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

Project Advisory Group (PAG)

Meeting No. 4

May 16, 2017

Florida Department of Transportation - District 6

Project Team

VENETIAN ISLANDS HISTORIC BRIDGES

FDOT

MIAMI-DADE COUNTY

Cooperating Agencies

US Army Corps of Engineers

United States Coast Guard

Purpose and Need for Project

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.

Structural and Functional Deficiencies

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

*** Based on FDOT Bridge Information, April 3rd 2017**

FO= Functionally Obsolete **SD=** Structurally Deficient

Agenda

1. Project Status
2. Alternatives Analysis
   - Screening Matrix
   - Alt. 6 – High Level Fixed Bridge
3. Viable Alternatives
   - No-Build
   - Build
4. Estimated Costs
5. Anticipated Schedule
6. Environment
7. Evaluation Matrix
8. Next Steps

Class of Action (COA) Determination

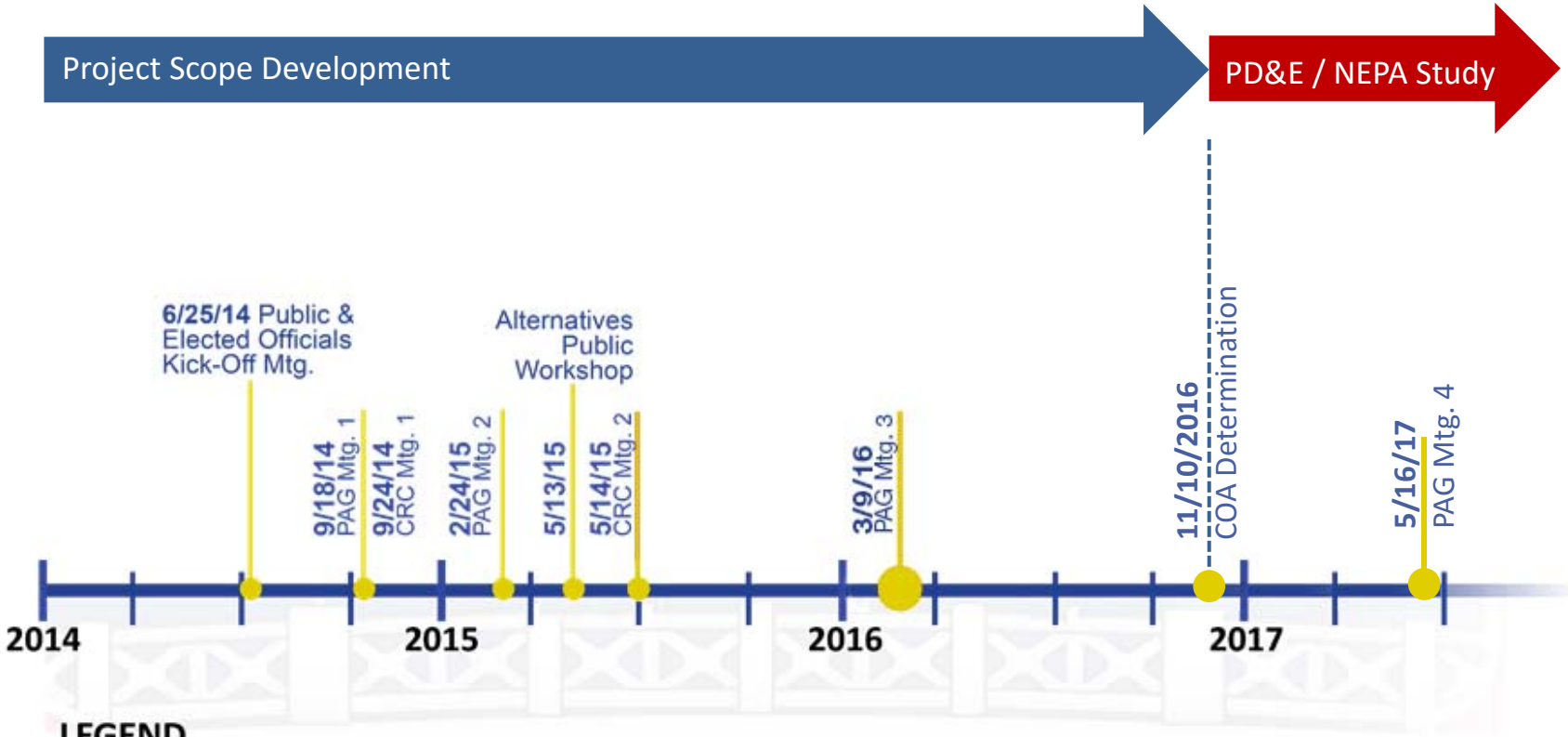
- In **October 2016**, the Federal Highway Administration (FHWA) agreed the Project Development & Environment (PD&E) Study would proceed under the National Environmental Policy Act (NEPA).

- 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).

Project Status



LEGEND

CRC: Cultural Resource Committee

MTG: Meeting

PAG: Project Advisory Group

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
1	Do Nothing	0	3	3	0	0	6
2	Transportation Systems Management & Operations (TSM&O)	0	3	3	0	0	6
	Rehabilitation Alternatives						
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
	Replacement Alternatives						
	Typical Sections						
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
	Fixed Alternatives						
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
	Movable Bridge Alternatives						
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

Further Analysis to Address Comments from the Alternatives Workshop

Replacement Alternative – Fixed Bridges

Alt. 6

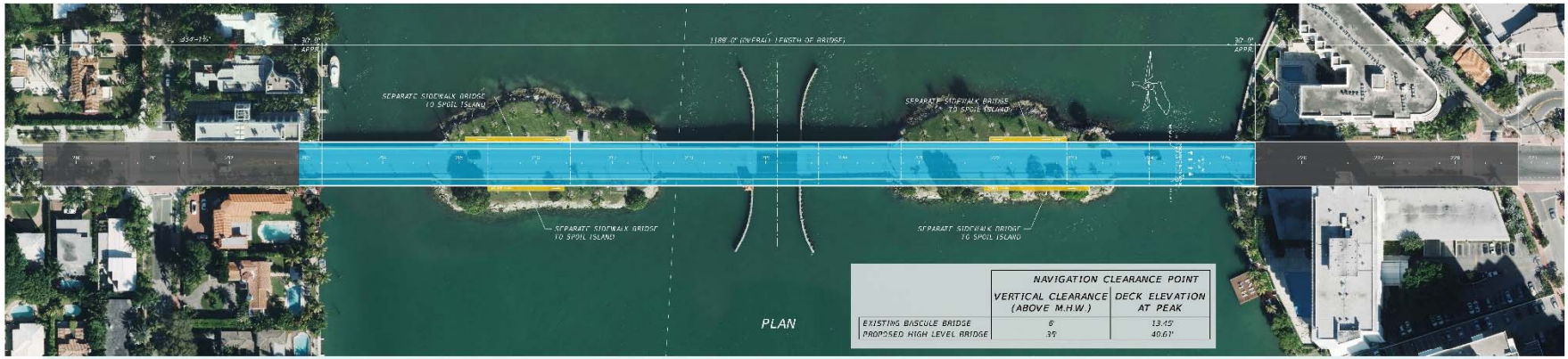
Alt. 6 – High Level Fixed Bridge

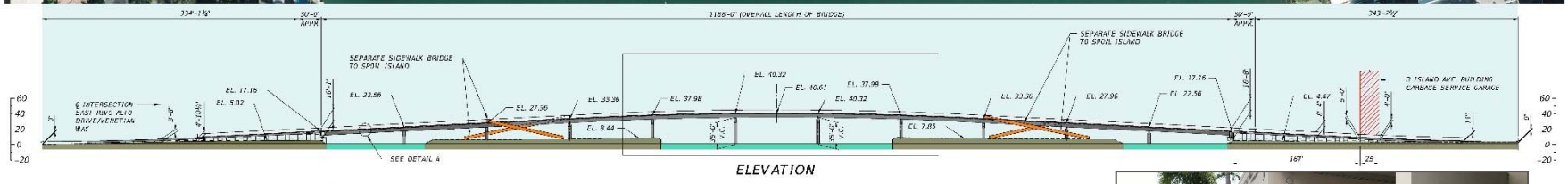
Bridge	Vertical Clearance
Julia Tuttle Causeway	35 ft.
Proposed Venetian East High Level Fixed Bridge	**35 ft.**
McArthur East	35 ft.

Alt. 6

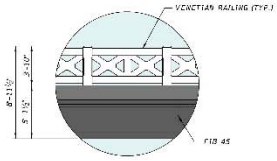
Replacement Alternative – Fixed Bridges

Alt. 6 – High Level Fixed Bridge

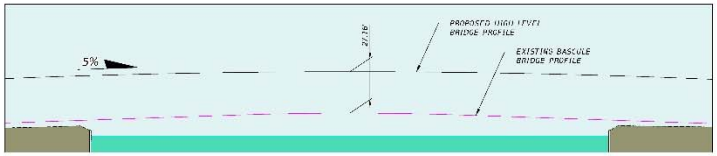




ELEVATION



DETAIL A



VERTICAL PROFILE

Alt. 6

Replacement Alternative – Fixed Bridges

Alt. 6 – High Level Fixed Bridge – Facing North

Alt. 6

Replacement Alternative – Fixed Bridges

Alt. 6 – High Level Fixed Bridge – Facing North

Alt. 6

Replacement Alternative – Fixed Bridges

Alt. 6 – High Level Fixed Bridge – Facing West

Alt. 6

Replacement Alternative – Fixed Bridges

Alt. 6 – High Level Fixed Bridge – Facing East

Replacement Alternative – Fixed Bridges

Alt. 6

Alt. 6 – High Level Fixed Bridge – East Approach

Facing North

Facing South

Replacement Alternative – Fixed Bridges

Alt. 6

Alt. 6 – High Level Fixed Bridge – West Approach

Facing North

Facing South

Alt. 6

Replacement Alternative – Fixed Bridges

Alt. 6 – High Level Fixed Bridge

Estimated Cost Range: $52 - $57 Million

Alternatives Analysis

Alt. 6- High Level Fixed Bridge vs Alt. 7 & M4 – Arched Beams with Double Leaf Bascule Bridge

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
1	Do Nothing	0	3	3	0	0	6
2	Transportation Systems Management & Operations (TSM&O)	0	3	3	0	0	6
	Rehabilitation Alternatives						
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
	Replacement Alternatives						
	Typical Sections						
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
	Fixed Alternatives						
5	Tunnel	3	0	1	1	1	6
6	High Level Fixed Bridge	3	0	1	1	2	7
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10	Cast-in-Place Slab (Flat/Variable Depth)	3	0	2	2	1	8
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	Movable Bridge Alternatives						
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

Viable Alternatives

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

ALTERNATIVE	DESCRIPTION
	NO-BUILD ALTERNATIVES
1	**Do Nothing –** The bridges remain as is with routine maintenance only.
2	**Transportation Systems Management & Operations (TSM&O)** – The bridges remain as is with routine maintenance only. Transit and other operational improvements would be made to facilitate transportation along the corridor.
	BUILD ALTERNATIVES - REHABILITATION
4	**Fixed Bridge Rehabilitation with Beam Strengthening** - Rehabilitation of the fixed bridges to improve safety and load carrying capacity. Includes beam strengthening to achieve a higher load carrying capacity.
M1	**Bascule Bridge Rehabilitation –** Rehabilitation of the eastern movable bridge to improve safety and achieve a higher load carrying capacity.
	BUILD ALTERNATIVES - REPLACEMENT
	Typical Sections – The replacement of the bridges would require that a new typical section be selected along with the railing type.
T1	**Venetian Railing** – This railing replicates the existing railing on the bridges, but may not satisfy the current standards for railings.
	FIXED ALTERNATIVES The replacement of the bridges would require that the structural system for the fixed bridges be selected.
7	**Arched Beams** – This alternative provides low-level bridges, replicates the arched beams and maintains the look of the existing bridges.
	Movable Bridge Alternatives – The replacement of the eastern movable bridge would require that the movable bridge type be selected.
M4	**Double Leaf Bascule Bridge** – The existing bridge would be replaced in kind.

Viable Alternatives: No-Build

Alt. 1

Alt. 1 - Do Nothing

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

Does not meet purpose and need for project

Viable Alternatives: No-Build

Alt. 2 – Transportation System Management and Operations

Alt. 2

- 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

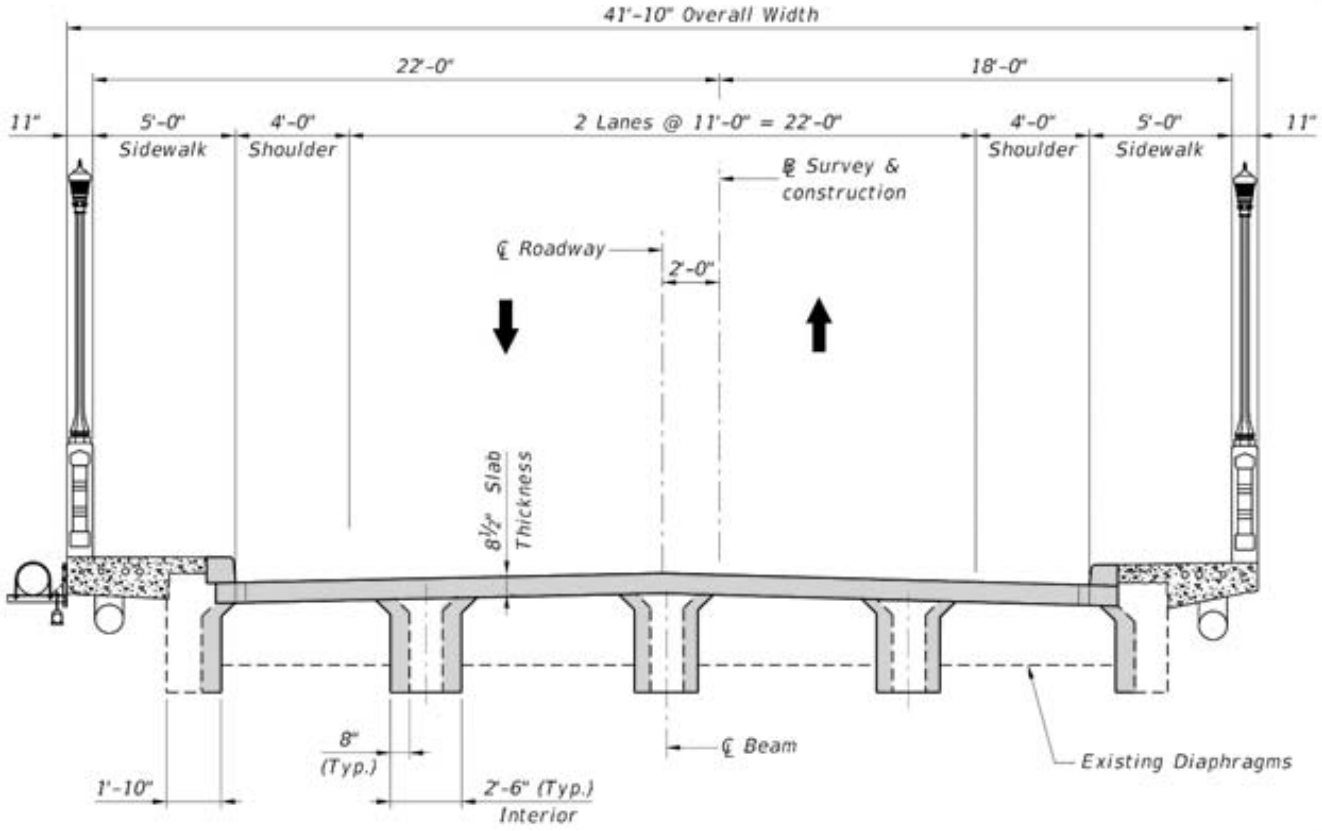
Alt. 4 - Fixed Bridge Rehab with Beam Strengthening

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



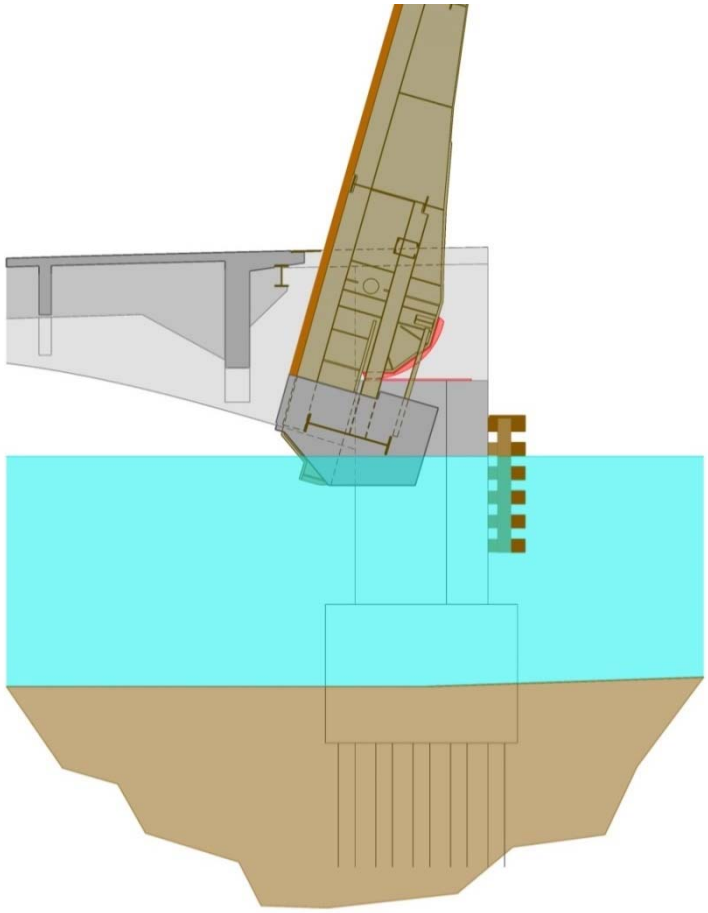
Estimated Cost Range: $42 - $44 Million

Viable Alternatives: Build

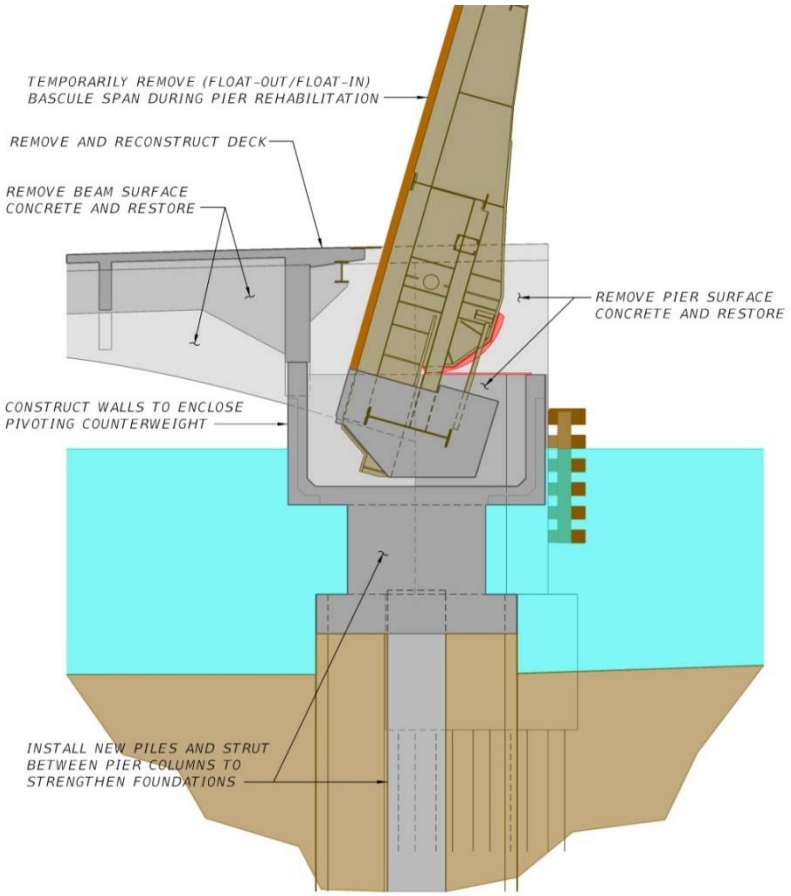
Rehabilitation Alternative

M1

Alt. M1 - Bascule Bridge Rehabilitation



SECTION THRU EXISTING BASCULE SPAN



SECTION THRU REHABILITATED BASCULE SPAN

Estimated Cost Range: $8 - $9 Million

Viable Alternatives: Build

Replacement Alternative – Typical Section Selection

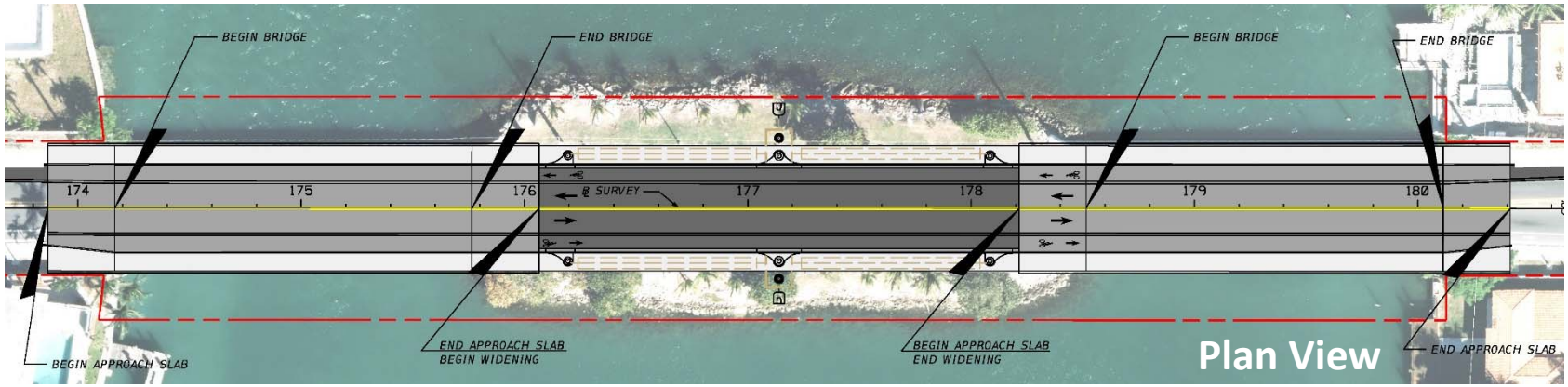
FIXED BRIDGE TYPICAL SECTION

Viable Alternatives: Build

Replacement Alternative – Fixed Bridges

Alt. 7

Alt. 7 –Arch Beam



Estimated Cost Range: $36 - $41 Million*

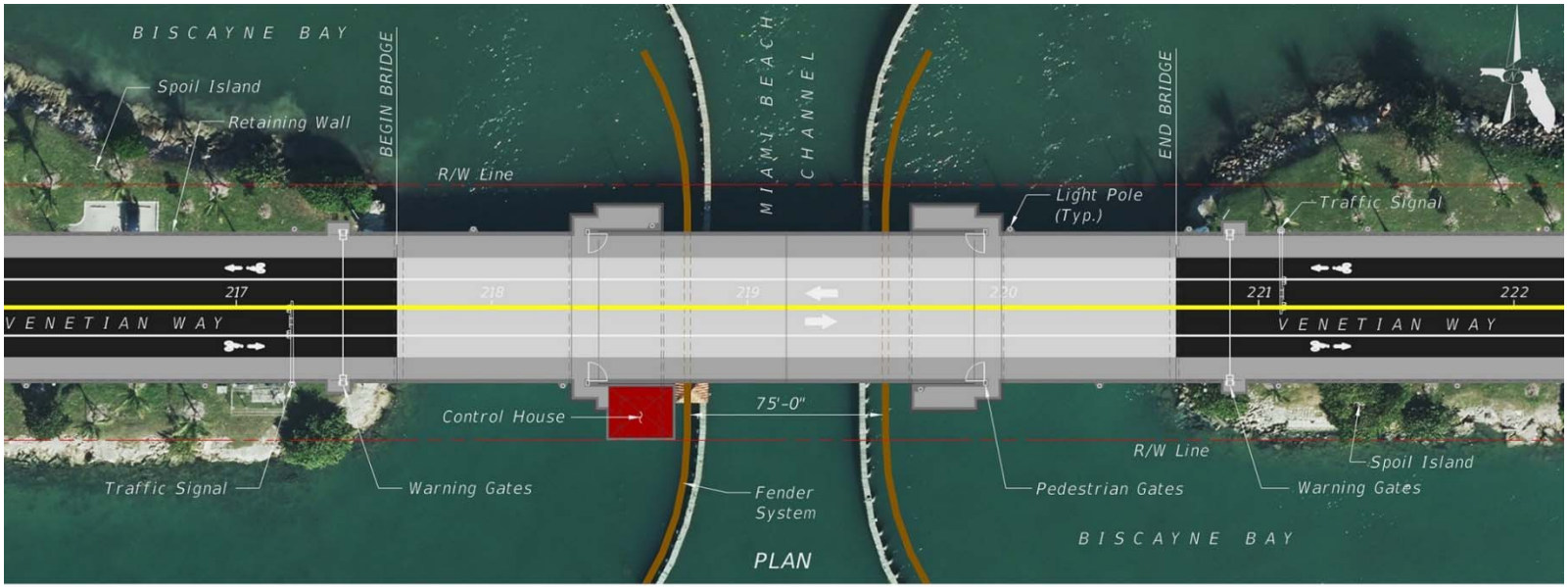
****High Range for Phased Construction***

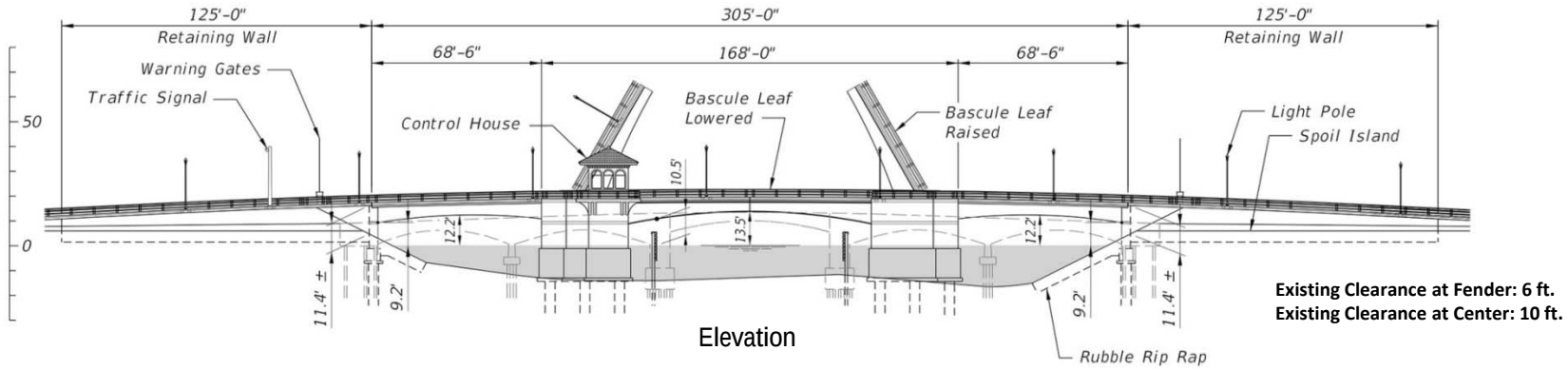
Viable Alternatives: Build

Replacement Alternative – Movable Bridge

M4

Alt. M4 – Double Leaf Bascule Bridge





Existing Clearance at Fender: 6 ft.
Existing Clearance at Center: 10 ft.

Estimated Cost Range: $29 - $33 Million

Viable Alternatives: Build

M4

Replacement Alternative – Movable Bridge

Alt. M4 – Double Leaf Bascule Bridge

MOVABLE BRIDGE 10 ELEVATION

Estimated Costs

Viable Build Alternatives

REHABILITATION (25-year Service Life)

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 - $159 M	

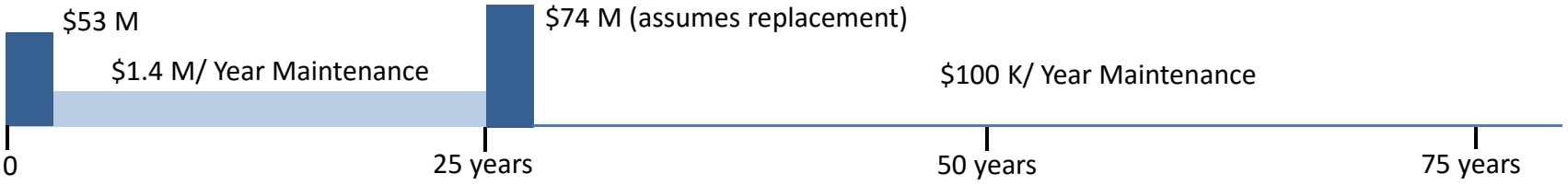
REPLACEMENT (75-year Service Life)

ALT. 7: Arched Beams Replacement	$36 - $41 Million
ALT. M4: Double Leaf Bascule Bridge	$29 - $33 Million
Total	$65 - $74 Million
Life Cycle Cost - $79 M	

Estimated Costs– Life Cycle Cost

NO BUILD (Unknown Service Life)

REHABILITATION (25-year Service Life)

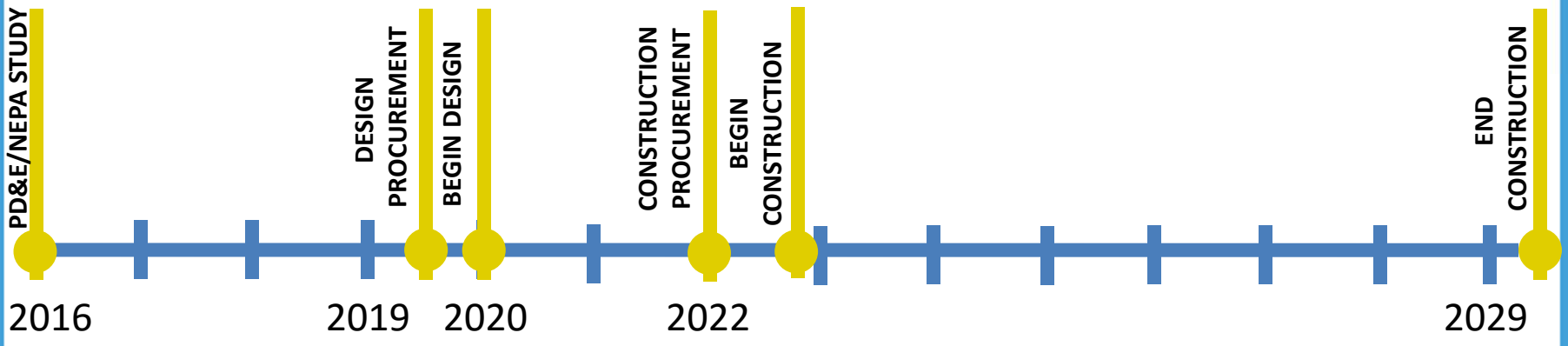


Assumes 2016 dollars. No Escalation for Inflation Included

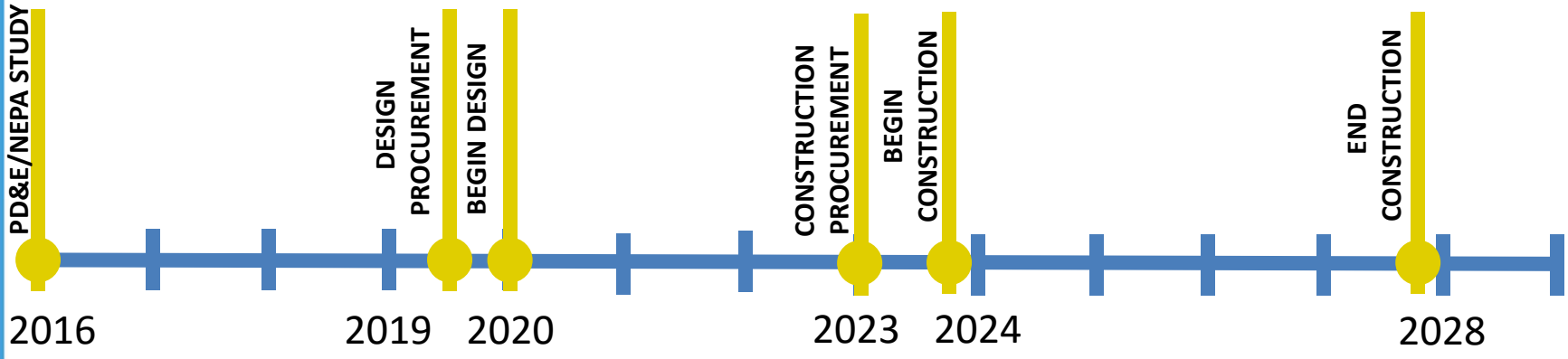
REPLACEMENT (75-year Service Life)

Anticipated Schedule

REHABILITATION (25-year Service Life)



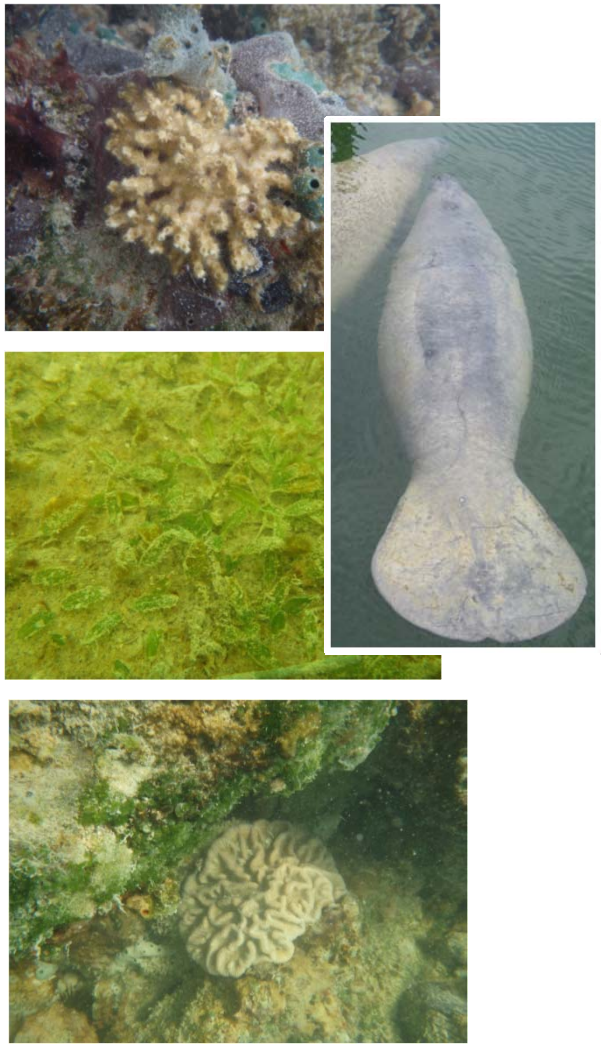
REPLACEMENT (75-year Service Life)



*** Assume 6 months for LDCA and 9 months for Construction Procurement**

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

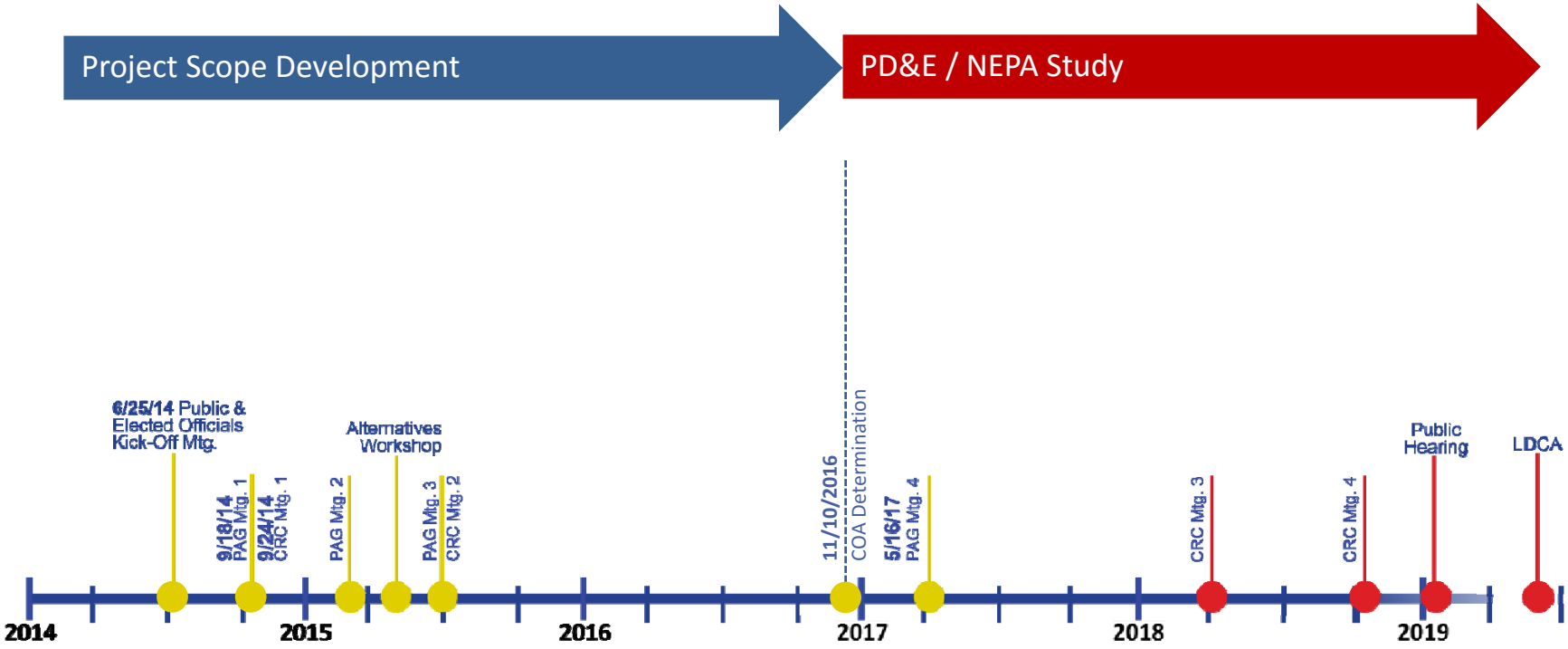
- **Adverse Effects**
  - Section 106 Effects Determination Case Study Report, Memorandum of Agreement, and further consultation with affected parties will be necessary.
  - Section 4(f) documentation also required.

Evaluation Matrix

Criteria		Weighting Factor	No Build Alternatives				Build Alternatives						Value Engineering Alternative	
							Rehabilitation				Replacement			
			Alt 1 - No Build	Score	Alt 2 - TSM&O	Score	Alt 3 - Rehabilitation without Beam Strenghtening	Score	Alt 4 - Rehabilitation with Beam Strenghtening and Alt M1 - Bascule Bridge Rehabilitation	Score	Alt 7 - Arched Beams with T1 - Venetian Railing and Alt M4 - Double Leaf Bascule Bridge	Score	VE Alternative	Score
Meets Purpose and Need			No		No				Yes		Yes			
Meets Current Safety Standards														
Service Life			0-3 years		0-8 years				25 years		75 years			
Typical Sectional Functionality			Substandard sidewalks and bicycle lanes		Substandard sidewalks and bicycle lanes				Substandard sidewalks and bicycle lanes		Meets current criteria			
Structural Capacity			H-15		H-15				HL-93		HL-93			
Hurricane Resistance			Not Satisfied		Not Satisfied				Satisfied		Satisfied			
Vessel Collision Resistance			Not Satisfied		Not Satisfied				Satisfied		Satisfied			
Bridge Clearances			Remain		Remain				Remain		Improved (Raised 1')			
Maintenance of Traffic During Construction			N/A		N/A				82 months		Phased Construction			
Utility Services														
Economic Impact														
Constructability														
Pedestrian and Bicycle Facilities			Remain as is		Remain as is				Pedestrian - Improved Bicycle - Remain as is		Improved			
Environmental Impacts														
NATURAL	Benthic Resources		No impact		No impact				Impact to corals from scour protection, substructure & beam strengthening		Impact to corals from scour protection, substructure replacement, spoil island shoreline			
NATURAL	Essential Fish Habitat		No impact		No impact				Minimal impacts from construction means and methods		Minimal impacts from construction means and methods/minimal impact to shoreline of spoil islands			
NATURAL	Threatened & Endnagered Species		No impact		No impact				Minimal impacts from construction means and methods		Minimal impacts from construction means and methods			
NATURAL	Water Quality		Scuppers discharge to OFW		Scuppers discharge to OFW				Scuppers discharge to OFW		Temporary impacts during construction/overall benfit			
PHYSICAL	Noise Impacts		No impact		No impact				Minimal impacts from construction means and methods		Temporary impacts during construction			
PHYSICAL	Air Quality		No impact		No impact				Minimal impacts from construction means and methods		Temporary impacts during construction			
PHYSICAL	Contamination Impacts		Not Applicable		Not Applicable				Not Applicable		Not Applicable			
Cultural and Historic	Historic - Section 106/4(f)		No Adverse Effect		No Adverse Effect				No Adverse Effect - some impact to resource		Adverse Effect - Resource replaced, NHRP may be applicable for the causeway			
SOCIAL and ECONOMIC	Aesthetic/Visual Impacts		Utilities remain		Utilities remain				Utilities remain		Wider section, bridge aesthetics replicated, utilities hidden, arch and railings remain			
SOCIAL and ECONOMIC	Recreational Areas		Not Applicable		Not Applicable				Not Applicable		Not Applicable			
SOCIAL and ECONOMIC	Community Cohesion		No impact		No impact				Temporary impact to access during construction		Temporary impact to access during construction			
Engineering Costs														
Construction Costs														
Maintenance Costs														
Life Cycle Costs														
Total Points														

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

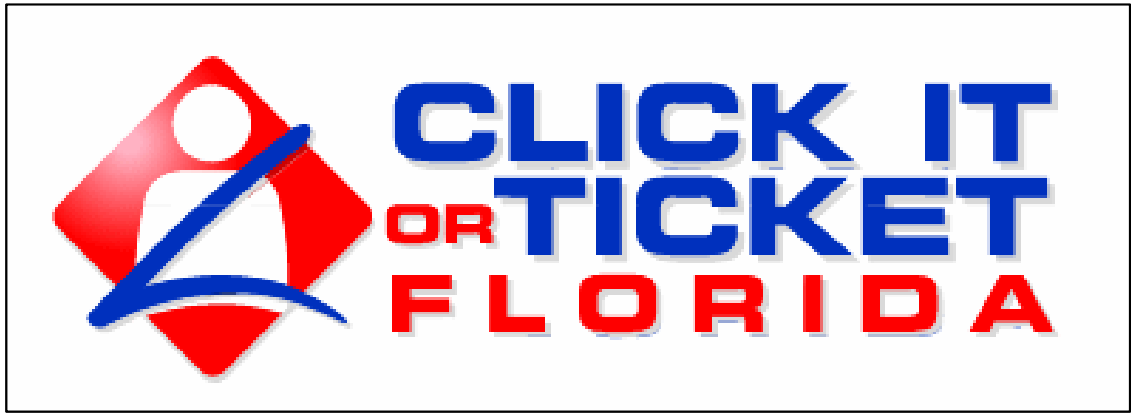
Next Steps



LEGEND

CRC: Cultural Resource Committee
MTG: Meeting
PAG: Project Advisory Group
LDCA: Location Design Concept Acceptance

Drive Safely



Stay Informed

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Miami-Dade County Contact

Public Information Officer: Karla Damian

Department of Transportation and Public Works

Email: 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**