

Addressing Roadway Inundation

Initiating a policy discussion



Commission Conference Presentation

May 3, 2022



Presentation Outline

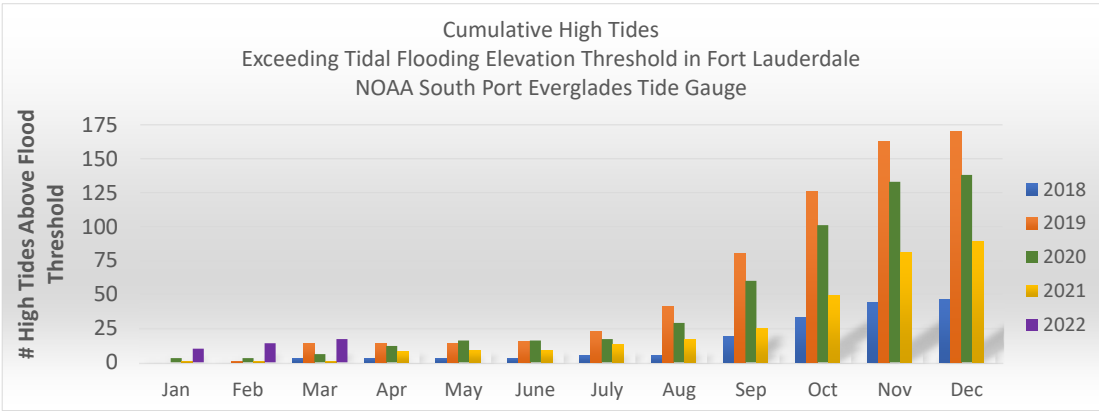
Objective: **Initiate a conversation on policies related to strategies to address roadway inundation**

- Tidal Inundation Overview
- Strategies to Address Roadway Inundation
- Challenges of Roadway Elevation
- Questions to Consider During Policy Development
- Next Steps

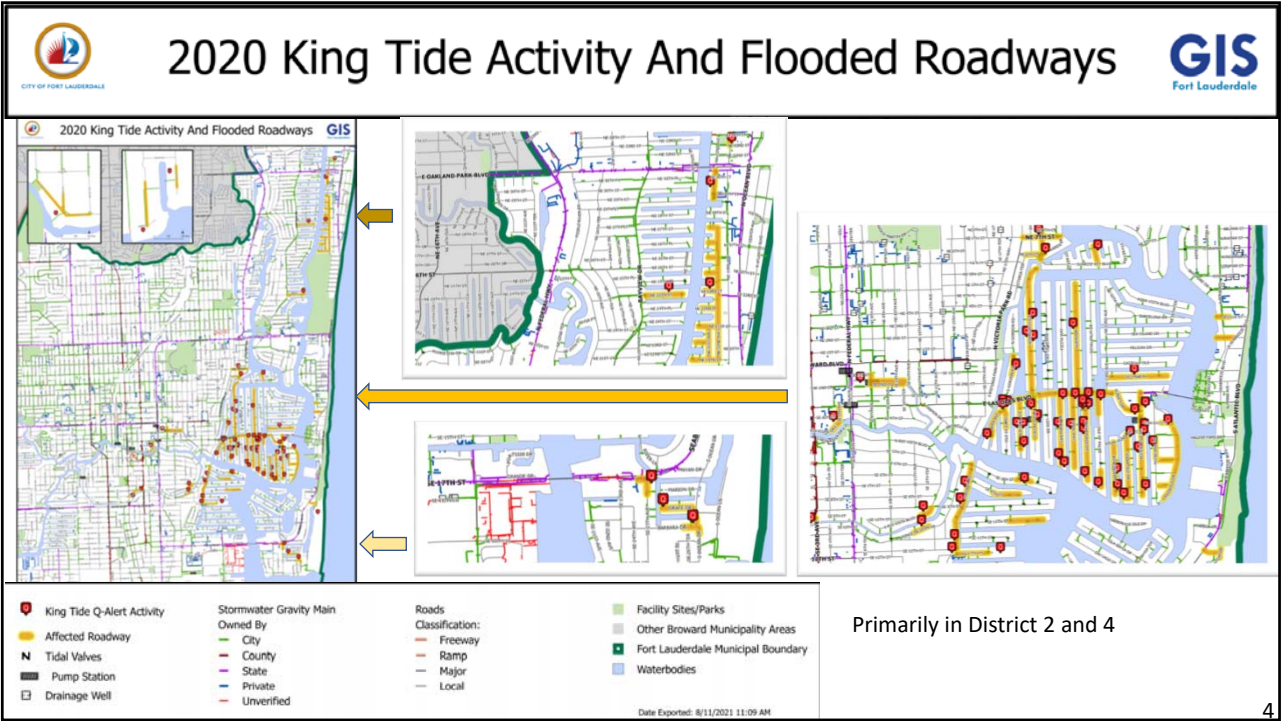


Tidal Flooding Frequency is Variable

- Trend toward more high tides earlier in the year



2018 = 46 high tides
2019 = 170 high tides
2020 = 138 high tides
2021 = 89 high tides
2022 = 17 thru March 31



Current Actions to Address Roadway Inundation

- **Reduce tidal access to roadways thru the stormwater system**
 - Lined or replaced damaged outfall pipes
 - Installed tidal valves (+185 to date)
- **Create barriers to tidal flow entering roadways**
 - Elevated public and private seawalls
- **Remove water from roadways**
 - Used portable pumps
 - Adding stormwater pumps to key areas

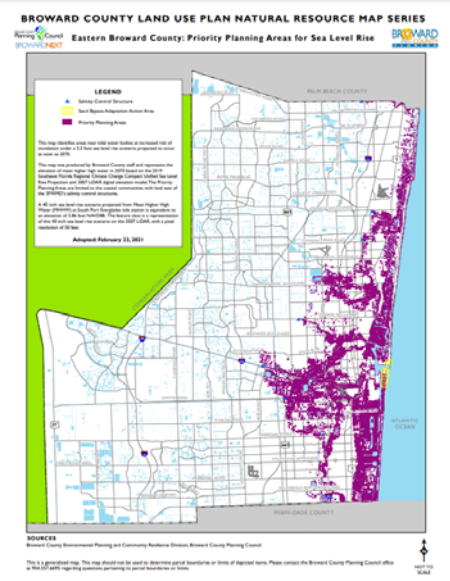


Isle of Palm seawall elevated

- Proposed Infrastructure
- Proposed Tidal Valve
 - Proposed Pump Station
 - Proposed water Quality Structure
 - Proposed Catch Basin
 - Proposed Storm Line
 - Proposed Seawall (raised)

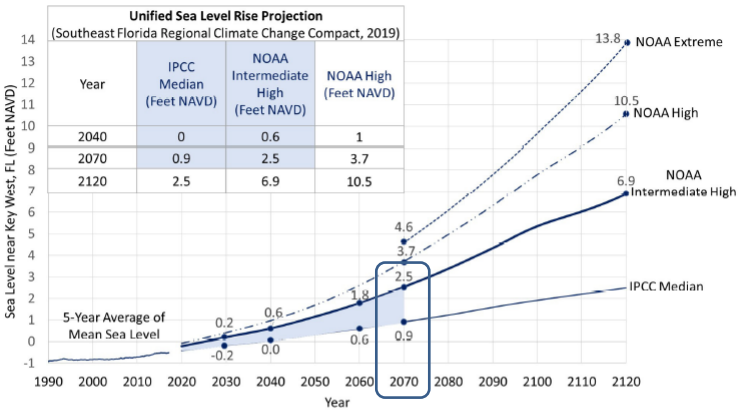
Future Strategies to Address Roadway Inundation

- **Elevate roadways above sea level**
 - Note: Prioritizes protection of roadways over private property and displaces more stormwater to private property
- **Planning and policy options**
 - Plan for managed retreat of low lying areas
 - Change development requirements re: roadways
 - Discuss road elevation in the context of potential private property elevation amendments
 - Require new developments to prepare for harmonization
 - Other possibilities...



2019 Unified Sea Level Rise Projection for SE FL in topographic elevation (NAVD)

FIGURE 2: Unified Sea Level Rise Referenced to NAVD

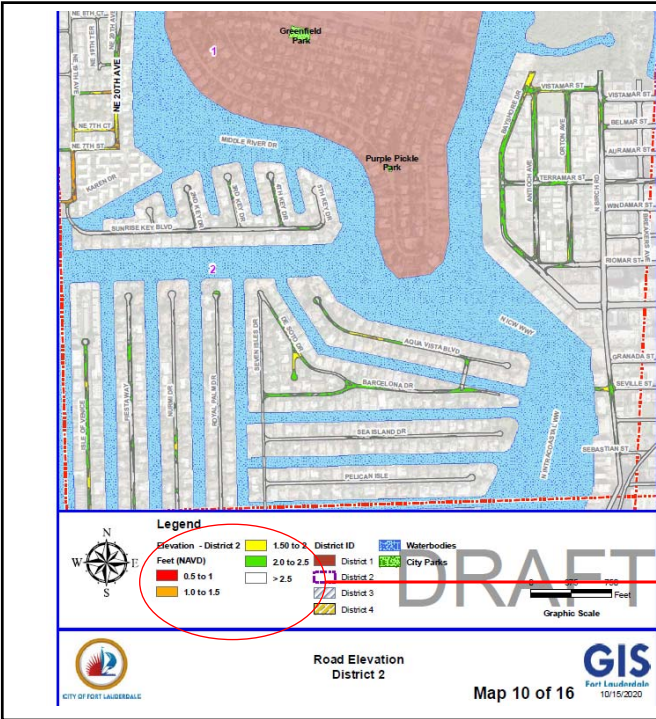


- Adopted by City Commission May 2020 for planning purposes

- Sea Level Rise is accelerating.
- 2.5 feet NAVD City min elevation for infrastructure expected to last 50 years (2070)
- Suggests some roads would need to be raised more than 18 inches
- Timing – New CIP projects added at the end of the 5 year plan

TABLE 3: Unified Sea Level Rise Projection Referenced to NAVD

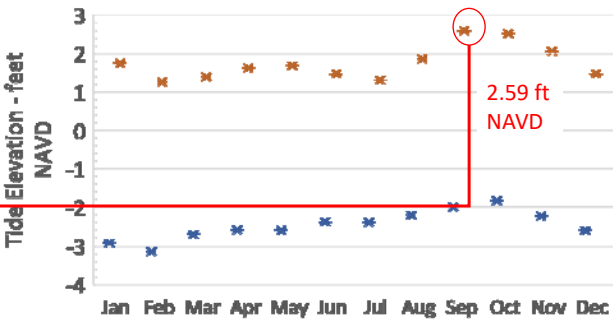
UNIFIED SEA LEVEL RISE PROJECTION (Southeast Florida Regional Climate Change Compact, 2019)			
Year	IPCC Median (Feet NAVD)	NOAA Intermediate High (Feet NAVD)	NOAA High (Feet NAVD)
2040	0	0.6	1
2070	0.9	2.5	3.7
2120	2.5	6.9	10.5



High Tides are getting HIGHER

Road Elevations below
2.5 feet NAVD elevation
Las Olas Isles, Seven Isles, and
Sunrise Key

Minimum and Maximum Monthly Tide 2020



A Media Perspective

Controversy arising in Miami Beach over raising roads to combat flooding



Miami Beach has been a pioneer when it comes to raising roads to keep streets from flooding, but the next phase of work is now causing controversy.

MIAMI BEACH, Fla. - Miami Beach has been a pioneer when it comes to raising roads to keep streets from flooding, but the next phase of work is now causing controversy.

<https://www.local10.com/news/local/2022/02/21/controversy-arising-in-miami-beach-over-raising-roads-to-combat-flooding/>

Elevating Roadways is Controversial, Expensive, and Has Legal/Fiscal Consequences for both Public and Private Entities

- The City may become liable for flooding on private property
- Properties differentially impacted depending on finished floor elevation
- May increase property values, insurability, and preserve property for the next mortgage cycle
- The cost of raising one road segment and associated utilities exceeds the City's annual budget for roadway maintenance and repair. Additional costs for harmonization and potential acquisition of private property.
- May generate planning for managed retreat

GOVERNING

THE FUTURE OF COMMUNITY DESIGN

Miami Beach Lifts Roads Due to Sea Rise, Floods Nearby Homes

To combat threats of rising sea levels, officials have decided to raise roads to protect existing infrastructure. But some homeowners claim the elevated roads sent floodwaters into their property, making them unrentable.

October 28, 2021 • Alex Harris, Miami Herald

Miami Herald

Miami Beach is raising roads for sea rise. Lawsuits say they're causing flooding too.

Miami Beach is raising roads for sea rise. Lawsuits say they're causing flooding too. By Alex Harris. Updated October 28, 2021 3:59 PM.

Oct 28, 2021

RESEARCH

Miami Beach Sued for Raising Roads for Sea-Level Rise

For Miami Beach, it's the latest challenge to efforts to deal with rising seas -- and an example of the legal hurdles that cities around the state (and nation) may face as they plan for the future.

October 28, 2021 • Alex Harris, Miami Herald

miami beach

citywide

- Resiliency
- Sustainability
- Light Rail
- Short-Term Rentals
- Ocean Drive
- Lincoln Road
- Bikes

study: lot and road elevation contribute to increased property values in miami beach

January 28, 2022

social media icons

photo of street scene

Visualizing a 12-14 inch Road Elevation



Required Property Modification

- Harmonization with the driveway and front yard
- Impacts to tree, landscaping
- Crown of road above finished floor of dwelling
- May need to elevate car port
- Sump pump installation on private land may be needed
- Elevate utilities connection to property (water meter etc)
- Owner willing to be bought out for 6.7 times the current property value

POLICY CONSIDERATION: Roadways Which May be Below Sea Level by 2050



Questions:

- Is roadway elevation at all locations feasible from an engineering standpoint?
- What underground utilities may be impacted?
- Should the City set a standard minimum elevation for roadways?
- What expectation across City will be created once the first road is elevated?
- Will road elevation require property owner consensus?
- Is the City willing to purchase private property to achieve elevation?
- Who pays for all or part of a roadway elevation project (special assessment versus General Fund, harmonization)?
- Once the City starts raising roadways, will there be adequate funding and time to raise all vulnerable roadways?
- What legal liability will the City create by elevating the road?
- What community benefit does raising a given roadway provide?
- How do you prioritize roadways for elevation using public funding?

How do you determine priority for using public funding to elevate roads?

Potential Criteria to Consider:

- Road Classification - City collector (e.g. Bayview Dr.) versus residential roadway (e.g. Mola Ave)
- Current vulnerability to flooding – roads at the lowest elevation
- More resilient roadways – roads which require less improvement to become more resilient
- Number of properties benefitting
- Property value along the road to be elevated
- By who is willing to be assessed for roadway elevation
- By who is willing to pay for the transitions to private property



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Next Steps

1. Conduct a Citywide vulnerability analysis including roadway elevations
2. Research actions by other jurisdiction
3. Continue the conversation



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