



Dunedin Causeway Bridge Project Development

Dunedin, FL

Project Application

**Bridge Investment Program (BIP)
Grant Application**

SEPTEMBER 2022

Contact

Pinellas County Board of County Commissioners

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- A. Benefit-Cost Analysis Technical Memorandum
- B. Benefit-Cost Analysis Spreadsheets
- C. Schedule
- D. Letters of Support
 - Pinellas County Board of County Commissioners
 - Forward Pinellas
 - City of Dunedin
- E. Technical Documents

- Preliminary Engineering Report
- Type 2 Categorical Exclusion Signed
- Economic Impact Assessment – Florida State Park System
- F. Financial Documents
 - Pinellas County Operations Commitment Letter
 - Board of County Commissioners Approval of BIP Grant
 - Pinellas County Capital Improvement Program - Project Budget Report

For additional documentation supporting this grant application, please see the project website:
<http://www.pinellascounty.org/dunedincauseway/>.

Project Application

Basic Project Information

Project Name

Dunedin Causeway Bridge Project Development herein referred to as **the Causeway Bridges Project**.

Eligibility Criteria

Project Description

Description: Pinellas County is requesting \$6.1 million in FY2022 Bridge Investment Program (BIP) grant funds to design the reconstruction of the two existing bridges (National Bridge Inventory ID 150067 [West Tide Relief Bridge] and 150068 [Main Bridge]) of the Dunedin Causeway. An investment of BIP dollars would account for 73.8% of the total project costs for the design phase. The replacement bridges replace the functionally obsolete existing structures, improve intermodal access, and incorporate measures that mitigate the impacts of sea level rise, all while minimizing environmental impacts.

The Dunedin Causeway, a designated state and county evacuation route, provides the only connection between the two parts of the City of Dunedin and to one of the most economically significant state parks in Florida. They are structurally deficient, often malfunctioning, costly to maintain, and must be replaced.

The causeway enables the movement of an estimated 1.4 million visitors annually, which results in an economic impact of \$222 million to the local economy. The causeway is the sole roadway off this coastal island with more than 700 dwelling units.

Details of the improvements to be built under this project are highlighted in the scope section of this document.

The Causeway Bridges Project meets all BIP goals by:

- Improving the **safety**, efficiency, and **reliability** of the movement of **people** and freight over the bridges
- Improving the **condition** of a bridges in the United States
- Leveraging and encouraging non-federal contributions from sponsors and stakeholders involved in planning, design, and construction of the Causeway Bridges Project.

Location: Pinellas County owns, operates, and maintains the bridges and has broad support from County residents and agencies for this project.

Involved Parties: Involved parties include the City of Dunedin, the Tampa Bay Regional Planning Council, Royal Stewart Arms Condominiums, Florida State Parks, and Sail Honeymoon and Forward Pinellas that are partnering with Pinellas County as stakeholders.

History: The causeway is the only access point to the mainland for those on Honeymoon Island; therefore, when it is closed for repairs, which happens more frequently as the bridges age, people are stranded on both sides. Incidences of mechanical failure of the bascule bridge have simultaneously affected vehicular and boat traffic, and there has been some cases of vessel collisions with the bridge structure caused by such failures. Emergency services have reduced efficiency because of the limited right-of-way on the bridge. The substandard multiuse path was not able to accommodate the flow of pedestrians and cyclists adequately and safely. Accordingly, the County posted a sign prohibiting riding on the path due to many collisions over the years. Cyclists now have to either walk their bike on the narrow sidewalk and path, or ride with traffic because there are no shoulders.

The County previously applied for BUILD grants for this project in FY 2019 and FY 2020. It has also previously requested \$750,000 in a Florida Department of Environmental Protection (FDEP) FY 20-21 Resilience Planning Grant for the causeway. In May 2020, the applicant published the outcomes of the Project Development and Environment (PD&E) Study for Dunedin Causeway Bridges.

BIP Request Amount

Exact amount in year-of-expenditure dollars: \$6,100,000
Local match amount: \$610,000

Total Project Cost

Estimate in year-of-expenditure dollars: \$6,100,000

Applicant

The primary applicant is Pinellas County, the sixth largest county in the state of Florida, with a population of nearly 1 million residents.

Maintenance Commitment

Pinellas County is committed to maintaining the bridges throughout their lifetime. The County anticipates \$225,000 of operation and maintenance per year and has provided a commitment letter for this funding in Appendix F.

Bike and Pedestrian Accommodation required by 23 U.S.C. 217(e)	<p>The project will improve bicycle and pedestrian access. It will include a 5-foot-wide sidewalk on the north side and a 15-foot-wide multiuse path on the south side. Additionally, the existing 2-foot shoulders will be expanded to 8 feet, which can serve as an additional bicycle facility.</p> <p>The Causeway Bridges Project satisfies the Bike and Pedestrian Accommodation required by 23 U.S.C. 217(e).</p>
Additional Project Information	
State(s) in which project is located	The project is in the state of Florida.
Does the project serve an urban or rural community?	The Causeway Bridges Project will serve the urbanized area of Dunedin-Honeymoon Island, Florida, see Figure 1 .
List all Project Co-Applicants	Not applicable
Identify the Lead Applicant	Pinellas County
Was an application for USDOT discretionary grant funding for this project previously submitted?	<p>Pinellas County previously submitted two applications for USDOT discretionary grant funding for this project as follows:</p> <ul style="list-style-type: none"> - Dunedin Causeway Bridges Replacement, FY20 BUILD Grant, 2020 - Dunedin Causeway Bridges Project, FY19 BUILD Grant, 2019
Is the project located (entirely or partially) in Federal or USDOT designated areas?	The project is not located in a federal- or USDOT-designated area.

National Bridge Inventory Data

Identification	
Item 1 – State Code & Name	12 & Florida
Item 8 – Structure Number	15 0067 15 0068 West Tide Relief Bridge Main Bridge
Item 5A – Record Type	1 – Route carried “ON” the structure
Item 3 – County Code & Name	103 & Pinellas County
Item 6 – Feature Intersected	St. Joseph Sound
Item 7 – Facility Carried	CR-586 Causeway Blvd.

Item 16 – Latitude	28.033391	28.030393
Item 17 – Longitude	-82.484144	-82.474349
Classification		
Item 112 – NBIS Bridge Length <i>(NBIS: National Bridge Inspection Standard)</i>	These structures meet or exceed the minimum length specified to be designated as a bridge for the NBIS purposes.	
Item 104 – Highway System of Inventory	N.A. – Inventory Route is not on the NHS.	
Item 26 – Functional Classification	16 – Minor Arterial	
Item 110 – Designated National Network	N.A. – The inventory route is not part of the national network for trucks.	
Item 21 – Maintenance Responsibility	2 – Pinellas County Public Works Department	
Item 22 – Owner	2 – Pinellas County Public Works Department	
Age and Service		
Item 27 – Year Built	1963	
Item 106 – Year Reconstructed	There has been no reconstruction.	
Item 42 – Type of Service	5 – Service On Bridge: Highway-pedestrian 5 – Service Under Bridge: Waterway	
Item 28A – Lanes on the Structure	2	
Item 29 – Average Daily Traffic	9,300 vehicles	
Item 109 – Average Daily Truck Traffic	4%	3%
Item 19 – Bypass, Detour Length	199 kilometers – Total additional travel for a vehicle, which would result from closing the bridge.	
Structure Type and Material		
Item 43 – Structure Type, Main	Material	
	5 – Prestressed concrete	3 – Steel
	Design	
	2 – Stringer/Multi-beam or girder	16 – Movable - Bascule
Condition		
Item 58 – Deck Condition	6 - Satisfactory Condition 5 - Fair Condition	

Item 59 – Superstructure Condition	6 - Satisfactory Condition	
Item 60 – Substructure Condition	6 - Satisfactory Condition	
Item 61 – Channel and Channel Protection	7 - Bank protection need minor repairs.	
Item 62 – Culverts	N - Not applicable. Used if structure is not a culvert.	
Geometric Data		
Item 49 – Structure Length	117.7 meters	362.8 meters
Item 50 – Curd of Sidewalk Widths	Right: 1.1 meters, Left: 1.8 meters	
Item 51 – Bridge Roadway Width, curb-to-curb	7.9 meters	
Item 52 – Deck Width, out-to- out	12.1 meters	
Item 32 – Approach Roadway Width	7.9 meters	8 meters
Item 47 – Inventory Route, Total Horizontal Clearance	7.9 meters	
Item 53 – Minimum Vertical Clearance over Bridge Roadway		
<i>*When no superstructure restriction exists above the bridge roadway, or when a restriction is 30 meters or greater, indicated as 99.99.</i>	99.99 meters*	5.27 meters
Item 54 – Minimum Vertical Underclearance	N - Feature not a highway or railroad 0 - Waterways beneath structure	
Item 55 – Minimum Lateral Underclearance on Right	N - Feature not a highway or railroad 0 - Waterways beneath structure	
Item 56 – Minimum Lateral Underclearance on Left	N - Feature not a highway or railroad 0 - Waterways beneath structure	
Load Rating and Posting		
Item 70 – Bridge Posting	5 - Equal to or above legal loads	
Item 41 – Structure Open, Posted, or Closed to Traffic	A - Open, no restriction	
Appraisal		

Item 113 – Scour Critical Bridges

3 - **Bridges are scour critical**; bridge foundations determined to be unstable for assessed or calculated scour conditions.

Inspections

Item 90 – Inspection Date

09/2021

07/2021

Project Selection Criteria

Criteria #1: State of Good Repair



\$75,000 in Agency annual O&M savings

The Causeway Bridges Project contributes to the State of Good Repair criteria by replacing outdated structures. The structures are rated by the Florida Department of Transportation (FDOT) as **Functionally Obsolete**, with sufficiency ratings of **47.5** and **58.0**, respectively. The project will reduce the need for an extensive near-term bridge repairs and rehabilitation. The 2022 National Bridge Inventory (NBI) data identifies the superstructure and deck of the bridges to be in **Fair Condition**.

Both bridges were constructed in 1963 with a life expectancy of 50 years. Today, the structures **do not meet current engineering standards** for resisting damage from high waves during significant storms and vessel impact. The bridge structures exhibit **evidence of corrosion** and are at risk for further **damage from storm waves and vessel collisions**.

Currently, the annual operation and maintenance (O&M) cost for the bridges is \$300,000 (no-build scenario). The Causeway Bridges Project O&M cost will be \$225,000, resulting in a **\$75,000 annual savings**.

Refer to page B-6 in the Supplemental Narrative for additional information.

Are the bridge(s) on the project in Fair condition? **Yes**

Criteria #2: Safety



**\$32.3 M in
emergency
response
savings**

This project contributes to the **Safety** criteria as follows:

- (1) New bridges will mitigate a safety flaw in the current bridge design. The current bridges have a 2-foot shoulder, whereas the new design calls for 8 feet. This widening will help reduce the most common crash type—hitting a fixed object. The five-year crash analysis detailed in the Preliminary Engineering Report shows that more than 70 percent of crashes along the project corridor were crashes with property damage, and more than 22 percent of crashes incurred injuries including two fatality crashes. The new design will reduce the crash frequency and severity.
 - (2) The absence of adequate shoulders results in the inability of incapacitated vehicles to pull over and increases the vehicle occupants' vulnerability while waiting for help. The narrow shoulders also hinder the passage of emergency vehicles, especially when the causeway is congested. Cyclists are forced to dismount if they use the sidewalk or trail because it is too narrow and collisions (and injuries) with pedestrians often occur. As a result, many cyclists opt to ride with vehicular traffic since the shoulders are not wide enough for their use, consequently increasing their vulnerability.
 - (3) Motorist safety will improve because the expanded shoulders will improve ease of access for emergency vehicles while simultaneously providing space for incapacitated vehicles to move out of the traffic flow. Non-motorist safety will also benefit from the widening of the northside sidewalk, which will allow for greater foot traffic. The sidewalk will also comply with requirements of the Americans with Disabilities Act (ADA) and be accessible to disabled travelers. The widening of the southside multiuse path/trail will enable cyclists to continue to ride their bikes on this bridge in a protected facility without posing a threat to pedestrians. Those cyclists who continue to ride on the road will be able to use the wide shoulders instead of riding with vehicular traffic when the shoulders are unencumbered.
 - (4) The new bridges will preserve emergency vehicle access to Honeymoon Island, maintaining effective emergency response times and reducing approximately 0.84 cardiac arrest deaths per year, using a methodology from FEMA and data from the American Heart Association.
- Refer to page B-9 in the Supplemental Narrative for additional information and the BCA.

Criteria #3: Mobility and Economic Competitiveness



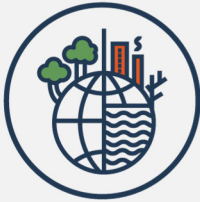
\$9.4 M
in travel time
savings

The proposed project contributes substantially to **Mobility and Economic Competitiveness** by providing a functioning transportation link to an economic engine of the local Pinellas County economy. Continued access for residents and millions of tourists is contingent upon the replacement of the two bridges, particularly in the event of evacuation because they provide the sole route to Honeymoon Island.

The multiuse path on the south side of the bridge is part of the Pinellas Trail spur. This trail connects Honeymoon Island to other bike and ped facilities, such as the Fred Marquis Pinellas Trail, and the statewide SUN Trail network. Overall, the project will improve mobility for non-motorized traffic along the bridges and facilitate access to the key networks.

Refer to page B-11 in the Supplemental Narrative for additional information.

Criteria #4: Climate Change, Resiliency, and the Environment



Increase
structural and
environmental
resiliency life by
75 years

This project contributes to the **Climate Change, Resilience, and the Environment** criteria by the following:

- (1) The bridge replacements will decrease vehicular congestion. Raising the bridges would reduce the number of times the bascule bridge needs to be opened for vessel traffic, thus decreasing congestion for vehicles and boats. Reductions in congestion reduce idling time, which also reduces carbon emissions.
- (2) The bridges are functionally obsolete and require significant maintenance efforts to maintain a good working condition status. At present, Pinellas County spends upward of \$300,000 annually on causeway bridge maintenance.
- (3) Mitigation and/or avoidance measures will be incorporated whenever possible during the design process.
- (4) There are no disproportionate negative environmental impacts on disadvantaged communities.
- (5) The existing bridges are presently susceptible to damage caused by storm surge from climate change and sea level rise impacts. The new structures are designed for a total life cycle of 75 years.

Refer to page B-12 in the Supplemental Narrative for additional information.

Criteria #5: Equity, Partnership, and Quality of Life



The bridges are the sole link to the mainland for approximately 1,500 Honeymoon Island resident.

The Project also has *strong regional support evidenced through the PD&E Process.*

This project contributes to the **Equity, Partnership, and Quality of Life** criteria the following:

- (1) Several Historically Disadvantaged Communities are within 8 miles from the causeway, and replacing the bridges ensures access to members of those communities to the nearest state park and free public beach access point.
- (2) Construction will occur on the existing county right-of-way, and temporary bridges will be put in place to minimize the impact of the construction on bridge users.
- (3) The project will improve multimodal access and provide safer crossing conditions for pedestrians and bicyclists.
- (4) Two transit routes connect transportation-dependent areas to Honeymoon Island via the causeway.
- (5) Widening the shoulders will allow bicyclists to ride on the multiuse path or on the shoulders and better accommodate emergency vehicles. The widened sidewalk will provide safer and more comfortable conditions for pedestrians on the bridges.

Refer to page B-13 in the Supplemental Narrative for additional information.

Criteria #6: Innovation



Innovative project delivery reduces risks and saves time.

This project contributes to the **Innovation** criteria by using innovative construction techniques and technologies. Composite reinforcing bars are anticipated to be used on susceptible concrete elements to extend the life of the structures. These reinforcing bars reduce the amount of steel needed in the structures, and they are rust resistant and non-corrosive, making them ideal for uses in marine environments. The use of composite bars will also have long-term benefits for the ongoing maintenance of the bridges, which will be subject to less rusting. Pinellas County will implement the Accelerated Bridge Construction (ABC) technique for this project to minimize construction-related impacts. ABC techniques include prefabrication and pre-staging, which are innovative strategies that minimize community and environmental impacts by expediting construction.

Refer to page B-17 in the Supplemental Narrative for additional information.

Project Costs

BIP Request Amount	Exact amount in year-of-expenditure dollars: \$6,100,000
Estimated Total of Other Federal funding	Estimate in year-of-expenditure dollars: \$0
Estimated Other Federal funding	Not applicable
Estimated non- Federal funding	Pinellas County Funding: \$610,000
Future Eligible Project Cost	Estimate in year-of-expenditure dollars: \$87,351,108
Previously incurred project costs	Estimate in year-of-expenditure dollars: \$4,643,000 (2021 STIP) Source: Florida State Transportation Improvement Program (STIP) Amount: \$10.213 million for PD&E (\$5,570,000 allocated in 2022)
Total Project Cost	Estimate in year-of-expenditure dollars: \$97,564,108 (PD&E + Construction)
If more than one bridge, will bridge bundling be used to deliver the Project?	Pinellas County intends to replace both bridges under the same project. The bridges were evaluated jointly in the PD&E phase and will be let together when the project is funded for construction. This will minimize the construction impacts on the communities and minimize construction costs because less time and effort will be needed for project staging.
If proposed project utilizes bundling, Cost of Unbundled Projects	Unknown
Amount of Future Eligible Costs by Project Type	Bridge Str. 150068 (Main Bridge): \$5.5 M Bridge Str. 150067 (West Tide Relief Bridge): \$0.61M

Benefit-Cost Analysis

The project is expected to generate \$115.3 million in discounted benefits. Given that the Dunedin Causeway is the only connection between Honeymoon Island State Park, one of the most-visited state parks in the state, the majority of these benefits stem from visitors' willingness to pay for ecosystem services and recreational value associated with user fees at the park, and the benefit of EMS access to provide medical support for outside hospital cardiac arrest events. Home to over 1,500 residents, the build scenario avoids costs associated with property buyouts for residential property owners on the island, who would have to relocate after

2036 in the no-build scenario due to bridge closure. Additional resilience benefits were calculated based on reduced displacement and damage costs between the build and no-build scenario due to anticipated storm surge impacts exacerbated by climate change. Improvements to cycling and pedestrian infrastructure, as well as time savings for the residential community on the island round out other major monetized benefits.

The benefit-cost analysis estimates a net present value of \$70.2 million and a benefit-cost ratio of 2.6.

Project Readiness and Environmental Risk

Project Readiness and Environmental Risk

Other Federal Funding and Non-Federal Funding Secured	TBD
NEPA Status – Indicate if the determination will likely be the result of a Categorical Exclusion (CE), Environmental Assessment (EA), or Environmental Impact Statement (EIS)	<p>Planned or Actual Start of NEPA Date: December 2014</p> <p>Planned or Actual Completion of NEPA Date: August 2020</p> <p>Final NEPA Determination or current status of NEPA process: Complete</p> <p>This project has received a Categorical Exclusion (CE) determination.</p>
Is the project currently programmed?	<p>Yes</p> <ul style="list-style-type: none"> - STIP # 437538 - 2045 Forward Pinellas Long Range Transportation Plan - Florida Transportation Plan
Is right-of-way acquisition necessary?	No
Right-of-way acquisition considerations	Not applicable, no right-of-way is needed for the project.
Design Status	This project is ready to proceed to the engineering and design stages. The planning and preliminary engineering feasibility efforts were completed during the PD&E study. Concept Plans and a Preliminary Engineering Report were prepared that explored replacement alternatives for both the Main Bridge and the West Tide Relief Bridge.
Project Readiness	The environmental risk of this project is low. Environmental concerns are not anticipated to impact the project schedule. A Type 2 CE was accepted by FDOT on August 24, 2020. A NEPA reevaluation will be prepared during the design phase of

the project to maintain eligibility for federal funding. Additionally, no right-of-way is required for this project. A reevaluation will be prepared during the design phase of the project to maintain eligibility for federal funding.

Project Priority Considerations

Project Priority Considerations:

This application supports the following priority considerations by ensuring the design is completed in time to begin construction prior to September 30, 2025. Without this funding, the project is unlikely to meet that deadline.



Dunedin Causeway Bridge Project Development

Dunedin, FL

Supplemental Narrative

Bridge Investment Program (BIP)
Grant Application

SEPTEMBER 2022

Contact

Pinellas County Board of County Commissioners

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Supplemental Narrative

Project Description, Location, and Parties

Project Description

Pinellas County is requesting \$6.1 million in FY2022 BIP grant funds to complete the design for the reconstruction of the two existing bridges of the Dunedin Causeway. This project is needed to address critical structural and functional deficiencies of the two existing Dunedin Causeway bridges along Causeway Boulevard from west of Royal Stewart Parkway to Gary Place/Gary Circle.

The Dunedin Causeway provides the sole, critical connection between the two parts of the City of Dunedin and one of the most economically significant state parks in the Florida Parks System. Causeway Boulevard, which includes both bridges, is a designated state and county evacuation route and provides the only access for the 1,500 residents of Honeymoon Island to the mainland, and for the million plus annual visitors capitalizing on a myriad of recreation and tourism facilities the island offers. The causeway itself is also significant regional destination, providing the public with free access to the causeway beaches. Tourism on Honeymoon Island State Park contributed \$222 million to the Florida economy in 2020–2021,¹ according to a 2021 report commissioned by the Florida Parks System. The report determined that Honeymoon Island State Park has one of the most significant economic impacts of all state parks in Florida.

The Main Bridge (Bridge Identification Number 150068) and the West Tide Relief Bridge (Bridge Identification Number 150067) were constructed in 1963. According to a 2015 FDOT Bridge Inspection Report, the main bascule bridge contains fractured critical components and is considered scour critical. Both bridges were found to be functionally obsolete and had sufficiency ratings of 47.5 and 58.0 (out of 100), respectively.

The Main Bridge is a two-lane, undivided low-level bascule bridge that spans the Gulf Intracoastal Waterway (ICWW), a designated Florida Strategic Intermodal System (SIS) facility and navigable waterway and connects Ward Island to the Dunedin Causeway. The West Tide Relief Bridge is a two-lane, undivided low-level fixed bridge that spans the relief channel. The total width of each bridge is 40 feet, 1 inch. For a depiction of the current typical section present on the Main and West Tide Relief Bridges, see **Figure 1**.

¹ Source:

<https://floridadep.gov/sites/default/files/2021%20Economic%20Impact%20Assessment%20Annual%20Report%200.19.2021%20FINAL.pdf>

Figure 1. Project Location Map



The current typical section for both bridges include one 11-foot-wide travel lane with a 2-foot-wide outside shoulder in each direction and sidewalks on the north side that are only 3.5 feet wide. There are no dedicated bicycle lanes; however, a 6-foot-wide multiuse path on the south side of the bridge is part of the Pinellas Trail spur. This trail connects Honeymoon Island to other bike and ped facilities, such as the Fred Marquis Pinellas Trail, and the statewide SUN Trail network. This path does not comply with Florida DOT’s current Design Manual width guideline of 10 feet for shared use path facilities which further warrants replacement of both bridges.

Transportation Challenges

Both the main and tide relief bridges do not meet current engineering standards for resisting damage from high waves during significant storms and vessel impact. Moreover, an assessment of the Dunedin Causeway bridges’ exposure to climate change found that the structures are already susceptible to storm surge, a fact that will make them increasingly vulnerable in the future.

Due to the naturally corrosive environment, the substructure of the bridges will also continue to degrade and need further repairs in the future. Both bridge structures exhibit evidence of corrosion and are at risk for scouring and further damage from storm waves and vessel collisions. The NBI finds that the Main Bridge is considered scour susceptible, and the West Tide Relief Bridge is considered scour critical with risk of foundation instability without scour countermeasures. Ongoing maintenance and repair of the main (bascule) bridge machinery also affects reliability and results in traffic delays. Major rehabilitation or replacement of both bridges is needed to keep the bridges open and the main (bascule) bridge operating efficiently. The County is considering all possible environmental data that may help in choosing a new bridge design, including 2018 projections prepared by the Tampa Bay Climate Science Advisory Council for rising sea levels.

Pinellas County and the project partners have extensive experience with the planning and implementation of significant bridge structures including the 57-year-old Belleair Causeway Bridge over the ICWW, which was replaced by Pinellas County in 2007.

Location

Project Coordinates: West Tide Relief Bridge 28.03,-82.48 & Main Bridge 28.03,-82,47

Located in central Florida along the Gulf of Mexico, Pinellas County is part of the Tampa–St. Petersburg–Clearwater, Florida Metropolitan Statistical Area. Pinellas County is 38 miles long, and 15 miles at its broadest point, for a total of 280 square miles, including 588 miles of coastline. The County comprises a series of barrier islands and a land peninsula that runs the length of Tampa Bay to the east and the Gulf of Mexico to the west. The intermingling of the County’s land area with multiple waterways creates a heavy reliance on the area’s many bridges for all modes of transportation. The Dunedin Causeway, the focus of this application, provides connection between mainland Pinellas County and Honeymoon Island, a barrier island containing a 385-acre state park with 4 miles of beach, as well as private residences. The Dunedin Causeway bridges are located near the entrance to Honeymoon State Park and provides access to a multiuse trail and many water sport activities. The facility provides access for an estimated 1.4 million visitors annually to the State Park and provides access to the heavily used public beaches along the causeway. This bridge is also the only way off this coastal island with 792 dwelling units.

Figure 2 Project Area Map



Project Parties

Pinellas County is fortunate to have the support of committed project partners, including private sector organizations; non-profit group; and federal, state, and local government agencies. A list of all project parties and details of the role pledged by public and private parties who are involved in delivering the project is provided in **Table 1**.

Pinellas County is the lead applicant for this project.

Table 1. Project Partners

Project Partner	Role in Project
Federal Partners	
FHWA	Approving Agency
USCG	Jurisdictional Agency
USACE	Jurisdictional Agency
State Partners	
FDEP	Jurisdictional Agency
SWFWMD	Jurisdictional Agency
FDOT	Project guidance through PD&E study phase
Local Partners	
City of Dunedin	Collaborative Stakeholder
Tampa Bay Regional Planning Council	ETDM Participant
Forward Pinellas	Advisory Stakeholder
Florida State Parks	Ad Hoc Committee Member-dependent stakeholder
Royal Stewart Arms Condominiums	Ad Hoc Committee Member-island residents
Sail Honeymoon	Ad Hoc Committee Member-causeway vendor

Significant public involvement has been undertaken on this project since 2014, including a kick-off meeting, alternatives workshop and public hearing, and other stakeholder outreach. Every effort has been made to involve, inform, and engage stakeholders in this process. Meetings and workshops have been well attended and productive. Community input pertaining to bridge aesthetics, recreational amenities, and noise concerns was carefully considered in development of alternatives and selection of the preferred alternative.

Pinellas County has extensive experience receiving and managing federal grants. Pinellas County was the recipient of several Highway Planning and Construction Funds in FY 2021 and 2022 as listed in Table 2 below. Pinellas County departments include functions ranging from airport to solid waste, animal services to emergency medical services, and parks to public works. With a 2022 budget of \$1.9B, transparent and accessible processes are the standard for implementation of a fiscally responsible budget that meets the approved annual budget and community programs and services.

Table 2. Other Highway Planning and Construction Project Funding for 2021 & 2022

Federal / State Agency, Pass-Through Entity/Program Title	Grant / Contract Number	Actual Expenditures 10/01/20-05/31/21	Estimated		
			Expenditures (Reimbursable Expenditures Only) 06/01/21-09/30/21	Expenditures as of 09/30/21	Amount Provided to Subrecipients as of 09/30/21
Passed through FDOT FY ending May 31, 2021					
Highway Planning and Construction	424564 4 68 01 G1494	137,477	-	137,477	
Highway Planning and Construction	424564 7 58 01	-	371,843	371,843	
Highway Planning and Construction	437736 2 38 01G1J83	160,368	150,000	310,368	
Highway Planning and Construction	438022 1 58 01/02 G1F28	469,099	469,099	938,198	
TOTAL		766,944	990,942	1,757,885	
Passed through FDOT FY ending June 30, 2022					
Highway Planning and Construction	437736 2 38 01G1J83		42,000	42,000	
TOTAL			42,000	42,000	

Detailed Project Budget

The planning and design of these bridges will cost \$16.31 million in 2020 dollars. The agency is requesting \$6.1 million for design. The construction will cost an additional \$81.25 million with a projected annual maintenance cost of \$225,000.

Table 3. Project Budget Summary by Source and Use

Project Phase	Federal Funds	Non-Federal Funds		Total	Status
	2022 BIP	State	Local		
PD & E		\$10,213,000		\$10,213,000	STIP
Main Bridge Design	\$4,941,000		\$549,000	\$5,490,000	Local fund; BIP grant
Main Bridge Construction			\$66,833,392	\$66,833,392	Local fund
Maine Bridge CEI			\$5,300,452	\$5,300,452	Local fund
West Tide Relief Bridge Design	\$549,000		\$61,000	\$610,000	Local fund; BIP grant
West Tide Relief Construction			\$8,545,649	\$8,545,649	Local fund
West Tide Relief CEI			\$571,615	\$571,615	Local fund
Total: Project Cost	\$4,500,000		\$82,851,108	\$97,564,108	

Project Outcome Criteria

Criteria #1: State of Good Repair

The proposed project will improve the condition and resiliency of critical transportation facilities.

Current Conditions

Both bridges were constructed in 1963 with a life expectancy of 50 years. Today, the structures do not meet current engineering standards for resisting damage from high waves during significant storms and vessel impact. Both bridge structures exhibit evidence of corrosion and are at risk of further damage from storm waves and vessel collisions. FDOT rates the structures as functionally obsolete, with sufficiency ratings of 47.5 and 58.0, respectively.

These low sufficiency ratings are derived in part by outdated design standards. For instance, the shoulders on the bridges are only 2 feet wide, and the sidewalks on the north side are only 3.5 feet wide. The multiuse path on the south side of the bridge is only 6 feet wide. The County has diligently maintained the structures, but the ongoing maintenance and repair of the Main (bascule) Bridge machinery affects the road’s reliability and results in traffic delays. **Replacement of both bridges is needed to keep the bridges open and the Main (bascule) Bridge operating efficiently.** Despite continued maintenance, bridge conditions are anticipated to further deteriorate, particularly due to the naturally corrosive environment that exacerbates wear on the substructure of the bridges, resulting in a need for further costly repairs.

Navigational Clearance

Current U.S. Coast Guard (USCG) navigational clearance guidelines for movable bridges at this location on the ICWW are 21 feet in the closed position and unlimited clearance in the open position. The existing bridge provides only 20 feet of vertical clearance at the fenders in the closed position. Unlimited navigational clearance is provided in the open position. Similarly, the existing horizontal clearance is 90 feet, while USCG guidelines require 100 feet. A major failure of the mechanical components of the existing movable bridge could cause the stranding of vehicular traffic or the suspension of pleasure boat and vital freight traffic on the ICWW. A replacement bridge will ensure the uninterrupted flow of vessels using this critical section of the ICWW.

Resilience

In tidal environments, bridge foundations are subjected to erosion. This process, also known as scour, is particularly exacerbated during major storm events. The two bridges in this grant application are especially vulnerable to scour. The Main Bridge is considered scour susceptible while the West Tide Relief Bridge is rated as being scour critical, which, without the implementation of scour countermeasures, carries the risk of foundation instability. The replacement bridges will be designed to withstand scour, wind, wave, and current forces of major storm events.

Scour Life-Cycle Cost Analysis

Table 4 demonstrates the long-term value of the proposed bridge replacements. The scour concerns of the existing bridges demand the immediate installation of scour countermeasures. Bridge rehabilitation does not correct the substandard design, is costly, and only extends the service life of the existing bridges a fraction of the design life of the proposed replacement structures. Both the no-build and rehabilitation alternatives include \$4 million in scour countermeasures, and the replacement alternatives include \$9.7 million for the West Tide Relief Bridge. **Figure 3** depicts the current FDOT bridge condition rating for the two bridges on the causeway.

Table 4. Long-Term Value of Proposed Bridge Replacements

Alternative	Cost	Annual O&M	Service Life
No-Build	\$4.0 million	\$300,000	15 years
Rehabilitation	\$37.3 million	\$263,000	25 to 30 years
Replacement	\$70.9 million	\$225,000	75 years

(low-level movable)			
Replacement (mid-level movable)	\$86.9 million	\$225,000	75 years
Replacement (fixed)	\$53.0 million	\$25,000	75 years

Figure 3 Dunedin Causeway Bridge Condition Rating

Element	Main (Bascule) Bridge No. 150068	Tide Relief Bridge No. 150067
Deck	Fair	Good
Superstructure	Satisfactory	Satisfactory
Substructure	Satisfactory	Satisfactory

"Fair" denotes that all primary structural elements are sound but may have minor section loss, cracking, spalling or scour.

"Satisfactory" denotes that structural elements show some minor deterioration.

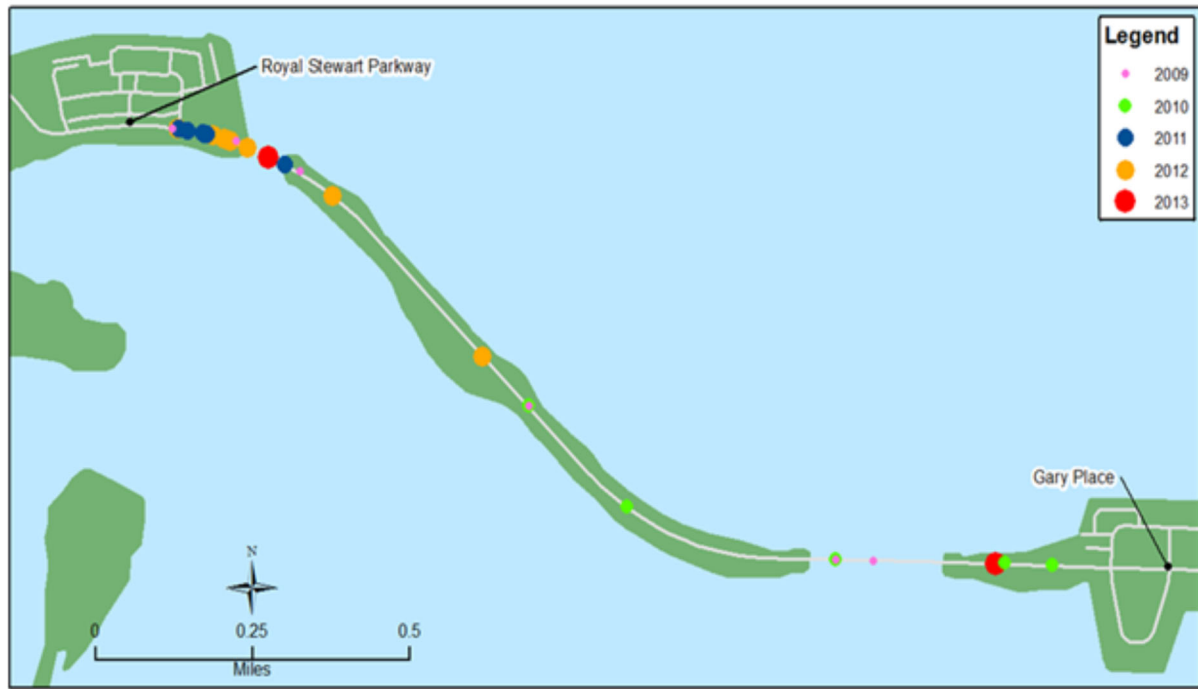
"Good" denotes that structural elements show some minor problems.

Criteria #2: Safety

The proposed project will ensure that a safe connection exists between Honeymoon Island and mainland Florida. In 2021, about 9,100 vehicles crossed these bridges each day.

For the five-year period (2009–2013), there were 27 crashes reported, for an average of 5.4 crashes per year. Of the 27 total crashes, 19 (or 70.4 percent) were crashes with property damage, and 6 (or 22.2 percent) were crashes with injuries. One crash reported in 2009 involved a pedestrian and resulted in an injury. There were 2 (or 7.4 percent) fatality crashes recorded along the corridor. One of the two fatalities was related to a crash occurring outside the public right-of-way (generally at parking or driveway areas). The average crash rate for the Causeway Boulevard corridor was 1.026 crashes per million vehicle miles traveled (MVMT). The FDOT statewide average crash rates for similar facilities is 2.503 crashes per MVMT. Within the corridor, Causeway Boulevard has a crash rate slightly lower than the FDOT average for similar facilities. As shown on **Figure 4**, most crashes occurred at the western limits of the project area, just southeast of Royal Stewart Arms Parkway.

Figure 4. Dunedin Causeway Crashes (2009–2013)



In addition to vehicular traffic, recreational vessels and freight move along the ICWW below the bridges. This project addresses gross deficiencies caused by a combination of age and substandard design. The proposed project will promote safety in three main categories: bridge width, navigation, and emergency evacuation.

Bridge Capacity and Accessibility

The existing bridge is narrow with limited shoulders. **There are no bike lanes, and a deficient sidewalk on the north side of the bridge.** The lack of sufficient shoulders means that an accident or disabled vehicle within the travel lanes can virtually shut down the bridge, preventing emergency service vehicles from reaching the causeway’s Honeymoon Island or recreational areas. **The lack of bicycle lanes means that bicyclists are forced to ride in the narrow travel lane or dismount and walk their bikes on the narrow and congested sidewalk/shared use path.**

The expanded sidewalk on the north side will safely accommodate the heavy pedestrian traffic that currently uses the bridges. On the south side, a widened multiuse path will comply with FDOT design standards and allow cyclists to ride along the entire path.

The new bridges will provide expanded shoulders that may be used as alternate on-road bicycle facilities. These shoulders will also serve as an emergency refuge for vehicles involved in crashes, and ensure emergency vehicle access for responding to any needs along the causeway or Honeymoon Island.

Navigation

The existing horizontal clearance for the Main Bridge over the ICWW is 90 feet; the existing vertical clearance is 20 feet above the mean high-water elevation at the face of the fenders. The Horizontal and vertical clearances of the Main Bridge do not meet current USCG guide clearances.

The substandard navigational clearances contribute to the deficiencies of the existing bridge structures.

Hurricane Evacuation

The Florida Division of Emergency Management and Pinellas County designated the Dunedin Causeway bridges as emergency evacuation routes. The bridges are critical in facilitating traffic flows during emergency evacuation periods because they provide the only link to the mainland for more than 500 residents located at the eastern end of Honeymoon Island. The closure of one or both bridges resulting from the ongoing superstructure deterioration or scour could strand residents and visitors on the island or between the island and mainland.

Criteria #3: Mobility and Economic Competitiveness

Mobility

Traffic will be maintained on both bridges during construction of replacement bridges. However, limited, short-term, temporary closures of each bridge will occasionally be necessary. Where possible, these closures will be limited to off-peak hours. Overall, the replacement bridges will maintain the single point of access to businesses and tourist attractions between the coastal communities of the City of Dunedin and the mainland of Pinellas County.

Construction of a new movable bridge with more vertical clearance than the existing bridge could reduce the number of required openings and result in less vehicular and fewer boat traffic delays. While the project will primarily use the right-of-way of the existing bridges, access to adjacent businesses, residences, and recreational areas could temporarily be affected and/or modified due to potential shifts in the bridge alignments. Consequently, project-caused negative economic effects are anticipated to be minimal.

The two bridges provide the only access from the mainland to the residential community on Honeymoon Island. In addition, the bridges connect residential communities on Honeymoon Island and Ward Island within the City of Dunedin to the causeway. The eastern approach of the Main Bridge is surrounded by medium-density residential uses with pockets of commercial/marine activities (including the Marker 1 Marina and boat ramps) and recreational features (including Rotary Park). Recreational uses (predominantly beaches, sailing, kayaking, and fishing) also border the western approach of the Main Bridge. While recreational features also exist at the eastern and western approaches of the West Tide Relief Bridge (including Honeymoon Island State Park), the north side of the western bridge approach includes high-density residential uses. Further, the Main Bridge crosses the ICWW (which is a navigable waterway that supports interstate commerce and is listed as part of Florida's SIS).

Economic Competitiveness

The proposed project provides critical support to the economic vitality of the local and regional economy. Honeymoon Island's sole mainland access is made across the project bridges. Moreover, the intercoastal waterways that flow beneath the structures are a significant ecological and economic resource for the region.

Honeymoon Island is one of the most visited and economically impactful parks in the Florida State Parks system. In 2019, a state economic impact assessment found it ranked second among all state parks for its contributions with a direct economic impact of over \$140 million. An update to that same study in 2021 estimated the park's iconic impact at \$222 million. In addition to revenues and

tax dollars, Honeymoon Island State Park supports more than 500 jobs.² Statewide, Florida State Parks contribute more than \$4.4 billion in direct economic impact to local communities annually, generating more than 62,000 jobs and welcoming more than 29 million visitors.

The proposed project contributes substantially to the continued functioning and growth of the local tourism-based Pinellas County economy. Continued access for residents and millions of tourists (both local and non-local) is contingent upon the replacement of the two causeway bridges. Both bridges service gaps in rural areas that are otherwise unfilled, particularly in the event of evacuation because the bridges serve as the sole route.

Criteria #4: Climate Change, Resiliency, and the Environment

The City of Dunedin and Pinellas County passed resolutions in 2008 that designate the entire Dunedin Causeway as a *Significant Pinellas County Greenway*. The proposed project has been designed to mitigate impacts to sensitive populations and environments, including estuarine wetlands. The barrier island park is a refuge for several species of plants and animals, including south Florida slash pines, mangroves, and several threatened and endangered species. The National Wetlands Inventory database identifies 42.0 acres of estuarine wetlands within the 200-foot project buffer. In addition, there is a concentration of black and white mangroves in protected areas leading up to both bridges.

All necessary measures will be taken to avoid and/or minimize impacts to wetlands to the greatest extent practicable during project design. Should avoidance and/or minimization not be practicable, a mitigation plan will be prepared.

No estuarine wetland mitigation bank service areas cover the proposed project area.

The proposed stormwater system will be developed to meet the design and performance criteria for the treatment and attenuation of discharges to impaired waters and outstanding Florida Waters. The project will be designed to meet state water quality and quantity standards, and best management practices will be used during construction. All necessary permits will be obtained in accordance with federal, state, and local laws and regulations during subsequent phases.

Potential pollutant sources to surface water quality from roadways and bridges include stormwater runoff into nearby surface waterbodies via drainage ditches or other conveyance systems. Stormwater runoff from urban sources, including roadways, carries pollutants such as volatile organic compounds, petroleum hydrocarbons, heavy metals, and pesticides/herbicides. Proper stormwater conveyance, containment, and treatment will be required in accordance with state and federal regulations and guidelines. Engineering features and hydrological drainage structures will be designed to meet or exceed requirements for stormwater transport, flow, and discharge.

The project area also contains environmentally sensitive shorelines, mangrove habitat, submerged subtidal seagrass beds/meadows, intertidal saltwater marshes, and intertidal flats (serving as essential fish habitat for several federally managed fish species and their prey), however, **the proposed project will have no significant short- term or long-term adverse impacts to wetlands or surface waters.**

² 2020-2021 Economic Impact Assessment Report Florida State Park System - <https://floridadep.gov/sites/default/files/2021%20Economic%20Impact%20Assessment%20Annual%20Report%200.19.2021%20FINAL.pdf>

Criteria #5: Equity, Partnership, and Quality of Life

Quality of Life

The two bridges in the project area connect communities on Honeymoon Island and Ward Island to the mainland. Condominiums (e.g., Royal Stewart Arms and Sunset Harbour) and commercial/marine facilities (including boat ramps) are located immediately adjacent to bridges.

The project will provide multiple improvements in the quality of life for area residents and tourists to the community. In addition to increasing multimodal transportation choices for individuals, it will also expand access and improve connectivity to essential services, jobs, and health care, and improve disaster preparedness by safeguarding the sole evacuation route for residents in the event of tropical weather common to the area.

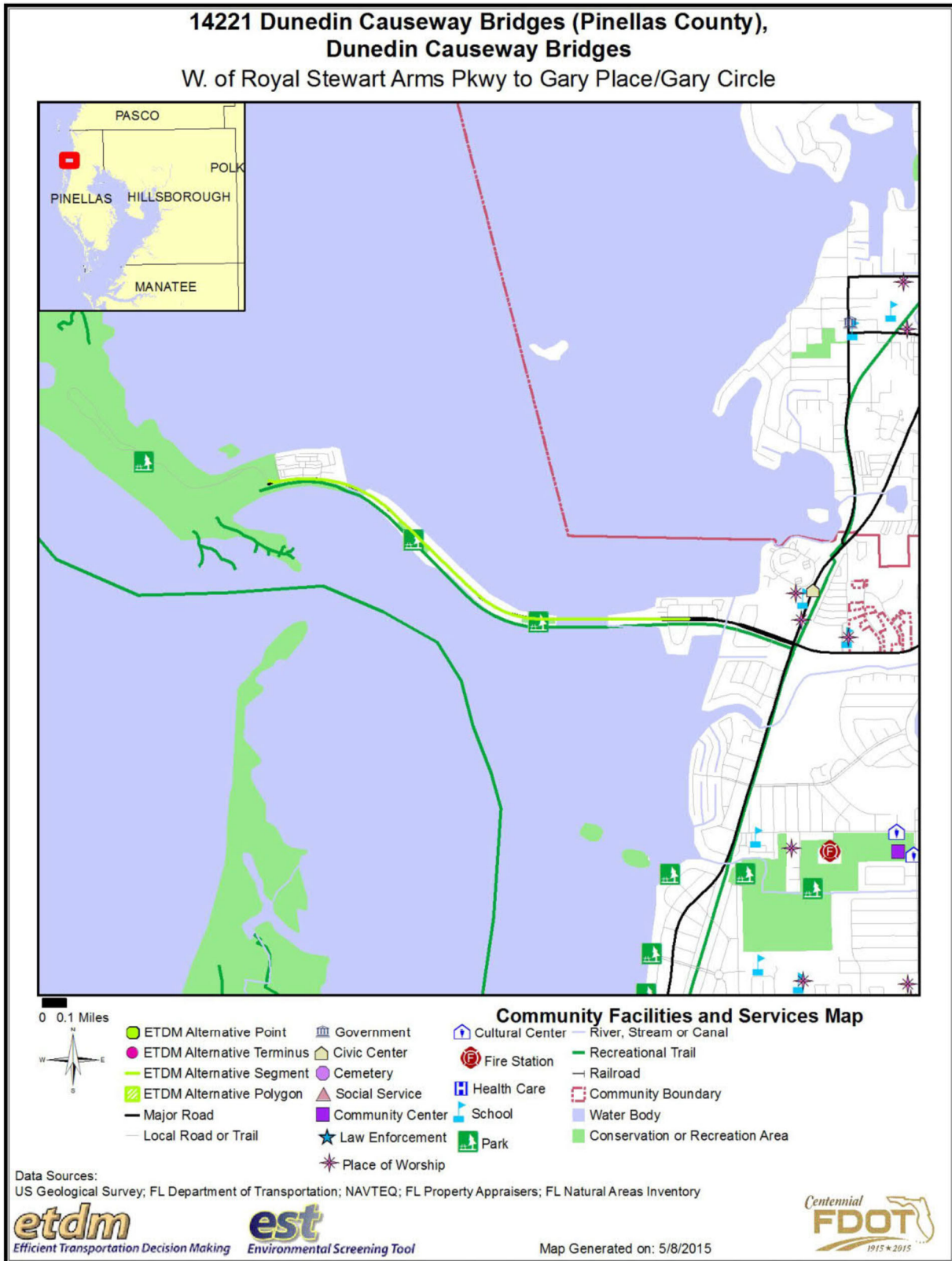
Traffic will be maintained on both bridges during construction of replacement bridges. However, limited, short-term, temporary closures of each bridge may be necessary. Construction of a new movable bridge with more vertical clearance than the existing bridge will reduce the number of required openings and result in less vehicular and fewer boat traffic delays. The proposed mid-level movable bridge reduces the number of openings by 50 percent, which would improve vehicle traffic flows and emergency evacuation/response times. The replacement bridge is also expected to enhance access/mobility (including the safety and comfort of pedestrians and bicyclists) because standard sidewalks, bicycle lanes, and a multiuse trail will be incorporated into the final design. For these reasons, mobility is anticipated to be greatly enhanced because of the project.

The project will not result in the isolation of neighborhood division or social/cultural areas. While access to proximate businesses, residences, and recreational assets could temporarily be affected and/or modified during the course of the bridge replacement, the proposed improvements will enhance access to tourist attractions between coastal communities and the mainland of Pinellas County and improve pedestrian/bicycle safety and mobility through the provision of sidewalks and bicycle lanes. **Figure 5** depicts a view of the current bridge conditions including the multiuse path, and **Figure 6** depicts existing trails and other recreational facilities near the bridges. Therefore, overall impacts on the social environment and community cohesion are anticipated to be minimal.

Figure 5. Bridge Street View



Figure 6. Trails and Community Facilities Map



Equity

This project will be developed in accordance with the Civil Rights Act of 1964, the Civil Rights Act of 1968, and Title VI of the Civil Rights Act, Executive Order 12898 (Environmental Justice), which ensures that minority and/or low-income households are neither disproportionately and adversely impacted by major transportation projects, nor denied reasonable access to them by excessive costs or physical barriers.

The bridge projects provide access to two transportation service providers that service disadvantaged areas (Pinellas Suncoast Transit Authority and TMS of Brevard, Inc.).

The Dunedin Causeway is not situated in a historically disadvantaged community (HDC) or an opportunity zone (OPZ); however, several HDCs and OPZs are within 8 miles of the causeway, and reconstruction of the bridges will benefit these communities (**Figure 7**) by preserving access to the public waterfront recreational areas served by the bridges.

Figure 7. Map of Historically Disadvantaged Communities and Opportunities Zones near the Project Area



Partnership

Pinellas County has the support of committed project partners, including private sector organizations; non-profit groups; and federal, state, and local government agencies. A list of all project parties and details of the role pledged by public and private parties involved in delivering the project is provided as follows.

Project Partner	Role in Project
Federal Partners	
FHWA	Approving Agency
USCG	Jurisdictional Agency
USACE	Jurisdictional Agency
State Partners	
FDEP	Jurisdictional Agency
SWFWMD	Jurisdictional Agency
FDOT	Project guidance through PD&E study phase
Local Partners	
City of Dunedin	Collaborative Stakeholder
Tampa Bay Regional Planning Council	ETDM Participant
Forward Pinellas	Advisory Stakeholder
Florida State Parks	Ad Hoc Committee Member-dependent stakeholder
Royal Stewart Arms Condominiums	Ad Hoc Committee Member-island residents
Sail Honeymoon	Ad Hoc Committee Member-causeway vendor

Significant public involvement has been undertaken for this project since 2014, including a kick-off meeting and an alternatives workshop. Every effort has been made to involve, inform, and engage stakeholders in this process. Meetings and workshops were well attended and productive. Community input pertaining to bridge aesthetics, recreational amenities, and noise concerns was carefully considered in selecting the preferred alternative. The City of Dunedin assembled an Ad Hoc Committee of residents, the Honeymoon Island State Park Director, Business Community representatives, and City Staff to review all documentation to ensure that the correct bridge alternative would be chosen. The public can remain apprised of the progress status by visiting the project website.

Criteria #6: Innovation

The proposed project incorporates innovative strategies in three main categories: (a) Innovative Technologies, (b) Innovative Project Delivery, and (c) Innovative Financing detailed below.

Innovative Technologies

The proposed project will use innovative materials and construction methods.

Materials

Composite reinforcing bars will be used on susceptible concrete elements to extend the life of the bridges. The initial cost of composite reinforcing bars is higher than mild steel; however, the reduced maintenance cost and extended life span justify the additional cost. In addition to the wind and wave forces that these bridges are subjected to during extreme weather events, the coastal location subjects the bridges to an aggressive saltwater environment. This environment is particularly corrosive for the reinforced concrete portions of the bridge because the embedded mild reinforcing steel corrodes and causes cracking in the concrete. The composite reinforcing bars reduce the amount of steel needed in the structure, and they are rust resistant and non-corrosive, making them ideal for uses in marine environments.

Method

Pinellas County will implement the innovative ABC technique on this project to minimize construction-related impacts. The ABC approach uses prefabricated elements and systems, innovative structural placement methods, and high-performance concrete for prefabricated elements techniques to minimize mobility impacts that occur because of on-site construction activities. This strategy also relies on aggressive construction staging, building around the existing bridge while maintaining traffic and bridge operations, and by using float in/out techniques for rapid span replacement. Bridge operating systems can be shop assembled, palletized, and adapted to ABC methods, which will reduce impacts to bridge users.

Innovative Project Delivery

To expedite the project delivery, Pinellas County will use the Adjusted Score Design-Build (ASDB) process, where the contract award is based on the lowest adjusted score, which is determined by dividing the price proposal by the sum of the technical score of the Letter of Interest and the technical proposal score. This method of alternative delivery ensures that a highly qualified design-build team is selected to design and construct a cost-effective project. Value added elements are considered during the proposal phase to ensure that the final product produces the best value for all stakeholders.

Innovative Financing



On November 7, 2017, voters renewed the one cent sales tax that funds long-term capital infrastructure projects that support the local community. Dubbed the “Penny for Pinellas,” this sales tax was first approved by voters in 1989 and remains so popular that nearly 83 percent of voters countywide voted for its renewal. This tax is collected by Pinellas County and is shared with the cities within the County. This innovative infrastructure funding source combines with sales tax revenue to fund much of the County’s Capital Improvement Program.

Benefit-Cost Analysis

Total calculated benefits of constructing new bridges are \$115.4 million in discounted 2020 dollars, while the costs are \$45.1 million. Ratio for cost benefit analysis is 2.6.

The Dunedin Causeway bridges are a choke point because they are the only way to get to Honeymoon Island State Park; these structures also serve as the sole connection for approximately 1,500 residents on the island to the mainland.

The Benefit-Cost Analysis made the following assumptions: The bridges will be past their useful life after 2035. Without a bridge, a loss of access to Honeymoon Island is assumed.

Costs

Capital costs for this project are expected to be \$68.7 million in undiscounted 2020 dollars through 2028. At a 7 percent real discount rate, these costs are \$45.1 million. **Table 5** shows how these costs are allocated across time and major expense category.

Table 5. Project Costs by Category and Year, in Undiscounted millions of 2020 Dollars

Cost Category	2023	2024	2025	2026	2027	2028	Total
Planning and Design	\$2.43	\$2.37					\$4.80
Construction			\$16.57	\$16.16	\$15.76	\$15.37	\$63.86
Total	\$2.43	\$2.37	\$16.57	\$16.16	\$15.76	\$15.37	\$68.66
Total, Discounted 7%	\$1.98	\$1.81	\$11.82	\$10.77	\$9.81	\$8.94	\$45.13

Source: 2020 PD&E

In addition to the upfront capital cost, operations and maintenance (O&M) costs are projected to average \$0.225 million per year in the long term. This is an annual reduction of \$75,000 compared to the expected \$0.3 million per year in annual maintenance for the no-build. However, because the no-build has an end-of life period of 15 remaining years starting in 2020, the build case assumes

negative benefits (a higher net difference in O&M between the no-build and build scenarios) for O&M from 2036 until the end of the analysis period in 2058. Over the entire 30-year analysis period these costs accumulate to -\$4.7 million in undiscounted 2020 dollars, or -\$0.7 million when discounted at seven percent. Assumptions for rehabilitation and replacement (R&R) costs were not specifically calculated, although benefits related to reduced displacement and damage costs associated with the build scenario’s climate resilient design were taken into consideration as a resilience benefit.

Benefits

In 2020 dollars, the Project is expected to generate \$115.3 million in discounted benefits using a seven percent discount rate. Given that the Dunedin Causeway is the only connection between Honeymoon Island State Park, one of the most-visited state parks in the state, the majority of these benefits stem from visitors’ willingness to pay for ecosystem services and recreational value associated with user fees at the park, and the benefit of EMS access to provide medical support for outside hospital cardiac arrest events. Home to over 1,500 residents, the build scenario avoids costs associated with property buyouts for residential property owners on the island, who would have to relocate after 2036 in the no-build scenario due to bridge closure. Additional resilience benefits were calculated based on reduced displacement and damage costs between the build and no-build scenario due to anticipated storm surge impacts exacerbated by climate change. Improvements to cycling and pedestrian infrastructure, as well as time savings for the residential community on the island round out other major monetized benefits. This leads to an overall project Net Present Value of \$70.2 million and a Benefit Cost Ratio (BCR) of 2.6. The overall project benefit matrix can be seen in **Table 6**.

Table 6. Project Impacts and Benefits Summary, Monetary Values in millions of 2020 Dollars

Current Status/Baseline & Problem to be Addressed	Change to Baseline/ Alternatives	Type of Impact	Population Affected by Impact	Economic Benefit	Summary of Results (at 7% discount rate)	Page Reference in BCA Appendix
Current Bridges will be no longer functional in a 15-year period (from 2020)	The replacement of two bridges along the Causeway maintains Honeymoon Island access	Willingness to Pay for Honeymoon Island State Park, which had over 1.6 million visitors in 2020	Recreational users of the park	Facility Amenities, as evaluated by park user fees that would not be collected in no-build	\$31.6	11
Current Bridges will be no longer functional in a 15-year period (from 2020)	The replacement of two bridges along the Causeway maintains Honeymoon Island access	Emergency Access is maintained for residents and visitors, avoiding deaths from prolonged emergency service response times	Approx. 1,500 residents on Honeymoon Island plus over 4,000 daily visitors to Honeymoon Island State Park	Avoided deaths from out-of-hospital cardiac arrest	\$40.0	10
Current bridges have substandard bike and pedestrian facilities, including a	New bridges will expand bike/ped facilities including a 15’ multi-use	Conditions will induce more cycling and biking trips, helping to	Number of annual cyclists/ pedestrians will expand from	Active Transportation and Health Benefits	\$3.7	10

Current Status/Baseline & Problem to be Addressed	Change to Baseline/ Alternatives	Type of Impact	Population Affected by Impact	Economic Benefit	Summary of Results (at 7% discount rate)	Page Reference in BCA Appendix
6' multi-use path and a 3 ½' sidewalk	path, 5' sidewalk, and two 8' shoulder/bike lanes	encourage active transportation and generate associated health benefits	34,000 and 12,000, respectively			
No-build scenario shows that current bridge will not have a useful life beyond the analysis period	New bridge will meet design standards that will allow it to serve the community up to 75 years post construction	Accrued benefits beyond the analysis period	Dunedin Causeway users	Residual Value of the new bridge beyond 2058	\$2.8	19
No-build scenario do not meet current engineering standards for resisting damage from high waves during significant storms (FDOT, 2020), which would generate economic losses to repair the bridge and limit the accessibility to the island by car.	The height of the new bridges will increase compared to the No-Build case, and the new infrastructure will meet the latest engineering designs to withstand high intensity storm events, reducing significantly the likelihood of infrastructure damage	High intensity storm surge events can generate damages to bridge infrastructure from of deck unseating, scour, debris impact and others.	Dunedin Causeway users	Reduced average annual economic losses from damage to infrastructure and displacement from extensive bridge damage as a result of storm surge events.	\$2.0	13
No-build scenario will eliminate accessibility to the island by car in 2035 from bridge closure, indefinitely affecting owners from an estimated 484 apartment units leading to a buyout program	New bridges will ensure continued access to the island through the analysis operation years.	Accessibility loss by car from bridge closures as there is an assumed 15-year remaining service life) until 2035	Owners and residents from apartment units in Honeymoon Island	Avoided costs from buyout program to property owners triggered from inaccessibility to Honeymoon Island	\$40.0	13
Current bridge is not expected to have a useful life past 2035, reducing its annual O&M costs of \$0.3 million to zero	The new bridges are expected to have O&M costs of approximately \$0.225 million	Benefits will accrue in the early years as the new bridges costs less to operate, but O&M costs past 2035 will turn to a negative benefit as the no-build has effectively no useful life	Pinellas County	Negative benefit of net O&M costs	(\$0.7)	19

Overall project impacts can be seen in **Table 7**, which shows the magnitude of change and direction of the various impact categories.

Table 7. Project Impacts and Benefits Summary, Monetary Values in millions of 2020 Dollars

Category	Unit	Quantity	Change
Market Value of residences on Honeymoon Island	2020\$	\$99,312,846	▲
Willingness to Pay for Honeymoon Island Park	Visitors	31,001,074	▲
Total Bicyclists – Build Case	#	1,894,221	▲
Total Pedestrians – Build Case	#	345,042	▲

In addition to the monetized benefits presented above, the project is expected to accumulate many benefits not quantified in this analysis

- Beach-goers who may have visited Honeymoon Island State Park may otherwise use beaches further away, increasing VMT and emissions rates.
- It is also expected that there will be other costs to residents of Honeymoon Island beyond a general increase in travel time and emergency response benefits, increasing the benefits of the Build Case.

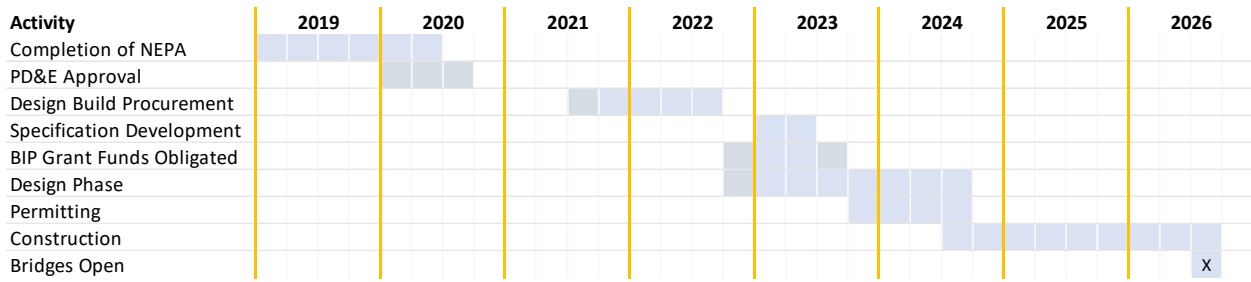
While these benefits are not easily quantifiable, they do provide real advantages and improvements that will be experienced by individuals and businesses in the region.

Project Readiness and Environmental Risk

The project has undergone the necessary environmental reviews. A Type 2 Categorical Exclusion was prepared and accepted by FDOT in August 2020 based on an extensive evaluation that determined the project poses a minimal environmental impact. Construction can begin when the design phase is completed. Pinellas County is confident it can tie the receipt of BIP funds to the design schedule because it has a good track record of project delivery.

Schedule

Should a BIP grant be awarded for this project, the Dunedin Causeway bridge replacements will follow a schedule comprised with construction beginning at the start of 2024 and 100 percent completion by Summer 2026. Following the award notification, the four major tasks include initiating the administration plan, dispersing the BIP grant funds, procurement of a design-build firm, and construction of the project.



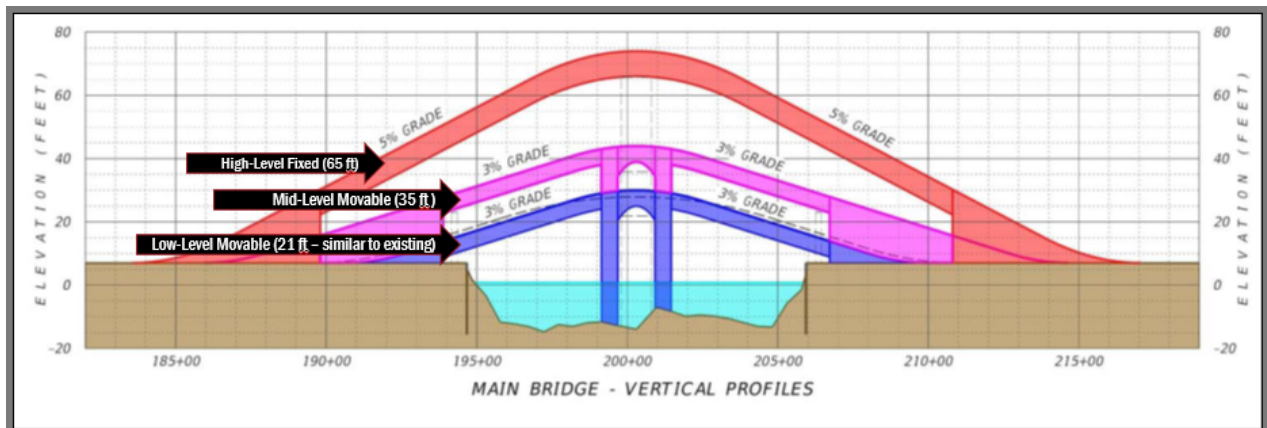
Engineering /Project Readiness

Given the urgency of replacing the structures, Pinellas County continues to advance the project, even as it seeks BIP grant funding. The County has programmed design funding for FY 2023. In anticipation of this start, the design consultant acquisition process is underway, with a firm expected to be selected by the end of October 2023. The design phase is expected to take approximately two years. The planning and engineering feasibility efforts were completed through the PD&E, Concept Plans, and the Preliminary Engineering Report that explored replacement alternatives for both the Main Bridge and the West Tide Relief Bridge. These documents were completed in 2020.

Three bridge types were considered for the Main Bridge replacement as depicted in **Figure 8**:

1. A new two-lane, movable span bridge (with 21 feet of vertical clearance)
2. A new two-lane movable span b ridge (with 35 feet of vertical clearance)
3. A new two-lane, high-level fixed span bridge (with 65 feet of vertical clearance)

Figure 8. PD&E Bridge Alternatives Considered



The mid-level, movable bridge (35 feet high) option was selected by the County as the preferred alternative as a result of the PD&E Study. The study determined that the preferred alternative will have minimal environmental impacts while also serving the community’s transportation needs. The proposed mid-level movable bridge and approaches can be constructed within the existing right-of-way; purchase of additional right-of-way is not required.

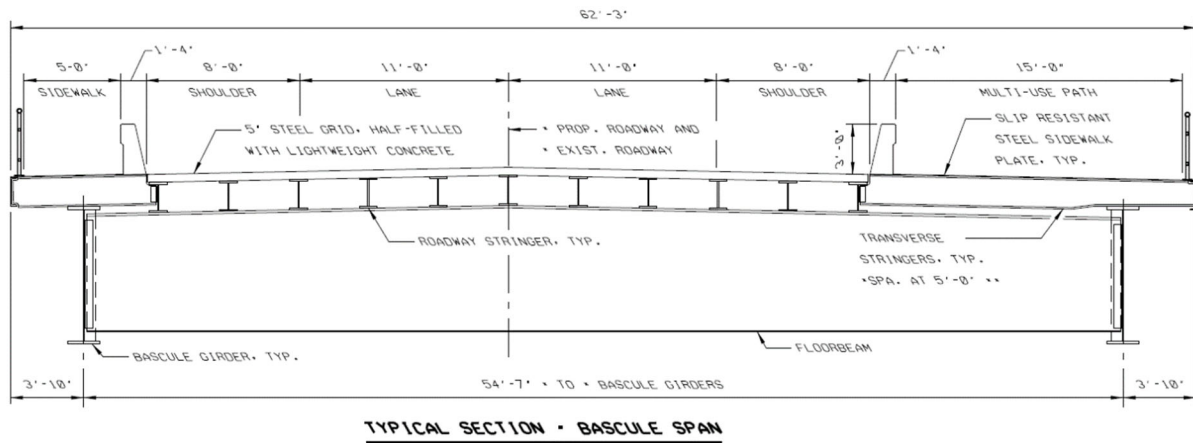
The total length of the proposed 35-foot-high movable span bridge is 1,741 feet, 2 inches. The bridge includes a 196-foot, 8-inch-long bascule span. Approach spans will make up the balance of

the bridge length. The substructure will consist of piers supported on prestressed concrete piles or drilled shafts.

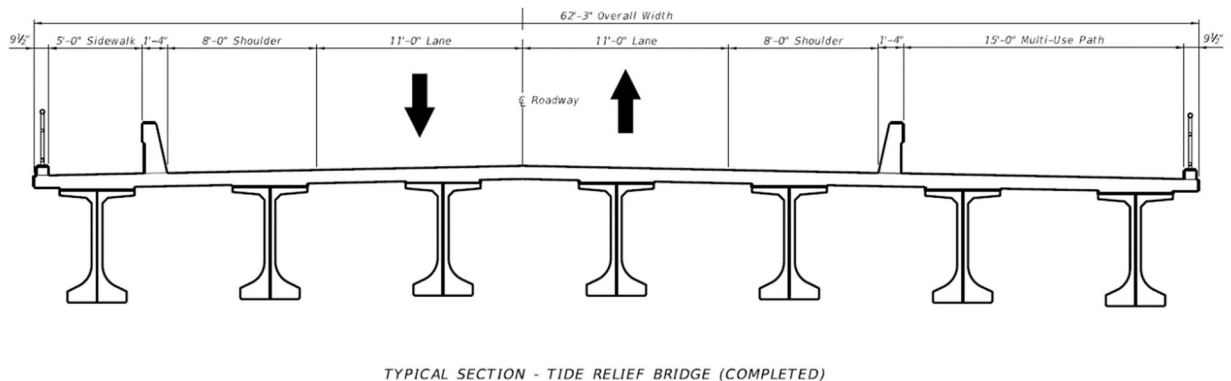
A double-leaf bascule span is proposed. The proposed configuration is similar to that of the existing bridge. The bascule leaves rotate around a horizontal axis located on each side of the channel to provide unlimited vertical clearance over the channel with the leaf in the fully open position. The bascule leaves will consist of steel main girders, floor beams, stringers, and a solid surface deck.

Roadway reconstruction is limited to the bridge approaches. Access to recreational areas along Causeway Boulevard will still be maintained.

Figure 9. Bascule Span Typical Section



The proposed tide relief bridge will provide 14.5 feet of minimum vertical navigation clearance and 18 feet at the center span. The horizontal clearance between the piers will be 115 feet. The proposed maximum grade is 4.75 percent which meets ADA requirements. Roadway reconstruction is limited to the bridge approaches. The approach roadway will return to the existing grade in advance of the intersections with Gateshead Drive on the west side of the bridge. Access to recreational areas along Causeway Boulevard will still be maintained. The proposed improvements can be constructed within the existing right-of-way. Purchase of additional right-of-way is not required.



Design Criteria

The project Design Criteria were set forth in the Preliminary Engineering Report and include:

- Channel clearance requirements
 - Design methodology
 - Design loads and load factors
 - Movable span operation requirements
 - Environmental classification
- Roadway minimum design controls and standards

Figure 10. Existing Functionally Obsolete Bridge Typical Section

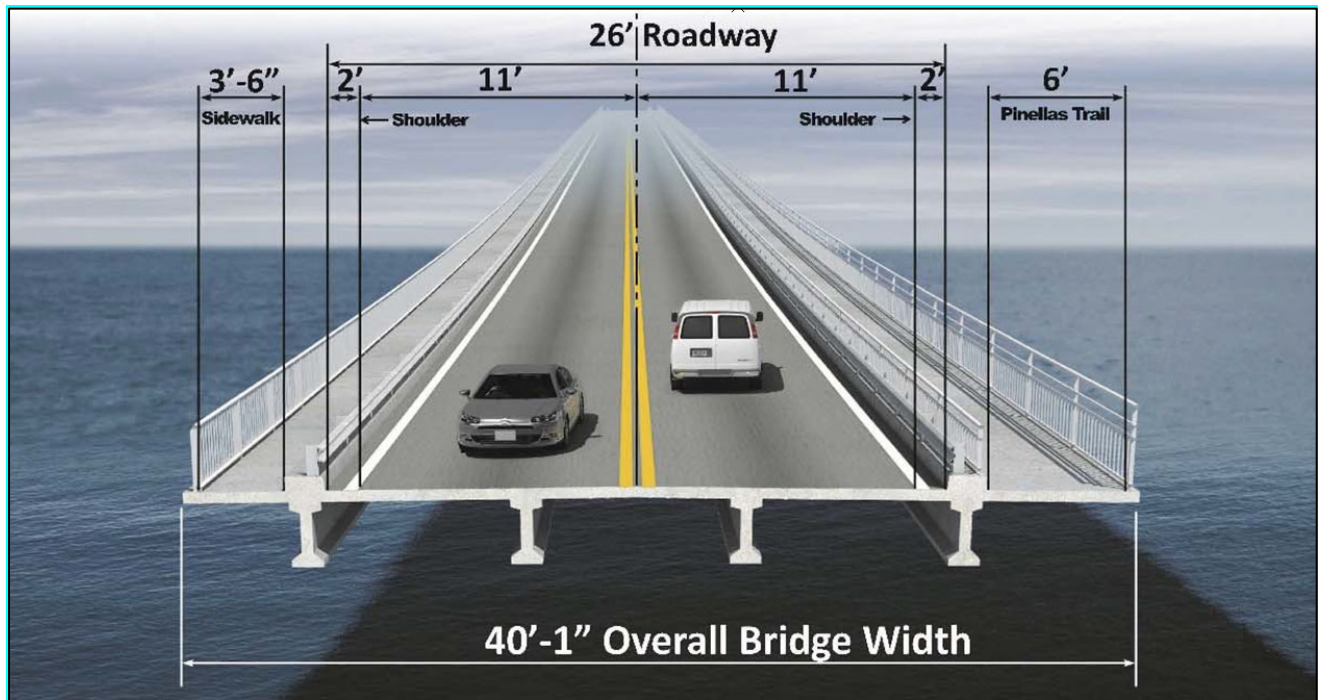
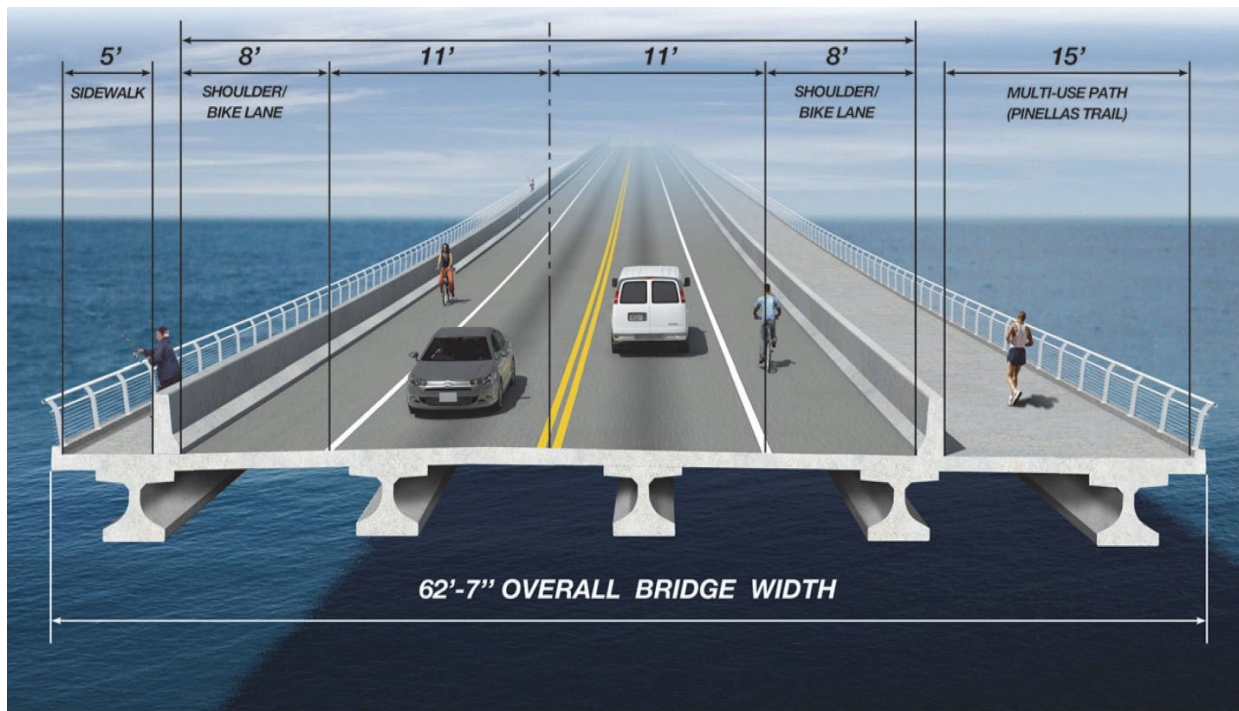


Figure 11. Proposed Bridge Typical Section



Environmental Risk

The environmental risk of this project is low. Additionally, no right-of-way is required for this project because the replacement structure will be built within the existing public right-of-way. The PD&E process, conducted in accordance with NEPA, was completed in May 2020. A Type 2 CE was prepared and accepted by FDOT in August 2020. A NEPA reevaluation will be prepared in the Design Phase of the project to maintain eligibility for federal funding.

Consultation with environmental regulatory and resource agencies was conducted during the PD&E Study. The preferred Alternative selected for construction results in minimal environmental impacts while meeting the identified transportation needs. Additional coordination with environmental regulatory and resource agencies will occur during the design phase of the project.

The following technical reports were also prepared to support this project:

- Cultural Resources Assessment Survey
- Section 4(f) Determination of Applicability
- Location Hydraulics Technical Memorandum
- Pond Siting Report
- Water Quality Impact Evaluation
- Noise Study Report
- Air Quality Technical Memorandum
- Contamination Screening Evaluation Report
- Other Supporting Documentation regarding Contamination
- Dunedin Causeway Final PER May 2020