue, Alternate US 19, Florida Avenue, Meres Boulevard, Gulf Road, Whitcomb Boulevard, East Tarpon Drive and Tarpon Avenue.

5.1 EXISTING TRAFFIC CONDITIONS

Traffic counts were conducted in January and February of 2012 at key locations in the study area. Pinellas County provided 72-hour directional volume counts on Meres Boulevard, Whitcomb Drive, East Tarpon Drive, and Spring Boulevard. URS conducted 72-hour directional volume counts on Riverside Drive just east and west of the Beckett Bridge, as well as intersection turning movement counts from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. (including bicycles and pedestrians) at the following locations:

- Alternate US 19 at Tarpon Avenue, and
- Alternate US 19 at Meres Boulevard.

Additionally, traffic counts along Alternate US 19 and Florida Avenue were obtained from FDOT Florida Traffic Online for the latest available year (2010). The traffic count data is documented in the *Design Traffic Technical Memorandum*, published separately. The existing (2012) AADT volumes are illustrated in **Figure 5-1**. The segment of Alternate US 19 located north of Tarpon Avenue is posted with a speed limit of 45 mph. All other roadways in the study area have a posted speed limit of 30 mph. It should also be noted that the Beckett Bridge is currently load-posted to a maximum weight limit of 15 tons, which prohibits certain trucks and buses from using the bridge.

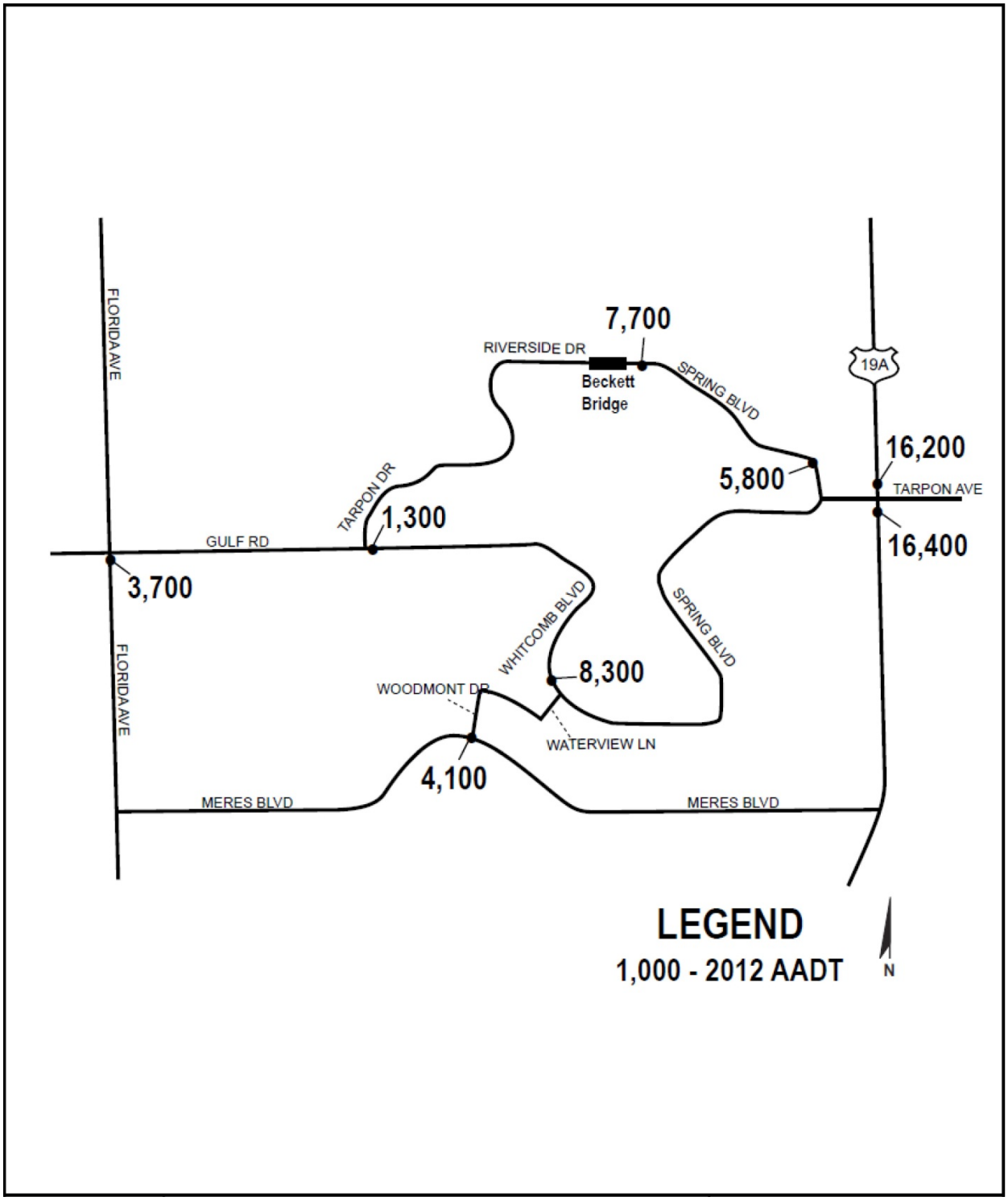


Figure 5-1 – Existing (2012) AADT Volumes

5.1.1 Existing Traffic Volumes

Twenty-four hour counts were averaged for a three-day period and multiplied by the appropriate weekly seasonal adjustment factor to obtain the AADT volumes. Since the latest available data on Alternate US 19 and Florida Avenue was based on 2010 AADT information from FDOT, these counts were adjusted to the year 2012 based on historical traffic growth in the area. The existing (2012) AADT volumes are illustrated in **Figure 5-1**.

To obtain the existing peak hour directional traffic, the AADT volumes were multiplied by the appropriate K and D factors. The K-factor utilized is based upon consultation with the FDOT District Seven Office, where a K-factor of 9.0 percent for Alternate US 19 and 9.5 percent for other collector roadways was determined to be acceptable. The D-factor utilized is based upon an evaluation of the existing directional traffic volumes in the study area, which ranges between 55.2 percent and 63.8 percent. For consistency, these factors were used for both the existing and future traffic volumes. Existing (2012) peak hour directional volumes and intersection peak hour volumes (turning movement volumes) are provided in **Figure 5-2** and **Figure 5-3**, respectively.

5.1.2 Existing Conditions Traffic Operations Analysis

Intersection traffic operations for existing conditions within the study area were determined by inputting the peak hour traffic volumes into the latest version of the *Highway Capacity Software* (HCS+), which is based upon fundamental principles found in the Transportation Research Board's *Highway Capacity Manual*.

Table 5-1 summarizes the existing intersection delay and level of service (LOS) results based on the analysis for the signalized intersections along Alternate US 19 at Meres Boulevard and at Tarpon Avenue. Currently, Alternate US 19 at Meres Boulevard operates at LOS C overall in both the a.m. and p.m. peak hours, while Alternate US 19 at Tarpon Avenue operates at LOS C in the a.m. peak hour and LOS D during the p.m. peak hour. The northbound approach at the Alternate US 19 at Tarpon Avenue intersection currently operates at LOS E during the p.m. peak hour.

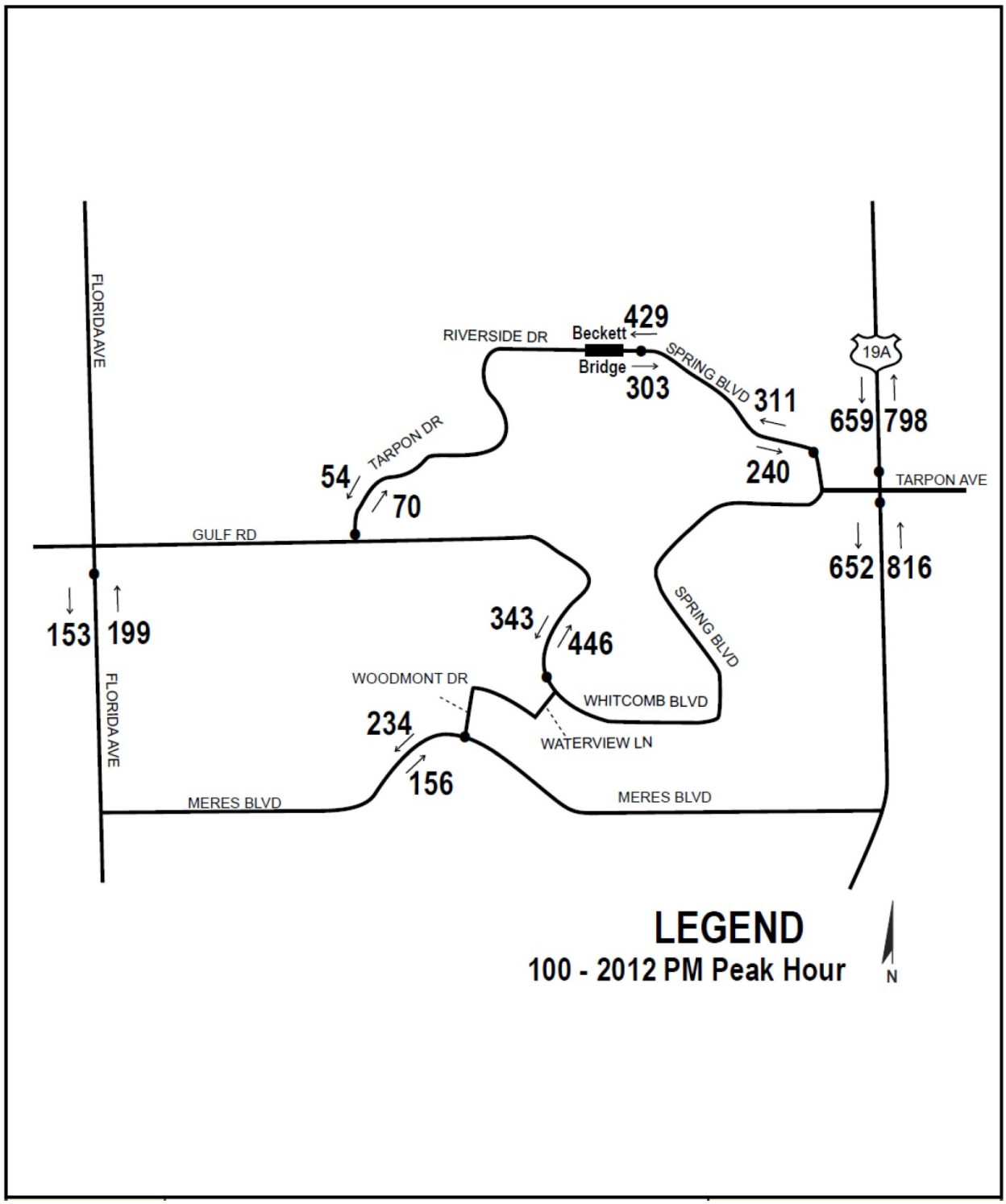


Figure 5-2 – Existing (2012) Peak Hour Directional Volumes

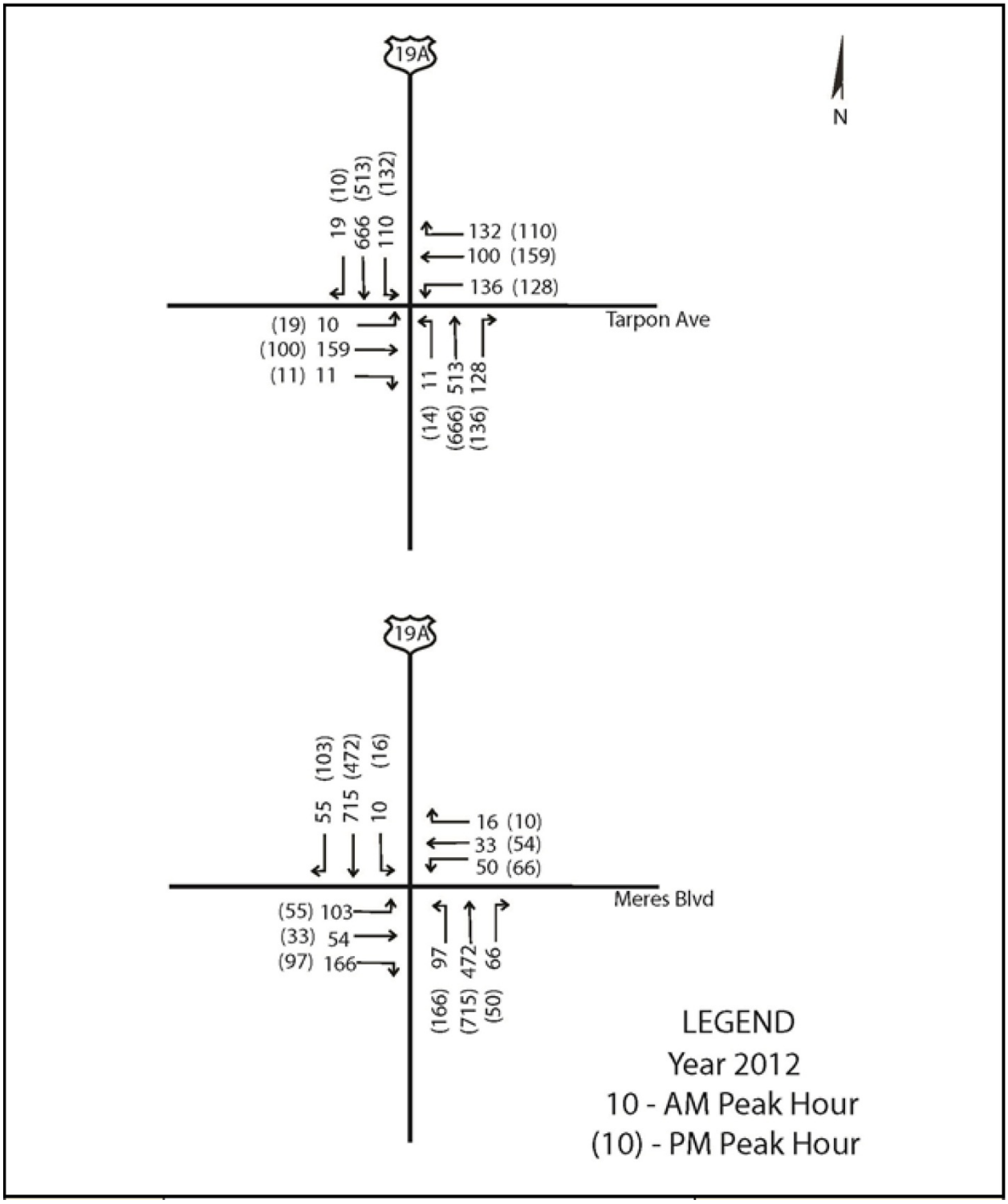


Figure 5-3 – Existing (2012) Intersection Peak Hour Volumes (Intersection Turning Movements)

Table 5-1 – Existing (2012) Signalized Intersection Peak Hour Level of Service

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Meres Boulevard	Northbound	635	931	28.4	C	27.7	C
	Southbound	780	591	30.3	C	18.4	B
	Eastbound	323	185	27.1	C	33.6	C
	Westbound	99	130	39.0	D	46.6	D
			Overall	**29.6**	**C**	**26.6**	**C**
Alternate US 19 at Tarpon Avenue	Northbound	652	816	25.9	C	55.7	E
	Southbound	795	655	21.7	C	22.5	C
	Eastbound	180	130	44.1	D	48.5	D
	Westbound	368	397	30.3	C	34.4	C
			Overall	**26.9**	**C**	**40.1**	**D**

5.1.3 Existing Conditions Arterial Analysis

An arterial analysis was conducted using the capacities provided in the *2009 FDOT Quality/LOS Generalized Tables.* Results show that Alternate US 19 is currently operating over capacity (LOS E). It should be noted that Alternate US 19 has been designated by Pinellas County as a constrained roadway. All of the other roadways in the study area operate at an acceptable LOS (LOS C or better). **Table 5-2** shows the results based on the generalized table capacities using urban, state and non-state roadway classifications.

Table 5-2 – Existing (2012) Arterial Level of Service

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	311	B
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	429	C
Tarpon Drive (North of Gulf Road)	2U	630	70	B
Florida Avenue (South of Gulf Road)	2U	630	199	B
Meres Boulevard (West of Woodmont Drive)	2U	630	234	B
Whitcomb Boulevard (South of Poulos Lane)	2U	630	446	C
Alternate US 19 (South of Tarpon Avenue)	2D	660	816	E
Alternate US 19 (North of Tarpon Avenue)	2U	880	798	C

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.

[1] Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.

[2] LOS Standard for all study area roadways is LOS D.

5.2 Opening Year and Design Year Analysis

5.2.1 Traffic Forecasting Methodology

Two scenarios were used to develop the traffic projections for the Opening Year (2018) and Design Year (2038). **Scenario 1** assumes that a two-lane bridge (the Beckett Bridge) connects Riverside Drive with Spring Boulevard across Whitcomb Bayou. This scenario is intended to illustrate the traffic conditions for the following PD&E alternatives:

- No-Build (Maintain Existing Bridge)
- Rehabilitation of the Existing Bridge
- Replacement with a New Movable Bridge
- Replacement with a New Fixed Bridge

Scenario 2 assumes that there is no bridge connection across Whitcomb Bayou. This scenario is intended to illustrate the traffic conditions for the following PD&E alternatives:

- No-Build with Removal of the Existing Bridge

Methodology to develop future traffic projections for both scenarios is described in detail in the *Design Traffic Technical Memorandum*. The redistribution of traffic under Scenario 2 was determined from a comparison of the Tampa Bay Regional Planning Model (TBRPM), Version 7.1 with and without the Beckett Bridge. The redistribution of Beckett Bridge traffic under Scenario 2 is illustrated in **Figure 5-4**. As discussed previously, the Beckett Bridge is currently load-posted to a maximum weight limit of 15 tons, which prohibits certain trucks and buses from using the bridge. The actual truck/heavy vehicle percentage is less than one percent. If any of the proposed bridge rehabilitation or replacement alternatives are selected, this load restriction will no longer be applicable to the bridge. Accordingly, a peak hour heavy vehicle percentage of two percent was assumed in the analysis to provide a conservative estimate for future scenarios.

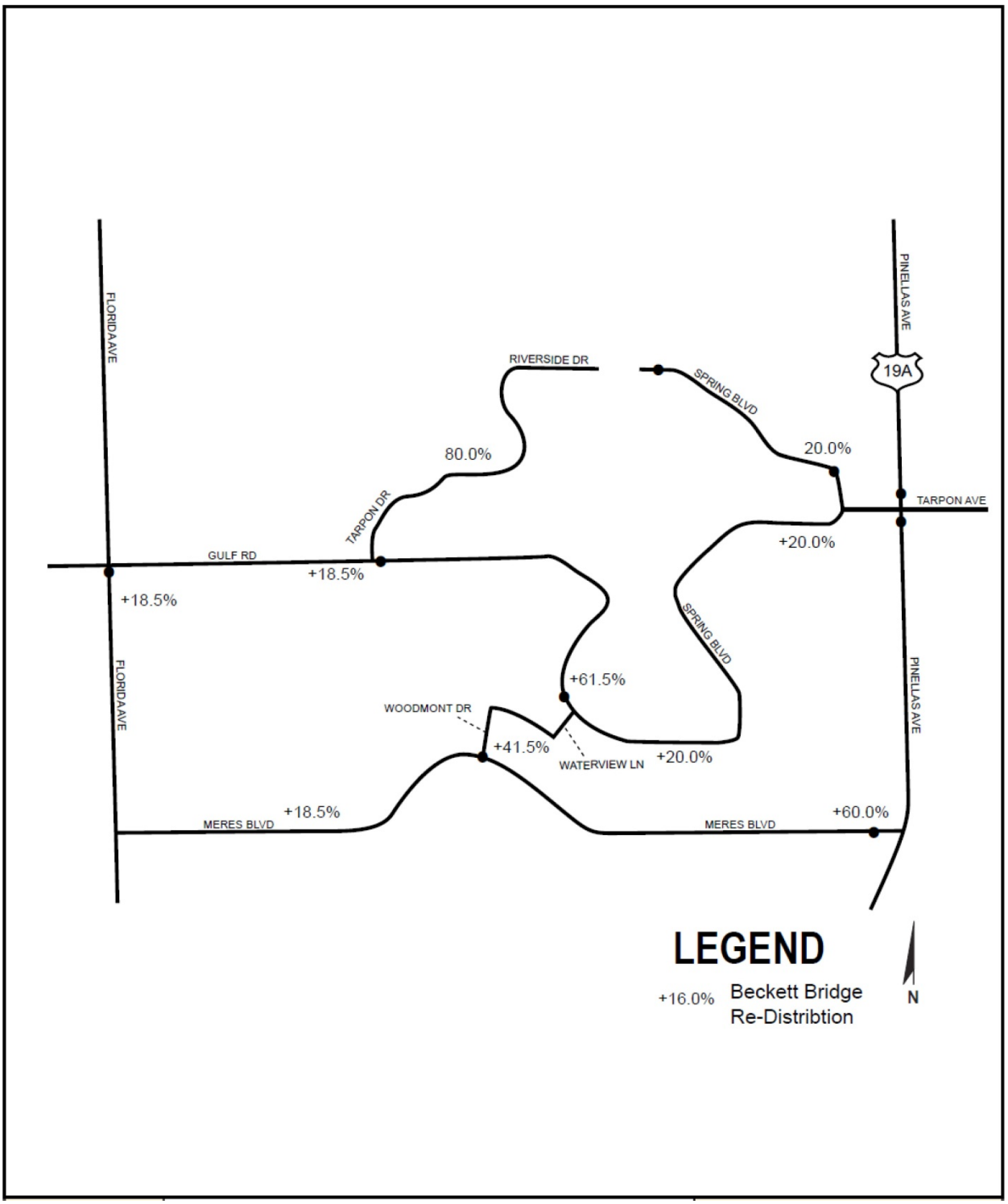


Figure 5-4 – Redistribution of Beckett Bridge Traffic

5.2.2 Opening Year (2018) and Design Year (2038) AADT Volumes

Daily traffic projections were based on applying a growth rate of 1.03 percent per year to the existing (2012) AADT volumes. Projections were based on increases from 2012 to the 2018 Opening Year (for 6 years) and from 2012 to the 2038 Design Year (for 26 years). For Scenario 2, the AADT volumes were reallocated based on the redistribution of traffic provided on **Figure 5-4**. Opening Year (2018) and Design Year (2038) AADT volumes under both scenarios are illustrated on **Figures 5-5 through 5-8**.

5.2.3 Opening Year (2018) and Design Year (2038) Peak Hour Volumes

Directional peak hour traffic projections were derived by applying the K and D factors to the Opening Year (2018) and Design Year (2038) AADT volumes. Opening Year (2018) and Design Year (2038) directional peak hour volumes under both scenarios are illustrated on **Figures 5-9 through 5-12**.

The peak hour traffic projections at the intersections of Alternate US 19 at Tarpon Avenue and Alternate US 19 at Meres Boulevard were developed by applying a 1.03 percent growth rate annually to the existing (2012) counts. Opening Year (2018) and Design Year (2038) intersection peak hour volumes under both scenarios are illustrated on **Figures 5-13 through 5-16**.

5.2.4 Opening Year (2018) Intersection Analysis

The Opening Year (2018) traffic conditions were analyzed under both scenarios using the Transportation Research Board's *Highway Capacity Manual* (HCM) and HCS+ for the two study area intersections.

Scenario 1 – Bridge Remains

Table 5-3 summarizes the intersection delay and LOS results based on the Opening Year (2018) analysis with the Beckett Bridge (Scenario 1) at the signalized intersections along Alternate US 19 at Meres Boulevard and at Tarpon Avenue.

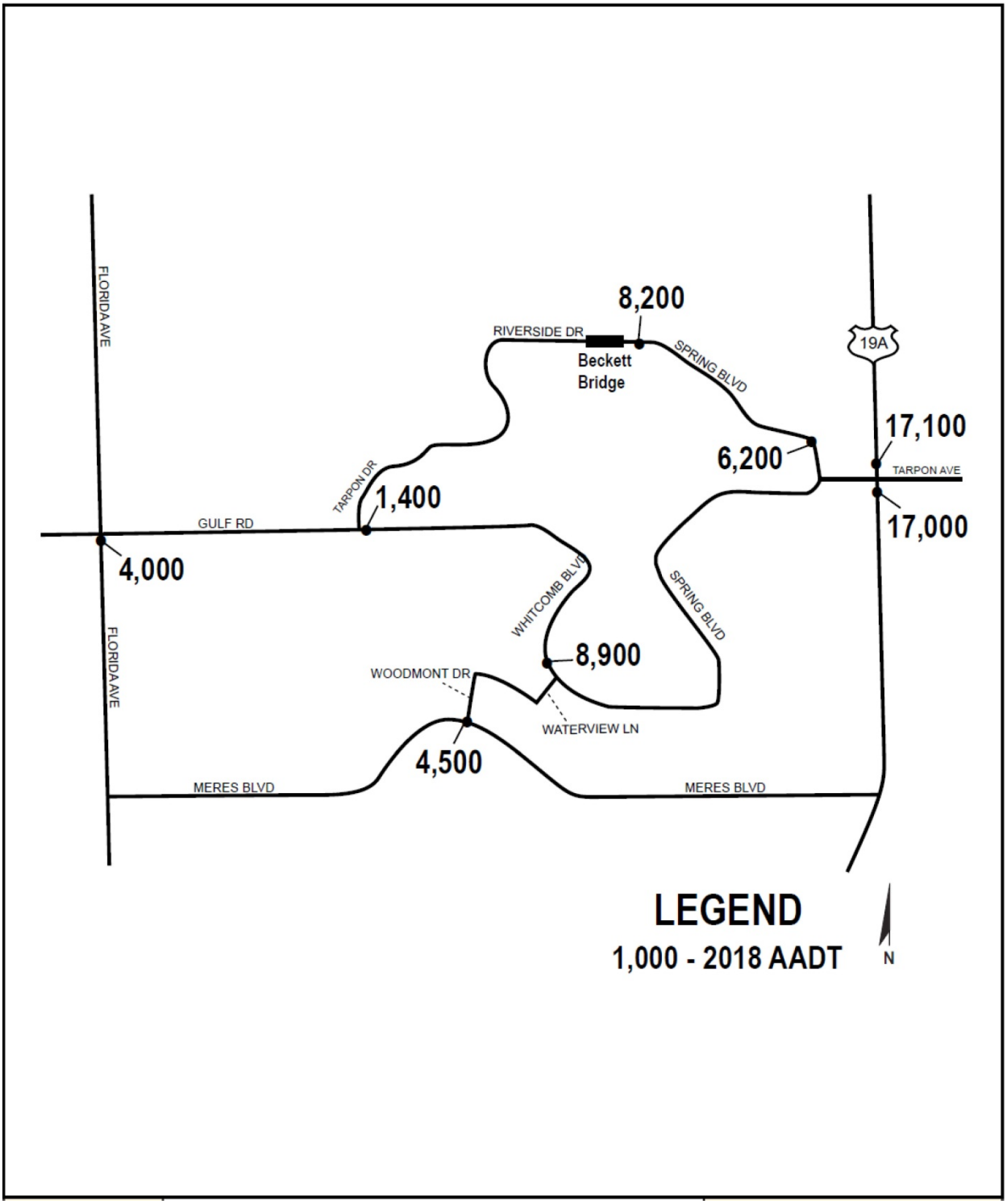


Figure 5-5 – Opening Year (2018) AADT Volumes – Scenario 1

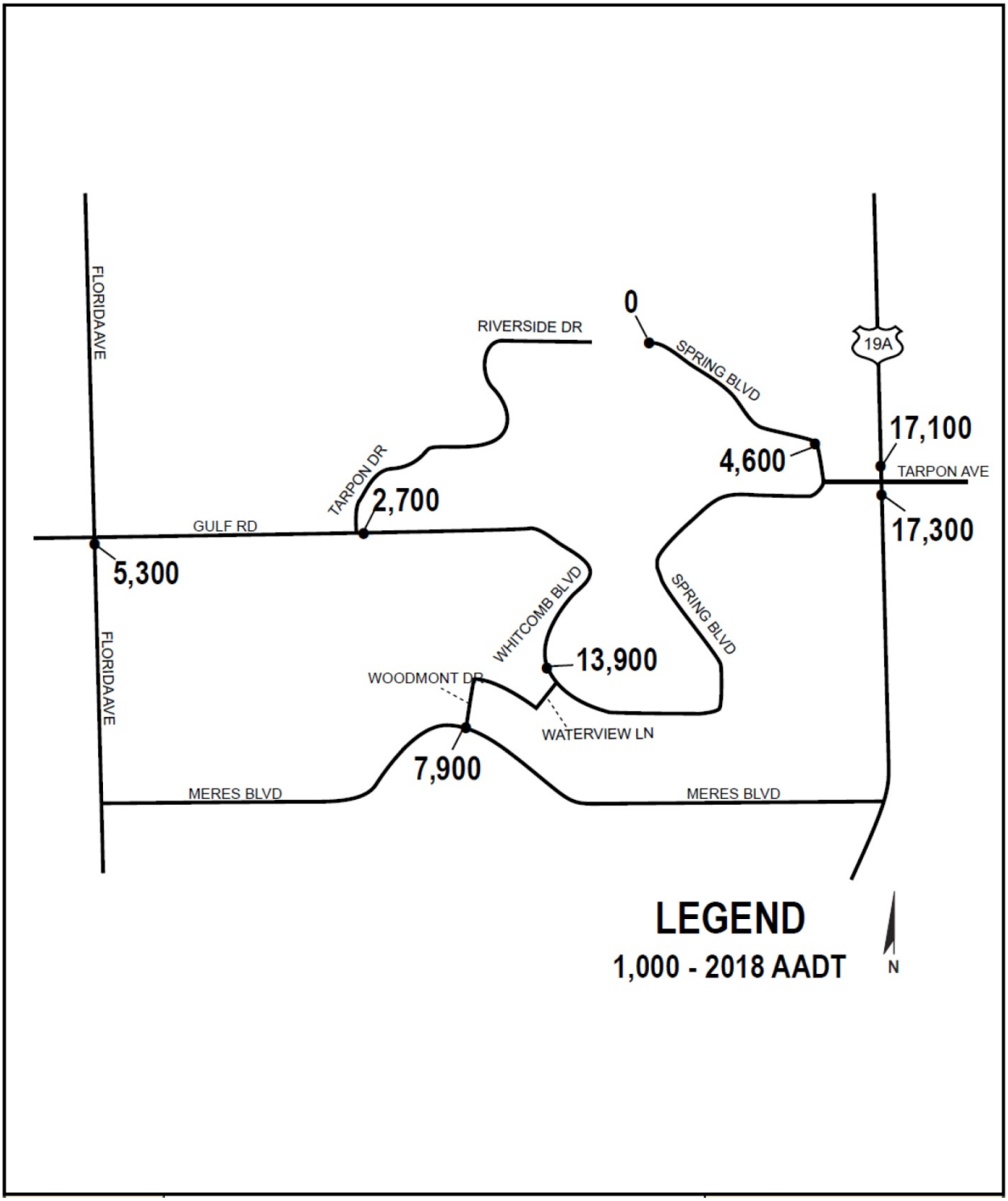


Figure 5-6 – Opening Year (2018) AADT Volumes – Scenario 2

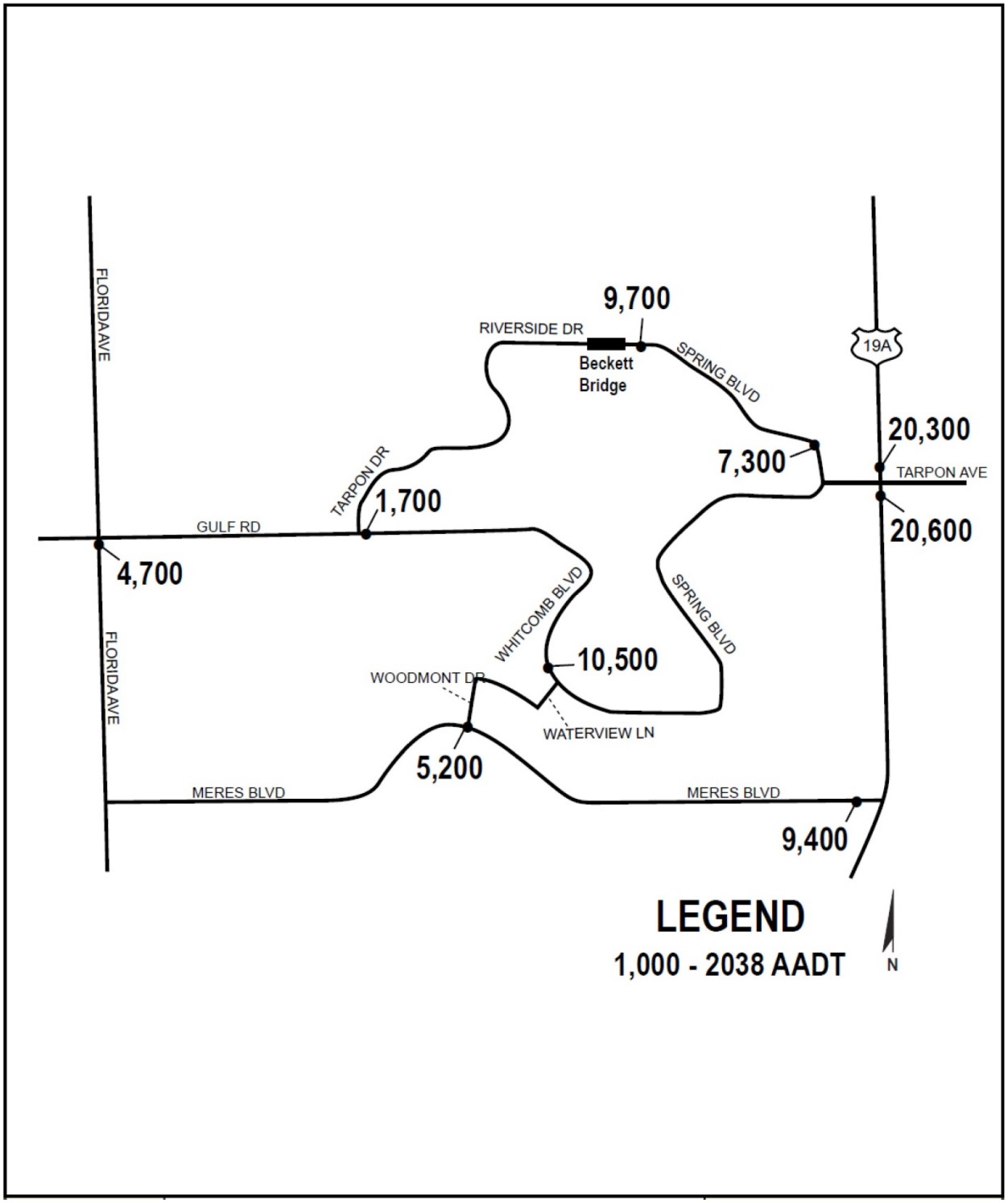


Figure 5-7 – Design Year (2038) AADT Volumes – Scenario 1

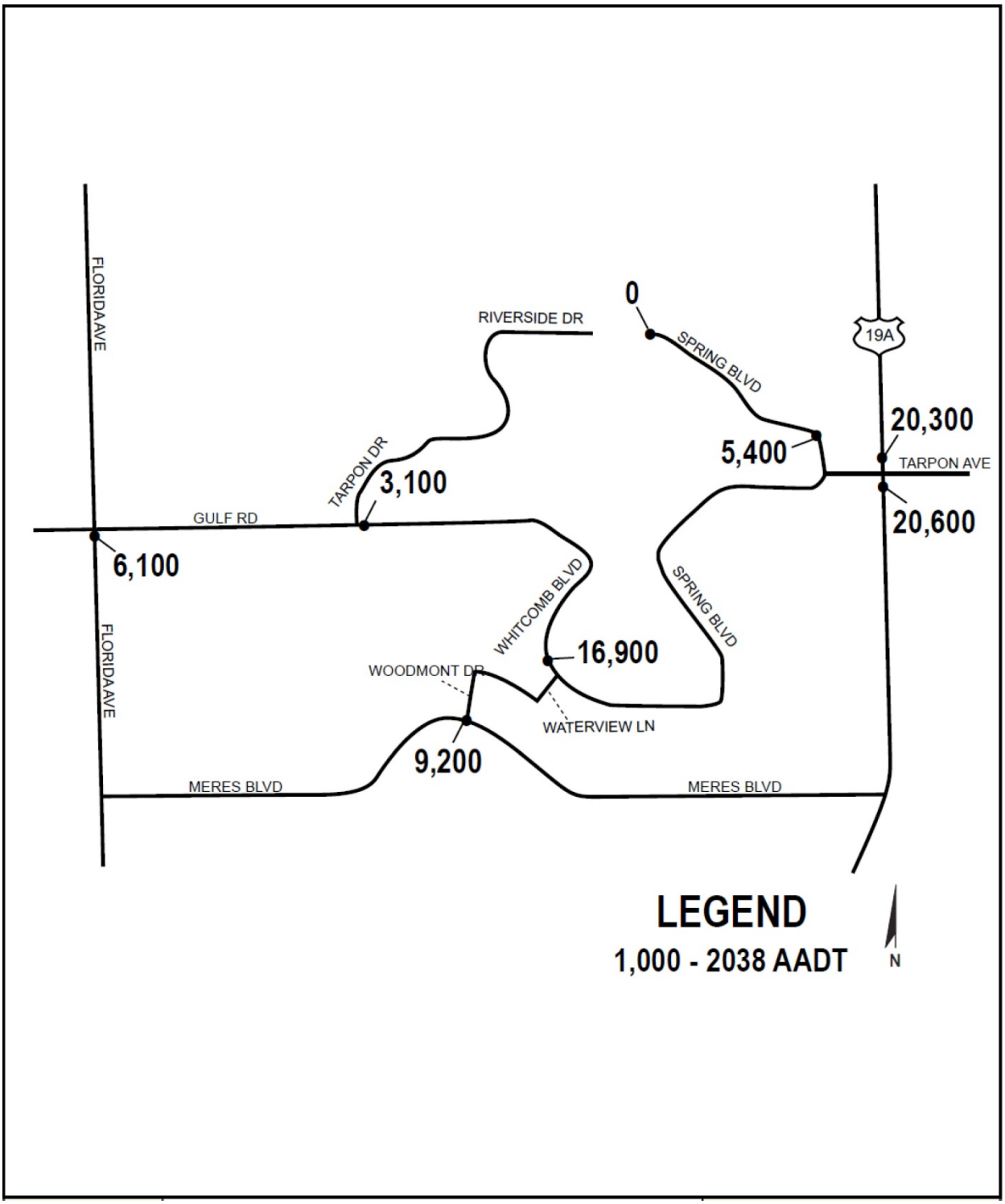


Figure 5-8 – Design Year (2038) AADT Volumes – Scenario 2

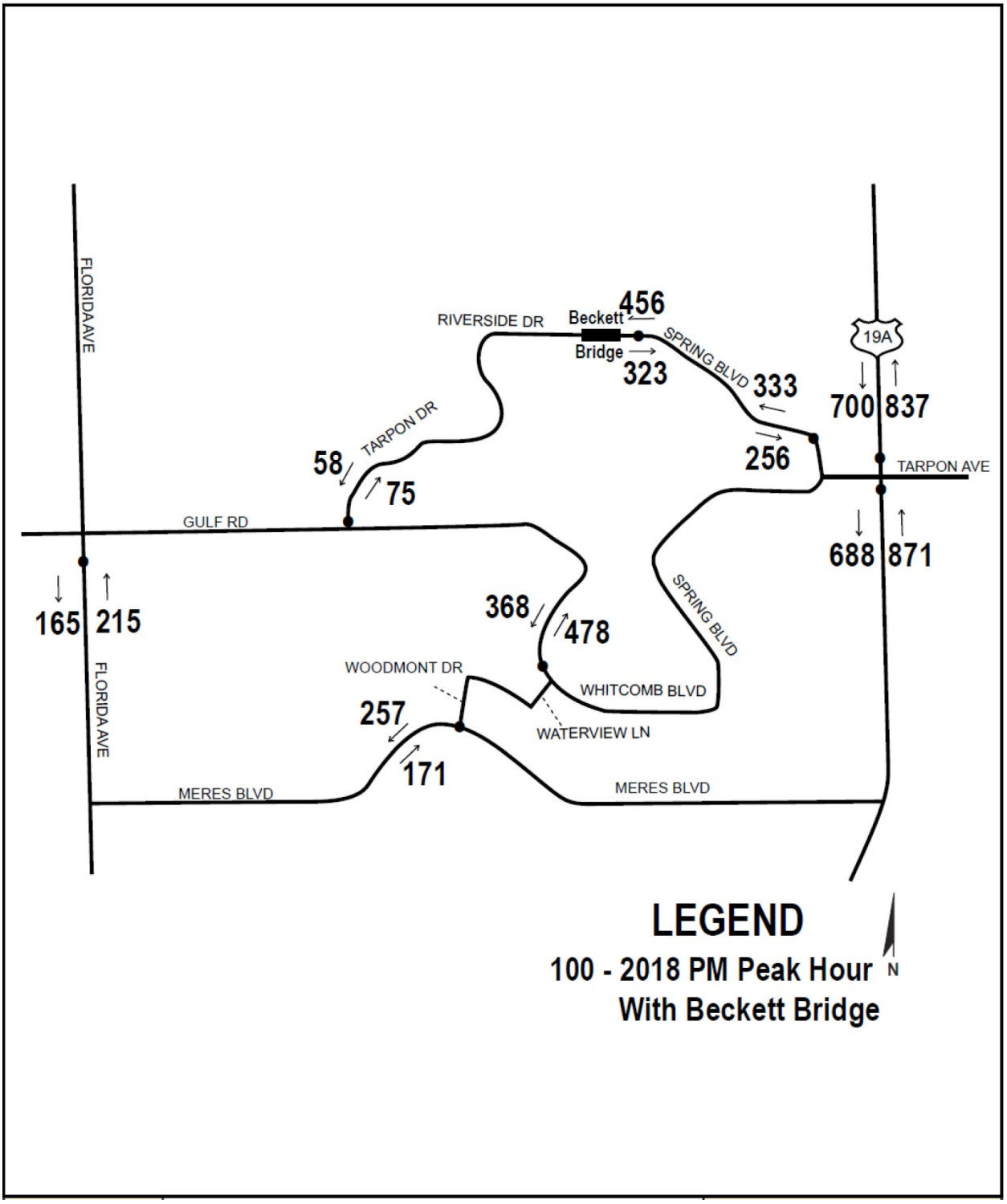


Figure 5-9 – Opening Year (2018) Peak Hour Directional Volumes – Scenario 1

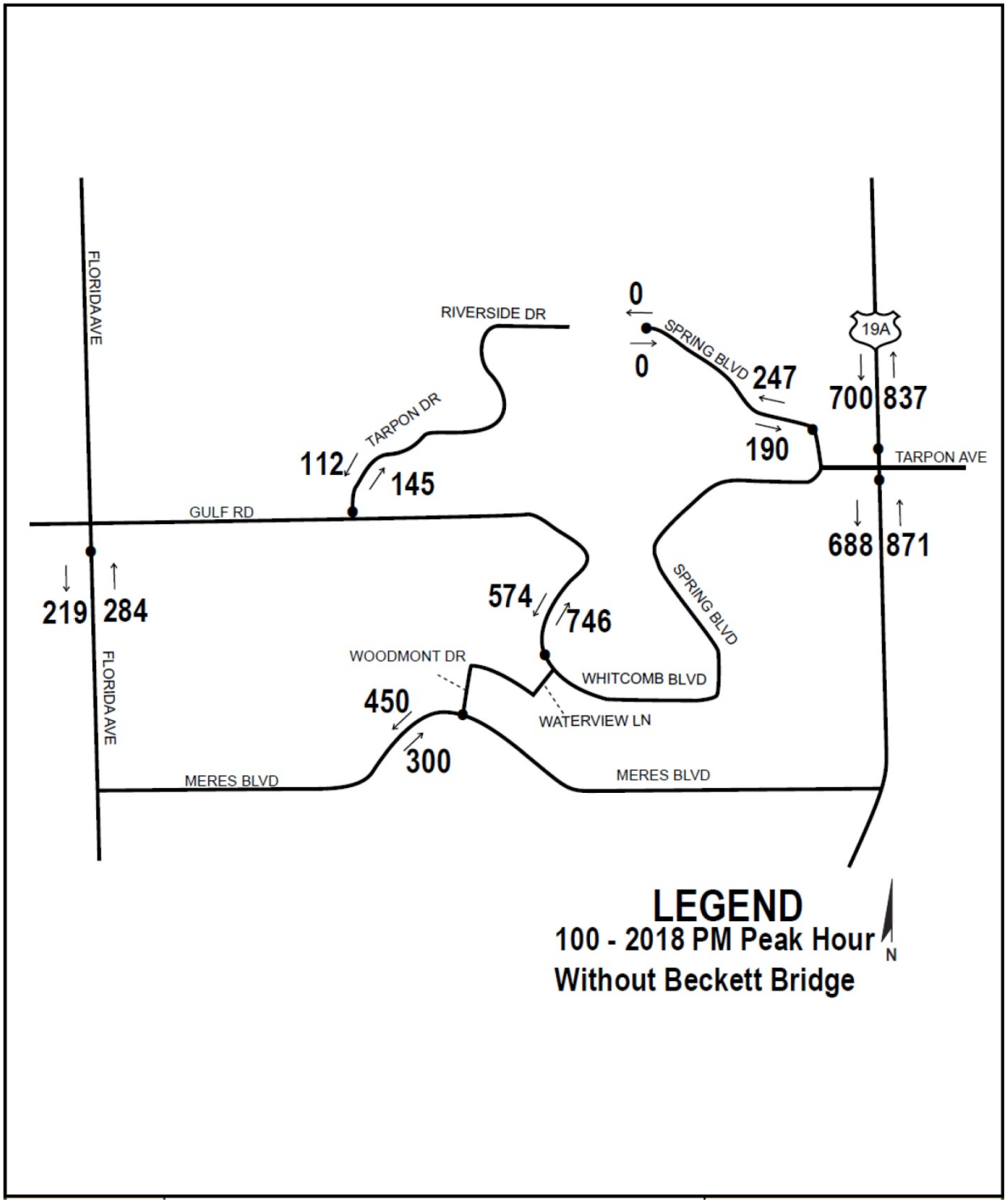


Figure 5-10 – Opening Year (2018) Peak Hour Directional Volumes – Scenario 2

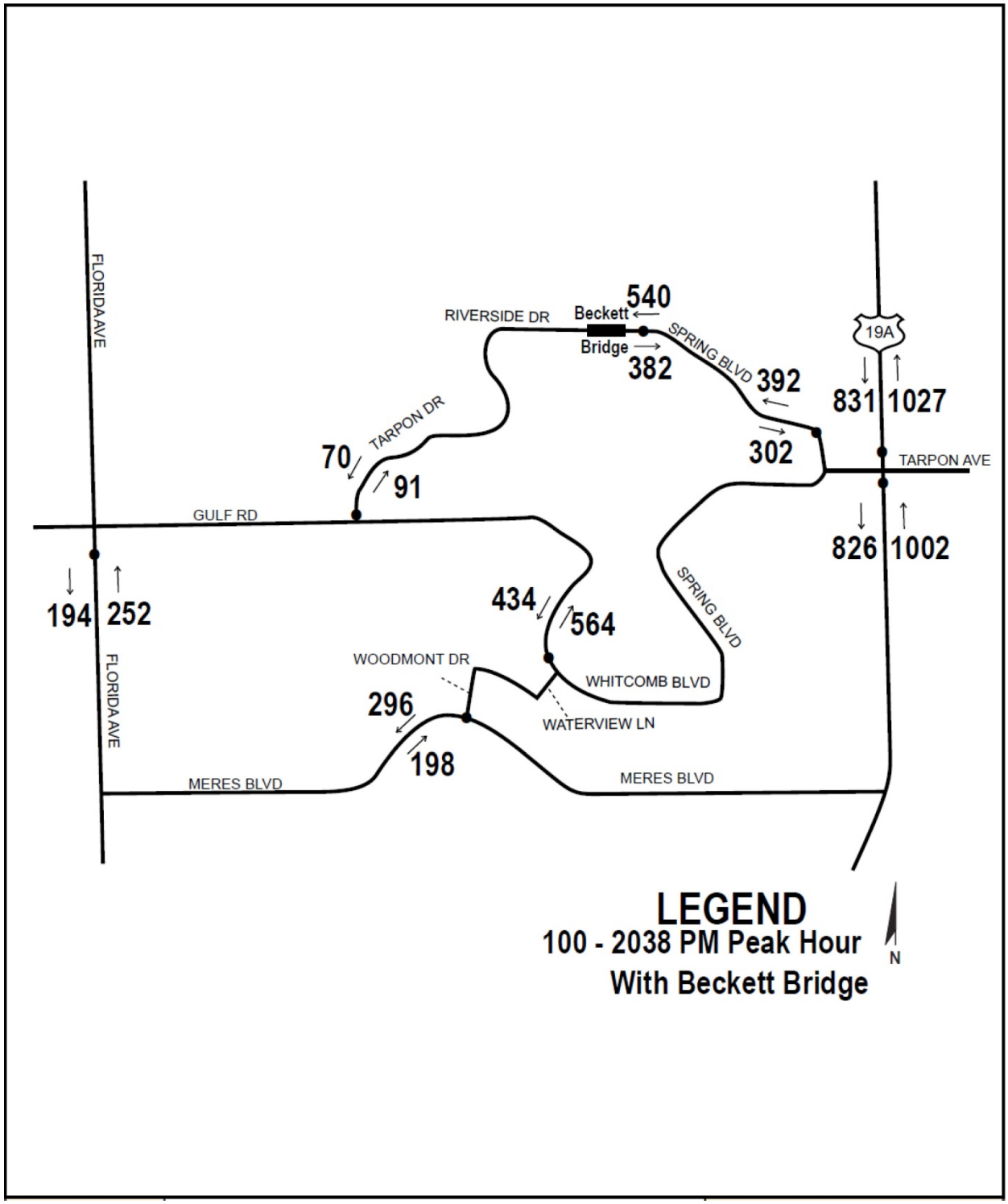


Figure 5-11 – Design Year (2038) Peak Hour Directional Volumes – Scenario 1

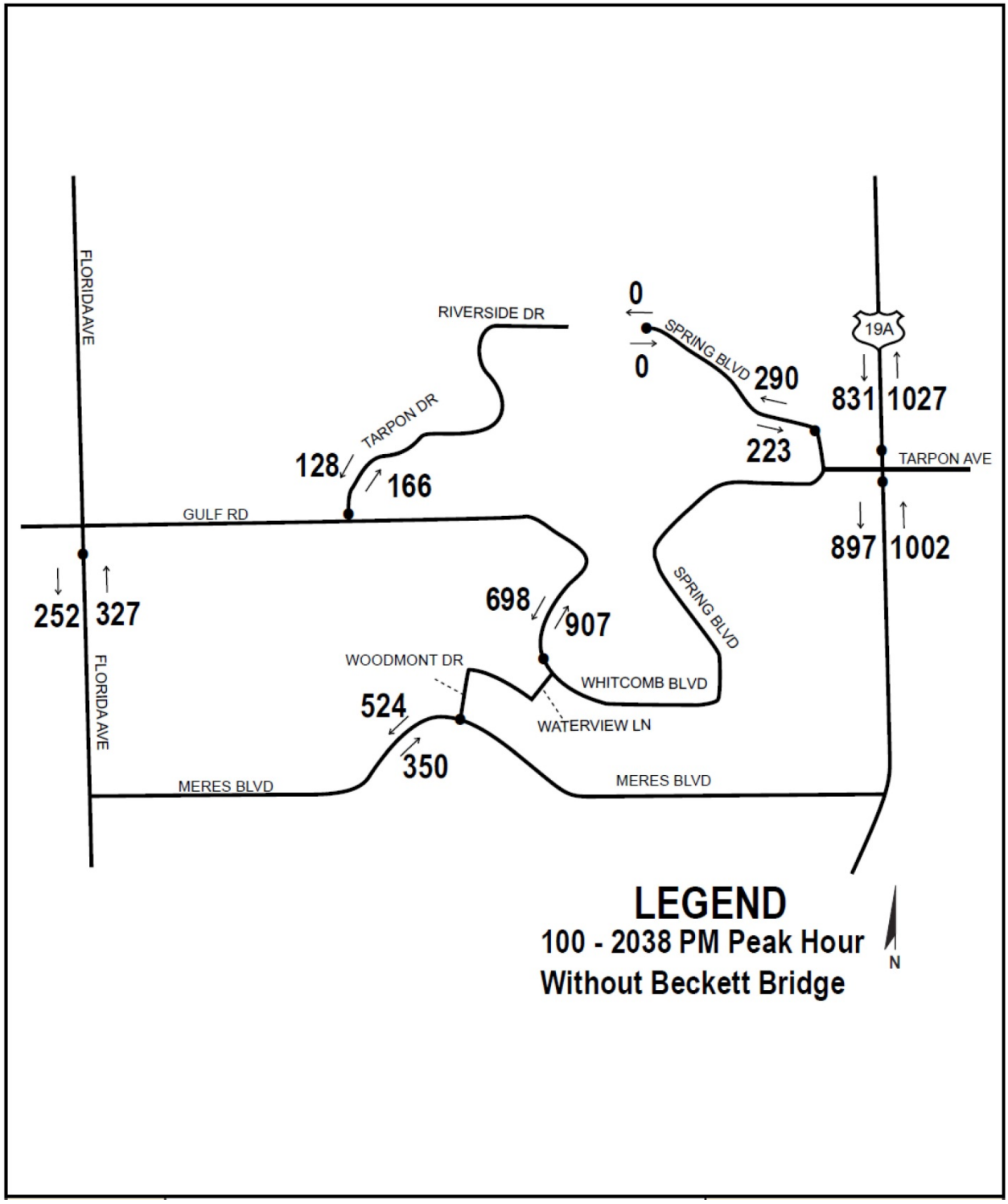


Figure 5-12 – Design Year (2038) Peak Hour Directional Volumes – Scenario 2

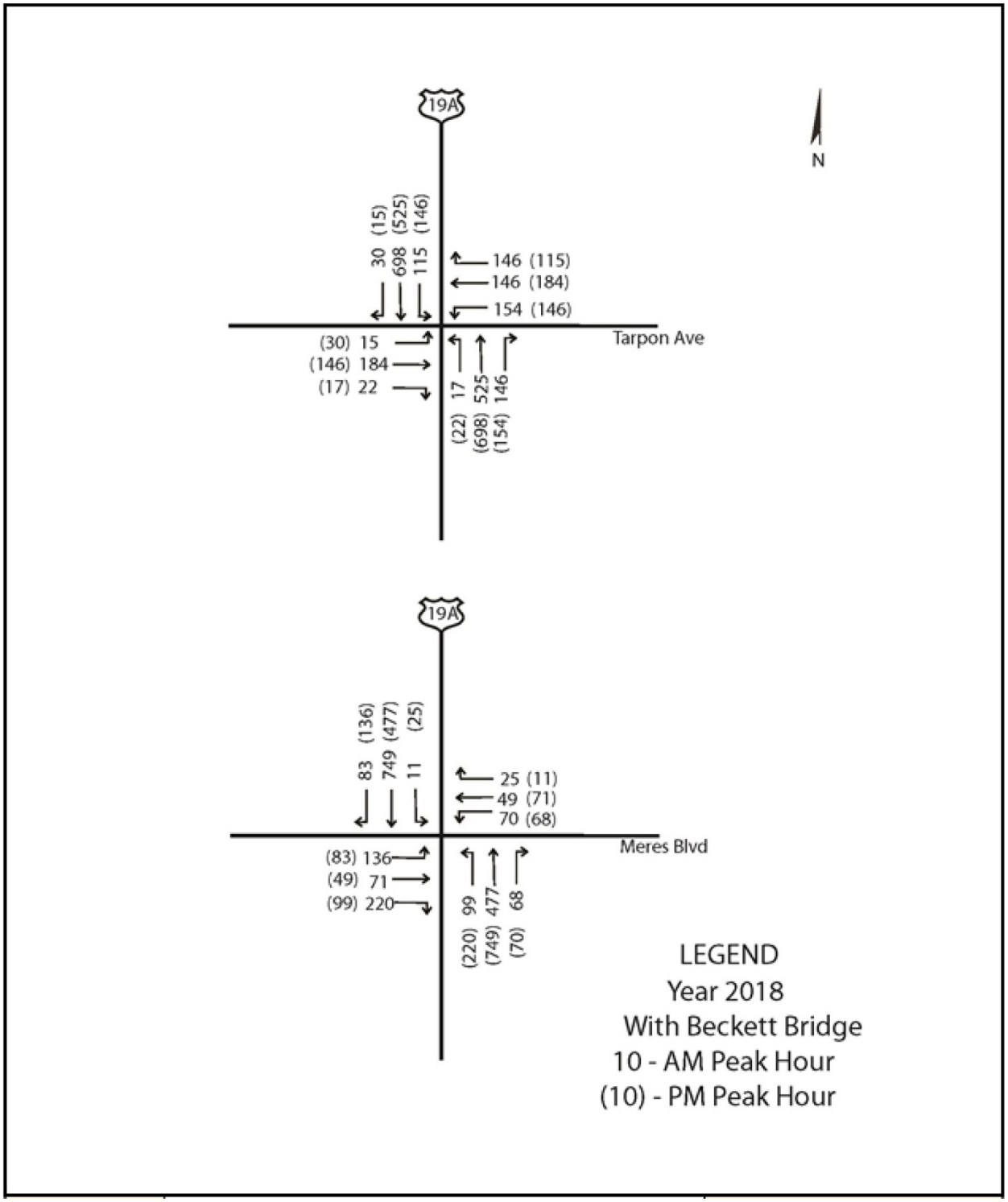


Figure 5-13 – Opening Year (2018) Intersection Peak Hour Volumes – Scenario 1

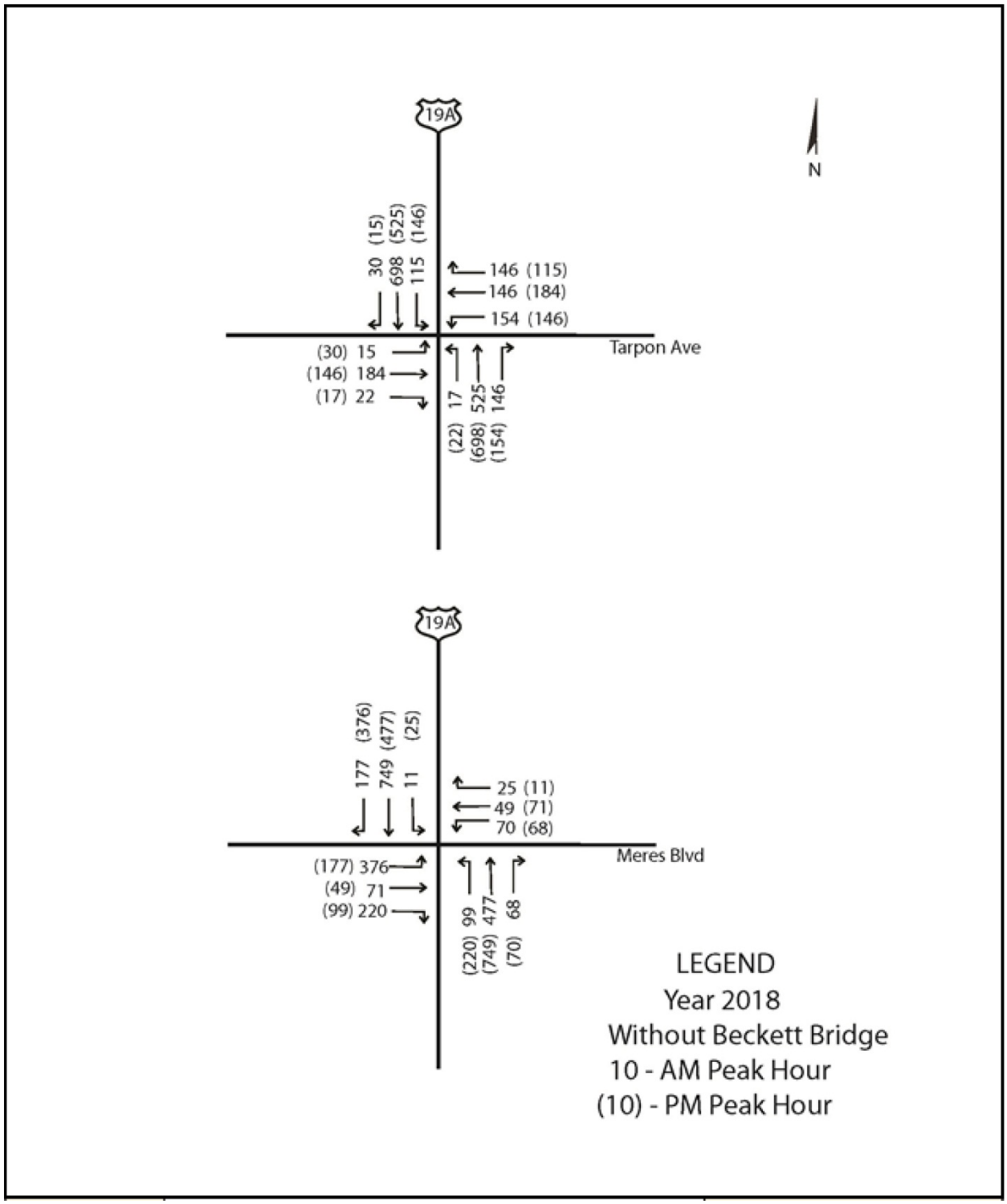


Figure 5-14 – Opening Year (2018) Intersection Peak Hour Volumes – Scenario 2

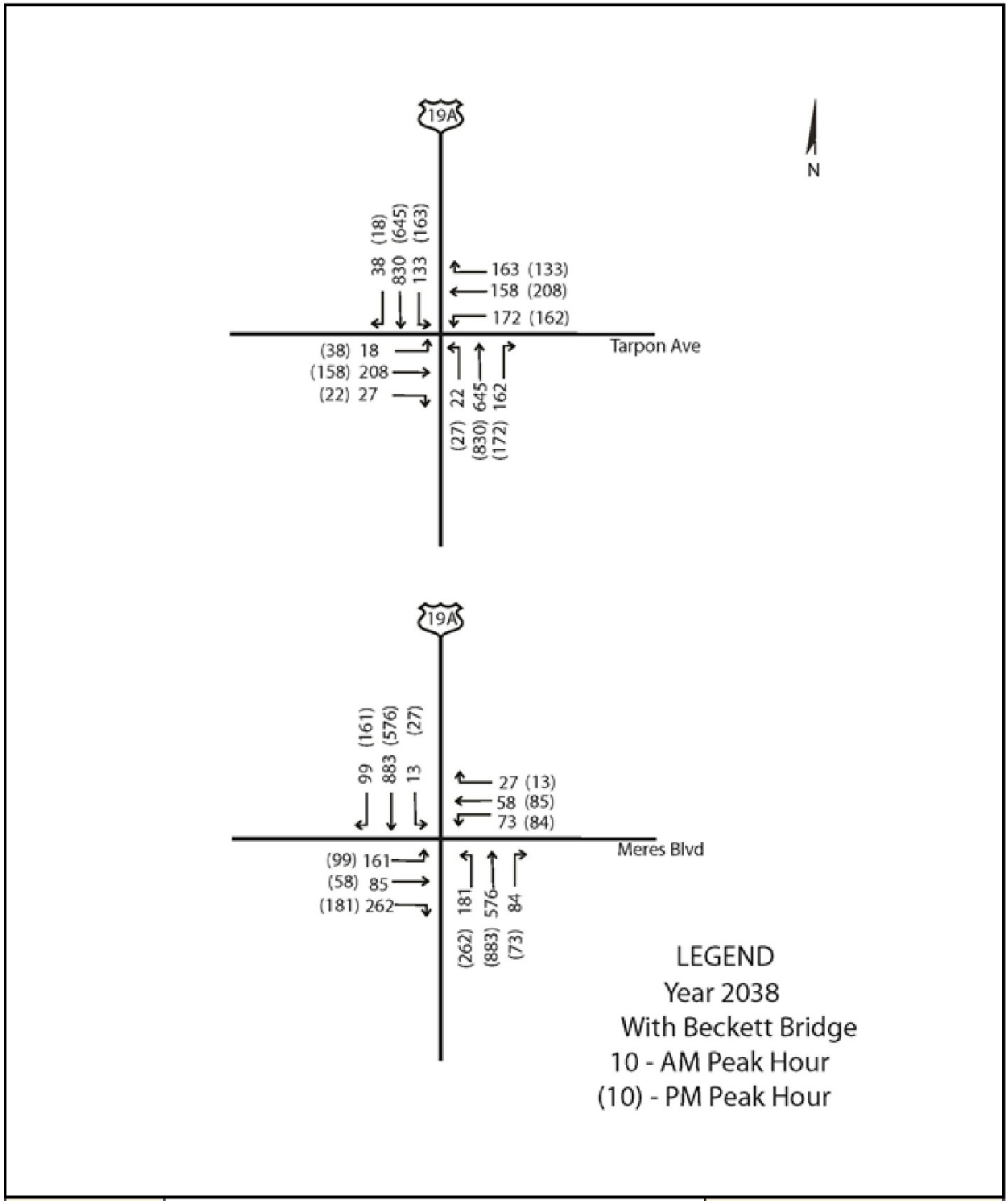


Figure 5-15 – Design Year (2038) Intersection Peak Hour Volumes – Scenario 1

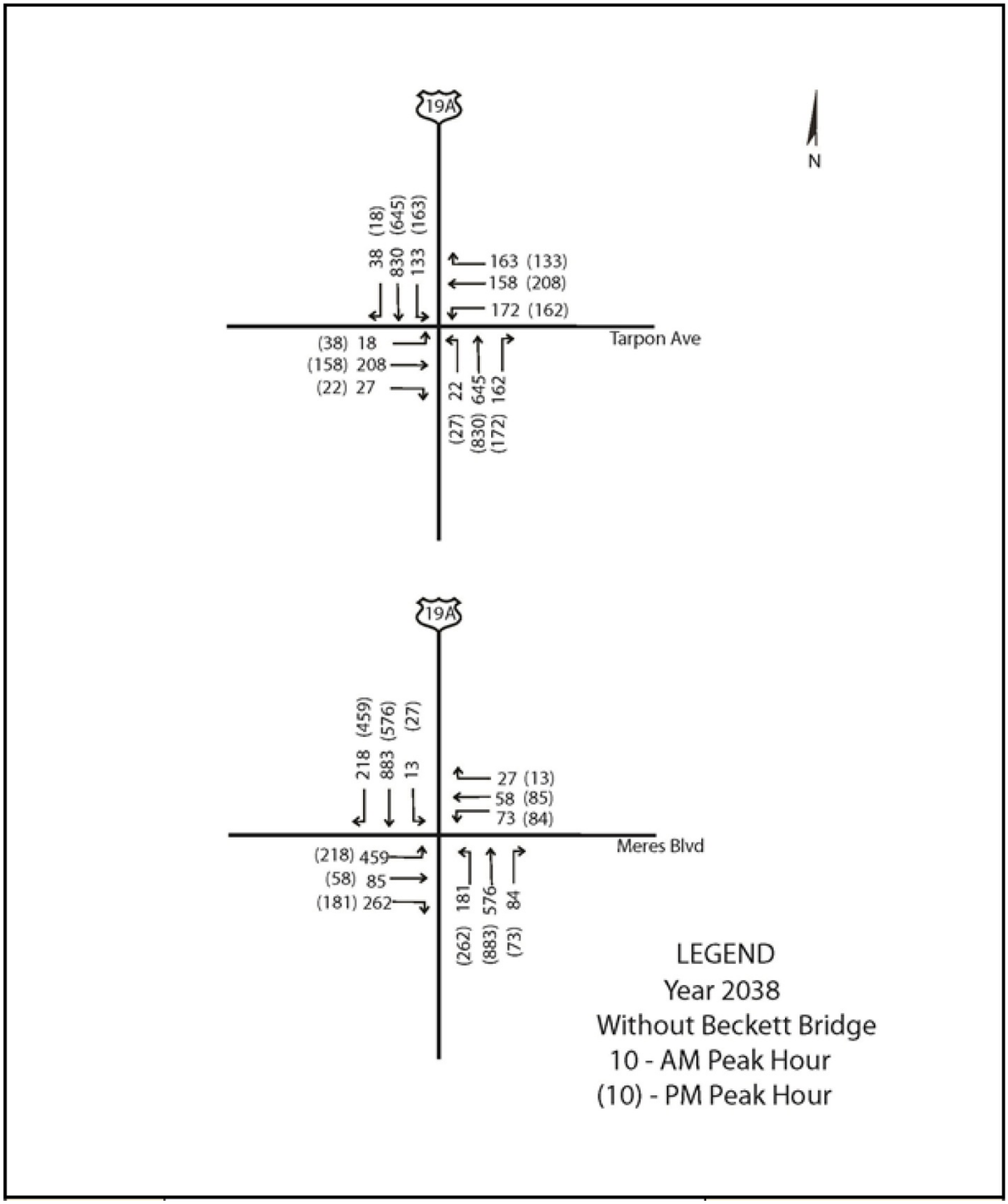


Figure 5-16 – Design Year (2038) Intersection Peak Hour Volumes – Scenario 2

Table 5-3 – Opening Year (2018) Signalized Intersection
Peak Hour Level of Service – Scenario 1

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Meres Boulevard	Northbound	644	1039	18.4	B	31.8	C
	Southbound	843	638	22.2	C	18.4	B
	Eastbound	427	231	35.8	D	34.0	C
	Westbound	144	150	51.4	D	46.9	D
			Overall	**25.9**	**C**	**29.0**	**C**
Alternate US 19 at Tarpon Avenue	Northbound	688	874	20.1	C	59.9	E
	Southbound	843	686	18.3	B	23.2	C
	Eastbound	221	193	47.4	D	53.1	D
	Westbound	446	445	39.2	D	36.6	D
			Overall	**26.1**	**C**	**43.1**	**D**

In 2018, with the bridge, the intersection of Alternate US 19 at Meres Boulevard is projected to operate at LOS C overall during both the a.m. and p.m. peak hours. The Alternate US 19 at Tarpon Avenue intersection is projected to operate at LOS C in the a.m. peak hour and LOS D during the p.m. peak hour. Consistent with the existing (2012) conditions analysis, the northbound approach for the Alternate US 19 at Tarpon Avenue intersection continues to operate at LOS E during the p.m. peak hour.

Scenario 2 – Bridge Removed

Table 5-4 summarizes the intersection delay and LOS results based on the Opening Year (2018) analysis without the Beckett Bridge (Scenario 2) at the signalized intersections along Alternate US 19 at Meres Boulevard and at Tarpon Avenue. In 2018, without the bridge, the intersection of Alternate US 19 at Meres Boulevard is projected to operate at LOS C overall in the a.m. peak and the p.m. peak hour. The intersection of Alternate US 19 at Tarpon Avenue is projected to operate at LOS C in the a.m. peak hour and LOS D during the p.m. peak hour. During the p.m. peak hour, the northbound approach of Alternate US 19 at Tarpon Avenue is anticipated to continue to operate at LOS E. It should be noted that in Scenario 2, the same level of traffic is projected to utilize the Alternate US 19 at Tarpon Avenue intersection after the redistribution around Whitcomb Bayou.

Table 5-4 – Opening Year (2018) Signalized Intersection
Peak Hour Level of Service – Scenario 2

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Meres Boulevard	Northbound	644	1039	19.4	B	27.6	C
	Southbound	937	878	22.4	C	17.3	B
	Eastbound	667	325	53.7	D	38.6	D
	Westbound	144	150	49.5	D	49.6	D
			Overall	**32.0**	**C**	**26.7**	**C**
Alternate US 19 at Tarpon Avenue	Northbound	688	874	20.1	C	59.9	E
	Southbound	843	686	18.3	B	23.2	C
	Eastbound	221	193	47.4	D	53.1	D
	Westbound	446	445	39.2	D	36.6	D
			Overall	**26.1**	**C**	**43.1**	**D**

5.2.5 Opening Year (2018) Arterial Analysis

An arterial analysis was conducted for the Opening Year (2018) under both scenarios using the capacities provided in the *2009 FDOT Quality/LOS Generalized Tables.*

Scenario 1 – Bridge Remains

An arterial analysis was conducted for the Opening Year (2018) with the Beckett Bridge (Scenario 1) using the capacities provided in the *2009 FDOT Quality/LOS Generalized Tables.* Results show that Alternate US 19 is projected to continue to deteriorate to LOS F. As previously noted, Alternate US 19 has been designated by Pinellas County as a constrained roadway, and the failing level of service can be attributed to additional land use in the area and not as a result of the bridge improvements. All of the other roadways in the study area operate at an acceptable LOS (LOS C or better). **Table 5-5** shows the results based on the generalized table capacities using urban, state and non-state roadway classifications.

Table 5-5 – Opening Year (2018) Arterial Level of Service – Scenario 1

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	333	B
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	456	C
Tarpon Drive (North of Gulf Road)	2U	630	75	B
Florida Avenue (South of Gulf Road)	2U	630	215	B
Meres Boulevard (West of Woodmont Drive)	2U	630	257	B
Whitcomb Boulevard (South of Poulos Lane)	2U	630	478	C
Alternate US 19 (South of Tarpon Avenue)	2D	660	871	F
Alternate US 19 (North of Tarpon Avenue)	2U	880	837	D

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.
[1] Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.
[2] LOS Standard for all study area roadways is LOS D.

Scenario 2 – Bridge Removed

An arterial analysis was conducted for the Opening Year (2018) without the Beckett Bridge (Scenario 2) using the capacities provided in the *2009 FDOT Quality/LOS Generalized Tables.* Results show that Alternate US 19 is projected to continue to deteriorate to LOS F. As previously noted, Alternate US 19 has been designated by Pinellas County as a constrained roadway, and the failing level of service can be attributed to additional land use in the area and not as a result of the direct removal of the bridge. Additionally, without the bridge, the redistribution of traffic is projected to degrade the operations on Whitcomb Boulevard to LOS F. All of the other roadways in the study area operate at an acceptable LOS (LOS C or better). **Table 5-6** shows the results based on the generalized table capacities using urban, state and non-state roadway classifications.

Table 5-6 – Opening Year (2018) Arterial Level of Service – Scenario 2

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	247	B
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	N/A	N/A
Tarpon Drive (North of Gulf Road)	2U	630	145	B
Florida Avenue (South of Gulf Road)	2U	630	284	B
Meres Boulevard (West of Woodmont Drive)	2U	630	450	C
Whitcomb Boulevard (South of Poulos Lane)	2U	630	746	F
Alternate US 19 (South of Tarpon Avenue)	2D	660	871	F
Alternate US 19 (North of Tarpon Avenue)	2U	880	837	D

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.
[1] Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.
[2] LOS Standard for all study area roadways is LOS D.

5.2.6 Design Year (2038) Intersection Analysis

The Design Year (2038) traffic conditions were analyzed under both scenarios using the Transportation Research Board's HCM and HCS+ for the two study area intersections.

Scenario 1 - Bridge Remains

Table 5-7 summarizes the intersection delay and LOS results based on the Design Year (2038) analysis with the Beckett Bridge (Scenario 1) at the signalized intersections along Alternate US 19 at Meres Boulevard and at Tarpon Avenue. In 2038, with the bridge, the intersection of Alternate US 19 at Meres Boulevard is projected to operate at LOS D overall during the a.m. and p.m. peak hours. The Alternate US 19 at Tarpon Avenue intersection is projected to operate at LOS C in the a.m. peak hour and LOS D during the p.m. peak hour. Consistent with the Opening Year (2018) analysis, the northbound approach for the Alternate US 19 at Tarpon Avenue intersection continues to operate at LOS E during the p.m. peak hour. Additionally, the northbound approach is projected to operate at LOS E in the a.m. peak hour.

Table 5-7 – Design Year (2038) Signalized Intersection Peak Hour Level of Service – Scenario 1

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Meres Boulevard	Northbound	841	1218	78.4	E	45.6	D
	Southbound	995	764	23.9	C	18.0	B
	Eastbound	508	338	49.1	D	39.7	D
	Westbound	158	182	53.4	D	51.6	D
			Overall	**49.3**	**D**	**36.9**	**D**
Alternate US 19 at Tarpon Avenue	Northbound	829	1029	24.1	C	68.9	E
	Southbound	1001	826	25.3	C	39.9	D
	Eastbound	253	218	48.0	D	54.7	D
	Westbound	493	503	45.9	D	38.2	D
			Overall	**31.1**	**C**	**52.3**	**D**

Scenario 2 – Bridge Removed

Table 5-8 summarizes the intersection delay and LOS results based on the Design Year (2038) analysis without the Beckett Bridge (Scenario 2) at the signalized intersections along Alternate US 19 at Meres Boulevard and at Tarpon Avenue. In 2038, without the bridge, operations at the intersection of Alternate US 19 at Meres Boulevard are projected to deteriorate to LOS E overall in the a.m. peak hour and LOS D in the p.m. peak hour. Additionally, the northbound approach is anticipated to operate at LOS E and the eastbound approach is anticipated to deteriorate to LOS F in the a.m. peak hour.

The intersection of Alternate US 19 at Tarpon Avenue is projected to operate at LOS C in the a.m. peak hour and LOS D during the p.m. peak hour. During the p.m. peak hour, the northbound approach of Alternate US 19 at Tarpon Avenue is anticipated to continue to operate at LOS E. It should be noted that in Scenario 2, the same level of traffic is projected to utilize the Alternate US 19 at Tarpon Avenue intersection after the redistribution without the bridge.

5.2.7 Design Year (2038) Arterial Analysis

An arterial analysis was conducted for the Design Year (2038) under both scenarios using the capacities provided in the *2009 FDOT Quality/LOS Generalized Tables.*

Table 5-8 – Design Year (2038) Signalized Intersection Peak Hour Level of Service – Scenario 2

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Meres Boulevard	Northbound	841	1218	78.4	E	43.9	D
	Southbound	1114	1062	22.6	C	18.8	B
	Eastbound	806	457	163.5	F	43.7	D
	Westbound	158	182	53.4	D	51.6	D
			Overall	79.5	E	35.2	D
Alternate US 19 at Tarpon Avenue	Northbound	829	1029	24.1	C	68.9	E
	Southbound	1001	826	25.3	C	39.9	D
	Eastbound	253	218	48.0	D	54.7	D
	Westbound	493	503	45.9	D	38.2	D
			Overall	31.1	C	52.3	D

Scenario 1 – Bridge Remains

An arterial analysis was conducted for the Design Year (2038) with the Beckett Bridge (Scenario 1) using the capacities provided in the *2009 FDOT Quality/LOS Generalized Tables.* Results show that Alternate US 19 is projected to continue to deteriorate to LOS F. As previously noted, Alternate US 19 has been designated by Pinellas County as a constrained roadway, and the failing level of service can be attributed to additional land use in the area and not as a result of the bridge improvements. All of the other roadways in the study area operate at an acceptable LOS (LOS C or better). **Table 5-9** shows the results based on the generalized table capacities using urban, state and non-state roadway classifications.

Scenario 2 – Bridge Removed

An arterial analysis was conducted for the Design Year (2038) without the Beckett Bridge (Scenario 2) using the capacities provided in the *2009 FDOT Quality/LOS Generalized Tables.* Results show that Alternate US 19 is projected to continue to deteriorate to LOS F. As previously noted, Alternate US 19 has been designated by Pinellas County as a constrained roadway, and the failing level of service can be attributed to additional land use in the area and not as a direct result of the removal of the bridge.

Table 5-9 – Design Year (2038) Arterial Level of Service – Scenario 1

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	392	C
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	540	C
Tarpon Drive (North of Gulf Road)	2U	630	91	B
Florida Avenue (South of Gulf Road)	2U	630	252	B
Meres Boulevard (West of Woodmont Drive)	2U	630	296	B
Whitcomb Boulevard (South of Poulos Lane)	2U	630	564	C
Alternate US 19 (South of Tarpon Avenue)	2D	660	1002	F
Alternate US 19 (North of Tarpon Avenue)	2U	880	1027	F

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.
1 Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.
2 LOS Standard for all study area roadways is LOS.

Additionally, without the bridge, the redistribution of traffic is projected to degrade the operations on Whitcomb Boulevard to LOS F. All of the other roadways in the study area operate at an acceptable LOS (LOS C or better). **Table 5-10** shows the results based on the generalized table capacities using urban, state and non-state roadway classifications.

Table 5-10 – Design Year (2038) Arterial Level of Service – Scenario 2

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	290	B
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	N/A	N/A
Tarpon Drive (North of Gulf Road)	2U	630	166	B
Florida Avenue (South of Gulf Road)	2U	630	327	B
Meres Boulevard (West of Woodmont Drive)	2U	630	524	C
Whitcomb Boulevard (South of Poulos Lane)	2U	630	907	F
Alternate US 19 (South of Tarpon Avenue)	2D	660	1002	F
Alternate US 19 (North of Tarpon Avenue)	2U	880	1027	F

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.
1 Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.
2 LOS Standard for all study area roadways is LOS D.

5.3 DETOUR ANALYSIS

5.3.1 Proposed Detour Route Alternatives

In order to evaluate potential traffic impacts to the surrounding study area roadways during the period of rehabilitation or replacement of the existing bridge structure, several detour options were explored. Construction for bridge rehabilitation or replacement is anticipated to occur for six to 24 months, depending on the extent of the improvements. **Figure 5-17** illustrates the proposed detour route alternatives, which include the following:

1. Whitcomb Boulevard - traffic diverted using Whitcomb Boulevard/South Spring Boulevard around Whitcomb Bayou - a distance of approximately 2.5 miles.

2. Meres Boulevard - traffic diverted using Meres Boulevard from Alternate US 19 to Florida Avenue

3. Klosterman Road-Carlton Road-Curlew Road - traffic diverted from Alternate US 19 using Klosterman Road, Carlton Road, and Curlew Road to Florida Avenue

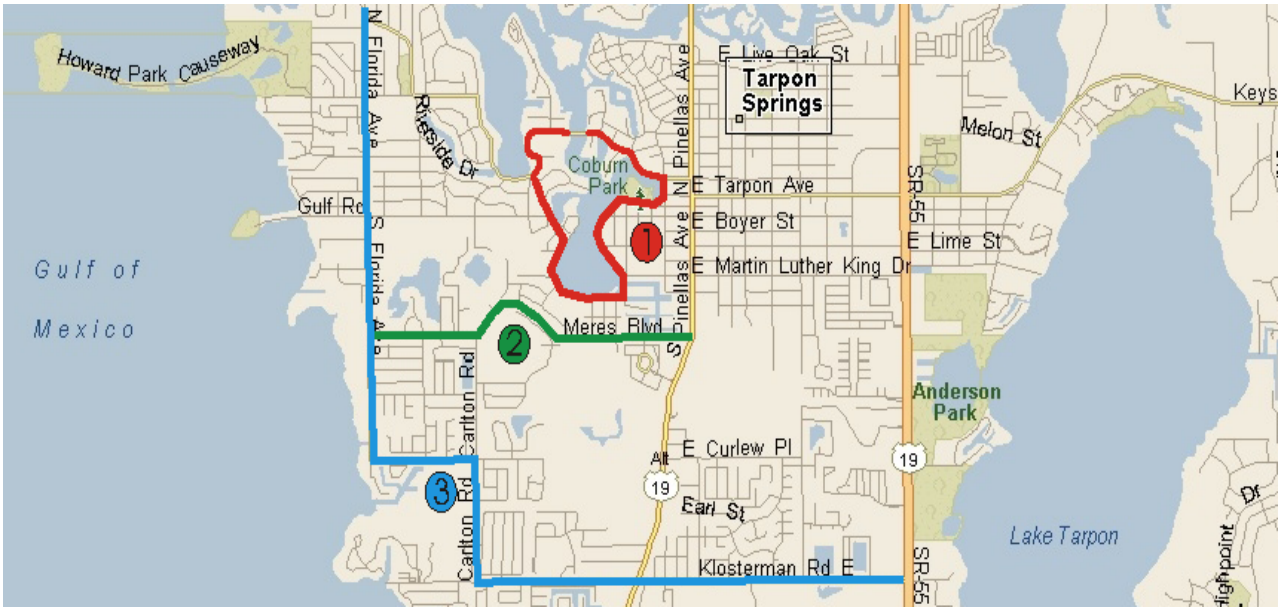


Figure 5-17 – Proposed Detour Route Alternatives

It should be noted that a comparison of the TBRPM origin/destination traffic patterns with and without the Beckett Bridge showed that none of the existing or future traffic traveling across the bridge would redistribute using the Klosterman Road-Carlton Road-Curlew Road alternative. In addition, this route is the longest and most circuitous of the alternatives, at approximately 2.75 miles in length. For these reasons, this alternative was eliminated from

further consideration.

Results of the analysis indicate that in the event of closure of the Beckett Bridge, reassigning traffic to Whitcomb Boulevard would increase congestion on this roadway to failing levels of service (LOS F). Conversely, if the traffic was rerouted via Meres Boulevard, then the study area roadways are anticipated to continue to operate at acceptable levels of service with the additional traffic. Detour route LOS analyses are summarized below in **Tables 5-11 through 5-14**.

Table 5-11 – Whitcomb Boulevard Detour Route Arterial Level of Service

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	247	B
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	N/A	N/A
Tarpon Drive (North of Gulf Road)	2U	630	427	C
Florida Avenue (South of Gulf Road)	2U	630	215	B
Meres Boulevard (West of Woodmont Drive)	2U	630	257	B
Whitcomb Boulevard (South of Poulos Lane)	2U	630	830	F
Alternate US 19 (South of Tarpon Avenue)	2D	660	871	F
Alternate US 19 (North of Tarpon Avenue)	2U	880	837	D

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.
[1] Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.
[2] LOS Standard for all study area roadways is LOS D.

Table 5-12 – Whitcomb Boulevard Detour Route Signalized Intersection Peak Hour Level of Service

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Tarpon Avenue	Northbound	705	902	53.5	D	91.0	F
	Southbound	984	800	97.1	F	60.3	E
	Eastbound	505	387	85.5	F	146.9	F
	Westbound	472	577	24.9	C	27.2	C
			Overall	**70.3**	**E**	**76.2**	**E**

Table 5-13 – Meres Boulevard Detour Route Arterial Level of Service

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	247	B
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	N/A	N/A
Tarpon Drive (North of Gulf Road)	2U	630	427	C
Florida Avenue (South of Gulf Road)	2U	630	567	C
Meres Boulevard (West of Woodmont Drive)	2U	630	609	D
Whitcomb Boulevard (South of Poulos Lane)	2U	630	478	C
Alternate US 19 (South of Tarpon Avenue)	2D	660	871	F
Alternate US 19 (North of Tarpon Avenue)	2U	880	837	D

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.

[1] Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.

[2] LOS Standard for all study area roadways is LOS D.

Table 5-14 – Meres Boulevard Detour Route
Signalized Intersection Peak Hour Level of Service

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Meres Boulevard	Northbound	644	1039	19.4	B	27.6	C
	Southbound	937	878	22.4	C	17.3	B
	Eastbound	667	325	53.7	D	38.6	D
	Westbound	144	150	49.5	D	49.6	D
			Overall	**32.0**	**C**	**26.7**	**C**

Based on these results, it is recommended that the detour route for the project occur along Meres Boulevard. Detour signage, including the use of Intelligent Transportation Systems (ITS), specifically electronic message panels, should be placed well in advance of the route location along Florida Avenue and Alternate US 19 (at a minimum). Additional electronic signage may also be needed at key locations throughout the neighborhood surrounding the Beckett Bridge and should provide (if at all possible) real-time information regarding potential delays on the route.

It should be noted that portions of Alternate US 19 operate at LOS F under either scenario, as well as the detour alternatives, in both the Opening Year (2018) and Design Year (2038). However, this corridor has been designated by Pinellas County as a constrained roadway, and the failing level of service can be attributed to additional land use in the area and not as a direct result of the project.

6.0 ALTERNATIVES CONSIDERED

6.1 CORRIDOR ANALYSIS

Beckett Bridge was originally constructed in 1924. Since that time, the existing two-lane bridge has provided an important link to areas west and north of the Bayou to downtown Tarpon Springs. The bridge is also located on a popular route for access to Fred Howard Park, a Pinellas County park located approximately 3.1 miles west on the Gulf of Mexico. Riverside Drive/North Spring Boulevard is an extension of Tarpon Avenue, which is a designated evacuation route. Beckett Bridge provides access to major north/south arterials including Alternate US 19 and US 19 for coastal residents during hurricane evacuation. The bridge also provides access for emergency vehicles, including police, ambulance and fire. The AADT volume is currently 7,700. In the design year (2038), the AADT is predicted to increase to 9,700.

Areas to the east and west of the bridge are densely developed. Therefore, other corridors for construction of a new bridge would result in substantial impacts to adjacent properties. In addition, construction of a new bridge on a new corridor would result in more impacts to the natural environment. If a replacement bridge is selected as the Preferred Alternative, construction along the existing corridor will best serve the purpose and need of the project and result in fewer impacts than a bridge constructed within a new corridor.

6.2 TRANSPORTATION SYSTEM MANAGEMENT MULTI-MODAL IMPROVEMENTS

Transportation System Management (TSM) multi-modal improvements are strategies for reduction of existing and potential future congestion. Typically TSM improvements include traffic signal and intersection improvements, transit improvements and changes in access management. These improvements are designed to improve efficiency without costly infrastructure improvements.

The purpose of this project is to establish a preferred alternative to remove, repair or replace a deteriorating existing bridge. Improving efficiency within the project corridor is not the objective of the proposed improvements considered for this project. There are no signalized intersections within the project limits. Accordingly, it was determined that TSM improvements are not feasible to address the project need.

6.3 NO-BUILD ALTERNATIVES

Two No-Build Alternatives were considered, No-Build and No-Build with Removal of the Existing Bridge.

6.3.1 No-Build

The No-Build Alternative includes only routine maintenance performed as needed to keep the bridge open to traffic until safety issues, such as reduced capacity due to ongoing deterioration, would require it to be closed. Repair or replacement could be considered at a later date. The No-Build Alternative does not include modification or improvements to the existing bridge or approach roadway. Existing geometric and other deficiencies, including substandard lane width and curbs would remain. No changes to the existing horizontal and vertical navigational clearances would occur.

There are a number of components of the bridge that are in an advanced state of deterioration that are not likely to be economically corrected by routine maintenance or in-kind repair. Estimating the remaining service life of these components is more subjective than quantitative analysis. However, given the age of the bridge and the extent of the deficiencies, without major rehabilitation the existing bridge is estimated to have no more than 10 years of remaining service. The No-Build Alternative was retained as a viable alternative throughout the duration of the PD&E study, though it is not the Preferred Alternative. The Preferred Alternative is described in Section 7.0 of this document.

6.3.2 No-Build with Removal of the Existing Bridge

This alternative is the same as the No-Build Alternative described above, except that the bridge would be demolished when it is no longer safe for traffic. No plans for future rehabilitation would be considered and a replacement bridge would not be constructed.

6.4 REHABILITATION ALTERNATIVE

The existing bridge service life can be extended with extensive repairs and modifications, implementation of measures that slow the rate of concrete and structural steel deterioration, replacement of severely deteriorated structural elements, replacement of worn, deteriorated, and outdated electrical and mechanical systems and replacement of substandard bridge railings. However, even after major rehabilitation, due to its age and condition, it is anticipated

that the bridge will require significant ongoing maintenance and periodic additional major repairs with corresponding disruptions to traffic. Rehabilitation to restore structural capacity, bring the bridge rails up to current safety standards, and mitigate future settlement would involve replacement of the bascule leaf (the steel draw span), the operating system (electrical and mechanical), and construction of crutch bents at each approach bent. These improvements, in conjunction with continued maintenance and periodic repair and/or rehabilitation, could extend the service life of the bridge 25 to 30 years (from 2013). It is not practical to extend the life of the bridge indefinitely.

Generally, if proposed improvements include substantial modification to the superstructure or substructure, the USCG is likely to require that the navigational clearances be improved to meet current USCG guide clearances for the affected waterway. However, there are no USCG guide clearances for the channel over which the Beckett Bridge is constructed. Accordingly, it is anticipated that the USCG will permit the proposed improvements described below for the Rehabilitation Alternative provided the proposed clearances are at least the same as the existing clearances. No changes in the navigational clearances are proposed. Replacement of the fender system would require a USCG permit.

The proposed Rehabilitation Alternative would include the following work and would extend the service life of the bridge a maximum of 25-30 years:

- Replace the sand-cement riprap at the abutments.
- Replace substandard approach guardrails.
- Remove all existing pile jackets and install new cathodic protection jackets on all concrete bent piles as well as steel bascule pier helper piles.
- Repair deteriorated concrete of the pile bent caps, bascule pier and rest pier, and provide cathodic protection in the form of zinc spray metalizing.
- Install crutch bents at Bents 2, 3, 4, 5, 8, 9, 10.
- Replace substandard concrete bridge railings with new traffic railings meeting crash testing requirements of NCHRP 350 (i.e. FDOT Standard Index 422 – 42" Vertical Face Traffic Railing).
- Hydro-blast the deteriorated concrete deck surface and install a new concrete overlay.

- Replace the expansion joints.
- Repair deteriorated concrete of the deck underside, beams and diaphragms, and provide cathodic protection in the form of zinc spray metalizing.
- Rehabilitate the control house including roof, windows and door or replace the control house.
- Replace the bascule leaf including counterweight, open steel and concrete filled grid deck.
- Replace the bascule span main drive machinery as well as the span locks and live load shoes.
- Replace the bascule span electrical system.
- Replace the bascule span traffic gates.
- Replace the bascule span barrier gate.
- Replace the fender system.

6.5 Bridge Replacement Alternatives

Two bridge types were considered for replacement alternatives:

1. A new, two lane, movable span bridge (with 7.8 feet of vertical clearance)
2. A new, two lane, mid-level fixed span bridge (with 28 feet of vertical clearance)

All build alternatives would be constructed on approximately the same alignment as the existing bridge to minimize environmental impacts and impacts to adjacent properties. An analysis of future LOS needs indicates that a two lane bridge will provide sufficient capacity in the design year. (This analysis is presented in Section 5 of this report.) No additional travel lanes are proposed. Conceptual plans for all replacement alternatives are included in Appendix G.

In general, the existing bridge would be demolished prior to construction of a replacement bridge. Accordingly, a detour would be required for all or part of the construction duration. The worst case detour, approximately 2.6 miles long, would be required for someone traveling from Bayshore Mobile Home Park (MHP), located immediately west of the bridge, to the Yacht Club located on the east shoreline of the channel. Analyses of other potential detour routes for

traffic using the bridge are discussed in Section 5.3 of this report. (Note: The traffic patterns for the No-Build with Removal of the Existing Bridge Alternative, after the bridge is removed, are likely to be similar to traffic patterns during the construction detour.) Demolition includes disposal of removed material in accordance with applicable state and federal regulations. Specific disposal requirements, such as identification and handling of hazardous materials, recycling, or artificial reef placement will be addressed in the design phase.

The navigational channel at the bridge site is not federally maintained. The USCG has not established guide clearances for movable or fixed bridges at this channel crossing. It is anticipated that a movable bridge providing at least the same horizontal and vertical clearances as the existing bridge would be permitted. The maximum vertical clearance that avoids impacts to the intersections of Riverside Drive with Chesapeake Drive and Forest Avenue at the project limits is 28 feet (at the fenders) for the fixed span alternatives. When the bridge is in the closed position, the maximum vertical clearance over the channel for the movable bridge alternative that would avoid impacts to the driveways to the Bayshore MHP on the west, and the Yacht Club on the east is 7.8 feet at the fenders.

Aesthetics for the proposed bridge will be based on Level Two criteria in accordance with the *FDOT Plans Preparation Manual.* This emphasizes full integration of efficiency, economy and elegance in all bridge components and the structure as a whole with consideration given to structural systems that are inherently more appealing. The project cost estimates include 10% of the construction costs for aesthetic enhancements.

Constraints affecting construction access and methods at the bridge site include the following:

- Shallow water depths
- Narrow channel at the bridge crossing
- Location of Tarpon Springs Yacht Club and Bayshore MHP docks immediately adjacent to the bridge
- Highly developed adjacent lands with limited areas for construction staging.

Construction methods to reduce the duration of detours and the corresponding disruptions to the traveling public were investigated. Typical means of reducing detour durations include

offline construction and phased construction. Offline construction, where a new bridge alignment is shifted away from an existing bridge so that traffic can be maintained on the existing bridge while the new bridge is constructed, is not practical for this site due to limited right-of-way, adjacent properties, and adjacent wetlands.

Phased construction involves construction of one side of a new bridge while maintaining traffic on a portion of the old bridge. Phased construction is not viable for the Beckett Bridge replacement for two reasons. First, it would require a slight offset of the existing alignment, or a temporary bridge, which would result in additional impacts to adjacent properties and to wetlands. Secondly, the existing bridge's bascule span is a two girder structural system which is not conducive to removal of part of the bridge. Given the above conditions and since the bridge replacement alternatives were developed with the goal of limiting impacts and right-of-way acquisition, neither offline nor phased construction were considered further.

Accelerated Bridge Construction (ABC) is another means of reducing detour durations and construction impacts. ABC utilizes a combination of construction means and technologies to increase the speed of construction, with particular emphasis on reducing the duration of on-site construction. Implementing ABC technology could reduce the required detour time by maximizing off-site prefabrication and taking advantage of partial construction of the proposed bridge while the existing bridge is still in service. Once the existing bridge was removed, the remaining portion of the bridge would be constructed. Pre-cast components would be transported to the site and erected until the bridge was complete. Reduced construction time would be realized by minimizing the amount of conventional cast-in-place concrete which typically requires a curing period to gain its required strength. Accordingly, costs and detour times developed for replacement alternatives assumed that ABC methods are proposed to be employed for all build alternatives.

6.5.1 Replacement with a Movable Bridge

The proposed movable span will provide 7.8 feet of vertical clearance at the fenders (in the closed position) and 25 feet of horizontal clearance between fenders for vessels traveling on the waterway. Unlimited vertical clearance will be provided in the open position for the width of the channel between the fenders. (Vertical clearance is measured at the lowest point of clearance within the navigation channel. The low point is generally located at one or both sides

of the channel, directly above the fender system that marks the channel limits.)

The maximum proposed grade is five percent, which meets ADA requirements. Roadway reconstruction is limited to the bridge approaches. The approach roadway will return to existing grade at Pampas Avenue on the east side of the bridge. On the west side of the bridge, the approach roadway will return to existing grade just east of Chesapeake Drive. The approach roadway will be close enough to the existing grades at the driveways to the Bayshore MHP, the Tarpon Springs Yacht Club and Venetian Court to allow connection of these driveways with minimal re-grading. Access to residential property driveways along Riverside Drive will still be accessible. Resurfacing (only) is proposed between Forest and Pampas Avenues.

The proposed roadway profile would be approximately two feet higher than the existing roadway at the west end of the bridge (Begin Bridge Station 135+95 as shown on concept plans), and approximately four feet higher at east end of the bridge ("End Bridge" Station 139+55). The proposed improvements can be constructed within the existing right-of-way. Purchase of additional right-of-way is not required.

Based on meetings with Southwest Florida Water Management District (SWFWMD) staff, it is anticipated that the project will qualify for the 62.330-443 General Permit to the Florida Department of Transportation, Counties, and Municipalities for Minor Bridge Alteration, Placement, Replacement, Removal, Maintenance, and Operation (previously Noticed General Permit 40D-400.443). If the project qualifies for this general permit, water quality treatment of stormwater runoff is not anticipated to be required. If treatment of stormwater is required by the Southwest Florida Water Management District, it is anticipated that compensatory, offsite treatment will be acceptable. Accordingly, acquisition of additional right-of-way is not anticipated to address water quality concerns.

Bridge Description

The total length of the proposed movable span bridge is 360 feet. The bridge includes a 123-foot long east approach, 152-foot long west approach, and an 85-foot long bascule span. A continuous superstructure is proposed to reduce future deck joint maintenance and provide for a smoother ride. The substructure may consist of bents or piers supported on prestressed concrete piles or drilled shafts and featuring reinforced concrete caps.

A single-leaf bascule span is proposed. The proposed configuration is similar to that of the existing bridge. The bascule leaf rotates about a horizontal axis located on one side of the channel to provide unlimited vertical clearance over the channel with the leaf in the fully open position. The bascule leaf will consist of steel main girders, floor beams, stringers, and a solid surface deck. The counterweight will be located inside the bascule pier and consist of concrete with steel ballast blocks for balancing the leaf. The bascule pier, approximately 56 feet by 40 feet will be supported by prestressed concrete piles or drilled shafts and feature concrete pier walls to enclose the machinery and counterweight. The rest pier, which supports the tip of the bascule span when in the fully closed position, will be similar to the other bents or piers.

The new movable bridge will feature traffic control safety devices that are required for movable bridges. These elements include traffic signals and traffic warning gates on both approaches and a resistance barrier gate on the rest pier side of the bascule span. The bridge will also feature a fender system equipped with standard navigation lights and clearance signs.

Proposed Movable Bridge Typical Section

The proposed bridge typical section for the Movable Bridge Alternative has a total out-to-out width of 47.2 feet as shown in **Figure 6-1**. The typical section includes two, 11-foot wide travel lanes with 5.5-foot shoulders that can function as undesignated bicycle lanes. Sidewalks, 6 feet wide, are proposed on both sides of the bridge.

Proposed Roadway Sections

The proposed roadway section for the Movable Bridge Alternative west of the bridge consists of two 10-foot wide through lanes, one in each direction, and 5.5-foot wide outside shoulders that can function as undesignated bicycle lanes. Because of the limited right-of-way, a six-foot wide sidewalk is proposed only on the north side of the roadway. No sidewalks are proposed on the south side of the roadway, adjacent to the Bayshore MHP. East of the bridge, the roadway section consists of two 11-foot wide through lanes, one in each direction, and 5.5-foot wide outside shoulders that can function as undesignated bicycle lanes. Six-foot wide sidewalks are proposed on both sides of the roadway. **Figures 6-2 and 6-3** illustrate the proposed roadway sections for the west and east sides of the bridge, respectively.

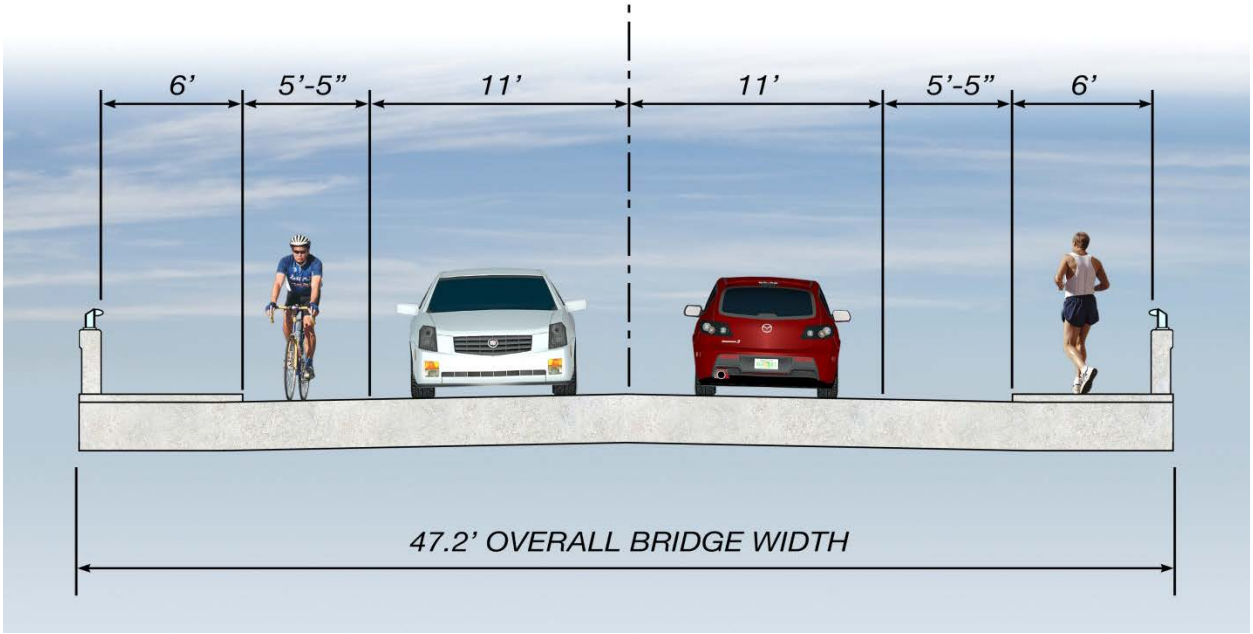


Figure 6-1 – Proposed Movable Bridge Typical Section

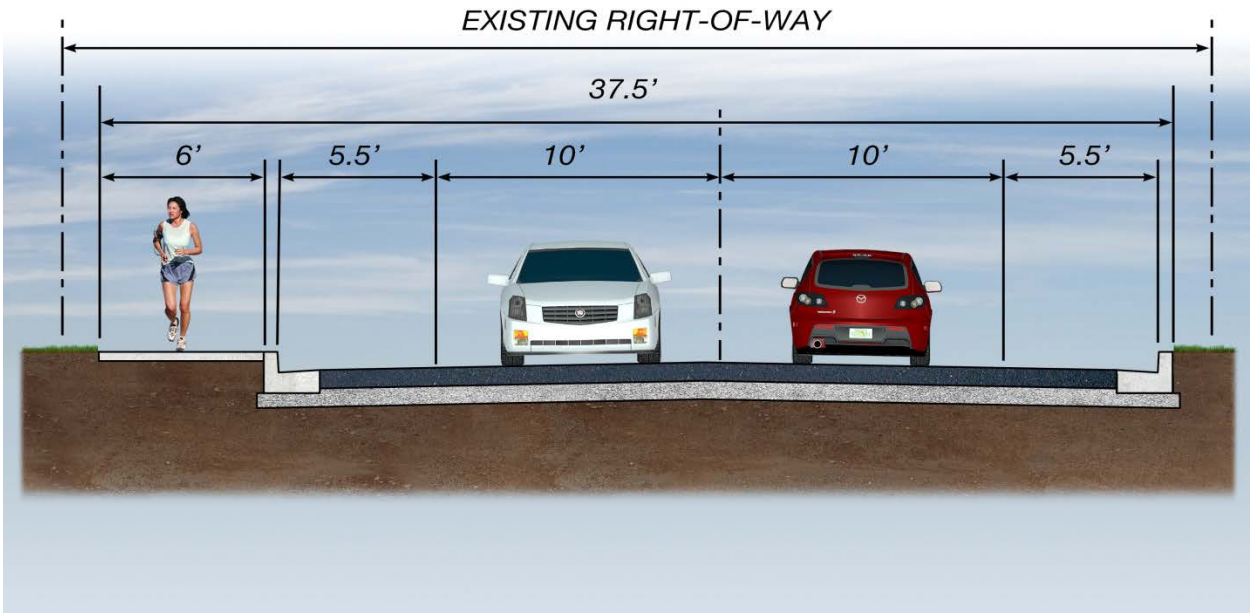


Figure 6-2 – Proposed Roadway Section West of Proposed Movable Bridge

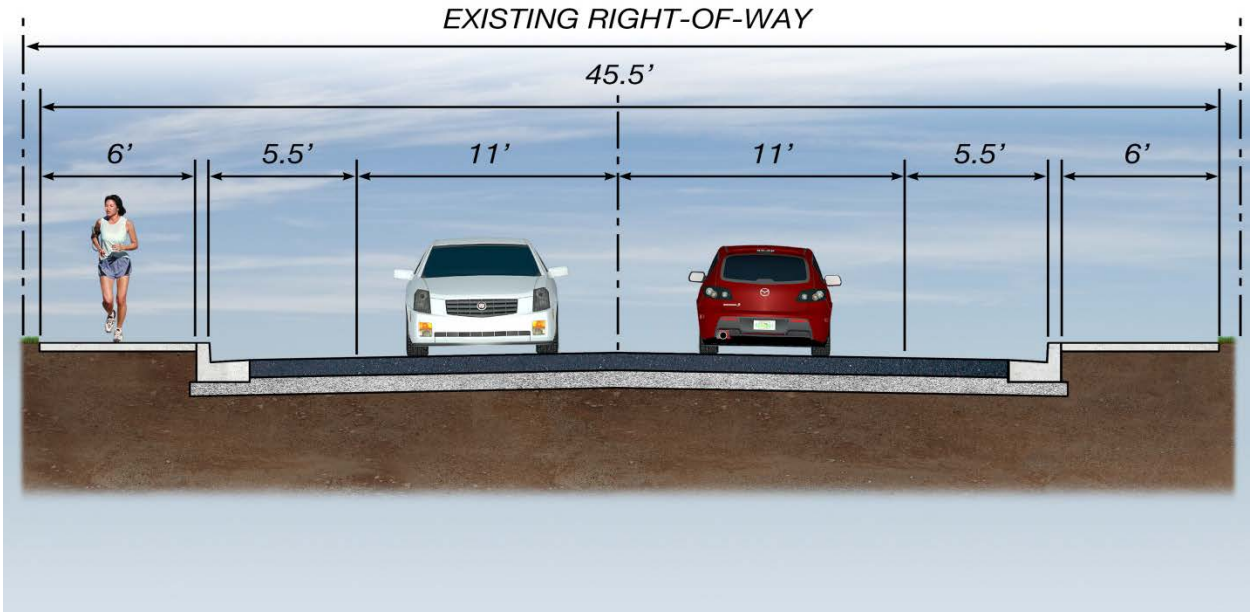


Figure 6-3 – Proposed Roadway Section East of Proposed Movable Bridge

6.5.2 Replacement with a Fixed Bridge

Two options, A and B, were developed for the fixed bridge alternative. Both options provide approximately 28 feet of vertical clearance over Whitcomb Bayou and 25 feet of horizontal clearance between fenders for vessels traveling on the waterway. The proposed maximum grade is 5%. The total length of the proposed fixed span bridge is 720 feet.

Both fixed bridge options require acquisition of additional right-of-way. Although the proposed roadway typical sections were developed to tie into the existing roadway right-of-way once the bridge structure returns to existing grade, impacts from gravity walls required to contain the fill for the much steeper slope of these alternatives block access to existing properties. Construction of new access roads is required to maintain access to the Bayshore MHP on the west side and to Venetian Court east of the bridge. The two fixed bridge options differ in the properties that are impacted to maintain access. Option A impacts the residential parcels on the north side of Riverside Drive. Option B impacts the Bayshore MHP on the south side of the roadway. More detail about the impacts of each option is provided later in this section.

The proposed bridge typical section for the fixed bridge alternative options has an out to out width of 39.6 feet. It consists of two, 11-foot travel lanes, 4.5-foot shoulders (which can be used as undesignated bicycle lanes) on both sides and a 6-foot sidewalk on the north side of the bridge. To minimize impacts to property owners, a sidewalk is not proposed on the south side

of the bridge. (See **Figure 6-4**.) Shoulder widths for the fixed bridge alternative are limited to 4.5 feet to avoid additional right-of-way impacts.

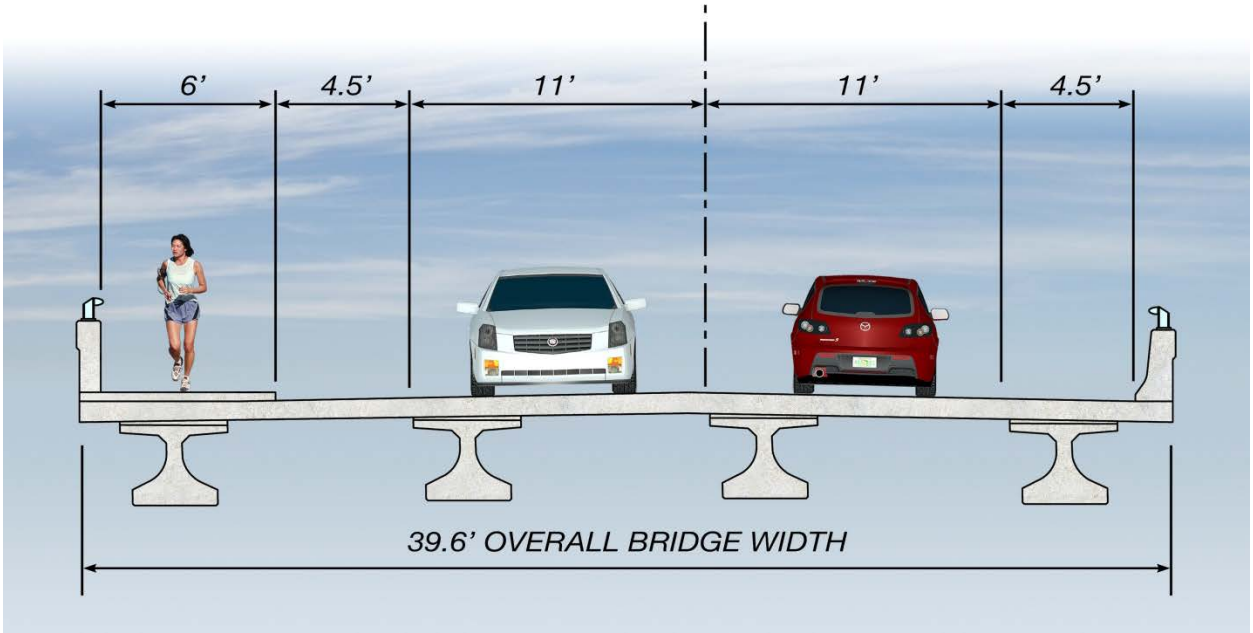


Figure 6-4 – Proposed Fixed Bridge Typical Section

The proposed roadway section west of the bridge consists of two, ten-foot wide travel lanes, a 5.5-foot wide shoulder, a six-foot wide sidewalk on the north side of the bridge, and a 5.5-foot wide shoulder on the south side of the bridge. Because of limited right-of-way, a sidewalk is not proposed on the south side of the bridge. Although the roadway section is 37 feet wide, the total width of the proposed section, including bridge railings in areas where the roadway is constructed on a raised embankment between retaining walls, is 39.6 feet. This section can be constructed in the approximately 40 feet of existing right-of-way.

East of the bridge, the proposed roadway section provides two, 11-foot wide travel lanes, a 5.5-foot wide shoulder and six-foot wide sidewalk on the north side of the bridge. A sidewalk is not proposed on the south side of the bridge to minimize impacts to adjacent property owners. Although the roadway section is 39 feet wide, the total width of the proposed section, including bridge railings in areas where the roadway is constructed on a raised embankment between retaining walls, is 41.6 feet. This section on embankment will require acquisition of some right-of-way on the north side of the road between Pampas Avenue and Forest Avenue, where the right-of-way narrows. **Figures 6-5 and 6-6** illustrate the proposed roadway sections for the fixed bridge alternatives.

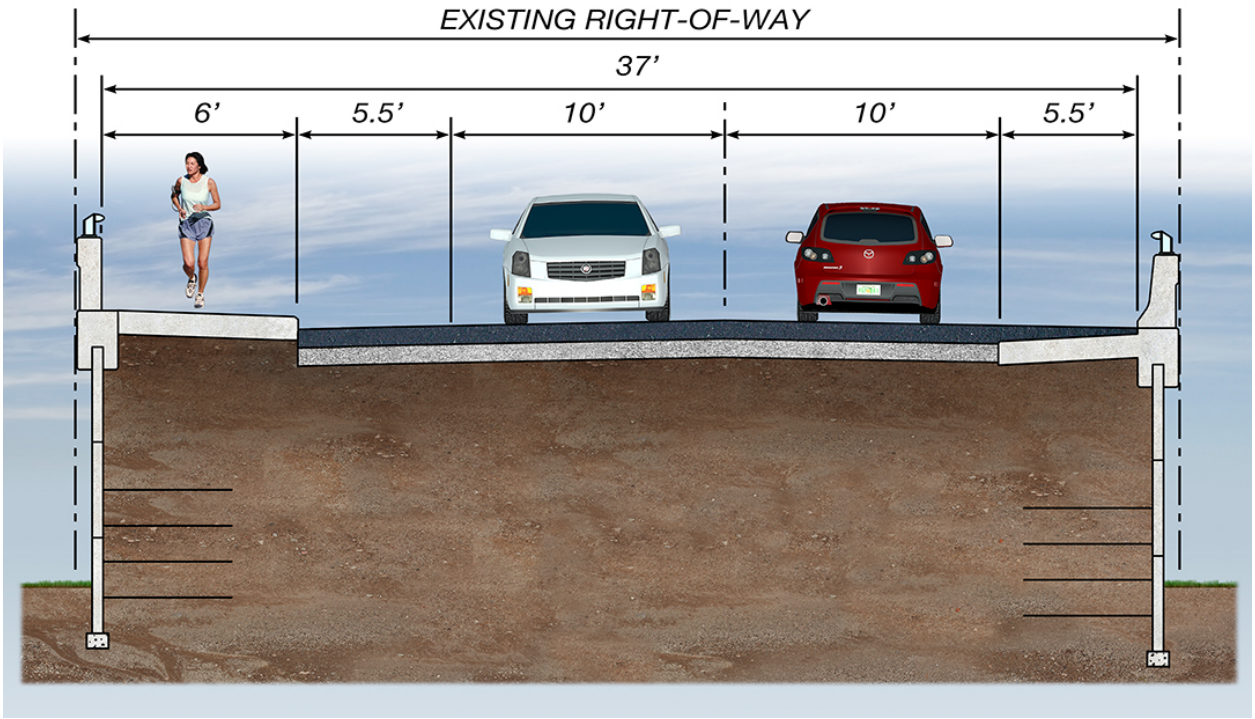


Figure 6-5 – Proposed Roadway Section West of Proposed Fixed Bridge

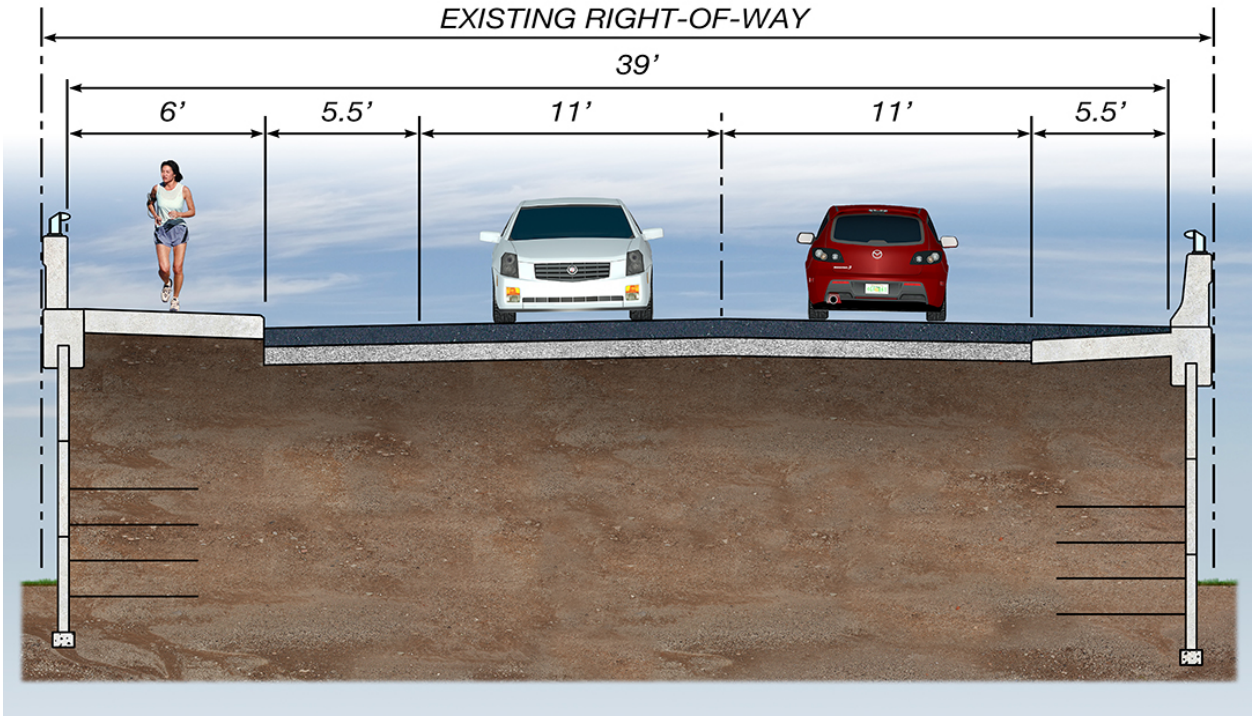


Figure 6-6 – Proposed Roadway Section East of Proposed Fixed Bridge

Fixed Bridge Alternative – Option A

The superstructure will may consist of prestressed concrete girder (Florida I-Beams) construction with a concrete deck. To span the access road to the Bayshore MHP, waterway, navigation channel and new Venetian Court extension, it is likely that the span lengths will vary slightly. The bridge may consist of nine spans, each approximately 80 feet long. Continuous superstructure units with a limited number of joints could be proposed to reduce future deck joint maintenance and provide for a smoother ride. The substructure for the bridge could consist of piers and/or bents supported on prestressed concrete piles or drilled shafts and featuring reinforced concrete caps. The total length of the proposed fixed span bridge is 720 feet.

The roadway profile at the intersection of Chesapeake Drive and Riverside Drive will be only about one to two feet above existing grade. A proprietary retaining wall system, such as Mechanically Stabilized Earth (MSE) walls, will be required on both sides of the roadway from Chesapeake Drive to station 134+42, where the bridge begins. The wall will begin just east of Chesapeake Drive on the north side of Riverside Drive and extend approximately 360 feet east.

On the south side of the roadway, the wall will begin just west of Chesapeake Drive and extend approximately 420 feet east. The height of the wall will increase to approximately 19 feet above existing ground, just west of the entrance driveway to the Bayshore MHP.

East of the proposed bridge, an MSE wall will extend approximately 340 feet on the north side and about 400 feet on the south side. The wall will end west of Forest Avenue where the approach roadway will return to the existing grade. The proposed retaining wall will block access to Riverside Drive for five single family residences west of the bridge, on the north side of the roadway. A new access road for the Bayshore MHP will be constructed north of Riverside Drive. The access road will connect with Chesapeake Drive and extend east through the parcels immediately adjacent to the north side of the roadway. The access road will then turn south and extend under the proposed bridge to connect to the Bayshore MHP driveway.

The minimum vertical clearance at the MHP driveway will be 14’6”. The five single family residences impacted are expected to require relocation.

On the east side of the bridge, the proposed bridge will eliminate access to Riverside Drive from

Venetian Court and Pampas Avenue. An extension of Venetian Court will be constructed from Pampas Avenue through the vacant lot adjacent to the Tarpon Springs Yacht Club, extend under the proposed bridge, and tie into the existing Venetian Court. A minimum vertical clearance of 14'6" is provided at Venetian Court.

Direct access to Riverside Drive for the single family residence on the corner of Pampas Avenue and Riverside Drive will be eliminated by the proposed retaining wall. Access from this location and from Venetian Court to Riverside Drive can be accomplished by traveling north on Pampas Avenue, turning east on High Street and south on Forest Avenue. The single family residence driveway located at approximately Station 145+20 will be modified (raised) to provide direct access to Riverside Drive. Vehicular access to private docks located south of Riverside Drive in the area between Station 144+00 and 145+20 will be blocked by the proposed retaining wall.

Fixed Bridge Alternative – Option B

The total length of the proposed fixed span bridge, Option B, is approximately 720 feet. The superstructure may consist of prestressed concrete girder (Florida I-Beams) construction with a concrete deck. To span the waterway, navigation channel and new Venetian Court extension, the span lengths will vary slightly. The bridge may consist of nine spans, each approximately 80 feet long. The last span on the east end of the bridge could include a skewed abutment to reduce the span length. The end bridge location could be moved further east, extending the bridge to provide a perpendicular abutment in final design. Continuous superstructure units with a limited number of joints are proposed to reduce future deck joint maintenance and provide for a smoother ride. The substructure for the bridge could consist of piers and/or bents supported on prestressed concrete piles or drilled shafts and featuring reinforced concrete caps.

The roadway is raised about one to two feet above existing grade at Chesapeake Drive. A retaining wall on both sides of the roadway will extend approximately 429 feet east, and vary in height from 1- 22 feet. The height of the wall will be approximately 22 feet at the location of the existing entrance driveway to the Bayshore MHP. East of the proposed bridge, along the north side of the road, the retaining wall will extend from the end of the bridge approximately 340 feet, to west of Forest Avenue where the approach roadway will return to the existing grade. East of the proposed bridge, along the south side of the road, the retaining wall will

extend from the end of the bridge approximately 400 feet. The wall will be approximately 21 feet high at the east end of the bridge.

The proposed retaining wall will block access to Riverside Drive for five single family residences west of the bridge, immediately north of the roadway. An access road will be constructed through the impacted parcels to provide access to Chesapeake Drive for the two waterfront parcels in this area. It is anticipated that three relocations on the north side of the road will be required. The driveway entrance to Bayshore MHP will be eliminated. Construction of a new entrance and exit for the MHP at Chesapeake Drive will impact approximately seven mobile home lots on the west end of the development.

As in Alternative A above, the proposed fixed bridge will eliminate the access to Riverside Drive from Venetian Court and Pampas Avenue. An extension of Venetian Court will be constructed from Pampas Avenue through the vacant lot adjacent to the Tarpon Springs Yacht Club, and extend under the proposed bridge with a minimum vertical clearance of 14'6". Although the proposed connector for this option minimizes impacts to the Tarpon Springs Yacht Club property, the connector will extend through the vacant residential lot just east of the Venetian Court intersection south of Riverside Drive and connect to Venetian Court.

Direct access to Riverside Drive for the single family residence on the corner of Pampas Avenue and Riverside Drive will be eliminated by the proposed retaining wall. Access from this location and Venetian Court to Riverside Drive can be accomplished by traveling north on Pampas Avenue, turning east on High Street and south on Forest Avenue. The single family residence driveway at approximately station 145+20 will be modified (raised) to provide direct access to Riverside Drive. Vehicular access will be blocked to docks located south of Riverside Drive in this area.

6.6 PROJECT COSTS

Cost estimates were prepared for the no-build and build alternatives (**Table 6-1**). In addition, demolition costs were estimated which apply to both the No-Build and No-Build with Removal of the Existing Bridge Alternatives. All estimates were based on the following:

- FDOT Structures Design Guidelines, Chapter 9-Bridge Development Report (BDR) Cost Estimating

- Historical Unit Prices for Similar Projects
- Conceptual Quantities

Table 6-1 – Estimated Construction Costs

	No Build (Removal of Existing Bridge)	Rehabilitation (25-30 Year)	New Low-Level Bascule Bridge	New Fixed Bridge Option A	New Fixed Bridge Option B
Construction	$475 K (Demolition)	$4.85 M	$7.92 M	$6.25 M	$6.25 M
Mobilization	$48 K (10%)	$0.39 M (8%)	$0.792 M (10%)	$0.63 M (10%)	$0.63 M (10%)
Maintenance of Traffic	$48 K (10%)	$0.48 M (8%)	$0.792 M (10%)	$0.62 M (10%)	$0.62 M (10%)
Aesthetic Enhancements	N/A	N/A	$0.792 M (10%) (10%)	$0.62 M (10%)	$0.62 M (10%)
Contingency	$143 K (30%)	$1.46 M (30%)	$1.58 M (20%)	$0.94 M (15%)	$0.94 M (15%)
Construction Total	**$714 K**	**$7.18 M**	**$11.87 M**	**$9.06 M**	**$9.06 M**
Design	$71 K (10%)	$1.08 M (15%)	$1.78 (15%)	$0.91 M (10%)	$0.91 M (10%)
CEI	$71 K (10%)	$1.06 M (15%)	$1.78 (15%)	$0.91 M (10%)	$0.91 M (10%)
Post Design	N/A	0.14 M (2%)	$0.36 M (3%)	$0.18 M (2%)	$0.18 M (2%)
Right-of-Way	N/A	N/A	N/A	$4.0M	$2.9 M
Project Total	**$0.9 M**	**$9.5 M**	**$15.8 M**	**$15.1 M**	**$14.0 M**

Construction cost estimates are based on the baseline structure described for each alternative. Contingencies are added to each alternative in accordance with engineering judgment and experience. Contingencies account for miscellaneous items that are not quantifiable at the conceptual design stage. For all alternatives a percentage of the basic construction costs were calculated to account for mobilization, maintenance of traffic, contingencies, design and construction engineering and inspection (CEI). Mobilization costs were estimated as 10% of construction for all alternatives except the Rehabilitation Alternative which was estimated at 8% due to the work requiring less material than replacement. Maintenance of traffic costs were estimated as 10% of construction for all alternatives.

For this project, 30% contingency was assumed for the Rehabilitation Alternative as is typical within the industry for work of that nature. Rehabilitation is typically more prone to scope

expansion as the project develops and therefore the percent contingency is higher than for build alternatives. A 15% contingency was assumed for the fixed bridge alternatives, assuming accelerated construction methods. A 20% contingency was assumed for the movable bridge alternative due to the more complex nature of movable bridge design and construction. Design and CEI costs were each estimated to be 10% of construction for two alternatives – no build with permanent removal of the bridge and replacement with a fixed bridge. CEI costs are estimated to be 15% of construction for rehabilitation or replacement with a movable bridge. All estimates need to be adjusted for inflation based upon the schedule of implementation. It is recommended that construction cost estimates be adjusted to the midpoint of construction when programming funds. Detailed cost estimates are provided in Appendix H.

Cost estimates for bridge replacement assume Level Two Aesthetics, as defined in the *FDOT PPM* (Section 26.9.4, January 1, 2013 edition). An additional 10% of the construction costs have been included to account for aesthetic enhancements. Aesthetic enhancements may include concrete surface finishes, decorative railings, light poles, light fixtures, landscaping and/or hardscaping features.

6.6.1 Right-of-Way Costs

Right-of-way costs for potential right-of-way takes of property impacted by the proposed fixed bridge alternatives were estimated using the "Just Market Value", the "Assessed Value" and the "Sales Comparison Value" determined by the Pinellas County Property Appraiser. The area impacted was multiplied by the estimated square foot value to obtain a "Right-of-Way Value." The "Right-of-Way Value" was then multiplied by factors of 2.5 and 3.0 to account for potentially negotiated higher price, administrative costs and other unknowns to estimate a low to high range of potential costs. A summary of the results is presented in **Table 6-2**.

Table 6-2 – Right-of-Way Cost Estimates

Fixed Bridge Alternative	Total Row Required (square feet)	Raw ROW Cost ($ millions)	Row Cost x 2.5 ($ millions)	ROW Cost x 3.0 ($ millions)
Option A	86,620	1.35	3.4	4.1
Option B	80,856	0.96	2.4	2.9

The estimated cost multiplied by a factor of 3.0 was used in the Life Cycle Cost Analysis and

shown in the Alternatives Evaluation Matrix. Additional information about the methodology used to estimate the costs is included in Appendix H.

6.6.2 Life Cycle Cost Analysis

A life cycle cost comparison was performed in accordance with the FDOT Manual *Life-Cycle Cost Analysis for Transportation Projects* to more completely evaluate and compare the costs for replacement vs. repair/rehabilitation. The costs used for the analysis came from several sources. The costs for the replacement bridges are as summarized above. Estimated costs for right-of-way and relocation are included. Operating and maintenance costs for the existing bridges were derived from data provided by the County and from similar projects. The timeline for rehabilitation assumes that the project starts with design in 2016 and is completed in 2020. The timeline for replacement is similar, assuming that construction is completed in 2020. Rehabilitation is assumed to provide a bridge that remains in service for an additional 25 years (from 2013) before being replaced.

Life-cycle costs were generated for the following four bridge rehabilitation and/or replacement scenarios. The detailed estimates are provided in Appendix H.

- Rehabilitate the bridge in 2020 then replace it with a new movable bridge in 2038 (25 years from 2013),
- Rehabilitate the bridge in 2020 then replace it with a new mid-level fixed bridge in 2038 (25 years from 2013),
- Replace the bridge in 2020 with a new movable bridge,
- Replace the bridge in 2020 with a new mid-level fixed bridge.

Life-cycle costs were computed on the basis of present worth. For each of the alternatives, a period of 107 years was used in the analysis for consistency. Replacement bridge alternatives are assumed to have a service life of 75 years. Cost expenditures beyond this period have a negligible effect on the cost comparison. At the recommendations of FDOT, District 7 Structures and FDOT, Central Office, Structures, a discount rate of 5% was used in the analysis. The effect of inflation and the cost of future construction are accounted for in the discount rate. As recommended by FDOT, discount rates of 4% and 6% were used to test the sensitivity of the analysis. In addition, the estimated life of a rehabilitated bridge was tested by running the scenarios assuming a 20 year remaining service life and a 30 year service life, in addition to the baseline estimate of 25 years. The results of the life cycle cost comparison are presented in **Table 6-3**.

Table 6-3 – Results of Life Cycle Cost Comparison of Rehabilitation and Replacement Alternatives

Rehabilitation Service Life (years)	Discount Rate (percent)	Alternative					
		Rehabilitate / Replace with Movable Bridge	Rehabilitate / Replace with Fixed Bridge		Replace with Movable Bridge	Replace with Fixed Bridge	
			Opt. A	Opt. B		Opt. A	Opt. B
		Present Value ($Millions)					
20	4	17.6	16.7	16.2	14.8	13.0	12.2
20	5	15.3	14.7	14.3	13.3	11.8	11.1
20	6	13.5	13.0	12.6	12.2	10.9	10.2
25	4	16.4	15.7	15.3	14.8	13.0	12.2
25	**5**	**14.2**	**13.6**	**13.2**	**13.3**	**11.8**	**11.1**
25	6	12.4	11.9	11.7	12.2	10.9	10.2
30	4	15.3	14.6	14.3	14.8	13.0	12.2
30	5	13.0	12.6	12.4	13.3	11.8	11.1
30	6	11.3	11.0	10.8	12.2	10.9	10.2

Each row in the table represents a comparison of alternatives in terms of life-cycle costs. Values in different rows cannot be compared. For most scenarios considered, it is more economical to replace the bridge now than to repair/rehabilitate the bridge now and replace the bridge at a later date. However, at discount rates of 5%, and 6%, assuming that the remaining service life of the existing bridge is 30 years, it is more economical to repair/rehabilitate the movable bridge now and replace the bridge later than it is to replace the movable bridge now. Given that the life cycle cost analysis for this project is sensitive to the discount rate used (i.e., the lowest cost alternative varies depending on the discount rate) and rehabilitation service life, the costs can be considered relatively equal within the tolerances of the analysis. Furthermore, only direct (capital) costs were considered in the analysis; indirect (non-capital) costs such as user delay and accident costs were not included in the analysis. These costs are difficult to accurately quantify and are considered somewhat subjective. In all alternatives, indirect costs support the decision to replace the bridge now. Costs associated with user delays and accidents are anticipated to decrease with improvements in the facility (e.g., improved roadway geometry that decreases accidents.)

6.7 EVALUATION OF ALTERNATIVES

An Evaluation Matrix was developed (**Table 6-4**) to facilitate comparison of alternatives. Evaluation Criteria for operational and engineering issues, right-of-way impacts, environmental impacts, parks and recreation impacts, costs and construction time were considered for each alternative. The relative impact for each criterion is stated in the evaluation matrix. Advantages and disadvantages of each alternative are discussed below.

No-Build Alternative

The expected service life of the existing bridge is approximated at ten years or less. The advantages and disadvantages of this alternative are discussed below.

Advantages

- No adverse impacts to historic structures, recreational areas, wetlands and wildlife
- No noise or visual impacts.
- No changes in access to local streets.

Table 6-4 – Evaluation Matrix

Impact Evaluation Criteria	No Build	No Build/Remove Bridge	Rehabilitation	New Low-Level Movable Bridge	New Mid-Level Fixed Bridge Option A	New Mid-Level Fixed Bridge Option B
Roadway/Bridge Issues						
Width of Vehicular Travel Lanes	10 feet	N/A	10 feet	11 feet	11 feet	11 feet
Shoulders	None	N/A	None	5.5 feet	4.5 feet	4.5 feet
Sidewalks	2'2"	N/A	2'2"	6 feet– Both Sides	6 feet – One Side Only	6 feet – One Side Only
Meets Current Design/Safety Standards	No	N/A	No	Yes	Yes	Yes
Structural Deficiencies Corrected	No	N/A	Yes	Yes	Yes	Yes
Vertical/Horizontal Channel Clearance	6 feet/25 feet	N/A	6 feet/25 feet	7.8 feet/25 feet	28 feet/25 feet	28 feet/25 feet
Bridge Openings	No Change	N/A	No Change	Minimal to No Change	None	None
Right of Way Issues						
Overall Bridge Width	28 feet	N/A	28 feet	47.2 feet	39.6 feet	39.6 feet
Right-of-Way Required	None	None	None	None	2 acres	2 acres
Relocations	None	None	None	None	5 Residences	3 Residences, 7 Mobile Homes
Other Impacts	None	None	None	None	Yacht Club Parking Driveways on South Side, East of Bridge	Yacht Club Parking Driveways on South Side, East of Bridge
Environmental Impacts						
Impacts to Historic Bridge	None	High	High	High	High	High
Wetlands	None	Low	Low	0.03 acre	0.02 acre	0.02 acre
Wildlife	None	Low	Low	Low	Low	Low
Parks/Recreation	None	None	None	None	None	None
Visual Impacts	None	None	Low	Low	High	High
Noise Impacts (Permanent)	None	None	None	Low	Low	Low
Costs						
Total Project Costs[1]	N/A	$0.9 M (Demolition)	$9.5 M	$15.8 M	$15.0 M (ROW Costs= $4.0 M)	$13.9 M (ROW Costs=$2.9 M)
Construction Impacts						
Detour Duration	N/A	Permanent	6 months	12 months	24 months	24 months
Total Construction Time	N/A	N/A	12 months	24 months	24 months	24 months
Anticipated Service Life (2010)	10 years or less	10 years or less	25-30 years	75 years	75 years	75 years

[1] Costs include demolition, roadway and bridge construction, mobilization, maintenance of traffic, aesthetic enhancements, engineering design, construction engineering inspection (CEI) and contingency.

- Minor impacts to traffic as a result of on-going maintenance are anticipated.

Disadvantages

- Existing geometric deficiencies would not be corrected (e.g. narrow sidewalks).
- Structural and electrical deficiencies would not be corrected.
- Substantial continuing bridge maintenance would be required.
- Maintenance repairs could further disfigure the historic resource.
- Expected service life would be relatively short (about 10 years).
- Existing horizontal and vertical clearances will not be improved.

No-Build with Removal of Existing Bridge

Advantages and disadvantages of this alternative are the same as those stated for the No-Build Alternative above while the bridge is still serviceable. Additional advantages and disadvantages resulting from eventual permanent removal of the bridge include the following.

Advantages

- Any perceived visual impacts of the existing bridge will be eliminated.
- Noise impacts will be reduced to properties adjacent to the existing bridge.
- Maintenance costs associated with the existing bridge will be eliminated.
- Restriction of the navigation channel will be eliminated.

Disadvantages

- Removal of the NRHP Eligible bridge may result in an adverse impact.
- A crucial link to the Pinellas Trail east of the bridge will be eliminated for the proposed Howard Park Trail.
- Traffic on Whitcomb Drive and Meres Blvd. will increase during peak hours.
- Travelers coming from outlying areas will have a longer travel route to the recreational areas west of the bridge.
- An alternate route will not be available during local special local events
- A local emergency evacuation route from areas west of the bridge will be eliminated.

Rehabilitation Alternative

The existing service life of the bridge, if the repairs described for this alternative are made, is estimated to be 25-30 years. The extensive structural deterioration would need to be corrected by replacing portions of the superstructure and substructure. Some costly improvements that improve safety, but do not extend the service life of the existing bridge, may be required if federal funding is obtained. The return on the investment of funds for these improvements will be relatively short-lived.

Advantages

- Mechanical and electrical systems will be updated.
- Structural deficiencies will be corrected.
- No adverse impacts to recreational areas.
- Minimal to no impacts to wetlands and wildlife.
- No changes in access to local streets.
- A complete detour of only about six months is required for construction, which is less than the detour required for construction of a replacement bridge.

Disadvantages

- Replacement of the bascule leaf from the NRHP eligible bridge may result in an adverse impact.
- Installation of additional crutch bents and pile jackets would alter the appearance of the bridge and further diminish its appearance.
- Temporary noise impacts could occur during construction.
- No changes to the existing geometry of the bridge will occur.
- The substandard sidewalks would remain.
- The substandard shoulder width would remain.
- The bridge will continue to require openings to allow vessels to pass through the channel
- A six month detour will be required during construction

- Rehabilitation will only extend the service life of the existing bridge approximately 25-30 years.

Replacement with a Low-Level Movable Bridge

The anticipated service life of a new movable bridge is about 75 years. Advantages and disadvantages of this alternative are discussed below.

Advantages

- Structural, mechanical, electrical and geometric deficiencies will be corrected.
- Shoulders will provide an "undesignated" bicycle lane.
- Six-foot wide sidewalks will be provided on both sides of the bridge.
- The replacement bridge can be constructed within existing right-of-way.
- No impacts to existing intersections with Riverside Drive/Spring Boulevard will occur.
- No impacts to driveways within the project corridor will occur.

Disadvantages

- Replacement of the NRHP-eligible bridge may result in an adverse impact.
- Construction and life-cycle costs for a movable bridge are higher than for a fixed bridge.
- Operation and maintenance costs are higher for a movable bridge than for a fixed bridge.
- The bridge will continue to require openings to allow vessels to pass through the channel.
- A complete detour will be required for about one year for construction.
- Minor impacts to wetlands will occur (about 0.03 acre).

Replacement with a Mid-Level Fixed Bridge – Option A

The anticipated service life of the new bridge is about 75 years. The advantages and disadvantages of this alternative are discussed below.

Advantages

- Structural, mechanical, electrical and geometric deficiencies will be corrected.
- Shoulders will provide an "undesignated" bicycle lane.
- Bridge openings that disrupt vehicular traffic will be eliminated.
- Initial and long term maintenance costs will be reduced.
- Construction cost is less than cost of a new movable bridge.

Disadvantages

- Replacement of the NRHP-eligible bridge may result in an adverse impact.
- Boats requiring more than 28 feet of vertical clearance will not be able to navigate through the channel.
- Sidewalks will only be provided on the north side of the bridge.
- Substantial visual impacts to the surrounding area will result from construction of the higher bridge.
- A complete detour will be required for approximately two years during construction.
- Five residential relocations will be required.
- The existing intersections of Pampas Avenue and Venetian Court with Riverside Drive/Spring Boulevard will be eliminated.
- Construction of a connector road to re-establish the connections of Pampas Avenue and Venetian Court to Riverside Drive/Spring Boulevard will impact Tarpon Springs Yacht Club property
- Private docks on the south side of Riverside Drive, between Pampas Avenue and Forest Avenue will be inaccessible from the roadway due to retaining wall construction.

Replacement with a Mid-Level Fixed Bridge – Option B

The anticipated service life of the new bridge is about 75 years. The advantages and disadvantages of this alternative are discussed below.

Advantages

- Structural, mechanical, electrical and geometric deficiencies will be corrected.
- Shoulders will provide an "undesignated" bicycle lane.
- Bridge openings that disrupt vehicular traffic will be eliminated.
- Initial and long term maintenance costs will be reduced.
- Construction cost is less than cost of a new movable bridge.

Disadvantages

- Replacement of the NRHP-eligible bridge may result in an adverse impact.
- Boats requiring more than 28 feet of vertical clearance will not be able to navigate through the channel.
- Sidewalks will only be provided on the north side of the bridge.
- Substantial visual impacts to the surrounding area will result from construction of the higher bridge with retaining walls.
- A complete detour will be required for approximately two years during construction.
- Three residential relocations will be required.
- The existing intersections of Pampas Avenue and Venetian Court with Riverside Drive/Spring Boulevard will be eliminated.
- Construction of a connector road to re-establish the connections of Pampas Avenue and Venetian Court to Riverside Drive/Spring Boulevard will impact Tarpon Springs Yacht Club property and a vacant residential property on south of Riverside Drive.
- Private docks on the south side of Riverside Drive, between Pampas Avenue and Forest Avenue will be inaccessible from the roadway due to retaining wall construction.

6.8 Additional Rehabilitation Alternatives Evaluated After the Alternatives Public Meeting at the Request of the State Historic Preservation Officer

The Alternatives discussed in Sections 6.3 through 6.7 (with minor variations of the typical sections) were presented at an Alternatives Public Meeting on January 23, 2013. Based on potential social and environmental impacts and input from the community, No-build with

Removal of the Existing Bridge and Replacement of the Existing Bridge with a New Fixed Bridge were eliminated from further consideration. The majority of written comments received from the public after the Alternatives Public Meeting supported the "Rehabilitation" and/or "Replacement with a New Movable Bridge" alternative. Many members of the community also expressed support for improvements to the existing pedestrian facilities.

The Beckett Bridge remains one of seven, pre-1965 single-leaf bascule roadway bridges in Florida. It has been determined to be eligible for listing in the NRHP under Criterion A for its contributions to the patterns of development and transportation in the State, and under Criterion C for its distinct engineering. A Cultural Resource Committee (CRC) was established as part of the ongoing PD&E Study. Two meetings have been held to date. The first Meeting was held on October 29, 2012 and the second was held on March 13, 2013. At the second meeting, representatives of the SHPO stated that the SHPO strongly supported rehabilitation of the existing bridge in lieu of constructing a replacement bridge.

The Rehabilitation alternative, as presented to the Public at the January 23, 2013 Alternatives Public Meeting, described in Section 6.7 above, and presented to the CRC does not include widening the existing bridge. The CRC recognized that widening the sidewalks on the existing bridge, which are only 2'2" wide, was warranted to provide a safe facility and acknowledged input from the community on this issue. Accordingly, the CRC requested that the project team develop and evaluate a second rehabilitation alternative which included widening the existing sidewalks. Accordingly, the project engineers developed another alternative which will be referred to as the "Rehabilitation with Widening" Alternative in this document.

The results of the evaluation of the Rehabilitation with Widening alternative was presented to SHPO, FHWA, and FDOT staff on June 11, 2013 in Tallahassee. SHPO concurred that this alternative did not promote preservation of the existing bridge and requested evaluation of an additional rehabilitation alternative that did not require widening, but that provided a single wider sidewalk on one side of the existing bridge. Accordingly, this alternative was evaluated. The following sections summarize the evaluation of these two additional alternatives.

6.8.1 Evaluation of the Rehabilitation with Widening Alternative

Development of a Minimum Acceptable Typical Section for Rehabilitation

The first step in development of the Rehabilitation with Widening alternative was to establish the *minimum acceptable typical section*. Pinellas County, in coordination with FDOT District 7 staff, determined that widening the existing bridge would require compliance with the Florida Green Book to bring the bridge up to acceptable minimum current safety standards. Accordingly, a minimum acceptable typical section was developed based on these criteria. This typical section consists of two 11-foot travel lanes, one in each direction, 3-foot wide shoulders on both sides and 5.5 foot wide sidewalks on both sides of the bridge. The total width of the bridge would be 42 feet. The total width of the existing bridge is only 28 feet.

Description of Required Improvements to the Bascule Span and Approach Spans Required to Construct the "Rehabilitation with Widening" Alternative

Detailed engineering analysis indicates that the additional weight of the wider roadway (which provides the minimum acceptable typical section with shoulders, described above) and the proposed sidewalks cannot be accommodated by the existing bascule span or bascule pier.

Major modifications would be required to the existing bascule span, bascule pier and approach spans to accommodate the additional load and wider typical section. These include:

- The existing 28 foot wide steel bascule leaf will be replaced with a 42 foot wide bascule leaf.
- The bascule pier (the structure that supports the leaf) will be replaced to accommodate the wider bascule leaf and larger counterweight.
- The approach spans will be widened by adding two new prestressed concrete beams, one along each side of the bridge, to support the wider bridge deck.
- The existing bridge railing will be replaced with a light-weight steel, crash tested railing.

Other Structural Improvements include the following:

- The existing pile bents will be replaced.
- The bridge abutments will be replaced.
- The Control House will be relocated 7 feet to the north.

- Cathodic protection will be required in the remaining existing concrete elements of the bridge.

Conclusion

Rehabilitation of the existing bridge will require that the bridge meet current minimum safety standards. Widening of the bridge to provide shoulders and wider sidewalks will result in substantial alteration to look of the bridge and will require substantial modification to the existing bascule piers. The final structure will no longer resemble the original historic bridge. Replacement with a new movable bridge, of similar design, which is consistent with and compliments the local environment, is recommended.

6.8.2 Evaluation of Rehabilitation Alternative which Provides a Single Code Compliant Sidewalk without Widening, or with Minimal Widening of the Existing Bridge

At the June 11, 2013 meeting in Tallahassee, attended by URS, Pinellas County, FDOT, FHWA, and SHPO, representatives from SHPO requested consideration of an additional concept that would modify the existing bridge cross section to accommodate a single, code compliant, sidewalk, rather than two sidewalks has had been previously proposed. This section summarizes URS's technical evaluation of concepts with a sidewalk on one side only.

Reconfiguration of the Existing Bridge without Widening

The most desirable concept from a historic preservation perspective would be to avoid widening of the bridge and simply rework the arrangement of lanes and sidewalk(s) within the width of the existing bridge (28'-0½"). A modified section of the narrowest practical width would include minimum shoulders, a traffic railing (barrier) on the south side, two travel lanes, a sidewalk on a raised curb on the north side, and a traffic railing at the back of sidewalk. Assuming that design exceptions are granted for lane width (to allow two 10-foot wide lanes rather than the 11-foot minimum) and shoulder width (to allow a 2.5-foot shoulder adjacent to a traffic railing and a 1.5-foot shoulder adjacent to the curb rather than the 3-foot minimum required) the minimum clear roadway width for this configuration is 24 feet. With a minimum 5.5 foot wide sidewalk and two traffic railings (1.5' on the south side adjacent to traffic and 1'-1" at the back of sidewalk on the north side) the minimum bridge width that would accommodate this section is 32'-1", which is 4'-0½" wider that the existing bridge. Therefore, the existing bridge width is not sufficient to support two lanes and a single sidewalk without widening.

Reconfiguration of the Existing Bridge with Minimal Widening

The next most desirable concept from a historic preservation perspective would be one that limits bridge widening and associated impacts such that the existing bascule pier foundations can be saved. As discussed in the June 11 meeting, if the bridge is widened, the new bridge section must meet minimum standards. The minimum width of a bridge featuring a single sidewalk under this scenario would include 3-foot wide shoulders, a traffic railing on the south side (1.5'), two 11-foot wide travel lanes, a 5.5-foot wide sidewalk on a raised curb on the north side, and a traffic railing at the back of sidewalk (1'-1") on the north side. The clear roadway with of this section is 28 feet and the overall width of is 36'-1". To accommodate this section the bridge would need to be widened by 8'-0½".

The technical issues associated with widening the bridge by 8'-0½" were examined. The evaluation included calculating live load distribution factors (as an indicator of the increase in live load on a main girder due to widening) and approximating dead and live load changes associated with the proposed modifications. The analysis also included determining approximate span balance conditions and corresponding density of the counterweight needed to balance the bridge. The following summarizes the technical challenges disclosed in this investigation:

- As with any solution, the current live load (HL-93) is approximately 32% heavier than the original design load (HS-15 assumed based on year of construction).
- Live load distribution factor for the main girders of the bascule span would increase by 117%.
- The net of the above is an increased live load on the main girders that is 2.8 times the original design load.
- The movable span dead load (weight) would increase by approximately 49%.
- The density of the counterweight would need to be increased to approximately 360 per cubic foot (pcf) to properly balance the bascule span (note that the AASHTO recommended maximum density for counterweight concrete is 280 pcf).

Based on this evaluation it is our conclusion that widening the bridge to include a single sidewalk that meets current design criteria is not technically feasible unless the bascule pier is replaced as well. The increased dead load and live loads are beyond what the existing

foundations can handle without extensive strengthening. The physical size of the existing bascule pier footing precludes increasing the size of the counterweight and the density required of the existing size counterweight is well in excess of that recommended by AASHTO.

6.9 CONCLUSION

The existing bridge width is not sufficient to support two lanes and a single sidewalk without widening. In comparison to the widening concepts originally developed with two sidewalks (presented in Sections 6.x – 6.x of this report), a single sidewalk concept does not offer any significant improvements or reductions in impacts to the scope of bridge rehabilitation. Both require complete replacement of the bascule span and bascule piers.

6.10 SELECTION OF A RECOMMENDED ALTERNATIVE

As a result of public input, local government coordination, state and federal agency coordination, project costs, and a detailed comparative analysis of viable alternatives, Replacement of the Existing Bridge with a new Movable Bridge was selected as the Recommended Alternative.

By email, dated 08/03/13, SHPO concurred that replacing the existing bridge with a new movable bridge is preferable to rehabilitation of the existing bridge (based in part on the evaluation discussed in Section 6.8 above). In addition, FHWA concurred that replacement of the existing bridge with a new movable bridge rather than a fixed bridge was consistent with FHWA 23 CFR 650H. FHWA 23 CFR 650H Se 650.890 Movable Bridges states *"A fixed bridge shall be selected wherever practicable. If there are social, economic, environmental or engineering reasons which favor the selection of a movable bridge, a cost benefit analysis to support the need for the movable bridge shall he prepared as a part of the preliminary plans."*

7.0 RECOMMENDED CONCEPT

7.1 TYPICAL SECTION

The proposed bridge typical section for the Recommended Alternative – Replacement with a Low-Level Movable Bridge, has a total out-to-out width of 47.2 feet as shown in **Figure 7-1**. The typical section includes two, 11-foot wide travel lanes with 5.5-foot shoulders that can function as undesignated bicycle lanes. Sidewalks, six feet wide, are proposed on both sides of the bridge.

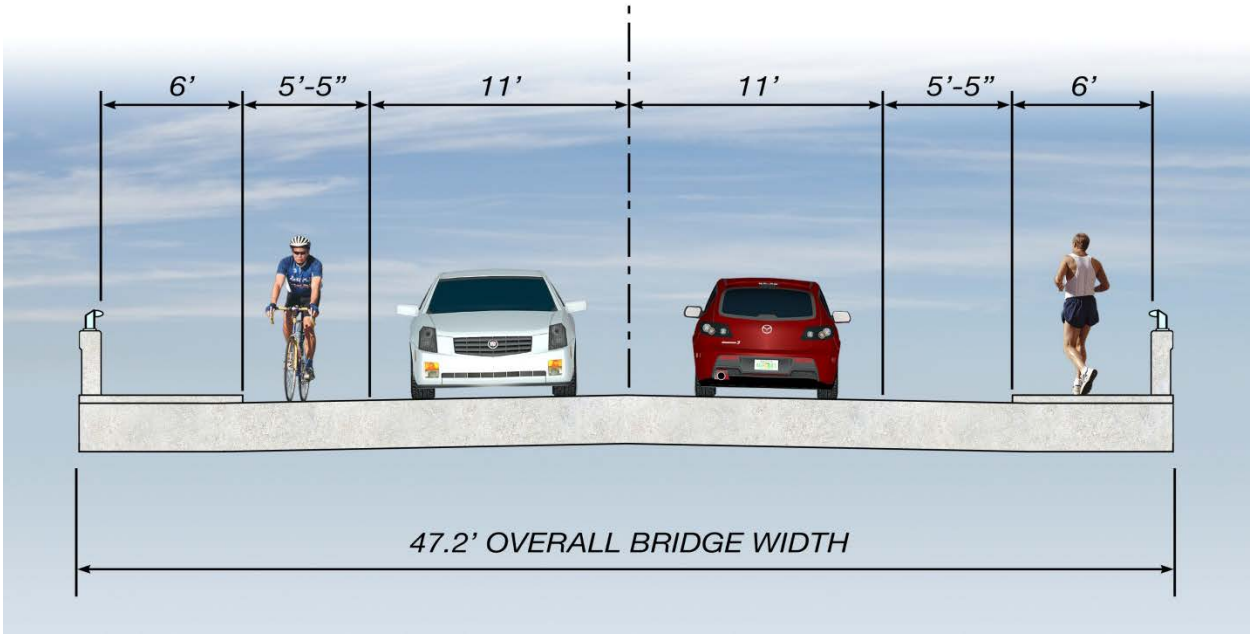


Figure 7-1 – Proposed Bridge Typical Section – Recommended Alternative

The proposed roadway section west of the bridge consists of two 10-foot wide through lanes, one in each direction, and 5.5-foot wide outside shoulders that can function as undesignated bicycle lanes. Because of the limited right-of-way, a six-foot wide sidewalk is proposed only on the north side of the roadway. No sidewalks are proposed on the south side of the roadway, adjacent to the Bayshore Mobile Home Park.

East of the bridge, the roadway section consists of two 11-foot wide through lanes, one in each direction, and 5.5-foot wide outside shoulders that can function as undesignated bicycle lanes. Six-foot wide sidewalks are proposed on both sides of the roadway. **Figures 7-2 and 7-3** illustrate the proposed roadway sections for the west and east sides of the bridge, respectively.

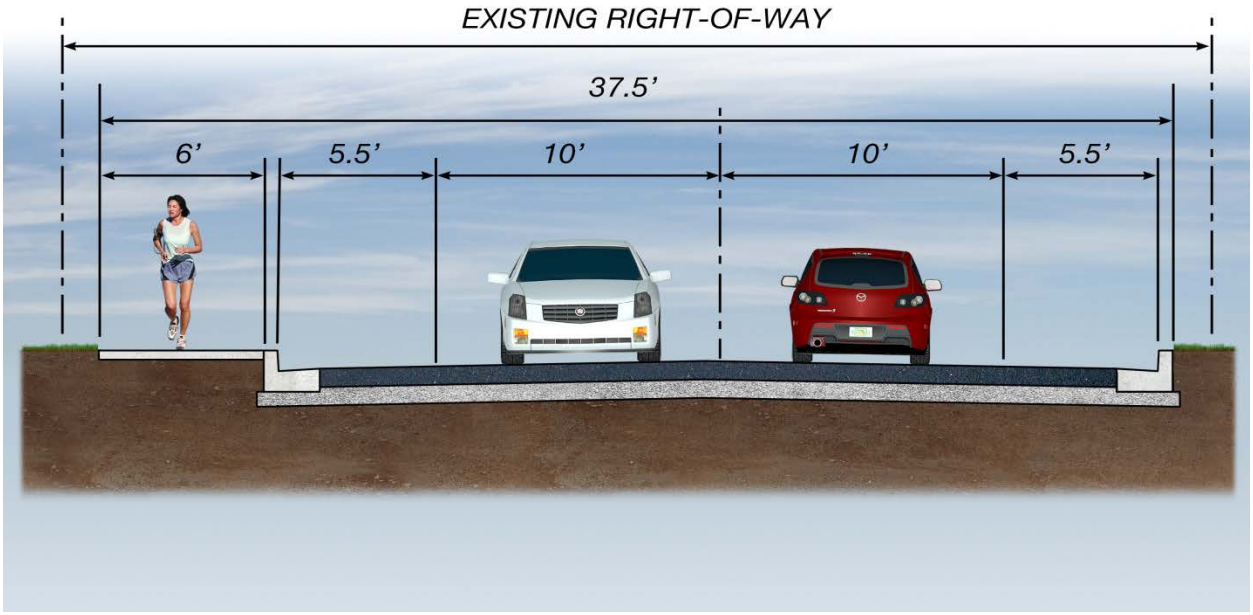


Figure 7-2 – Proposed Roadway Section West of Proposed Movable Bridge

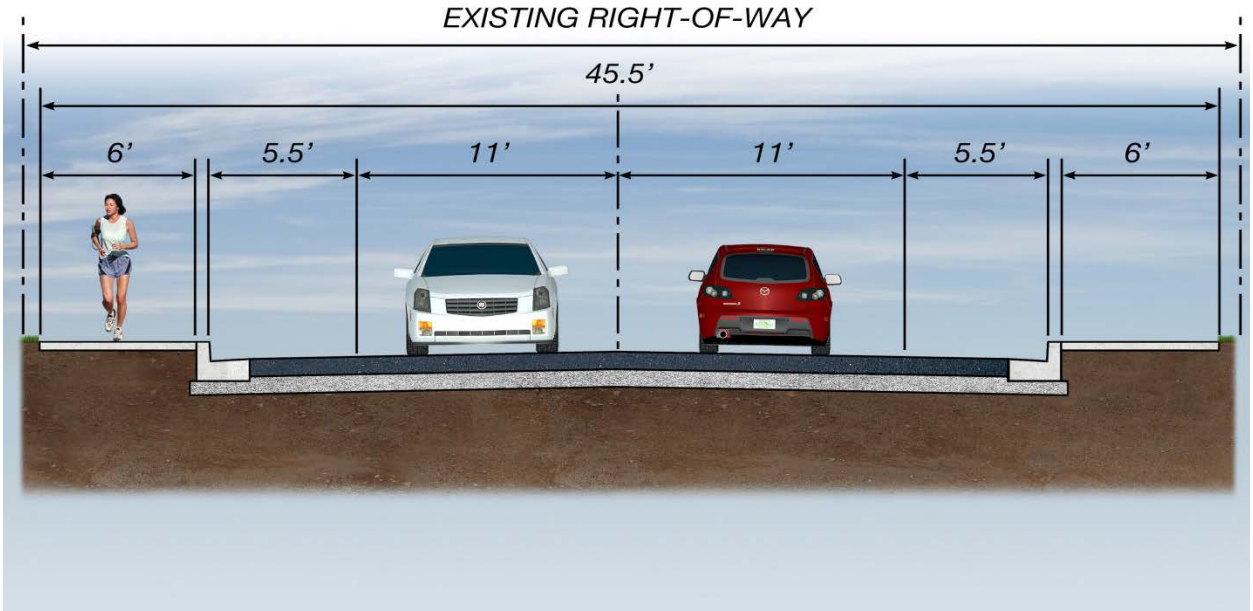


Figure 7-3 – Proposed Roadway Section East of Proposed Movable Bridge

7.2 Intersection Concepts and Signal Analysis

There are no signalized intersections within the project limits. No changes to the intersections of Chesapeake Drive, Venetian Court or Forest Avenue are proposed.

7.3 Design Traffic Volumes

A Design Traffic Technical Memorandum was prepared in accordance with the FDOT Design Traffic Handbook (Topic No. 525-030-120)). Detailed information concerning the methodology employed for this traffic study can be found in this report, published separately from the PER.

Design Year (2038) AADT Volumes

Daily traffic projections were based on applying a growth rate of 1.03 percent per year to the existing (2012) AADT volumes. Projections were based on increases from 2012 to the 2038 Design Year (for 26 years). Design Year (2038) AADT volumes are illustrated on **Figure 7-4**.

Design Year (2038) Peak Hour Volumes

Directional peak hour traffic projections were derived by applying the K and D factors to the Design Year (2038) AADT volumes. Design Year (2038) directional peak hour volumes under both scenarios are illustrated on **Figure 7-5.**

The peak hour traffic projections at the intersections of Alternate US 19 at Tarpon Avenue and Alternate US 19 at Meres Boulevard were developed by applying a 1.03 percent growth rate annually to the existing (2012) counts. Design Year (2038) intersection peak hour volumes under both scenarios are illustrated on **Figure 7-6**.

Design Year (2038) Intersection Analysis

The Design Year (2038) traffic conditions for the Recommended Alternative were analyzed using the Transportation Research Board's HCM and HCS+ for the two study area intersections.

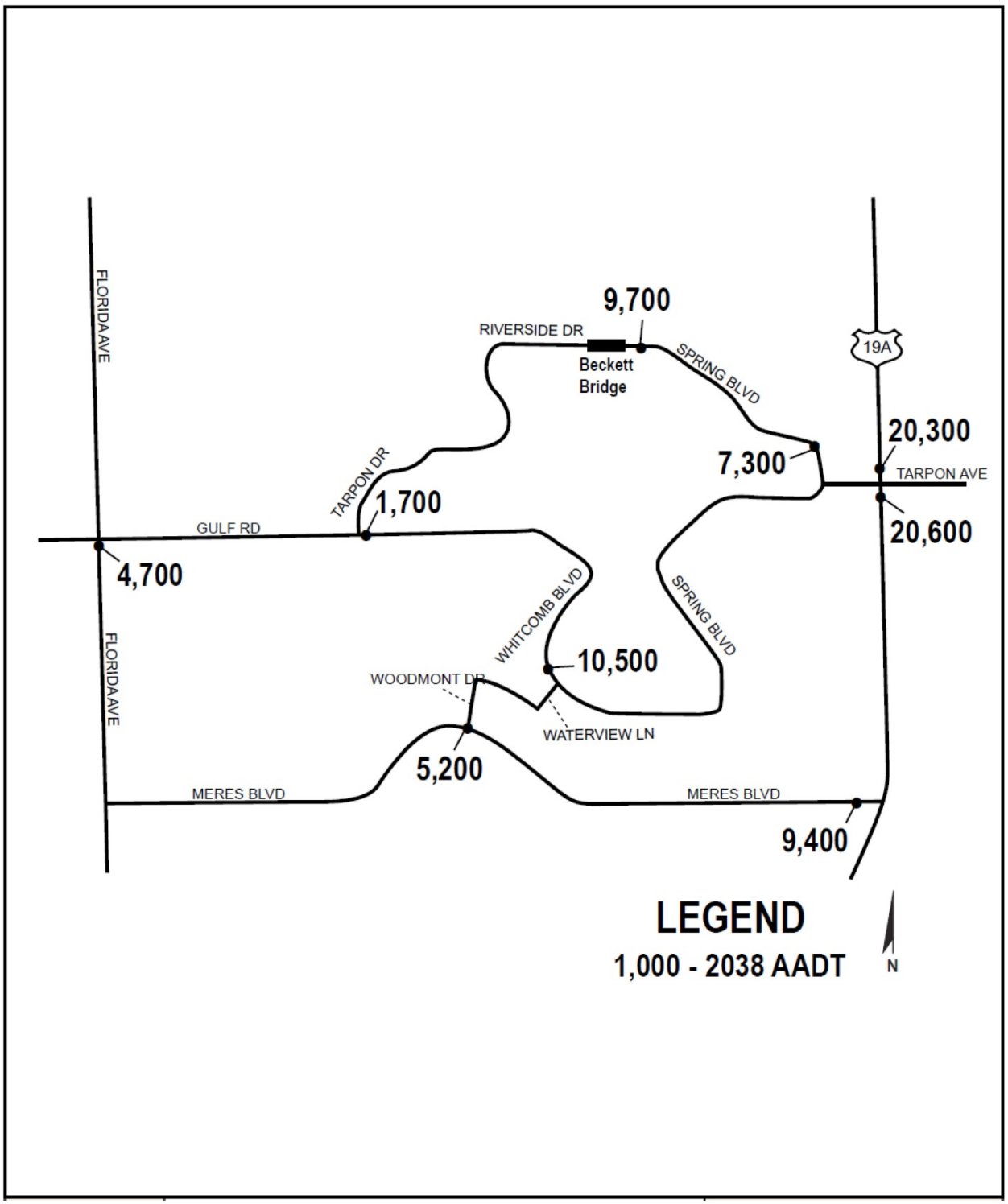


Figure 7-4 – Design Year (2038) AADT Volumes

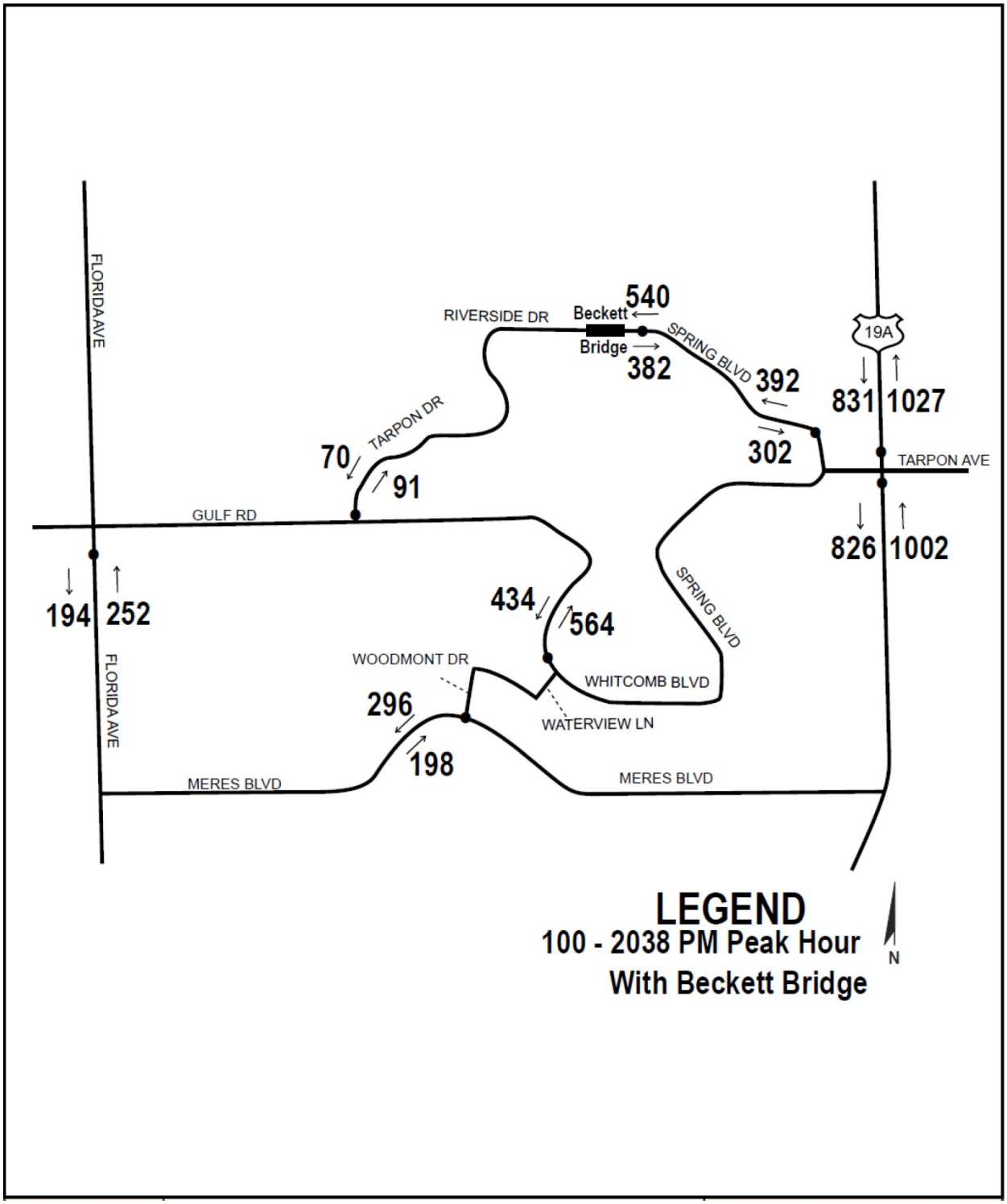


Figure 7-5 – Design Year (2038) Intersection Peak Hour Volumes

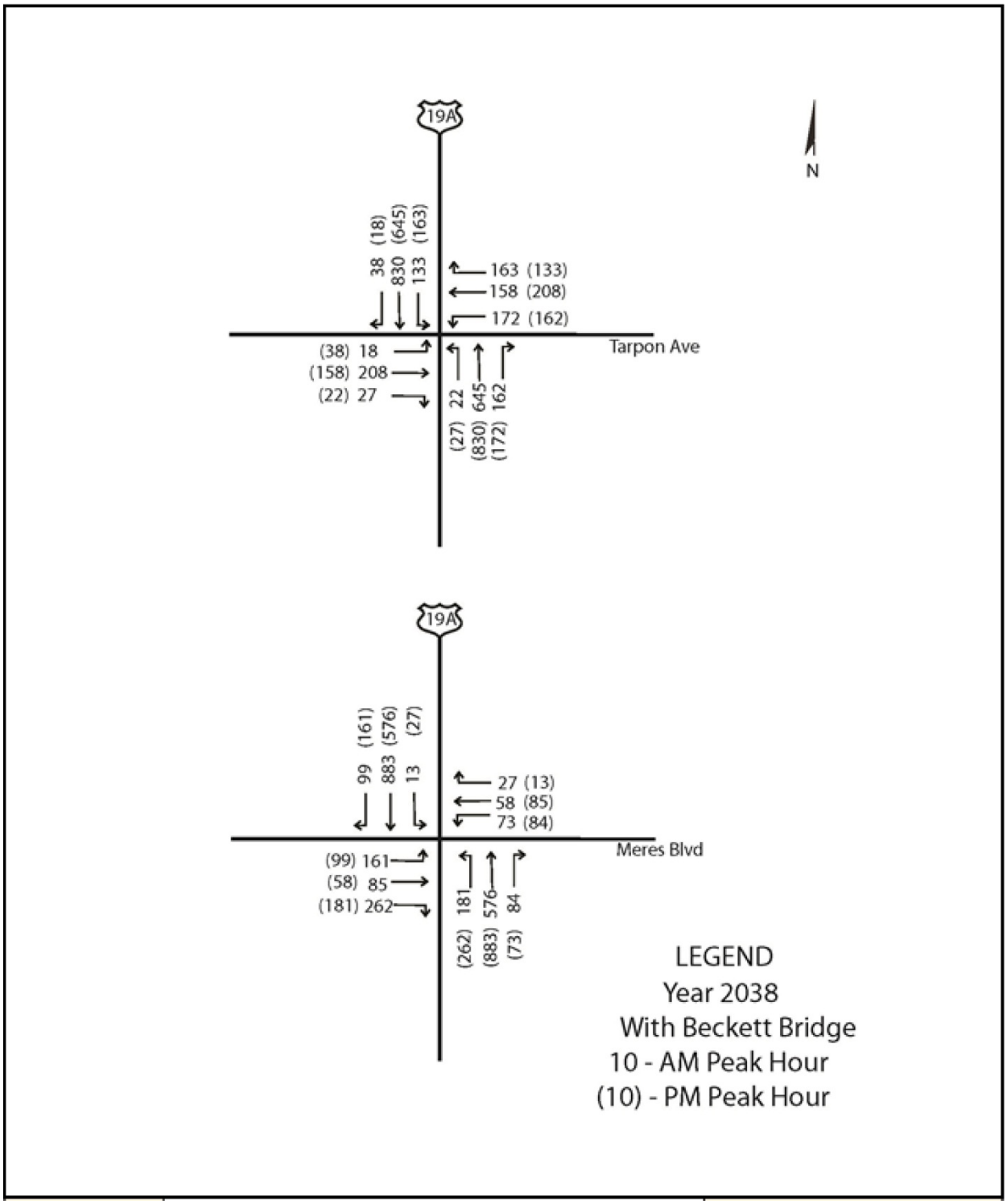


Figure 7-6 – Design Year (2038) Intersection Peak Hour Volumes

Table 7-1 summarizes the intersection delay and LOS results based on the Design Year (2038) analysis at the signalized intersections along Alternate US 19 at Meres Boulevard and at Tarpon Avenue. In 2038, the intersection of Alternate US 19 at Meres Boulevard is projected to operate at LOS D overall during the a.m. and p.m. peak hours. The Alternate US 19 at Tarpon Avenue intersection is projected to operate at LOS C in the a.m. peak hour and LOS D during the p.m. peak hour. Consistent with the Opening Year (2018) analysis, the northbound approach for the Alternate US 19 at Tarpon Avenue intersection continues to operate at LOS E during the p.m. peak hour. Additionally, the northbound approach is projected to operate at LOS E in the a.m. peak hour.

Table 7-1 – Design Year (2038) Signalized Intersection Peak Hour Level of Service Recommended Alternative

Intersection	Approach	Approach Traffic Volume		A.M. Peak Hour		P.M. Peak Hour	
		AM	PM	Delay (in sec/veh)	LOS	Delay (in sec/veh)	LOS
Alternate US 19 at Meres Boulevard	Northbound	841	1218	78.4	E	45.6	D
	Southbound	995	764	23.9	C	18.0	B
	Eastbound	508	338	49.1	D	39.7	D
	Westbound	158	182	53.4	D	51.6	D
			Overall	**49.3**	**D**	**36.9**	**D**
Alternate US 19 at Tarpon Avenue	Northbound	829	1029	24.1	C	68.9	E
	Southbound	1001	826	25.3	C	39.9	D
	Eastbound	253	218	48.0	D	54.7	D
	Westbound	493	503	45.9	D	38.2	D
			Overall	**31.1**	**C**	**52.3**	**D**

Design Year (2038) Arterial Analysis

An arterial analysis was conducted for the Design Year (2038) using the capacities provided in the 2009 FDOT Quality/LOS Generalized Tables. An arterial analysis was conducted for the Design Year (2038) using the capacities provided in the 2009 FDOT Quality/LOS Generalized Tables. Results show that Alternate US 19 is projected to continue to deteriorate to LOS F. As previously noted, Alternate US 19 has been designated by Pinellas County as a constrained roadway, and the failing level of service can be attributed to additional land use in the area and not as a result of the bridge improvements. All of the other roadways in the study area operate

at an acceptable LOS (LOS C or better). **Table 7-2** shows the results based on the generalized table capacities using urban, state and non-state roadway classifications.

Table 7-2 – Design Year (2038) Arterial Level of Service

Segment	Existing No. Lanes	Peak Hour Directional Capacity[1]	Peak Hour Directional Traffic Volumes and LOS	
			Volume	LOS[2]
Spring Boulevard (North of Tarpon Avenue)	2U	630	392	C
Riverside Drive/Spring Boulevard (at the Beckett Bridge)	2U	630	540	C
Tarpon Drive (North of Gulf Road)	2U	630	91	B
Florida Avenue (South of Gulf Road)	2U	630	252	B
Meres Boulevard (West of Woodmont Drive)	2U	630	296	B
Whitcomb Boulevard (South of Poulos Lane)	2U	630	564	C
Alternate US 19 (South of Tarpon Avenue)	2D	660	1002	F
Alternate US 19 (North of Tarpon Avenue)	2U	880	1027	F

Source: 2009 FDOT Quality/LOS Handbook Generalized Tables, Table 7.
1 Adjustments made for Non-State Roadway designation and inclusion/exclusion of turn-lanes, where applicable.
2 LOS Standard for all study area roadways is LOS.

7.4 Right-of-Way Needs and Relocations

The proposed bridge replacement and associated roadway improvements will be constructed within the County's right-of-way. Construction of the proposed bridge will not require acquisition of any additional right-of-way and will not result in the relocation of any residences or businesses.

7.5 Cost Estimates

The cost estimate for the Recommended Alternative is provided in **Table 7-3**. The estimates were based on the following:

- FDOT Structures Design Guidelines, Chapter 9-Bridge Development Report (BDR) Cost Estimating
- Historical Unit Prices for Similar Projects
- Conceptual Quantities

Table 7-3 – Estimated Construction Costs

	Recommended Alternative Low-Level Movable Bridge
Construction	$7.92 M
Mobilization	$0.792 M (10%)
Maintenance of Traffic	$0.792 M (10%)
Aesthetic Enhancements	$0.792 M (10%)
Contingency	$1.58 M (20%)
Construction Total	**$11.87 M**
Design	$1.78 (15%)
CEI	$1.78 (15%)
Post Design	$0.36 M (3%)
Right-of-Way	N/A
Project Total	**$15.8 M**

Construction cost estimates are based on the baseline structure. Contingencies were added in accordance with engineering judgment and experience. Contingencies account for miscellaneous items that are not quantifiable at the conceptual design stage. A percentage of the basic construction costs were calculated to account for mobilization, maintenance of traffic, contingencies, design and construction engineering and inspection (CEI). Mobilization costs were estimated as 10% of construction. Maintenance of traffic costs were estimated as 10% of construction. A 20% contingency was assumed for the Recommended Alternative, a replacement movable bridge, assuming ABC methods. This percentage was applied due to the complex nature of movable bridge design and construction.

Design and CEI costs were each estimated to be 15% of construction costs. All estimates need to be adjusted for inflation based upon the schedule of implementation. It is recommended that construction cost estimates be adjusted to the midpoint of construction when programming funds. Detailed cost estimates are provided in **Appendix H**.

Cost estimates for the Recommended Alternative assume Level Two Aesthetics, as defined in the *FDOT PPM* (Section 26.9.4, January 1, 2012 edition). An additional 10% of the construction costs have been included to account for aesthetic enhancements. Aesthetic enhancements may include concrete surface finishes, decorative railings, light poles, light fixtures, architectural features of the control house, landscaping and/or hardscaping features. An "Aesthetic Committee", which will include members of the community and local governments, will address the aesthetics of the bridge design during the Design Phase of the project.

7.6 PEDESTRIAN AND BICYCLE FACILITIES

The proposed replacement bridge will provide six foot wide sidewalks and 5.5 foot wide shoulders on both sides of the bridge. The shoulders will function as undesignated bicycle lanes for experienced cyclists. These facilities will be continued on the approach roadways east of the existing bridge. West of the proposed bridge, the six foot sidewalk on the south side will be eliminated because of right of way constraints. Construction of a sidewalk in this area would require acquisition of property from the Bayshore Mobile Home Park. It is anticipated that if the existing mobile home park is redeveloped in the future, sidewalks could be added. These improvements will provide safer bicycle and pedestrian facilities on the bridge and approach roadways. The proposed sidewalk approaching the western terminus of the bridge will be tapered to transition to the narrower roadway section. Signs will be installed which clearly indicate that the sidewalk will end.

No officially designated County or regional pedestrian or bicycle trails cross the Beckett Bridge. However, the Pinellas Trail, a 37 mile long regional trail, extending from St. Petersburg to Tarpon Springs is located just east of the project. The Pinellas County Trailways Plan, included in the Pinellas County MPO 2035 Long Range Transportation Plan, identifies three future recreational bicycle/pedestrian trails that will connect to the Pinellas Trail and continue west. These trails are not currently funded, but are included in the Planned Cost Feasible Trailways Projects. The proposed Howard Park Trail will provide access to Howard Park from the Pinellas Trail via Riverside Drive/North Spring Boulevard, crossing the Beckett Bridge.

7.7 UTILITY IMPACTS

Knology Broadband of Florida, Bright House Networks, Progress Energy Florida, Verizon, and the City of Tarpon Springs operate utilities within the project area. Knology Broadband has aerial coaxial cables entering the project area along Spring Boulevard on the east side of the bridge and along Riverside Drive on the west side of the bridge. These Knology cables are co-located on Progress Energy utility poles. Spurs of the aerial coaxial cables extend along Chesapeake Drive from Doric Court to the Bayshore Cove Mobile Park, and along Forest Avenue from North Spring Boulevard to High Street. In addition, a Knology broadband underground coaxial cable is located adjacent to the Tarpon Springs Yacht Club along the north side of Spring Boulevard.

City of Tarpon Springs wastewater force mains are located along Riverside Drive. A six inch force main is located on the south side of the bridge and a 12 inch force main is located on the north side of the bridge; however, these mains are located outside of the bridge fender system**.** A pump station is located on the north side of Riverside Drive at Chesapeake Drive. No other City utilities occur within the project limits.

Utilities will be located more precisely during the Design phase of the project and coordination with utility owners will continue. Depending on the location and depth of the utilities, construction of the proposed project may require adjustment of some of these facilities. Since no construction will occur outside of existing right-of-way, relocation or adjustment of most utilities located outside the existing County right-of-way is not anticipated. Cost for relocation or adjustment of activities is not included in the cost estimates prepared for the project since most are anticipated to be incurred by the utility owner. It is not anticipated that the proposed project will impact the existing City of Tarpon Springs Force Main.

7.8 TEMPORARY TRAFFIC CONTROL PLAN

Construction of a replacement bridge will require approximately 18 months of work at the project site. Initial work will be performed while the route remains open to traffic. During this period of approximately four months, work will be performed at the site that may require disruptions to traffic, including lane closures and short-term, off peak hour, road and/or sidewalk closures. These disruptions will be necessary to move equipment and materials to and from the site and to perform demolition and construction activities outside of the travel way.

Following this initial work phase, the majority of the demolition and construction work will be performed during a full detour of approximately 12 months. **Figure 7-7** illustrates the proposed detour route alternatives which were evaluated during the PD&E Study. Details of this evaluation are provided in Section 5.0 of this report. The alternative detour routes include the following:

- Whitcomb Boulevard - traffic diverted using Whitcomb Boulevard/South Spring Boulevard around Whitcomb Bayou - a distance of approximately 2.5 miles.
- Meres Boulevard - traffic diverted using Meres Boulevard from Alternate US 19 to Florida Avenue
- Klosterman Road-Carlton Road-Curlew Road - traffic diverted from Alternate US 19 using Klosterman Road, Carlton Road, and Curlew Road to Florida Avenue.

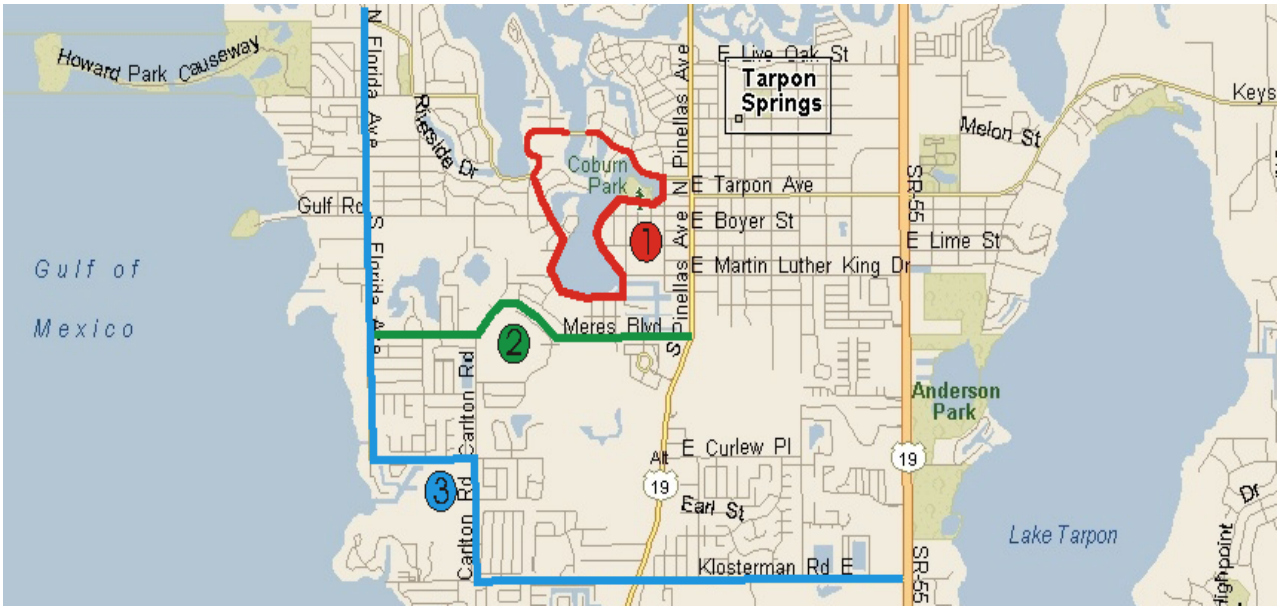


Figure 7-7 – Detour Routes

Upon completion of the detour period the new bridge and roadway will be reopened to traffic. However, construction activities, including commissioning and testing of the movable span will still be required. During this period of approximately two months some single lane closures and/or short-term, off-peak hour closures may be required to test the operation of the new movable span, deliver materials and perform work outside of the travel way.

Throughout construction, barge mounted construction equipment, delivery barges, and

supporting tugs and skiffs may occupy part of the waterway. Operations in the water will be coordinated with the USCG. Temporary restrictions to navigation will be required to perform the construction work. Such work will be conducted in accordance with the requirements established by the USCG and published via a Notice to Mariners.

It should be noted that a comparison of the TBRPM origin/destination traffic patterns with and without the Beckett Bridge showed that none of the existing or future traffic traveling across the bridge would redistribute using the Klosterman Road-Carlton Road-Curlew Road alternative. In addition, this route is the longest and most circuitous of the alternatives, at approximately 2.75 miles in length. For these reasons, this alternative was eliminated from further consideration.

Results of the analysis indicate that in the event of closure of the Beckett Bridge, reassigning traffic to Whitcomb Boulevard would increase congestion on this roadway to failing levels of service (LOS F). Conversely, if the traffic was rerouted via Meres Boulevard, then the study area roadways are anticipated to continue to operate at acceptable levels of service with the additional traffic.

Based on these results, it is recommended that the detour route for the project occur along Meres Boulevard. Detour signage, including the use of Intelligent Transportation Systems (ITS), specifically electronic message panels, should be placed well in advance of the route location along Florida Avenue and Alternate US 19 (at a minimum). Additional electronic signage may also be needed at key locations throughout the neighborhood surrounding the Beckett Bridge and should provide (if at all possible) real-time information regarding potential delays on the route.

It should be noted that portions of Alternate US 19 operate at LOS F under either scenario, as well as the detour alternatives, in both the Opening Year (2018) and Design Year (2038). However, this corridor has been designated by Pinellas County as a constrained roadway, and the failing level of service can be attributed to additional land use in the area and not as a direct result of the project.

Maintenance of traffic and sequence of construction will be planned and scheduled to minimize traffic delays throughout the project. Signs will be used as appropriate to provide notice of detours, lane closures and other pertinent information to the traveling public. The local news media will be notified in advance of detour lane closings and other construction-related activities, which could excessively inconvenience the community.

7.9 DRAINAGE

The existing drainage system within the project limits is predominantly sheet flow along the Riverside Drive roadway to Whitcomb Bayou/Spring Bayou which outfalls to the Anclote River. The existing Beckett Bridge discharges directly to the Whitcomb Bayou/ Spring Bayou via scuppers and at the bridge approaches. Currently no existing stormwater management facilities are located within or adjacent to the project limits.

Based on meetings with Southwest Florida Water Management District (SWFWMD) staff, it is anticipated that the project will qualify for the 62.330-443 General Permit to the Florida Department of Transportation, Counties, and Municipalities for Minor Bridge Alteration, Placement, Replacement, Removal, Maintenance, and Operation (previously Noticed General Permit 40D-400.443). If the project qualifies for this general permit, water quality treatment of stormwater runoff is not anticipated to be required.

Conceptual drainage proposed for the Recommended Alternative will include the installation of scuppers for bridge deck drainage as well as a curb and gutter drainage system along the roadway east and west of the bridge. The roadway currently has no stormwater management system in place, so the proposed curb and gutter drainage system may help lessen reported flooding along portions of the roadway. The proposed system will convey collected stormwater runoff from the roadway to the tidal Whitcomb Bayou in the vicinity of the bridge.

During the Design phase, the proposed drainage system for this project will be designed in accordance with the FDOT and Pinellas County drainage standards and procedures to carry stormwater runoff away from the roadway. If water quality treatment is required by the SWFWMD, the possibility of providing compensatory off-site treatment will be further explored (during the Design phase). Other treatment options, including stormwater ponds along the corridor, are limited. All discharge piping that leads to Whitcomb Bayou will be equipped with

approved Manatee Exclusion Devices, as described in a February 2011 information circular developed by the Florida Fish and Wildlife Conservation Commission. Preliminary drainage calculations for the proposed improvements are included as **Appendix I**.

7.10 BRIDGE ANALYSIS

The proposed replacement bridge is a low-level bridge with a movable span over the navigation channel. The total length of the proposed new bridge is 360 feet. The bridge includes a 123-foot long east approach, 152-foot long west approach, and an 85-foot long bascule span.

The maximum proposed grades on either end of the bridge are five percent, which meets ADA requirements. Roadway reconstruction is limited to the bridge approaches. The approach roadway will return to existing grade at Pampas Avenue on the east side of the bridge. On the west side of the bridge, the approach roadway will return to existing grade just east of Chesapeake Drive. The approach roadway will be close enough to the existing grades at the driveways to the Bayshore MHP, the Tarpon Springs Yacht Club and Venetian Court to allow connection of these driveways with minimal re-grading. Access to residential property driveways along Riverside Drive will still be accessible. Resurfacing (only) is proposed between Forest and Pampas Avenues.

A continuous superstructure, from abutment to movable span, is proposed for the approach spans to reduce future deck joint maintenance and provide for a smoother ride. The substructure for the prestressed slab unit spans are bents or piers supported on prestressed concrete piles or drilled shafts and featuring reinforced concrete caps.

A single-leaf rolling-lift bascule span, with an underdeck counterweight (deck girder configuration with the girders and counterweight located below the deck), is proposed for the movable span. The proposed configuration is similar to that of the existing bridge. The bascule leaf rotates about a horizontal axis located on one side of the channel and rolls back on a track as it opens to provide unlimited vertical clearance over the channel with the leaf in the fully open position. The proposed movable span will provide 7.8 feet of vertical clearance at the fenders (in the closed position) and 25 feet of horizontal clearance between fenders for vessels traveling on the waterway. (Vertical clearance is measured at the lowest point of clearance within the navigation channel. The low point is located at the side of the channel closest to the

bascule pier, directly above the fender system that marks the channel limits.) The bascule leaf will consist of steel main girders, floor beams, stringers, and a solid surface deck. The counterweight will consist of concrete with steel ballast blocks for balancing the leaf. The bascule pier will be supported by prestressed concrete piles or drilled shafts and feature concrete pier walls to enclose the machinery and counterweight. The rest pier, which supports the tip of the bascule span when in the fully closed position, will be similar to the other bents or piers.

The new movable bridge will feature traffic control safety devices that are required for movable bridges. These elements include traffic signals and traffic warning gates on both approaches and a resistance barrier gate on the rest pier side of the bascule span. The bridge will also feature a fender system equipped with standard navigation lights and clearance signs.

The bridge, which crosses Whitcomb Bayou, is not required to be designed to resist vessel impact. The low member vertical clearance of the proposed bridge is less than eight feet with the bascule span in the closed position. There is no evidence that the existing vertical clearances of the fixed approach span and movable span (6-feet) are not sufficient for current marine usage, or that the type and number of vessels using the bayou will change dramatically in the future. There are no commercial marinas present in Whitcomb Bayou.

Wave Vulnerability: According to the *Final Report, Design Storm Surge Hydrographs for the Florida Coast, D. Max Sheppard and William Miller Jr., September 2003,* the 100-yr Storm Surge Elevation for the Anclote River is approximately 11.5 feet. The storm surge elevation at the bridge is anticipated to be similar to this elevation. It is anticipated that wave heights at the bridge during a coastal storm event would not be substantial because of the lack of a significant fetch needed to develop wind-driven waves. In addition, the presence of topographical features, including numerous adjacent residential buildings and trees reduce wind velocities at the surface of the water. The Beckett Bridge is important for evacuation during a storm event. Although it is not considered a designated emergency evacuation route, it is considered an extension of Tarpon Avenue, which is a designated emergency evacuation route. The proposed bridge, while non-critical, and therefore not required to be designed for wave forces, should be designed with consideration for reducing the potential effects of wave action.

7.11 NAVIGATION

The existing bridge crosses a narrow channel of Whitcomb Bayou. The bridge provides approximately six feet of vertical clearance at the fenders, and approximately 25 feet of horizontal clearance between the fenders. A USCG bridge permit will be required for construction of the proposed replacement single-leaf movable bridge. The USCG is a cooperating agency for this project. Coordination concerning navigational issues has been ongoing throughout the PD&E Study.

The proposed replacement bridge will be constructed on approximately the same alignment as the existing bridge and provide approximately 7.8 feet of vertical clearance in the closed position at the fenders, slightly more than the existing bridge. In the open position, unlimited clearance will be provided between the fenders. This is an improvement to the existing condition since the bascule leaf currently does not open fully and unlimited clearance is not provided for the entire width of the channel. The proposed horizontal clearance is the same as the existing bridge, 25 feet. Construction of the replacement bridge will not adversely impact navigation in the channel.

7.12 ENVIRONMENTAL IMPACTS

Detailed studies and evaluations were conducted to determine the potential for adverse impacts associated with construction of the proposed improvements to the Beckett Bridge. Baseline data, evaluation criteria and the results of these studies are contained in the project files and published separately in the following reports or technical memoranda: Air Quality Technical Memorandum, NESHAP Asbestos and Protective Coatings Survey Report, Contamination Screening Evaluation Technical memorandum, Noise Study Report, Biological Assessment Technical Memorandum, Wetland Evaluation/Essential Fish Habitat Technical Memorandum, Cultural Resources Assessment Survey Report, Section 106 Determination of Availability, Section 106 Case Study Report, Programmatic Section 4(f) Document.

It is anticipated that environmental impacts associate with the Recommended Alternative will be minimal, except for adverse impacts to the historic bridge. The following summarizes anticipated impacts associated with the Recommended Alternative. The Type II Categorical Exclusion Determination Form, published separately, provided a detailed analysis of potential impacts and addresses agency comments and concerns expressed in the ETDM Program Summary Report.

7.12.1 Social and Economic Impacts

Land Use: Land use patterns are established in the vicinity of the project and not expected to change substantially over the next few years. The proposed improvements will not require acquisition of additional right-of-way. Replacement of the functionally obsolete bridge in the same location with a similar movable bridge will have minimal impact on land use in the area. The proposed project will not adversely impact the cohesion of the communities in the vicinity of the bridge.

Community Resources: Community services, including those providing emergency services located within approximately 1.5 miles of the project include two fire stations, one police station, one hospital, five religious institutions, and five schools. In addition, the Pinellas County Health Department operates a health center within the City of Tarpon Springs, located approximately 1.2 miles from the Beckett Bridge.

Replacement of the existing bridge will have a positive impact on access to community resources. The existing bridge is currently load posted. School busses and large emergency vehicles are prohibited from crossing the bridge. Six public schools are located within three miles of the Beckett Bridge. According to the Route and Safety Auditor for the Pinellas County School Board, if the bridge were rehabilitated or replaced, school bus traffic would be re-routed to travel along Spring Boulevard/Riverside Drive and cross the Beckett Bridge. Approximately 15 to 20 school busses per day could potentially use the bridge. The detour results in additional costs for busses that service schools in the vicinity of the project. The proposed replacement bridge would result in a cost savings for operation of school busses in the community.

Traffic will be detoured during construction of a replacement bridge, if selected as Preferred Alternative. Two detour routes are proposed, the longest is approximately 2.75 miles. Emergency response times could be affected for some areas in the immediate vicinity of the bridge while the detour is in effect

7.12.2 Impacts to Cultural Resources

Section 4(f): Marked and unmarked paddle trails are identified in the "Guide to Pinellas County Blueways," published by the Pinellas County Planning Department in April 2010. One unmarked trail begins in Spring Bayou at Craig Park, just south of the Beckett Bridge. The trail continues

north through Whitcomb Bayou, passing under the Beckett Bridge continuing to the Anclote River and eventually to the Gulf of Mexico. Access to navigational opportunities will be maintained to the greatest extent possible during construction. No impacts to this unmarked trail will result by replacement of the Beckett Bridge with the proposed new movable bridge.

Whitcomb Bayou is located within the Pinellas County Aquatic Preserve. The proposed project will be constructed within the existing Pinellas County transportation right-of-way which is designated for transportation. An Environmental Resource Permit, a USCG bridge permit and a Section 10/Section 404 permit will be required from the USACOE. Compliance with all requirements and conditions of these permits will ensure that potential impacts to water quality, fish and wildlife are avoided or minimized. The proposed project will not cause any proximity impacts that would permanently impair or diminish the Pinellas County Aquatic Preserve resources' attributes which qualify the preserve for protection under the provisions of Section 4(f).

The existing historic bridge was determined to be eligible for listing in the National Register of Historic Places (NRHP). Since the bridge will be demolished, a Programmatic Section 4(f) Evaluation was prepared to evaluate avoidance alternatives and minimization of impacts. Mitigation to offset the impacts to this resource are outlined in the Evaluation and in the Memorandum of Agreement (MOA) among SHPO, FHWA, FDOT and Pinellas County. The conclusion of Programmatic Section 4(f) Evaluation is that the provisions of Section 4(f) and 36 CFR Part 8—will be fully satisfied.

Historic and Archaeological Sites: A CRAS was conducted for this study. The results are documented in the CRAS report, published separately. The recommendations in the CRAS were approved by FHWA on March 13, 2013. SHPO concurred with the findings of the CRAS on April 11, 2013. No archaeological sites were newly identified within, or adjacent to, the project corridor during the current survey. No previously recorded archaeological sites were located within the archaeological APE.

This survey resulted in the identification of 16 newly recorded historic resources within the APE including one bridge (8PI12017) and 15 buildings (8PI12043-8PI12055, 8PI12068, 8PI2069). One of these newly recorded historic resources, Beckett Bridge (8PI12017), was determined to be eligible for listing in the NRHP by FHWA and SHPO. The remaining resources (8PI12043-

8PI12055, 8PI12068, 8PI12069) are considered ineligible for listing in the NRHP as individual historic resources or as contributing resources to a historic district.

A Cultural Resource Committee (CRC) was established to address Section 106 issues and conduct good faith consultation with affected parties. After consideration of a detailed evaluation of rehabilitation alternatives described in Section 6 of this document, SHPO stated that ample evidence had been provided to support that a new movable bridge would be preferable to rehabilitation.

A Section 106 Case Study Report was prepared to document the impacts to the historic resource. A Section 106 MOA among SHPO, FHWA, FDOT and Pinellas County which specifies conditions required to mitigate for the adverse impacts resulting from demolition of the existing bridge was prepared. This MOA is included in the Programmatic 4(f) Evaluation and in Appendix J of this document.

This MOA requires the Historic American Engineering Record (HAER) documentation of the bridge, which includes large-format photography, printing historic plans on archival paper, and preparing a written narrative. In addition, the following mitigation measures are included:

The replacement bridge will be a single-leaf, rolling lift bridge type of similar design and scale. However, other aesthetic elements of the bridge will be determined by an aesthetics committee that will be assembled during the Design phase. This committee will include representatives of the community and local governments, including the Tarpon Springs Historical Society.

- Pinellas County will ensure representative, significant engineering elements from the Beckett Bridge will be identified and salvaged. These elements may be incorporated into the design of the new bridge. The reuse of these historic elements will be determined by Pinellas County in coordination with the aesthetics committee and will not require consultation with FDOT, FHWA or SHPO. If during construction it is determined that the existing bridge elements are not salvageable for reuse into the design of the new bridge, Pinellas County will salvage a few intact elements for display in a location identified by Pinellas County and within the vicinity of the new bridge.

- Pinellas County will ensure that the existing historic bridge plaque will be removed and stored in an area protected from human and natural damage until it can be incorporated into the new control house that will be constructed as part of the new bridge. The bridge plaque will be placed on the new control house so that it is visible to pedestrians.

- Pinellas County will ensure that information regarding the Beckett Bridge, which is suitable for inclusion in a "public-facing website for project information and educational purposes" and/or suitable for use on a mobile device, such as "What Was There" or "Next Exit History", is developed. This information will provide a historic account of the bridge to educate the public on its history.

7.12.3 Impacts to Natural Resources

Wetlands: The proposed project will impact approximately 0.01 acre of mangrove swamp and 0.02 acre of oyster bars. No seagrass beds will be impacted. The wetlands within the project study area impacted by the proposed improvements were assessed using the Uniform Mitigation Assessment Methodology (UMAM) per Chapter 62-345, FAC. Based on meetings with regulatory agencies, it is anticipated that mitigation for these impacts will not be required. However, if mitigation is required by one of the reviewing agencies, "in-kind" mitigation at the project site may not be a feasible option due to the limited ROW and surrounding developments. Therefore, an "out-of-kind" mitigation option, such as water quality improvements, may be requested during the design and permitting phases of this project. Any proposed mitigation will be coordinated with the NMFS, FWS, and the SWFWMD during the Design phase.

Water Quality: A Water Quality Impact Evaluation (WQIE) was conducted in accordance with the FDOT PD&E Manual. The WQIE checklist is included in **Appendix E**. The project is located within the Pinellas County Aquatic Preserve which is an Outstanding Florida Water. Based on meetings with SWFWMD staff, it is anticipated that the project will qualify for the 62.330-443 General Permit to the Florida Department of Transportation, Counties, and Municipalities for Minor Bridge Alteration, Placement, Replacement, Removal, Maintenance, and Operation (previously Noticed General Permit 40D-400.443). If the project qualifies for this general permit, water quality treatment of stormwater runoff is not anticipated to be required.

The County will implement appropriate best management practices during construction to prevent water quality violations. An Environmental Resource Permit will be required for

construction of the proposed project. The contractor will comply with all permit requirements and conditions related to water quality. Because the proposed new bridge does not provide any additional capacity, it is not anticipated that this project will have a substantial impact on water quality.

Floodplains: In accordance with the requirements set forth in 23 CFR 650A, the project corridor was evaluated to determine the effects, if any, of the proposed alternatives on the hydrology and hydraulics of the area.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), Panel 19 of Map Number 12103C00196 (September 2003), the Beckett Bridge and immediate vicinity are located within the 100 year floodplain in designated Zone AE. The Base Flood Elevation established for Minnetta Bayou/ Spring Bayou is elevation 10 feet which is associated with coastal tidal surge conditions.

The proposed replacement bridge will be constructed in approximately the same location as the existing bridge to minimize impacts. There are no existing or proposed cross drains within the project limits. The proposed structure (replacement bridge) will be hydraulically equivalent to or greater than the existing structure, and backwater surface elevations are not expected to increase. Within the project corridor, the improvements to the existing Riverside Drive and Beckett Bridge represent transverse encroachments on the floodplain. This encroachment should remain at existing levels. As a result, the project will not affect existing flood heights or floodplain limits.

Cut and fill activities required as part of the roadway improvements are not expected to significantly impact the fauna, flora, and open space environments along the corridor. The project will not result in substantial adverse environmental impacts. The proposed project will not significantly change the risks or damages associated with roadway flooding. There will not be significant change in the potential for interruption or termination of emergency services or emergency evacuation routes. Therefore it has been determined that this encroachment is not significant.

The encroachments for the bridge will mainly involve modifications at the approaches to the bridges as well as incidental encroachments due to bridge modification or replacement activities, where applicable. Since the existing flood zones are associated with coastal surge, compensation for the floodplain impacts is not anticipated to be required by the regulatory agencies.

Coastal Zone Consistency: According to the ETDM Program Screening Tool Track Clearinghouse Projects Report for this project, the State of Florida has determined that this project is consistent with the Florida Coastal Zone Management Plan (FCMP). The State's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process in accordance with Section 373.428, Florida Statutes.

Wildlife and Habitat: Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FWC). Project biologists made a finding of "no effect" for the southeastern American kestrel and Florida sandhill crane, and a finding of "not likely to adversely affect" for the wood stork and eastern indigo snake. For all the other evaluated species, a determination that the project "may affect, but is not likely to adversely affect" these species was concluded in the report. The FWC, by letter dated April 22, 2013 concurred with these determinations and supported the protected species commitments identified in the report which include the following:

1. Compliance with the USFWS "Standard Protection Protocols for the Eastern Indigo Snake" and paragraph E of the U.S. Army Corps of Engineers Eastern Indigo Snake Programmatic Key.

2. Compliance with the USFWS and FWC approved "Standard Manatee Construction Conditions" during all in-water construction phases of the project, and coordination with the USFWS and FWC during the design and permitting phases of the project for additional site-specific manatee protection measures to be implemented during construction.

3. Submission of a blasting plan (if blasting occurs), which includes the use of qualified observers and an aerial survey, to USFWS and FWC for review and approval prior to construction.

4. Coordination of wetland impacts with the appropriate resource agencies and propose mitigation to offset any adverse impacts to listed species habitat, if determined to be warranted.

5. If an active bald eagle nest is identified within the 660-foot buffer zone around the construction area, mitigation measures will be implemented to avoid disturbing the species, which may include control of the timing and location of construction activities and establishment of a buffer zone around active nesting sites.

6. Coordination with FWC for the removal of the osprey nests on a utility pole within the construction area during the design and permitting phase of the project.

By letter dated June 12, 2013, the USFWS concurred with the Biological Assessment's determination that the project may affect, but is not likely to adversely affect the piping plover, is not likely to adversely affect the wood stork or eastern indigo snake, and will have no effect on federally listed plants. The USFWS further noted that there is no appropriate habitat for the piping plover, no suitable foraging habitat for the woodstork. In addition the Service states that no undisturbed upland habitat near the project that might support the eastern indigo snake or listed plants. Accordingly, the USFWS will not require implementation of the "Standard Construction Measures for the Eastern Indigo Snake".

USFW also stated that they will not be able to make an impact determination for the Florida manatee, gulf sturgeon or sea turtles until more specific information is available concerning construction. The timing and duration of construction, as well as construction methods, will determine the appropriate conditions to safeguard manatees and other aquatic species. Accordingly, Pinellas County has committed to continued coordination with the USFWS during the Design phase concerning potential impacts to these species.

Because of the constrained project location, it is not anticipated that blasting will be employed for demolition of the existing bridge. However, if blasting is proposed, the selected contractor will be required to submit a blasting plan which includes the use of qualified observers and an aerial survey, to USFWS and FWC for review and approval prior to construction.

The project study area is located within a designated FWS consultation area for the Florida scrub jay (*Aphelocoma coeruluscens*). Based on a review of available and field reviews, no scrub jay habitat is available within the project study area and no populations have been reported or observed. Therefore, no further scrub jay consultation with USFWS should be required for this project.

Essential Fish Habitat: Construction of the proposed project will not result in the loss of open water area designated as EFH. However, approximately 0.02 acre of oyster beds and 001 acre of mangroves will be impacted. Impacts to oyster beds will likely be temporary; live oysters can be relocated prior to construction and oysters may recolonize the area following construction. If required by conditions of the environmental permits or the USCG Bridge Permit, all permanent and temporary loss of these habitats will be mitigated. Accordingly, no populations of any of the 26 representative fish, shrimp, and crab species and the coral complex listed by the GMFMC are expected to be adversely affected by the proposed project.

By email dated, April 15, 2013, the NMFS stated that the essential fish habitat effect determinations presented in the Wetland Evaluation/Essential Fish Habitat technical memorandum appear to accurately reflect potential impacts to NMFS trust resources for the proposed bridge replacement. Given the relatively low quantity of impacts to fish habitats estimated for all the alternatives, NMFS also stated that they would be generally more inclined to accept appropriate off-site (but within the same drainage basin) "in-kind" mitigation, rather than "out-of-kind" mitigation for unavoidable project impacts. NMFS also requested continued coordination at the conclusion of the PD&E Study and during the Design phase when more detailed compensatory mitigation proposals are developed.

7.12.4 Physical Impacts

Noise: A noise study analysis was performed for this project following FDOT procedures that comply with Title 23 Code of Federal Regulations (CFR), Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. The evaluation used methodologies established by the FDOT and documented in the PD&E Manual, Part 2, Chapter 17 (May 2011). The prediction of traffic noise levels, with and without the proposed improvements (replacement of the Beckett Bridge), was performed using the FHWA's Traffic Noise Model (TNM-Version 2.5).

Twenty-seven noise sensitive sites, including 26 residential sites and one meeting room (Tarpon Springs Yacht Club) were identified. The existing (2012) traffic noise levels are predicted to range from 54.6 to 63.2 decibels on the "A" weighted scale (dB(A)), which are traffic noise levels that would not approach, meet, or exceed the Noise Abatement Criteria (NAC) at any of the evaluated noise sensitive sites. In the future without the proposed improvements (no-build), traffic noise levels were predicted to range from 55.8 to 64.4 dB(A), which are also levels

that would not approach, meet, or exceed the NAC at any of the evaluated sites. In the future with the proposed improvements (build), traffic noise levels were predicted to range from 56.9 to 64.7 dB(A), which are also levels that would not approach, meet, or exceed the NAC at any of the evaluated sites. Additionally, when compared to the existing condition, traffic noise levels with the improvements are not predicted to increase more than 2.8 dB(A). As such, the project would not substantially increase traffic noise (i.e., an increase in traffic noise of 15 dB(A) or more).

Since future traffic noise levels with the proposed improvements are not predicted to approach, meet, or exceed the NAC at any of the noise sensitive sites or substantially increase, noise abatement measures were not considered. However, Pinellas County commits to review the project for any changes in land use during the Design Phase of the project to ensure that all noise sensitive sites that received a building permit prior to the project's Date of Public Knowledge (i.e., the date the environmental documentation is approved) have been evaluated. No construction or posted building permits were observed within the project limits during a land use survey that was performed on November 13, 2012.

Construction of the proposed project would result in temporary construction-related noise and vibration. It is anticipated that the application of the *FDOT Standard Specifications for Road and Bridge Construction* will minimize or eliminate this noise and/or vibration. Should unanticipated noise or vibration issues arise during the construction process, the Project Engineer, in coordination with the Contractor, will investigate additional methods of controlling these impacts.

Land uses such as residential, offices, and parks are considered incompatible with highway noise levels exceeding the NAC. In order to reduce the possibility of new noise-related impacts, noise level contours were developed for the future improved roadway facility (see Section 6 of this NSR). These noise contours delineate the distance from the improved roadway's edge-of-travel lane to where 56, 66, and 71 dB(A) (the FDOT's NAC for Activity Categories A, B/C, and E, respectively) is expected to occur in the year 2038 with the proposed improvements. Local officials will be provided a copy of the Final NSR to promote compatibility between land development in the area and the project should it be selected as the Preferred Alternative and completed.

Air Quality: The US Environmental Protection Agency does not anticipate any negative air

quality impacts relating specifically to the project. Pinellas County is currently designated to be an attainment area for all of the National Ambient Air Quality Standards (NAAQS). Accordingly, the transportation conformity requirements of the Clean Air Act are not applicable to the project. The proposed replacement two-lane bridge is not a capacity improvement.

The project alternatives were subjected to the FDOT's screening model, CO Florida 2004 (Version 2.0.5, which employs United States Environmental Protection Agency (USEPA)-developed software (MOBILE6 and CAL3QHC). This model is a carbon monoxide (CO) screening model that makes various conservative worst-case assumptions related to site conditions, meteorology, and traffic. The results of the screening analysis indicate that the greatest one- and eight-hour CO concentrations would be 6.1 and 3.7 ppm, respectively - levels that would not meet or exceed the NAAQS for this pollutant. Accordingly, the project "passes" the screening model. An Air Quality Technical Memorandum documenting the air quality screening analysis was prepared for this project and is available at the County offices.

Construction: Construction activities for the proposed improvements will have air, noise, water quality, traffic flow, and visual impacts for those residents and travelers within the immediate vicinity of the project. The air quality impact will be temporary and will primarily be in the form of emissions from diesel powered construction equipment and dust from demolition activities, embankment and haul road areas. Air pollution associated with the creation of airborne particles will likely be effectively controlled through the use of watering or the application of calcium chloride in accordance with FDOT's *Standard Specifications for Road and Bridge Construction* as directed by the County Project Manager.

Noise and vibration impacts will be from the heavy equipment movement and construction activities, such as demolition, pile driving and vibratory compaction of embankments. Noise control measures will likely include those contained in FDOT's *Standard Specifications for Road and Bridge Construction*.

Water quality impacts resulting from erosion and sedimentation will likely be controlled in accordance with FDOT's *Standard Specifications for Road and Bridge Construction* and through the use of Best Management Practices. Stormwater pollution prevention measures will likely be developed per FDOT standards and in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements.

Maintenance of traffic and sequence of construction will be planned and scheduled to minimize traffic delays throughout the project. Signs will be used as appropriate to provide notice of detours, lane closures and other pertinent information to the traveling public. The local news media will be notified in advance of detour lane closings and other construction-related activities, which could excessively inconvenience the community.

A sign providing the name, address, and a contact telephone number will be displayed on-site to assist the public in obtaining immediate answers to questions and logging complaints about project activity. In general, the objective of the maintenance of traffic plan for the project will be to detour traffic away from the construction zone. No temporary roads or temporary bridges will be required.

Construction of the roadway may require minor excavation of unsuitable material (muck). Construction of the roadway will require placement of embankments, and use of materials such as lime rock, asphaltic concrete, and Portland cement concrete. Although not anticipated, if demucking is required, it will likely be performed in accordance with Section 120 of the FDOT *Standard Specifications for Road and Bridge Construction*. The removal of structures and debris will be in accordance with local and State regulatory agencies permitting this operation. The contractor is responsible for methods of controlling pollution on haul roads (if used), in borrow pits, other materials pits, and areas used for disposal of waste materials from the project. Temporary erosion control features, as specified in the FDOT's *Standard Specifications for Road and Bridge Construction*, Section 104, will likely consist of temporary grassing, sodding, mulching, sandbagging, hay bales, slope drains, sediment basins, sediment checks, artificial coverings, and berms.

Contamination: A Contamination Screening Evaluation Report (CSER) was prepared as part of the Beckett Bridge Pinellas County Study as required by FDOT's PD&E Manual, Part 2, Chapter 22 (revised January 17th, 2008) and in accordance with the Federal Highway Administration (FHWA) Technical Advisory T 6640.8a (dated October 30th, 1987). Consistent with this guidance and based on environmental records searches, land use surveys, field surveys and other screening methodologies cited within the PD&E manual, eight potential contamination sites were identified within the vicinity of the project corridor. Of the eight sites, six were identified as "No" contamination risk, one was identified as "Low" contamination risk, and one was

identified as “Medium” contamination risk.

The “Low” risk site corresponds to the wooden structures (i.e., piles) immediately adjacent to the Beckett Bridge which could contain creosote and/or arsenic as preservatives. Should some or all of these piles require removal or disturbance during the construction period, they should be evaluated beforehand to verify the presence or absence of these substances. If these substances are present, precautions should be taken by the contractor to help prevent the leaching of creosote into the waterway or the generation of arsenic-containing dust.

The “Medium” risk site, Stamas Yacht, Inc., presents a contamination potential based on current and historical environmental records, however, the site is located a substantial distance from the existing Riverside Drive right-of-way and will not be impacted as part of the current project design. Accordingly, no further evaluation of these sites is recommended during the Design phase of the project unless changes are made to the project design that could potentially change the location or alignment of the bridge.

An asbestos survey of the Beckett Bridge structure was conducted as part of the PD&E Study. The purpose of this survey was to identify and sample suspect asbestos-containing materials (ACM) and heavy metals based protective coatings to provide information regarding the identity, location, condition and approximate quantities of these materials so that proper remediation and disposal methods can be evaluated.

The survey was conducted on April 29, 2012 by an Asbestos Hazard Emergency Response Act (AHERA) accredited inspector in general accordance with the sampling protocols established in Environmental Protection Agency (EPA) 40 Code of Federal Regulations (CFR) 763. Thirteen bulk samples were collected from four homogeneous areas of suspect ACM. No Asbestos Containing Materials were identified as a result of the survey. Three painted surfaces, suspected of containing heavy metal based paints, were observed during the survey and sampled. None of the sample results indicated that the paints were Lead Based Paint (LBP).

7.13 AESTHETICS AND LANDSCAPING

A Section 106 Memorandum of Agreement (MOA) was signed by the County, FDOT, FHWA and SHPO, which outlines mitigation and conditions required to offset the impacts of removing the historic Beckett Bridge. SHPO has requested that the design of the replacement bridge, in

terms of engineering, be similar to the existing bridge. Accordingly, the MOA requires that the design consist of a single-leaf, rolling-lift bridge to preserve the character of the area. In addition, the MOA specifies that some elements of the existing bridge may be incorporated into the new bridge, or displayed in a location within the vicinity of the bridge. (The MOA is published separately for this project and is included in Appendix J.)

SHPO has agreed; however, that decisions regarding the specifics of the design, in terms of aesthetic elements, will be determined during the Design phase by an "Aesthetics Committee". The committee will include members of the community, Tarpon Springs Historical Society and local government. The County has proposed a budget of ten percent of the construction cost for aesthetics for the replacement bridge.

8.0 SUMMARY OF PERMITS AND NAVIGATION

8.1 PERMITS

The ETDM screening process, Advanced Notification process and subsequent agency coordination provided opportunities for preliminary coordination with regulatory and commenting agencies during the PD&E study. EPA, USFWS, FDEP and USACE provided comments concerning the proposed project during the PD&E study. A meeting with SWFWMD was held to discuss preliminary drainage plans and requirements.

The USACE and the SWFWMD regulate impacts to wetlands and surface waters within the project study area. Other agencies, including the USFWS, NMFS, EPA and FWC, review and comment on environmental permit applications. In addition, the FDEP manages the use of sovereign submerged, state-owned lands and regulating stormwater discharges from construction sites. The USCG will require a Bridge Permit for the replacement bridge.

The following permits are anticipated to be required for construction of the Recommended Alternative.

- **US Coast Guard** – A Bridge Permit will be required. The proposed replacement bascule bridge will provide approximately 7.8 feet of vertical clearance at the fenders and a minimum of 25 feet of horizontal clearance between the fenders. There are no USCG bridge clearance guidelines for this waterway. The proposed design and navigation clearances have been coordinated with the USCG throughout the study.

- **Southwest Florida Water Management District (SWFWMD)** – Based on a meeting with SWFWMD staff, on November 13, 2012, it is anticipated that the project will qualify for the 62.330-443 General Permit to the Florida Department of Transportation, Counties, and Municipalities for Minor Bridge Alteration, Placement, Replacement, Removal, Maintenance, and Operation (previously Noticed General Permit 40D-400.443). If the project qualifies for this general permit, water quality treatment of stormwater runoff is not anticipated to be required. The meeting notes are included at the end of this section.

- **US Army Corps of Engineers** – It is anticipated that the project will qualify for a Nationwide Permit, or a combination of Nationwide Permits (Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act).

Chapter 253 Florida Statute states that authorization is required from the Board of Trustees of the Internal Improvement Trust Fund (Board) for any activities in, on, or over state-owned, sovereign submerged lands (state lands). The public; to maintain traditional uses, such as navigation and fishing; to provide maximum protection of all state lands; and to ensure that all private uses of state lands will generate revenue as just compensation for that privilege. The existing bridge is located within a Sovereign Submerged Lands Easement granted by the Board to the Pinellas County Board of County Commissioners on February 1, 1996. This easement authorized repairs of the existing FDEP, Division of State Lands has been delegated by the Board to manage the use of State Lands for the good of the bridge. It is likely that construction of a new bridge will require modification of this easement. This authorization will be obtained during the ERP permitting process.

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the United States without an NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one acre of disturbance must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, FAC, or an individual permit issued pursuant to Chapter 62-620, FAC. A major component of the NPDES permit is the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site and discusses good engineering practices (i.e. best management practices) that will be used to reduce the potential for pollutant discharges during construction.

8.2 AVOIDANCE, MINIMIZATION AND MITIGATION

During the evaluation of the alternatives and selection of the Recommended Alternative, avoidance and minimization of environmental impacts was a major consideration. Issues of special concern include natural resources (mangroves and other wetlands, wildlife and habitat), socioeconomic impacts (right-of-way acquisition, noise and access to community resources, impacts to navigation and motorists), cultural resource impacts (NRHP eligible site and recreational lands), cost, and construction time frames.

Construction of a new bridge on an alignment north or south of the existing bridge would result in additional wetland impacts and additional right-of-way impacts. The Recommended Alternative consists of construction of a replacement bridge on approximately the same alignment as the existing bridge. Detouring traffic for the duration of construction is proposed. Accordingly, phased construction – which could result in additional impacts – will not be required. Reduction in the width of the typical section was also considered to minimize environmental impacts. Eleven-foot wide travel lanes are proposed, rather than 12-foot wide lanes.

Retaining walls are proposed at the bridge approaches to minimize and avoid right-of-way and wetland impacts. The proposed design will include piers spaced further apart than the existing pile bents. Accordingly, an overall reduction in the footprint of the structure on the bay bottom may result, depending on final design.

8.2.1 Best Management Practices

Construction related impacts to wetlands and water quality will be avoided and minimized to the maximum extent practical through the use of Best Management Practices and erosion control methods found in the latest edition of FDOT's *Standard Specifications for Road and Bridge Construction.* Wetland areas that are not permitted to be impacted will be delineated in the field and staked silt fence will be used to protect these areas. Delineation of wetland areas within the project corridor will be shown on final construction plans.

Construction areas will be contained in turbidity curtains and the project will follow all general and specific regulatory permit conditions regarding turbidity during construction. Final plans will also include a Stormwater Pollution Protection Plan that shows the locations of the turbidity curtains and silt fence.

8.2.2 Protected Species Minimization Measures

A Biological Assessment was prepared for the project and coordinated with the US Fish and Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FWC). Project biologists made a finding of "no effect" for the Southeastern American kestrel and Florida sandhill crane, and a finding of "not likely to adversely affect" for the wood stork and eastern indigo snake. For all the other evaluated species, a determination that the project "may

affect, but is not likely to adversely affect" these species was concluded in the report. The FWC, by letter dated April 22, 2013 concurred with these determinations and supported the protected species commitments identified in the report. The following commitments will minimize potential adverse impacts to protected wildlife species in the project area.

1. Compliance with the USFWS and FWC approved "Standard Manatee Construction Conditions" during all in-water construction phases of the project, and coordination with the USFWS and FWC during the design and permitting phases of the project for additional site-specific manatee protection measures to be implemented during construction.

2. Submission of a blasting plan (if blasting occurs), which includes the use of qualified observers and an aerial survey, to USFWS and FWC for review and approval prior to construction.

3. Coordination of wetland impacts with the appropriate resource agencies and propose mitigation to offset any adverse impacts to listed species habitat, if determined to be warranted.

4. If an active bald eagle nest is identified within the 660-foot buffer zone around the construction area, mitigation measures will be implemented to avoid disturbing the species, which may include control of the timing and location of construction activities and establishment of a buffer zone around active nesting sites.

5. Coordination with FWC for the removal of the osprey nests on a utility pole within the construction area during the design and permitting phase of the project.

By letter dated June 12, 2013, USFWS stated that they will not be able to make an impact determination for the Florida manatee, gulf sturgeon or sea turtles until more specific information is available concerning construction. The timing and duration of construction, as well as construction methods, will determine the appropriate conditions to safeguard manatees and other aquatic species. Accordingly, Pinellas County has committed to continued coordination with the USFWS during the design phase concerning potential impacts to these species.

8.2.3 Mitigation

Wetlands

Mitigation through Chapter 373.4137, F.S. (i.e., Senate Bill, 1986) is not available for this project because FDOT is not the applicant. A review of the available data from FDEP and the water management districts indicates that the proposed project currently is not located within the service area of any permitted mitigation banks. Accordingly, if mitigation is required, unavoidable wetland impacts will have to be mitigated by creating, restoring, enhancing, or preserving wetlands on-site or off-site within the same drainage basin if there are no mitigation opportunities at the project site.

Anticipated wetland impacts to mangroves and oyster beds are minimal. No seagrass beds will be impacted. Utilizing the calculated wetland impact acres and the existing condition UMAM scores, the proposed construction will result in 0.003 to 0.005 units of wetland functional loss. Mitigation is not anticipated to be required by the SWFWMD since the project should qualify for a general permit. It is also anticipated that the project will qualify for a nationwide permit from the USACOE. However, if regulatory policies or preliminary determinations change during the design phase and mitigation is required, "in-kind" mitigation at the project site may not be a feasible option due to the limited ROW and surrounding developments. Therefore, an "out-of-kind" mitigation option, such as water quality improvements, may be requested during the design and permitting phase of this project. Any proposed mitigation will be coordinated with the NMFS, FWS, and the SWFWMD during the design phase.

Historic Resources

Mitigation is required for demolition of the NRHP eligible Beckett Bridge. A Memorandum of Agreement (MOA) among SHPO, FHWA, FDOT and Pinellas County was prepared to address appropriate mitigation of the historic bridge. This MOA includes the Historic American Engineering Record (HAER) documentation of the bridge, which includes large-format photography, printing historic plans on archival paper, and preparing a written narrative. In addition, the following mitigation measures, recommended by the CRC are included:

- The replacement bridge will be a single-leaf, rolling-lift bridge of similar design. However, other aesthetic elements of the bridge will be determined by an aesthetics committee that will be assembled during the design phase. This

committee will include representatives of the community and local governments, including the Tarpon Springs Historical Society.

- Elements of the old bridge will be salvaged and incorporated into the design of the new bridge. The specifics of the design will be determined by the aesthetics committee and community during the design phase.

- There is an existing historic marker or plaque on the current bridge which includes the date the bridge was erected and names of Pinellas County Commissioners at that time. This historic plaque will be incorporated into a new plaque or monument which provides some "bullet history" of the bridge. In lieu of an actual 'monument", the new plaque or marker could be attached to the control house so that it could be seen by pedestrians crossing the bridge.

- Information will be prepared which is suitable for the existing "NextExitHistory" and "Whatwashere" Apps. These are free Apps that use gps technology to identify the location of the historic site relative to the App user's location.

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES

FILE NUMBER: PA 399655

Date:	11/13/2012		
Time:	10:00 AM		
Project Name:	Beckett Bridge		
Attendees:	Richard Alt, Joe Andress, Julie Brennan, Pinellas County, 727-464-3946, Ann Venables, Robert Johnson, Tony Horrnik jbrennan@co.pinellas.fl.us		
County:	Pinellas	**Sec/Twp/Rge:**	11, 12/27/15
Total Land Acreage:	3.5 acres	**Project Acreage:**	3.5 acres

Prior On-Site/Off-Site Permit Activity:

- Existing drawbridge

Project Overview:

- Upgrade bridge – three scenarios, final design based on public input
- Low level – could qualify for N.G. permit 40D-400.443 – no drainage issues
- Mid level – ERP General permit for new road area

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Provide the limits of jurisdictional wetlands.
- Surface water/wetlands limits at replacement of bridge will be the existing seawall.
- Provide appropriate mitigation using UMAM for impacts, if applicable.
- Demonstrate elimination and reduction of wetland impacts.
- Maintain minimum 15 foot, average 25 foot wetland conservation area setback or address secondary impacts.
- Add manatee exclusion devices where necessary.

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- Existing road.
- WBID 1440A – impaired for nutrients
- OFW
- No floodplain issues (hurricane surge only)

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Discharges to an infinite basin (Whitcomb Bayou); attenuation not necessary.

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- Provide water quality treatment for new road.
- In addition, must provide a net environmental improvement.
- Applicant must demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use.
- Will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated (Venetian Court).

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)
• May have to adjust existing easement due to lane widening. • Title determination for the project will be required.
Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)
• The permit must be issued to the county • Provide detailed construction surface water management plan.
Application Type and Fee Required:
• Notice General Construction ERP – Sections A and B of the ERP Application - $250 • General Construction ERP – Sections A, C and E of the ERP Application. • < 10 acres of project area and < 5000 sf of wetland or surface water impacts - $1456.00
Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)
•
Disclaimer: The District ERP pre-application meeting process is a service made available to the public to assist interested parties in preparing for submittal of a permit application. Information shared at pre-application meetings is superseded by the actual permit application submittal. District permit decisions are based upon information submitted during the application process and Rules in effect at the time the application is complete.

9.0 SUMMARY OF PUBLIC INVOLVEMENT

A project specific Public Involvement Program was implemented for this PD&E study. The program identified the key stakeholders and recommended activities to inform and solicit input from the community. Opportunities for community, stakeholder and agency input were provided throughout the duration of the study. A stakeholders' mailing list, which included property owners, local government staff and officials, agency representatives, special interest groups and other interested parties was maintained and updated throughout the study. More detailed information, including copies of all newsletters, handouts, meeting materials and comments received from the public are available in the *Comments and Coordination Report*, published separately.

This section documents public involvement efforts to date. It will be updated in the Final PER.

9.1 PROJECT WEBSITE

A project specific web page was established on the Pinellas County website (pinellascounty.org\beckettbridge.com) at the beginning of the study to provide updated information about the project and upcoming public meetings for the duration of the study. Comments and questions can be forwarded to the project team by email via the contact page on the website. Visitors to the website are also invited to email, write or call the County Project Manager with questions or concerns. The project schedule, newsletters, and meeting exhibits are posted on the website.

9.2 NEWSLETTERS

A newsletter was prepared and mailed with the invitation to the January 23, 2013 Alternatives Public Workshop.

9.3 AGENCY AND LOCAL GOVERNMENT COORDINATION

9.3.1 Efficient Transportation Decision Making (ETDM)/Advanced Notification (AN)

FDOT District Seven initiated the ETDM screening phase of the project. This process initiated early coordination with all Environmental Technical Advisory Team (ETAT) members. The process began with distribution of the Advanced Notification (AN) in October 2010. The *ETDM Programming Screen Summary Report* was published on June 30, 2011. A copy of the AN package and the summary report are included in Appendix A.

9.3.2 Kick-Off Presentation and other Presentations to the Pinellas County Board of County Commissioners (BCC)

A "Kick-Off Presentation" was made to the Pinellas County BCC to introduce the project on March 13, 2012 at a regularly scheduled BCC meeting. Invitations to the meeting were distributed to all federal, state and local government officials; Pinellas County and City of Tarpon Springs staff; and FDOT.

Alternatives proposed to be shown to the public at the January 2013 Alternatives Public Workshop were presented to the BCC on October 30, 2012.

The staff "Recommended Alternative", replacement of the existing movable bridge with a new two lane movable bridge on approximately the same alignment as the existing bridge, was presented to the BCC at their October 22, 2013 meeting. The BCC approved the staff's recommendation to move forward and present the Recommended Alternative to the public at a Public Hearing in February 2014. After consideration of all public input received at the Public Hearing, the BCC agreed to meet at a regularly scheduled BCC meeting on April 15, 2014 to decide whether to confirm their approval of the Recommended Alternative. The invitation to the public hearing included an invitation to the April 15, 2014 BCC meeting.

A presentation was made to the BCC on April 15, 2014 which summarized the results of the February 26, 2014 Public Hearing. The Commission confirmed and ratified their approval of the "Recommended Alternative" to move forward as the "Preferred Alternative", and to be submitted to the Federal Highway Administration for approval.

9.3.3 City of Tarpon Springs Staff Coordination Meeting

Pinellas County hosted a coordination meeting with the Tom Funcheon, City of Tarpon Springs Public Works Director, and Gary Schurman, Engineering Projects Supervisor, on September 13, 2012. Alternatives developed to date were presented and discussed. Strategies to involve the local communities and City officials and staff were also discussed.

9.3.4 Pinellas County Metropolitan Planning Organization (MPO) Meetings

Presentations were made at MPO Board and MPO Advisory Committee meetings between October 15, 2012 and November 14, 2012. This presentation included a discussion of the PD&E Process and the status of the ongoing study. In addition, conceptual designs and anticipated

environmental impacts of alternatives that were anticipated to be carried forward to the Alternatives Community Workshop were presented. The meetings were held on the following dates.

- MPO Pedestrian Transportation Advisory Committee Meeting - 10/15/12
- MPO Bicycle Advisory Committee Meeting - 10/22/12
- MPO Technical Coordinating Committee (TCC) - 10/24/12
- MPO Citizens Advisory Committee (CAC) - 10/25/12
- Pinellas County MPO Board - 11/14/12

After the BCC approved the "Recommended Alternative" at their October 22, 2013 meeting, presentations were made to the MPO CAC, TCC and MPO Board. This presentation included information about the "Recommended Alternative" proposed to be presented at the February 2014 public hearing. The meetings were held on the following dates.

- MPO Technical Coordinating Committee (TCC) - 10/23/13
- MPO Citizens Advisory Committee (CAC) - 10/25/13
- Pinellas County MPO Board - 11/13/13

9.3.5 City of Tarpon Springs Commission Presentations

A presentation was made to the City of Tarpon Springs Commission on November 20, 2012, prior to the January 2013 Alternative Workshop. A presentation was also made to the Tarpon Springs City Commission on October 1, 2013 to update them on the status of the project.

9.3.6 Other Stakeholder Groups

Presentations about the alternatives evaluated during the study were made to the following groups.

Tarpon Springs Yacht Club Board Meetings

- October 17, 2012
- December 18, 2013

Tarpon Springs Chamber of Commerce breakfast meeting - November 21, 2012.

Tarpon Springs Rotary Club - January 31, 2012

Tarpon Springs Historical Society – January 16, 2014

A PowerPoint presentation was made about the status of the project and evaluation of alternatives at all meetings. Members of the project team were available to address questions and concerns at all meetings.

9.3.7 Cultural Resource Committee Meetings (CRC)

A number of historic structures are located within the vicinity of the Beckett Bridge project corridor. In addition, the Beckett Bridge was determined to be eligible for listing in the National Register of Historic Places by FHWA and SHPO early in the project. Accordingly, a Cultural Resource Committee (CRC) was assembled to address historic resource issues during the study. Three meetings were held during the course of the study. The first CRC meeting was held on October 29, 2012 at the Tarpon Springs Heritage Museum. Representatives from SHPO, FHWA, FDOT, Tarpon Springs Historic Society, USCG, City of Tarpon Springs and Pinellas County were invited. The purpose of the meeting was to discuss alternatives currently under consideration, the historic significance of the bridge and to provide an opportunity for input into the Section 106 process.

A second CRC meeting was held on March 13, 2013. At this meeting, public comments received at the Alternatives Community Workshop were presented. Discussion also included a review of the rehabilitation and movable bridge alternatives, potential effects to the historic bridge and discussion of possible mitigation/minimization measures. As a result of this meeting, the project team investigated three additional rehabilitation concepts that would provide safer and wider sidewalks.

A third CRC meeting was held on April 24, 2014, after the Public Hearing and subsequent County Commission Meeting. The “Replacement of the Existing Bridge with a New Low-Level Movable Bridge Alternative” was presented as the Recommended Alternative at the February 26, 2014 Public Hearing. At the subsequent County Commission meeting on April 15, 2014, the Commission concurred that the Recommended Alternative could proceed to FHWA as the

Preferred Alternative. The April 24, 2014 CRC meeting included an update on the results of the Public Hearing and Commission meeting, a discussion of the Section 106 process completed to date, a discussion of effects, and a discussion of desired mitigation measures to be included in the Memorandum of Agreement.

9.4 PUBLIC MEETINGS

9.4.1 Alternatives Community Workshop

An Alternatives Community Workshop was held on January 23, 2013 at the Tarpon Springs Yacht Club in Tarpon Springs Florida, located adjacent to the Beckett Bridge. The meeting was well attended; 120 individuals signed in. The purpose of the meeting was to present the alternatives under evaluation, and provide an opportunity for community input. Graphics and informational boards about the alternatives considered were on display and a short video presentation was shown continuously throughout the evening. Project team members and County staff were available to address individual questions and accept comments. Comment forms and the Alternatives Evaluation Matrix were provided to attendees. A court reporter was also available to record public comments.

A total of 71 individuals submitted comments between December 28, 2012 (the date the workshop invitation letter was mailed) and February 28. These comments included those submitted on comment forms, in letters, via email or via the "contact us" page on the website, or verbally provided to the court reporter at the meeting. A summary of comments received, as well as a summary of responses, was provided to all those who submitted comments and posted on the project website. Summary of comments received is provided below.

Summary of Comments

Not all comments included a preference for a specific proposed alternative. Some comments requested alternatives other than those presented. The following summary accounts for comments that did state a preference for an alternative that was presented at the Workshop. Please note that a decision regarding the selection of a "Preferred Alternative" is based on many factors, one of which is community input. **These numbers are not considered "votes."**

No-Build	7
No-Build with Removal of Existing Bridge	2
Rehabilitation	11

Rehabilitation or Movable Bridge	12
New Movable Bridge	32
New Fixed Bridge (Vertical Clearance 28 feet)	4

Preference for Alternatives Other than those Presented

- Construction of a fixed bridge with only seven to eight feet of clearance
- Rehabilitation with widening to provide bicycle lanes and sidewalks
- Rehabilitation with an inoperable movable span
- Rehabilitation with improved sidewalks to accommodate disabled
- Rehabilitation with current weight restrictions enforced
- Consider a tunnel

Many individuals expressed strong opposition to removing the existing bridge permanently.

Many individuals commented on specific concerns. A summary of issues raised follows:

Pedestrian/Bicycle Facilities

- Bicycle lanes and sidewalks are needed on the new bridge.
- The existing sidewalk is not adequate, wider sidewalks are needed.
- Bicycle lanes and sidewalks should be constructed on Riverside Drive approaching the bridge.
- Bicycle lanes and sidewalks are important especially since there is a nationwide emphasis on health and exercise
- Money should not be spent for bicycle lanes or sidewalks on the bridge since there are currently no bicycle lanes and sidewalks on Riverside Drive approaching the bridge.
- Only one sidewalk is needed; there is no need to impact property owners with two sidewalks.
- Bicycle lanes and sidewalks should be added to the bridge if rehabilitated.
- Bicycle lanes are not needed and a sidewalk is needed only on one side
- Sidewalks should accommodate those with disabilities.

- The bridge should be closed to traffic and open only to pedestrians and bicycles.
- The bridge should have one walking lane and one lane for vehicles.

Vertical Clearance

- Limiting clearance will negatively affect waterfront property values by restricting access to deeper water for tall boats.
- Constructing a movable bridge to accommodate all boats is desirable.
- Tarpon Springs is a "water-based" community. There are too many "water – based" events to construct a fixed bridge.
- Whitcomb Bayou serves as a refuge for all boats during storm events. Clearance should not be limited.
- There are not enough boats requiring more than 28 feet of clearance to justify the cost of a new movable bridge or for a fixed bridge higher than 7 or 8 feet.
- Limiting clearance will not affect waterfront property values.
- Constructing a movable bridge to accommodate a few tall boats is not economical.
- The fixed bridge will provide enough vertical clearance since the water depth in the bayou and channel does not allow for large sail-boats.
- Opportunities to relocate existing boats that require the bridge to open at docking facilities on the other side of the bridge should be explored.

Historical Context and Significance

- A new bridge should be similar in design to the existing historic bridge.
- Tarpon Springs is and important heritage tourist attraction and the historic bridge is part of the attraction for tourists.
- The historical character of the bridge should be preserved.
- A fixed bridge will negatively affect the historic character, beauty and aesthetics of the area.
- Construction of a replacement bridge will negatively impact the historic character of the community.
- The Tarpon Springs Historical Society opposed replacement of the historic bridge and supports rehabilitation.

Costs

- Spending additional money to accommodate boats with high masts is not reasonable.
- Spending money on a new bridge is not acceptable.
- Rehabilitation is not a long-term solution.
- A new bridge should be constructed now since construction will cost more in the future.
- A mid-level fixed bridge will save bridge tender costs and allow most boats to pass under.
- Money should not be spent to continually repair the bridge, it should be replaced.
- Costs to buy right-of-way and possible legal challenges if eminent domain is necessary to acquire the right-of- way for the fixed bridge will likely exceed the cost of the movable bridge.
- The bridge will last more than ten years if No-Build is selected.

Flooding and Roadway Repairs

- Riverside Drive and the Bridge cannot function as an effective evacuation route because the bridge approaches flood in storm conditions.
- Potholes should be repaired and flooding issues on Riverside Drive should be addressed before money is spent replacing the bridge.
- Repair or replacement of Riverside Drive is needed between the bridge and Alternate US 19.
- Detour
  - Damage to local roads on the detour route should be repaired after construction is complete.
  - The Moorings Condominium entrance is located on a blind curve on Whitcomb Bayou. A detour will increase traffic to this area and possibly create a dangerous situation. The Moorings representative requested that traffic not be detoured to Whitcomb Boulevard, but should be directed from South Florida Avenue to Meres Boulevard.

Community/Property Impacts

- A new bridge will destroy the uniqueness of the community.
- The fixed bridge options will destroy the ambiance of the community.
- The fixed bridge will impact property and destroy waterfront views.
- The fixed bridge looks like a freeway and is not compatible with the community.
- A new bridge should minimally impact the current residents.
- Impacting property to construct the proposed fixed bridge is not acceptable.
- Retaining walls are intrusive on views of the mobile home park and others.
- The movable bridge is less intrusive on nearby properties.
- The movable bridge maintains the "community" feeling of the area.

Traffic and Evacuation

- The bridge should not be removed since it is important for emergency evacuation.
- The assisted living facilities on Chesapeake Drive rely on the bridge for immediate access for emergency response.
- The bridge is important for moving traffic from the Sunset Hills area into town.
- The fixed bridge will negatively impact traffic patterns for adjoining residents.
- The bridge is important for access to downtown Tarpon Springs.
- More speed bumps should be installed on Riverside Drive.

Other

- The trailer park should be purchased for a city park.

9.4.2 Public Hearing

A Public Hearing was held on February 26, 2014 at the Tarpon Springs Yacht Club. Information about the "Recommended Alternative" and all other alternatives evaluated during the PD&E study was presented. An invitation letter, project fact sheet, public notice and comment form were mailed to approximately 1,200 property owners and other stakeholders three weeks prior to the Public Hearing. One hundred persons signed in at the meeting.

Graphics and informational boards about the alternatives considered were on display prior to and after the formal portion of the Public Hearing. The formal portion of the hearing consisted of an introduction by County staff, a 30 minute video presentation and a formal public comment period. Project team members and County staff were available to address individual questions and accept comments. A Public Hearing Handout which included the Alternatives Evaluation Matrix was provided to attendees. Comment forms were available. A court reporter recorded the formal portion of the Public Hearing and was also available to record public comments on a one-to-one basis during the informal portion of the hearing.

Six individuals spoke at the public hearing. Twenty-two individuals submitted comments during the official Public Hearing comment period. These comments included those submitted on comment forms, in letters, via email or via the "contact us" page on the website, or verbally provided to the court reporter at the meeting. A summary of the comments is provided below.

- 19 – Supported Recommended Alternative
- 1 – Requested a new low-level fixed bridge
- 1 - Requested preservation of existing bridge
- 1 – Requested consideration of a fixed bridge or repair of existing bridge with the elimination of the "drawbridge functionality".

Speakers at Public Hearing:

Five of the six speakers specifically stated that they supported the Recommended Alternative.

One objected and expressed desire for a low-level fixed bridge.

Comment Forms, Letters and Emails Received

Fourteen individuals specifically supported Recommended Alternative.

One individual expanded on comments made at public hearing.

Two individuals (Ms. Cyndi Tarapani and Mr. Robert Faison) objected to the Recommended Alternative.

- Ms. Tarapani requested preservation of the existing bridge

- Mr. Faison requested consideration of a fixed bridge or repair of the existing bridge but eliminate the functionality of the drawbridge.

Four individuals did not specifically state support for the Recommended Alternatives, but stated concerns or raised questions associated with the proposed replacement of the existing bridge.

Summary of Comments and Concerns:

Comments related to the Proposed Detour

- Is it possible to construct a temporary pedestrian bridge or provide a "ferry" for pedestrians during construction?
- Requested a temporary bridge during construction for vehicles and for emergency evacuation
- Suggested that construction techniques exist that could reduce detour time in half
- Requested detour signage that was clear to travelers, provided a specific detour signage plan
- Requested that roadways on the detour routes be repaired prior to closing the bridge

Comments related to the design/looks of the Recommended Alternative

- Requested design similar to existing, but wider with sidewalks and bike lanes as proposed.
- Requested that the new bridge be designed similar to existing historic bridge

Comments Related to Roadway and Drainage

- Spring Boulevard needs to be elevated because it floods during high tides during storms, preventing access to the bridge for evacuation.
- Requested that drainage improvements be made to the approach roadways.

Funding and Cost

- How will the bridge be funded?
- Will my property taxes be raised to pay for the bridge?

Other Comments

- Can future Commissioners change the status of the project since it will take several years to design?
- Boat access to the Bayou is needed for sanctuary during hurricanes.
- The new bridge should be "boat friendly" with bumpers that don't obstruct the slips at the Tarpon Springs Yacht Club.
- A number of individuals expressed support for incorporating parts of the existing bridge into the new bridge.
- The existing speed bumps are not necessary. The speed bumps cause safety problems for two-wheel vehicles. Local police should enforce the speed limits.
- Are there plans to deepen or restore the channel?
- There is an active osprey nest near the site.
- Requested that boat owners be able to operate the movable span remotely to eliminate the need for County staff to open the bridge

Two individuals who own property immediately adjacent to the bridge expressed concerns about how the proposed project could affect their property.

Stephen Katsarelis, owner of the single family residence in the southeast corner of the bridge, across from the Yacht Club supported the recommended alternative but expressed the following concerns:

- Concerned about privacy of his pool and hot tub from the raised bridge
- Concerned about impacts to his privacy fence and hedge
- Concerned about safety – specifically speeding on wider bridge, stated that more effective speed bumps should be considered
- Requested additional information about contaminated sites mentioned in the public hearing presentation

Robert Faison, resident at 408 Riverside Drive, immediately adjacent to the bridge in the northwest quadrant, across from Bayshore Mobile Home Park, objected to the Recommended Alternative. Mr. Faison recommended that the County consider a fixed bridge or repair the existing bridge but eliminate "the draw bridge functionality". He also expressed the following

concerns about impacts from the Recommended Alternative:

- Impacts from traffic noise from additional traffic
- Impacts to view
- Safety exiting residential driveway
- Increase in traffic accidents
- Impacts of Construction noise
- Impacts to wood privacy fence
- Impacts to his current access to the sidewalk on Riverside Drive

Ms. Tarapani, president of the Tarpon Springs Preservation Society, requested that the existing bridge be restored.