City of Atlantic Beach

Stormwater Master Plan Update

February 27 2012

CDM Smith

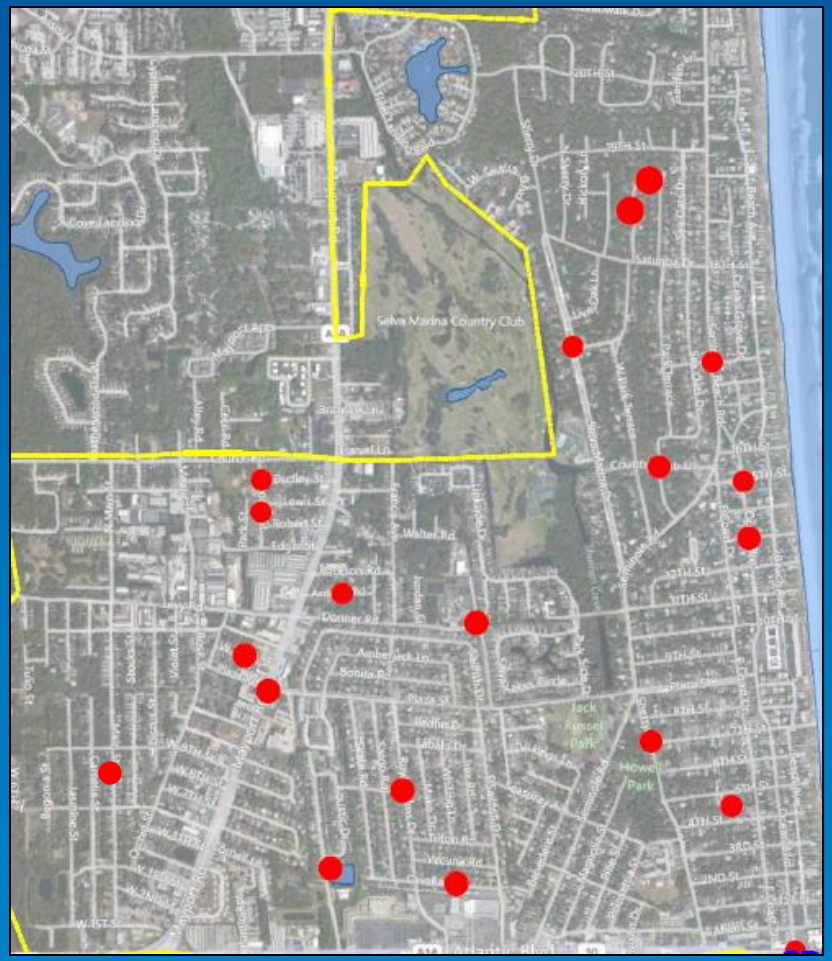
Meeting Purpose: Update City Commission on the Stormwater Master Plan Update

- Overview of StormWater Master Plan (SWMP) Update and City Implementation
- Present Capital Improvement Projects
- Review and Update of Onsite Retention Requirement
- Ditch Rehabilitation Options

The City Implemented 22 Cost-effective Projects to Reduce Flooding Since 1999

Project	Cost
1. 1999 Stormwater Improvements	$415,000
2. W. 13th Street Drainage Improvements	$39,000
3. Sherry Drive Reconstruction	$1,375,000
4. Selva Marina Improvements	$317,000
5. Core City	$4,784,000
6. Dewees/Coquina Drainage & Paving Imps.	$134,000
7. Church Rd. Water & Road Imps.	$152,000
8. Plaza Road Turn Lane for Post Office	$55,000
9. Jordan Street Paving & Drainage	$109,000
10. Town Center Phase III	$130,000
11. Country Club Lane	$84,000
12. George & Dudley Drainage Improvements	$98,000
13. Seminole Ditch Headwall	$13,000
14. Ocean Blvd. - 13th Street Drainage	$139,000
15. Selva Grande Ditch Headwall	$26,000
16. Ocean Blvd. - 14th-16th Drainage	$272,000
17. George St. Sidewalk & Drainage	$36,000
18. Ardella Road Drainage Project	$4,000
19. Royal Palms Stormwater Project	$3,125,000
20. Cavalla Road Bulkheads	$9,000
21. Selva Tierra Ditch Improvements	$26,000
22. Hopkins Creek Regional Pond	$1,573,000
Total	**$12,915,000**

These Projects Also Saved the City Over $8 Million in Capital Costs and Preserved Historic Parks, Trees, and Wetlands



- Improved Flood Control LOS
  - T. S. Fay
- Increased Treatment and Water Quality Benefits
- New Park

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This Update Addresses

- Additional guidance and options for onsite stormwater volume controls (LID)
- Remaining nuisance ponding and system connectivity
- Ditch safety and increased maintenance
- FDEP NPDES MS4 permit support and emerging regulations
- GIS Coordination
- Potential sea level rise impacts on the system

Capital Improvement Plan (CIP)

The Projects Were Scored by CDM and City Staff for the Following Categories

Public Safety

- Based on potential risk from stormwater flooding and ponding

Daily Traffic Impacted

- Based on road classification and other access, with higher scores for arterial/collector roads

Nuisance to Residents

- Based on observed field conditions, topographic evaluation, and input from City staff

History of Complaints Received

- Based on complaints submitted by citizens to City staff

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Project Ranking

		Ranking Criteria				
CDM Rank	Location	Public Safety (max 40)	Daily Traffic Impacted (20 or 10)	Nuisance to Residences (max 20)	History of Complaints Received (max 20)	**Total (max 100)**
Evaluated Areas						
1	East Coast Drive - Atlantic to Ahern	40	20	20	20	**100**
2	Seminole Road Ditch	40	20	0	15	**75**
3	Salt Air Drainage Upgrades - Magnolia (100 block)/Poinsetta Streets (100 & 200 Block)/Pine St	10	10	20	20	**60**
4	Oceanwalk ditch (between OW and Selva Norte)	20	0	20	20	**60**
5	100 / 200 / 300 Block Seminole	10	20	10	10	**50**
6	1080 West Plaza at Carnation and Gladiola at West Plaza	10	10	10	20	**50**
7	**Begonia street – West 6th to 9th**	10	10	20	10	**50**
8	**Main Street between Levy and Stewart**	30	10	0	10	**50**
9	Mealy Street industrial area and Dudley Street west of Donner Park	10	10	20	10	**50**
10	Robert St/ Lewis St/ Dudley St Ditch	20	0	10	20	**50**

- **A total of 42 problem areas were visited and evaluated as part of the evaluation.**

Recommended CIP

Rank	Project	Conceptual Capital Cost Estimate
1	East Coast Drive - Atlantic to Ahern	$ 360,000
2	Seminole Road Ditch	$ 3,400,000
3	Salt Air Drainage Upgrades - Magnolia (100 block)/Poinsettia Streets (100 & 200 Block)/Pine St	$ 250,000
4	Oceanwalk ditch (between OW and Selva Norte)	$ 0
5	100 / 200 / 300 Block Seminole	$ 580,000
6	1080 West Plaza at Carnation and Gladiola at West Plaza	$ 120,000
7	Begonia street – West 6th to 9th	$ 350,000
8	Main Street between Levy and Stewart	$ 530,000
9	Mealy Street industrial area and Dudley Street west of Donner Park	$ 25,000
10	Robert St/ Lewis St/ Dudley St Ditch	$ 171,000
	TOTAL	$ 5,846,000

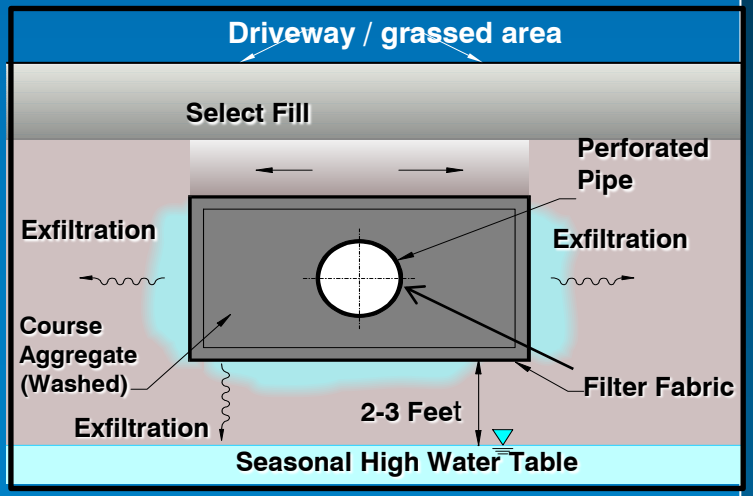
Onsite Stormwater Controls and Options

Current Ordinance Overview

- Application of Low Impact Development concepts to redevelopment by more than 10% or 400 sq-ft of impervious area
- No net loss of onsite surface storage (to avoid displacing historic onsite stormwater onto adjacent parcels and to maintain existing aquifer recharge)
- No increase in runoff volume for the 25 year 24 hour design storm (to avoid increases in runoff volume, flooding and pollution to offsite while maintaining aquifer recharge) – SJRWMD Standard

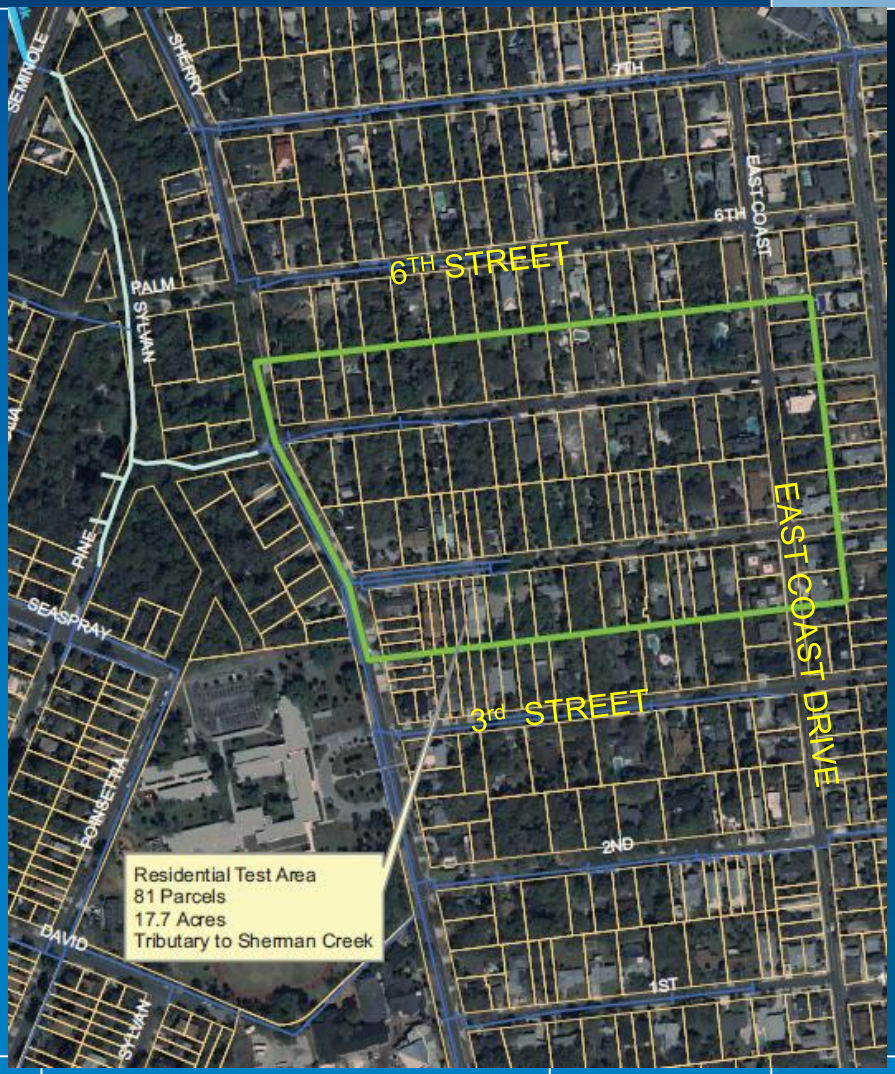
Onsite Stormwater Control Evaluation

- Test area
- Evaluation for existing and potential redevelopment conditions
  - Impervious area,
  - Groundwater table
- Considered four LID BMPs
  - Swales/retention
  - Rain gardens/bioretention
  - Exfiltration trench
  - Underground storage

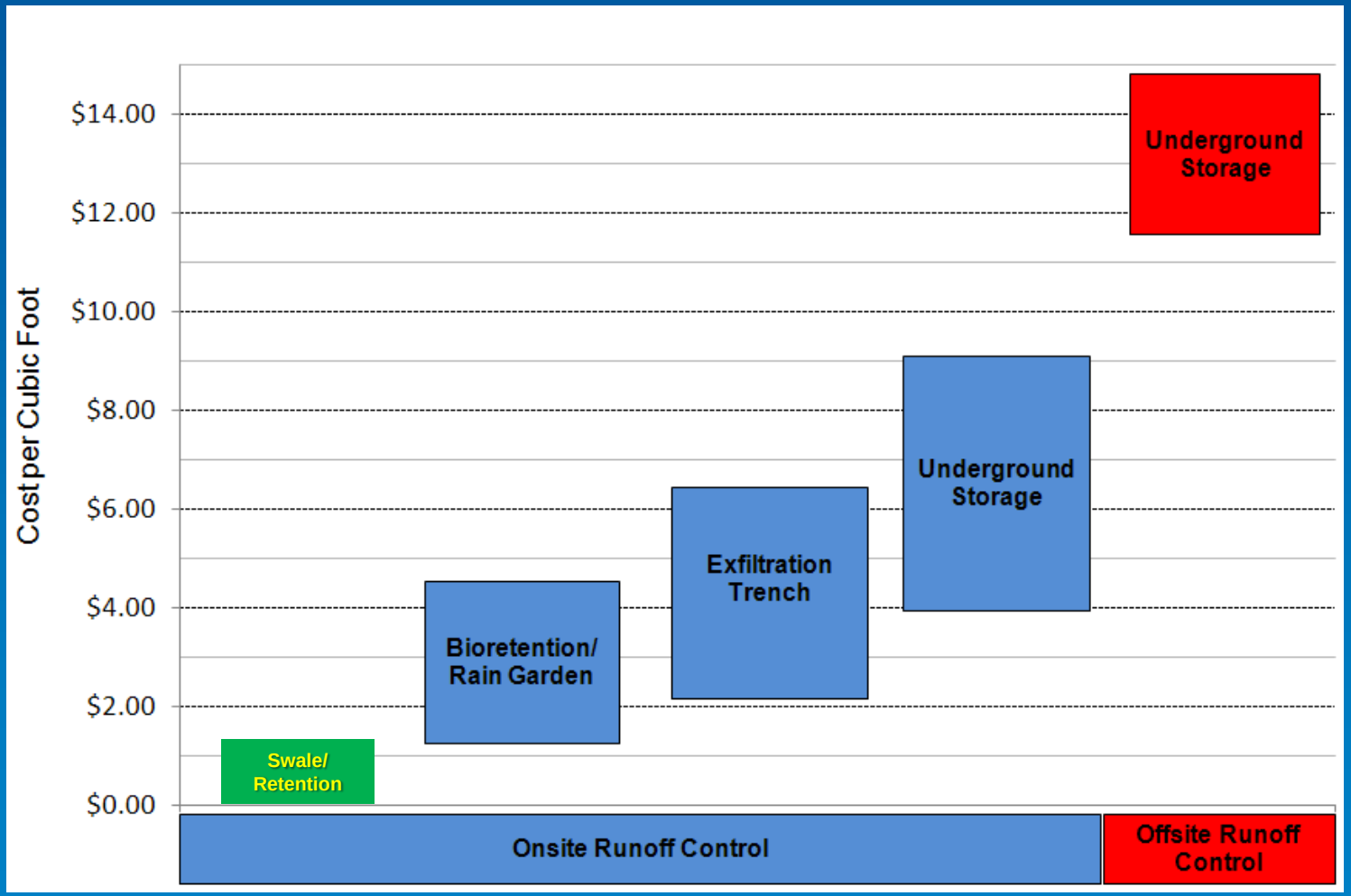


Test Area Evaluated

- 81 Parcels
- Total Area: 17.7 Acres
- Existing parcels impervious Range: 0-78%
- Composite : 32% impervious



Onsite Stormater Controls are the Most Cost-Effective and Practicable Option



Conceptual Costs to Meet the Current Ordinance

- Swales or yard retention are the most cost-effective controls and allow for dual use
- Based on all parcels applying the same BMP type

	Swale/ Retention	Bioretention	Exfiltration Trench	Underground Vault	Offsite Underground Vault
Test Area Total Cost	$18,300	$144,100	$210,700	$352,500	$673,000
Ratio	36.8	4.7	3.2	1.9	1.0
Cost per Parcel	$200	$2,900	$4,300	$7,200	$13,700
Cost/cu-ft	$0.40	$2.80	$4.10	$6.80	$13.10

The City is already providing a credit for infiltration

- Credit for storage available between the BMP and 1+ ft above the seasonal high groundwater elevation
- Further credit refinement would require additional groundwater and soil data
- Maintain the current credit based on depth to groundwater, given the current data available

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Ditch Maintenance and Capital Improvements

CDM Inspected Several Major Ditches

- Flood Control
- Traffic/Pedestrian Safety
- Tree Protection/City aesthetics
- Water Quality
- Private Property
- Life Cycle Cost


Robert Street Ditch–FDOT


Levy Road


Seminole Road

Ditch Rehabilitation and Maintenance Evaluations

- Ownership and Access
  - Easements
  - Rights-of-way (ROWs)
- Level of Service
- Maintainability
- Equipment

Ditch rehabilitation considers several factors

Adjacent Structures

- Potential settling and vibration.

Adjacent Roads

- Excavation trench considerations and maintenance of traffic

Environmental Resource Permit

- Cannot increase peak flows or flood levels

Maintenance

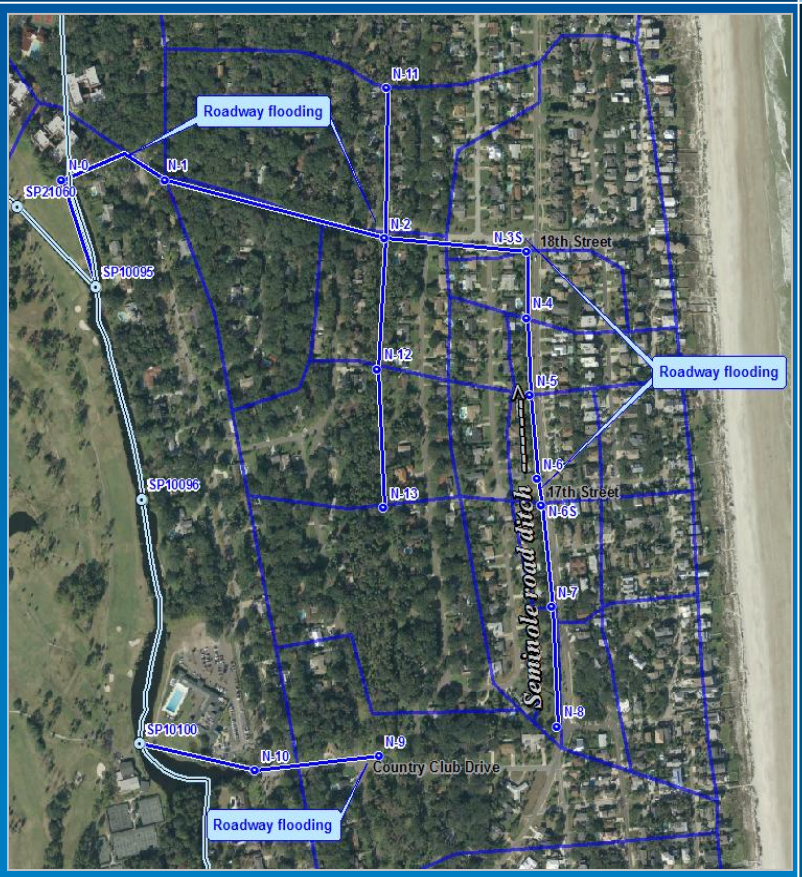
- City needs an accessible easement or ROW

Seminole Road Ditch Scored the 2nd Highest Score Citywide due to Adjacent Arterial Road

- Safety concerns
- City has planted trees to reduce hazard
- Frequent complaints

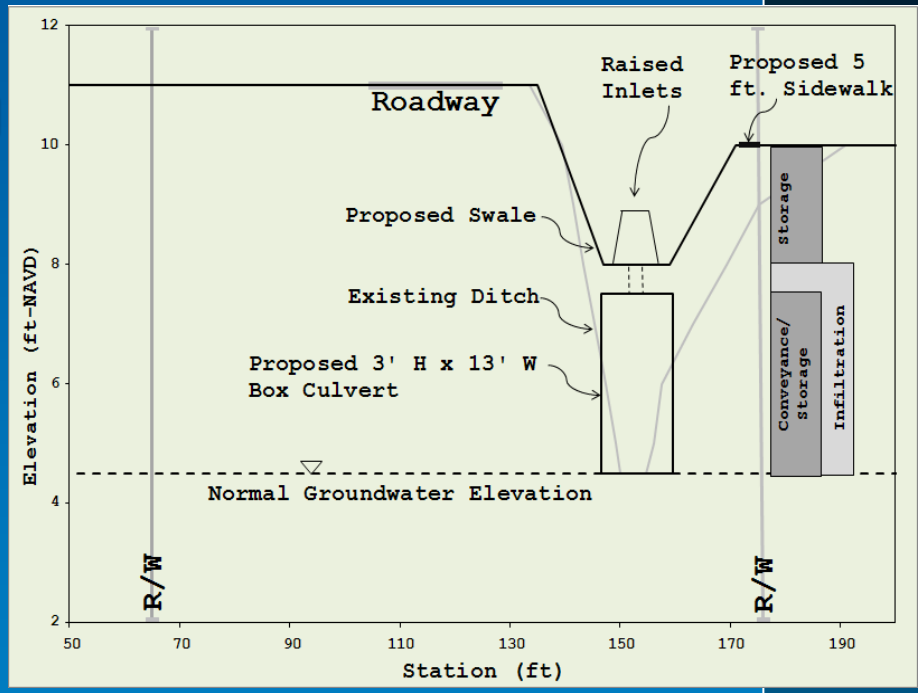
Seminole Road Ditch Evaluation

- Project ranked # 2 citywide
- Detailed engineering evaluation
- Comparison of existing condition and 2 alternatives
- Required to maintain hydraulic conveyance to avoid increasing peak flow rates downstream



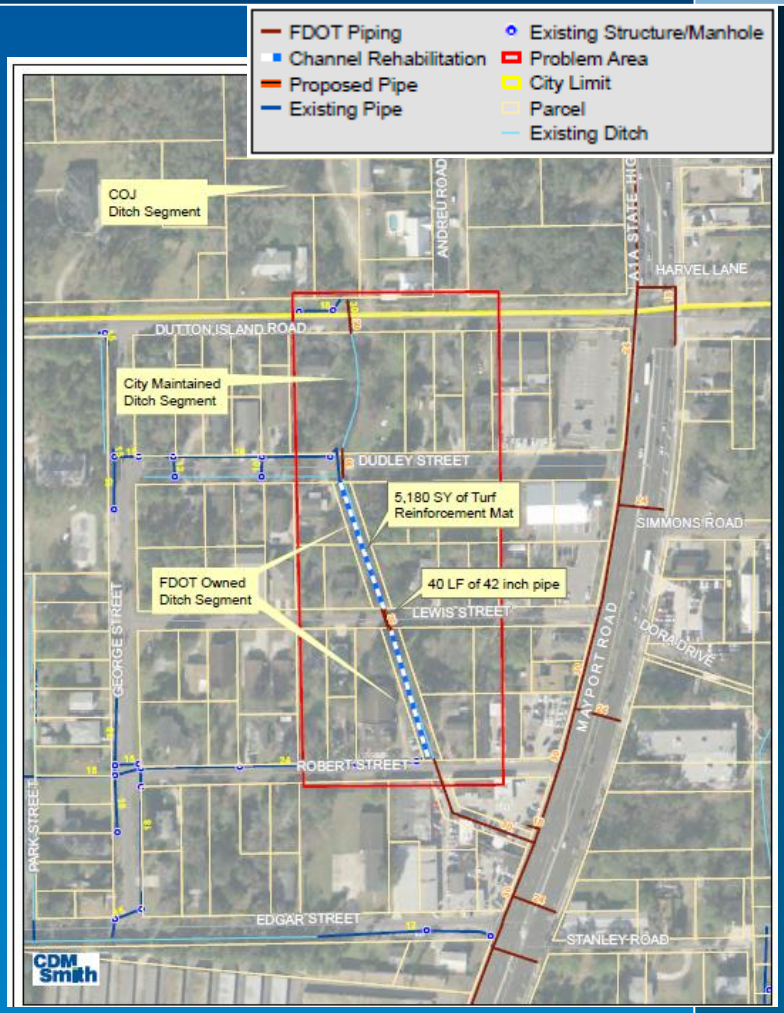
Seminole Road Ditch – Potential Improvement

- Ditch enclosure to increase traffic safety
  - 3 x 13 concrete box culvert
  - 2,140 ft of roadside swale with raised inlets
- Cost Estimate: $2.5 M - $3.4 M
  - Includes excavation trench adjacent to Seminole Road
  - Includes dewatering and MOT
  - Includes engineering and permitting
- Other potential solutions could be considered:
  - Regrade ditch and add retaining wall
  - Additional outfall to Sherman Creek or the Sherman Creek Canal



Robert Street Ditch is owned by FDOT and the options available to the City are limited to north of Dudley Street

- FDOT:
  - Rehabilitation of existing ditch
  - Upsize of existing 30 inch pipe at Lewis Street to reduce peak velocities
- Atlantic Beach
  - Potential upsize of existing 30 inch pipe at Dudley Street
- Jacksonville
  - Maintain the portion of the ditch north of Dutton Island Road



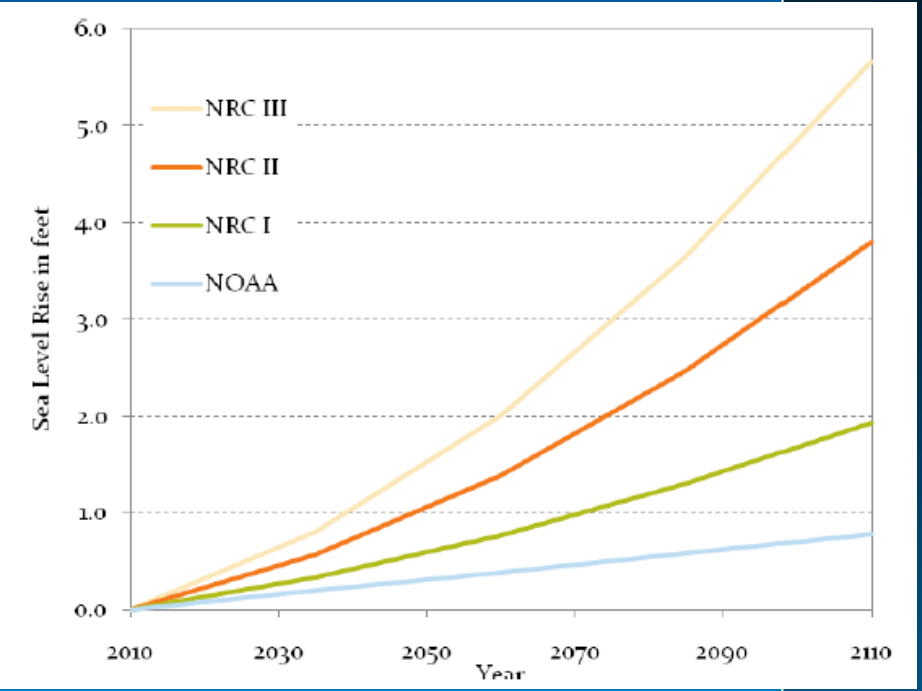
Robert Street Ditch

- CDM estimated a conceptual cost for a typical ditch (500 ft long, 6 ft deep, and 35 ft wide)
- Construction cost is highly dependent on site specific factors

Sea Level Rise Considerations

Potential Sea Level Rise

- Uncertainty – Different projections
- Projections include measured data (NOAA), as well as 3 sea rise scenarios based on USACE guidance
- Support long term planning in low lying areas which may experience higher and more frequent tides
- Projects should include corrosion prevention measures to extend their useful life



	Sea Level Rise in Feet			
Year	NOAA	NRC I	NRC II	NRC III
2010	0.0	0.0	0.0	0.0
2035	0.2	0.3	0.6	0.8
2060	0.4	0.8	1.4	2.0
2085	0.6	1.3	2.5	3.6
2110	0.8	1.9	3.8	5.7

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