RESILIENCY OPEN HOUSE

» WE ARE READY

We are a resilient and safe coastal community.

Tuesday, January 29, 2019

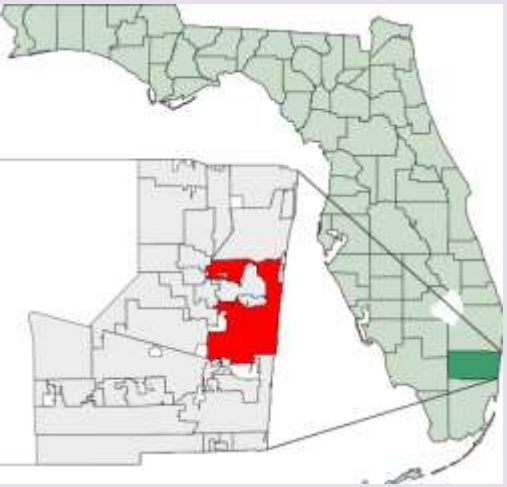
6:00 – 6:45 p.m. | See presentations on resiliency initiatives

6:45 – 7:30 p.m. | View displays, ask questions

City Hall, 1st floor Commission Chambers

100 North Andrews Avenue | Fort Lauderdale, FL 33301

Our Community

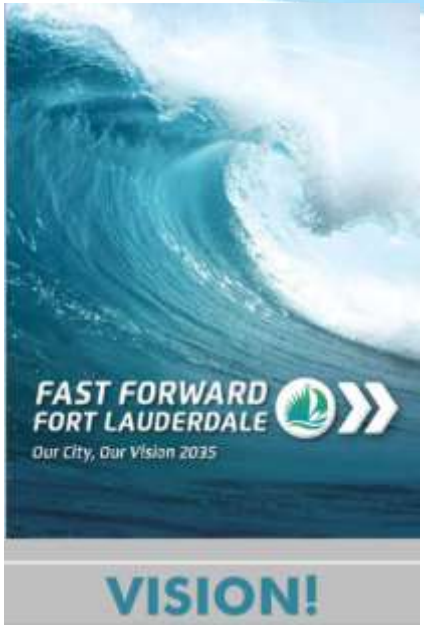


Area: 38.6 sq miles
Land: 34.7 sq miles
Water: 3.8 sq miles
Waterways: 165 miles

2018 Population: 182,827
2017 Visitors: 12.83 million
2017 Just Value Property: $49.2 Billion

"The Place You Never Want to Leave"

Our Vision



Implementation

PRESS PLAY
FORT LAUDERDALE
Our City, Our Strategic Plan 2018

G2 GOAL 2: Be a sustainable and resilient community.

Fort Lauderdale's roadways and bridges, water and wastewater systems, and drainage infrastructure will be more structurally sustainable to meet the needs of current and future generations. This will make our City increasingly resilient to inclement weather, high-tides, future water demands, and a growing population. Our community will utilize sustainable construction techniques and efficiencies to blend buildings with the natural environment, and increase recycling practices to minimize our environmental impact.

- Proactively maintain our water, wastewater, road and bridge infrastructure
- Reduce flooding and adapt to sea level rise
- Improve climate change resiliency by incorporating local, regional and mega-regional plans
- Reduce solid waste disposal and increase recycling
- Improve air and water quality and our natural environment
- Secure our community's water supply

DEFINING URBAN RESILIENCE

Resilience is about **surviving and thriving**, regardless of the challenge.

The ROCKEFELLER FOUNDATION

*Urban **resilience** is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.*

City Resilience Index

The Resilience of a City Relates to:

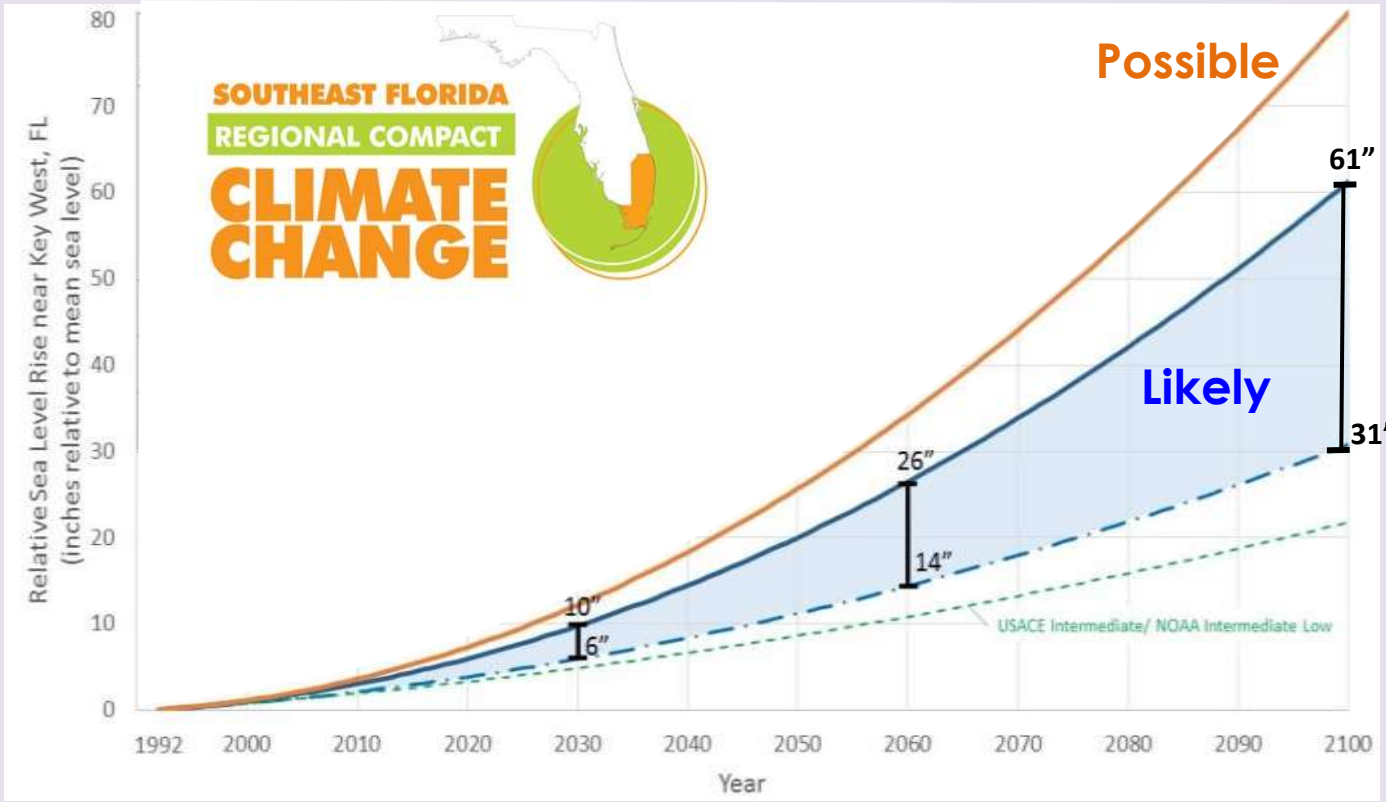
- Leadership and Strategy
- Health and Well Being
- Economy and Society
- Infrastructure and Ecosystems

https://assets.rockefellerfoundation.org/app/uploads/20160201132303/CRI-Revised-Booklet1.pdf

Stressors and Shocks

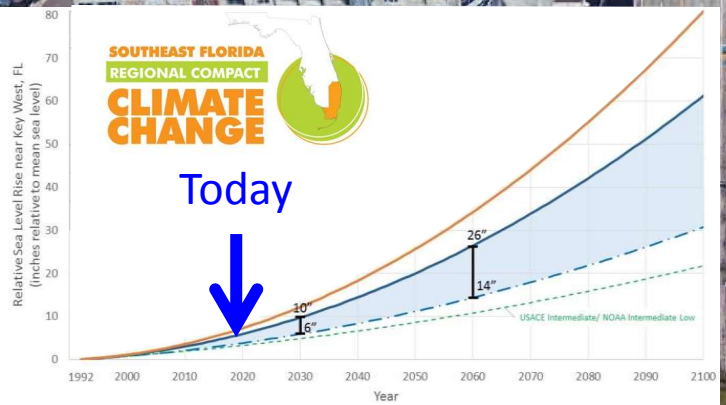
Projecting Sea Level Rise

2015 Unified Sea Level Rise (SLR) Projection for SE FL



- 3" SLR since 1992
- 2030: 6-10" SLR
- 2060: 14-26"
- Orange line for long term projects with low risk tolerance (2060: 34")

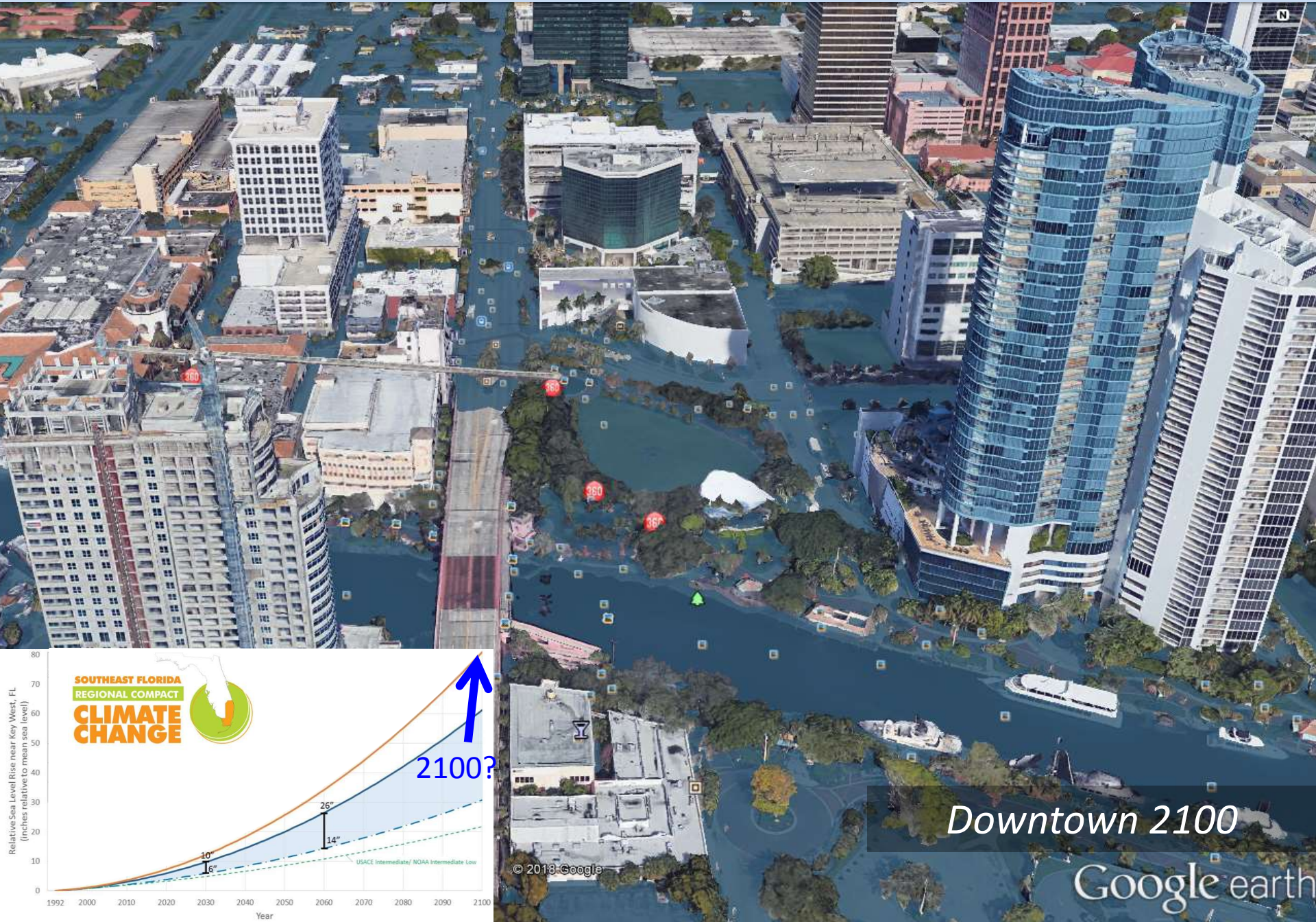
Fort Lauderdale – VENICE OF AMERICA



Downtown

Google earth

Fort Lauderdale's Future Without Climate Action



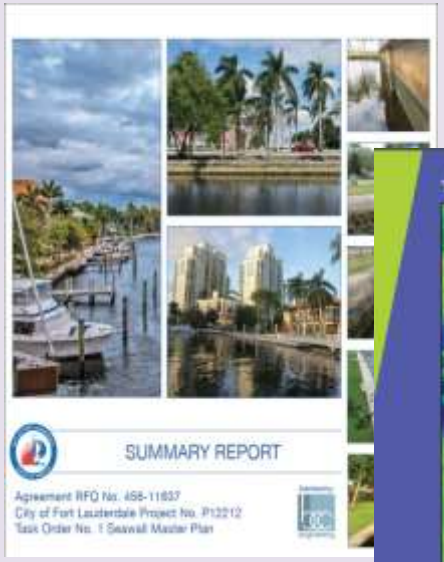
A Culture of Resiliency

WE ARE READY

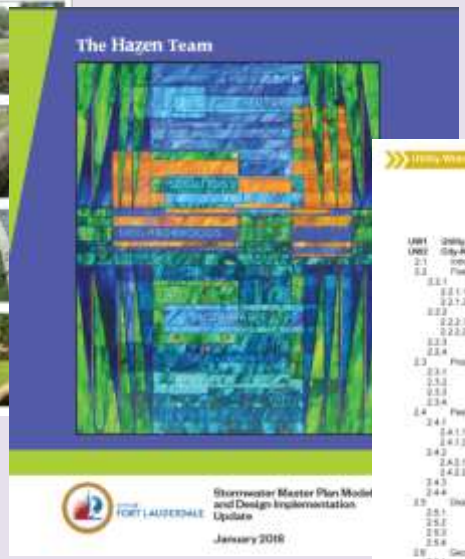
We are a resilient and safe coastal community.

Master Planning for Resiliency

Seawalls

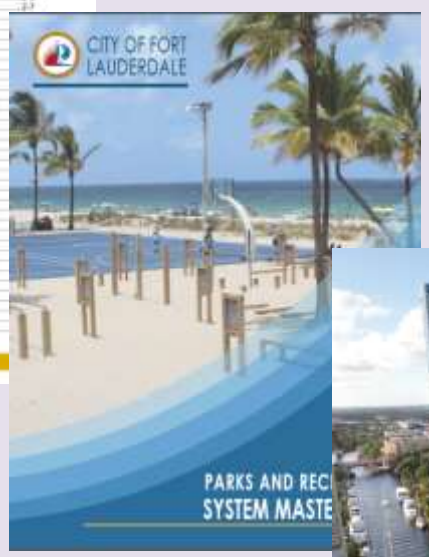


Stormwater

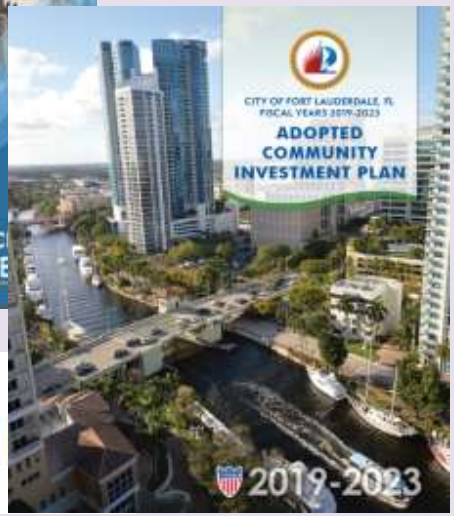


Utilities

Parks



Investments in Resiliency



WE ARE READY

We are a resilient and safe coastal community.

Partners in Resiliency

BROWARD COUNTY FLORIDA

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

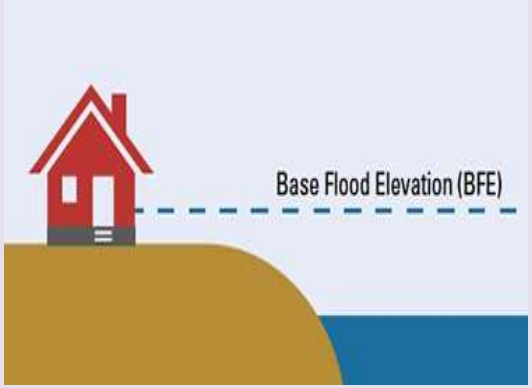
Council of Fort Lauderdale Civic Associations, Inc.
PO Box 30106
Fort Lauderdale FL 33303

GREATER FORT LAUDERDALE CHAMBER OF COMMERCE
EXPERIENCE. BETTER. BUSINESS.

FAU FLORIDA ATLANTIC UNIVERSITY

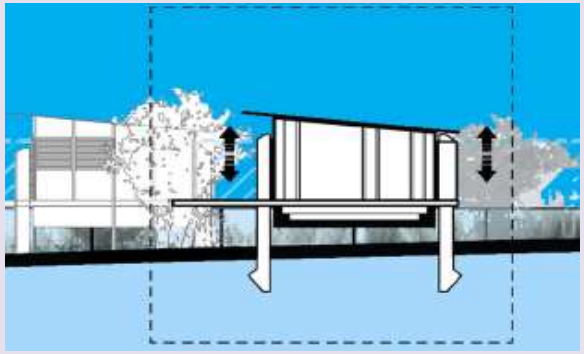
Planning for Resiliency

Planning for Resiliency



Adopted Regulations and Plans Related to Resilience

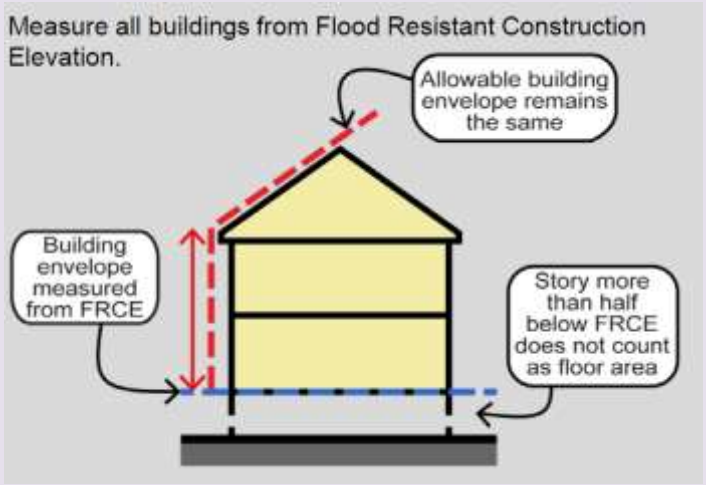
- Floodplain Ordinance (DSD - Floodplain Division)
- Seawall Ordinance (DSD - Building Department)
- Florida Friendly Landscape Code (DSD – Landscape Div.)
- Adaptation Action Areas adopted in Comprehensive Plan and Community Investment Plan (Public Works)
- NEA Botanizing North Beach Village (FAU and DSD – UDP Division)
- NOAA Sea Grant ADaPT Project (FAU and DSD – UDP Division)
- Technical Assistance Panel Studies - Riverwalk and Uptown Urban Village (ULI)

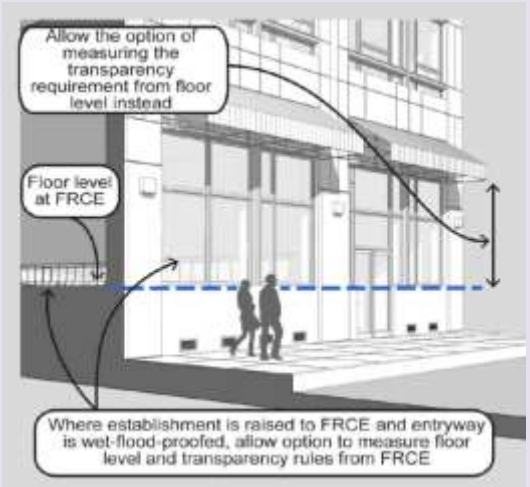


Proposed Resiliency Regulations

Proposed Regulations related to Resilience

- **Cool roof ordinance** (Public Works/Sustainability Department)
- **Consider maximum freeboard requirement without penalty for height** (DSD - Urban Design and Planning)
- **Review pervious areas requirements in zoning districts** (Public Works/ Sustainability Department and DSD- Urban Design and Planning)



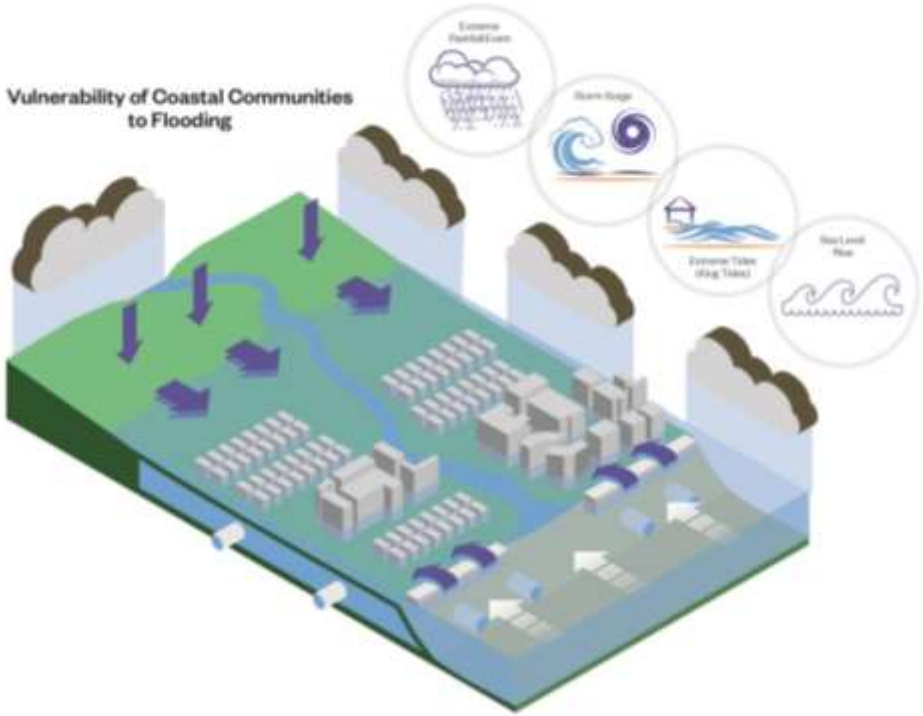


Studying Resiliency

Pending Resilience Study- Climate Vulnerability Assessment (DSD - Floodplain Management)

- FDEP Florida Resilient Coastlines Program Funding

- Conduct vulnerability assessment to identify entities at risk from sea level rise, storm surge, and other climate change-related impacts
  - Population groups
  - Socioeconomic indicators
  - Public investments
  - Infrastructure
  - Natural systems



Comprehensive Plan Update – Climate Change Element

- Reduce city-operation production of GHGs 80% by 2050.
- Develop new green building standards ordinance.
- Reduce fossil fuel use by 20% in city fleet by 2025.
- Encourage a mix of uses in development to reduce vehicle miles travelled.
- Enhance pedestrian and bicycle infrastructure.
- Expand tree canopy to 23.6% by 2025.
- Utilize blue-green (waterways and open space) infrastructure in public right of way.

Comprehensive Plan Update

Historic Preservation Element

- Develop a climate and environment resiliency program for historic and archaeological resources based on susceptibility to climate and environmental change/events.

Parks and Recreation Element

- Create a plan and prioritize specific parks in which to install renewable energy infrastructure (e.g. solar panels).
- Incorporate sustainable building and Florida Friendly landscaping design for all parks and recreation facilities (including retrofitting and/or renovation projects).

Infrastructure

- Reduce risks related to sea level rise and climate change in the City's water, sewer, and stormwater infrastructure.

Designing for Resiliency

Design Manual

In 2017, the City began development on a community-wide manual to address sustainability and resiliency for projects in the public realm.

Fast Forward Fort Lauderdale Design and Construction Manual

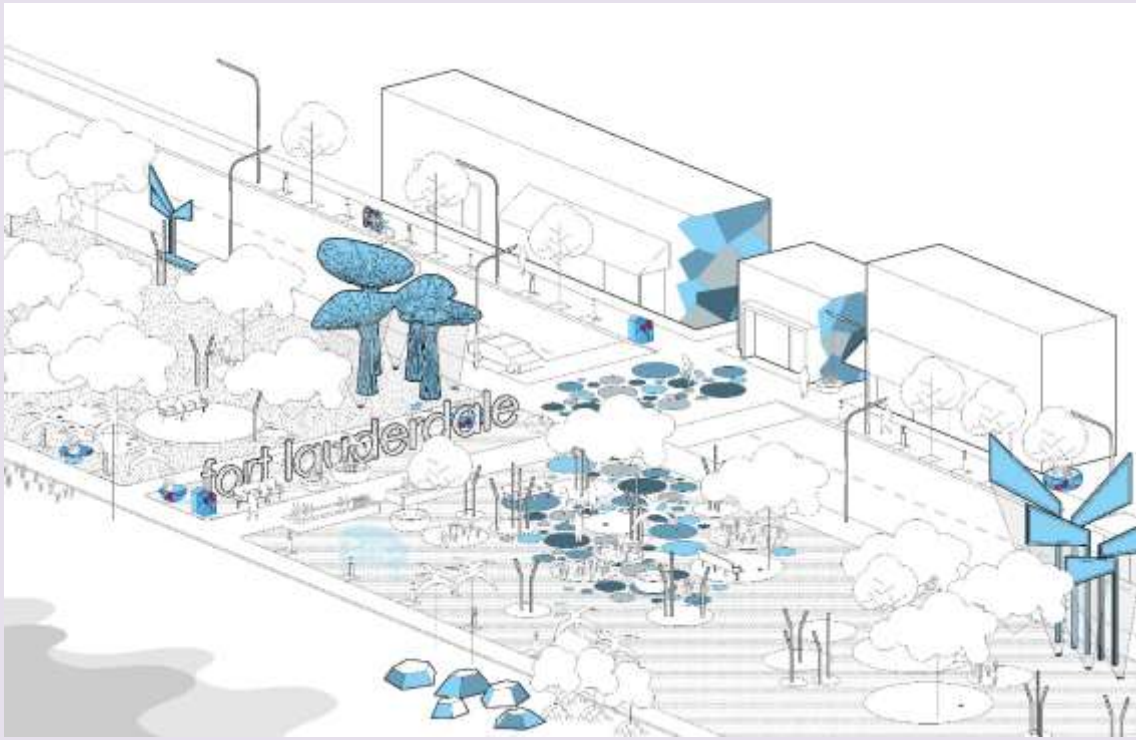
WE ARE READY

We are a resilient and safe coastal community.

Design Manual

The manual will be completed Summer 2019 and complements City goals by establishing a design framework that:

1) Celebrates our uniqueness of “place”
2) Promotes healthy and active lifestyles
3) Designs for increased flooding and climate change adaptation



WE ARE READY

We are a resilient and safe coastal community.

Building for Resiliency

Building for Resiliency

Building for Resiliency

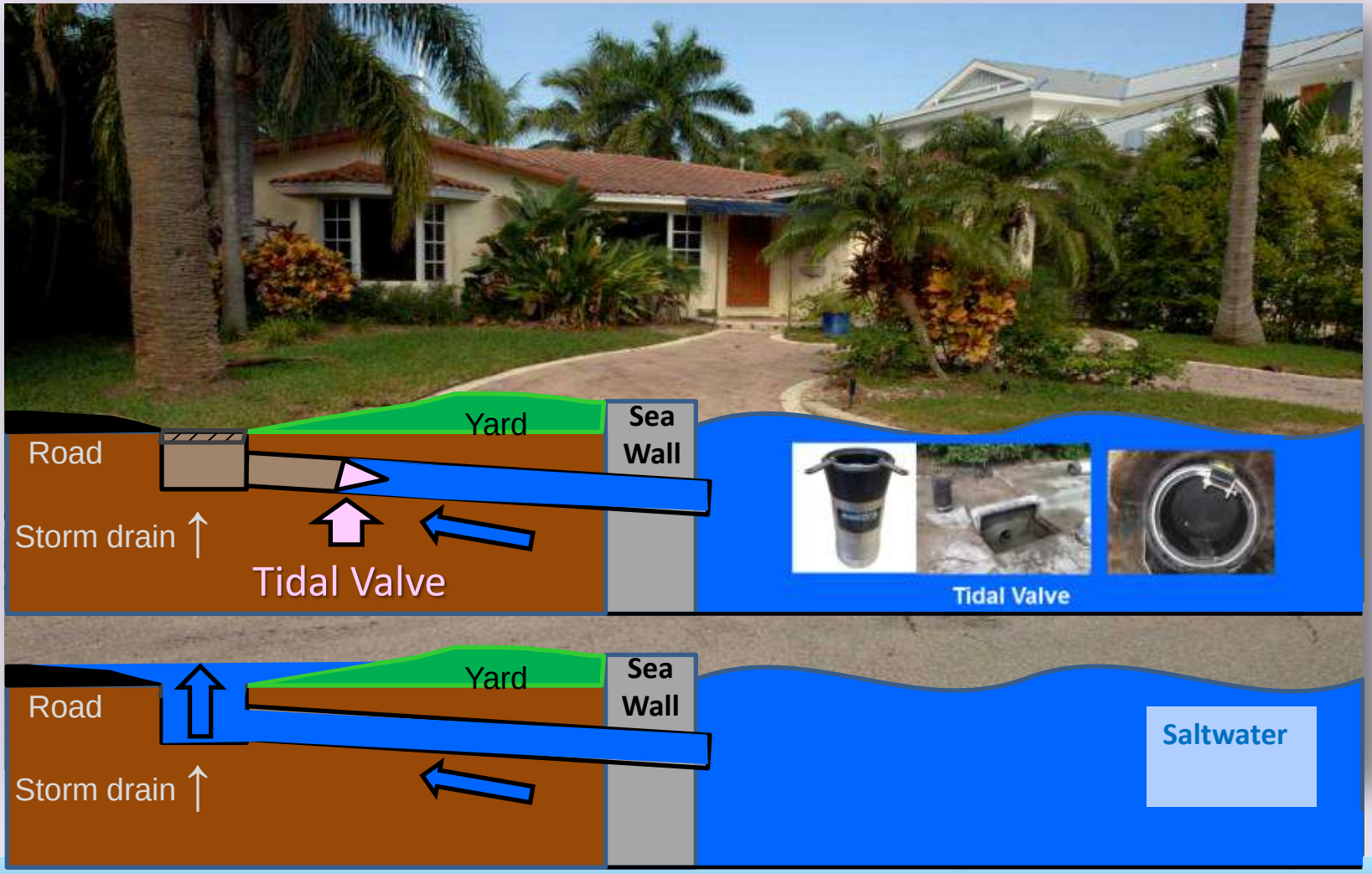
Resiliency is built into everything we do:

- **Adopted master plans**
- **Citywide asset management tools**
- **Stormwater CIP and operational projects**
- **Inflow/infiltration (I/I) investments**
- **Construction methods and materials**
- **Critical structure elevations**

We are already seeing results!

Stormwater Master Plan

Tidal valves: over 160 installed (and >100 more planned)



Tidal Valves

SW 27th Terrace: new tidal valve and drainage system

Before

After

Tidal Valves

Bayshore Drive: new tidal valves (>1,000 benefitting parcels)

Before

After

Stormwater Master Plan

Phase II design plans complete for seven high-priority neighborhoods:

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 33324
Phone * 954-519-1483 Fax * 954-519-1412

December 04, 2018

City of Fort Lauderdale
Attention: Rares Petrica
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.

Broward County Surface Water Management Review - GRANTED

EPGMD has reviewed the project for compliance with the Surface Water Management requirements of Chapter 27, Article V Sec. 27-191 through 27-202 of the Broward County Code.

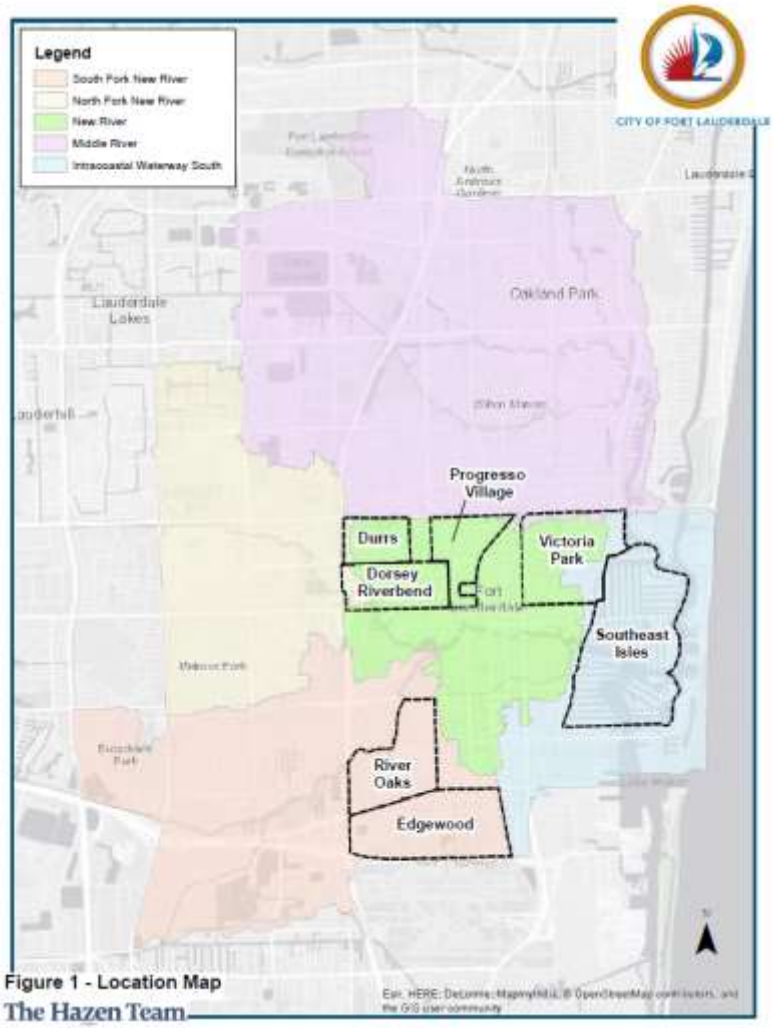
Based on the information submitted, Surface Water Management License No. SWM2018-081-0 was issued on 12/04/2018. The above named licensee is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents and specifications, as submitted by licensee, and made a part hereof.

Please be advised that no Certificate of Occupancy can be issued on this project until released, in writing, by all EPGMD divisions as required. Such release will be pending approval of any engineering certifications required by specific condition No. 15.

The above referenced approvals will remain in effect subject to the following:

1. Not receiving a filed request for a Chapter 120, Florida Statutes administrative hearing;
2. the attached SFWMD General Conditions;
3. the attached SFWMD Special Conditions;
4. the attached Broward County General Conditions;
5. the attached Broward County Specific Conditions;
6. the attached 17 exhibits.

Issuance of the above referenced Broward County license(s) constitutes a final agency determination. A person with a substantial interest may file a petition to request review of or to intervene in a review of a final administrative determination, subject to the provisions of Section 27-14, Broward County Code of Ordinance.



Stormwater Master Plan

Phase II design plans complete for seven high-priority neighborhoods:

D-01 Water Quality
(through Dorsey Riverbend)

Discharge Point ID	Type of Discharge	Do the proposed improvements increase the amount of discharge at this point? (Y/N)	Total Length of New/Restored Swales (ft)	Total WQ Swale Treatment (acres)	Total Length of Proposed Infiltration (acres)	Total WQ Treatment Provided for Discharge (acres)
D-01	Outfall via Dorsey Riverbend	Y	3624	1.0	3524	3.6

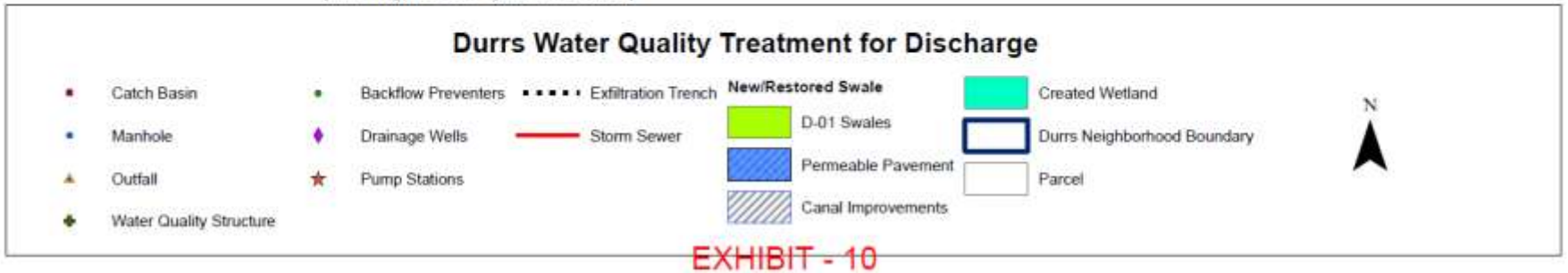


EXHIBIT - 10

Public Seawalls

Public seawall projects:

- Isle of Palm (May 2019)
- Cordova Road (July 2019)
- Ten additional segments to replace/elevate with Stormwater Phase II

Before and after renderings during King Tide for the proposed Cordova Road seawall replacement project

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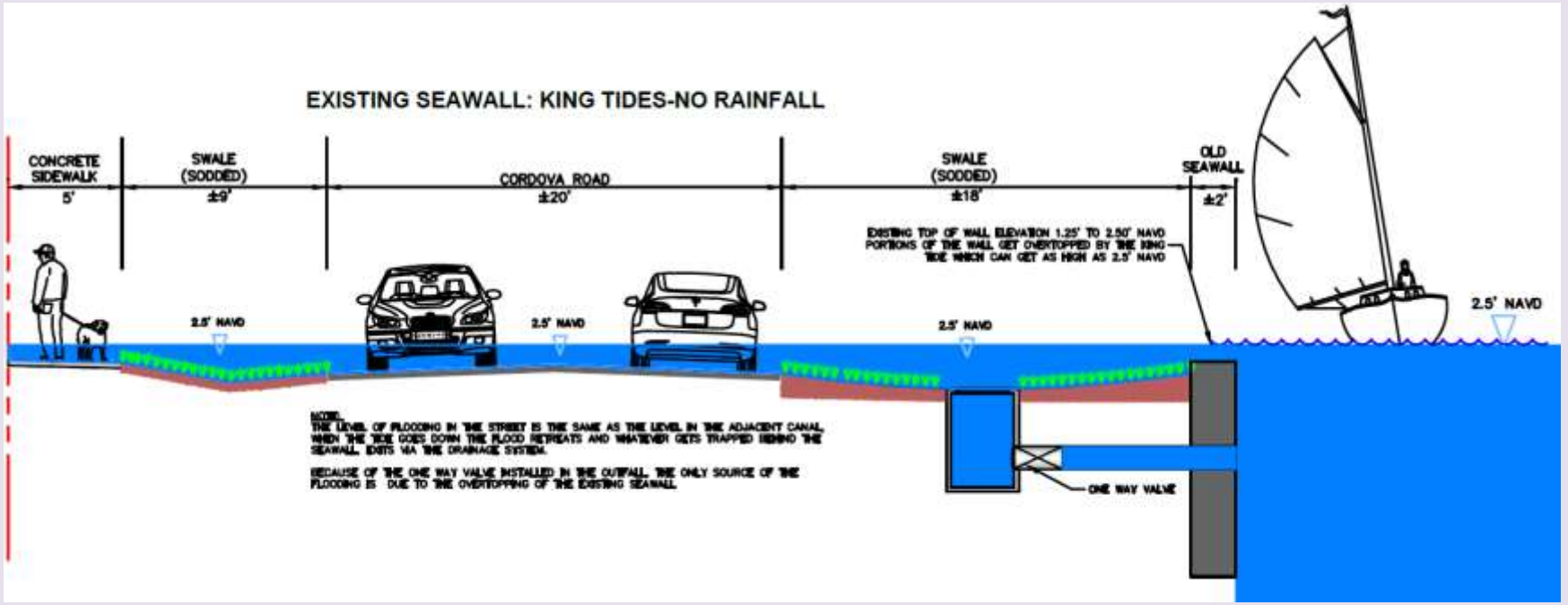

Before and after renderings during King Tide for the proposed Cordova Road seawall replacement project

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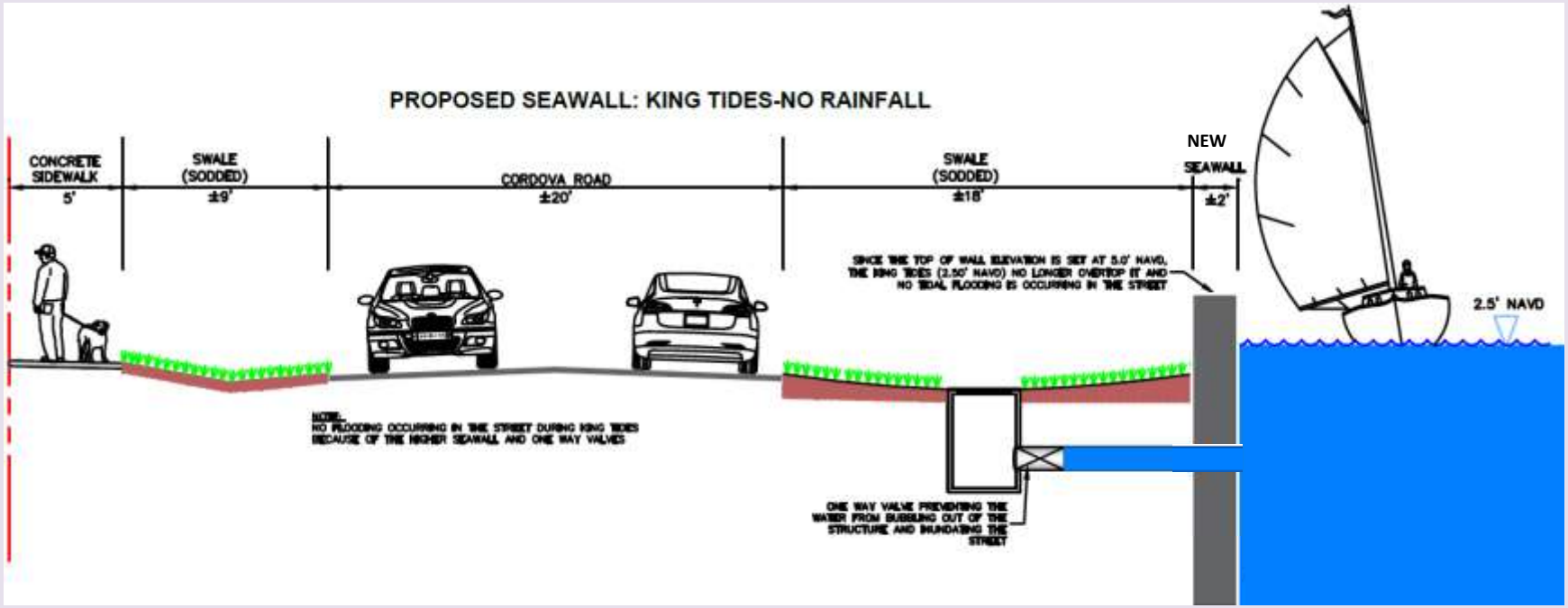


Before and after renderings during King Tide for the proposed Cordova Road seawall replacement project

Inflow/Infiltration

Inflow/infiltration, or I/I, is the <u>most cost-effective method</u> to and improve the level of service for a wastewater utility while addressing rising groundwater .

<u>I/I program highlights</u>:

- **Lowers risk of sewer backups**
- **Reduces investment in larger pipes and facilities**
- **Improves public health and environment by reducing overflows**
- **Six critical basins**
- **216,000 feet (41 miles) with over 4,300 laterals to be completed by Sept 2020**

Inflow/Infiltration

Mainline sewer rehabilitation by lining:

Before

After

Inflow/Infiltration

Sewer manhole rehabilitation by lining:

Before

After

Inflow/Infiltration

Sewer lateral rehabilitation by lining:

Before

After

Inflow/Infiltration

Smoke testing underway to identify system weaknesses:

Illicit (non-approved) inlet

Missing/damaged clean-out caps

Facilities

New Fire Station No. 54

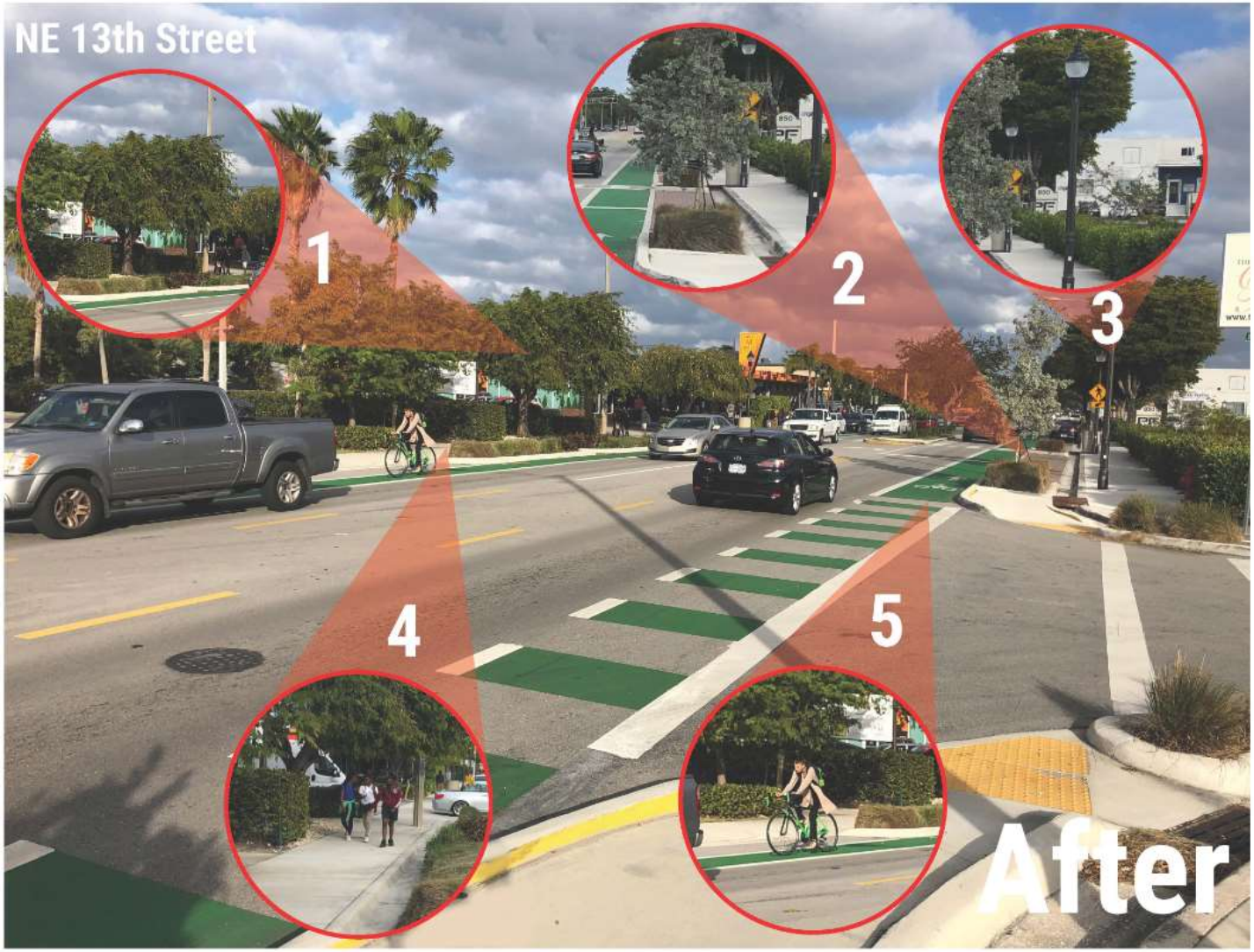
- Occupied on 12/12/18
- Finished floor elevation at 7.0’ (NAVD 88)
- Wind design load of 140 MPH or 180 MPH for 3-second intervals
- Florida Green Building Coalition (FGBC) Certification standards
- Sustainable design elements

Critical Elevations

2015 tidal flooding

Retrofitting existing electric panels for wastewater lift stations reduces the likelihood of failing during King Tide or heavy rainfall events

Improving Mobility and Resiliency



Resiliency Improvements

1. Shade trees to reduce the urban heat island effect.
2. Pervious parking isles and bio-swales to reduce flooding issues.
3. LED lighting to help reduce energy costs.
4. Wider sidewalks to increase safety and encourage people to walk.
5. Green bike lanes to help reduce heat island effect, increase awareness of people biking, and help curb emissions.

Track Progress

Visit *Lauderworks* for more project-related information at:

https://gis.fortlauderdale.gov/lauderworks/

Funding Resiliency

Why Invest in Resiliency?

- Preserve neighborhoods
- Sustain property values and tax base
- Favorable cost benefit ratio for mitigation investments
- BECOME the city you never want to leave

National Benefit-Cost Ratio Per Peril *BCR numbers in this study have been rounded	Federally Funded	Beyond Code Requirements
Overall Hazard Benefit-Cost Ratio	6:1	4:1
Riverine Flood	7:1	5:1
Hurricane Surge	Too few grants	7:1
Wind	5:1	5:1
Earthquake	3:1	4:1
Wildland-Urban Interface Fire	3:1	4:1

Table 1. Benefit-Cost Ratio by Hazard and Mitigation Measure.

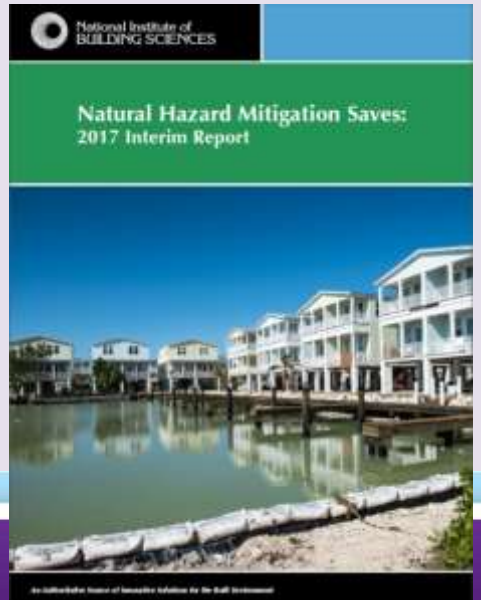
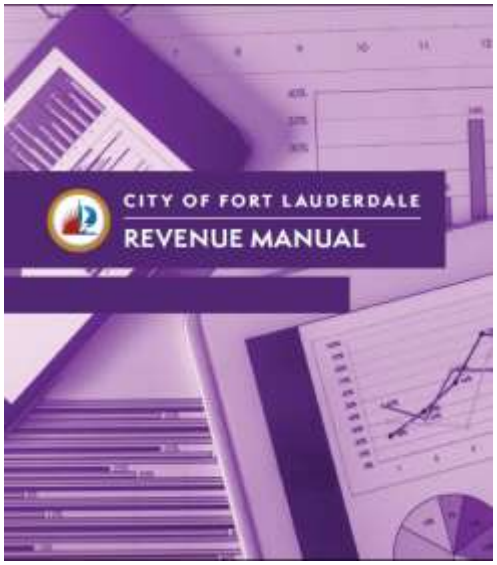


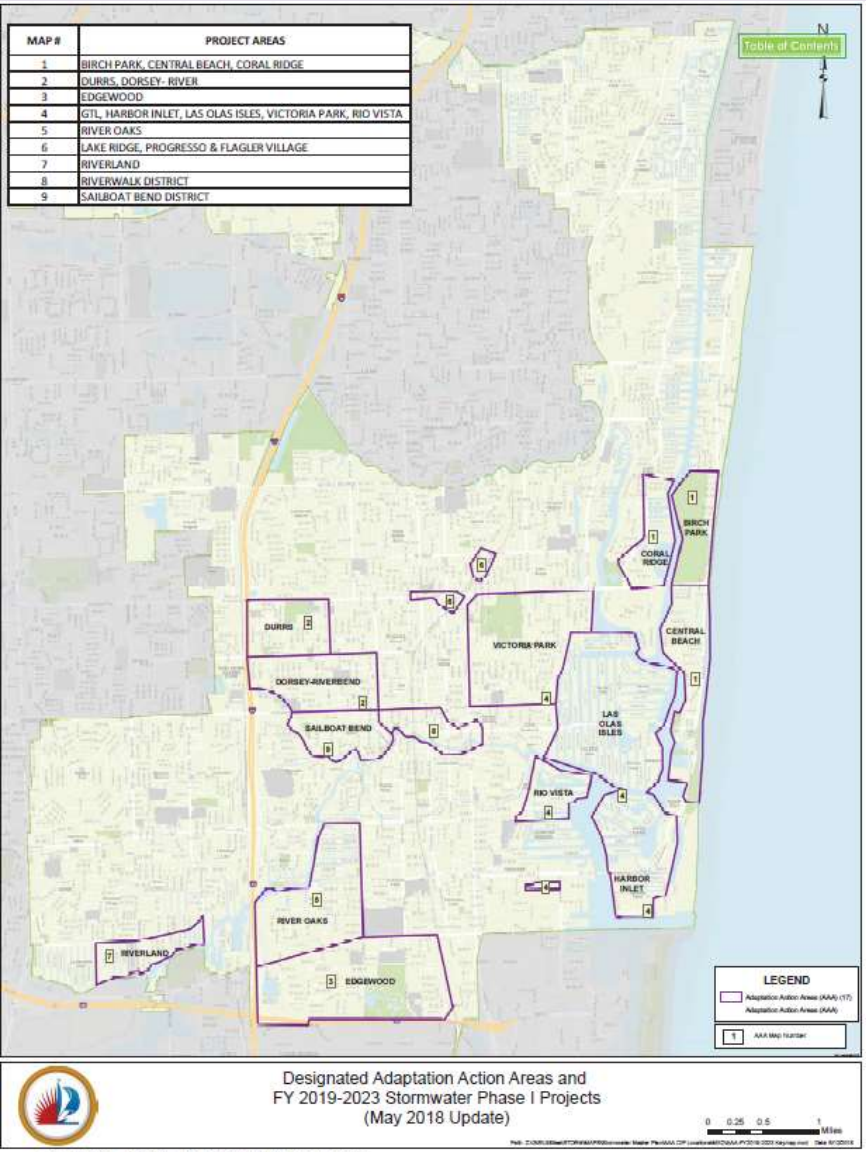
Figure 3. BCR of coastal flooding mitigation by elevating new homes above 2015 IRC requirements (by state).

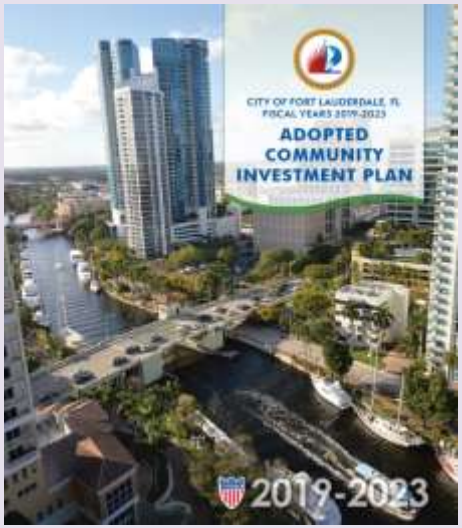
The Cost of Resiliency

Stormwater Operations Funding



Funding Resiliency - 2019





- **17 Adaptation Action Areas** meeting
- **42** Capital Projects listed for **funding**
- **14** projects completed since FY2016

- $200M Water and Sewer Bond issued and implementation underway
- Select seawalls funded for elevation

Funding Resiliency

- **Revenue Bonds**
  - Water & Wastewater Bond
  - Stormwater Bond (pending)
- Utility Fees (R. Bond Debt Service)
- Special Revenue Funds
- Impact Fees
- Grant Funding
- Energy Service Contracts

- **General Obligation Bonds**
  - Public Safety
  - Parks
- Property Tax (G.O. Bond Debt Service)
- Property Tax Millage
- Special Assessments
- Private Investment
- P^3


CITY OF FORT LAUDERDALE
WE ARE READY
We are a resilient and safe coastal community.

Questions?