

Interim Flooding Solutions

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Land Use and Sustainability Committee

March 4, 2022

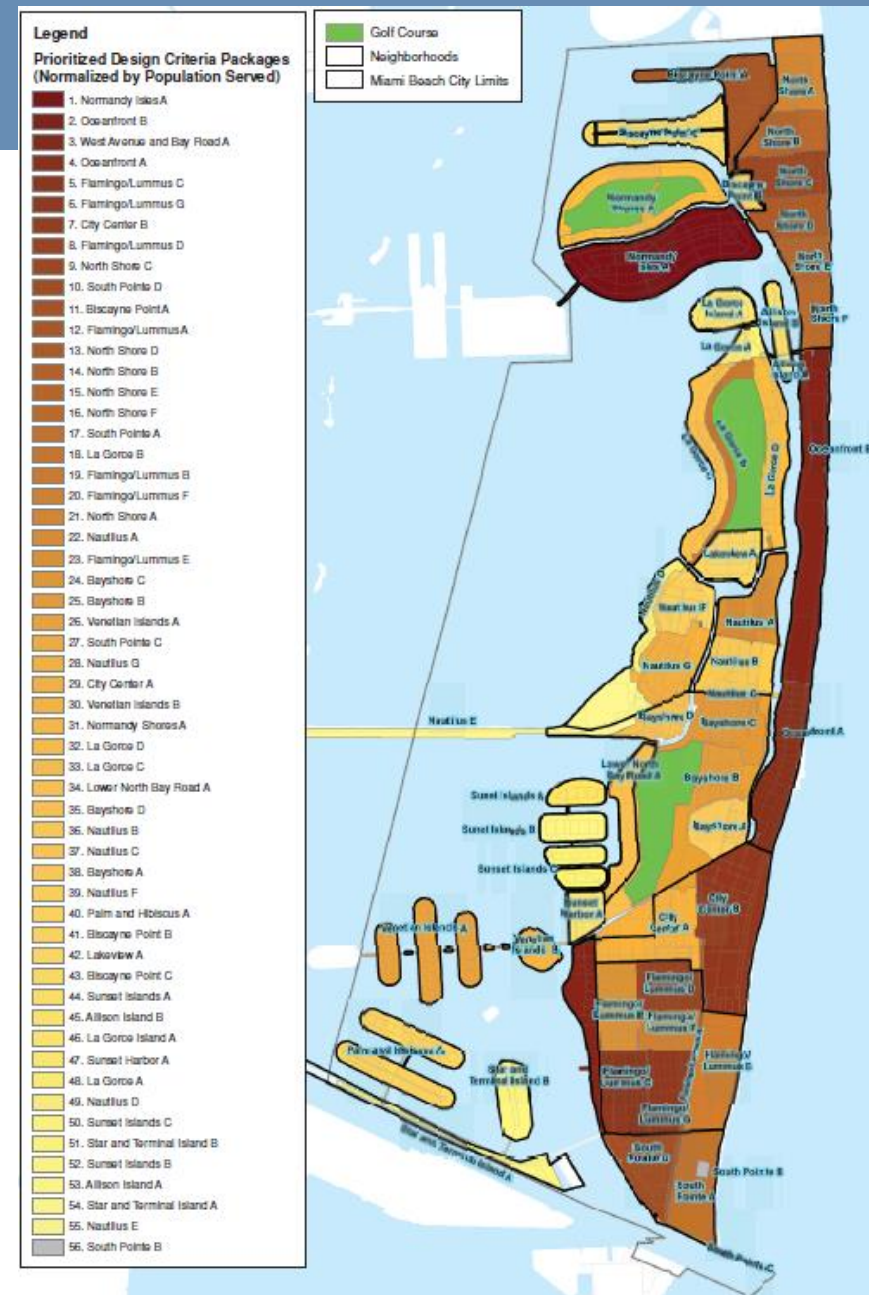
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- 1 Background
- 2 Analysis
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- 5 Questions/Comments

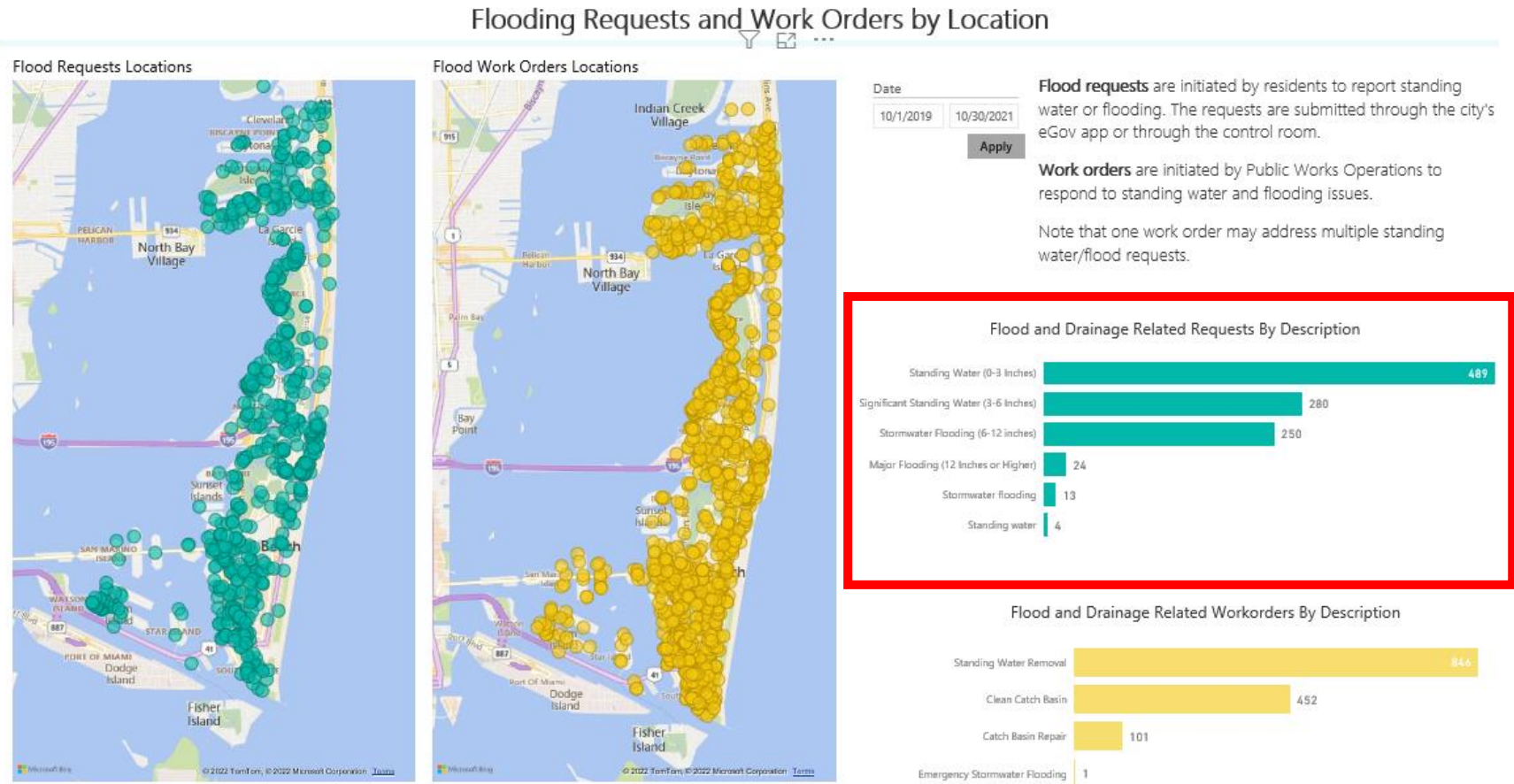


Background

- NIPs are planned to address flooding throughout the City:
 - ✓ rainfall-induced flooding
 - ✓ tidal (“sunny day”) flooding
- NIPs are complex, large projects.
- Staff evaluated simpler **interim flooding solutions** for areas susceptible to flooding with no forthcoming NIPs.



Resident Flood Notices Analyzed to Create a Heat Map



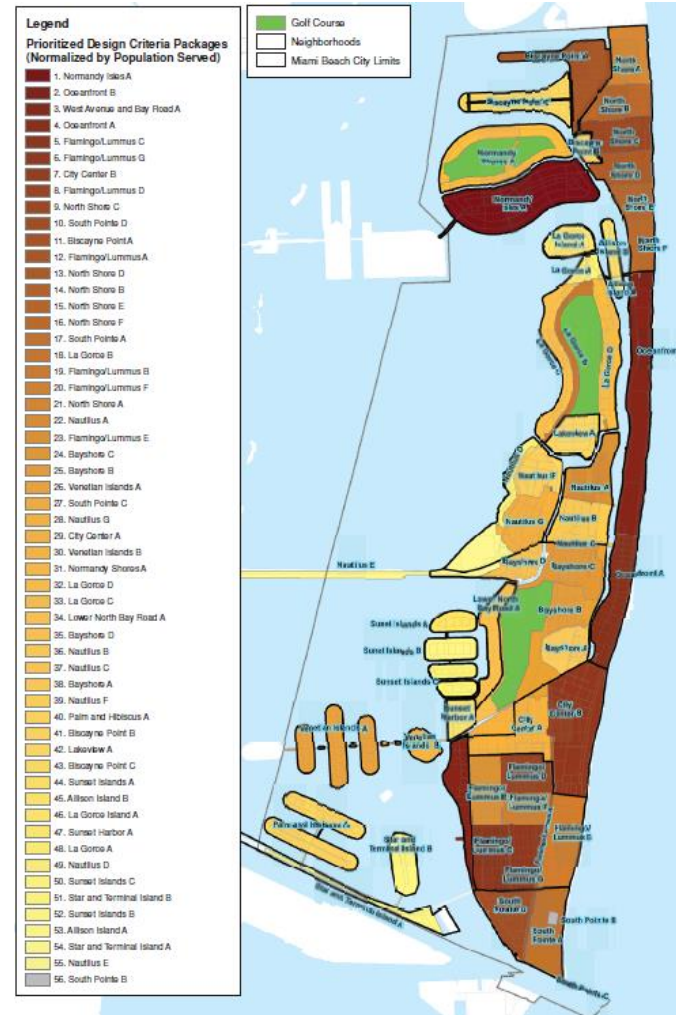
* Flooding requests reflected on the City's Powe BI tool for a two-year period (Oct 2019-Oct 2021).

Prioritization of Work

1. Identified areas to be excluded

Areas Excluded From Analysis	Reason
Sunset Harbor	Recently Completed Stormwater Project
Sunset Islands	Recently Completed Stormwater Project
Venetian Islands	Recently Completed Stormwater Project
Palm and Hibiscus	Recently Completed Stormwater Project
Indian Creek	Ongoing Stormwater Project
Alton Rd	Currently Under Design
West Ave	Currently Under Design
First Street	Currently Under Design
North Beach	
Town Center	Upcoming NIP
Normandy Isles	Upcoming NIP

2. Inverse order of NIPs prioritization

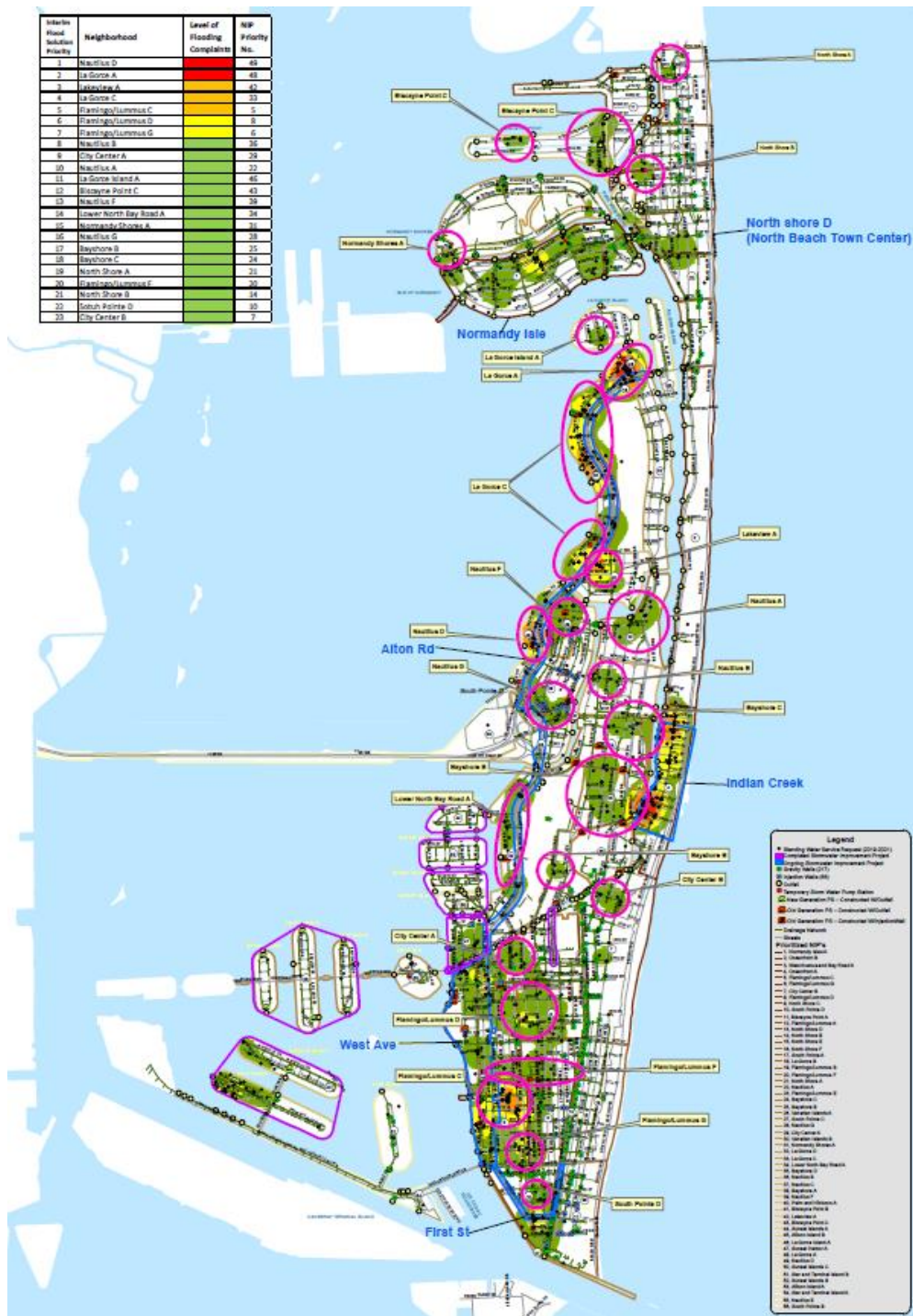


3. Prioritized areas based on level of complaints

Interim Flood Solution Priority	Neighborhood	Level of Flooding Complaints	NIP Priority No.
1	Nautilus D		49
2	La Gorce A		48
3	Lakeview A		42
4	La Gorce C		33
5	Flamingo/Lumms C		5
6	Flamingo/Lumms D		8
7	Flamingo/Lumms G		6
8	Nautilus B		36
9	City Center A		29
10	Nautilus A		22
11	La Gorce Island A		46
12	Biscayne Point C		43
13	Nautilus F		39
14	Lower North Bay Road A		34
15	Normandy Shores A		31
16	Nautilus G		28
17	Bayshore B		25
18	Bayshore C		24
19	North Shore A		21
20	Flamingo/Lumms F		20
21	North Shore B		14
22	South Pointe D		10
23	City Center B		7

Resulting Flooding Heat Map and Top 10 Hot Spots

Interim Flood Solution Priority	Neighborhood	Level of Flooding Complaints	NIP Priority No.
1	Nautilus D		49
2	La Gorce A		48
3	Lakeview A		42
4	La Gorce C		33
5	Flamingo/Lummus C		5
6	Flamingo/Lummus D		8
7	Flamingo/Lummus G		6
8	Nautilus B		36
9	City Center A		29
10	Nautilus A		22



Design Criteria

Option 1: add inlets and connection to existing system

- Design rain **3 inches in 24 hours** with a peak intensity of 1 inch per hour.
- Tailwater elevation = 0.6 feet NAVD. This is the seasonal high-water elevation.



Option 2: expand conveyance + add injection well system

- Design rain **5 inches in 24 hours** with a peak intensity of 1.5 inch per hour.
- Tailwater elevation = 0.6 feet NAVD. This is the seasonal high-water elevation.

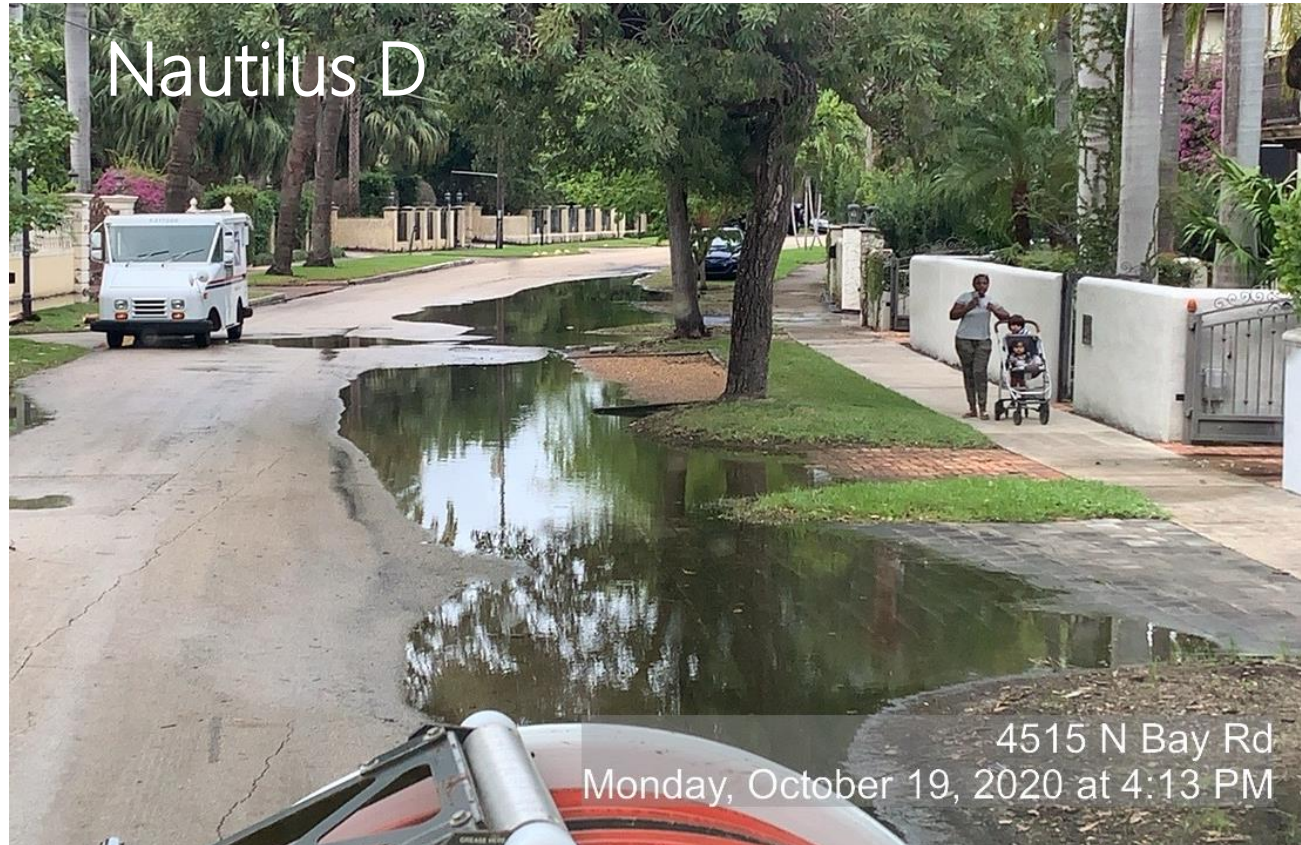


City's stormwater program for comparison:

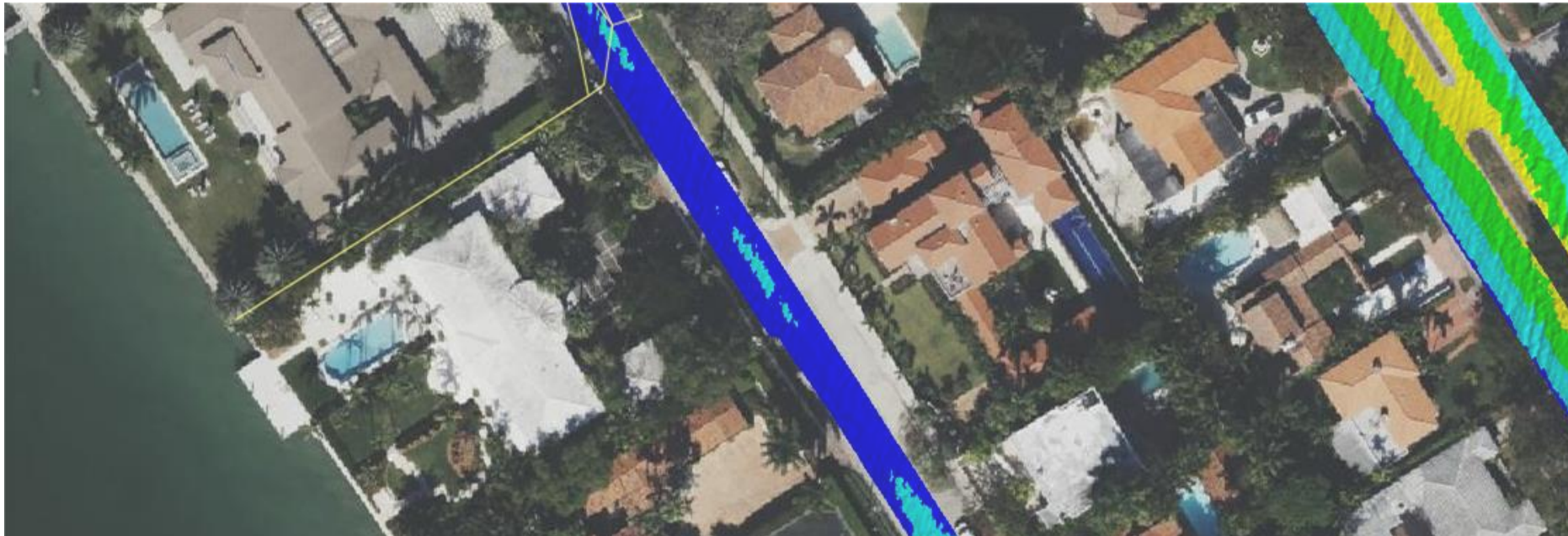
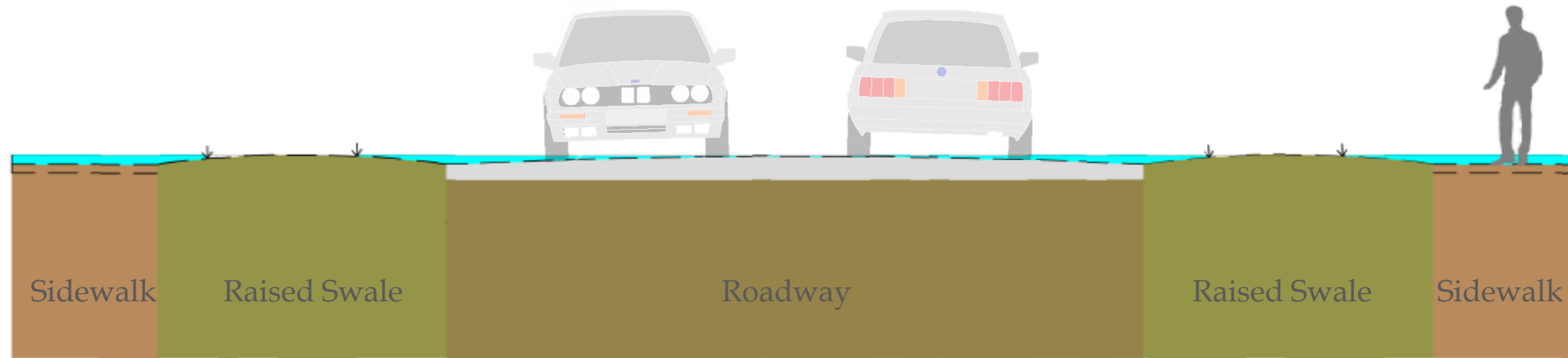
- Design rain **8.75 inches in 24 hours** with a peak intensity of 3 inches per hour.
- Tailwater elevation = 2.7 feet NAVD.



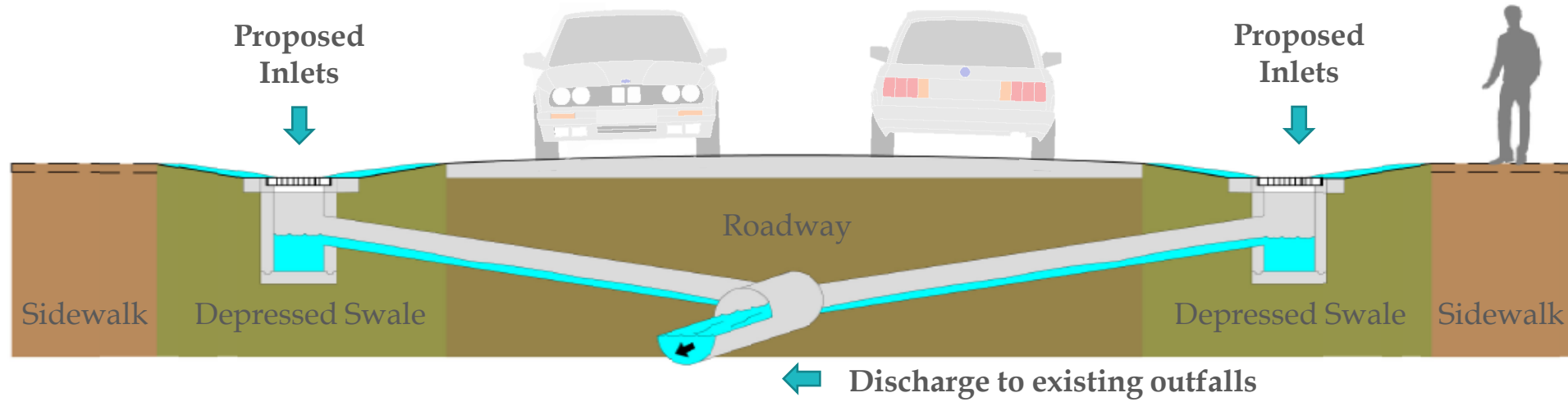
Existing Conditions



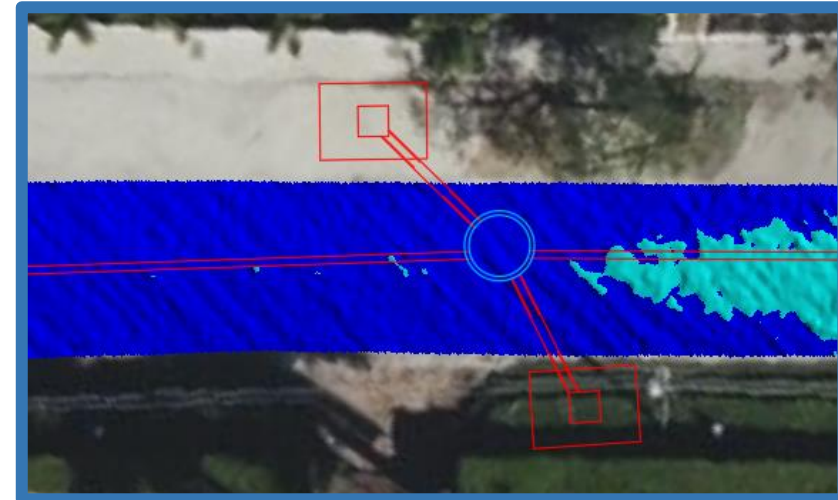
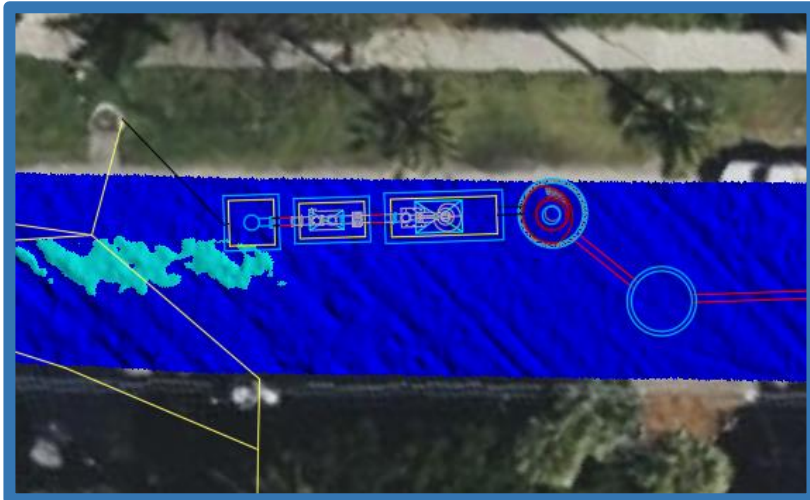
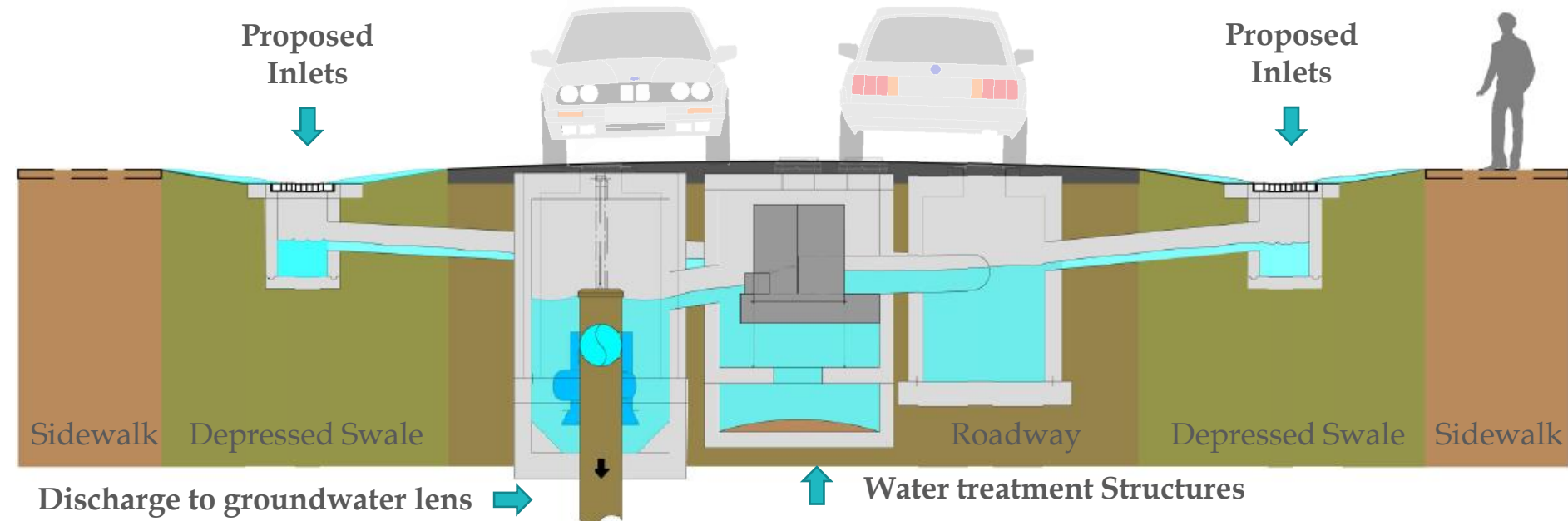
Existing Conditions



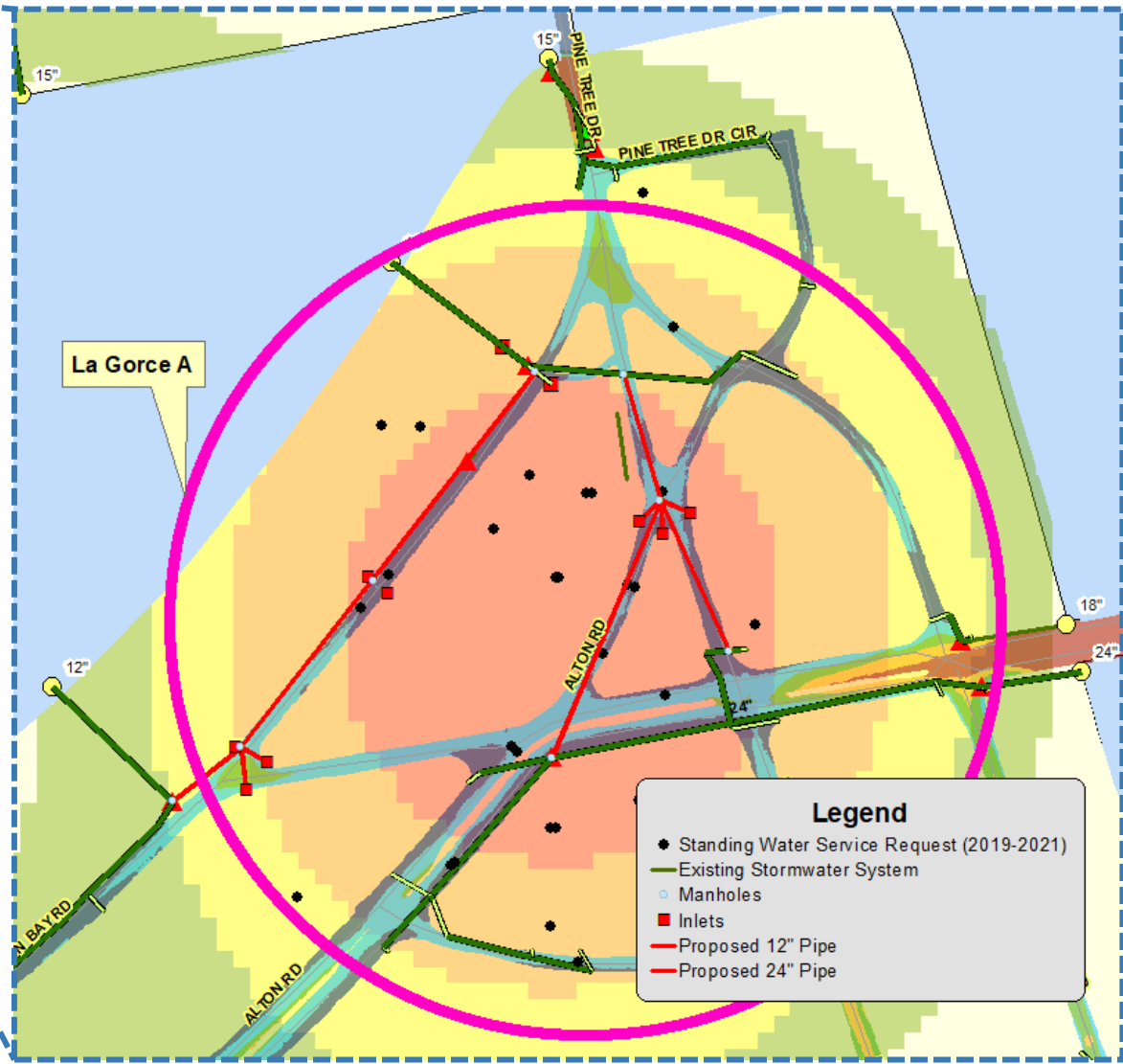
Option 1: adding inlets and connection to existing system



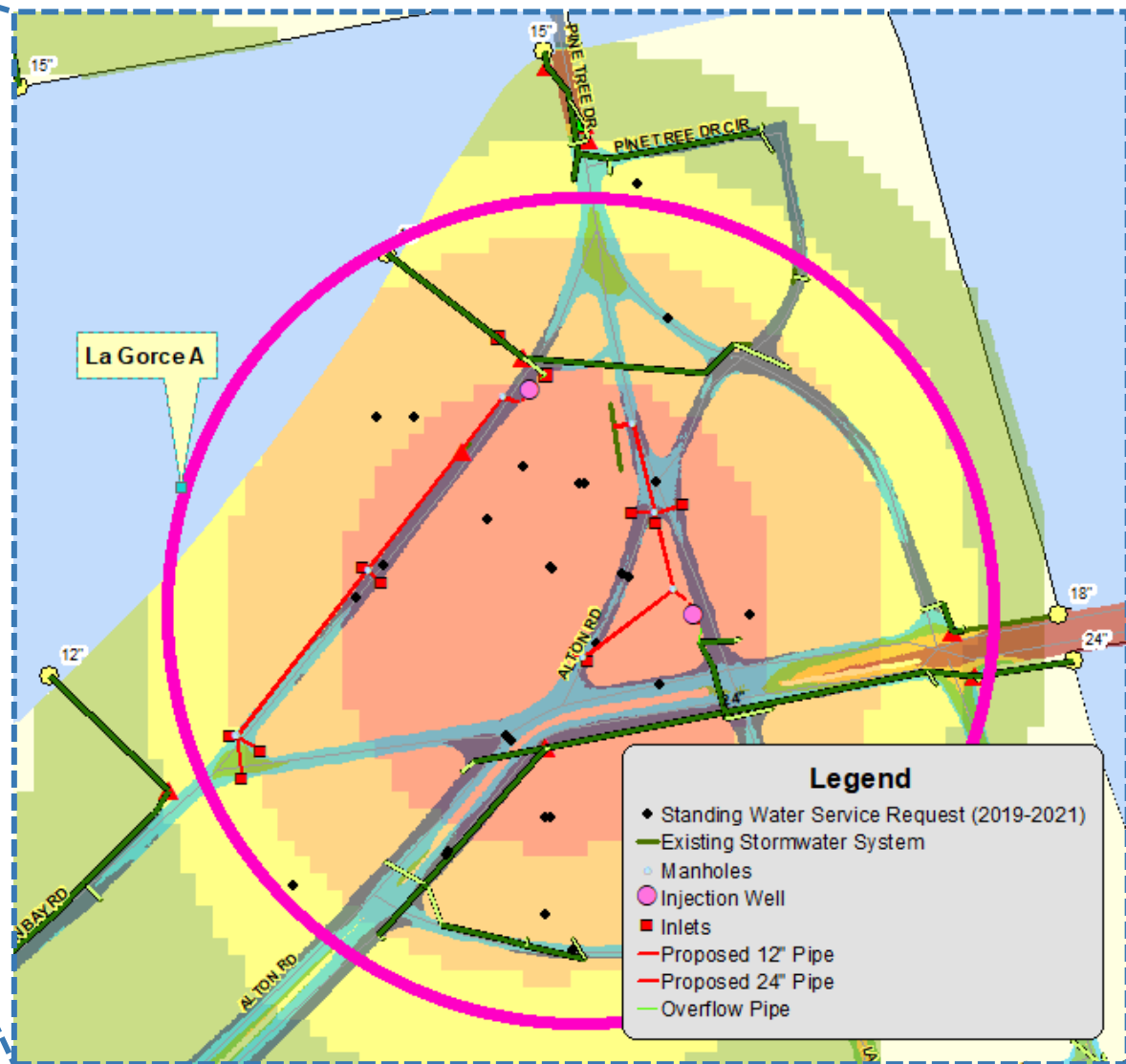
Option 2: also adds new conveyance + injection well system



Option 1- Expanded Conveyance @ La Gorce A



Option 2- Expanded Conveyance plus Injection Well System @ La Gorce A



Staff Recommends Implementation of Option 2

	Option 1 – Expanded Conveyance	Option 2 – Expanded Conveyance plus Injection Well System
Estimated Total Cost ^a	\$18M	\$26M
Advantages	<ul style="list-style-type: none"> • Lower cost • Reduced flooding duration 	<ul style="list-style-type: none"> • Greater reduction to flooding duration • Improved water quality • Injection wells can be used in future NIP's
Disadvantages	<ul style="list-style-type: none"> • No water quality benefits, which may be required by regulators. 	<ul style="list-style-type: none"> • Greater cost
	<ul style="list-style-type: none"> • Does not address “Sunny Day” (tidal) flooding, nor severe rainfall flooding. • Flooding will occur when rain and/or groundwater level exceed design conditions • Some swales may need to be regraded at location of proposed inlets. • Pipes and inlets may not be salvaged in future NIP's 	

^a Estimated costs to implement interim flood solutions for the top 10 identified areas include the following: Engineering, Construction, CEI and Contingency for class 5 level estimate.

Proposed Implementation Plan

Priority	Neighborhood	Estimated Project Cost (Millions)	Project Implementation Plan					
			FY 23	FY 24	FY 25	FY 26	FY 27	FY 28
1	Nautilus D	\$3.2	<i>Design</i>	<i>Construction</i>				
2	La Gorce A	\$2.0	<i>Design</i>	<i>Construction</i>				
3	Lakeview A	\$2.6		<i>Design</i>	<i>Construction</i>			
4	La Gorce C	\$4.9		<i>Design</i>	<i>Construction</i>			
5	Flamingo/Lummus C	\$2.3			<i>Design</i>	<i>Construction</i>		
6	Flamingo/Lummus D	\$2.5			<i>Design</i>	<i>Construction</i>		
7	Flamingo/Lummus G	\$2.2				<i>Design</i>	<i>Construction</i>	
8	Nautilus B	\$1.4				<i>Design</i>	<i>Construction</i>	
9	City Center A	\$2.3					<i>Design</i>	<i>Construction</i>
10	Nautilus A	\$2.4					<i>Design</i>	<i>Construction</i>
Total		\$25.8						

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Questions

