



# VENETIAN CAUSEWAY (Venetian Way)

Project Development & Environment (PD&E) Study  
FROM NORTH BAYSHORE DRIVE TO PURDY AVENUE

FM No. 422713-2-22-01

Efficient Transportation Decision Making (ETDM): 12756



Cultural Resources Committee (CRC)

Meeting No. 3 • March 6, 2018

Florida Department of Transportation - District 6



## Cooperating Agencies



**US Army Corps  
of Engineers®**



**United States  
Coast Guard**



The purpose of the proposed project is to address identified structural and functional deficiencies of the twelve existing bridges (ten low-level fixed spans and two movable bascules), through potential alternatives such as no build, replacement or rehabilitation.

Bridge No.	DOT Bridge #	NBI Condition Rating								
		Sufficiency Rating								Deficiency FO/SD
		2011	2012	2013	2014	2015	2016	2017	2018*	2018
1	874459	32.6	32.6	32.6	19.0	-	-	64.0	64.0	-
2	874460	52.0	52.0	54.7	45.9	45.9	45.9	49.9	50	FO
3	874461	55.5	55.5	52.2	46.0	46.0	36.5	41.3	38.9	FO
4	874463	55.5	55.5	55.3	46.0	46.0	36.5	41.3	38.9	FO
5	874465	47.9	47.9	47.6	36.5	36.5	36.5	41.3	38.9	FO
6	874466	57.6	57.6	54.4	48.2	48.2	39.2	43.8	40.1	FO
7	874471	55.5	49.9	52.2	46.0	46.0	46.0	41.3	37.6	FO
8	874472	55.5	55.5	55.5	46.0	46.0	36.5	41.3	23.6	FO
9	874473	64.0	64.0	61.0	48.7	48.7	48.7	44.3	27.4	FO
10	874474	57.5	54.5	54.5	32.1	32.1	32.1	32.2	32.2	FO
11	874477	64.0	64.0	56.7	41.0	41.0	30.0	35.6	34.3	FO
12	874481	68.1	68.1	68.1	40.4	40.4	40.4	34.9	34.9	FO

FO= Functionally Obsolete  
SD= Structurally Deficient

Sufficiency Ratings increased after 2016 Bridge 1 Emergency Repair  
 Sufficiency Ratings that decreased from 2017 to 2018

\* Based on FDOT Bridge Information, January 2, 2018

A bridge is considered to be **functionally obsolete** if it has deck geometry, load carrying capacity, clearance or approach roadway alignment that no longer meets the criteria for the system of which the bridge is a part. Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths or vertical clearances to serve the traffic demand or those that may be occasionally flooded.

Bridges are considered to be **structurally deficient** where 1) significant load carrying elements are found to be in poor or worse condition due to deterioration and/or damage or, 2) the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to the point of causing intolerable traffic interruptions.

Any bridge classified as structurally deficient is excluded from the functionally obsolete category.

1. Project Status
2. Purpose of CRC
3. Alternatives Analysis
4. Viable Alternatives
5. Evaluation Matrix
6. Recommended Alternative
7. Historic Resources
8. Section 106 Process
9. Next Steps



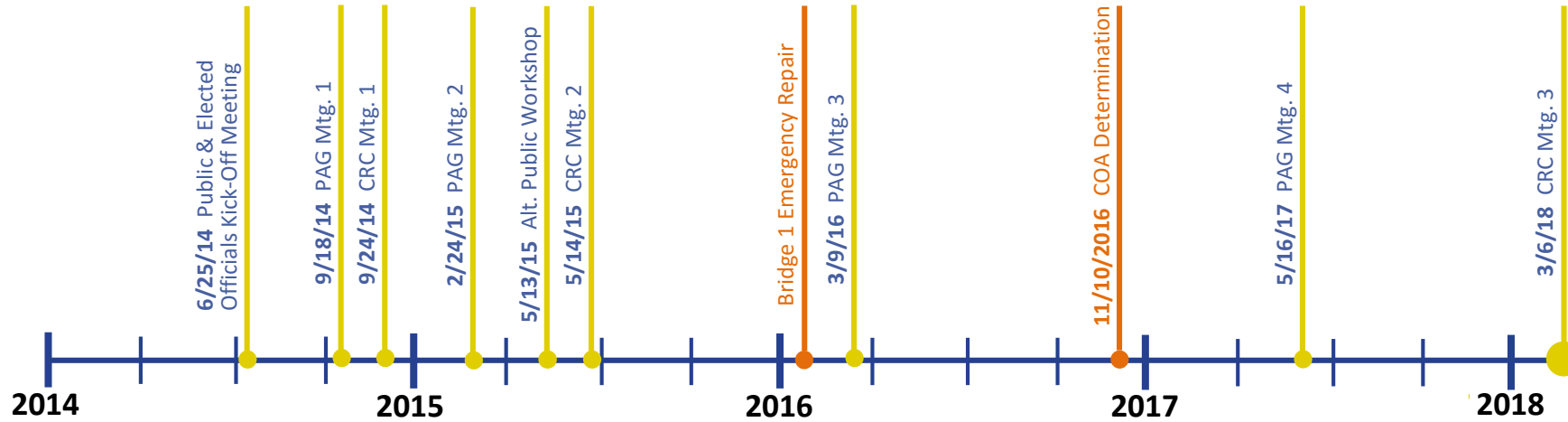
## Class of Action (COA) Determination

- In **October 2016**, the Federal Highway Administration (FHWA) agreed the Project Development & Environment (PD&E) Study would proceed under the National Environmental Policy Act (NEPA).
- Class of Action (COA) determination of **Environmental Assessment (EA)** was approved on **November 10, 2016**.

## National Environmental Policy Act (NEPA) Assignment – Effective 12/14/2016

Pursuant to 23 United States Code (U.S.C.) 327, the Florida Department of Transportation (FDOT) has assumed Federal Highway Administration's (FHWA's) responsibilities under the National Environmental Policy Act (NEPA) for highway projects on the State Highway System (SHS) and Local Agency Program (LAP) projects off the SHS. In general, FDOT's assumption includes all highway and roadway projects in Florida whose sources of federal funding comes from FHWA or which constitute a federal action through FHWA. This includes responsibilities for environmental review, interagency consultation and other regulatory compliance-related actions pertaining to the review or approval of NEPA projects. Therefore, whereas FHWA was previously identified as the Lead Federal Agency, this function is now served by FDOT with approval authority resting in the Office of Environmental Management (OEM).





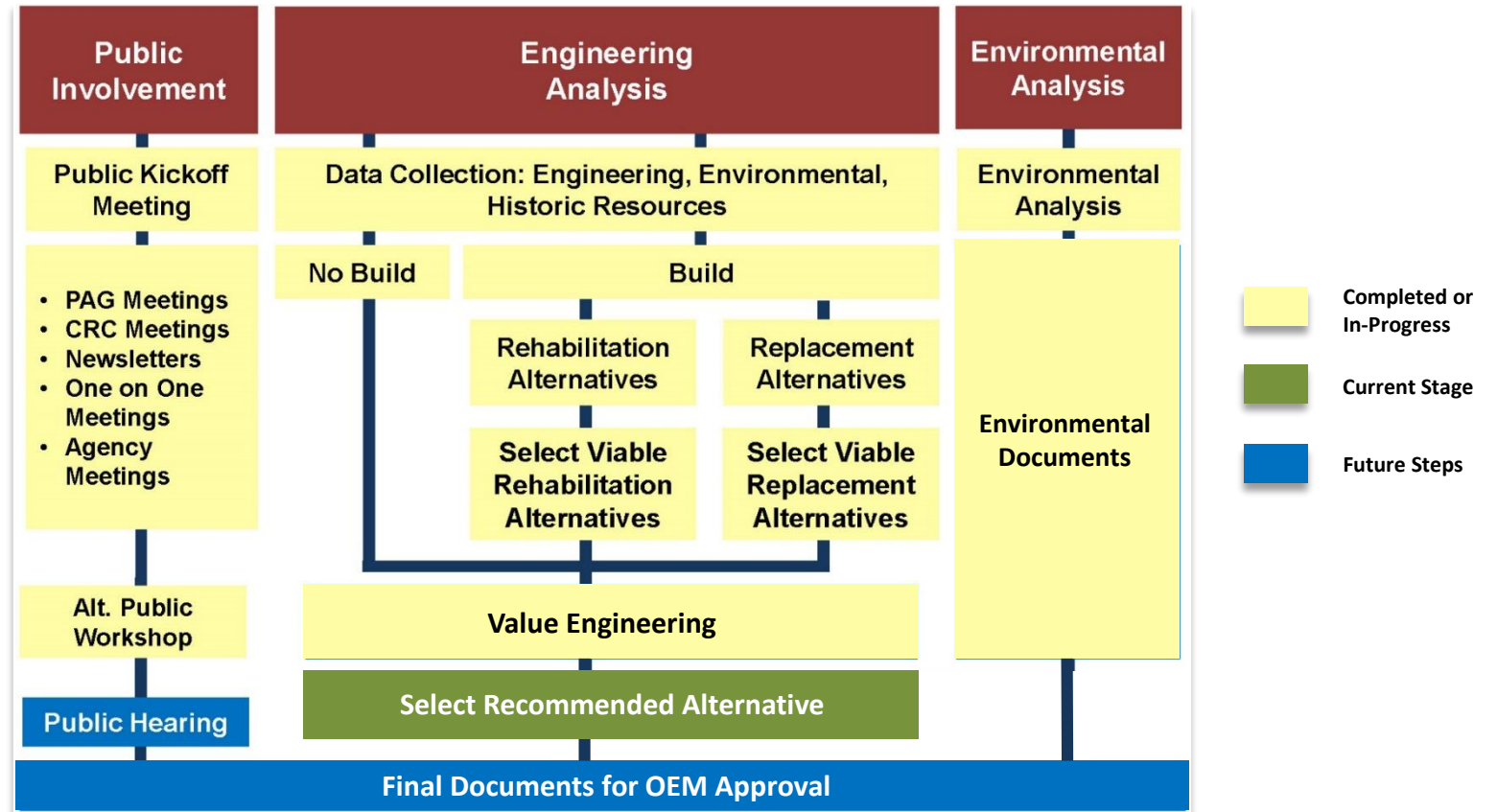
**LEGEND**

**CRC:** Cultural Resource Committee

**MTG:** Meeting

**PAG:** Project Advisory Group

To conduct and document good faith consultation with affected parties in compliance with Section 106 of the National Historic Preservation Act.



## Historic Resource – Venetian Causeway



- Constructed in 1926
- Oldest causeway in Florida
- Listed on the National Register of Historic Places (NRHP)
- Listed as Historic in the Cities of Miami and Miami Beach

## Screening Matrix – Reasonable Alternatives

Alternative	Description	Meets Purpose and Need	Sensitive to Historic Resource	Sensitive to Natural and Physical Environment	Meets Rehab or Replacement Parameters	Community Preference	Total
<b>NO-BUILD ALTERNATIVES</b>							
1	No-Action	0	3	3	0	0	6
2	Transportation Systems Management & Operations (TSM&O)	0	3	3	0	0	6
<b>BUILD ALTERNATIVES</b>							
<b>Build Alternatives - Rehabilitation</b>							
3	Fixed Bridge Rehab w/out Beam Strengthening	3	3	2	2	1	11
4	Fixed Bridge Rehab with Beam Strengthening	3	3	2	3	2	13
M1	Bascule Bridge Rehabilitation	3	3	2	3	2	13
<b>Build Alternatives - Replacement</b>							
<b>Bridge Typical Sections</b>							
T1	Venetian Railing	3	3	3	3	3	15
T2	Wyoming Railing TL-4 at coping	3	0	3	2	1	9
T3	Wyoming Railing TL-3 at curb and Original Venetian Railing at Coping	3	1	3	2	1	10
T4	Wyoming Railing TL-3 at curb and Custom Railing at Coping	3	0	3	2	0	8
<b>Fixed Bridge Alternatives</b>							
5	Tunnel	3	0	1	1	1	6
6	High Level Fixed Bridge	3	0	1	1	2	7
7	Arched Beams	3	3	2	3	3	14
8	FIB With Arched Fascia	3	1	2	2	1	9
9	FIB	3	0	2	2	0	7
10	Cast-in-Place Slab (Flat/Variable Depth)	3	0	2	2	1	8
11	Infill Spoil Islands	3	0	0	1	3	7
<b>Movable Bridge Alternatives</b>							
M2	Swing Bridge	3	0	2	2	0	7
M3	Vertical Lift Bridge	3	0	2	2	0	7
M4	Double Leaf Bascule Bridge	3	3	2	3	3	14
M5	Single Leaf Bascule Bridge	3	0	2	2	0	7

Screening Matrix - Scoring Methodology	Score
High	3
Medium	2
Low	1
Not Applicable	0

Alternatives considered for additional study shown in **Red**

ALTERNATIVE	DESCRIPTION
<b>NO-BUILD ALTERNATIVES</b>	
1	<b>No Action</b> – The bridges remain as is with routine maintenance only.
2	<b>Transportation Systems Management &amp; Operations (TSM&amp;O)</b> – The bridges remain as is with routine maintenance only. Transit and other operational improvements would be made to facilitate transportation along the corridor.
<b>BUILD ALTERNATIVES - REHABILITATION</b>	
4	<b>Fixed Bridge Rehabilitation with Beam Strengthening</b> - Rehabilitation of the fixed bridges to improve safety and load carrying capacity. Includes beam strengthening to achieve a higher load carrying capacity.
M1	<b>Bascule Bridge Rehabilitation</b> – Rehabilitation of the eastern movable bridge to improve safety and achieve a higher load carrying capacity.
<b>BUILD ALTERNATIVES - REPLACEMENT</b>	
<b>Typical Sections</b> – The replacement of the bridges would require that a new typical section be selected along with the railing type.	
T1	<b>Venetian Railing</b> – This railing replicates the existing railing on the bridges, but may not satisfy the current standards for railings.
<b>FIXED ALTERNATIVES</b>	
The replacement of the bridges would require that the structural system for the fixed bridges be selected.	
7	<b>Arched Beams</b> – This alternative provides low-level bridges, replicates the arched beams and maintains the look of the existing bridges.
<b>Movable Bridge Alternatives</b> – The replacement of the eastern movable bridge would require that the movable bridge type be selected.	
M4	<b>Double Leaf Bascule Bridge</b> – The existing bridge would be replaced in kind.

The alternatives that were developed for the project have been evaluated based on the ability of each to meet the project needs.

## Alt. 1 – No-Action

- Existing Deficiencies will Remain
- Continued Deterioration
- Extensive Periodic Repairs and Maintenance



**Does not meet purpose  
and need for project**

## Alt. 2 – Transportation System Management and Operations (TSM&O)

- Enhanced Bus service
- Facilitate Pedestrians and Bicyclists
- Existing Deficiencies will remain, but safe bridges required for effective TSM&O



**Does not meet purpose and need for project**

## Rehabilitation Alternative

### Alt. 4 - Fixed Bridge Rehab with Beam Strengthening

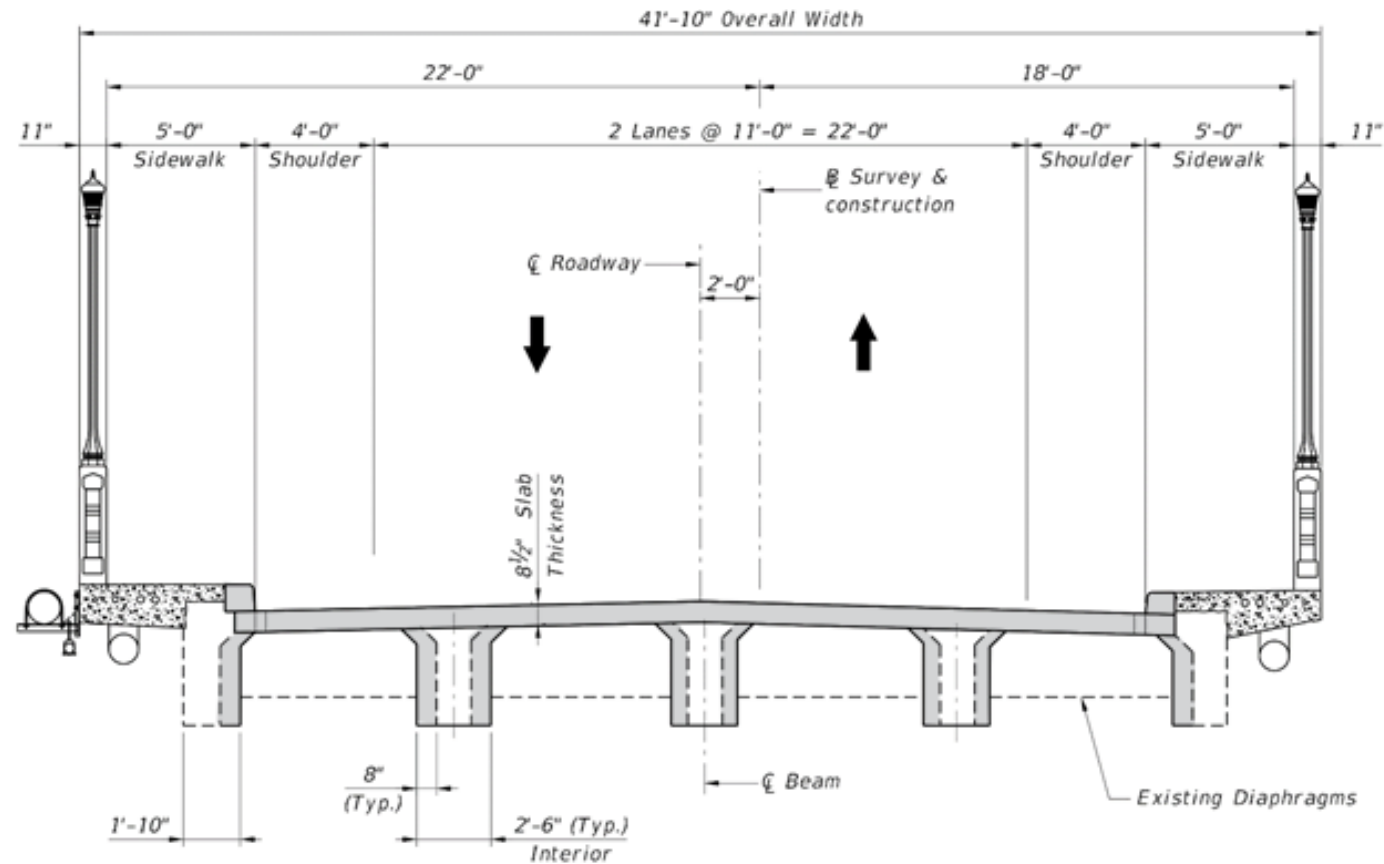
Estimated Cost Range: \$42 - \$44 Million

#### Typical Section

- Expand Sidewalk to 5 feet to meet minimum requirement for ADA
- 4 foot Shoulder does not meet 5.5 foot shoulder requirement for bike lane

#### Rehabilitation includes:

- Deck Replacement Beam and Foundation Strengthening
- 41'-10" Overall width to remain, Venetian Railing to remain

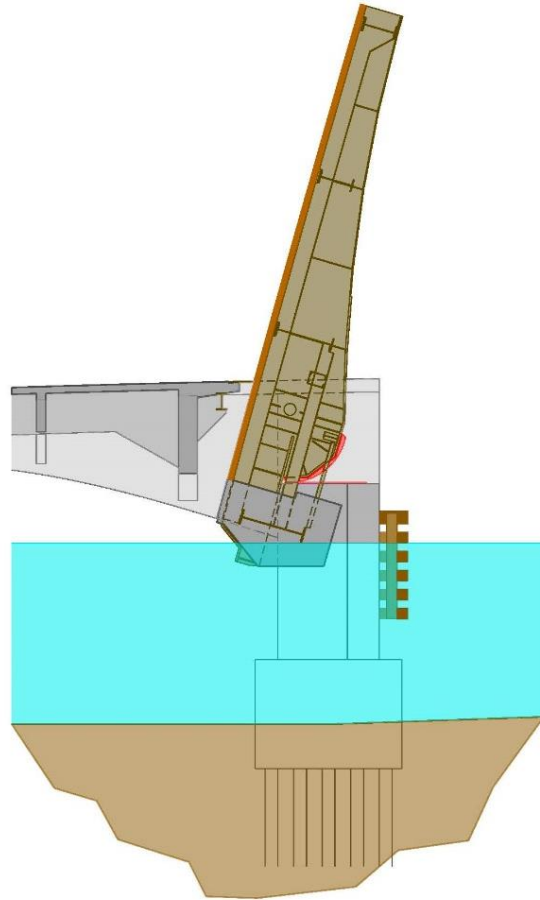




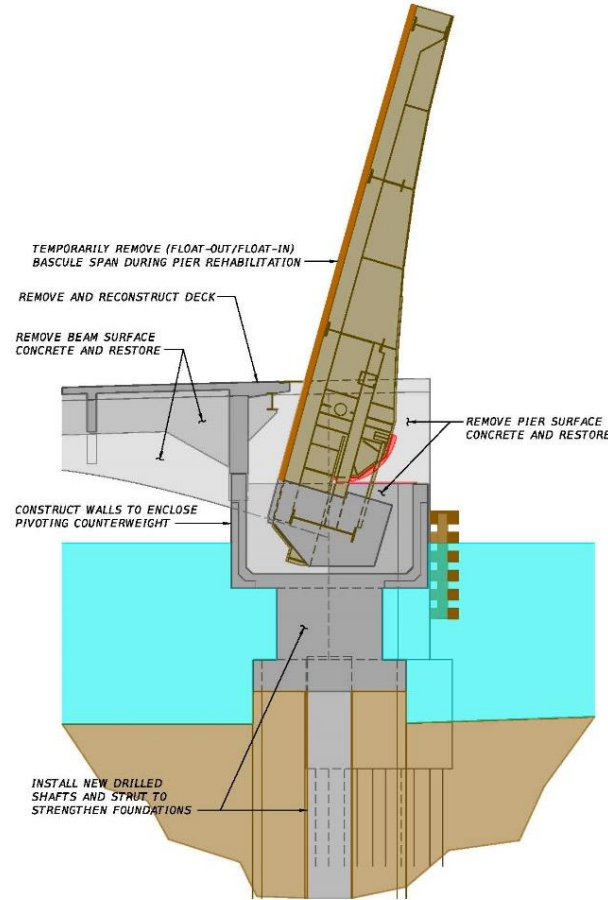
## Rehabilitation Alternative

Alt. M1 - Bascule Bridge Rehabilitation

Estimated Cost Range : \$8- \$9 Million



SECTION THRU EXISTING BASCULE SPAN



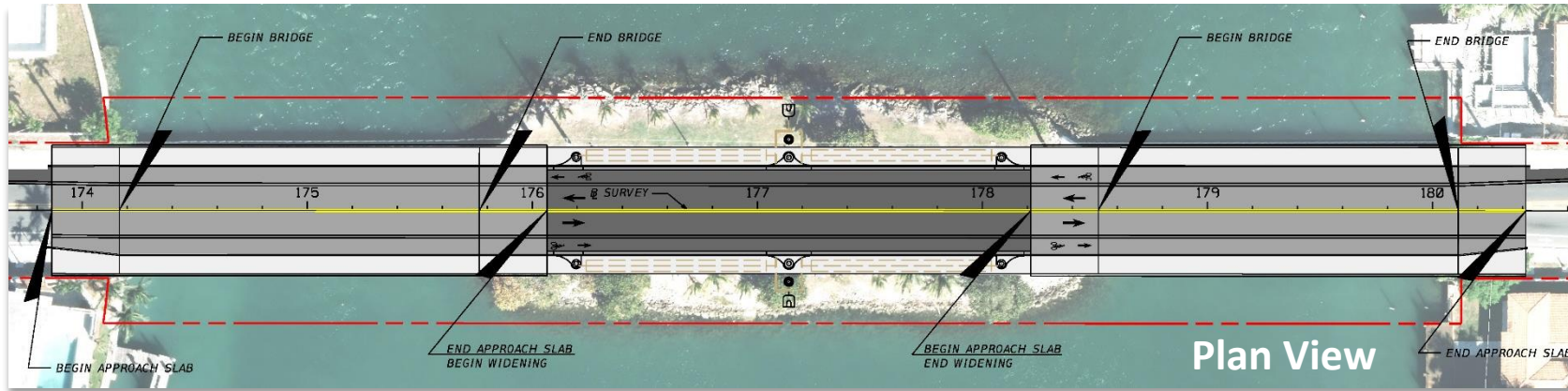
SECTION THRU REHABILITATED BASCULE SPAN

## Replacement Alternative – Fixed Bridges

Alt. 7 – Arch Beam

Estimated Cost : \$43 - \$47 Million

*\*High Range for Phased Construction*



Plan View

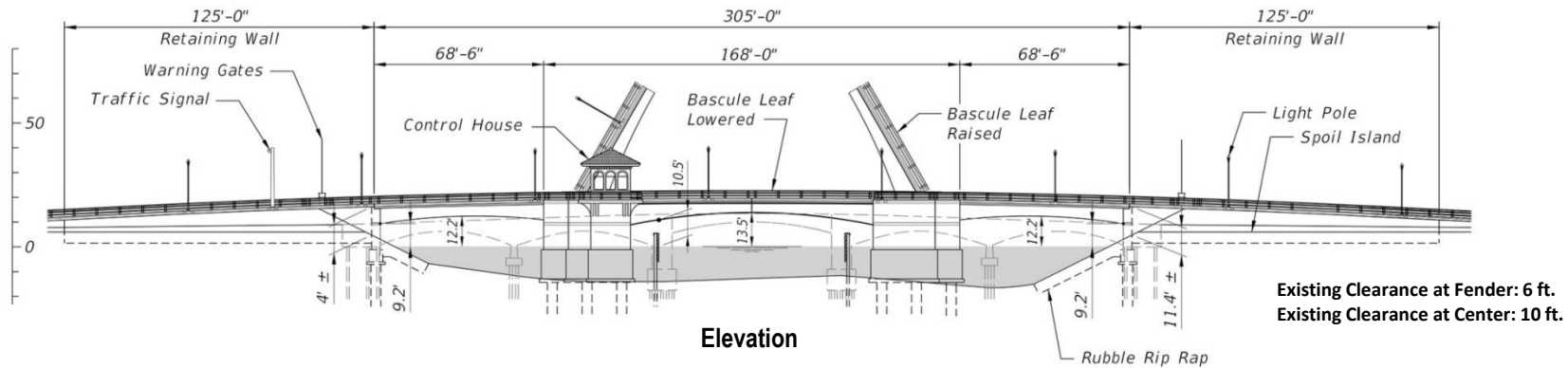
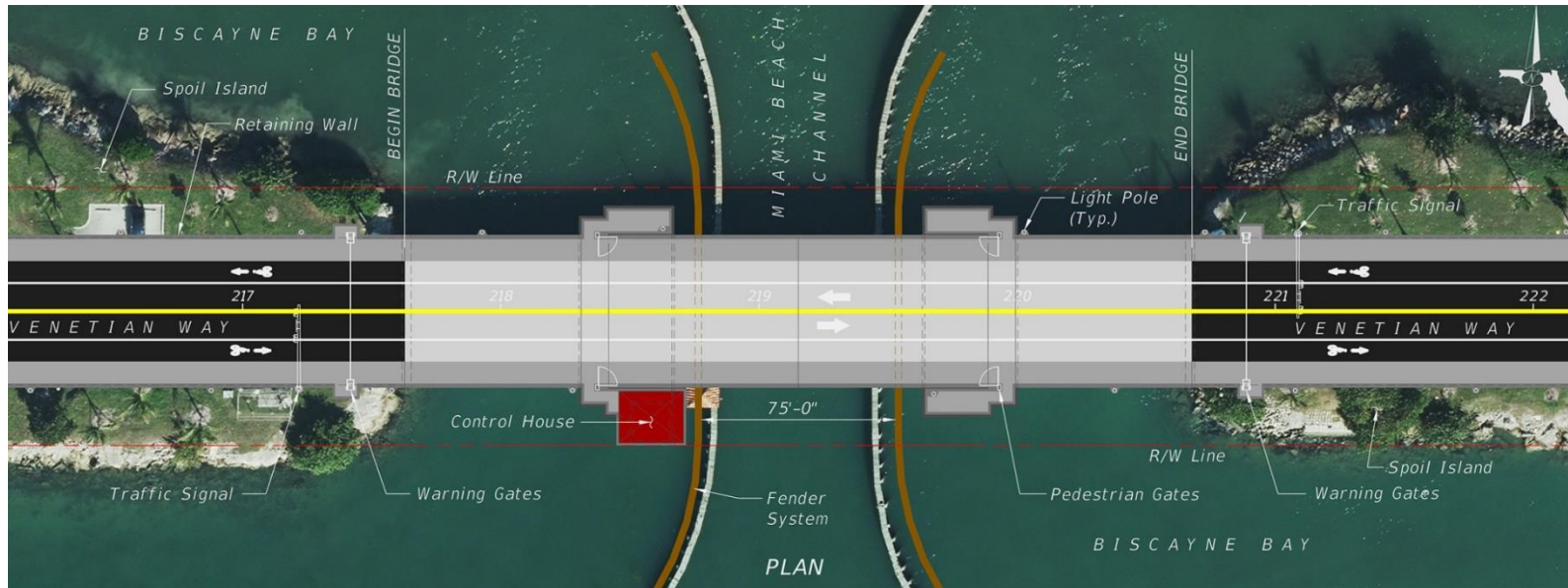


Elevation View

## Replacement Alternative – Movable Bridge

Alt. M4 – Double Leaf Bascule Bridge

Estimated Cost Range: \$39 - \$43 Million



## Replacement Alternative – Movable Bridge

### Alt. M4 – Double Leaf Bascule Bridge



MOVABLE BRIDGE 10 ELEVATION

## Viabile Build Alternatives

### REHABILITATION

**ALT. 4: Fixed Bridge Rehab with Beam Strengthening**      \$42 - \$44 Million

**ALT. M1: Bascule Bridge Rehabilitation**      \$8 - \$9 Million

**Total**      \$50 - \$53 Million

**Life Cycle Cost**      \$241 M (75-year service life)

\$179 M (25-year service life Rehab  
then Replacement)

### REPLACEMENT

**ALT. 7: Arched Beams Replacement**      \$43 - \$47 Million

**ALT. M4: Double Leaf Bascule Bridge**      \$39 - \$43 Million

**Total**      \$82- \$90 Million

**Life Cycle Cost**      \$96 M (75-year Service Life)

# Viable Alternatives: Life Cycle Cost

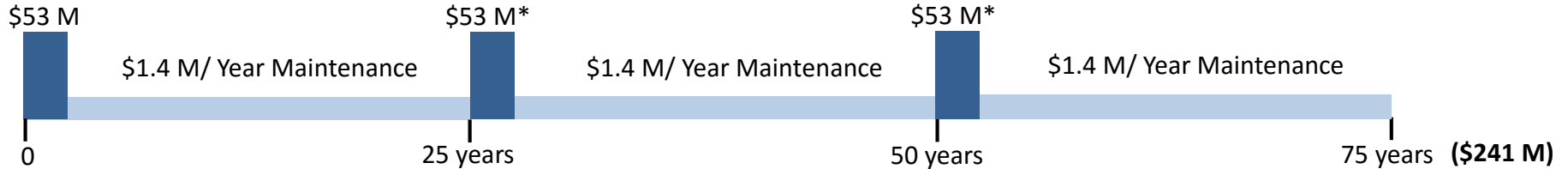
## NO-BUILD (Unknown Service Life)



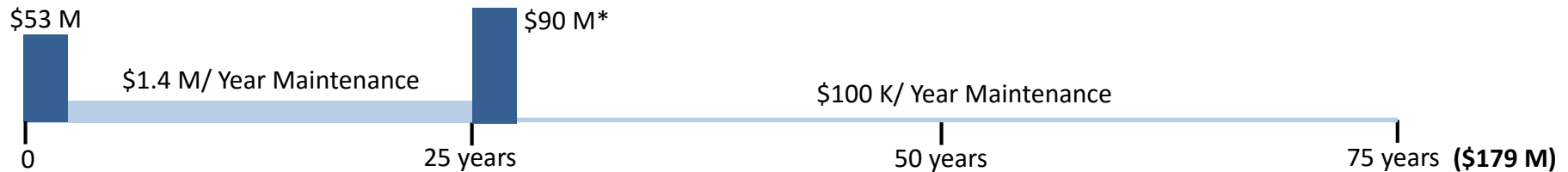
## REHABILITATION (75-year Service Life)

Assumes 2016 dollars.  
No Escalation for  
Inflation Included.

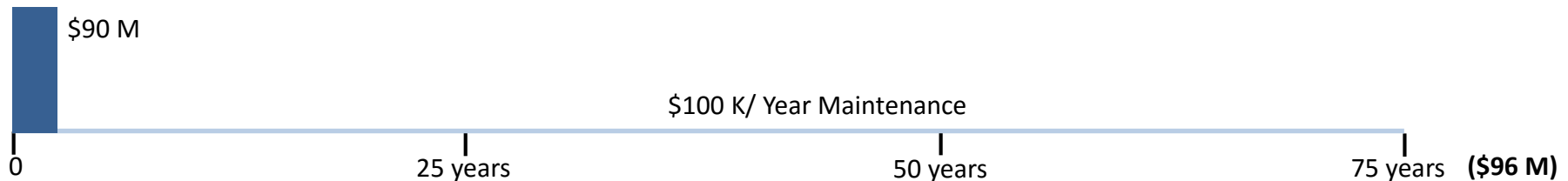
\*Present value



## REHABILITATION (25-year Service Life) – Then Replacement



## REPLACEMENT (75-year Service Life)

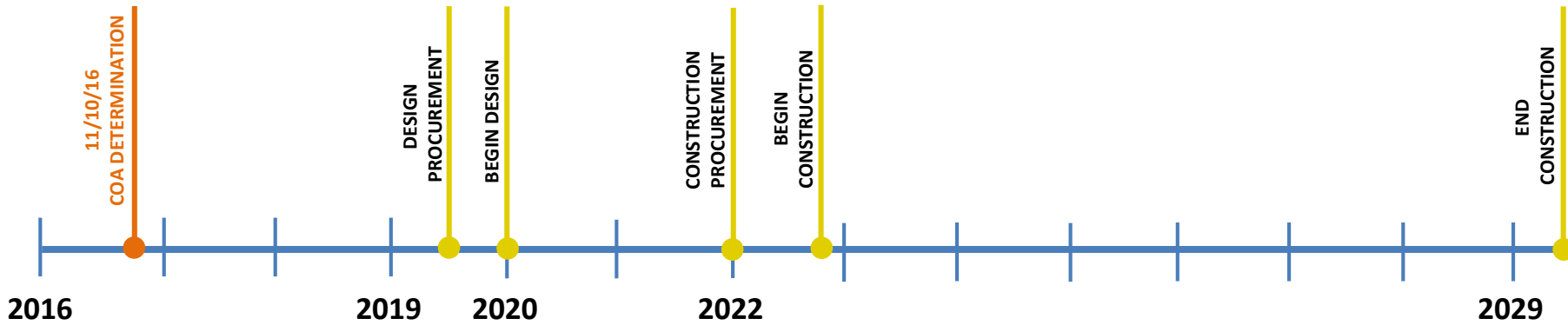


# Viable Alternatives: Anticipated Schedule

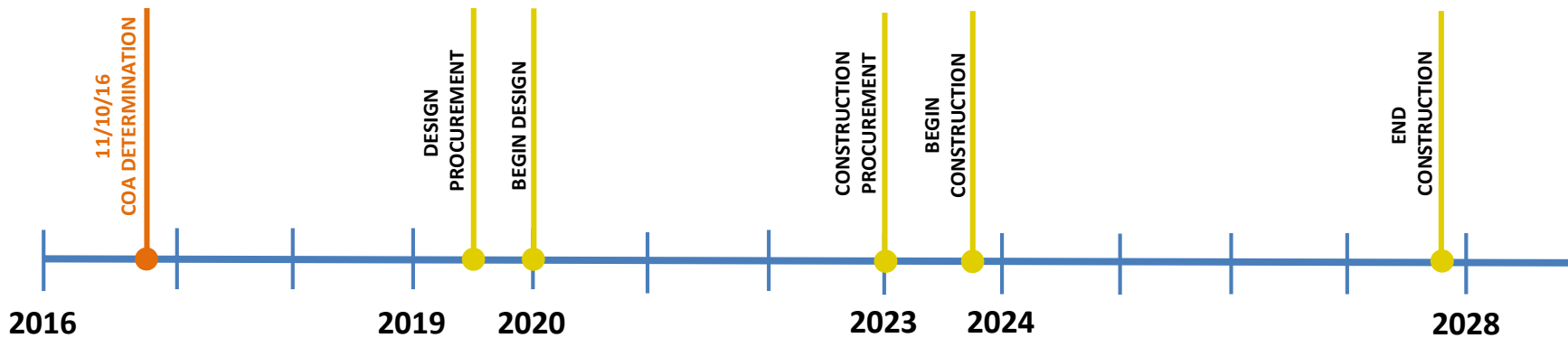
Project Scope Dev.

PD&E / NEPA Study

## REHABILITATION (25-year Service Life)



## REPLACEMENT (75-year Service Life)



## Environmental Impacts of No-Build vs Build

- **No-Build Alternatives result in no environmental impacts**
- **Build Alternatives (Rehab. or Replacement)**
  - Similar natural resource impacts for both rehabilitation and replacement.
  - Potential impact to corals on substructure & scour protection areas
  - Temporary impacts due to construction methods
    - Barge Use, water quality, noise, air quality
  - Minimal threatened & endangered species involvement
    - Informal Section 7 (of the Endangered Species Act) Consultation with USFWS & NMFS
  - Retain and improve bicycle and pedestrian access





## Historic Resource Impacts of No-Build vs. Build

- **No-Build Alternatives result in No Adverse Effects/Impacts to the historic resources**
- **Build Alternatives**
  - Rehabilitation - May likely result in Adverse Effects/Impacts to the historic resources
  - Replacement - Adverse Effects/Impacts to the historic Resources
- **Adverse Effects**
  - Section 106 Effects Determination Case Study Report, Memorandum of Agreement, and further consultation with affected parties will be necessary.
  - Section 4(f) documentation also required.



# Evaluation Matrix

Criteria	No Build Alternatives				Build Alternatives				
	Alt 1 - No-Action	Score	Alt 2 - Transportation System Management and Operations	Score	Rehabilitation		Replacement		
					Alt 4 - Rehabilitation with Beam Strengthening and Alt M1 - Bascule Bridge Rehabilitation	Score	Alt 7 - Arched Beams with T1 - Venetian Railing and Alt M4 - Double Leaf Bascule Bridge	Score	
Meets Purpose and Need	No	0	No	0	Yes	3	Yes	5	
Meets Current Safety Standards	No	1	No	1	Partially	3	Yes	5	
Service Life	0-8 years	1	0-8 years	1	25 years	2	75 years	5	
Typical Sectional Functionality	Substandard sidewalks and bicycle lanes	1	Substandard sidewalks and bicycle lanes	1	Substandard sidewalks and bicycle lanes	2	Meets current criteria	5	
Structural Capacity	H-15	1	H-15	1	HL-93	5	HL-93	5	
Hurricane Resistance	Not Satisfied	0	Not Satisfied	0	Satisfied	5	Satisfied	5	
Vessel Collision Resistance	Not Satisfied	0	Not Satisfied	0	Satisfied	5	Satisfied	5	
Bridge Clearances	Remain	1	Remain	1	Remain	1	Improved (Raised 1')	2	
Maintenance of Traffic During Construction	N/A	5	N/A	5	82 months	1	48 months (phased construction)	3	
Utility Services	Remain	3	Remain	3	Remain	3	Improved	5	
Economic Impact	None	1	None	1	None	3	Improved	5	
Constructability	No Impact	5	Minimal	4	Major Impact	1	Some Impact	3	
Pedestrian and Bicycle Facilities	Remain as is	1	Remain as is	1	Pedestrian - Improved Bicycle - Remain as is	2	Improved	5	
<b>Environmental Impacts</b>									
NATURAL	Benthic Resources	no impact	5	no impact	5	impact to corals from scour protection, substructure & beam strengthening	3	impact to corals from scour protection, substructure replacement, spoil island shoreline	2
	Essential Fish Habitat	no impact	5	no impact	5	minimal impacts from construction means and methods	4	minimal impacts from construction means and methods/minimal impact to shoreline of spoil islands	3
	Threatened & Endangered Species	no impact	5	no impact	5	minimal impacts from construction means and methods	4	minimal impacts from construction means and methods	3
	Water Quality	Scuppers discharge to OFW	0	Scuppers discharge to OFW	0	Scuppers discharge to OFW	0	temporary impacts during construction/overall benefit	5
PHYSICAL	Noise Impacts	no impact	5	no impact	5	minimal impacts from construction means and methods	5	temporary impacts during construction	5
	Air Quality	no impact	5	no impact	5	minimal impacts from construction means and methods	5	temporary impacts during construction	5
	Contamination Impacts	Not Applicable	0	Not Applicable	0	Not Applicable	0	Not Applicable	0
Cultural and Historic	Historic - Section 106/4(f)	No Adverse Effect	5	No Adverse Effect	5	No Adverse Effect - some impact to resource	3	Adverse Effect - Resource replaced, National Register of Historic Places listing may be affected	1
SOCIAL and ECONOMIC	Aesthetic/Visual Impacts	utilities remain	3	utilities remain	3	utilities remain	4	wider section, bridge aesthetics replicated, utilities hidden, arch and railings remain	4
	Recreational Areas	Not Applicable	0	Not Applicable	0	Not Applicable	0	Not Applicable	0
	Community Cohesion	no impact	3	no impact	3	temporary impact to access during construction	3	temporary impact to access during construction	5
<b>Project Costs</b>									
Engineering Costs (Bridges only)	\$ -	5	\$ -	5	\$6.9 Million	3	\$11.7 Million	1	
Construction Costs (Bridges only)	\$ -	5	\$ -	5	\$53 Million	3	\$90 Million	1	
Yearly Maintenance Costs (first 25 years)	\$1.4 Million	1	\$1.4 Million	1	\$1.4 Million	1	\$100,000	5	
Life Cycle Costs over 75 years	Unknown	0	Unknown	0	\$179 Million	1	\$96 Million	3	
<b>Total Points</b>		<b>67</b>		<b>66</b>		<b>75</b>		<b>101</b>	

### Legend

Score	Description
0	No Benefit or Not Applicable
1	Most impactful or least benefit
2	Very impactful or little benefit
3	Moderate impact or moderate benefit
4	Little impact or very beneficial
5	Least impactful or most benefit

# Recommended Alternative

## Replacement Alternative – Bridge Typical Section

### Alt. T1 – Venetian Railing



- Developed with input from the Venetian Island residents.

## Replacement Alternative – Fixed Bridges

Alt. 7 – Arch Beam

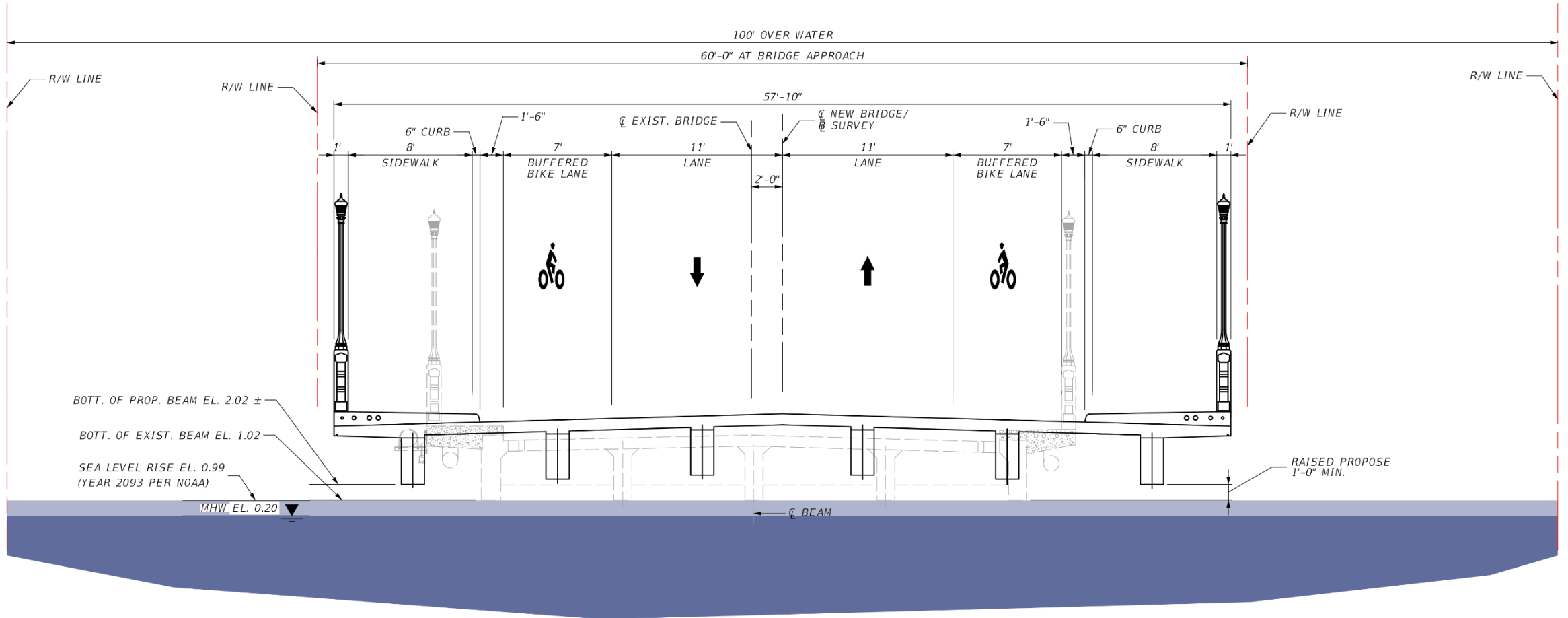
Estimated Cost Range: \$43 - \$47 Million\*

*\*High Range for Phased Construction*



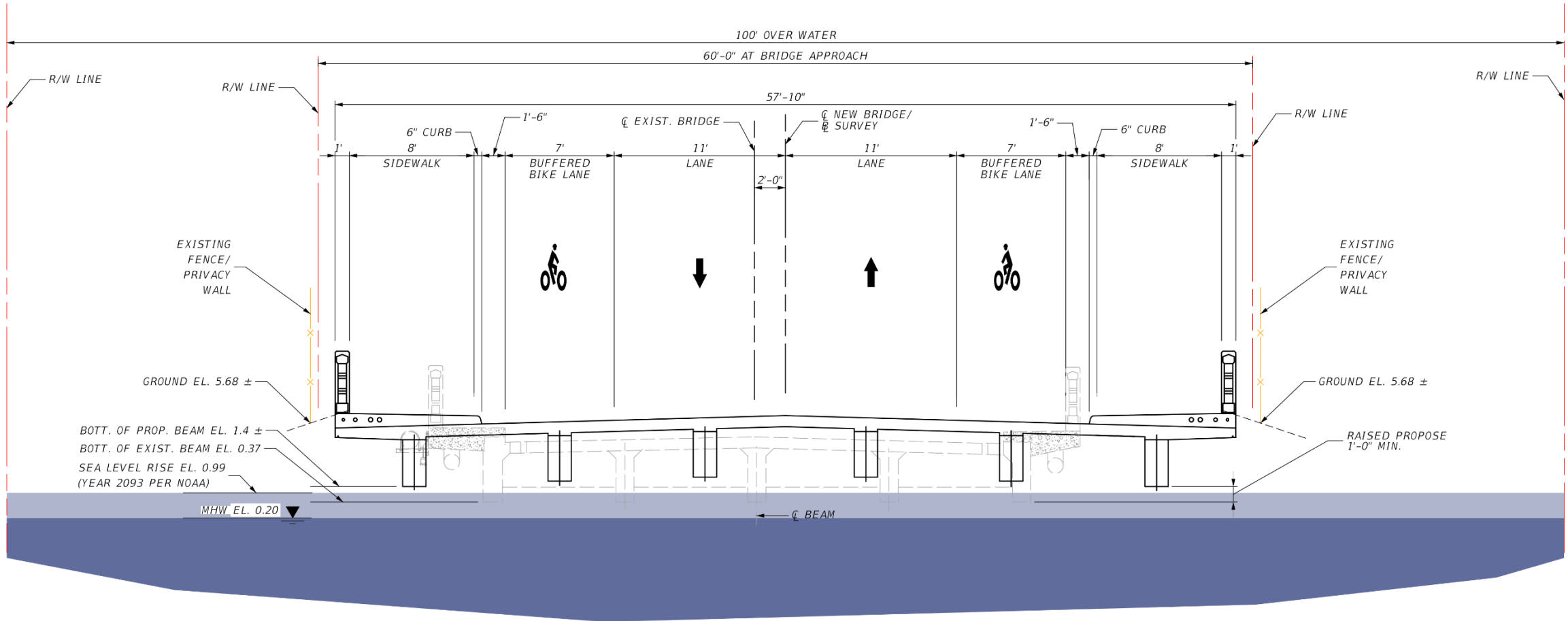
Elevation View

## Replacement Alternative – Raised Bridge Typical Section



Bridge Section at Pier

## Replacement Alternative – Raised Bridge Typical Section



Bridge Section at Approach

## Replacement Alternative – Movable Bridge

Alt. M4 – Double Leaf Bascule Bridge

Estimated Cost Range: \$39 - \$43 Million



MOVABLE BRIDGE 10 ELEVATION



- Draft CRAS report prepared and currently under review, and final will be submitted to SHPO following review.
- 27 resources documented as part of the CRAS
  - Two previously recorded buildings (8DA11740 and 8DA11754), two previously recorded linear resources (8DA11375 and 8DA12366), and ten newly identified buildings (8DA14385-8DA14394).
- The National Register-listed resource, Venetian Causeway (8DA4736), was converted to the Venetian Islands Resource Group (8DA14395) and includes the twelve individual bridges (8DA14373-8DA14384) as six manmade islands and five earthen causeway landings that are contributing features.
- Terrace Towers (8DA11754) and Collins Canal (8DA11375) determined eligible
- Belle Isle Court Apartments (8DA14394) considered eligible



## Adversely Affected

- Historic Bridges to be replaced

## Measures to Minimize Harm

1. HABS/HAER Recordation in accordance with Secretary of the Interior
2. Project Design that is sensitive to the historic characteristics of the bridges:
  - Reconstruction of the significant design elements such as; the low profile bridges which preserves the historical appearance of the original structure, by using arched beams with the same span configurations.
  - Reconstruction of the geometrically designed concrete bridge railings.
  - Reconstruction of the bridge lighting fixtures.
  - Reconstruction of the Bridge Tender House for the New East Bascule Bridge that is inspired by the existing Mediterranean style architecture while also seeking to the current age of its construction.
3. Project Review by the State Historic Preservation Officer (SHPO).

## Section 106 of National Historic Preservation Act

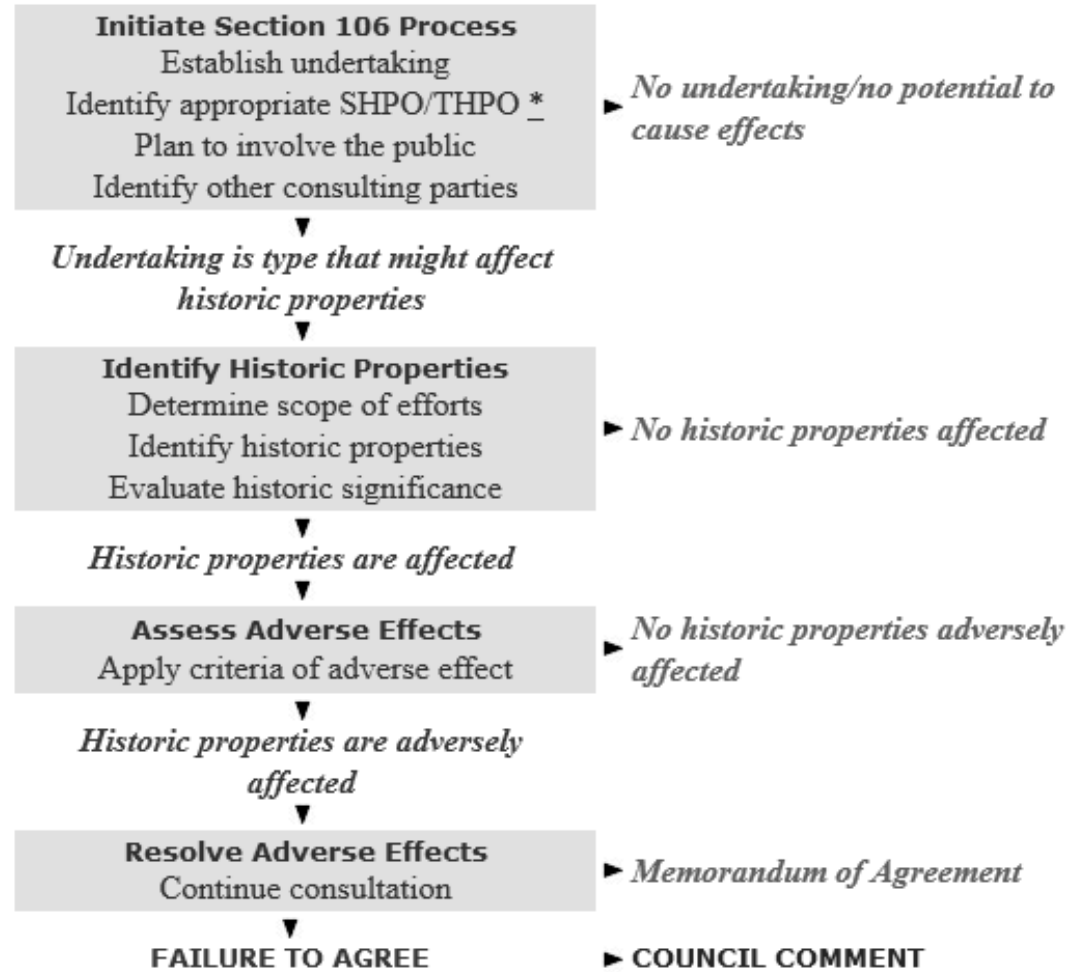
### Cultural Resources Assessment Survey

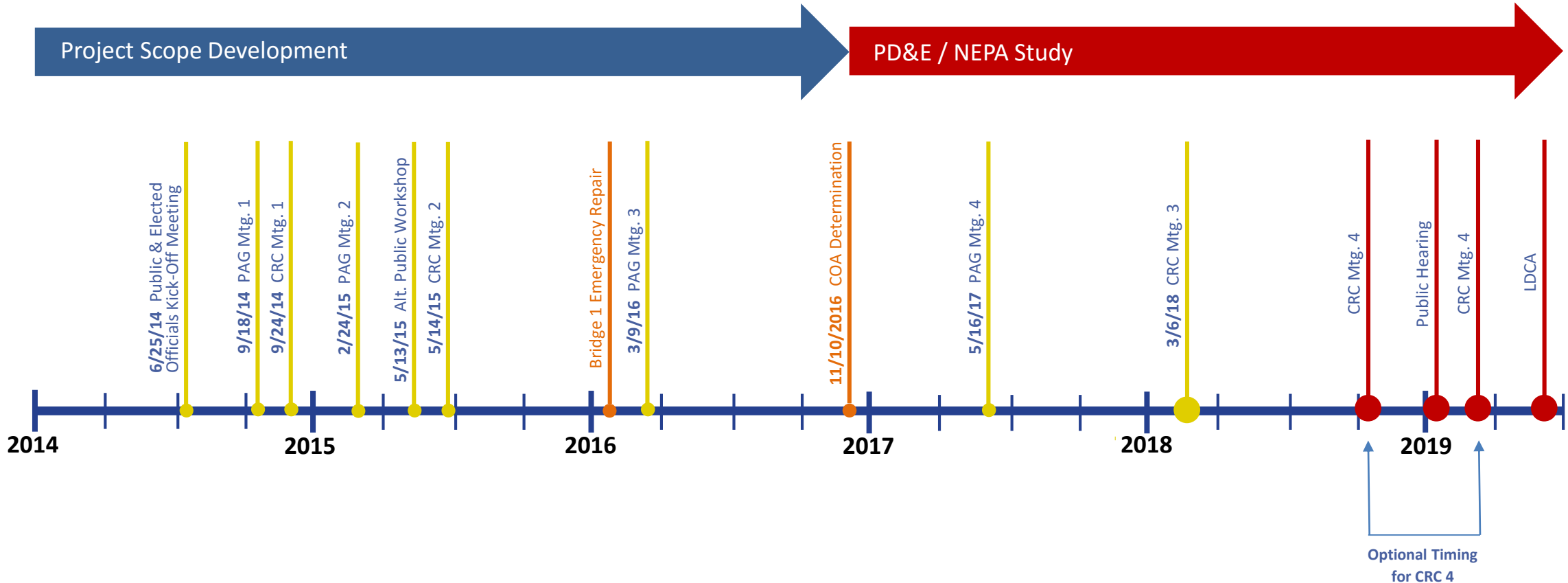
- Establish Area of Potential Effect
- Identify and Document Resources
- Evaluate Significance according to NRHP Criteria

### Evaluation of Effects -Determination of Effects Case Study

#### Apply Section 106 Criteria of Effects

- Replacement Will be Adverse Effect
- Develop MOA and Section 4(f) Programmatic or Individual Statement  
Documentation to document there is no prudent or feasible alternative to the proposed improvements





**LEGEND**

**CRC:** Cultural Resource Committee

**MTG:** Meeting

**PAG:** Project Advisory Group

**LDCA:** Location Design Concept Acceptance



## FDOT Contact

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Phone: 305-470-5201

## Miami-Dade County Contact

**Public Information Officer: Karla Damian**

Department of Transportation and Public Works

Email: [kdamian@miamidade.gov](mailto:kdamian@miamidade.gov)

Phone: 786-469-5420

## ONLINE

- Project webpage - Updates posted weekly

<http://www.fdotmiamidade.com/venetianbridgestudy>

- Efficient Transportation Decision Making (ETDM)

<https://etdmpub.fla-etat.org/est/>

- Click on Project Number on left hand menu
- Type in 12756
- Click "Go" or press Enter

