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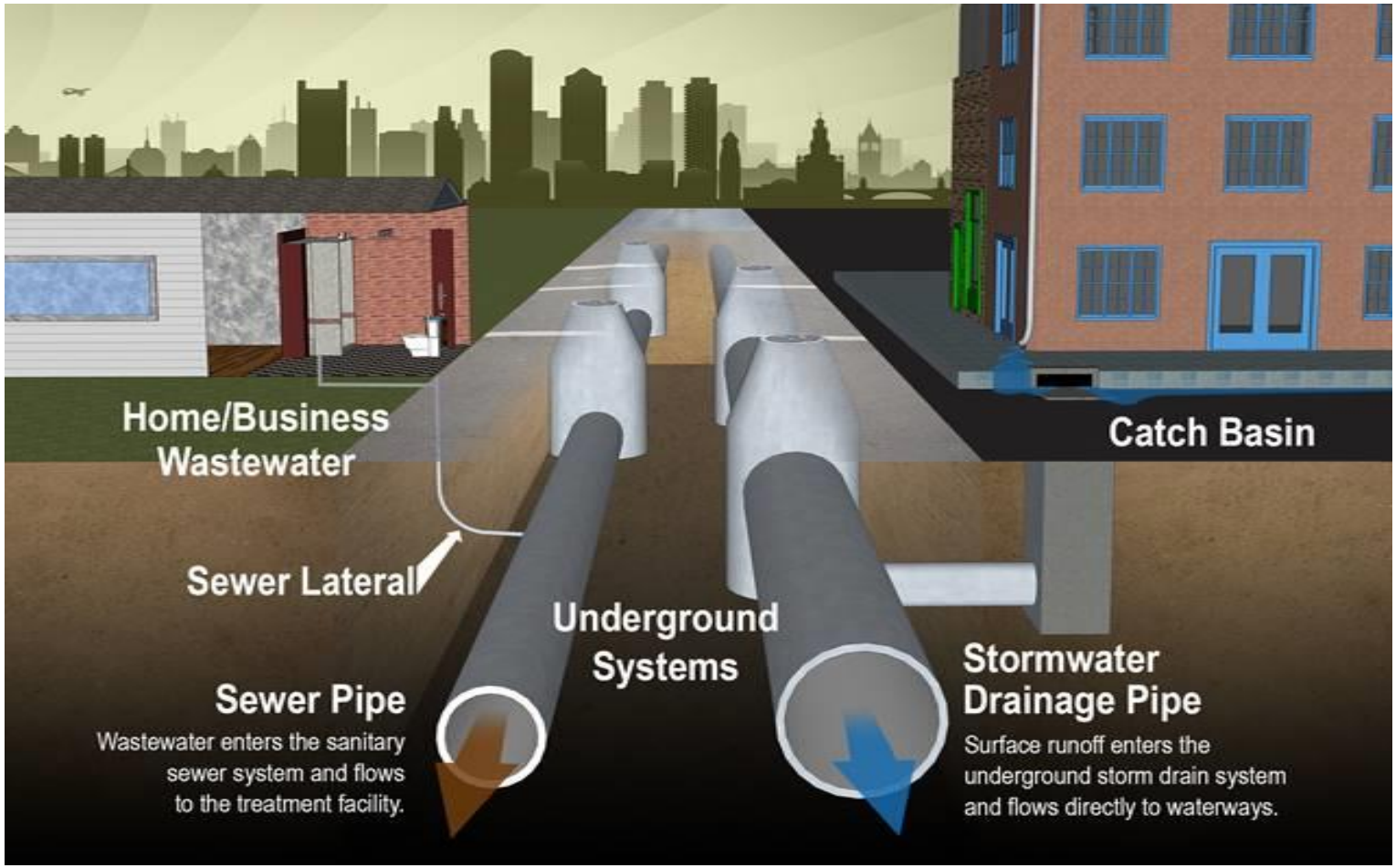
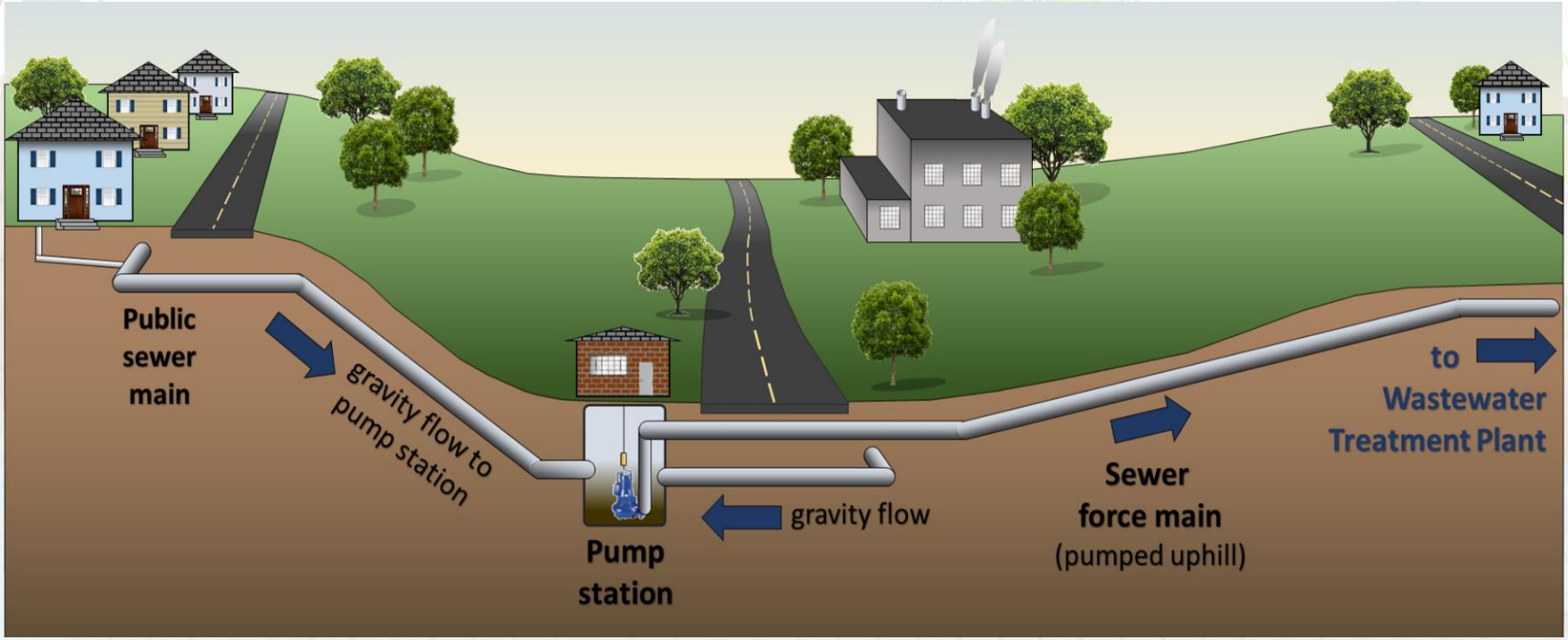
Infrastructure Update

December 8, 2020

What's Under Our Feet?



Wastewater



The City's system collects wastewater via 188,260' of Gravity Sewer & 830 Manholes, which flows to 12 Pumping Stations that pump the wastewater, through 10,310' of Force Main for treatment at the FTL plant

The Master Plan

- **Water, Wastewater, Stormwater**
  - Complete evaluation of the system infrastructure
  - Review of system maintenance operations
- **Capital Improvement Plan**
  - Short-term and long-term improvements
  - Addressing climate resiliency
  - Planning for growth

Excessive Rainfall and Tropical Storm Eta

1. Rainfall Amounts

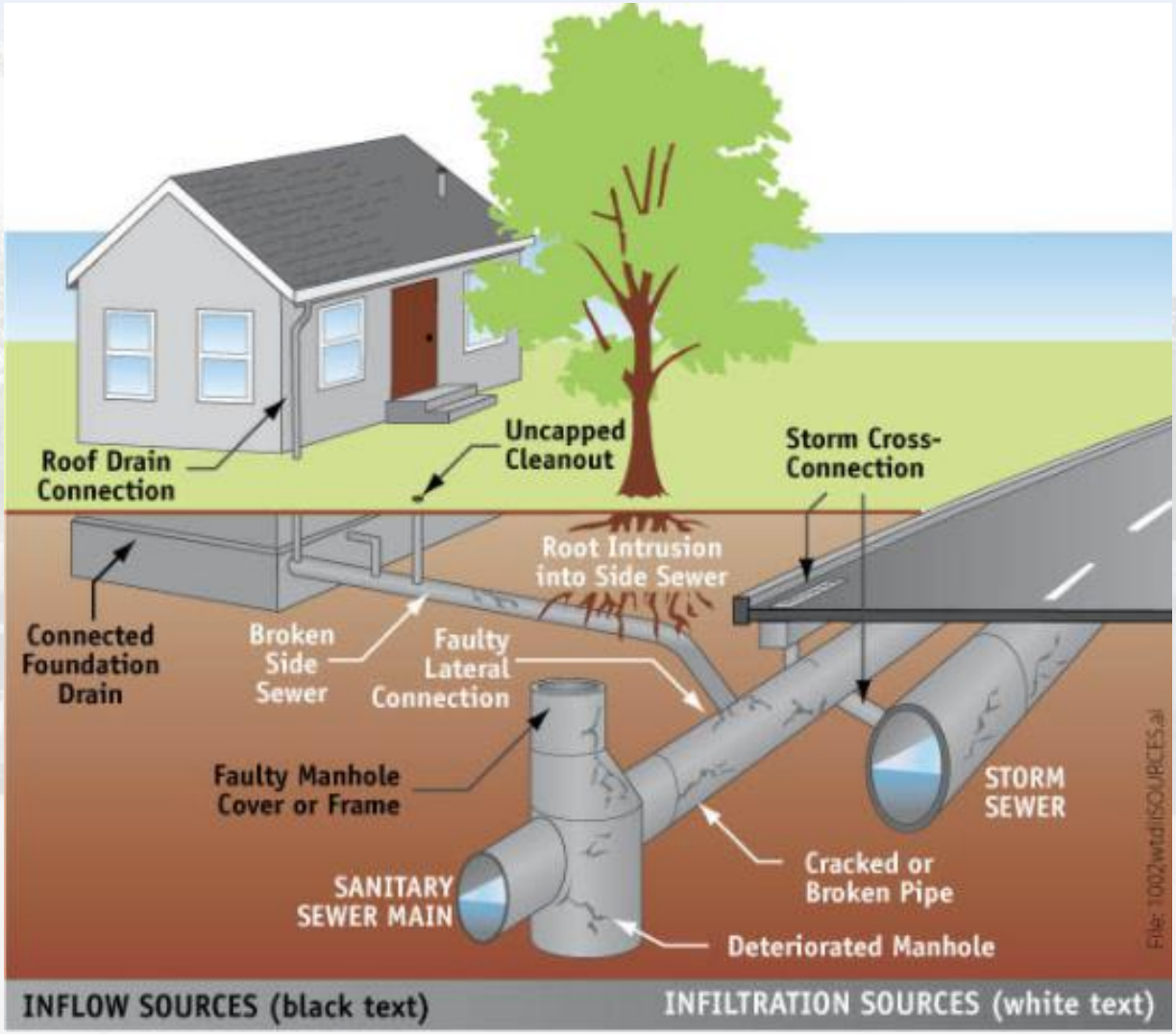
2. Flow Levels

3. Impacts to wastewater and stormwater

Inflow and Infiltration

- Infiltration and inflow (I&I) is water flow in a sanitary sewer system that occurs during and after a rainfall through holes, cracks, joints and manholes. I&I is the main cause of sanitary sewer overflows (SSO) to streets, or nearby receiving waters.
- The extent of infiltration also correlates with the condition of aging sewers.

Inflow and Infiltration



How the Wastewater Flows

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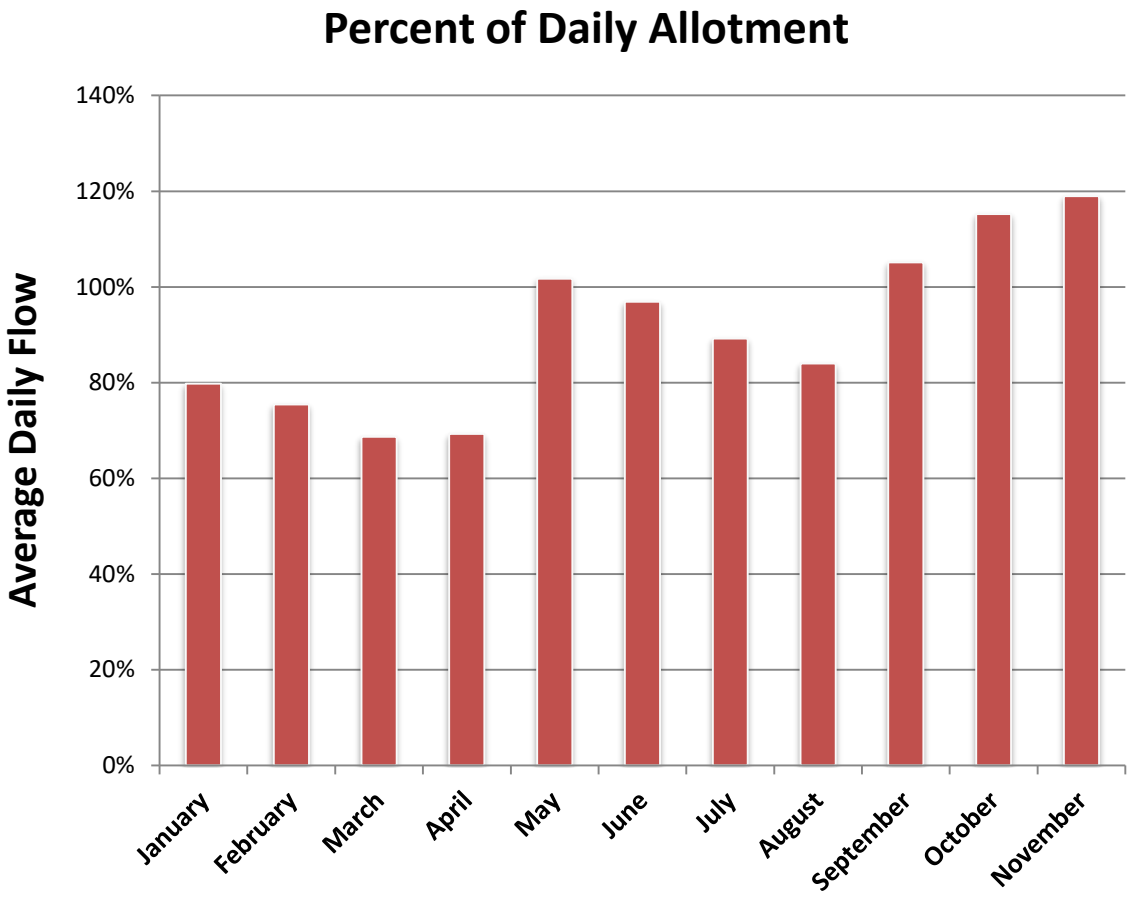
Flow Levels



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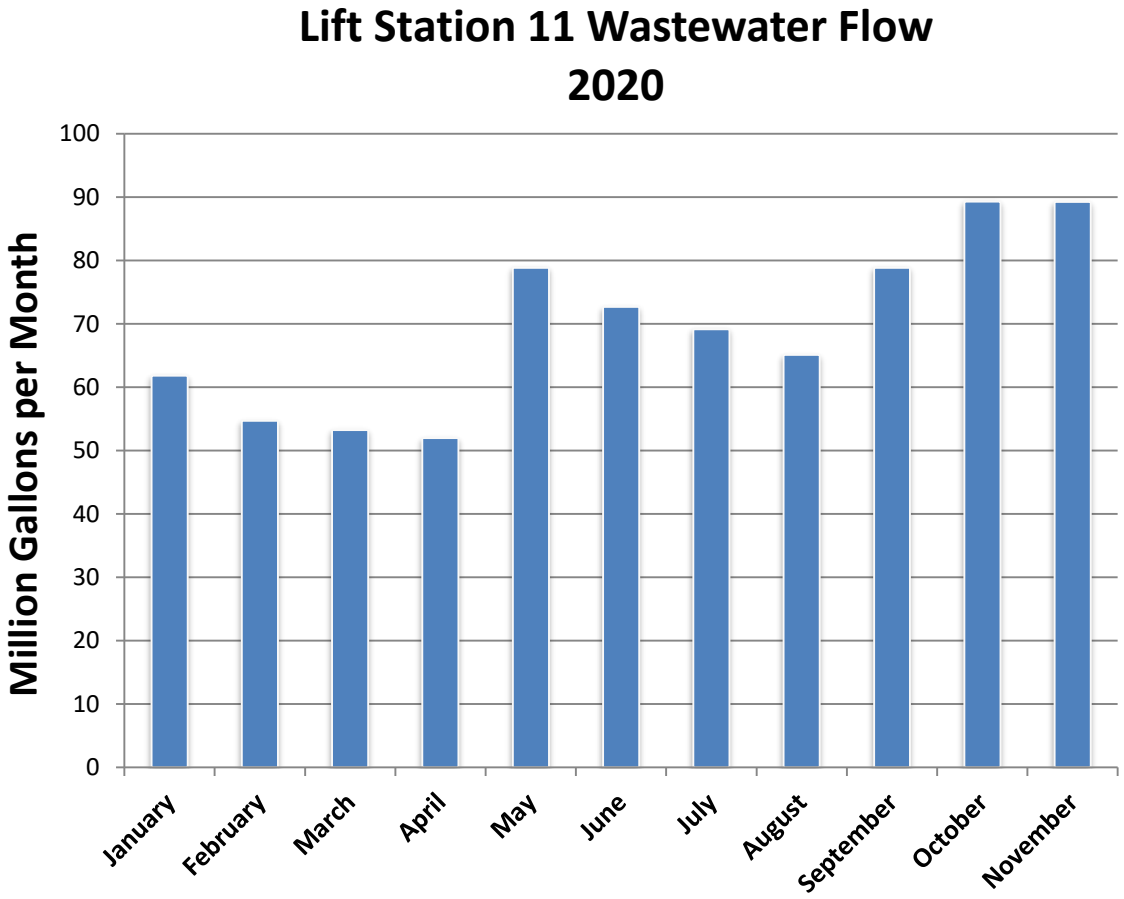
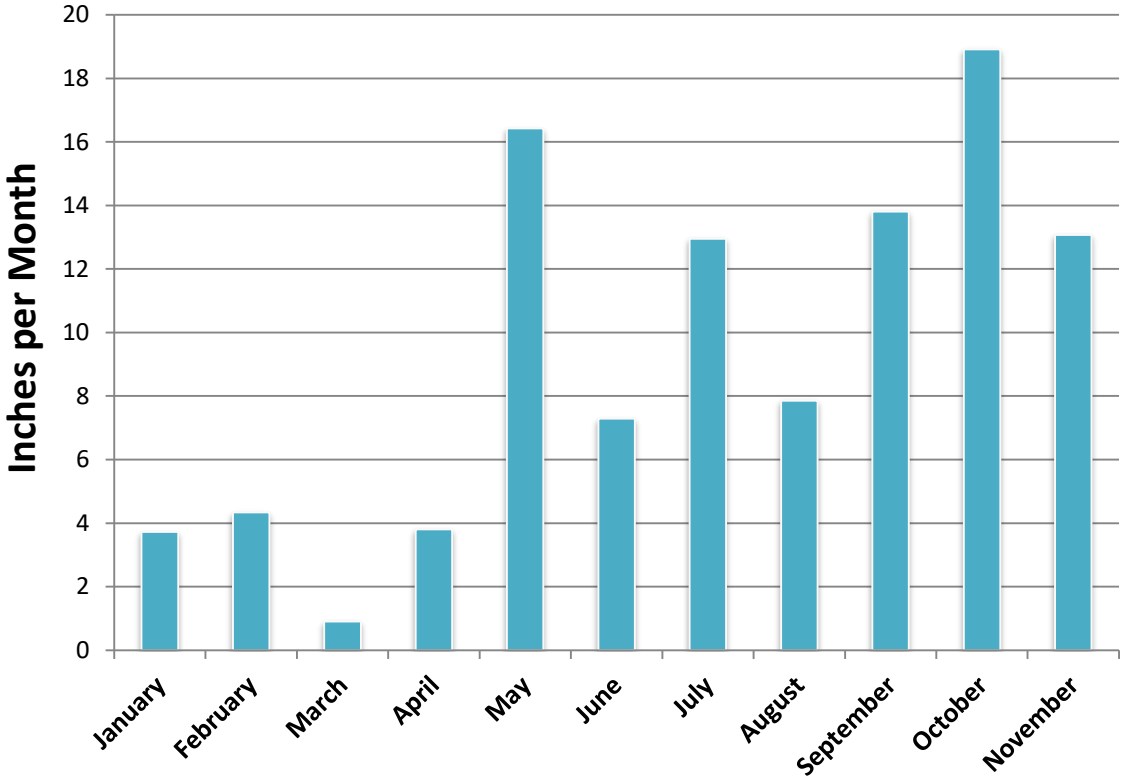

Lift Station 11 Wastewater Flow
2020
Million Gallons per Month
100
90
80
70
60
50
40
30
20
10
0
January
February
March
April
May
June
July
August
September
October
November

Lift Station 11 Rainfall 2020



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Short Term Solutions

To Sewer System Issues

- Assessment of the system through camera directed to problem areas to determine where and why the problem is the most acute

- Repair of obvious leaks

10-Year CIP Wastewater System Projects

Station No. 1 | Replacement - $649k

Station No. 8 | Odor Control - $9k

Station No. 4 | Replacement - $556k

Station No. 4 | Service Basin Lining (I&I project) - $169k

Station No. 2 | Replacement - $575k

Station No. 5 | Basin Lining (I&I project) - $1.4M

Station No. 10 | Service Basin Lining (I&I project) - $1.1M

Station No. 5 | Electrical and Force Main Replacement - $364k

Station No. 10 | Rehabilitation - $188k

Station No. 7 | Rehabilitation and Force Main Replacement $318k

Station No. 6 | Force Main Replacement - $327k

Station No. 8 | Electrical and Force Main Replacement - $191k

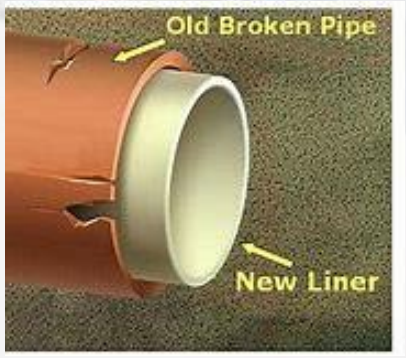
Station No. 9 | Rehabilitation - $142k

TOTAL – $6.0 MIL

Strategies and Techniques for Maintaining Pipes

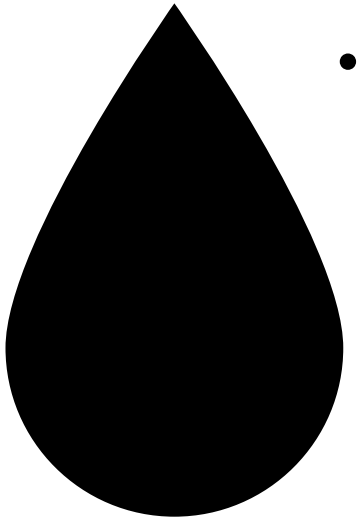
CCTV Inspection Program

Sewer Lateral Lining Program



Sewer Lining Program

Stormwater Management

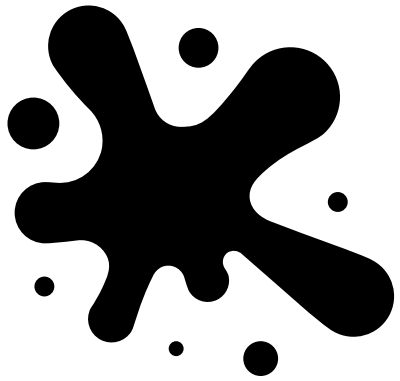


- **National Pollutant Discharge Elimination System ("NPDES") Monitoring Program**
  - Inter-Local Agreement with Broward County to perform the testing
  - Reducing the amount of pollutants entering the local waterways

Stormwater Management

- **NPDES Activities that must be tracked:**
  - Street sweeping (distance and amount of debris removed)
  - Catch basins inspected, cleaned, repaired and installed
  - Stormwater pipe inspected, cleaned, repaired and installed
  - Outfalls inspected, cleaned, repaired and installed
  - Adopt-A-Street activities
  - Waterway Clean-up statistics
  - Certifications and training received by employees
  - Public education and outreach activities

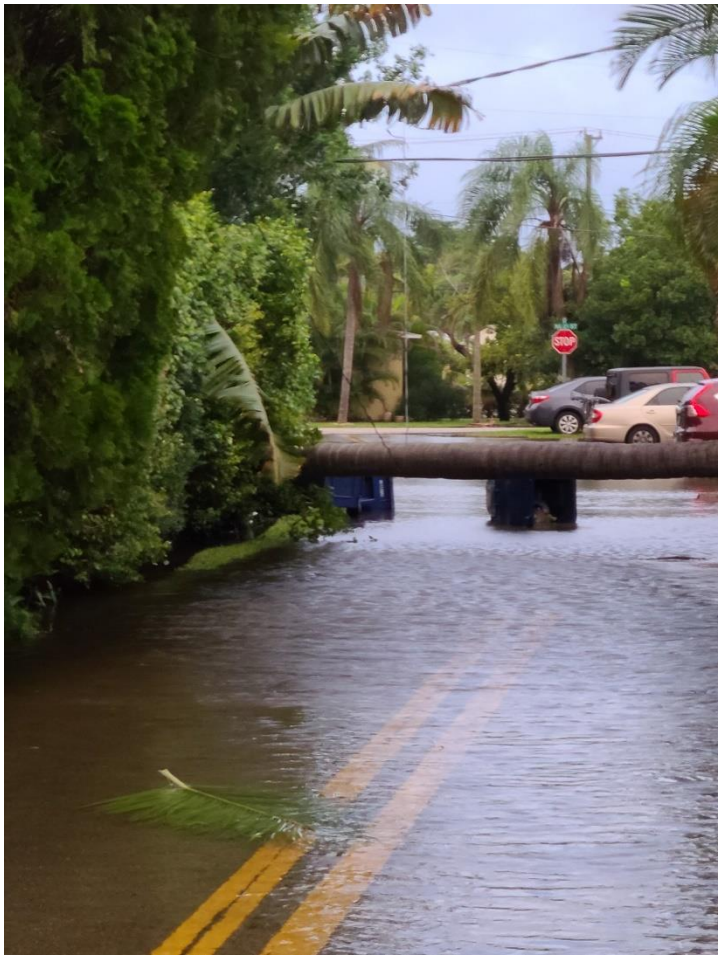
Stormwater Management



- Groundwater levels based on rainfall
- High Tides
- Infill and infiltration (I &I)
- Drain clogs
- Catchbasins and drains are meant to be leaky pipes!

Elevation Levels

Among the lowest elevations in the state – and we are an island!



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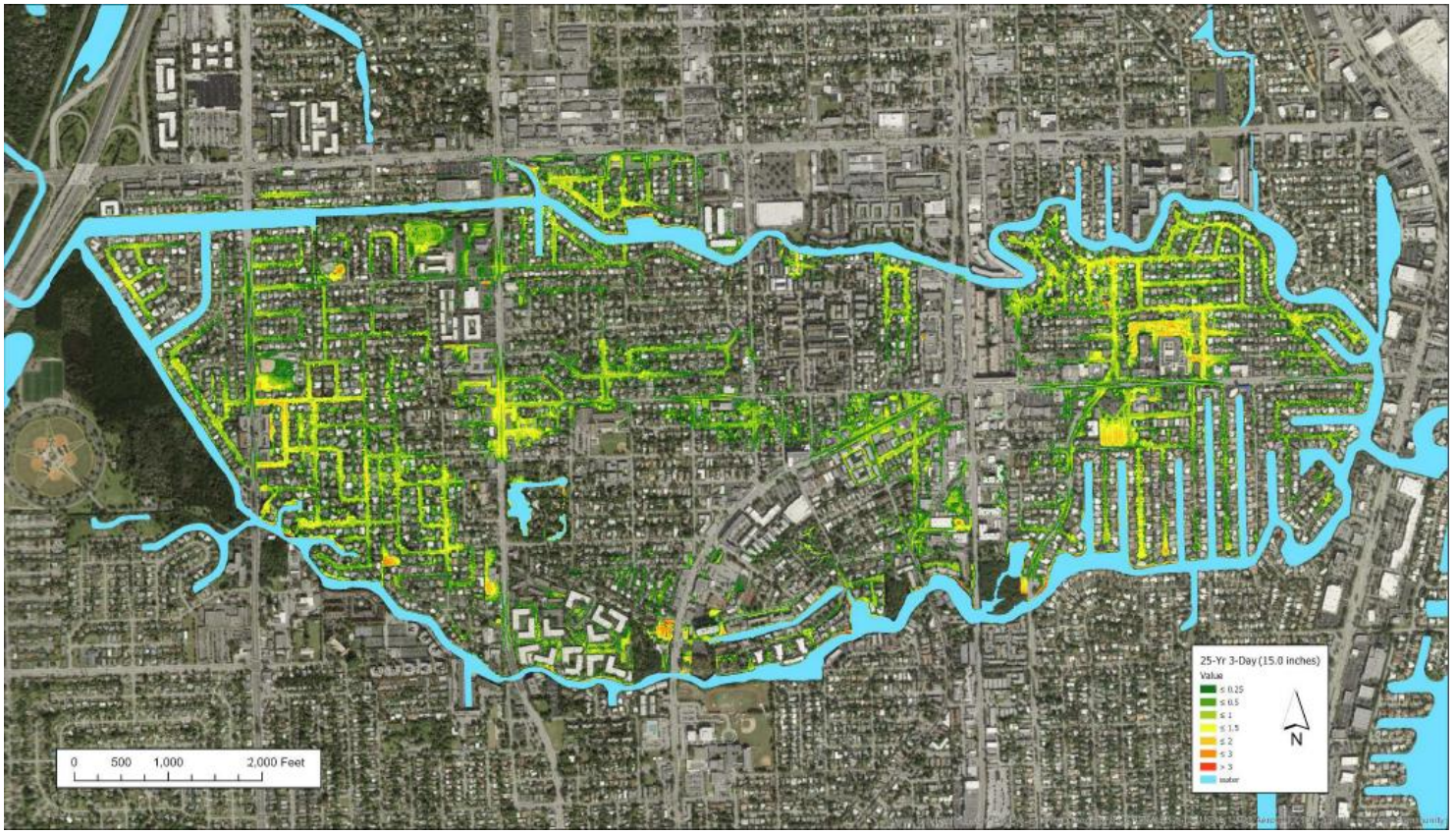

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Short Term Solutions

To Stormwater Drainage Issues

- Assessment of the system

Stormwater System – 10 Year Horizon

- **Projects Designed to:**
  - Improve existing Level of Service (LOS)
  - Meet regulatory requirements
  - Improve stormwater runoff quality

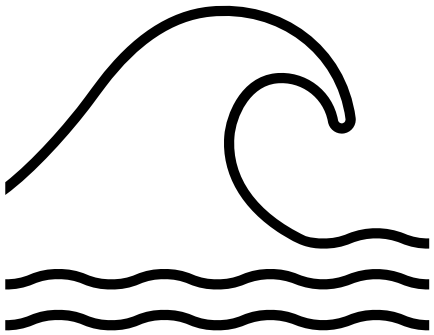
- 12 projects proposed Level of Service score +19%

Existing Roadway LOS			Proposed Roadway LOS		
Severity	Miles	Weighted	Severity	Miles	Weighted
1	7.80	7.80	1	7.14	7.14
2	2.39	4.78	2	0.93	1.86
3	0.22	0.66	3	0.04	0.11
	Total Weighted	13.24		Total Weighted	9.11
	Total Roads (mi)	35.68		Total Roads (mi)	35.68
	LOS Score	**0.628**		**LOS Score**	**0.745**

10 Year CIP Stormwater Projects

Project		Estimated Cost of Recommended Improvements
Project #1: Coral Gardens Drive Outfalls & Stormwater System Improvements	$	707,346.00
Project #2: NE 28th Drive Outfall Improvements & Project #3: NE 14th Avenue Outfall Improvements	$	361,800.00
Project #4: NW 24th Street to NW 22nd Street Stormwater System & Outfall Improvements	$	497,596.50
Project #5: NW 3rd Avenue Stormwater System & Outfall Improvements	$	698,766.75
Project #6: NE 30th Street Outfall Improvements	$	337,149.00
Project #7: NE 28th Drive Outfall Improvements	$	108,040.50
Project #8: NE 7th Terrace Stormwater System and Outfall & Project #9: NE 17th Avenue Stormwater Outfall Improvements	$	318,822.75
Project #10: NE 27th Drive Stormwater Exfiltration Trench	$	246,091.50
Project #11: NW 25th Street Stormwater Exfiltration Trench	$	658,678.50
Project #12: NE 25th Street & NE 8th Terrace Stormwater Exfiltration Trench	$	593,682.75
Total:	**$**	**4,527,974.25**

Sea Level Rise



- 6 inches since 1985
- Projected to rise by 1.8 feet by 2060
- King tides add another 1.5 feet

A Recent Study

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Future Development

- The Master Plan incorporates increased system capacity in anticipation of future redevelopment.

10 Year Wastewater CIP with Growth

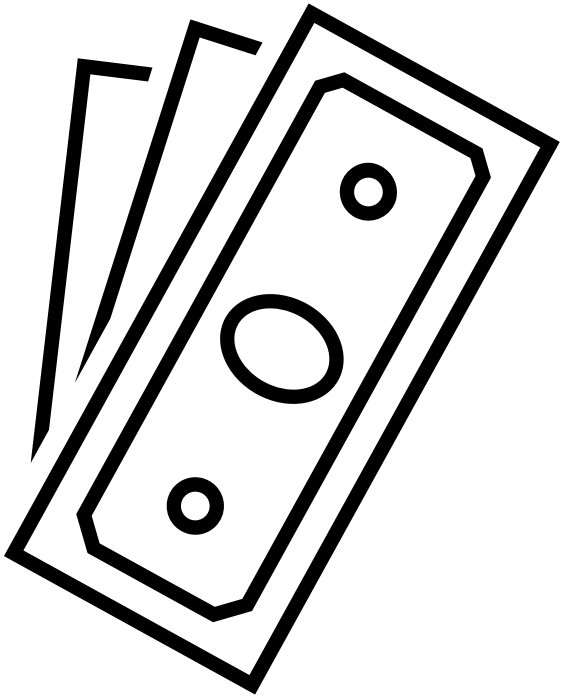
Project		Estimated Cost of Recommended Improvements
Project #1 - Lift Station No. 11 Pump Impeller Upgrade*	$	22,477.50
Project #2 - Lift Station No. 1 Replacement & Force Main Replacement*	$	671,005.82
Project #3 - Lift Station No. 4 Service Basin Lining	$	199,390.41
Project #4 - Lift Station No. 4 Replacement	$	593,735.67
Project #5 - Lift Station No. 2 Replacement	$	612,908.98
Project #6 - Lift Station No. 5 Service Basin Lining*	$	1,571,529.40
Project #7 - Lift Station No. 5 Electrical, Pumps & Force Main Replacement*	$	566,845.09
Project #8 - Gravity Main Trunkline Replacement*	$	5,502,991.50
Project #9 - Lift Station No. 3 Service Basin Lining*	$	1,256,724.52
Project #10 - Lift Station No. 3 Rehabilitation & Force Main Replacement*	$	1,549,449.00
Project #11 - Lift Station No. 7 Service Basin Lining*	$	409,862.23
Project #12 - Lift Station No. 7 Rehabilitation & Force Main Replacement*	$	659,002.84
Project #13 - Lift Station No. 6 Pump & Force Main Replacement*	$	514,622.36
Project #14 - Lift Station No. 8 Odor Control, Electrical, Pump & Force Main Replacement	$	342,856.80
Project #15 - Lift Station No. 10 Service Basin Lining	$	1,273,275.45
Project #16 - Lift Station No. 10 Rehabilitation	$	225,374.40
Total:	**$**	**15,972,051.96**

10 Year Horizon CIP Summary

Water	**$13.7M (upgrades)**
Water	**$ 0.1M (upsize for redevelopment)**
Wastewater	**$ 6.0M (upgrades)**
Wastewater	**$ 2.9M (upsize for redevelopment)**
Stormwater	**$ 4.5M**
Staffing	**$ 0.1M**
TOTAL	**$27.3M**

Funding Sources

- Utility Rate Structure Study
- Impact Fee assessment
- Federal infrastructure funding
- General Funds
- Bonds



Next Steps

- Assess, identify and mitigate immediate needs based on Tropical Storm Eta impacts
- Clear all storm drains
- Prioritize Key projects in the Master Plan
- Assess and identify funding sources
- Establish collaborations with neighboring cities
- Educating residents about the Plan and how they can help
- Create public outreach campaign