

Presentation to the Infrastructure Task Force Advisory Committee

October 19, 2020 – 2:00 pm

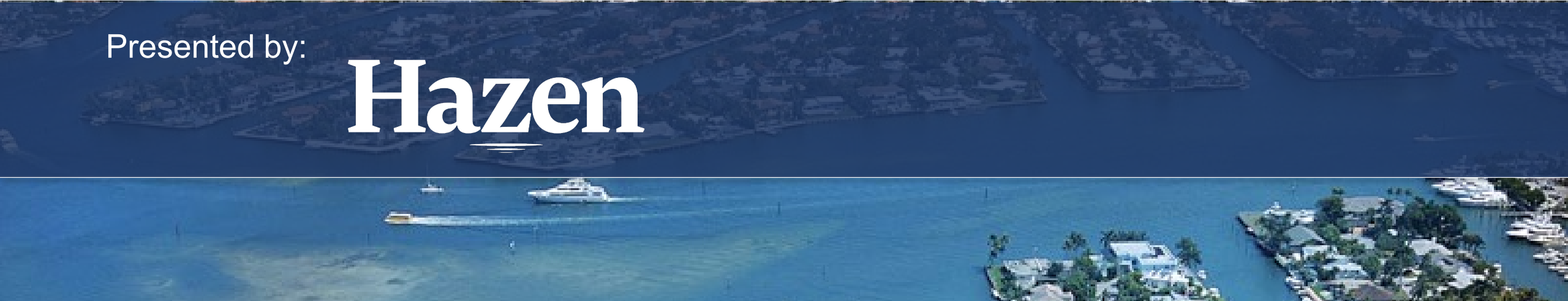


CITY OF FORT LAUDERDALE



Presented by:

Hazen

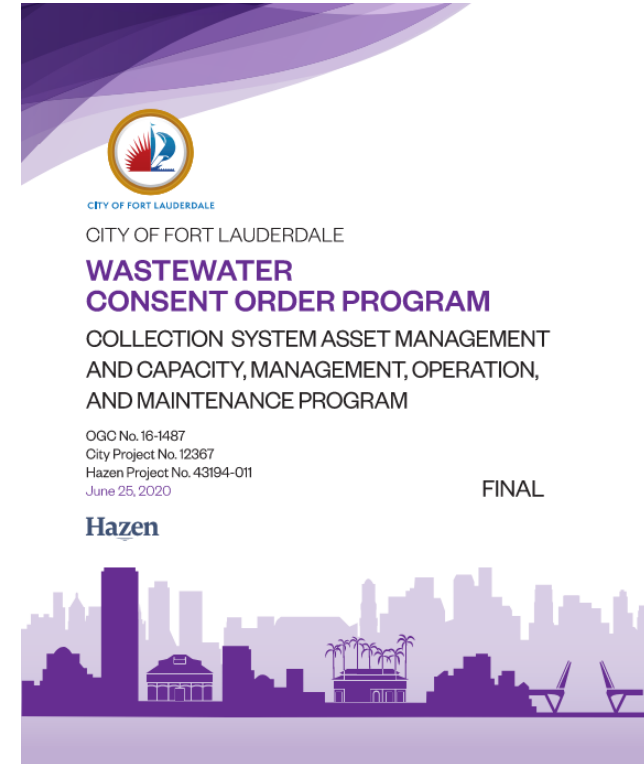


What is an AM-CMOM?



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- AM-CMOM = Asset Management- Capacity Management, Operation and Maintenance
- Required by Consent Order
- Based on EPA Guidelines
- The AM portion resulted in development of maps to visualize the risk of the collection and transmission system



How is Risk Calculated?



Risk Assessment Criteria (Risk = LOF x COF)	GM	PS	FM
Likelihood of Failure (LOF)			
Pipe age and material	X		X
Potential for overflow		X	
Condition		X	
Expected service life		X	
Pipe break information (2014–2018)			X
Force main peak operating pressures			X
Pipe layout profile			X
External and internal physical factors (includes proximity to saltwater intrusion)	X		X
Pipe maintenance (includes cleaning and previous inspections)	X		X
Consequence of Failure (COF)			
Financial impact (including diameter, depth, surface type)	X		X
Community impact (residential and essential services, environmental compliance, surface type)	X		X
Financial impact (horsepower)		X	
Community impact (average dry weather flow, residential and essential services, environmental compliance)		X	
Proximity to potable water wellfield or private water wells			X
System reliability			X

COF, LOF and Risk Score for Various Assets



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- Gravity System
- Pump Station
- Force Main System

Gravity LOF



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Legend

· Manhole

■ Pump Station

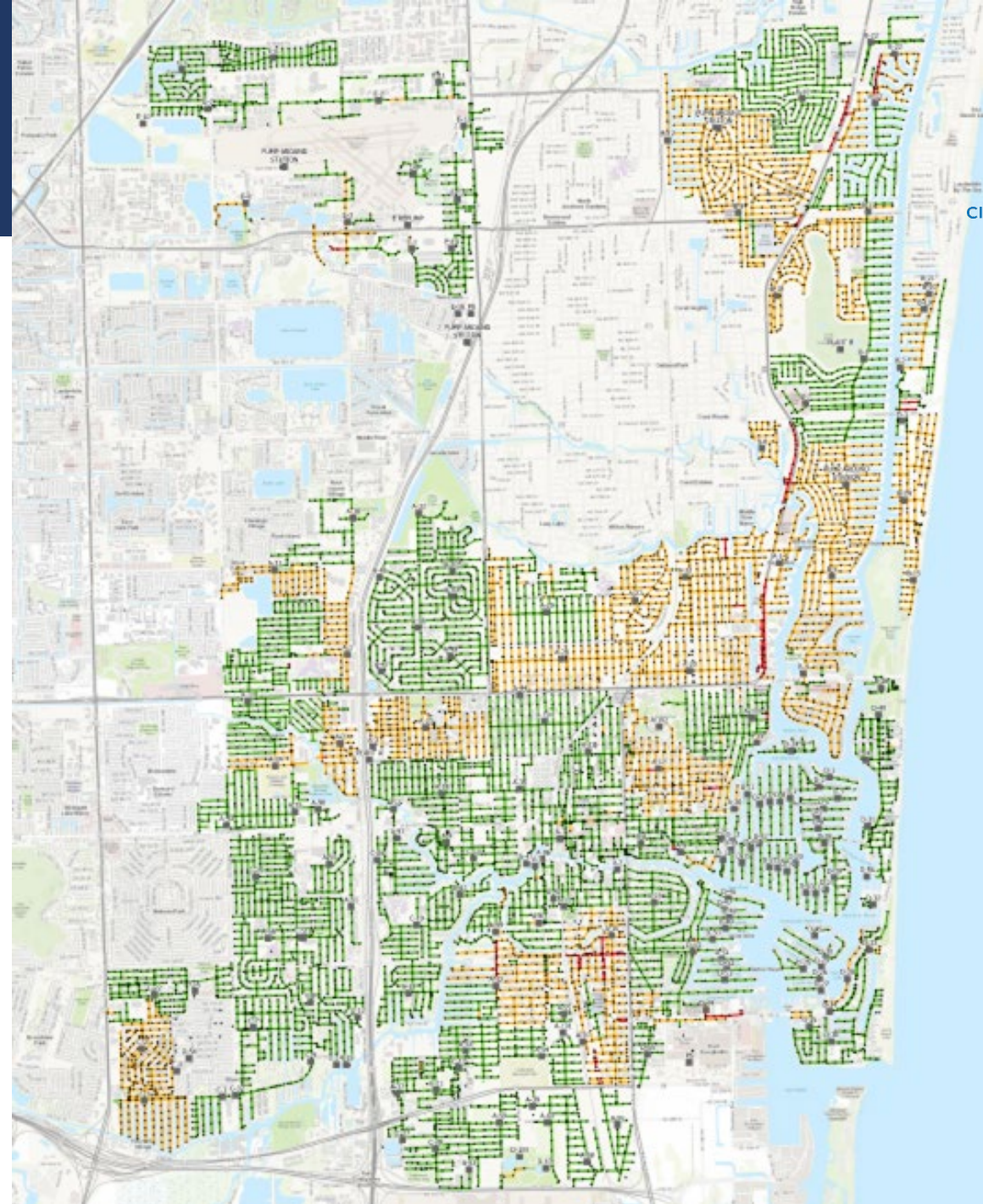
Gravity Main LOF

Overall LOF Score

— 1.4 - 3.2

— 3.2 - 5.0

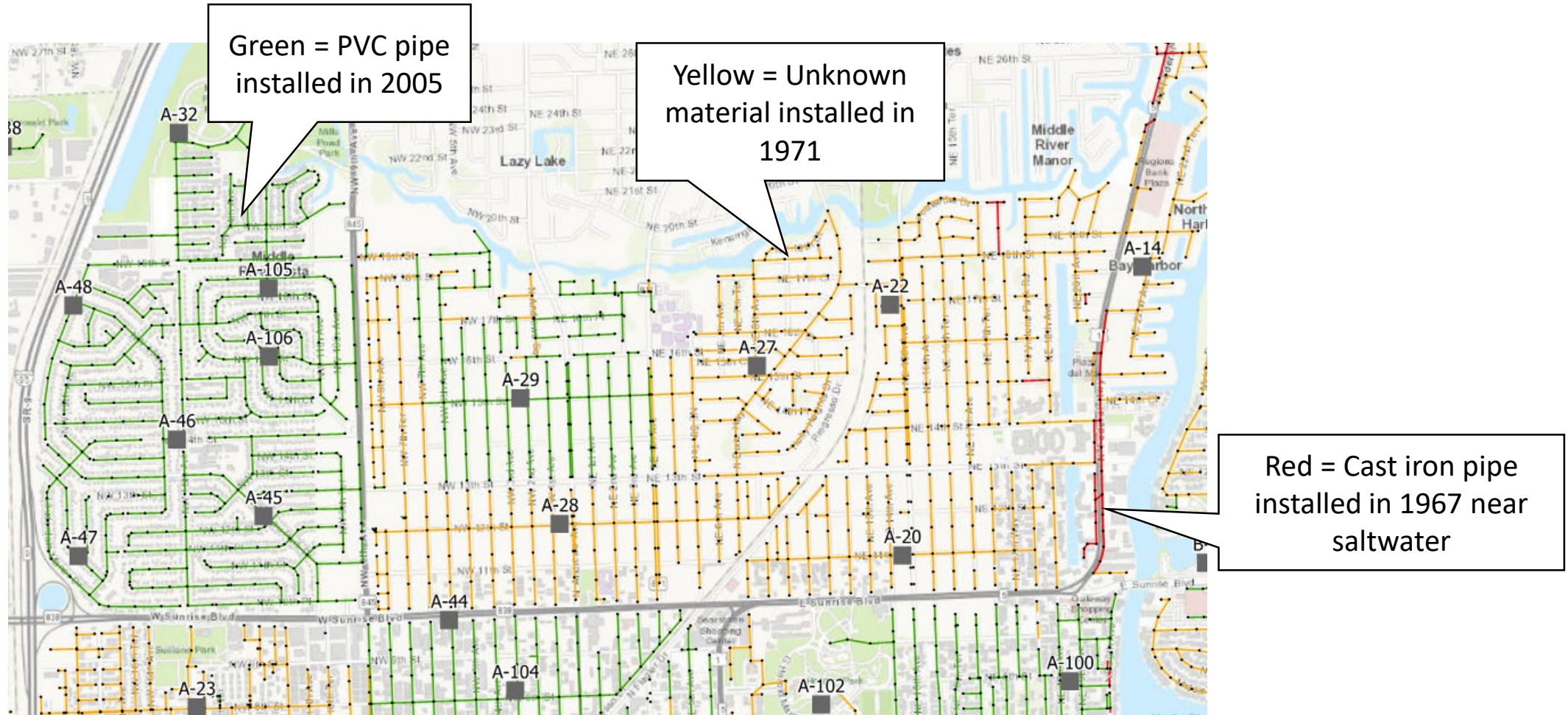
— 5.0 - 7.4



Gravity LOF



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This data also informs as to which areas need further investigation

Gravity COF



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Legend

● Manhole

Pump Station

■ Pump Station

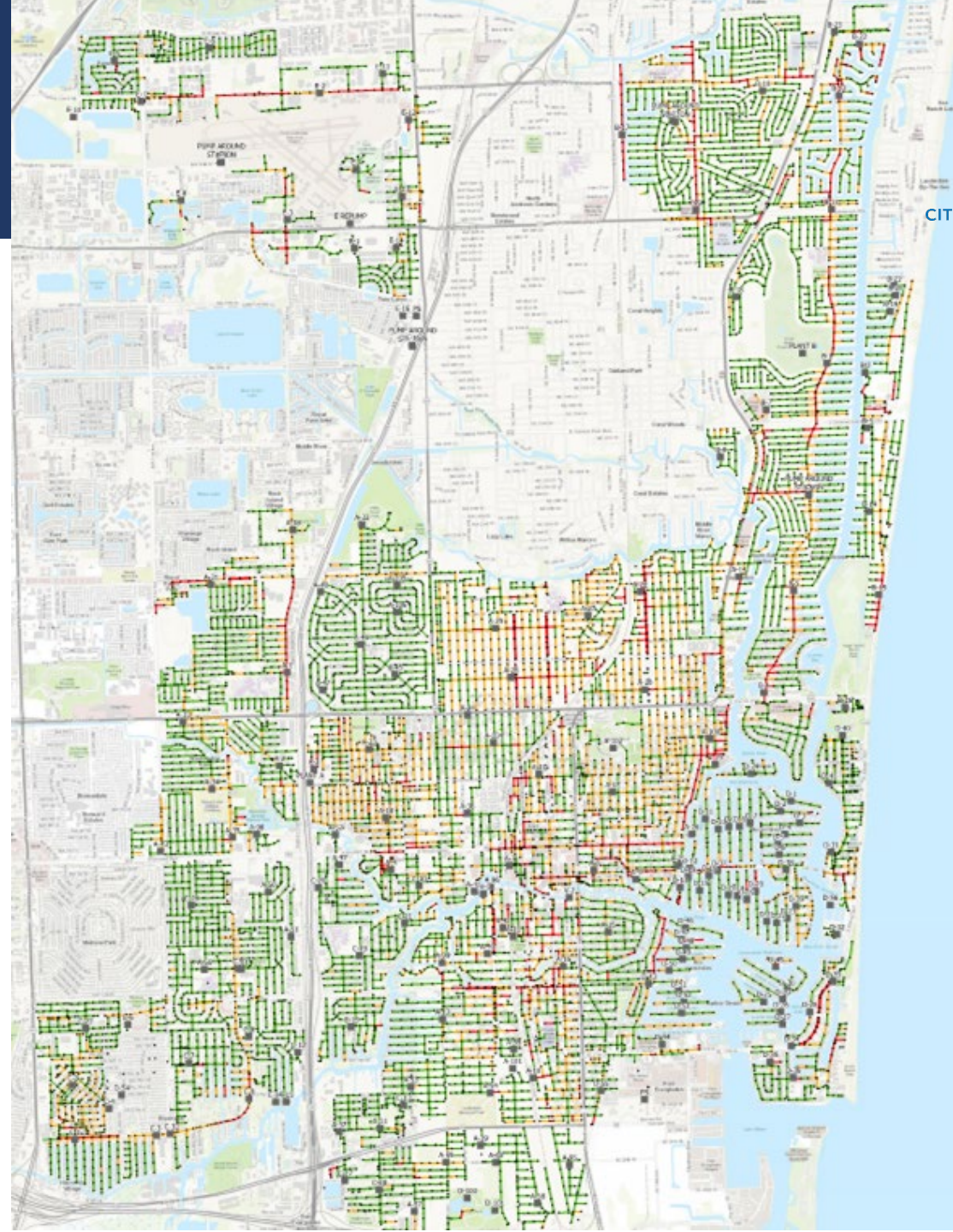
Gravity Main COF

Overall COF Score

— 1.0 - 4.4

— 4.4 - 5.7

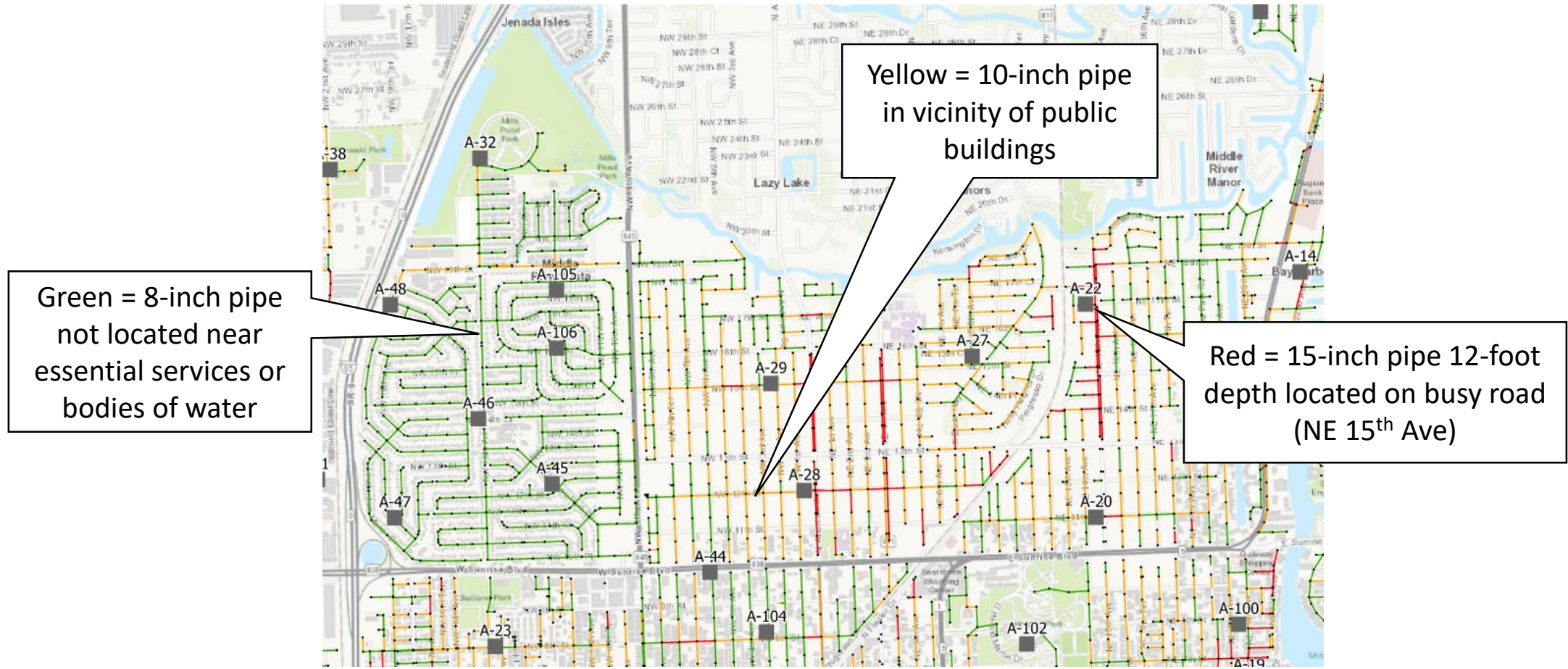
— 5.7 - 10



Gravity COF



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This data also informs as to which areas need further investigation

Gravity Risk Score



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Legend

● Manhole

Pump Station

■ Pump Station

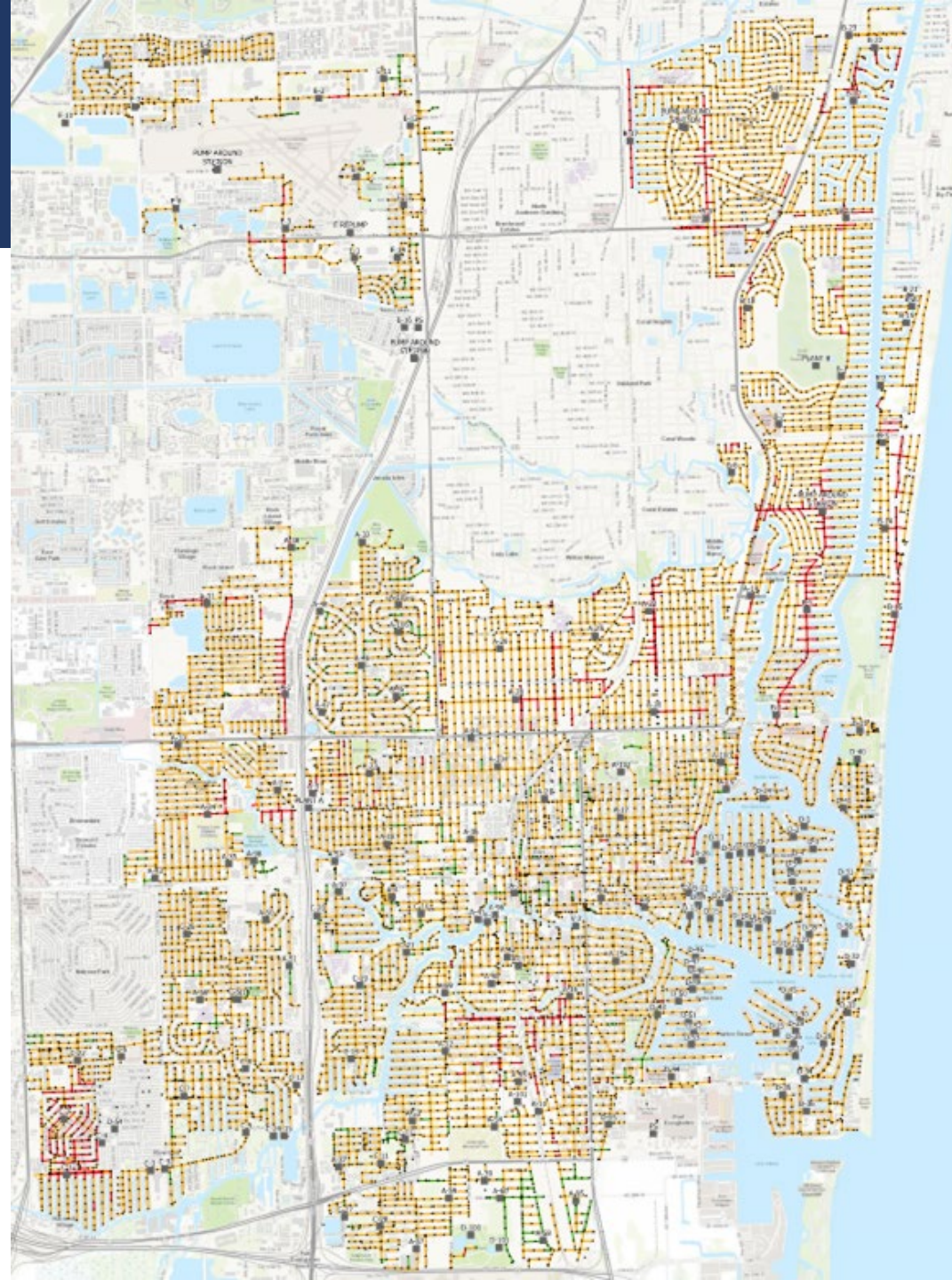
Gravity Main Risk

Overall Risk Score

— Low Risk Priority

— Medium Risk Priority

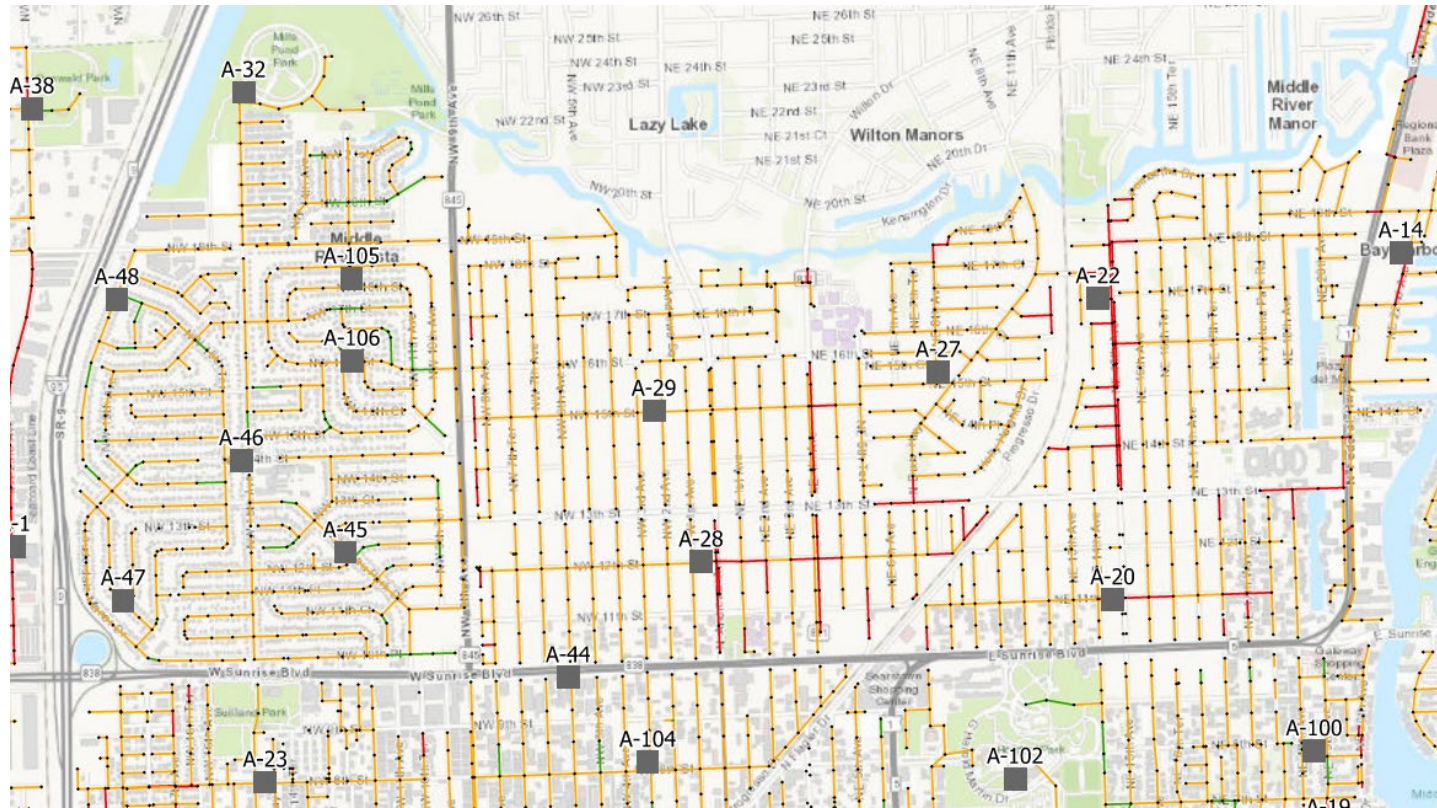
— High Risk Priority



Gravity Risk Score



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		1	4	7	10
LOF	1	1	4	7	10
	2	2	8	14	20
	4	4	16	28	40
	7	7	28	49	70
	10	10	40	70	100

1 - 4	Low Risk Priority
5 - 28	Medium Risk Priority
29 - 100	High Risk Priority

Pump Station Risk Score



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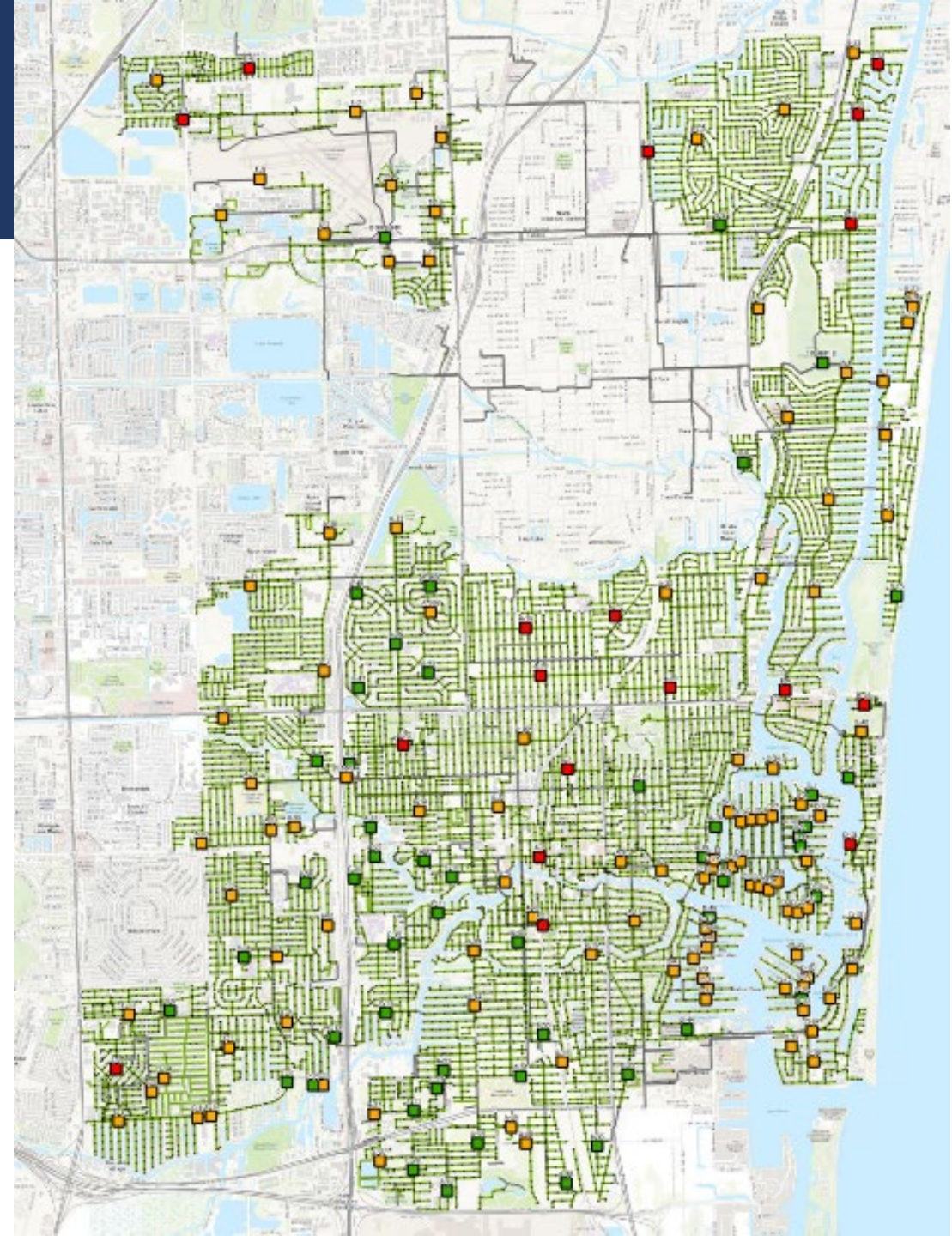
Legend

- Manhole
- Force Main
- Gravity Main

Pump Station Risk

Overall Risk Score

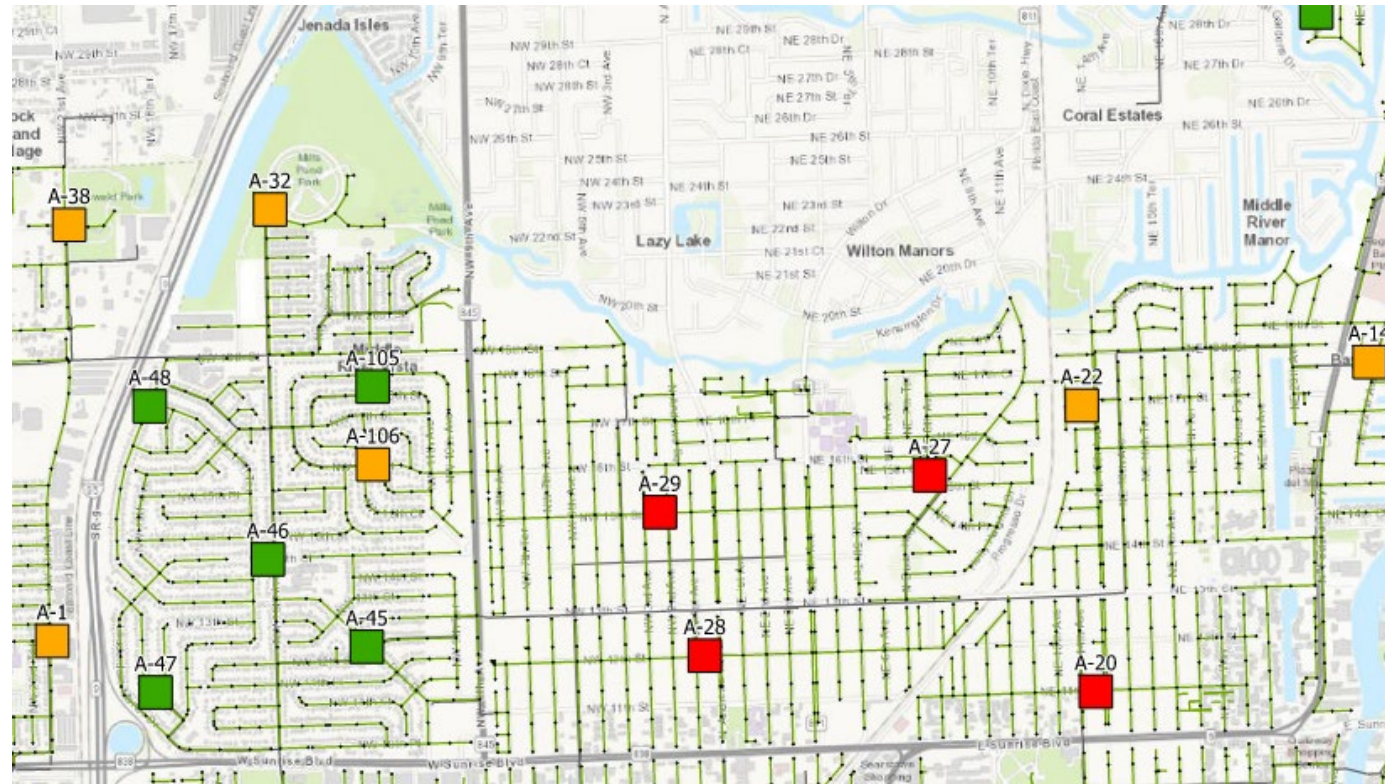
- Low Risk Priority
- Medium Risk Priority
- High Risk Priority



Pump Station Risk Score



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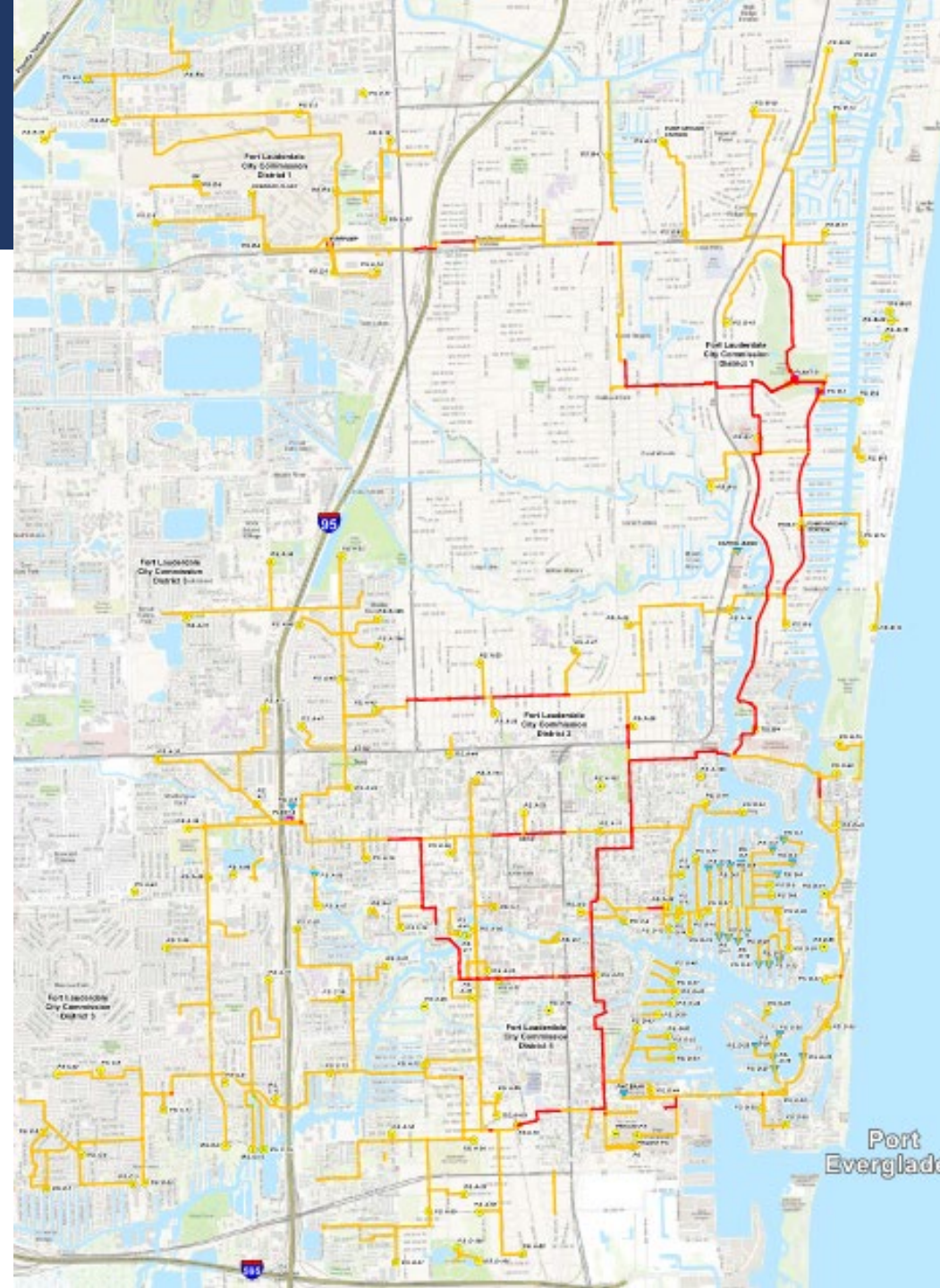
		COF			
		1	4	7	10
LOF	1	1	4	7	10
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1 - 4	Low Risk Priority
5 - 28	Medium Risk Priority
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Force Main Risk Score



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Legend

Overall Risk Score

- Low Risk Priority
- Medium Risk Priority
- High Risk Priority

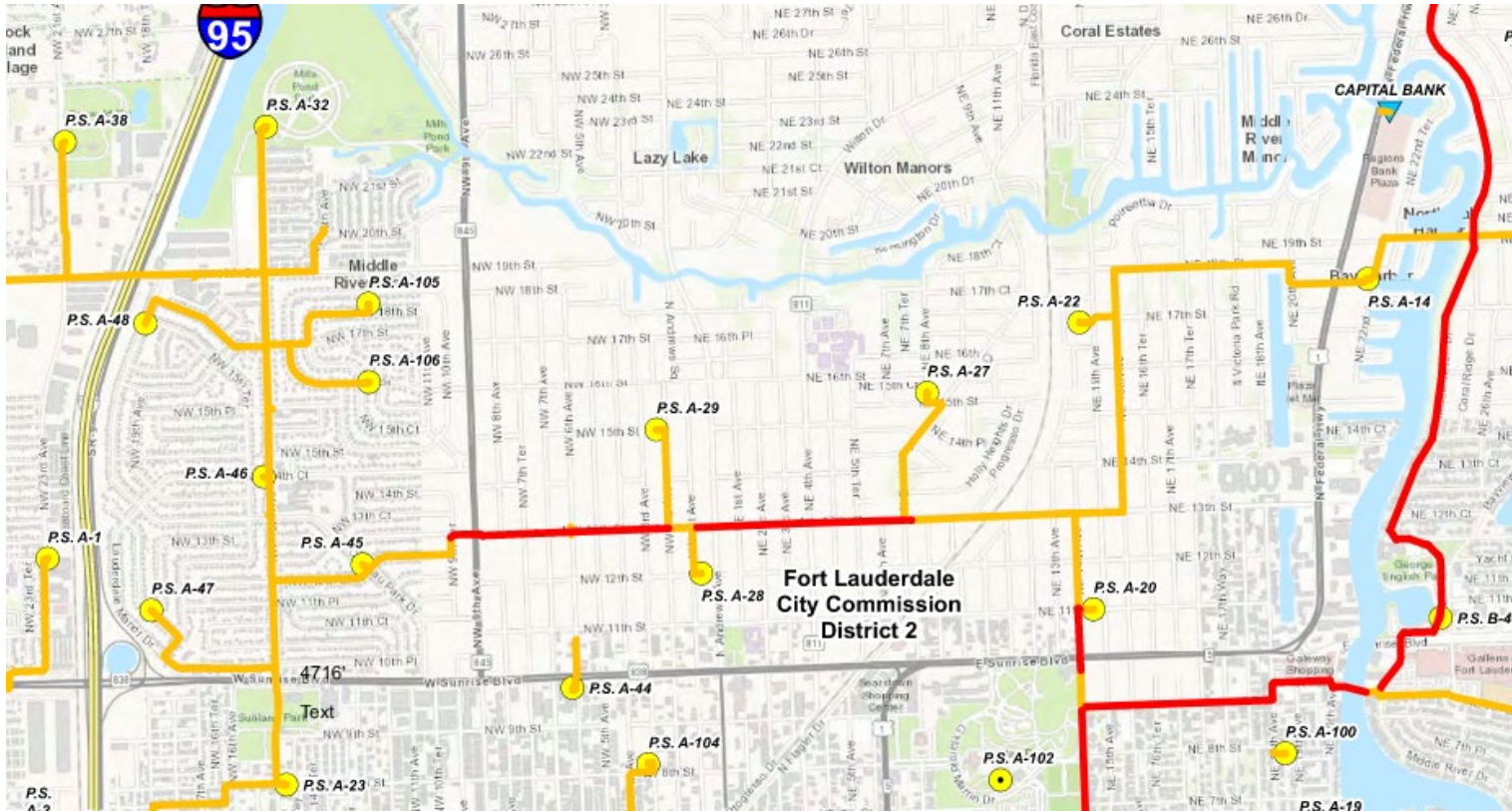
Pump Station Locations

- Pump Station
- Lift Station
- Repump Station

Force Main Risk Score



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COF

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LOF	1	1	4	7	10
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1 - 4	Low Risk Priority
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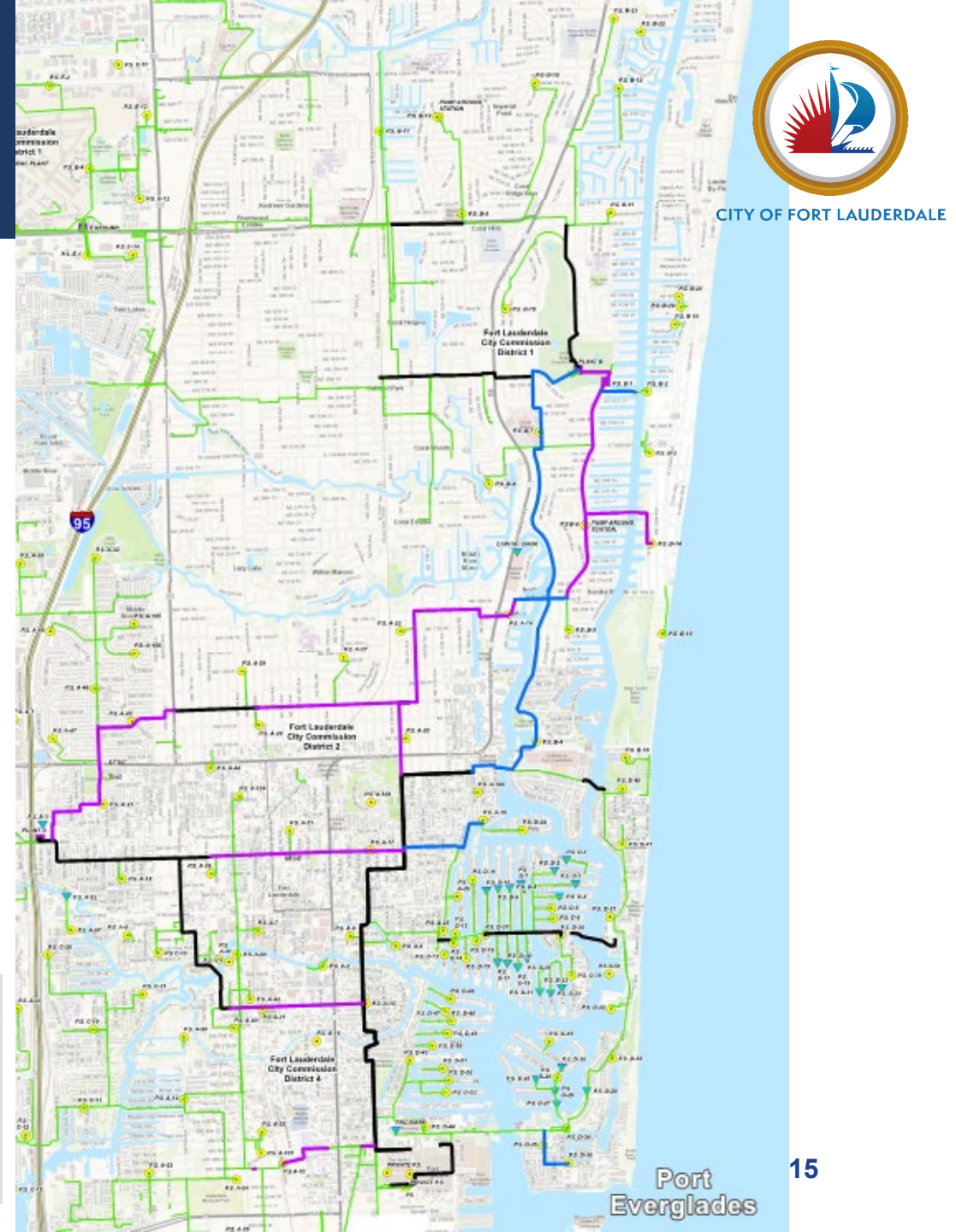
FM Recommended Future Work

- The Consent Order required the Force Main Condition Assessment (FMCA) Report to provide a list of Projects to be added to Phase II of the Consent Order.
- The FMCA Report also recommended other FMs to be rehab/replaced as part of the City's CIP.

Legend

Capital Planning

- Current Consent Order Project
- Recommended Rehab/Replacement Project to be Added to CIP
- Recommend Rehab/Replacement Project to be Added to Phase II Consent Order
- No Further Assessment





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Backup Slides



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Projects to be Added to Phase II of Consent Order



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Project	Limits of Project	Length of Project	Pipe Size/Material	Rationale
1	Victoria Park FM Replacement	4,700 feet	16-inch cast-iron pipe	Due to recent pipe failure.
2	NE 36th Street Repair Project	1,200 feet	12-inch cast-iron pipe	Due to recent pipe failure.
3	South Middle Force Main Crossing	1,800 feet	12-inch DIP	Due to recent pipe failure.
4	Pump Station D-36 Discharge FM Replacement	2,000 feet	8-inch and 10-inch cast-iron pipe	Due to recent pipe failure.
5	Replacement of FM from Pump Station B Discharge to the Middle River	27,500 feet (of replacement FM)	42-inch DIP	High risk of failure. Note this project is currently in construction as part Project P 12566.

Sections of Force Main that Need to be Added as a Future Rehabilitation/Replacement Project



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Project	Limits of Project	Length of Project	Pipe Size/Material	Rationale
1	Bayview Drive from NE 21st Street to NE 37th Court and to the suction side of Repump Station B	9,600 feet	16-inch and 18-inch cast-iron pipe	Very high likelihood of failure. Segments of this FM have reported multiple breaks. This section of FM also includes stormwater conflict structure which may increase the deterioration of the main.
2	From Pump Station B-14 to the 16-inch cast-iron FM on Bayview Drive	3,400 feet	12-inch cast-iron pipe	More than 50-year-old FM with a subaqueous crossing is connected to the other recommended project to be replaced.
3	NE 5th Street between NW 6th Avenue and NE 14th Avenue	5,600 feet	16-inch cast-iron pipe and 18-inch and 20-inch DIP	High risk of failure. Maintenance concerns have been reported on this FM.
4	SE 7th Street between SW 5th Avenue and SE 9th Avenue	4,900 feet	36-inch DIP	High risk of failure. High consequence of failure. Maintenance concerns have been reported on this FM.
5	From Eastern End of NW 13 Street Phase 2 and PS A-3	5,600 feet	30-inch cast-iron pipe	High risk of failure. High consequence of failure. Maintenance concerns have been reported on this FM.
6	NW 13th Street Phase 2 Project	3,200 feet	24-inch cast-iron pipe	FM is more than 50 years old with medium to high likelihood of failure.
7	NW 13th Street Phase 3 Project	7,600 feet	20-inch, 18-inch, and 14-inch cast-iron pipe	FM is more than 50 years old with medium to high likelihood of failure.
8	NW 13th Street Phase 4 Project	8,100 feet	16-inch, 14-inch, 12-inch, and 10-inch cast-iron pipe	FM is more than 50 years old with medium to high likelihood of failure.
9	Along SW 19th Street between SW 3rd Avenue and SW 4th Avenue	100 feet	30-inch DIP	High risk of failure.
	Along SW/SE 18th Court between SW 1st Avenue and SE 1st Avenue, along SE 1st Avenue between SE 18th Court and Mariner Drive, along Mariner Drive between SE 1st Avenue and East of SE 4th Avenue	2,000 feet	30-inch and 36-inch DIP	High risk of failure.
	Near intersection of A1A and SE 10th Avenue	400 feet	36-inch DIP	High risk of failure.
10	Rehabilitation of Repump Station B Discharge Force Main from Repump Station B to George English Park	18,600 feet	42-inch DIP	High risk of failure

Gravity Mains COF and LOF Parameters



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Likelihood of Failure Score

- Years Since Pipe Installation and Pipe Material
- External and Internal Physical Factors
- Pipe Maintenance



RISK

Consequence of Failure Score

- Financial Impact on Utility
 - *Pipe diameter*
 - *Depth to pipe invert*
 - *Surface Type*
- Community Impact on Utility
 - *Residential and Essential Services Impact*
 - *Environmental Compliance*
 - *Surface Type*

Pump Stations COF and LOF Parameters



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Likelihood of Failure Score

- Potential for Overflow based on modeling results
- Condition
- Service Life



RISK

Consequence of Failure Score

- Financial Impact on Utility
 - Total horsepower of station
- Community Impact
 - Residential and Essential Services Impact
 - Environmental Compliance
 - Average Dry Weather Flow

Force Mains COF and LOF Parameters



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Likelihood of Failure Score

- Years Since Pipe Installation
- Pipe Material
- Pipe Break Information
- Peak Operating Pressure
- Pipe Layout Profile
- External and Internal Factors
- Pipe Maintenance



RISK

Consequence of Failure Score

- Pipe Diameter
- Proximity to Potable Water
- Residential and Essential Services Impact
- System Reliability
- Financial Impact on Utility
- Community Impact
- Environmental Compliance



FMCA Phase 1



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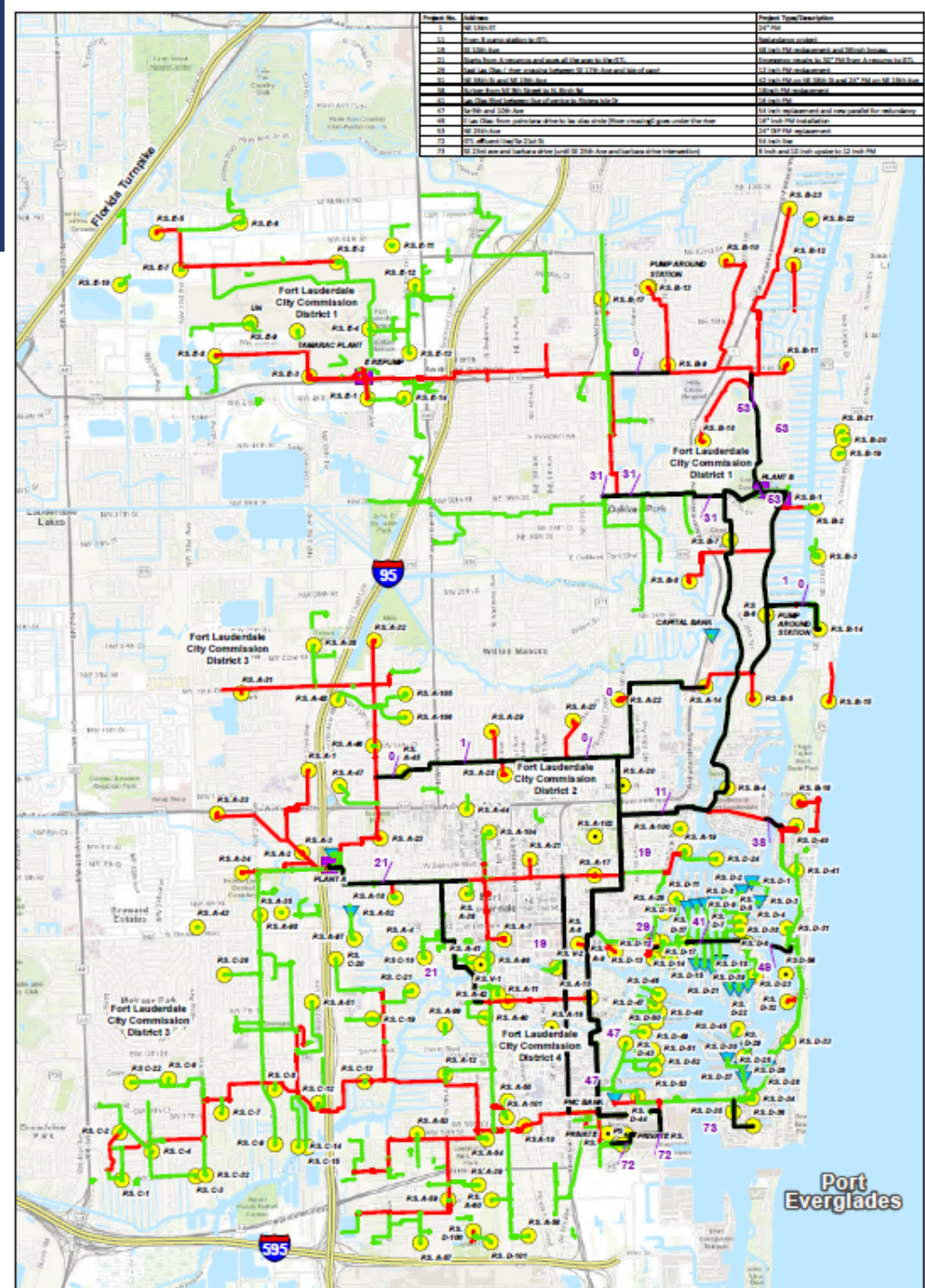
Tier 1 Assessment and no Further Assessment Segments

Figure 19 - City-owned Pressurized Mains Tiers



Legend

- Tier
 - 1 (Red line)
 - no further assessment (Green line)
- Capital Planning
 - CIP Projects (Black line)
- Pump Station Locations
 - Pump Station (Yellow circle)
 - Lift Station (Blue triangle)
 - Repump Station (Purple square)



Force Main Tier 1 Condition Assessment



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