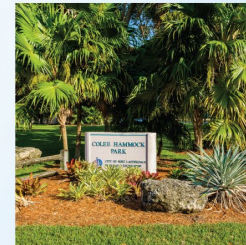




# Fortify Lauderdale

Building a Resilient Future  
in Fort Lauderdale



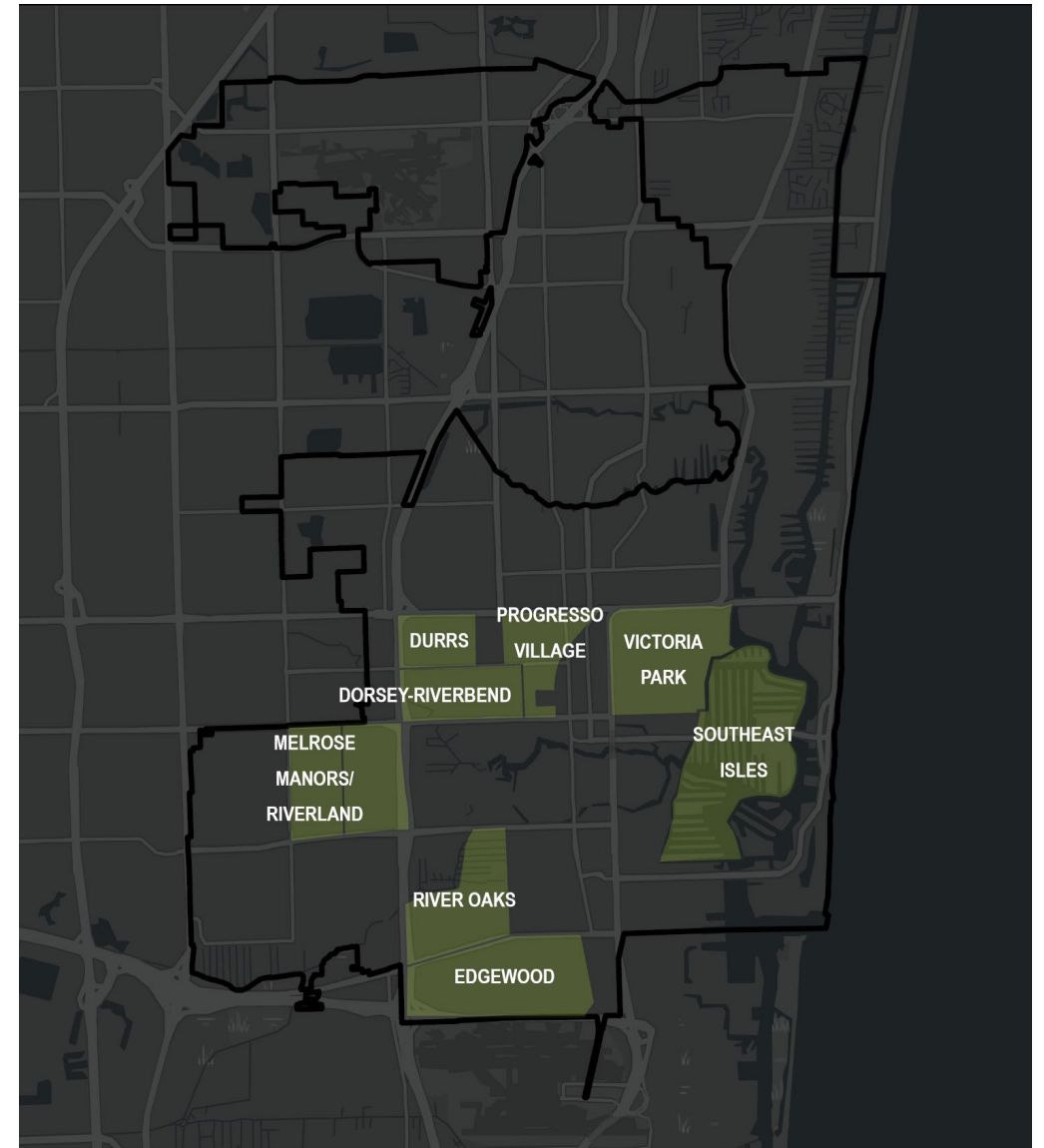
Tranche 2 Neighborhoods  
Stormwater Management Improvements  
City Project No. 12852  
City Commission Meeting  
October 1, 2024

# Meeting Agenda

- **Original Eight Neighborhoods**
- **Tranche 2 Neighborhoods**
- **Data Collection**
- **Conceptual Approaches by Neighborhood/Project**
- **Project Schedule/Costs**
- **Public Outreach**
- **Questions**

# Original Eight Neighborhoods

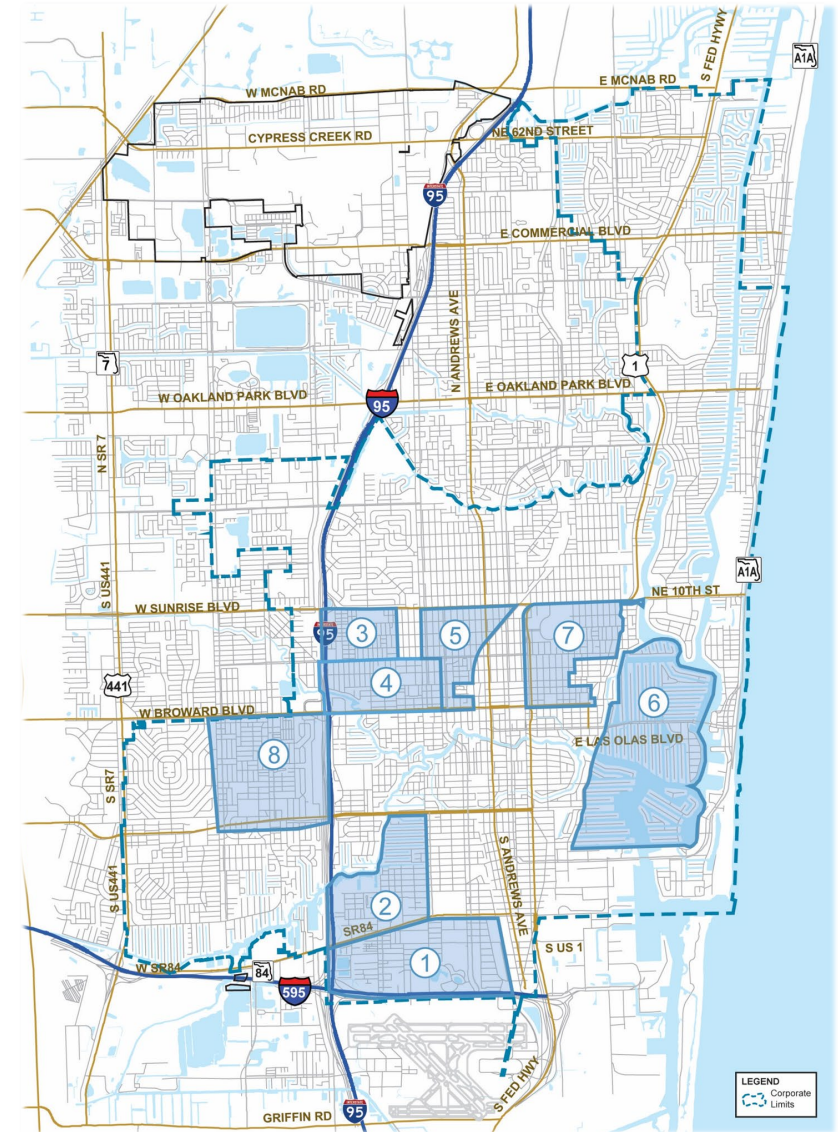
- Edgewood
- River Oaks
- Dorsey-Riverbend
- Durrs
- Progresso Village
- Victoria Park
- Southeast Isles
- Melrose Manors/Riverland





# Original Neighborhoods Progress

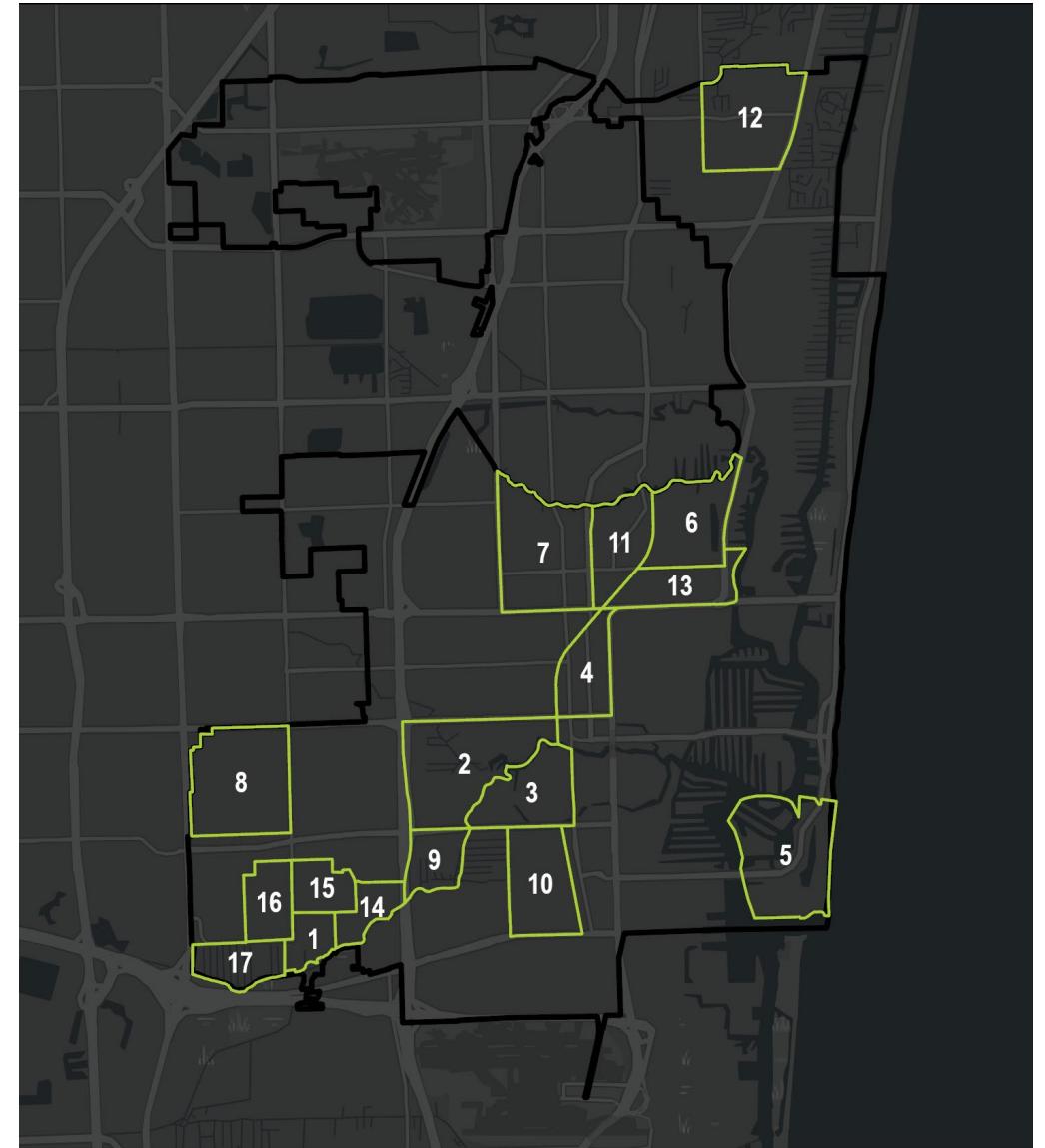
Neighborhood	Project Status
1a Edgewood	Construction substantially complete
1b Osceola Creek Dredging (Edgewood)	Construction substantially complete
2a River Oaks (Underground Utilities)	Construction substantially complete
2b River Oaks (Pump Stations)	In Construction
3 Durrs	In Construction
4 Dorsey-Riverbend	In Construction
5 Progresso Village	Bidding Fourth Quarter 2024
6 Southeast Isles	Bidding Third Quarter 2025
6a Southeast Isles / Merle Fogg Seawalls Replacement	Complete
7 Victoria Park	Bidding First Quarter 2025
8 Melrose Manors / Riverland Civic	Design completion Fourth Quarter 2025





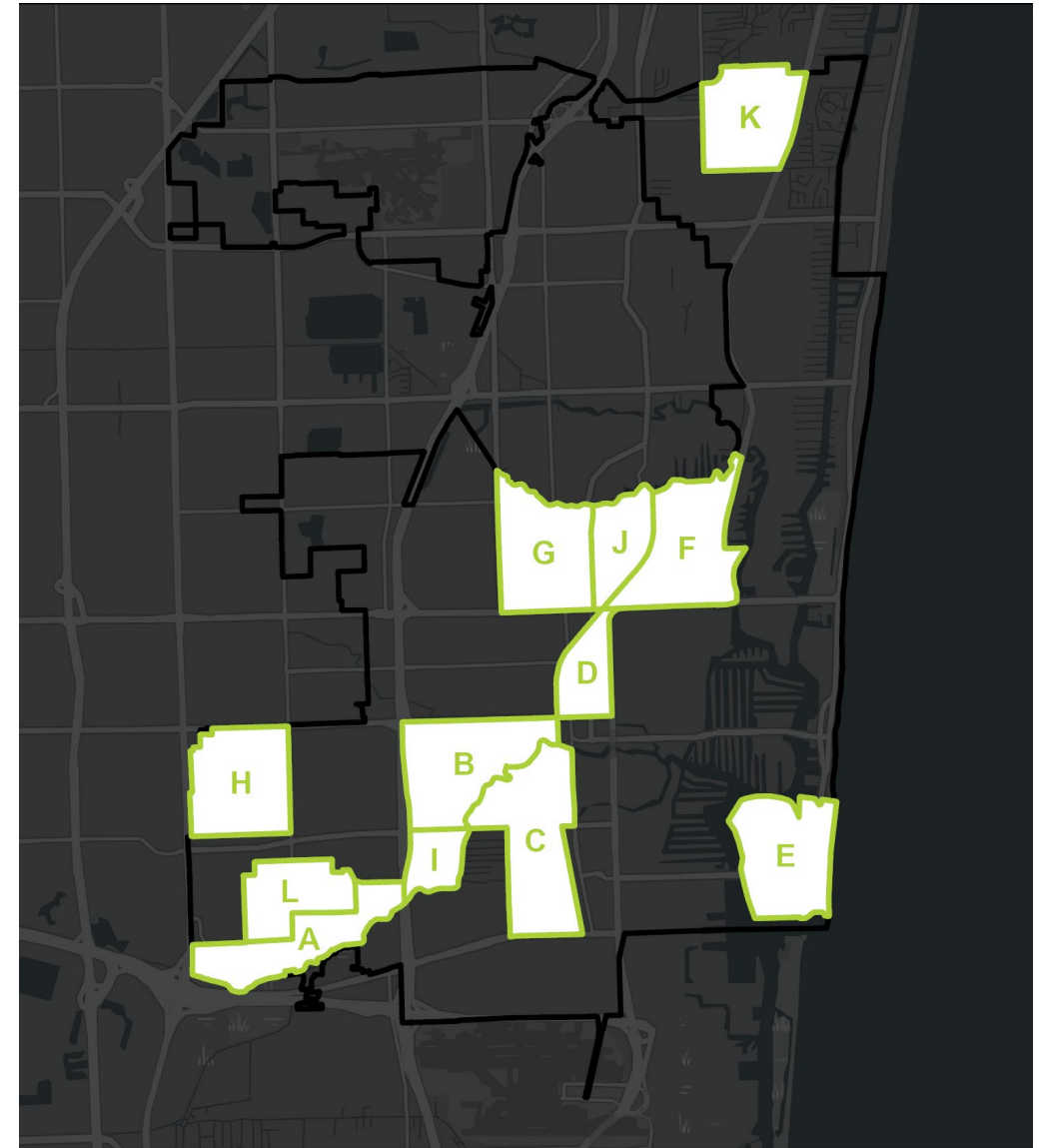
# Tranche 2 Neighborhoods

1. River Landings & Adjoining Areas
2. Sailboat Bend, Riverside Park & Adjoining Areas
3. Tarpon River
4. Flagler Village
5. Harbour Isles & Adjoining Areas
6. Poinsettia Heights
7. South Middle River
8. Melrose Park
9. Shady Banks
10. Croissant Park
11. Middle River Terrace
12. Imperial Point
13. Lake Ridge
14. Riverland Manors/Woods & Adjoining Areas
15. Chula Vista & Adjoining Areas
16. Riverland Village
17. Lauderdale Isles



# Projects

- A. River Landings, Riverland Manors/Woods, Lauderdale Isles & Adjoining Areas
- B. Sailboat Bend, Riverside Park & Adjoining Areas
- C. Tarpon River and Croissant Park
- D. Flagler Village
- E. Harbour Isles & Adjoining Areas
- F. Poinsettia Heights and Lake Ridge
- G. South Middle River
- H. Melrose Park
- I. Shady Banks
- J. Middle River Terrace
- K. Imperial Point
- L. Chula Vista, Riverland Village & Adjoining Areas



# The 17 Neighborhoods were consolidated into 12 Projects based on a variety of factors

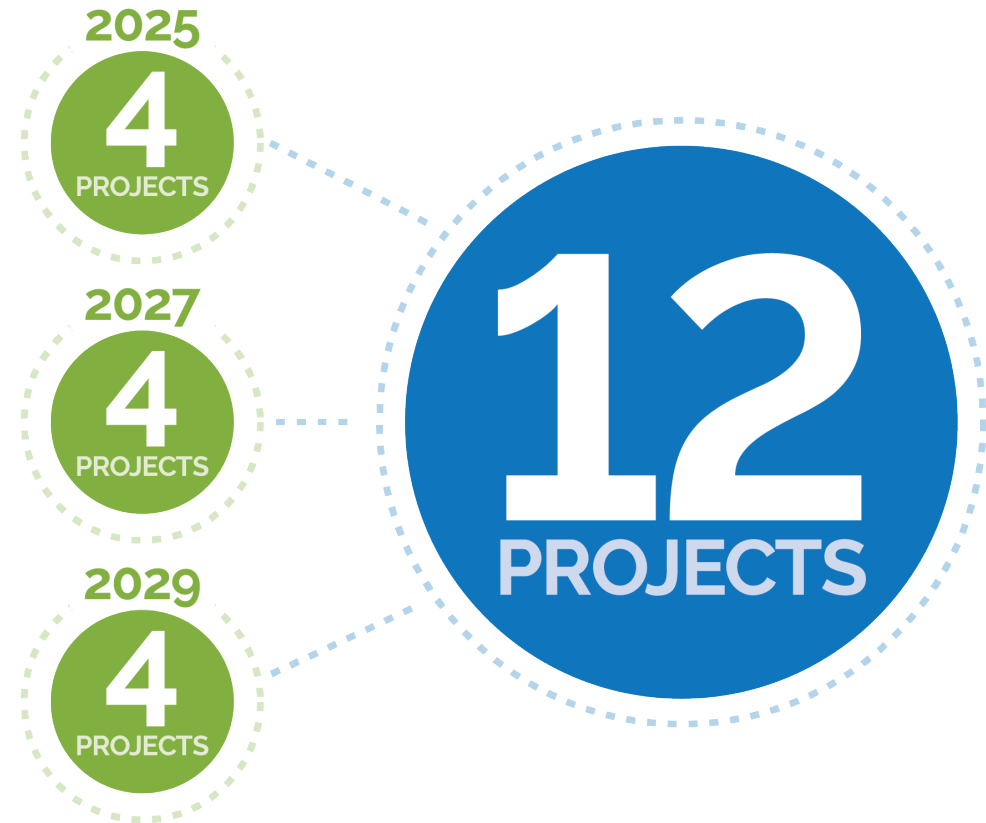
- Proximity/Adjacency
- Similarity of hydrologic conditions and drainage infrastructure





# Project Phasing must also consider a number of factors

- Program funding/financing
- City ability to simultaneously manage multiple design/construction projects
- Project interdependencies



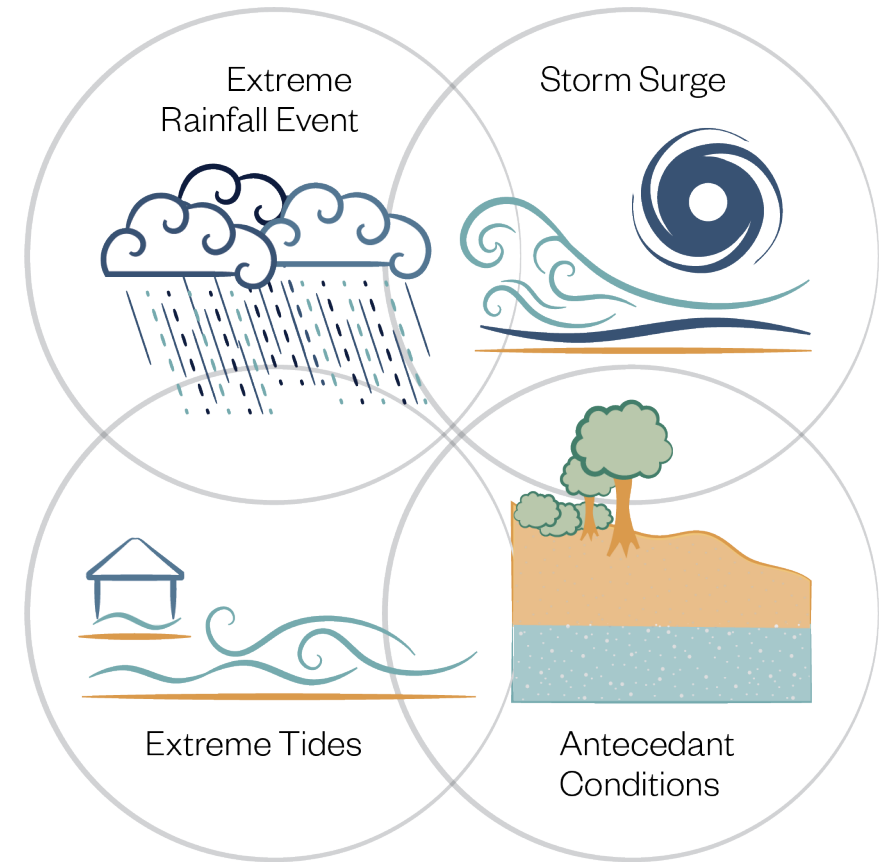
# Prioritization of Projects is still ongoing and will include consideration of...

- Flooding severity  
(based on **model results** and observation data)
- Critical assets within drainage basins
- Interdependencies
- Spatial distribution  
(impacts on neighbors and traffic)

currently using  
preliminary model results,  
while model is being  
updated

# Underway with updating the Stormwater Model to capture advancements in resilience planning

- Model conditions and parameters consistent with FS 380.093 (Resilient Florida Grant Program)
- Incorporation of future “extreme rainfall change factors”
- Incorporation of future groundwater conditions
- Consideration of regional water management operations



**Re-evaluating to a higher standard**



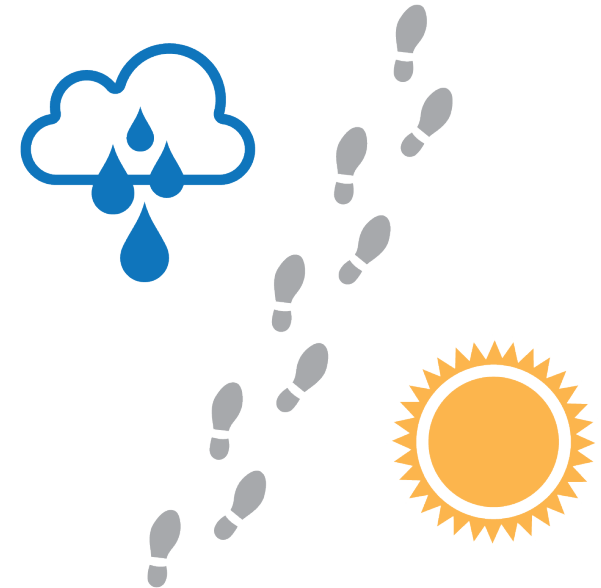
# Data Collection is critical and wet weather afforded timely opportunities

Hazen's field data collection for the 17 neighborhoods occurred during June/July 2024.

- Neighborhoods were visited in wet and dry conditions.

Priority locations within the neighborhoods were determined using:

- Flood prone areas (preliminary modeling)
- Low elevations (2018 DEM)
- Properties with FEMA repetitive losses



# Spatial coverage for data collection was widespread



Wet Weather Site Visits

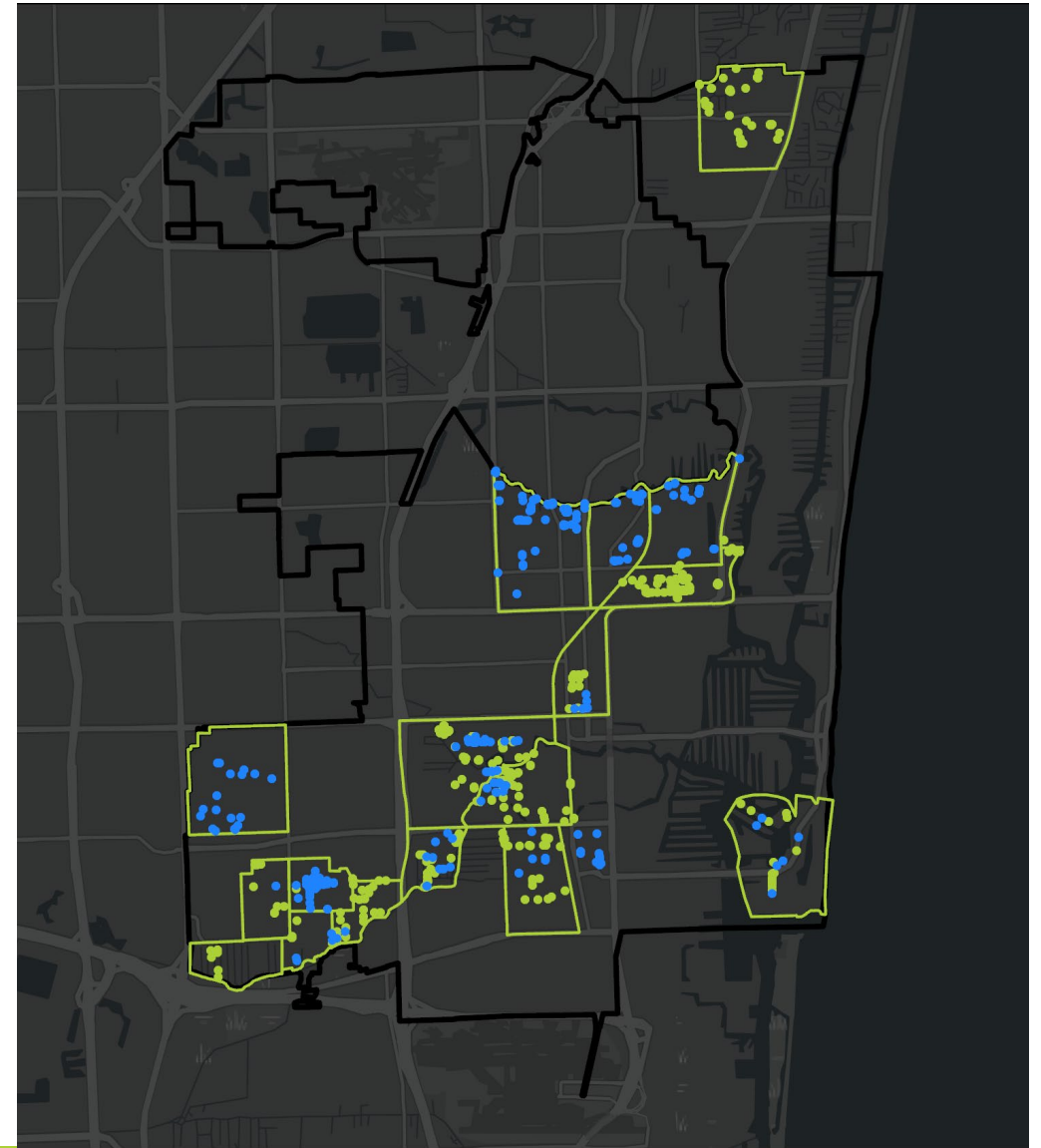
511 NW 17th St, Fort Lauderdale, FL 33311, USA

☉ 327°NW (T) • 26.149014, -80.150366 ±5m ▲ -23m



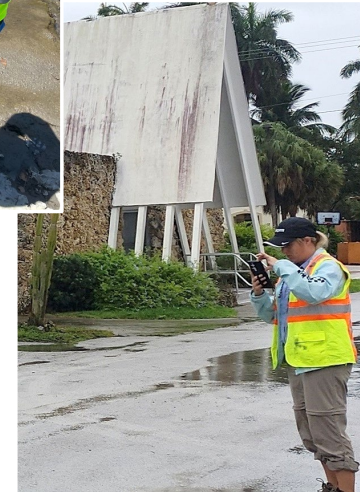
Neighborhood 7  
11 Jun 2024 10:39:43 AM

Dry Weather Site Visits



# Data Collection Team used ArcGIS Survey123...

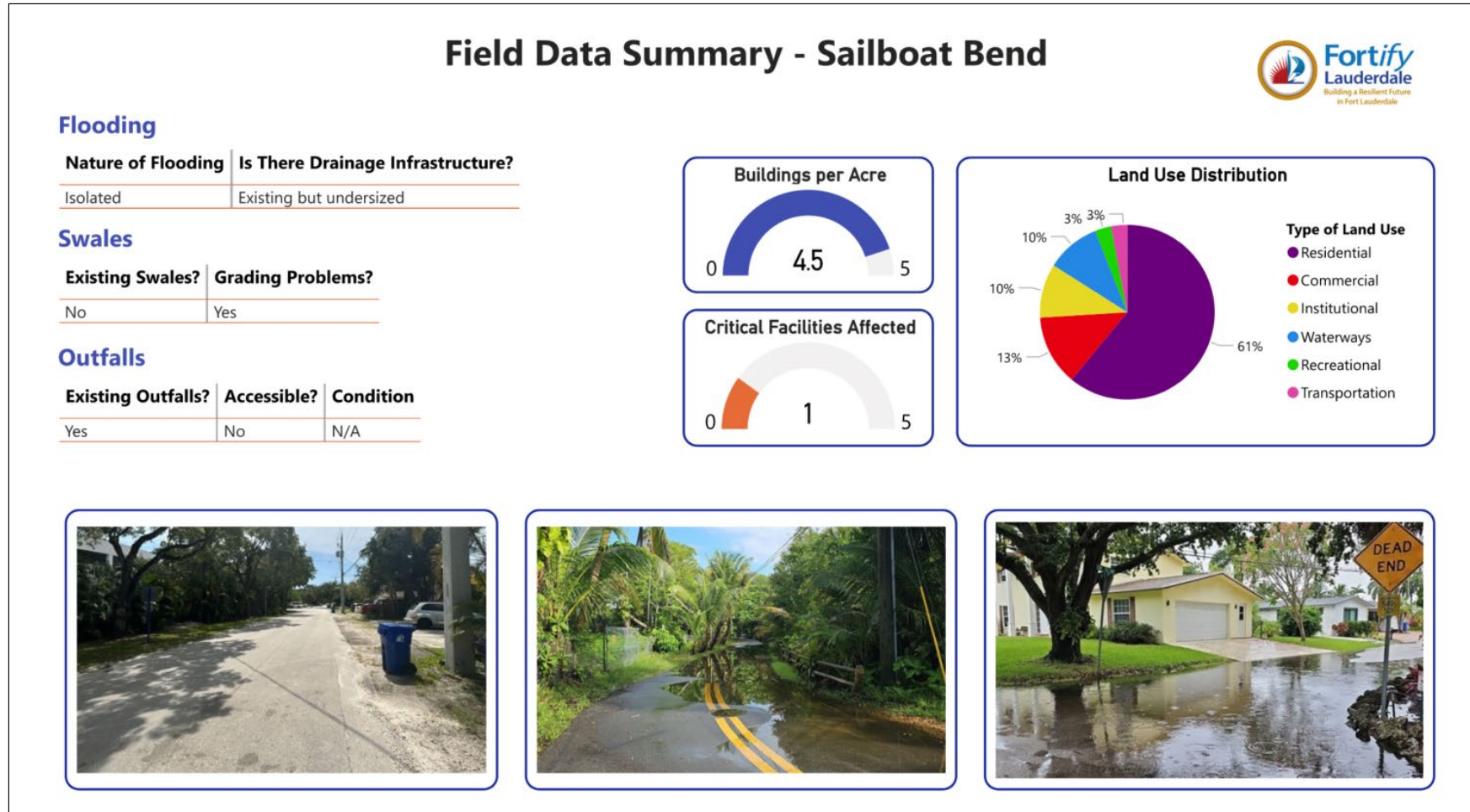
Swale Conditions  
Existing Infrastructure  
Outfall Conditions  
Mitigation Strategies



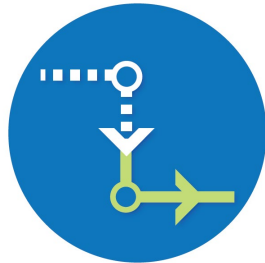
...and populated a PowerBI Dashboard



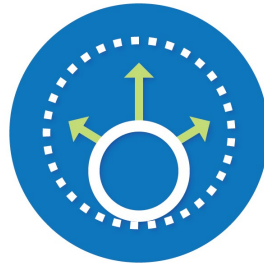
# ...providing a neighborhood overview “at a glance”



# A variety of potential mitigation strategies is proposed



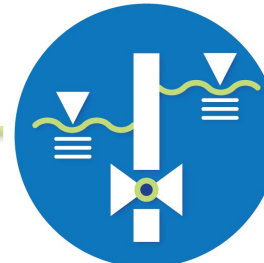
Extend Drainage System  
**DS**



Increase Conveyance Capacity  
**UP**



Install Pump Station  
**PS-I**



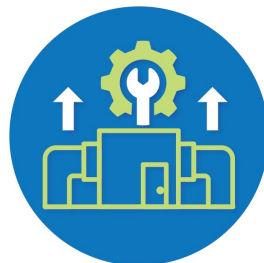
Install Tidal Valve  
**TV**



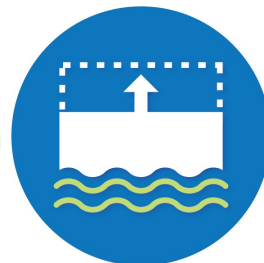
Capital Maintenance  
**MA**



Private Resiliency Program  
**PR**



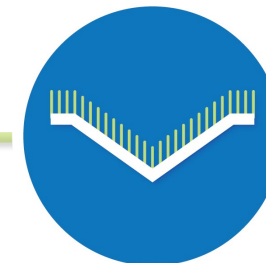
Upgrade Existing Pump Station  
**PS-U**



Raise Seawalls  
**RS**













Grading Improvements  
**GI**



Rehabilitate Grass Swales  
**SW**

# Takeaway from Field Work & Desktop Analyses

		Adaptation Strategies									
											
Project	Tranche 2 Neighborhoods	DS	UP	PS-I	MA	PR	PS-U	RS	GI	TV	SW
A	Riverland Manors, Lauderdale Isles, River Landings & Adjoining Areas	✓		✓		✓		✓	✓	✓	✓
B	Sailboat Bend, Riverside Park & Adjoining Areas	✓	✓	✓		✓		✓		✓	✓
C	Tarpon River and Croissant Park	✓	✓	✓		✓		✓		✓	✓
D	Flagler Village		✓		✓	✓	✓				
E	Harbour Isles & Adjoining Areas		✓			✓				✓	
F	Lake Ridge and Poinsettia Heights	✓	✓	✓		✓			✓		✓
G	South Middle River	✓	✓	✓		✓			✓		✓
H	Melrose Park			✓	✓	✓					
I	Shady Banks	✓	✓	✓		✓				✓	✓
J	Middle River Terrace	✓	✓	✓		✓			✓		✓
K	Imperial Point	✓	✓			✓					✓
L	Riverland Village and Chula Vista & Adjoining Areas	✓		✓	✓	✓		✓		✓	✓

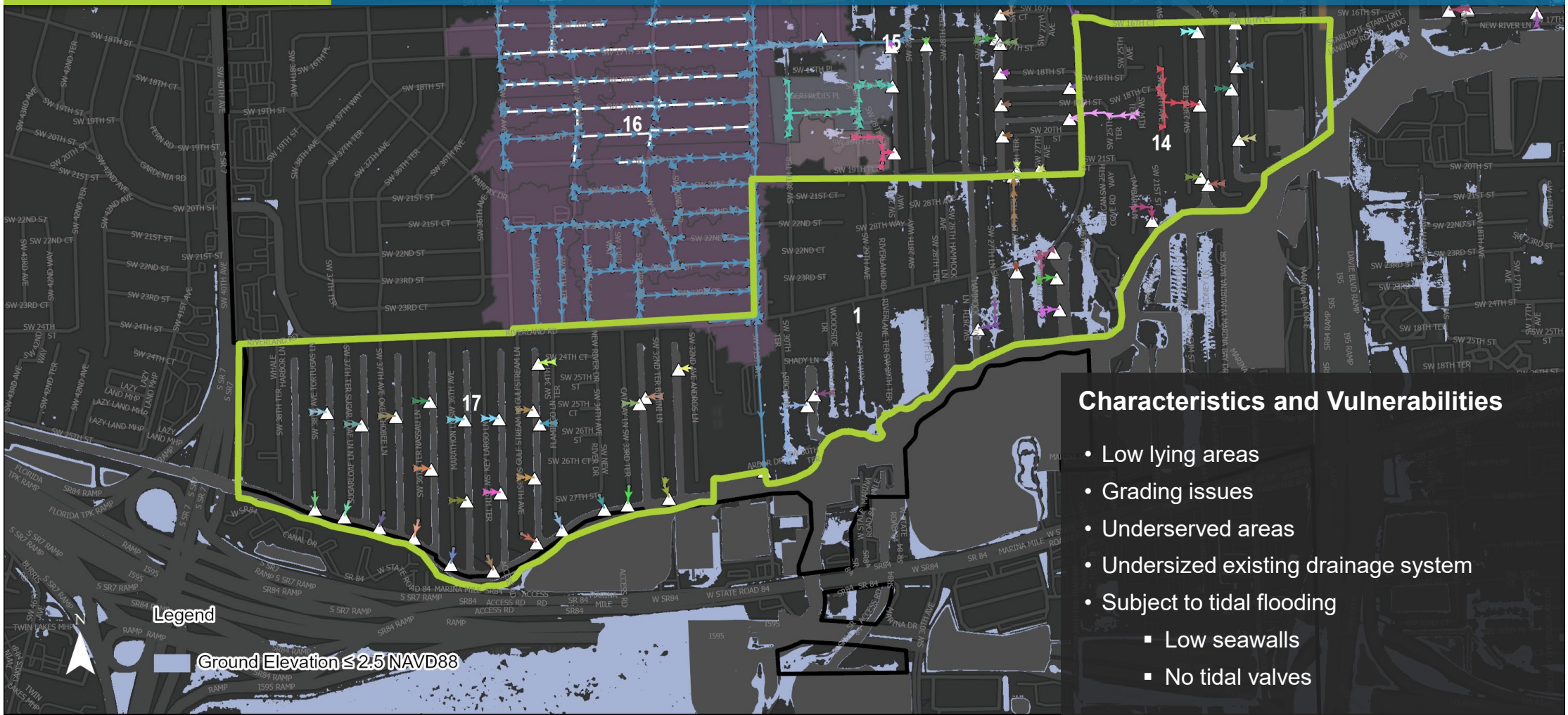


# Conceptual Approaches by Neighborhood/Project

The following slides include  
**a progression through each Project Area**  
which **depicts drainage basin characteristics,**  
**highlights particular vulnerabilities,** and  
**identifies an appropriate suite of adaptation strategies**  
to be utilized in the neighborhood(s).

# PROJECT A

## River Landings, Riverland Manors/Woods, Lauderdale Isles & Adjoining Areas





# PROJECT A

## River Landings, Riverland Manors/Woods, Lauderdale Isles & Adjoining Areas



### Potential Adaptation Strategies

-  Grading Improvements
-  Rehabilitate Grass Swales
-  Extend Drainage System
-  Raise Seawalls
-  Install Tidal Valve
-  Install Pump Station
-  Private Resiliency Program

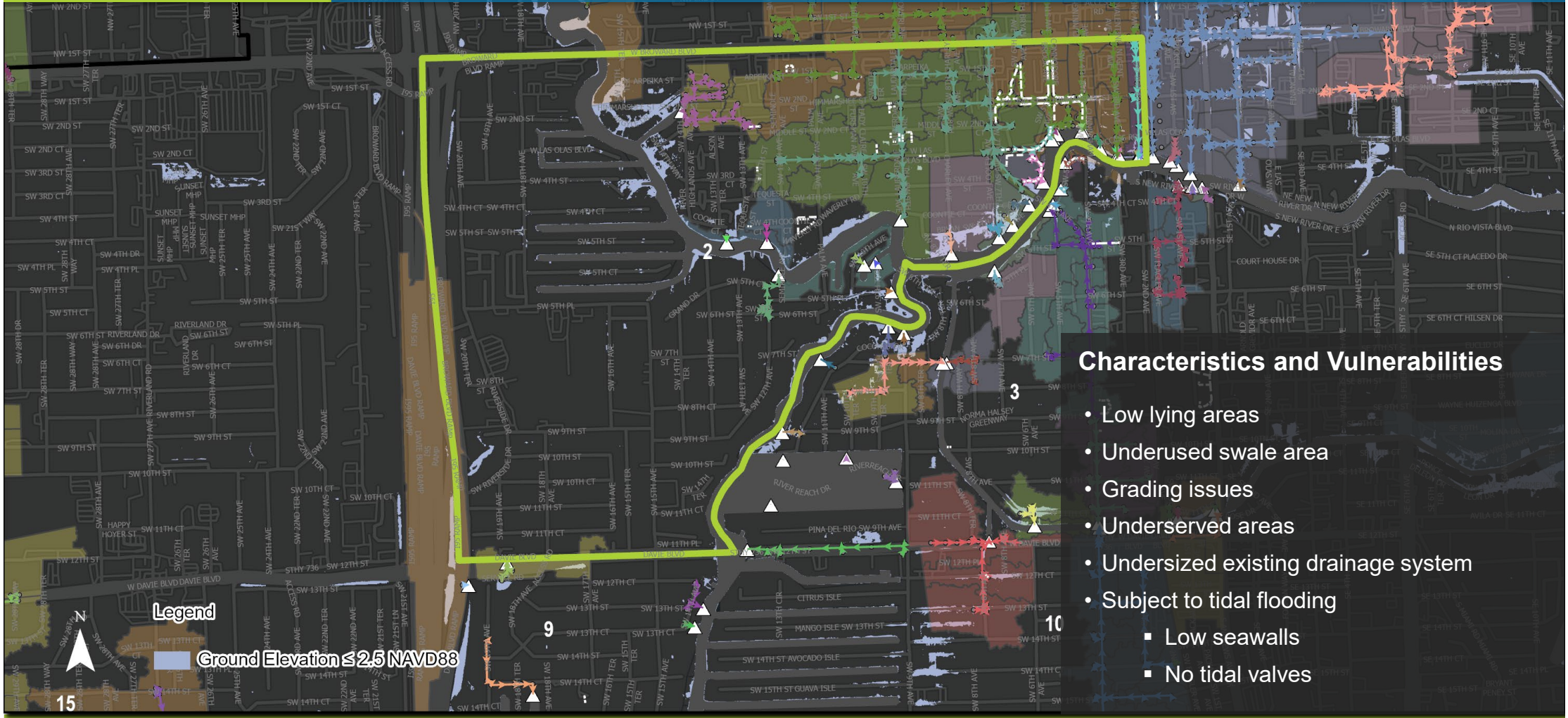
Legend

Ground Elevation  $\leq$  2.5 NAVD88



# PROJECT B

## Sailboat Bend & Adjoining Areas



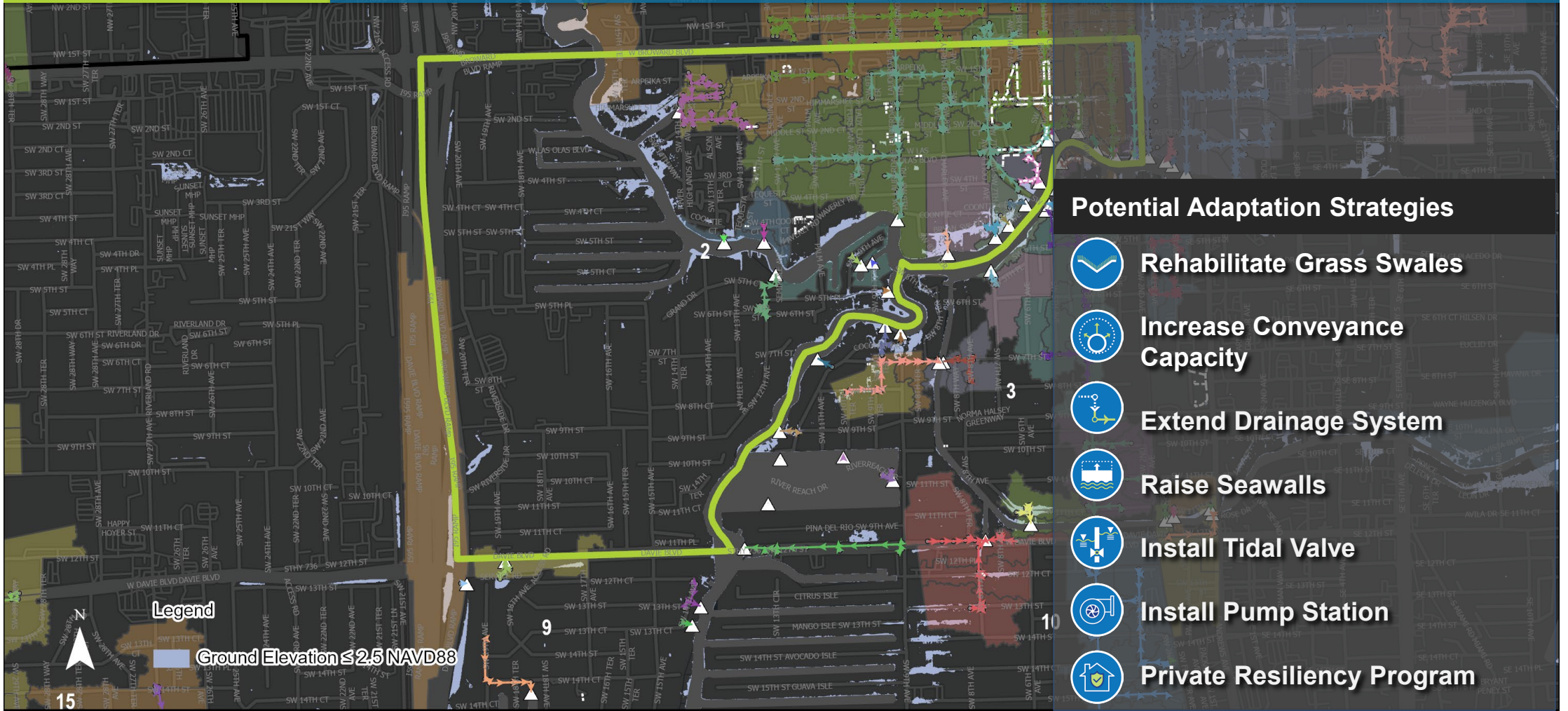
### Characteristics and Vulnerabilities

- Low lying areas
- Underused swale area
- Grading issues
- Underserved areas
- Undersized existing drainage system
- Subject to tidal flooding
  - Low seawalls
  - No tidal valves



# PROJECT B

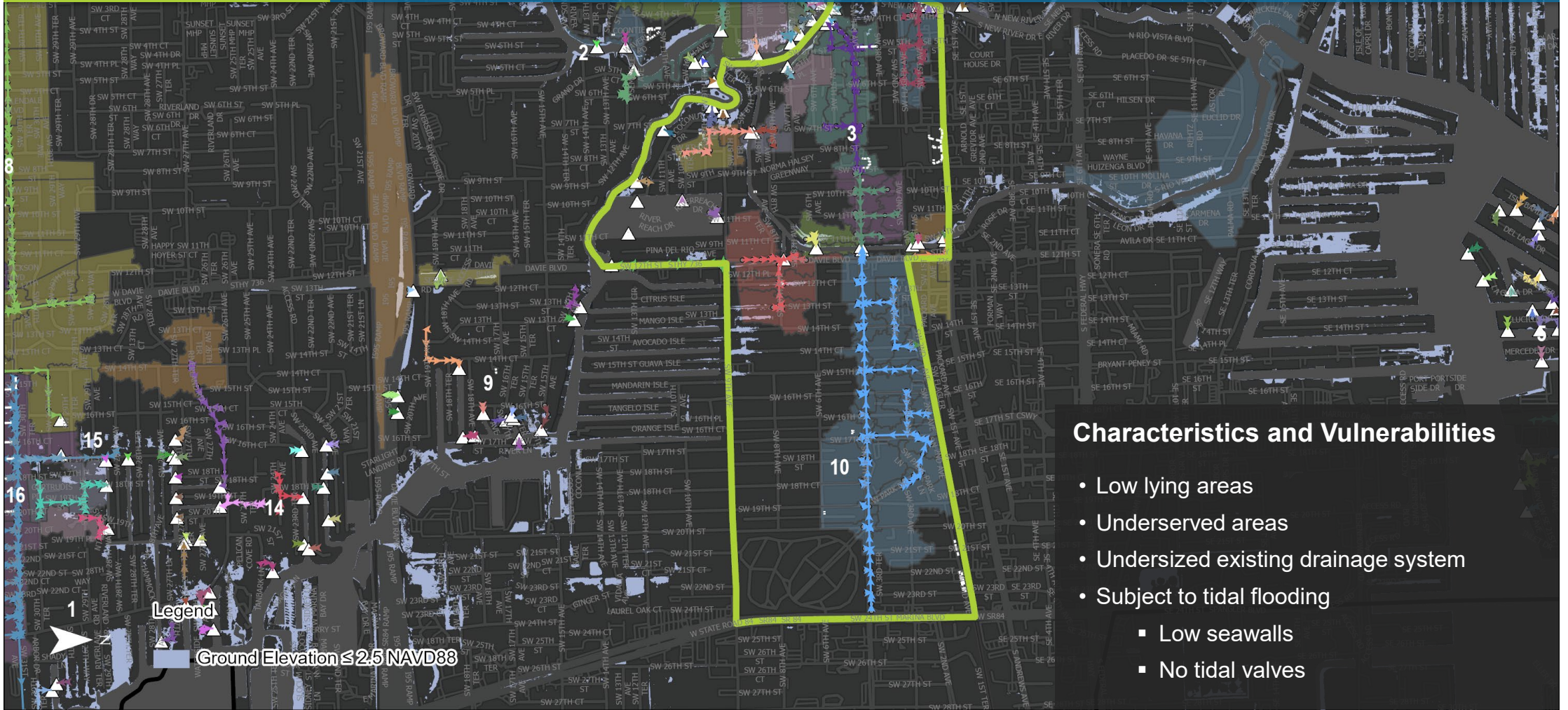
## Sailboat Bend & Adjoining Areas





# PROJECT C

## Tarpon River and Croissant Park



### Characteristics and Vulnerabilities

- Low lying areas
- Underserved areas
- Undersized existing drainage system
- Subject to tidal flooding
  - Low seawalls
  - No tidal valves










# PROJECT C

## Tarpon River and Croissant Park

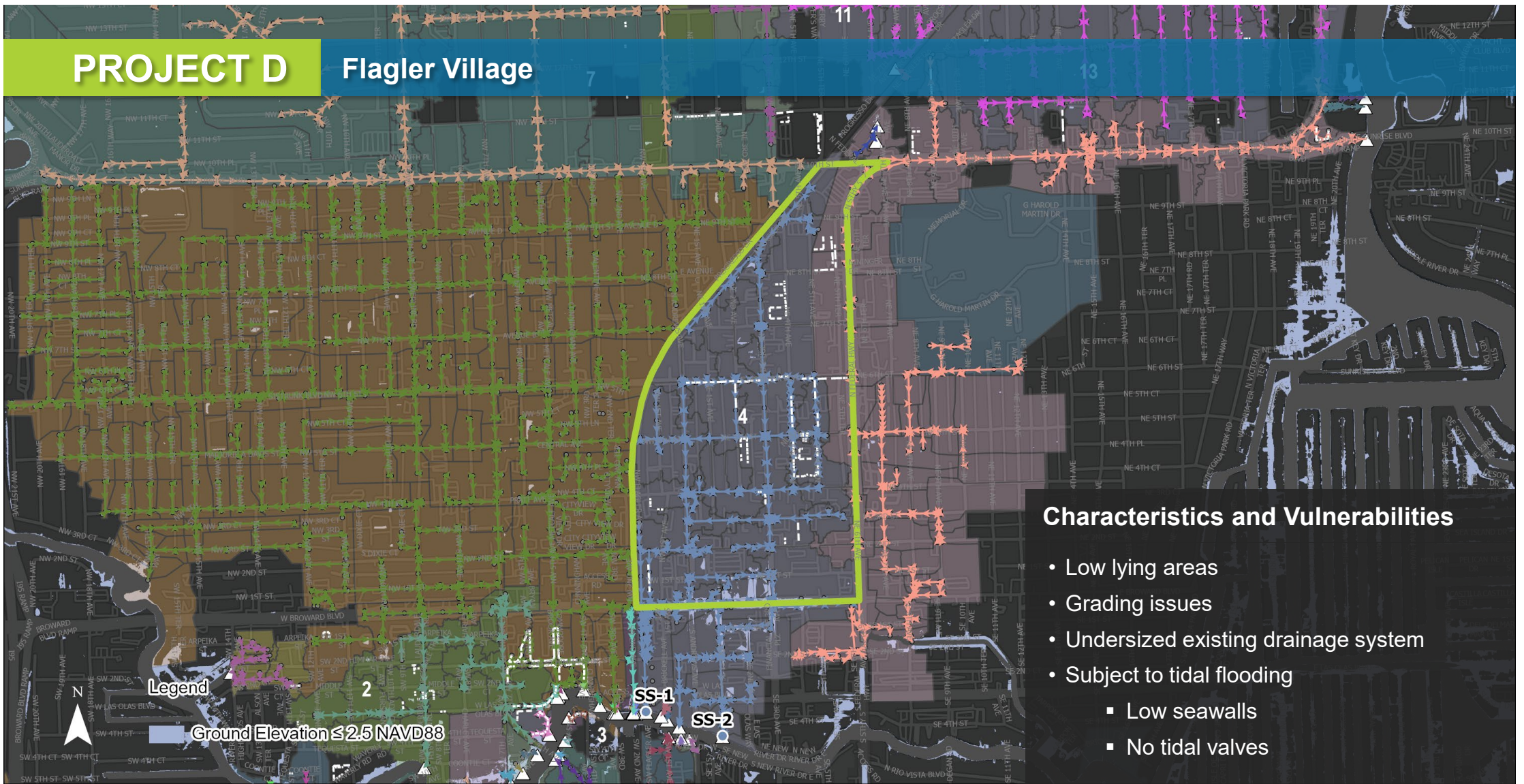


### Potential Adaptation Strategies

-  **Rehabilitate Grass Swales**
-  **Increase Conveyance Capacity**
-  **Extend Drainage System**
-  **Raise Seawalls**
-  **Install Tidal Valve**
-  **Install Pump Station**
-  **Private Resiliency Program**



# PROJECT D Flagler Village



## Characteristics and Vulnerabilities





- Low lying areas
- Grading issues
- Undersized existing drainage system
- Subject to tidal flooding
  - Low seawalls
  - No tidal valves



# PROJECT D Flagler Village



## Potential Adaptation Strategies

-  Increase Conveyance Capacity
-  Upgrade Existing Pump Stations
-  Capital Maintenance
-  Private Resiliency Program



# PROJECT E

## Harbour Isles & Adjoining Areas



### Characteristics and Vulnerabilities

- Low lying areas
- No clearly defined swales
- Underserved areas
- Undersized existing drainage system
- Subject to tidal flooding
  - Low seawalls
  - No tidal valves

# PROJECT E Harbour Isles & Adjoining Areas



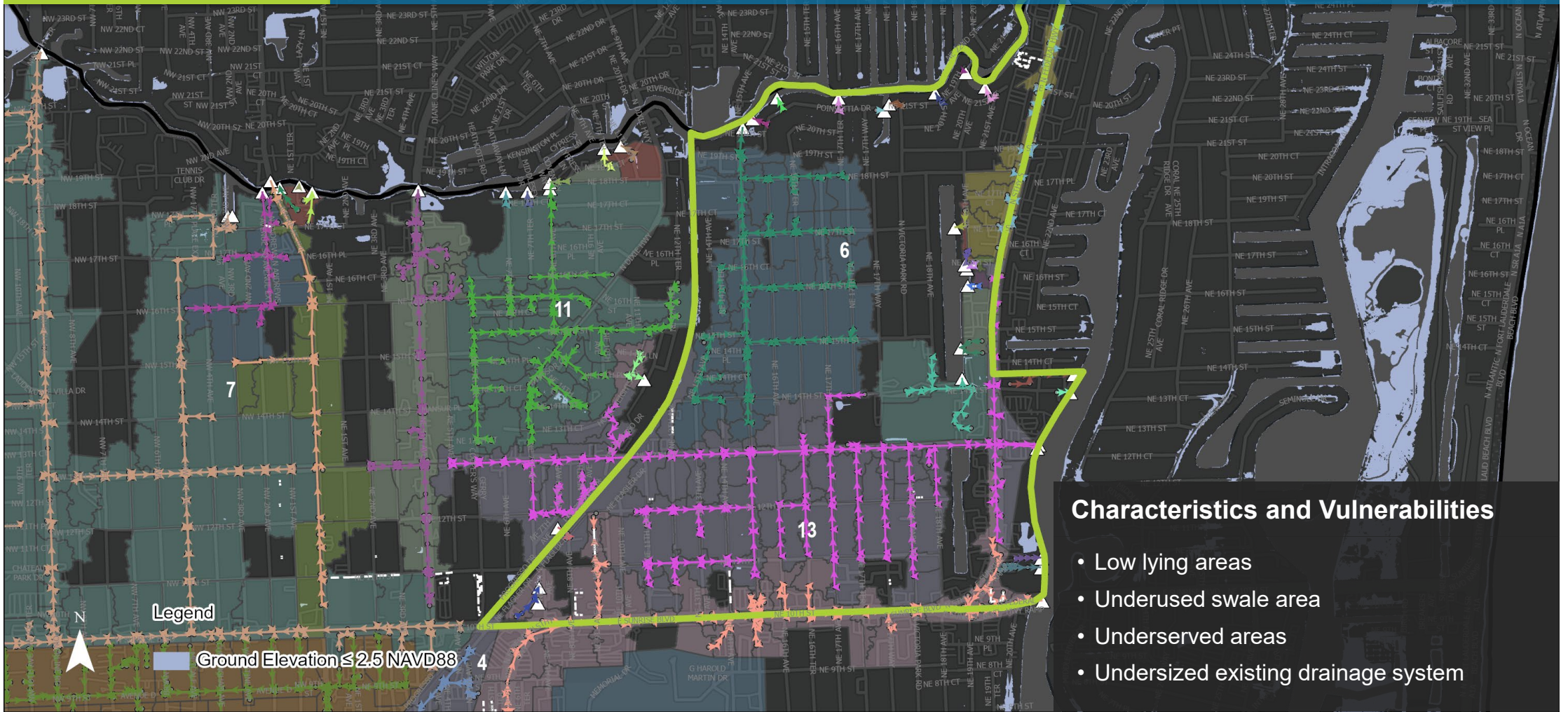
## Potential Adaptation Strategies

-  Increase Conveyance Capacity
-  Install Tidal Valve
-  Private Resiliency Program



# PROJECT F

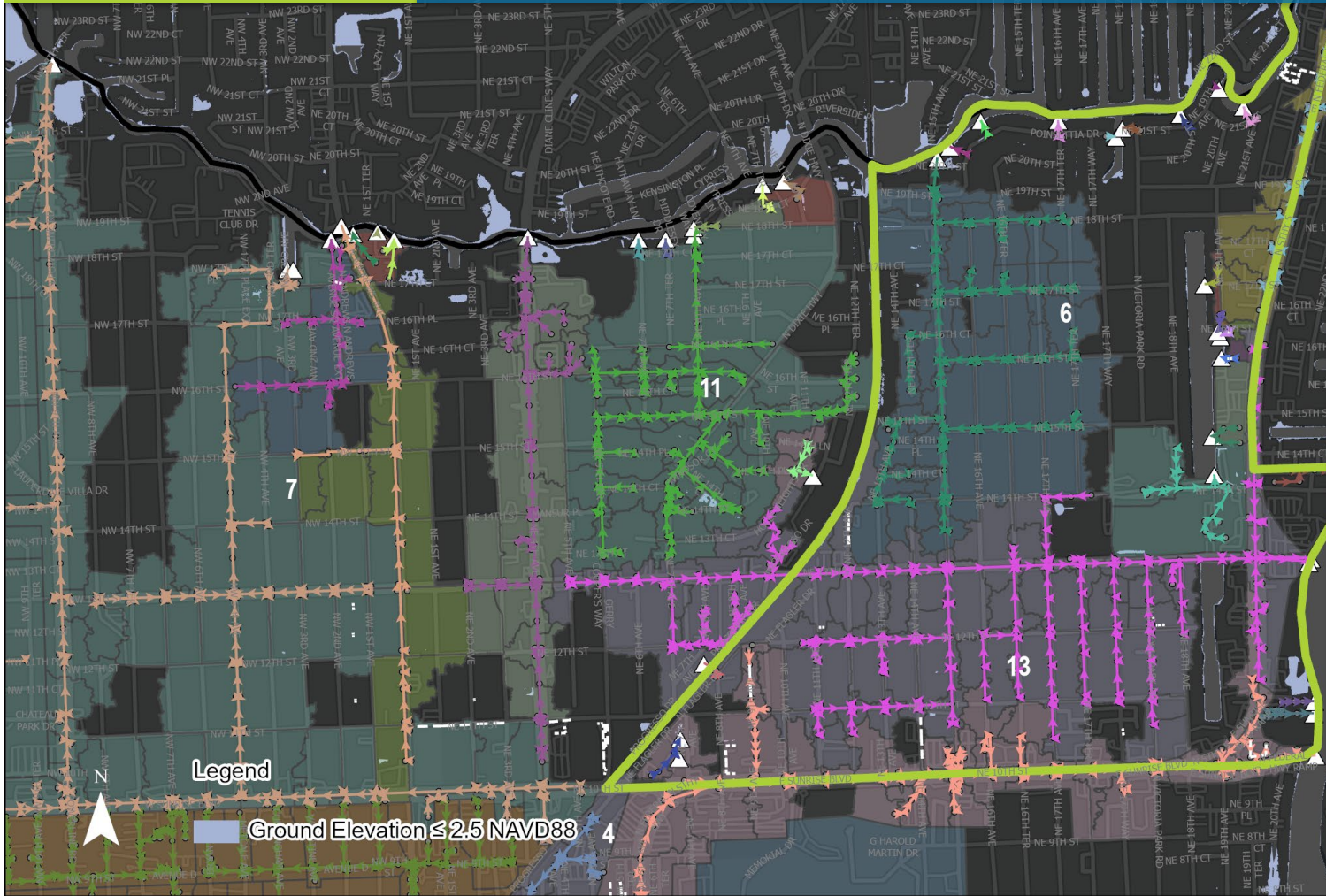
## Poinsettia Heights and Lake Ridge





# PROJECT F

## Poinsettia Heights and Lake Ridge



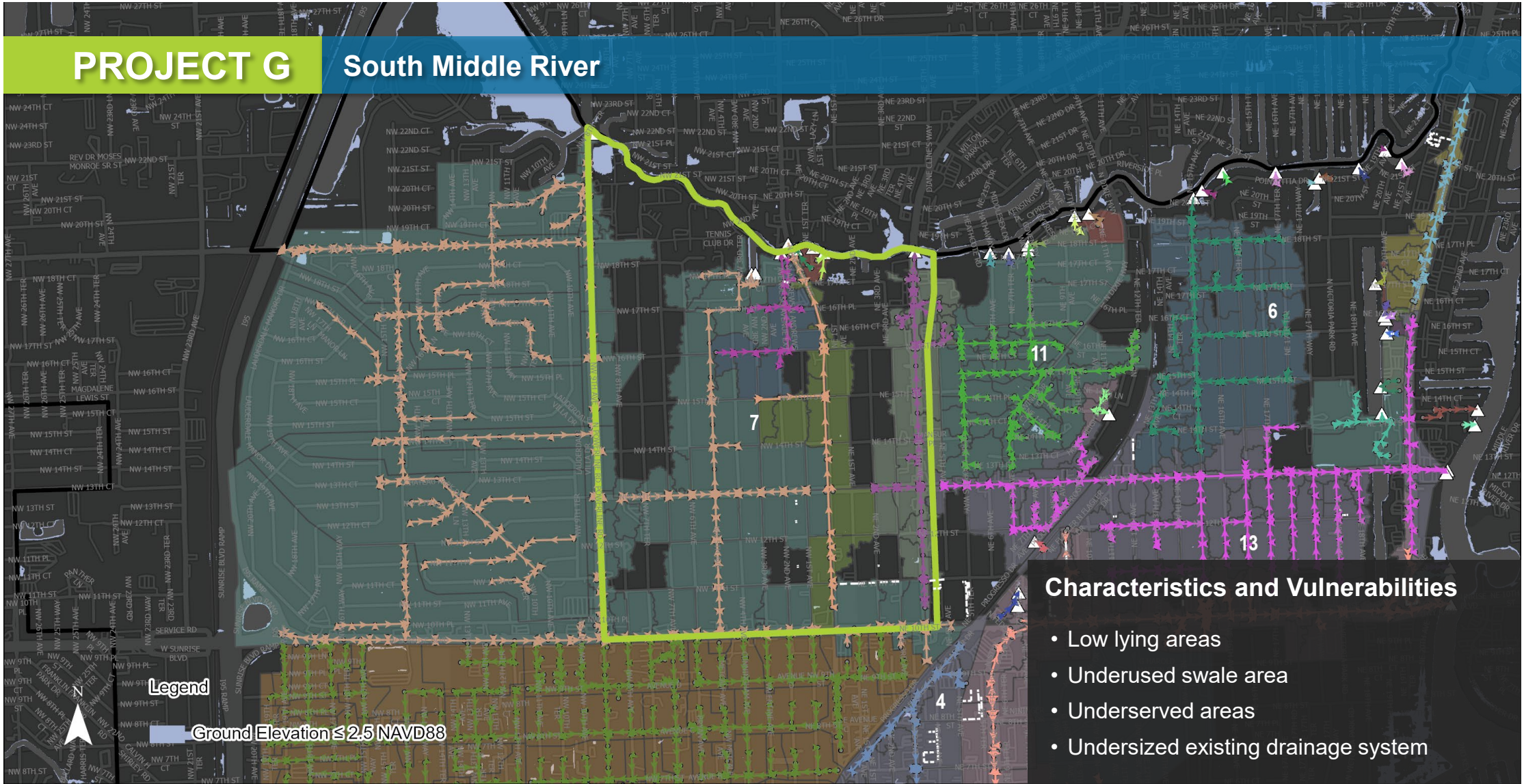
### Potential Adaptation Strategies

-  Grading Improvements
-  Rehabilitate Grass Swales
-  Increase Conveyance Capacity
-  Extend Drainage System
-  Install Pump Station
-  Private Resiliency Program



# PROJECT G

## South Middle River



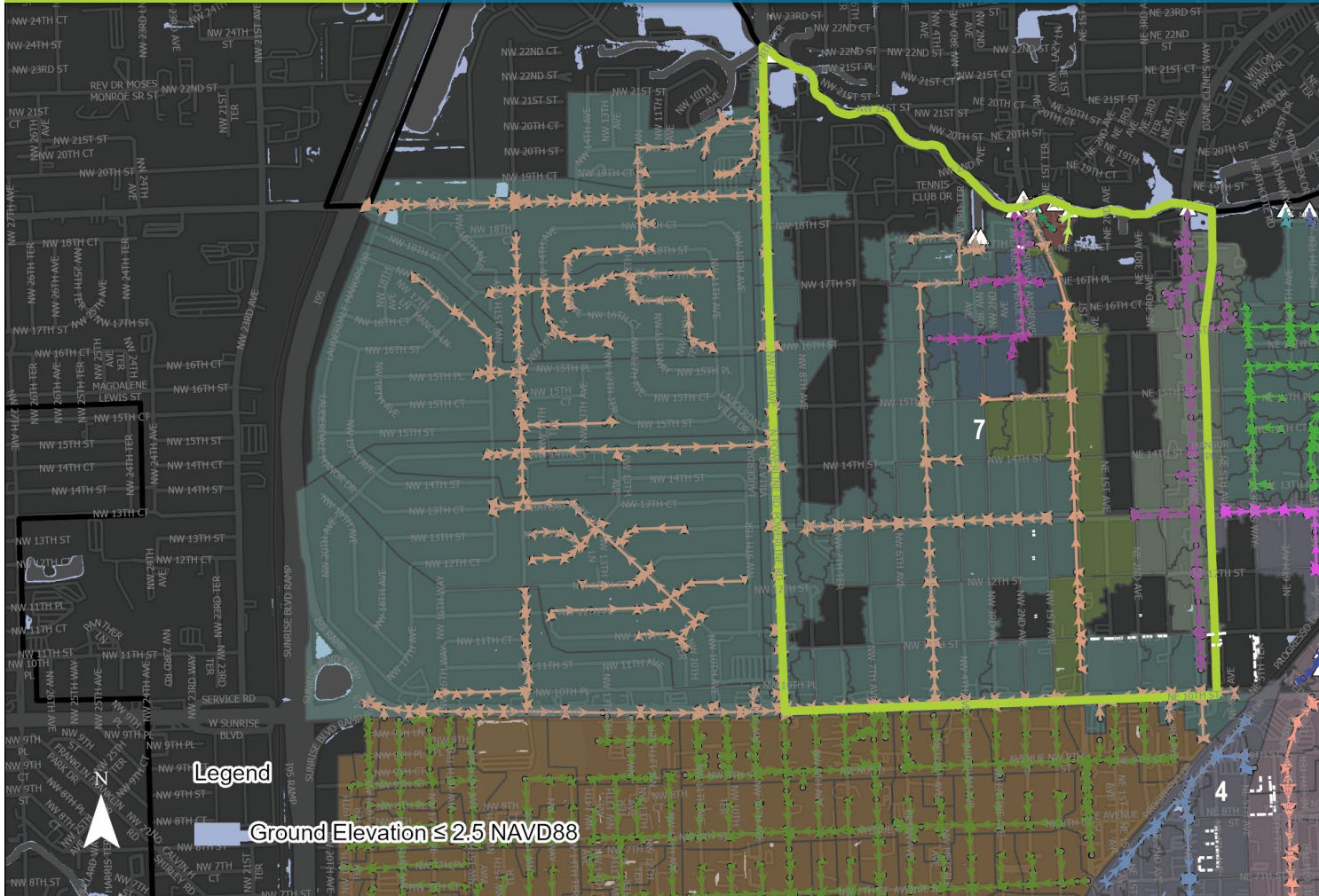
### Characteristics and Vulnerabilities

- Low lying areas
- Underused swale area
- Underserved areas
- Undersized existing drainage system



# PROJECT G

## South Middle River



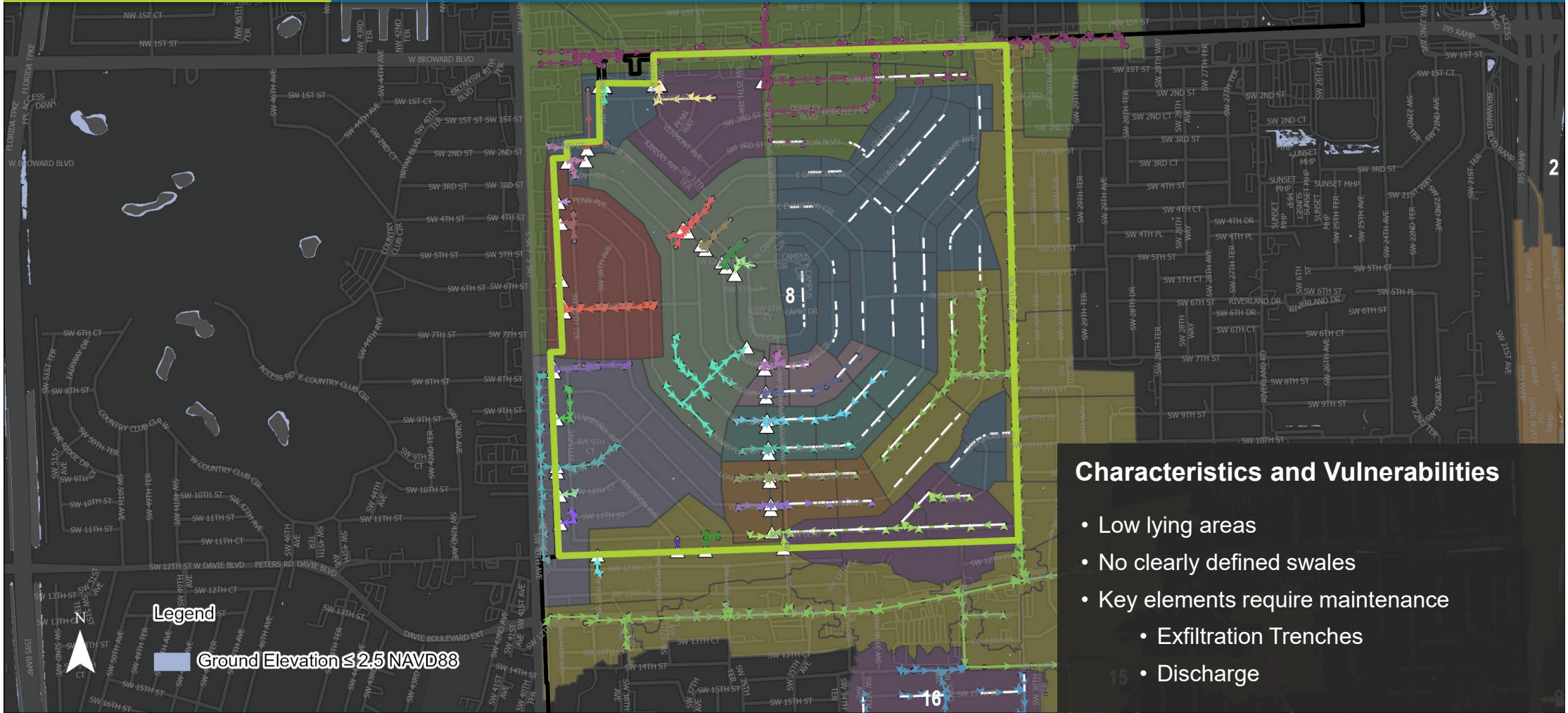
### Potential Adaptation Strategies

-  Grading Improvements
-  Rehabilitate Grass Swales
-  Increase Conveyance Capacity
-  Extend Drainage System
-  Install Pump Station
-  Private Resiliency Program



# PROJECT H

## Melrose Park



### Characteristics and Vulnerabilities

- Low lying areas
- No clearly defined swales
- Key elements require maintenance
  - Exfiltration Trenches
  - Discharge



# PROJECT H

## Melrose Park



### Potential Adaptation Strategies



Install Pump Station



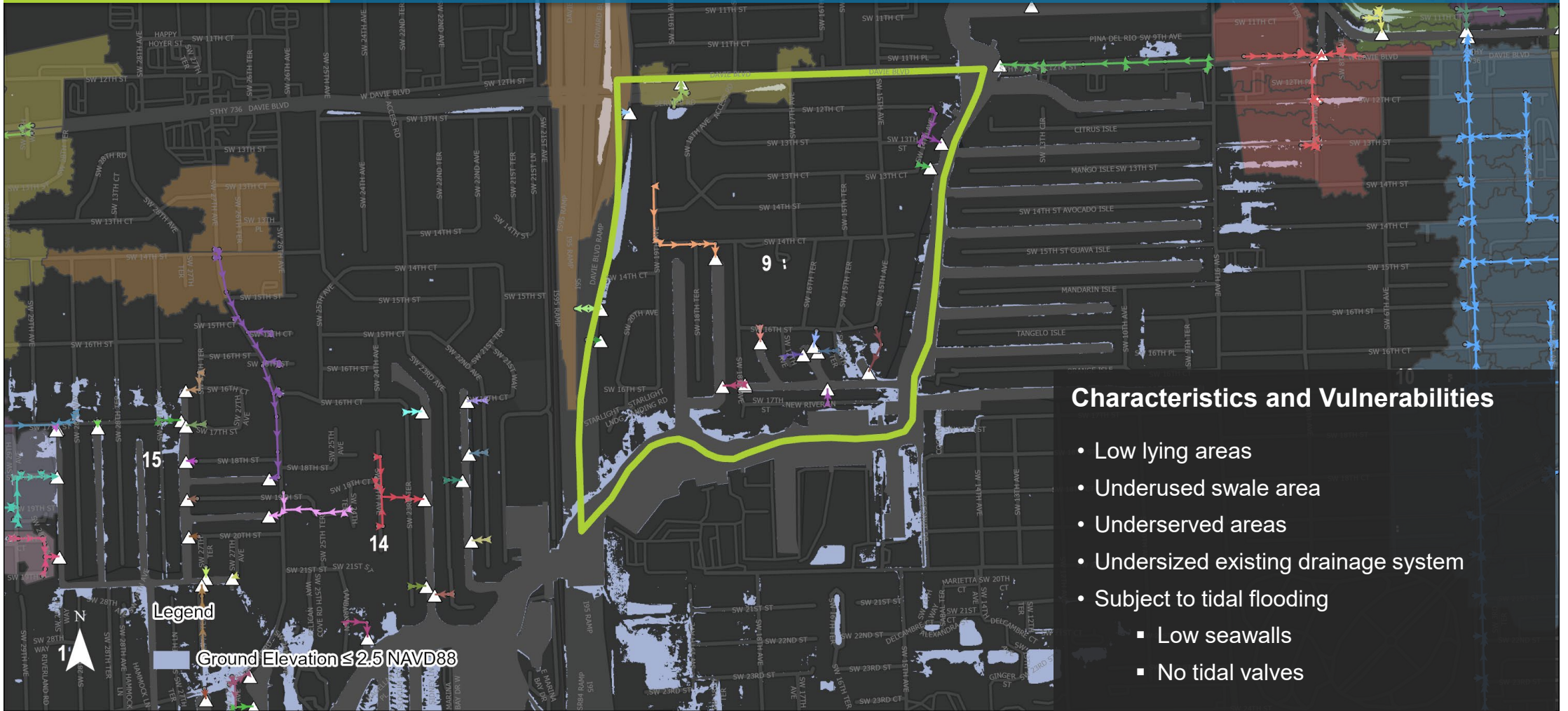
Capital Maintenance



Private Resiliency Program

# PROJECT I

## Shady Banks



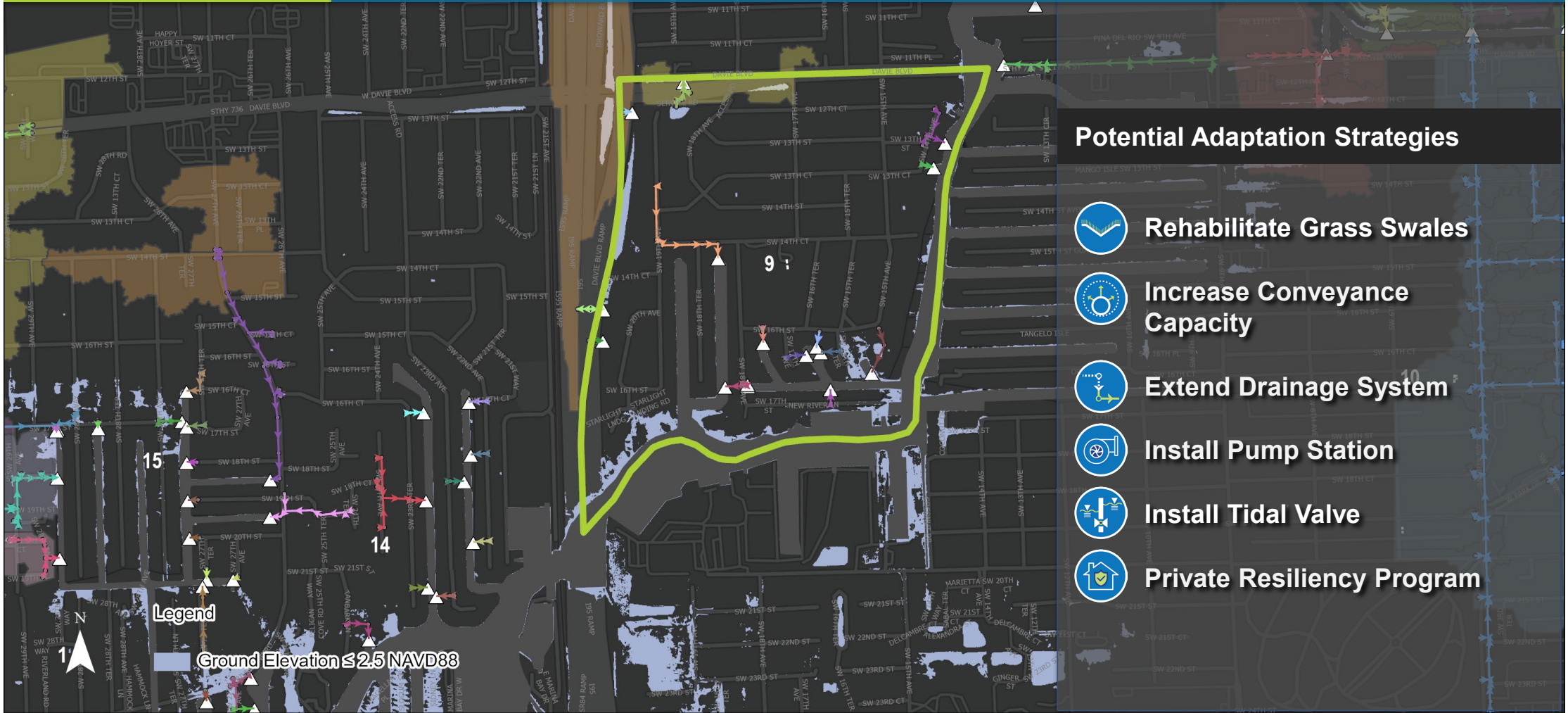
### Characteristics and Vulnerabilities

- Low lying areas
- Underused swale area
- Underserved areas
- Undersized existing drainage system
- Subject to tidal flooding
  - Low seawalls
  - No tidal valves




# PROJECT I

## Shady Banks



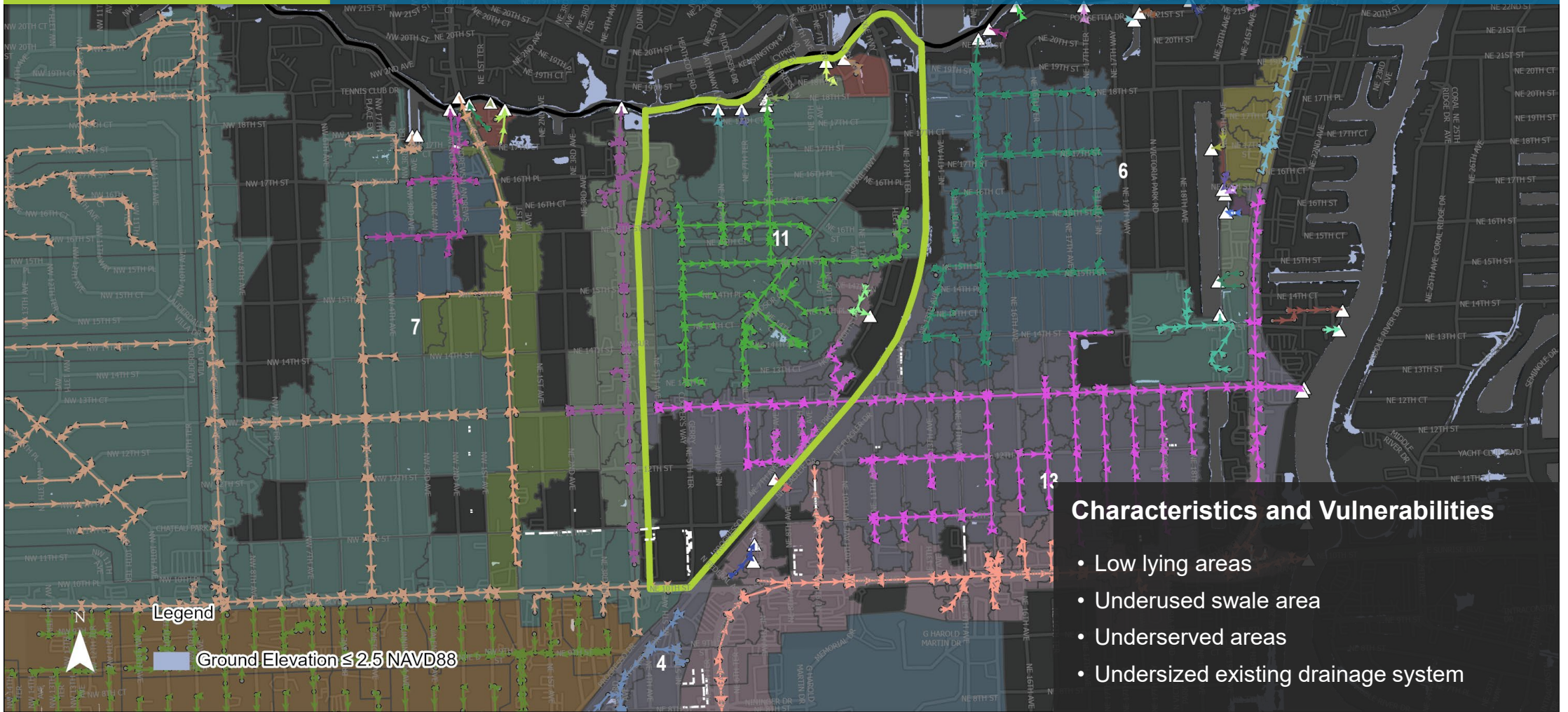
### Potential Adaptation Strategies

-  **Rehabilitate Grass Swales**
-  **Increase Conveyance Capacity**
-  **Extend Drainage System**
-  **Install Pump Station**
-  **Install Tidal Valve**
-  **Private Resiliency Program**



# PROJECT J

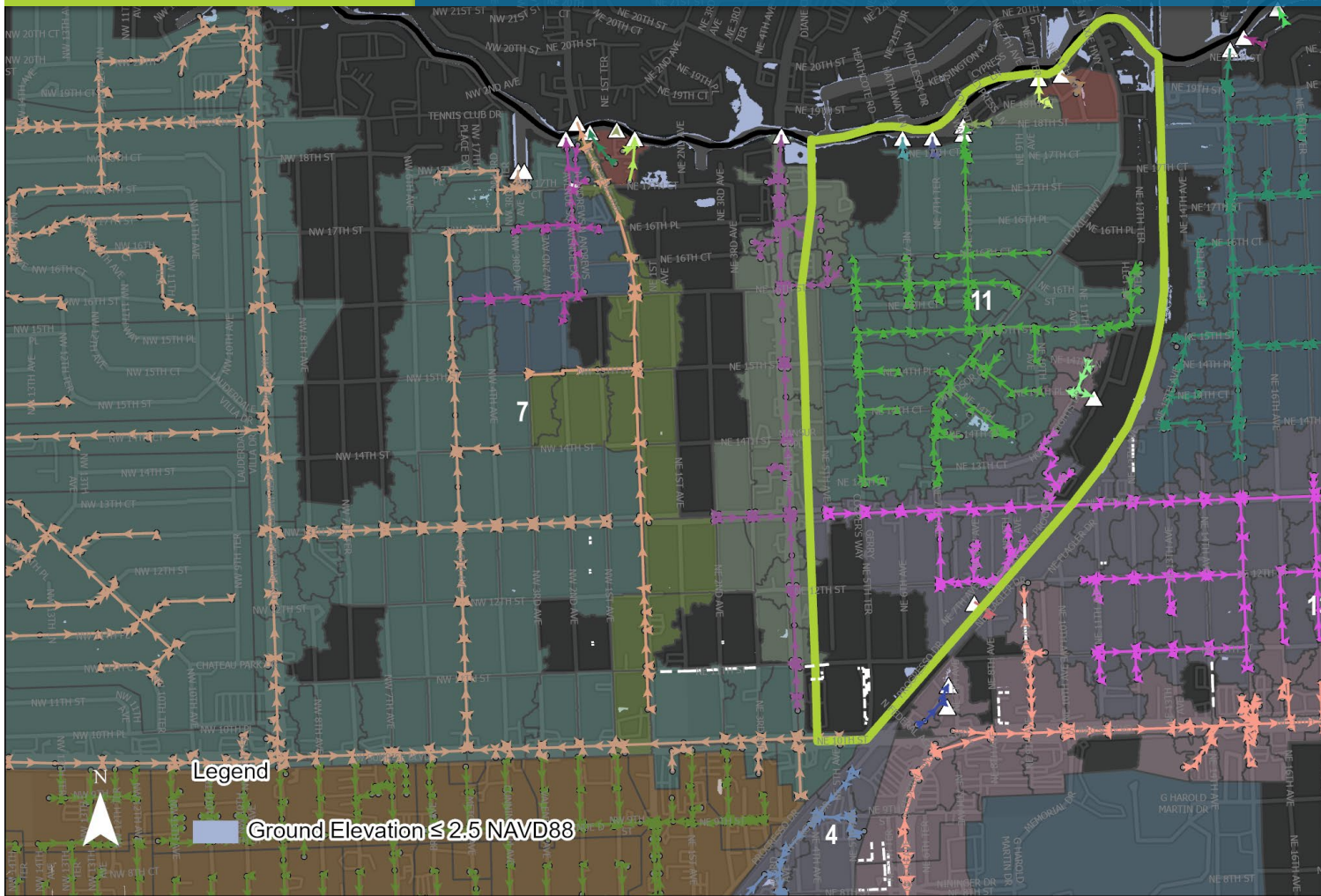
## Middle River Terrace





# PROJECT J

# Middle River Terrace



### Potential Adaptation Strategies



Rehabilitate Grass Swales



Grading Improvements



Increase Conveyance Capacity



Extend Drainage System



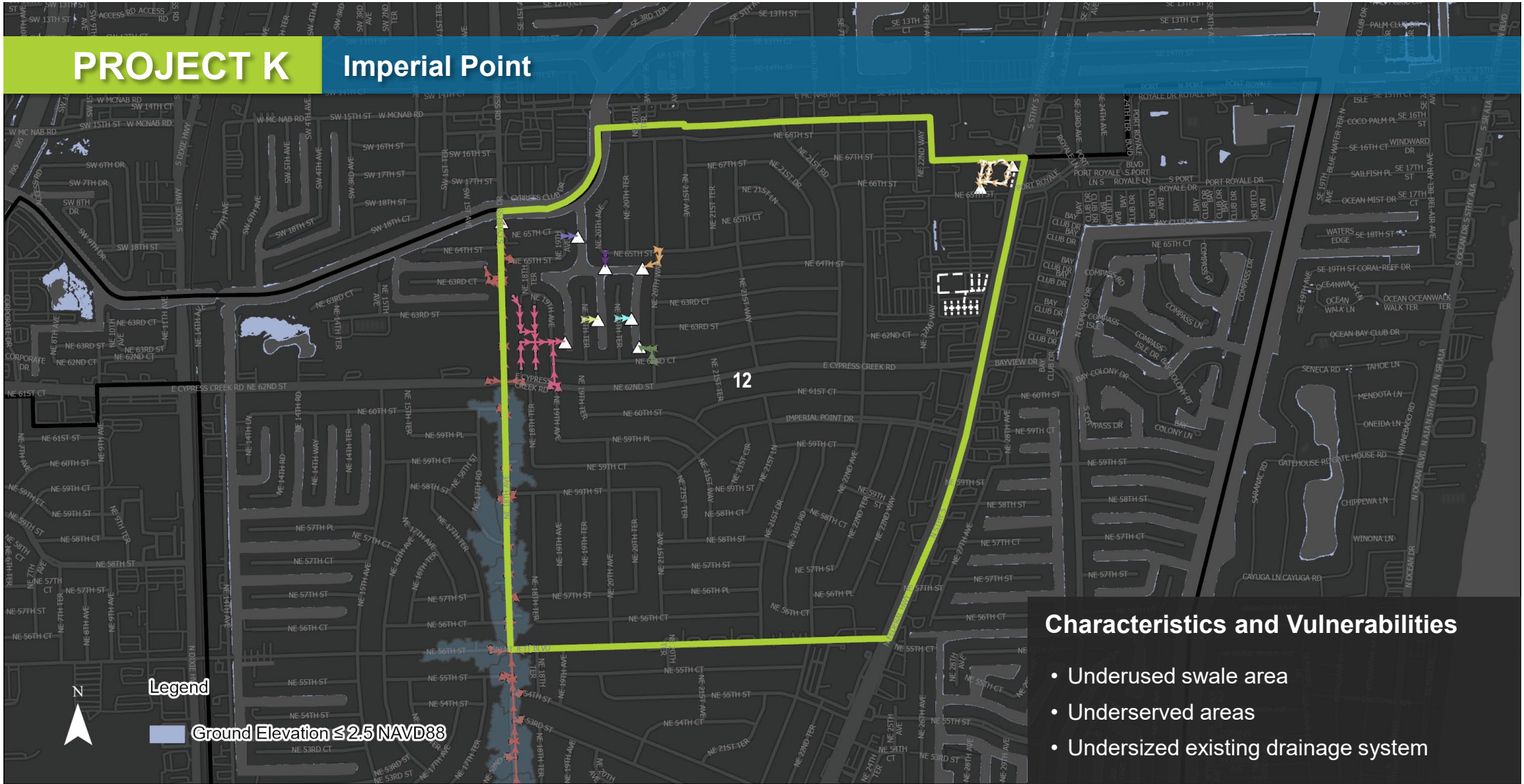
Install Pump Station



Private Resiliency Program



# PROJECT K Imperial Point

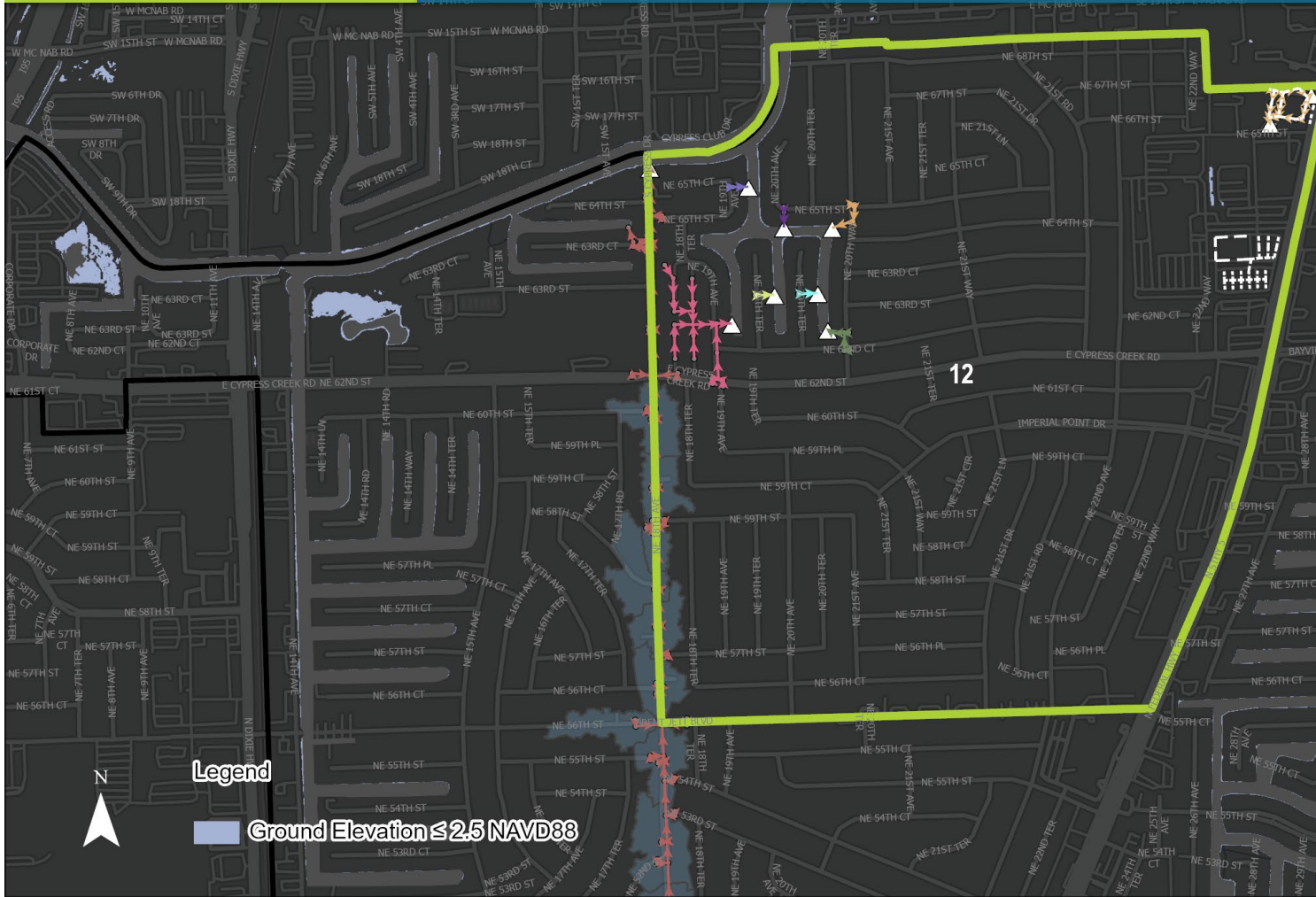


## Characteristics and Vulnerabilities



- Underused swale area
- Underserved areas
- Undersized existing drainage system



# PROJECT K Imperial Point

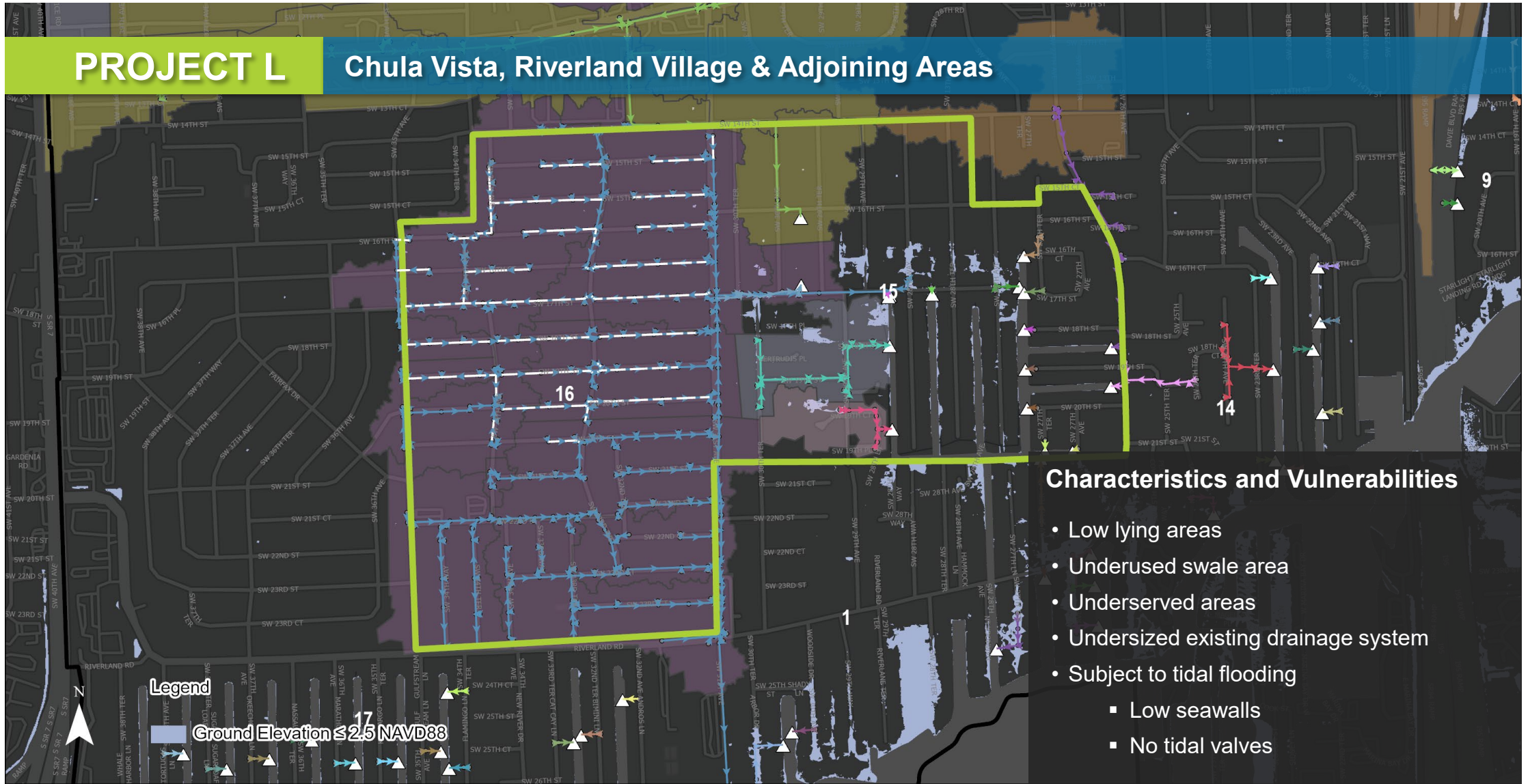


## Potential Adaptation Strategies

-  **Rehabilitate Grass Swales**
-  **Increase Conveyance Capacity**
-  **Extend Drainage System**
-  **Private Resiliency Program**

# PROJECT L

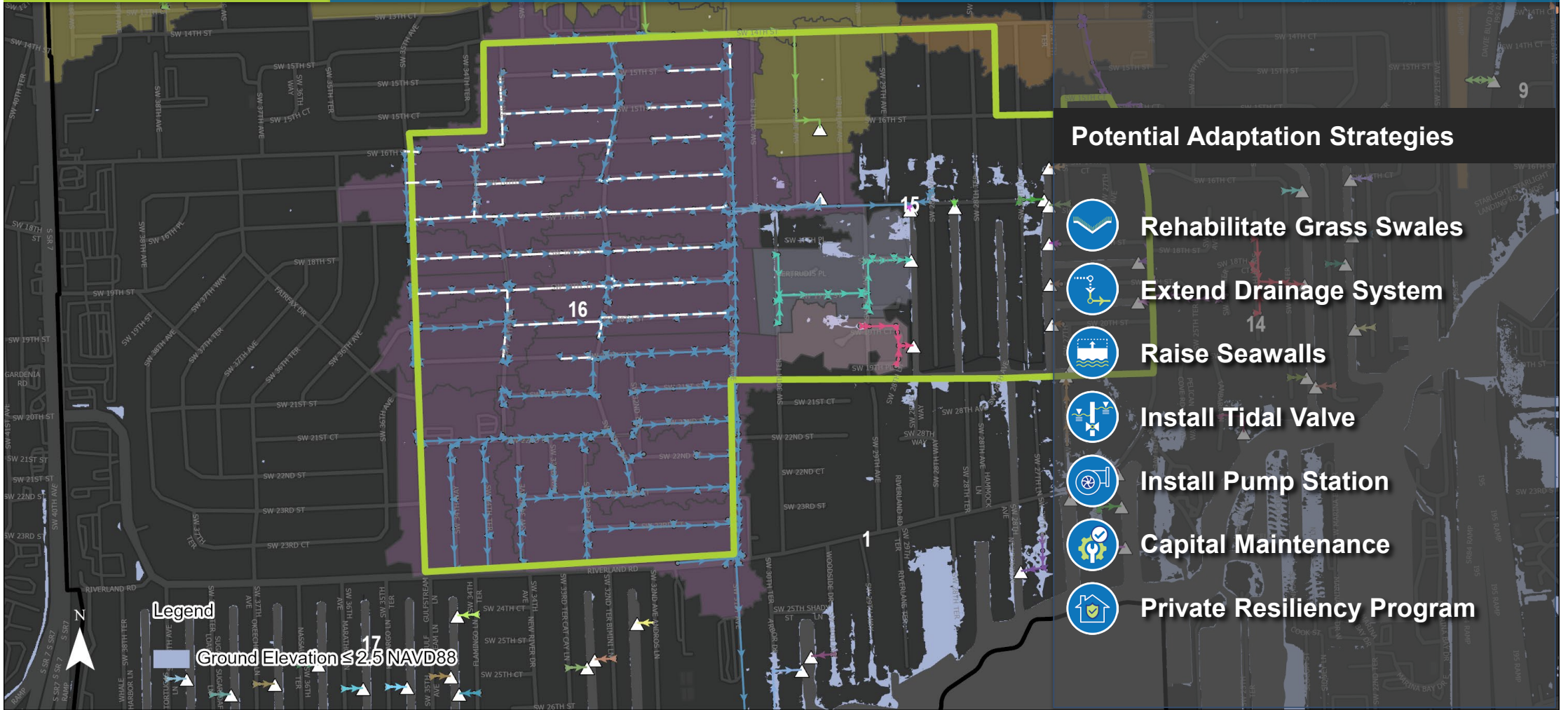
## Chula Vista, Riverland Village & Adjoining Areas





# PROJECT L

## Chula Vista, Riverland Village & Adjoining Areas



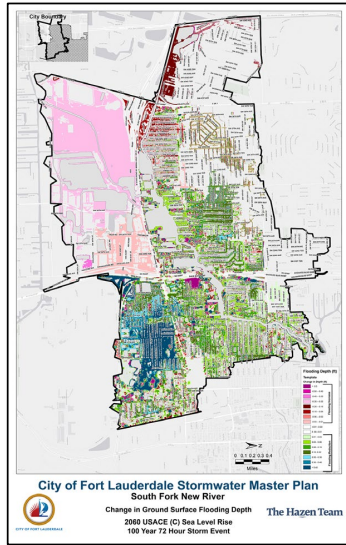
### Potential Adaptation Strategies

-  Rehabilitate Grass Swales
-  Extend Drainage System
-  Raise Seawalls
-  Install Tidal Valve
-  Install Pump Station
-  Capital Maintenance
-  Private Resiliency Program

#### Legend

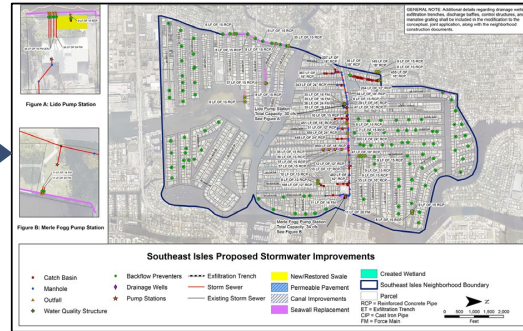
Ground Elevation  $\leq 2.5$  NAVD88

# Broward County permitting of the projects will be critical



Modeling update well underway

## Conceptual Design



- Kickoff meeting held with County
- Follow-up meeting scheduled for October

## Separate Tranche 2 Conceptual Permit

**BROWARD COUNTY**  
FLORIDA

Environmental Protection and Growth Management Department  
**ENVIRONMENTAL ENGINEERING AND PERMITTING DIVISION**  
Water and Environmental Licensing Section  
1 North University Drive, Mailbox 201, Plantation, Florida 33334  
Phone \* 954-519-1453 Fax \* 954-519-1412

December 04, 2018

City of Fort Lauderdale  
Attention: Rares Peitica  
100 N Andrews Ave  
Fort Lauderdale, FL 33301

RE: Fort Lauderdale Stormwater Master Plan Conceptual  
City of Fort Lauderdale, S/T/R (01-50-42)

This is to notify you of the Environmental Protection and Growth Management Department's (EPGMD) action concerning your application received 04/16/2018. The application has been reviewed for compliance with the following requirements:

**ERP Review - GRANTED**

EPGMD has the authority to review the project for compliance with the provisions of Chapter 373, Part IV, Florida Statutes pursuant to an agreement between EPGMD, DEP and the SFWMD. The agreement is outlined in a document entitled "DELEGATION AGREEMENT AMONG THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT, AND BROWARD COUNTY."

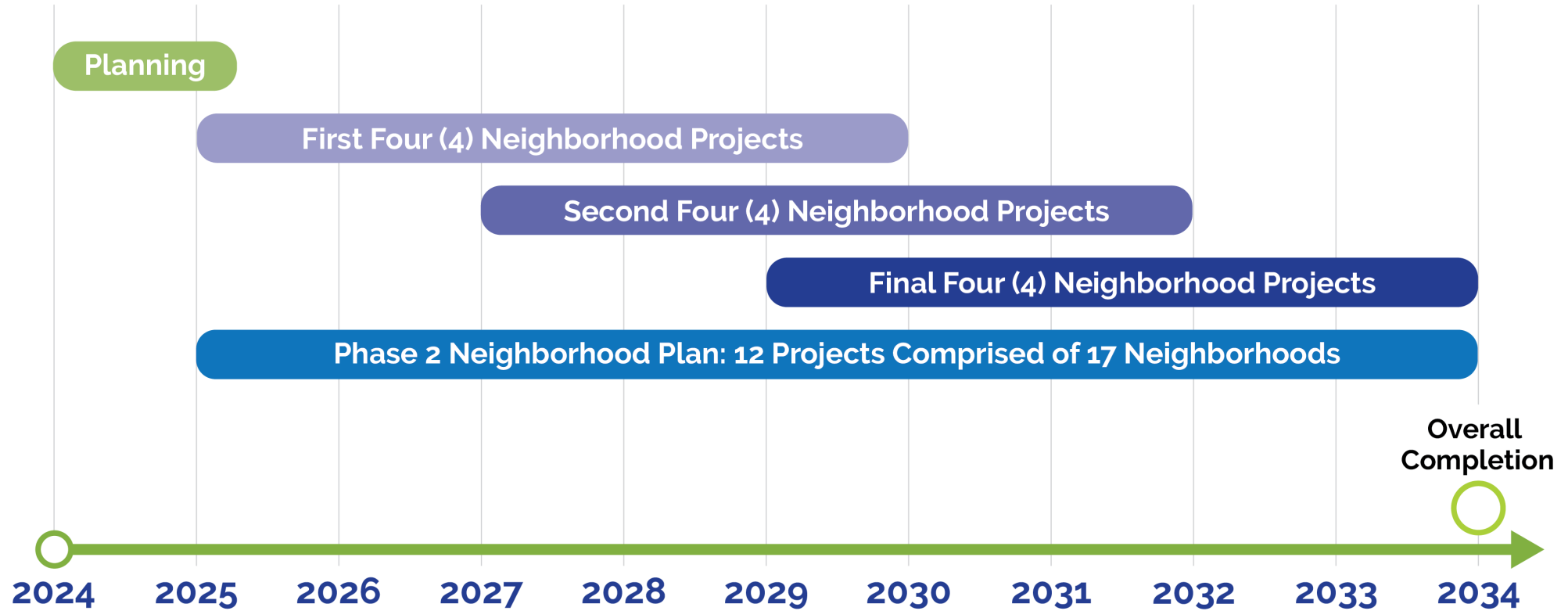
Based on the information submitted, Environmental Resource Permit No. 06-80003-P was issued on 12/04/2018.

Should you object to the conditions of the Environmental Resource Permit, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the attached "Notice of Rights", we will assume you concur with the action taken by EPGMD.

Locks in planning level concepts for future design and construction

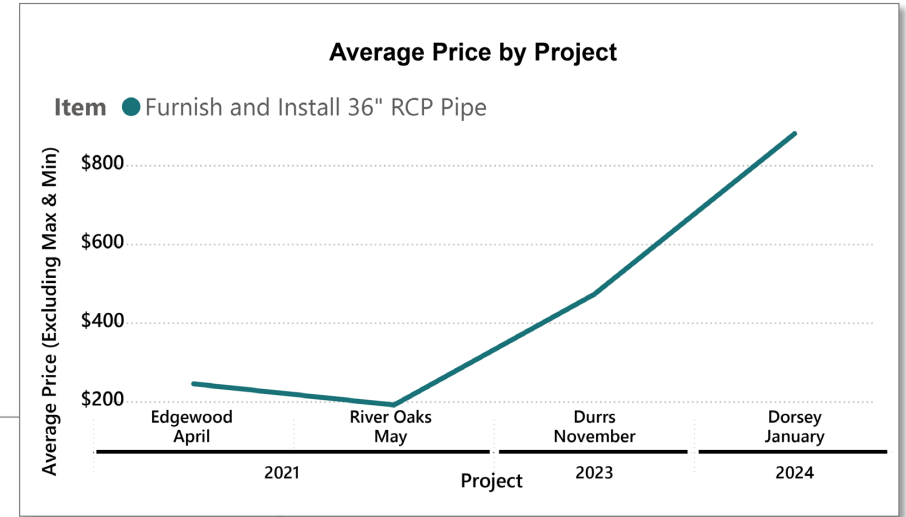
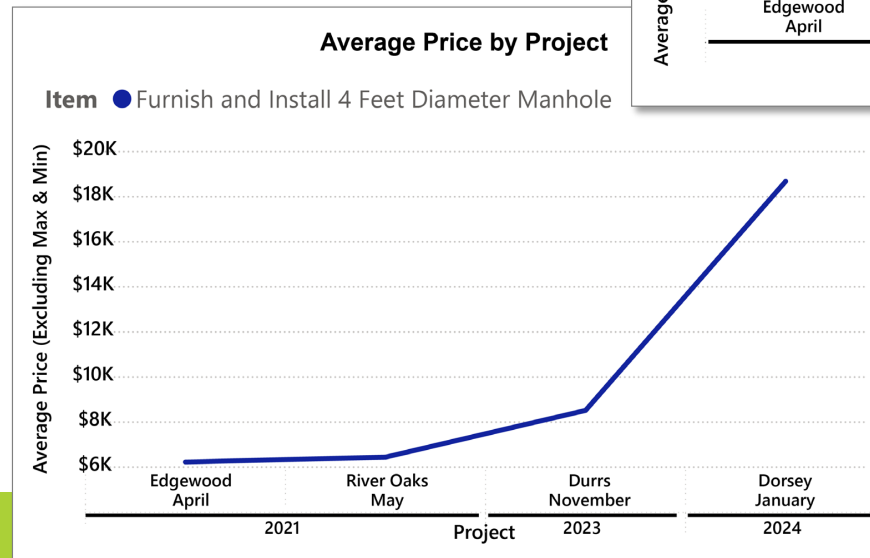


# The Phased Project Schedule plans for completion by 2034



# We are building a Cost Database to benefit the Program

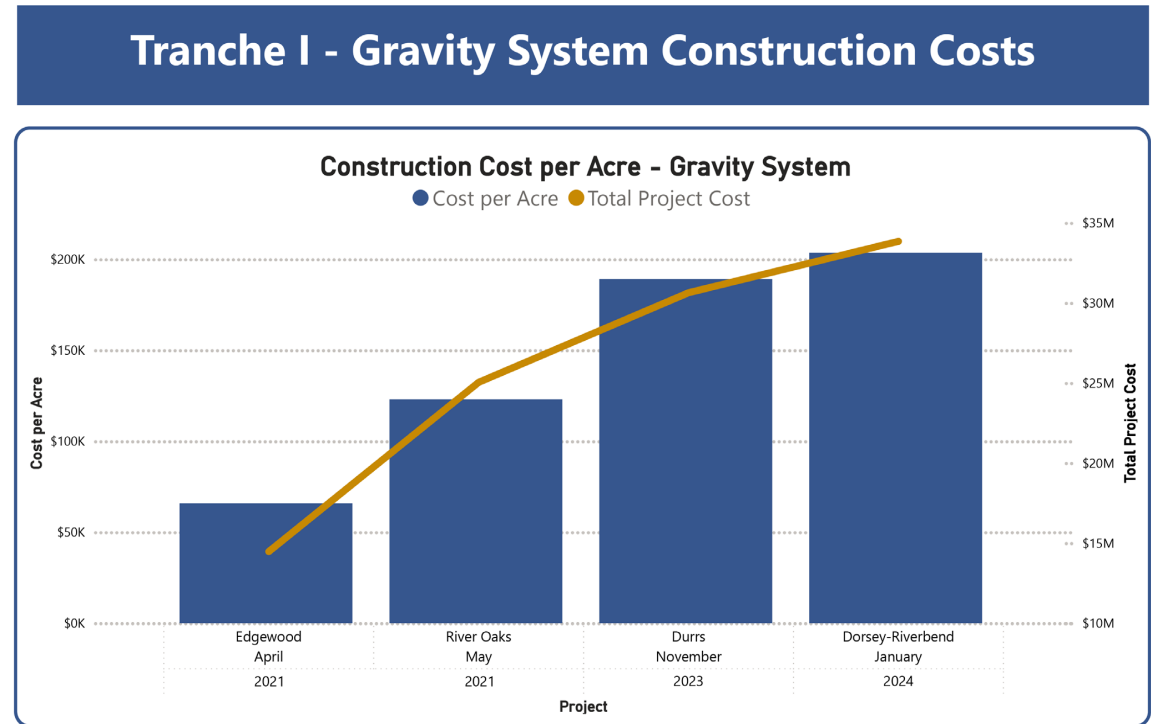
- Developed to compare bid prices from all program projects
- Items included are sorted into various categories
- Improves cost estimating
- Allows trending analysis





# Updating of City's preliminary Tranche 2 project costs will be completed in the upcoming months, but some initial observations include:

- Major construction cost escalation over last few years
- Likely Tranche 1 shortfall in funding



# Public Outreach is a key component of the overall program

- Tranche 2 Neighborhood Meetings (planning, design, construction)
- Broader Citywide engagement relative to Private Property Resilience
  - City Staff
  - Homeowners/Businesses
  - Development Community

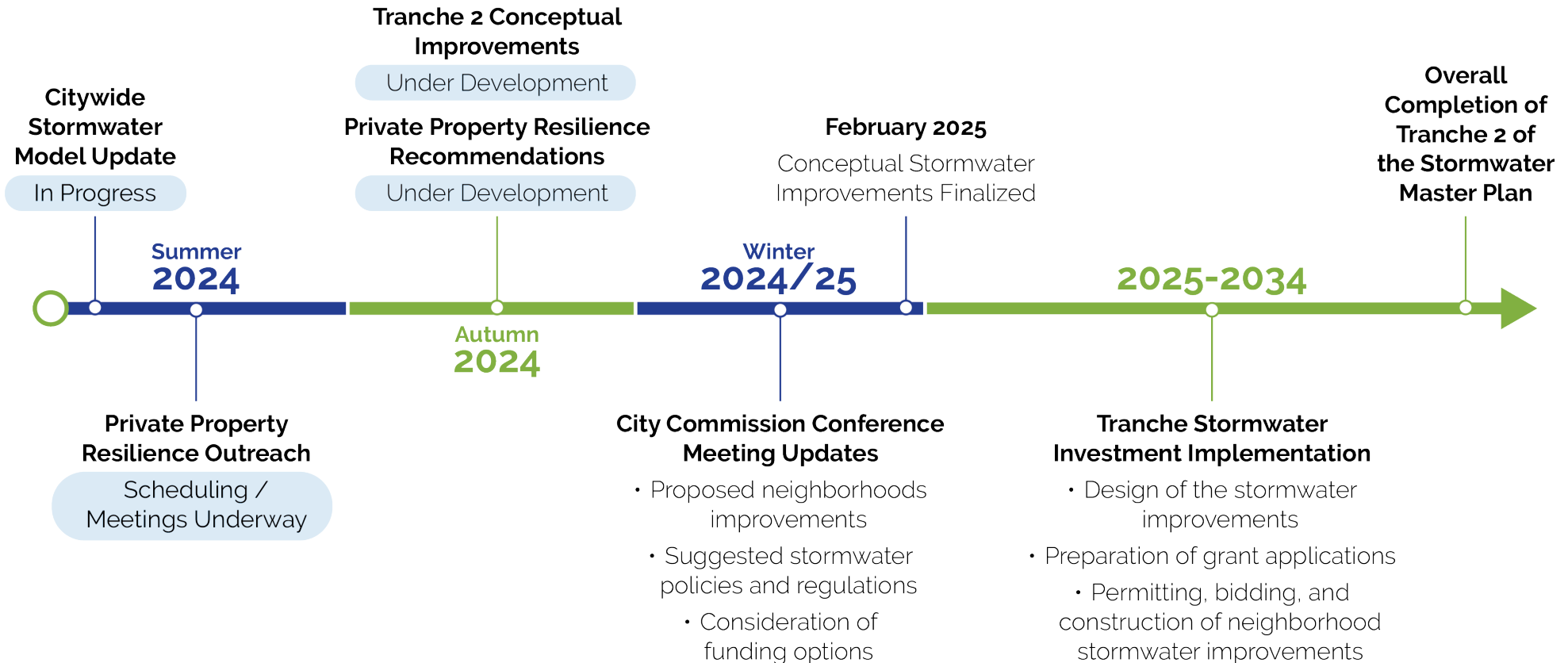


**“Best results achieved via collaboration”**





# Update on Tranche 2 Neighborhood Improvements Timeline

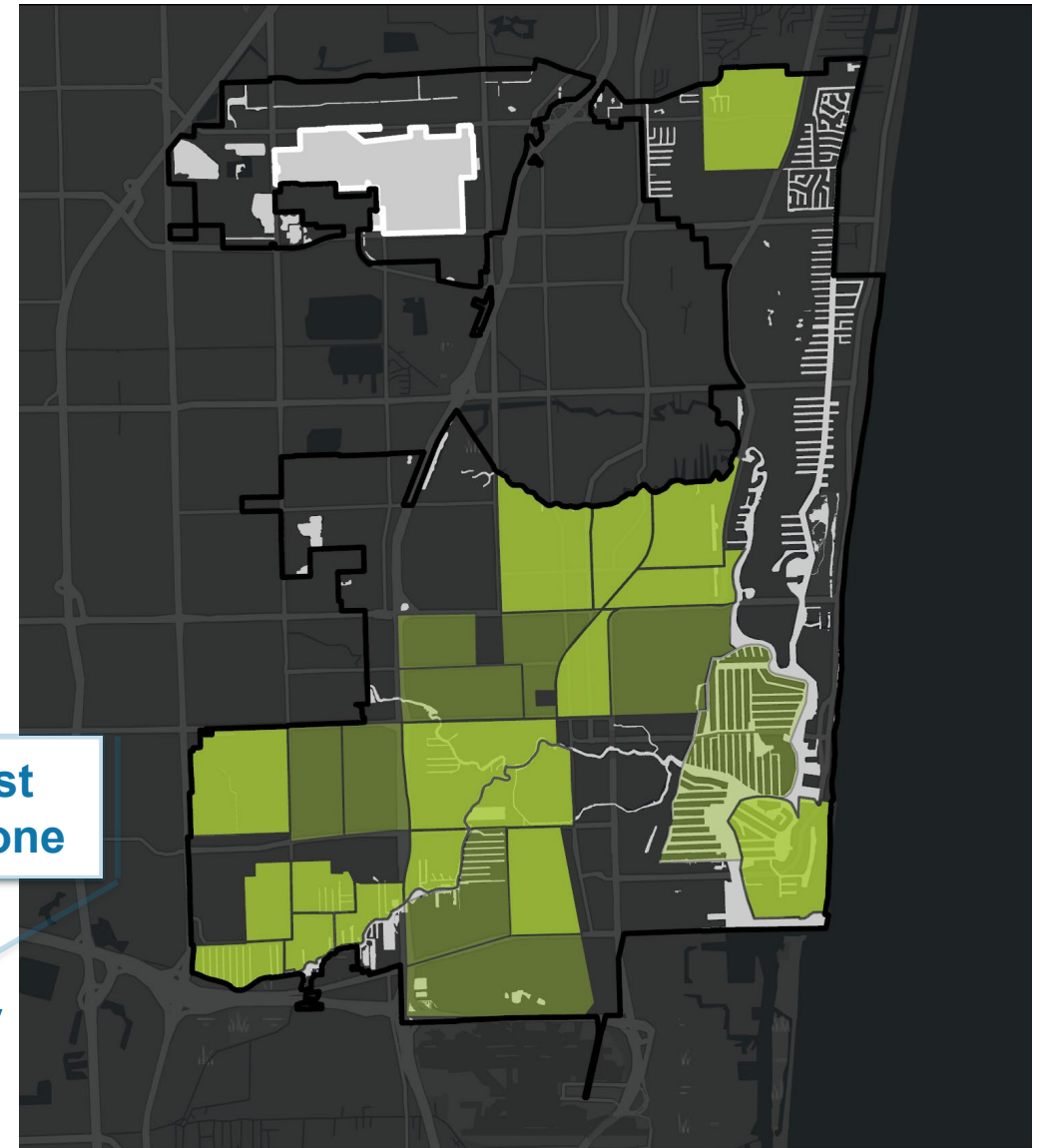


# The City's Neighborhood Stormwater Capital Investments are significant

	Area	
	Acres	Percent
City of Fort Lauderdale	20,030	100%
Waterbodies	2,327	12%
FTL Executive Airport	498	2%
Original Neighborhoods	4,088	20%
Tranche 2 Neighborhoods	5,197	28%
Remaining Area	7,920	38%

After completion of the proposed neighborhood projects, the City will have **addressed 62% of the City** with stormwater improvements.

the most flood-prone







**Fortify**  
**Lauderdale**  
Building a Resilient Future  
in Fort Lauderdale

# Questions