



STORMWATER

Presented to
Palm Coast City Council
July 26, 2011

City Council Goals & Objectives

- Five Year Goal – Maintain a Safe Community & provide quality services
- Top Priority – Street Valley Gutters
- Top Priority - Pipe Replacement Program
- Top Priority - Swales
- Top Priority - Stormwater System Hydraulic Modeling
- Major Project – Canal Control Structure 1 Per Year



Infrastructure Inventory for Stormwater Drainage System

- 19 Major Canal Control Structures
- 12 Minor Canal Control Structures
- 72 Major Roadway Crossing Culverts
- 1,555 Minor Roadway Crossing Culverts
- 145 Culverts Leading into Saltwater Canals
- 369 Valley Gutters Crossing Roadways
- 1,100+ Miles of Roadside Swales
- 154 Miles of Drainage Ditches
- 58 Miles of Freshwater Canals
- 26 Miles of Saltwater Canals
- Drainage Inlets, Spillways, Catch Basins, etc.





I-1 Structure



I-4 Structure



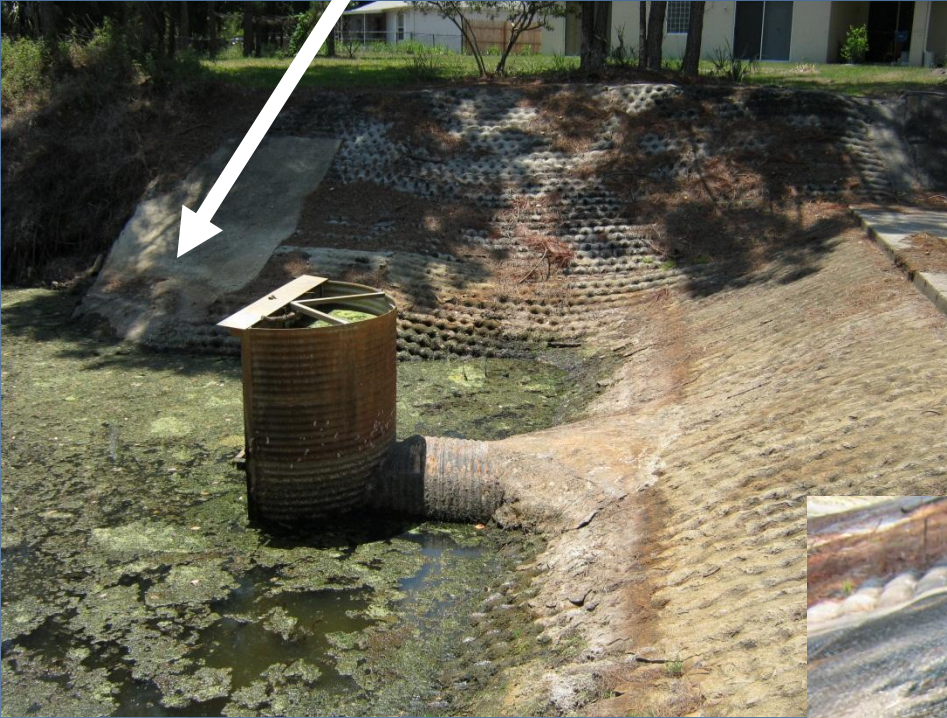
I-6 Structure



ITT Structure



P-1 Structure





L-4 Structure



Canal Control Structures

How Were They Rated?

Structural Condition Rating:

Rating physical condition of the structure:

pipe condition, riser and gate condition, concrete cracking, erosion and blockage of waterway down stream.

Hazard Condition Rating:

Rating potential hazard of a catastrophic failure of the structure:

Potential for roadway damage, property damage, flooding and erosion.

Total Rating:

Priority for replacement was based on the total sum of both ratings for each structure.



Canal Control Structure Condition Rating Chart

Structural Condition Rating	# of Structures
6 – Failure, non-functioning	2
5 – Needs replacement/ repair	7
4 – Functioning /Deteriorating	4
3 – Functioning / Minor Deterioration	10
2 – Replaced	3
1 – Recent replacement	5
Total	31



L-1 Structure
Structural Rate = 6



BA-1 Structure
2010 Completed
Structural Rate = 1



Canal Control Structure Hazard Rating Chart

Potential Hazard Rating	# of Structures
6 – Roadway loss, flooding, blockage	5
5 – Possible road loss, blockage	3
4 – Road damage, blockage	11
3 – Severe erosion, water loss	4
2 – Minor erosion, water loss	5
1 – Water loss	3
Total	31



M-2 Structure
Mulberry Creek
Hazard Rating = 1



R-1 Structure
Royal Palms Canal
Hazard Rating = 6





Canal Control Structure Total Rating Chart

Total Rating	# of Structures
Worse 11	2
9	8
8	4
7	6
6	4
5 or less	7
Total	31



**BT-2 Structure – Total Rating = 11
Bird of Paradise Drive on Bellaire Waterway
Deterioration is Underwater**

2012 Budget = 1 Replacement

Canal Control Structures 5-Year Plan



<u>Structure</u>	<u>Waterway</u>	<u>Roadway</u>	<u>Rating</u>	<u>Year</u>
R-1	Royal Palms	Belle Terre Parkway	11	2012
BT-2	Bellaire	Bird of Paradise Drive	11	2013
L-1	Sesame	Sentinel Trail	9	2014
M-2	Mulberry	Old Kings Road North	9	2014
I-1	Iroquois	Underwood Trail	9	2015
I-4	Ulysses (N)	Underwood Trail	9	2015
I-6	Ulysses (S)	Underwood Trail	9	2015
L-4	Royal Palms	Royal Palms	9	2016

Major Roadway Crossing Culverts

Rating Condition	# of Crossings
6 – Failure, non-functioning	0
5 – Needs replacement/repair	0
4 – Functioning /Deteriorating	13
3 – Functioning / Minor Deterioration	42
2 – Replaced	9
1 – Recent replacement	8
Total	72



**Emergency – Florida
Park Drive June 2010
Cost \$666,244**



Major Roadway Crossing Culverts



London Drive



Sesame Boulevard

Completed 2011
\$ 430,391.18



Emergency Repairs

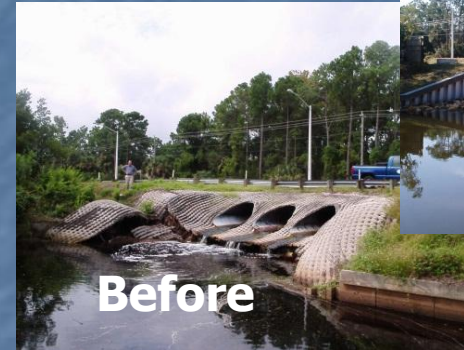


Before



After

**Emergency
Rippling Waterway
Structure Cost \$85,000
July 2010**



Before

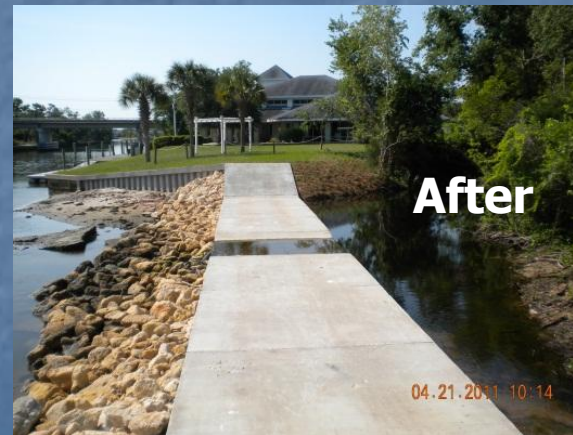


After

**Emergency – East Side
Crandell Cove Cost \$154,000
Jan. 2010**



Before



After

**Emergency - Mulberry Creek
Headwall Replacement Cost \$251,000
April 2011**



Planned Construction vs. Emergency Repair Cost

Florida Park Drive

Estimated planned construction = \$ 369,110
Actual emergency repair = \$ 666,244

Mulberry Creek Structure

Estimated planned construction = ~\$180,000
Actual emergency repair = \$ 251,000

Rippling Waterway Structure

Estimated planned construction = ~\$ 75,000
Actual emergency repair = \$ 85,000

D-10 Structure

Estimated planned construction = ~ \$ 60,000
Actual emergency repair = \$ 63,325

Crandell Cove

Estimated planned construction = ~ \$ 90,000
Actual emergency repair = \$ 154,000

Total Actual Emergency Cost = \$ 1,219,569
Total Planned Cost = \$ 774,110
Difference = \$ 445,459



Minor Roadway Culverts

Rating Condition	# of Culverts
6 – Failure, non-functioning	0
5 – Needs replacement/repair	82
4 – Functioning /Deteriorating	71
3 – Functioning / Minor Deterioration	~ 1,226
2 – Replaced	~ 135
1 – Recent replacement	41
Total	1,555



65 Burroughs Dr

65 Burroughs Drive



06.09.2011 09:50



2012 Budget = 30 Replacements

Minor Roadway Culvert Replacement Completed



65 Burroughs Drive

Minor Roadway Culverts

58 Burbank Dr



Minor Roadway Culvert – White Hall

White Hall Dr



Minor Culverts Draining into Saltwater Canals



Rating Condition	# of Culverts
6 – Failure, non-functioning	0
5 – Needs replacement/repair	18
4 – Functioning /Deteriorating	54
3 – Functioning / Minor Deterioration	72
2 – Replaced	0
1 – NEW Replaced < yrs.	1
Total	145



7 Ferguson Court

**Completed 2011
\$ 4,500.00**



2012 Budget = 2 Replacements

Valley Gutter Installations

104 of 369 Completed



2012 Budget = 10 Replacements

In Conjunction with Street Resurfacing Program

Swale Maintenance & Rehabilitation



Priorities are Complaint Driven



RECOMMENDED 5-YEAR PLAN



2012 Capital

Structures - 1
Major Crossings - 0
Minor Crossings - 30
To Saltwater Canals - 2
Valley Gutters - 10
Swales – 40 Miles

2013 Capital

Structures - 1
Major Crossings - 1
Minor Crossings - 30
To Saltwater Canals - 4
Valley Gutters - 10
Swales – 40 Miles

2014 Capital

Structures - 1
Major Crossings - 0
Minor Crossings - 30
To Saltwater Canals - 8
Valley Gutters – 10
Swales – 40 Miles

2015 Capital

Structures - 1
Major Crossings - 1
Minor Crossings - 30
To Saltwater Canals - 8
Valley Gutters - 10
Swales – 40 Miles

2016 Capital

Structures - 1
Major Crossings - 0
Minor Crossings - 30
To Saltwater Canals - 8
Valley Gutters - 10
Swales – 40 Miles

Future Capital

Structures – 18 remaining
Major Crossings – 53 remaining
Minor Crossings – 1,229 remaining
To Saltwater Canals – 114 remaining
Valley Gutters – 215 remaining
Swales - Ongoing



QUESTIONS ?







14
Rockinghorse Dr



01/31/2011 13:54



48 Kashmir



LLOLEETA



6 Rolland Ln



01/31/2011 14:05



Rollingsands



White Hall Dr



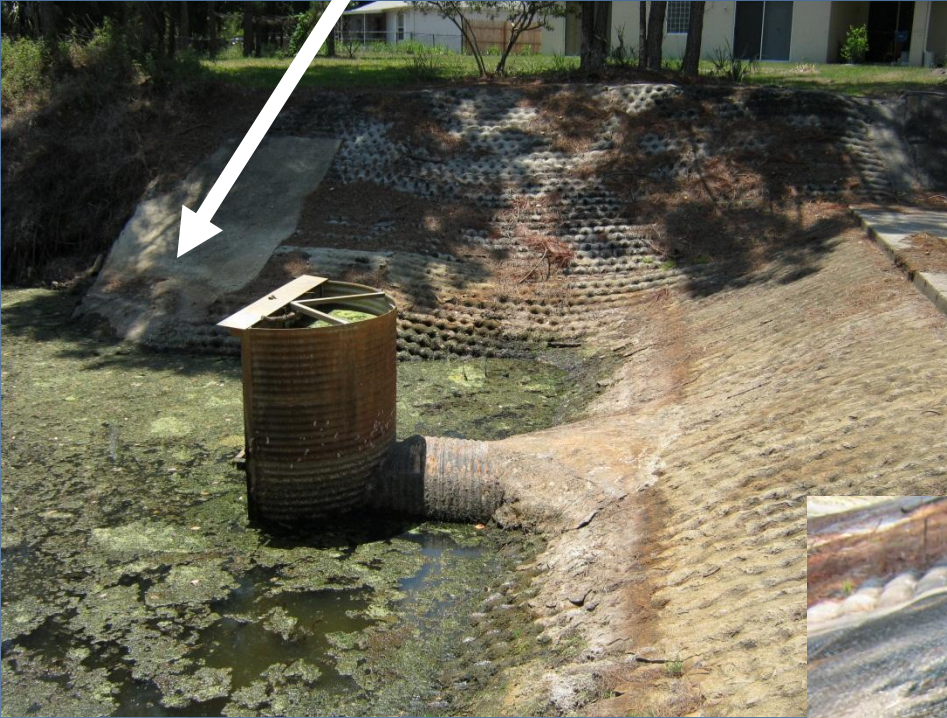


2 Rocking Horse Drive

14Woodshire Ln



P-1 Structure



ITT Structure





I-1 Structure

