City of Fort Lauderdale - Bridge Master Plan

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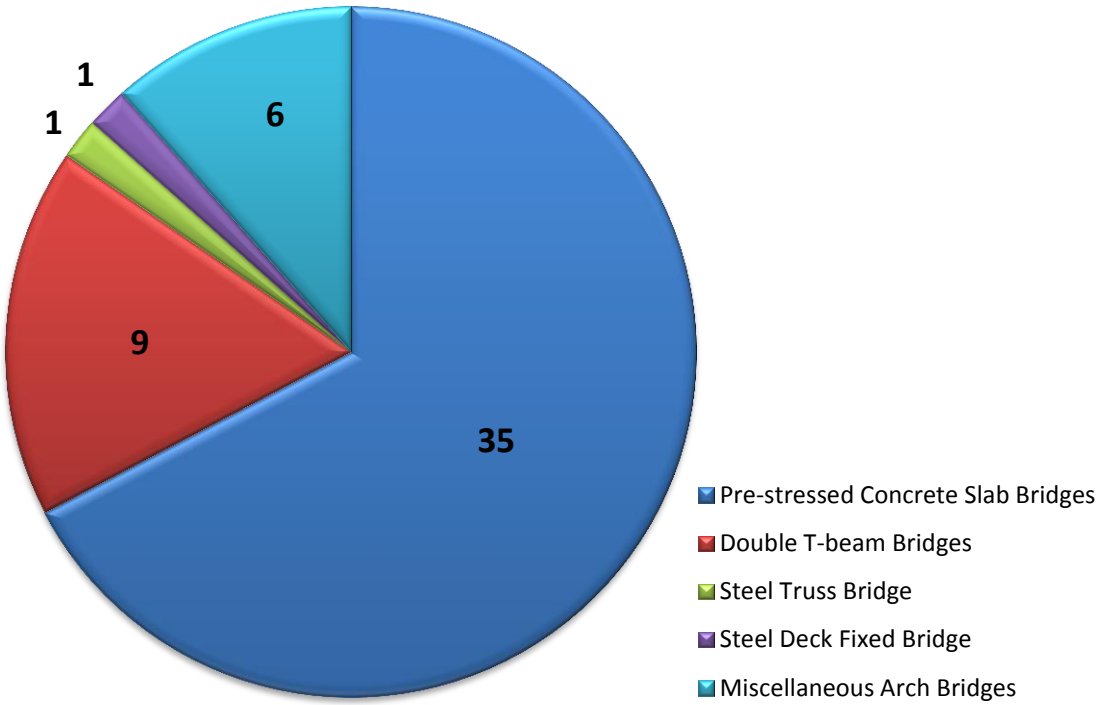
Agenda

- Background, Current Approach & Challenges
- Bridge Assessment Results
- Proposed Bridge Management Options
- Q&A

Background: Existing Bridge Inventory and Types

Currently the City owns and maintains 51 bridges
with the **Average age of 50 years-old**



Bridge Management Current Process

- Inspection of superstructure (decks, girders, barriers, etc.) bi-annually by FDOT.
- Inspection of substructure (Frames, piers, piles and bulkheads) bi-annually by FDOT.
- Based on visual observations by City Staff in conjunction with deficiencies indicated in the FDOT Bridge Inspection Report, bridges are recommended to be repaired or replaced on an annual basis.

Bridge Management - Current Repair Process

Repairs

- Concrete Repairs with approved FDOT materials
- Pile Concrete Jacketing (to improve strength and integrity of the piles)
- Corrosion Inhibitors
- Use of Fiber Reinforced Polymers (Wrap) for bridge rehab and extension of service life

Mechanism

- In-House Design
- Annual contract

Funding

- General Capital Operating Fund
- Special Obligation Construction Bond 2011 Fund
- Special Obligation Construction Bond 2008B Fund

Bridge Management Repair History – Past 5-Years

All repairs made through the annual contract

FY	2010	2011	2012	2013	Total
Bridges Repaired	6	4	7	0	**17**
Cost	$180,000	$120,000	$210,000	$0	**$510,000**

No funding was available in 2013

2014 Projects Under Construction Continuing into 2015

NE 55th Street	$147,112 rolled over for 2015 expenditures
Gordon Road	$250,000 rolled over for 2015 expenditures
Laguna Terrace	$40,000 rolled over for 2015 expenditures
SE 13th Street	$40,000 rolled over for 2015 expenditures

Bridge Management Current Replacement Process

Replacement	• Based on FDOT bridge inspection report
Mechanism	• CCNA for bridge design • Invitation to Bid for construction • CEI Consultant
Funding	• FDOT Funding (LAP) • General Capital Operating Fund • Special Obligation Construction Bond 2011 Fund • Water & Sewer Fund

Bridge Management Replacement History – Past 5-Years

FY	2010	2011	2012	2013	Total
Bridges Replaced	0	0	1	2	**3**
Cost	$0	$0	$1,544,692	$4,314,078	**$5,858,770**

2014 Projects Under Construction Continuing into 2015

Nurmi Drive – FDOT funded 100%
Isle of Palm – FDOT funded 100%
Isle of Venice – FDOT funded 100%
Fiesta Way – FDOT funded 100%
Sunrise Key – FDOT funded 100%

Current Challenges

- No comprehensive bridge management program in place.
- Insufficient annual funding allocated to address the needs of the bridges.
- Deferred maintenance increased the rate of deterioration of the bridges due to the corrosive environment.
- Due to a combination of age and deterioration, Limited load capacity is posted on 23 bridges.
  - Over the years, the load, bridges are required to carry has increased. As such, newer bridges are designed with a higher load capacity than those designed decades ago.

FAST FORWARD FORT LAUDERDALE 2035

We Are Connected

We move seamlessly and easily through a safe transportation system where the pedestrian is first.

PRESS PLAY FORT LAUDERDALE - STRATEGIC PLAN 2018

Infrastructure Goal 2: Be a sustainable and resilient community.

Objective 1: Proactively maintain our water, wastewater, road and bridge infrastructure.

Strategic Initiative 4: Examine funding options to maintain and update our aging bridge infrastructure, considering sea level rise , pedestrian friendliness, and aesthetics.

PRIOR CITY COMMISSION APPROVAL

March 18, 2014 - Motion to award a contract to TranSystems Corporation Consultants

Bridge Master Plan
Scope Of Work - Transystems Corp.

1. Inspection/Data Collection
    - Visual inspection of damaged bridge elements
    - Underwater inspection (scouring, undermining, stability, etc.)
    - Measurement of the area and length of damage
    - Photographic recording of damages
    - Review of FDOT District IV reports for City of Fort Lauderdale bridges

2. Evaluation/Data Analysis

3. Reporting
    - Report the results of the investigation and recommend repair schedule and budget
    - Develop Master Plan
    - Bridge Master Plan received on August 6th 2014

46 City Bridges Inspected by TranSystems

Bridge No.	Feature Carried	Feature Intersected
865732	Coconut Isle Drive	Grande Canal
865775	South Ocean Drive	Marion River
865709	NE 55th Street	Landings Inlet West
865710	Bayview Drive	Landings Inlet South
865733	Hendricks Isle Drive	Las Olas Canal
865731	South Gordon Road	Las Olas Canal
865745	Solar Plaza Drive	Rio Canal
865746	Solar Plaza Drive	Rio Placid Canal
865720	Old Dixie Highway	S. Fork Middle River
865707	NE 59th Avenue	Pelican Canal
865777	NE 18th Avenue	Cypress Creek Canal C-14
865727	NE 1st Street	Stranahan Lake
865765	SE 13th Street	Cerro Gordo River
865771	West Lake Drive	Estelle River
865708	Bayview Drive	Longboat Inlet
865748	SW 11th Avenue	N. Fork New River
865752	SW 7th Street	Tarpon River
865729	East Las Olas Boulevard	Himmarshee Canal
865728	SE 8th Avenue	Himmarshee Canal
865721	NE 15th Avenue	S. Fork Middle River
864025	Riverland Road	Branch South N New River
865738	SE 23rd Avenue	Rio Del Mar
865739	SE 23rd Avenue	Rio Castilla Canal

Bridge No.	Feature Carried	Feature Intersected
865740	NE 23rd Avenue	Rio Aragon Canal
865742	NE 23rd Avenue	Rio Giraldo Canal
865741	NE 23rd Avenue	Rio Toledo Canal
865782	SE 25th Avenue	Rio Idlewild Canal
865712	Castle Harbor Isle	Toulon Waterway
865713	NE 41st Street	Toulon Waterway
865772	West Lake Drive	Diane River
865773	West Lake Drive	Lucille River
865774	West Lake Drive	Mercedes River
865770	Laguna Terrace	Diane River
865760	SE 7th Street	Rio Cordova
865761	SE 8th Street	Rio Cordova
865762	SE 9th Street	Rio Cordova
865763	SE 10th Street	Rio Cordova
865764	SE 11th Street	Rio Cordova
865776	SE 2nd Court	Himmarshee Canal
865781	Access Road	Mills Pond Canal
865743	NE 26th Terrace	Rio De Sota
865759	SE 9th Street	Tarpon River
865758	SE 9th Avenue	Tarpon River
865783	Harborage Isle Drive	New River Sound
865789	SE 15th Avenue	Marcheta River
865790	SE 15th Avenue	Carlotta River

The five bridges not inspected by the consultant are under construction by FDOT

Typical Bridge Deficiencies: Concrete Pile Deterioration

Typical Bridge Deficiencies: Concrete Beam Deterioration

Typical Bridge Deficiencies: Concrete Delamination with Exposed Reinforcement

Typical Bridge Deficiencies: Concrete Delamination with Non-Exposed Reinforcement

Typical Bridge Deficiencies: Expansion Joint Deterioration

Typical Bridge Deficiencies: “Functionally Obsolete” Per FDOT

Deficiency Category Statistics

- Concrete pile deterioration 10%
- Deteriorated beam concrete superstructure 10%
- Concrete delamination with exposed reinforcement 28%
- Concrete delamination with non-exposed reinforcement 37%
- Expansion joint deterioration 5%
- Non-compliance functionally obsolete 10%

Short Term Recommendations

- Continue to address minor structural problems which, if unaddressed, will result in additional and larger structural damage to the bridge and require additional capital improvements

Proposed Short Term Repair Cost

No. of Bridges	Construction Cost	Administration Cost	Total
7	$170,000	$8,500	$178,500

Repairs include concrete patching, steel corrosion protection, and aluminum railings.

Long Term Recommendations

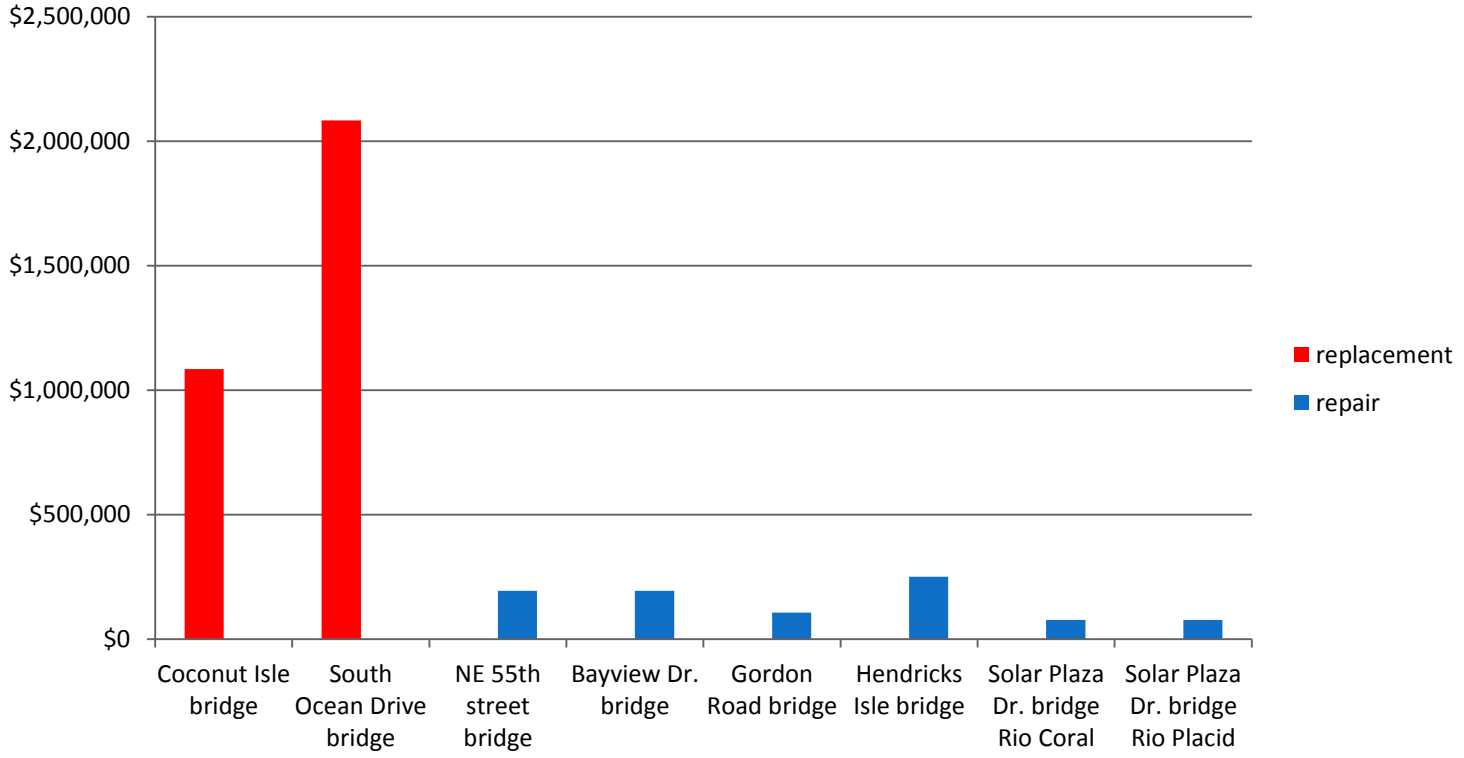
- Fall under 2 categories and are spread over a 20 year period:
  - Repair (Significant structural repair to extend the service life over 20 years)
  - Replacement
- 20 Year plan was based on service life, structural conditions, and location.

Long-term Recommended Activities over 20 years

Repair Type	0 - 5 years	6 - 10 years	11 - 15 years	16 - 20 years	Total
Repair	6	3	14	2	**25**
Replacement	2	0	4	11	**17**
Cost	$4,066,600	$432,050	$9,253,040	$21,384,668	**$35,136,308**

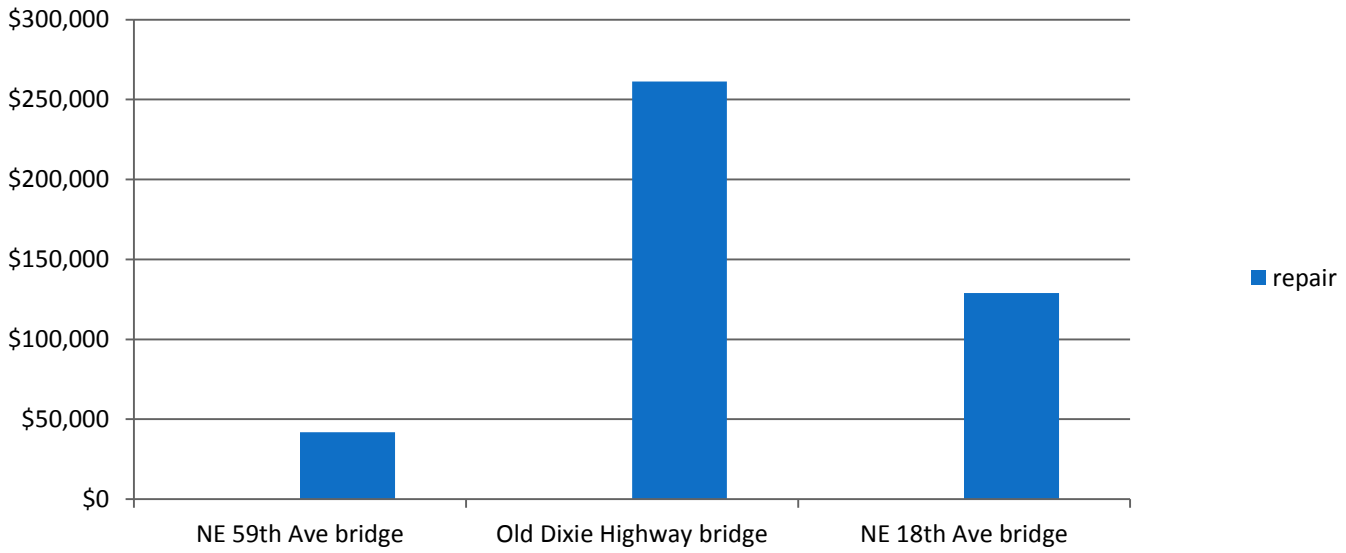
Twelve (12) bridges out of 51 do not require repair/replacement during this 20 year

Long-term 0-5 Year Period



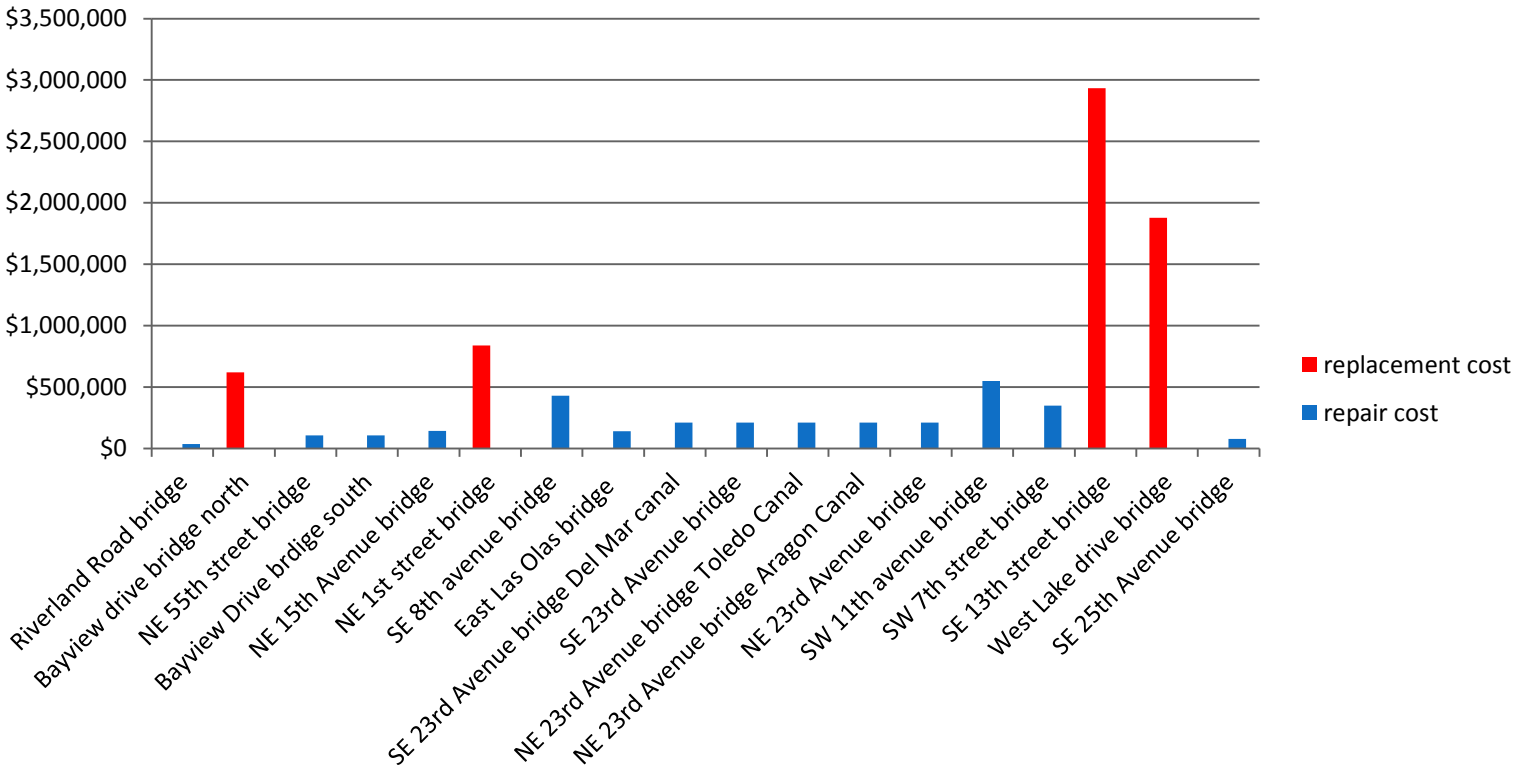
Total repair and replacement costs: $4,066,600

Long-term 6-10 Year Period



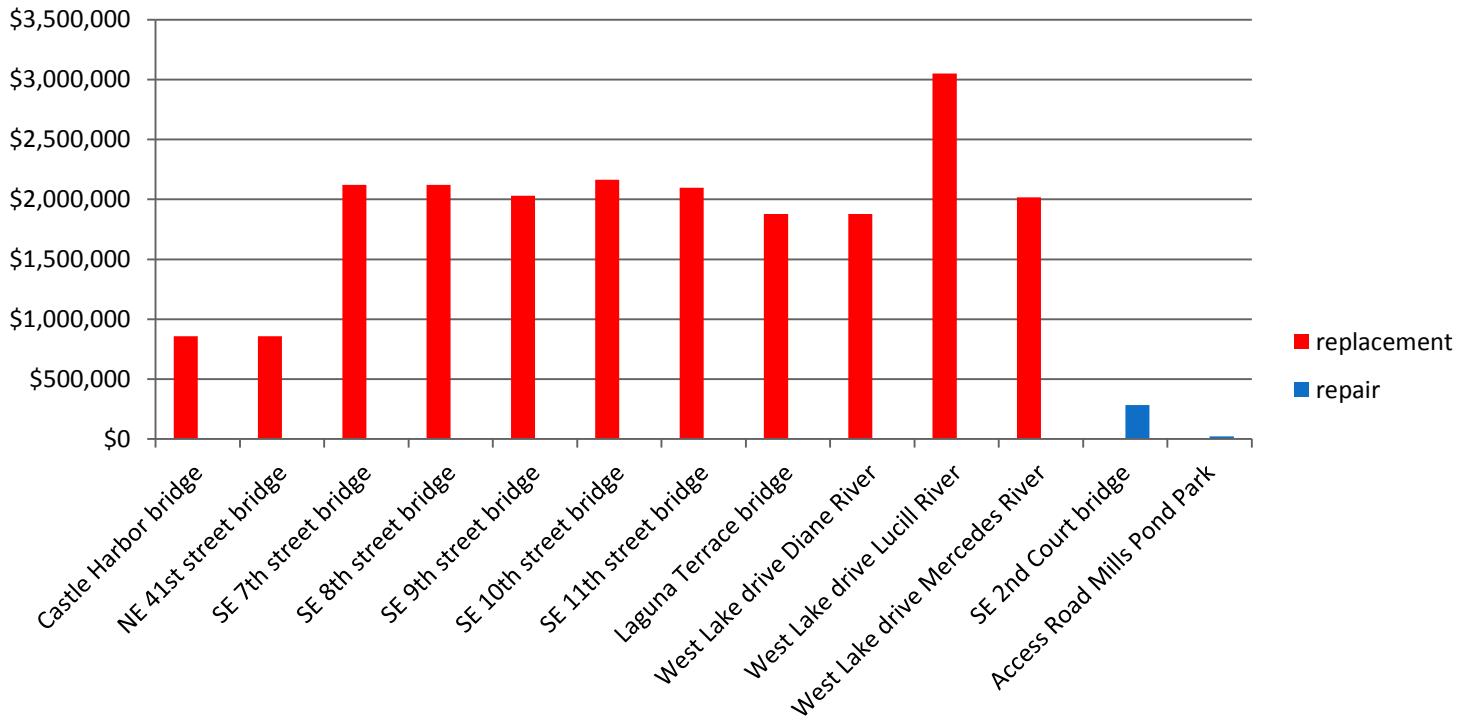
Total repair and replacement costs: $432,050

Long-term 11-15 Year Period



Total repair and replacement costs: $9,253,040

Long-term 16-20 Year Period



Total repair and replacement costs: $21,384,667

Available Budget

		Adopted Budget		
Fiscal year	**Annual Bridge Repair**	**Coconut Isle Bridge Replacement**	**South Ocean Dr. Bridge Replacement**	**Total**
2014 Carry Over	$277,000	$0	$0	$277,000
2015	$800,000	$1,300,454	$200,000	$2,300,454
2016	$280,000	$0	$650,000	$930,000
2017	$100,000	$0	$650,000	$750,000
2018	$100,000	$0	$650,000	$750,000
2019	$750,000	$0	$0	$750,000
Total	**$2,307,000**	**$1,300,454**	**$2,150,000**	**$5,757,454**

Budget per CIP List

Funding Requirement for the First 5-Years

Short Term (this year)	= $ 178,500
Long Term (0-5 years)	= $ 4,066,600
Total (0-5 years)	= $ 4,245,000
Current Funding Identified	= **$ 5,480,454**

Identified funding includes replacement of Coconut Isle and South Ocean Drive bridges

Potential Future FDOT funding is not included in this budget

Funding Challenge
6 – 20 Years

Budget Deficiency in 6-20

- Long term cost = $31,069,757

Q&A

Bridge Locations