



# North Bay Village Stormwater Master Plan (SWMP)

North Bay & Harbor Island Town Hall

*September 8, 2022*





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# COMMUNITY ENGAGEMENT



*Community Engagement Town Hall in April 2022.*



*Treasure Island Town Hall in July 2022.*



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# COMMUNITY ENGAGEMENT

[www.northbayvillage-fl.gov/stormwater](http://www.northbayvillage-fl.gov/stormwater)

Stormwater Master Plan [Click Here](#)

## Upcoming Town Hall Meetings

### Overview:

The Village is developing a Village-wide Stormwater Master Plan (SWMP) that will enable NBV to assess the existing stormwater infrastructure, evaluate current and future drainage conditions, determine allowable level of flooding and identify improvements to address future rain, flood, and water quality concerns based on scientifically-backed projections and state-of-the-art modeling tools.

### Important Links:

A PowerPoint presentation summarizing the SWMP is available [HERE](#).

The full Stormwater Master Plan is available [HERE](#).

### Timeline:

- Report – completed in June 2022
- Design – scope and dates to be determined
- Bidding/Construction – scope and dates to be determined



*Open the camera app from your phone and tap the notification to visit the website.*



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# COMMUNITY ENGAGEMENT

## Educational Outreach Materials and Resources Available Online

**STORMWATER MASTER PLAN** **APRIL 2022** **PROJECT UPDATE**

**PROJECT DESCRIPTION:**  
The Village is developing a Stormwater Master Plan (SWMP) to assess the existing stormwater infrastructure, evaluate current and future drainage conditions, determine allowable level of flooding, and identify improvements to address future rain, flood, and water quality concerns based on scientifically-backed projections and state-of-the-art modeling tools.

A stormwater system is designed to direct, collect, and drain rainwater away from roads, buildings, and public areas to limit flooding in the event of rain and storms. It is composed of a series of interconnected infrastructure components. These include underground pipes, storm drain inlets, pump stations, and swales all working together to comprise the overall system.

**STATUS UPDATE:**  
During March's Sustainability & Resilience Task Force meeting, and The North Bay Village Stormwater Master Plan Development and the Town Hall in April, the engineering consultant team, along with the Village Staff, provided an in depth look at all the work completed up to date. These include:

- Data Collection and Evaluation
- Existing Conditions Hydraulic and Hydraulic (H&H) and Water Quality Modeling
- Future Conditions H&H Modeling without Projects
- Identification/Ranking of Sub-basin for Existing/Future Conditions without Projects

A flood mapping activity was conducted during both meetings for both in-person and online attendees to gain valuable input from community members about where flooding is occurring in their neighborhood. The data collected will be utilized to develop the Stormwater Master Plan and will be included in the final report.

**YOUR FEEDBACK IS IMPORTANT TO US!**  
North Bay Village prioritizes community engagement and outreach efforts are ongoing to solicit community feedback. An interactive and electronic Flood Mapping tool was created to allow citizens to specify their experienced flooding and severity, and provide additional comments. To report flooding areas and provide additional feedback, please visit:  
[www.bit.ly/NBVStormwater](http://www.bit.ly/NBVStormwater)

**COMMUNITY MEETING!**  
Wednesday, April 6, 2022  
6:30 PM  
Hybrid Meeting

**ZOOM**  
Meeting ID: 892 5968 0548  
Passcode: 290454

may be submitted to: [publiccomments@nbvillage.com](mailto:publiccomments@nbvillage.com) before the meeting, visit: [www.bit.ly/NBVAgendas](http://www.bit.ly/NBVAgendas)

[www.northbayvillage-fl.gov](http://www.northbayvillage-fl.gov) | 305-756-7171 | [actionteambvillage.com](mailto:actionteambvillage.com)

Project Updates

**STORMWATER MASTER PLAN**

**WHAT IS A STORMWATER SYSTEM?**  
A stormwater system is designed to direct, collect, and drain rainwater away from roads, buildings, and public areas to limit flooding in the event of rain and storms. It is a complex underground system of pipes, storm drain inlets, pump stations, and swales all working together to move and drain stormwater.

**PROJECT OVERVIEW**  
On June 20, 2022, North Bay Village Commission adopted the Stormwater Master Plan (SWMP) with a \$40.8 million infrastructure roadmap, with the goal of:

- Increasing the community's ability to prepare for and withstand current and future flooding events
- Protecting the Village's critical infrastructure
- Improving water quality, preventing pollution, and protecting Biscayne Bay
- Enhancing the overall community resilience

The SWMP does not compel the Village to build out all recommended projects but serves as a guide or roadmap as the Village considers future infrastructure needs.

**WHAT IS NEXT?**  
In addition to the Stormwater Master Plan, the Village was awarded a grant from the Department of Environmental Protection to perform an island-wide vulnerability assessment, granting access to over \$100 million in infrastructure grants available from the State of Florida every year. The Village has already adopted its long-term Statute, and has established a culture of local engagement with the understanding that the main stakeholders of this island community are the 9,000 residents that call it home.

[www.northbayvillage-fl.gov/stormwater](http://www.northbayvillage-fl.gov/stormwater)

**WERE THE RESULTS?**  
aging systems are beyond their span of 30 years and need to be replaced, otherwise proposed drainage systems would not and new pumps are needed to drive severe inundation, with a portion of seawalls throughout are situated low compared to conditions and new pumps are needed to drive severe inundation, with a portion of seawalls throughout are situated low compared to conditions

**RECOMMENDATIONS:**  
all to a minimum cap elevation of 5.94 ft NAVD88 or higher, and reuse stormwater in future re-developments using green infrastructure including green and blue roofs, permeable pavers and porous asphalt roadways, parking lots, and permeable concrete sidewalks. Permeable infiltration gardens to reduce stormwater storage and reuse stormwater in future re-developments using green infrastructure including green and blue roofs, permeable pavers and porous asphalt roadways, parking lots, and permeable concrete sidewalks.

**HARBOR ISLAND**

- One new stormwater pump station
- The construction of 5.94 ft-NAVD88 seawall along the island perimeter
- No road raising necessary

ESTIMATED TO BE: **\$4.1 MILLION**

**BEFORE AND AFTER**  
and future maximum depth of 5-year storm with a duration of 2017 High Projection Curve. The severity of flooding and the colors shown on the map denote the incremental flood

**BEFORE AND AFTER**  
and future maximum depth of 5-year storm with a duration of 2017 High Projection Curve. The severity of flooding and the colors shown on the map denote the incremental flood

**WITH IMPROVEMENTS IN 2040**  
The construction of 5.94 ft-NAVD88 seawall along the island perimeter

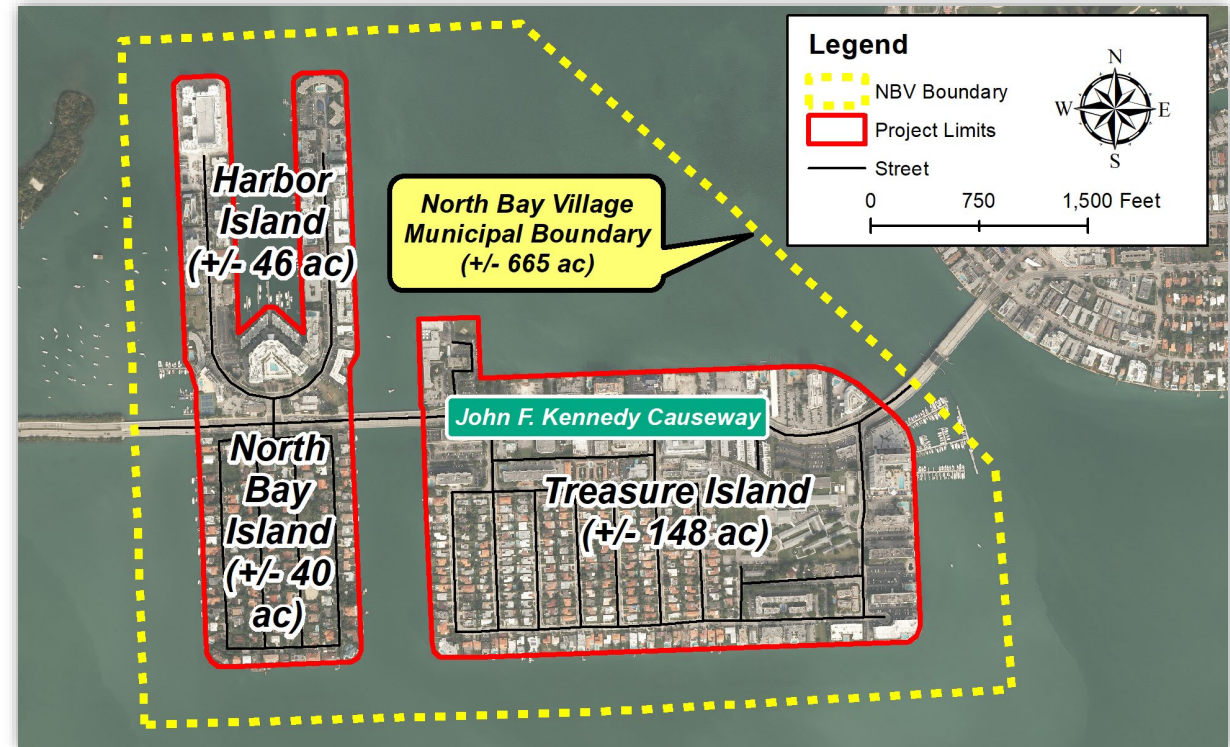
The Stormwater Master Plan Project and Findings Explained



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# PROJECT LOCATION OVERVIEW

- The Village retained BCC Engineering LLC. (BCC) to develop the Village's first Stormwater Master Plan (SWMP).
- Address flooding and resilience for the Village's three (3) islands:
  - Harbor Island
  - North Bay Island
  - Treasure Island

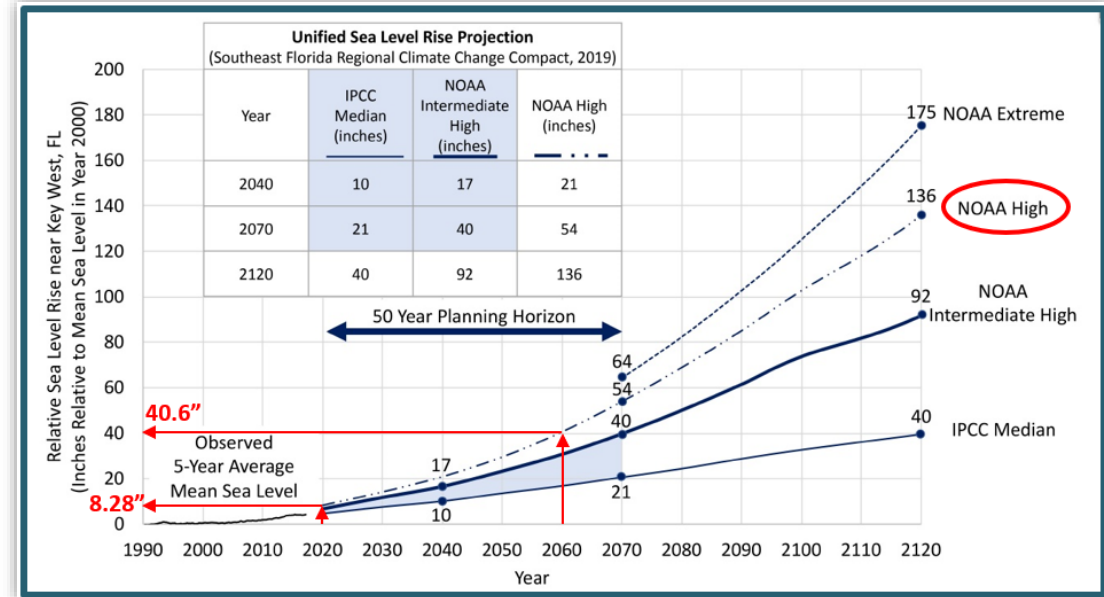




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# FUTURE CONDITIONS (2060) H&H MODELING W/O PROJECTS

- Defined 2060 planning horizon for future conditions using NOAA High Projection Curve
- Determined projected sea-level/groundwater rise and increases in rainfall amounts
- Revised H&H model parameters to reflect future and fully 'built-out' conditions
- Performed design storm and 'no rainfall' simulations to develop future depth of flooding maps



Change Factor (CF) Values and Future Condition Rainfall Depth			
Design Storm Event	Existing Condition Rainfall Depth (in.)	50 <sup>th</sup> Percentile (Median) Change Factor (CF) Value	Future Condition Rainfall Depth (in.)
5-YR 24-HR	6.97	1.08	7.53
10-YR 24-HR	8.44	1.10	9.28
25-YR 72-HR	13.00	1.11	14.43
100-YR 72-HR	17.50	1.17	20.48



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# FUTURE CONDITIONS (2060) H&H MODELING W/O PROJECTS

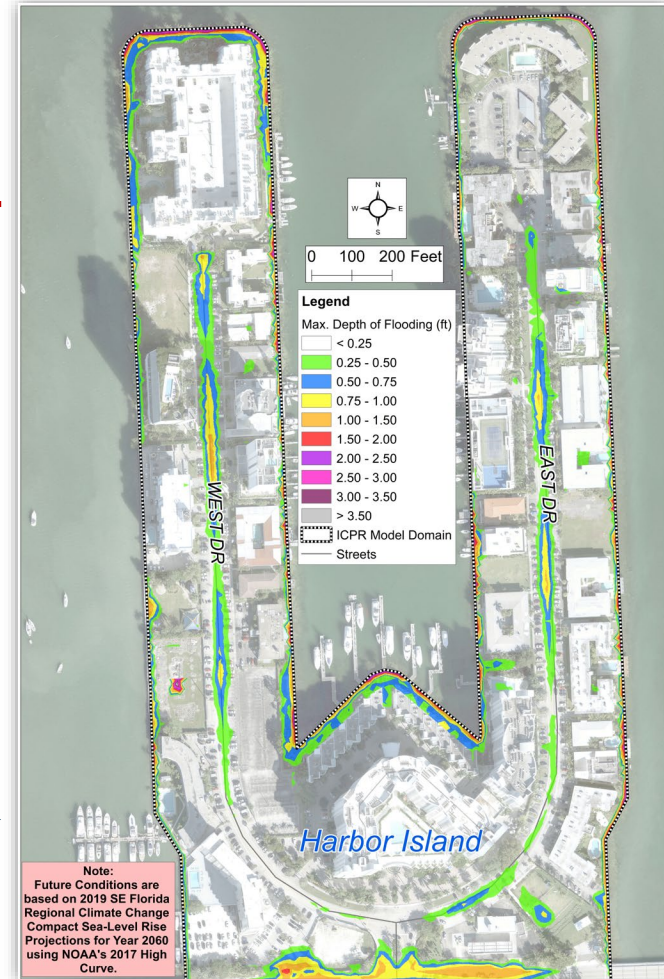


## 5-Year 24-Hour Storm Event

North Bay Island



Harbor Island





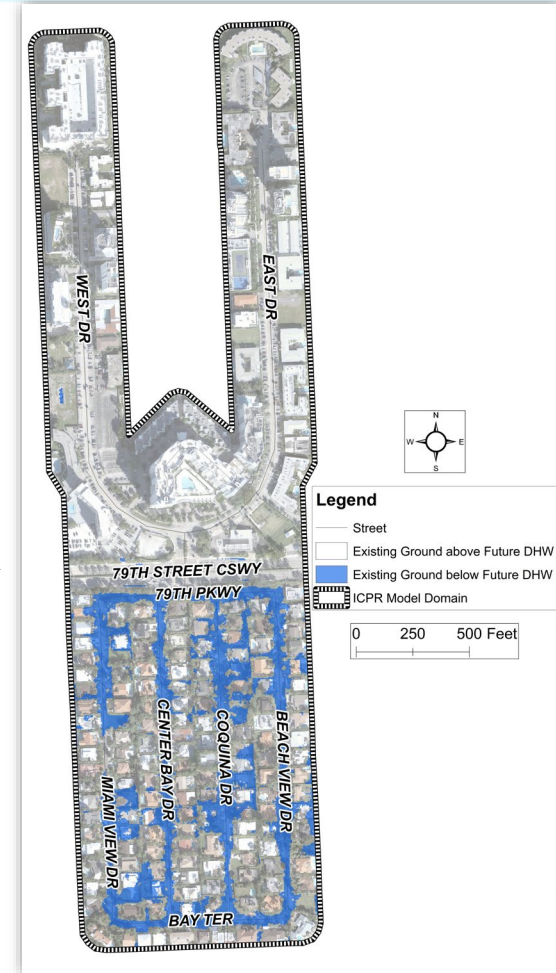
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# FUTURE CONDITIONS (2060) H&H MODELING W/O PROJECTS

Tidal  
Overtopping of  
Seawalls



Areas  
above/below  
Future DHW



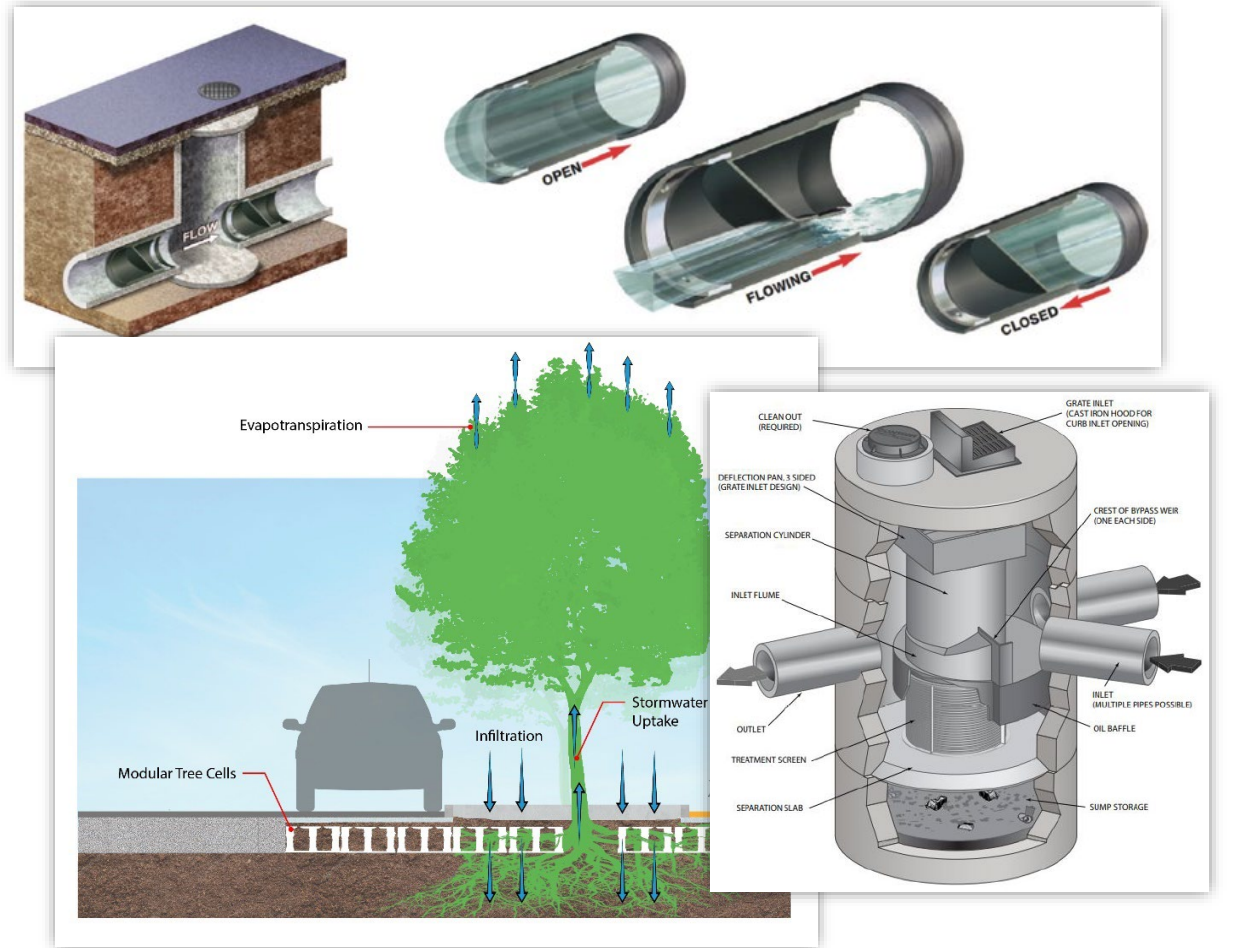




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# CAPITAL IMPROVEMENT PLAN (CIP) DEVELOPMENT

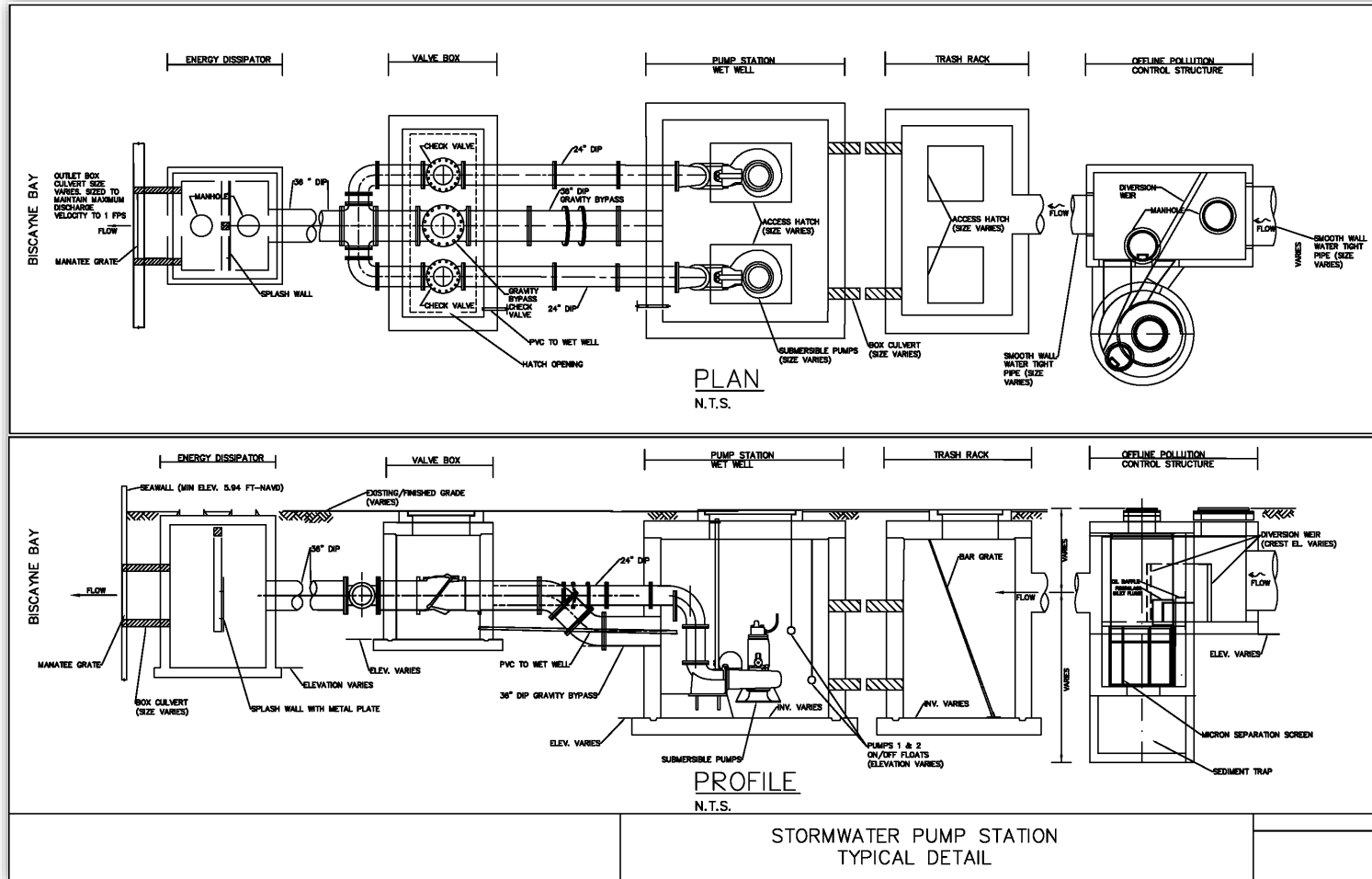
- Evaluated available stormwater BMPs, LID strategies and GI technologies for implementation.
- Formulated stormwater improvements projects to address existing/future FPLOS deficiencies and mitigate flooding conditions.
- Developed concept schematics to highlight and quantify proposed drainage infrastructure components.
- Established phasing approach for implementation of improvements.





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# CAPITAL IMPROVEMENT PLAN (CIP) DEVELOPMENT

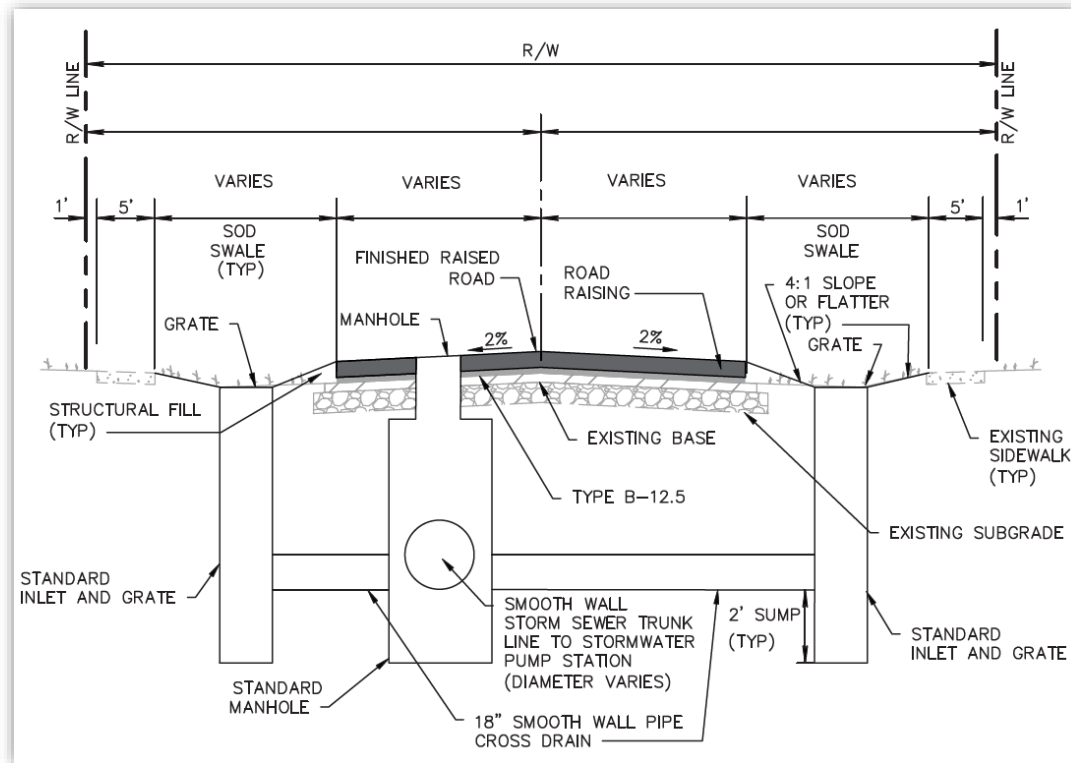




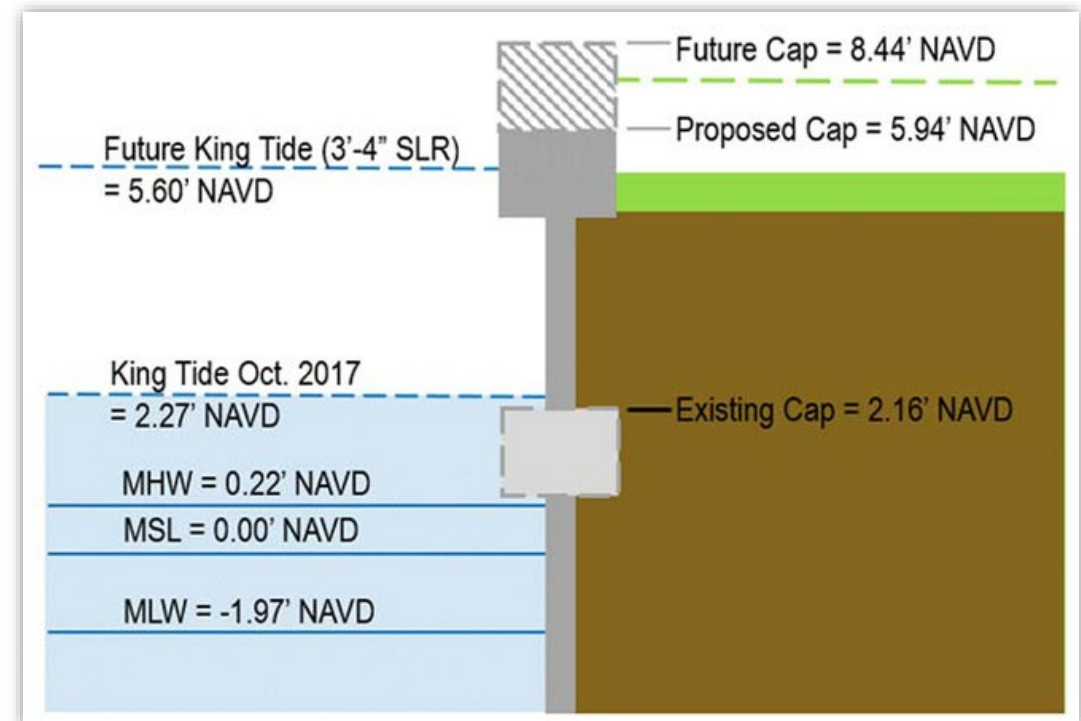
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# CAPITAL IMPROVEMENT PLAN (CIP) DEVELOPMENT

## Roadway Raising



## Private Seawall Raising





# NORTH BAY ISLAND CIP

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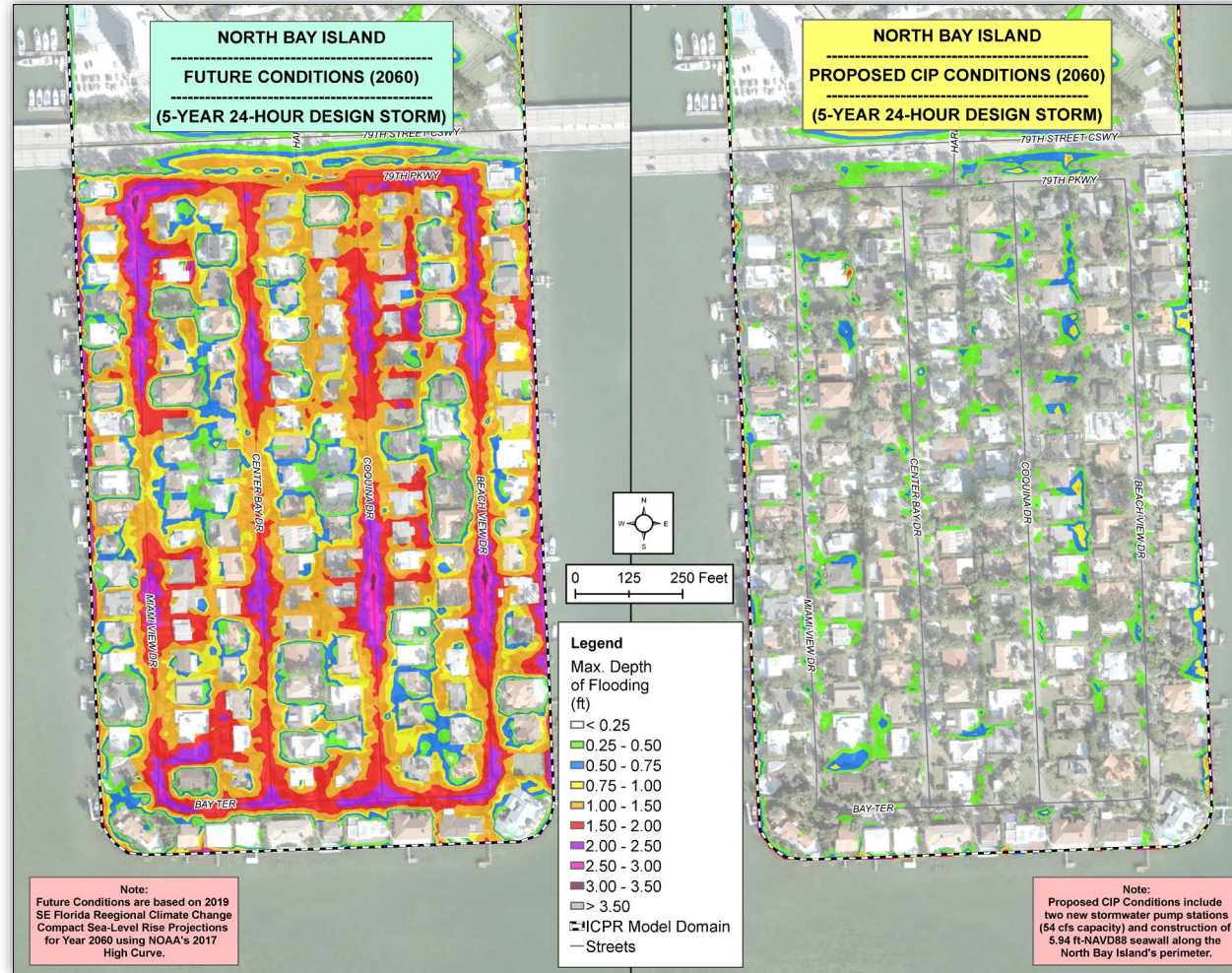
- Total Cost for implementing all proposed stormwater improvements on North Bay Island is estimated to be \$13.3 million.





# NORTH BAY ISLAND CIP

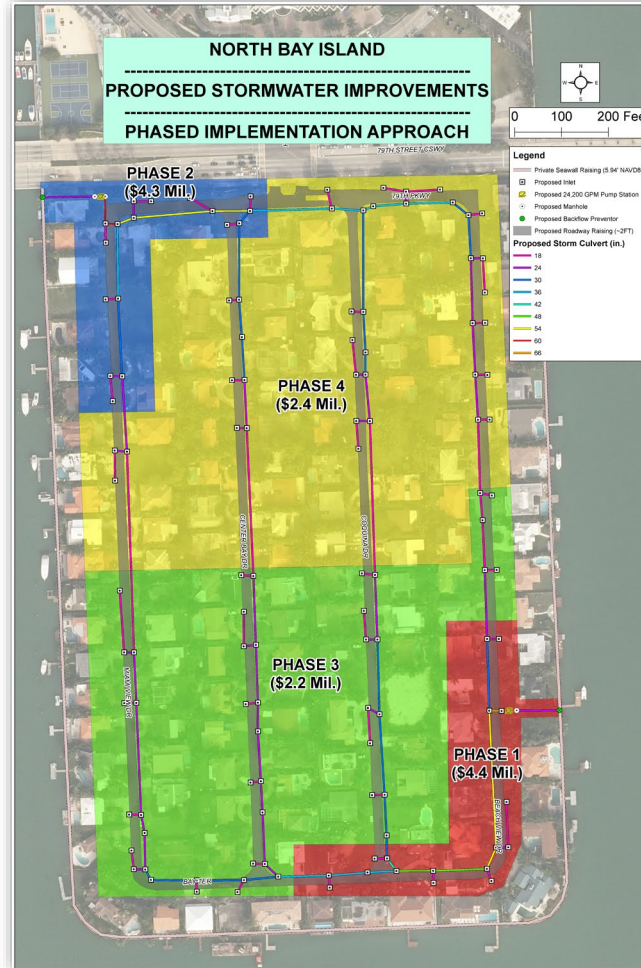
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# NBI CIP PHASING - PRIORITIZED IMPROVEMENTS





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# NBI CIP PHASING - PRIORITIZED IMPROVEMENTS

Construction Cost Estimate	
<i>Design</i>	\$1.0 million
<i>Construction - Underground Drainage</i>	\$8.7 million
<i>Construction - Raising Roadways 2-feet</i>	\$3.6 million
<b>Sub-Total</b>	<b>\$13.3 million</b>
Phase Breakdown	
Phase	North Bay Island
1	\$4.4 million
2	\$4.3 million
3	\$2.2 million
4	\$2.4 million
<b>Sub-Total</b>	<b>\$13.3 million</b>



# HARBOR ISLAND CIP

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- Total Cost for implementing all proposed stormwater improvements on Harbor Island is estimated to be **\$4.1 million**.

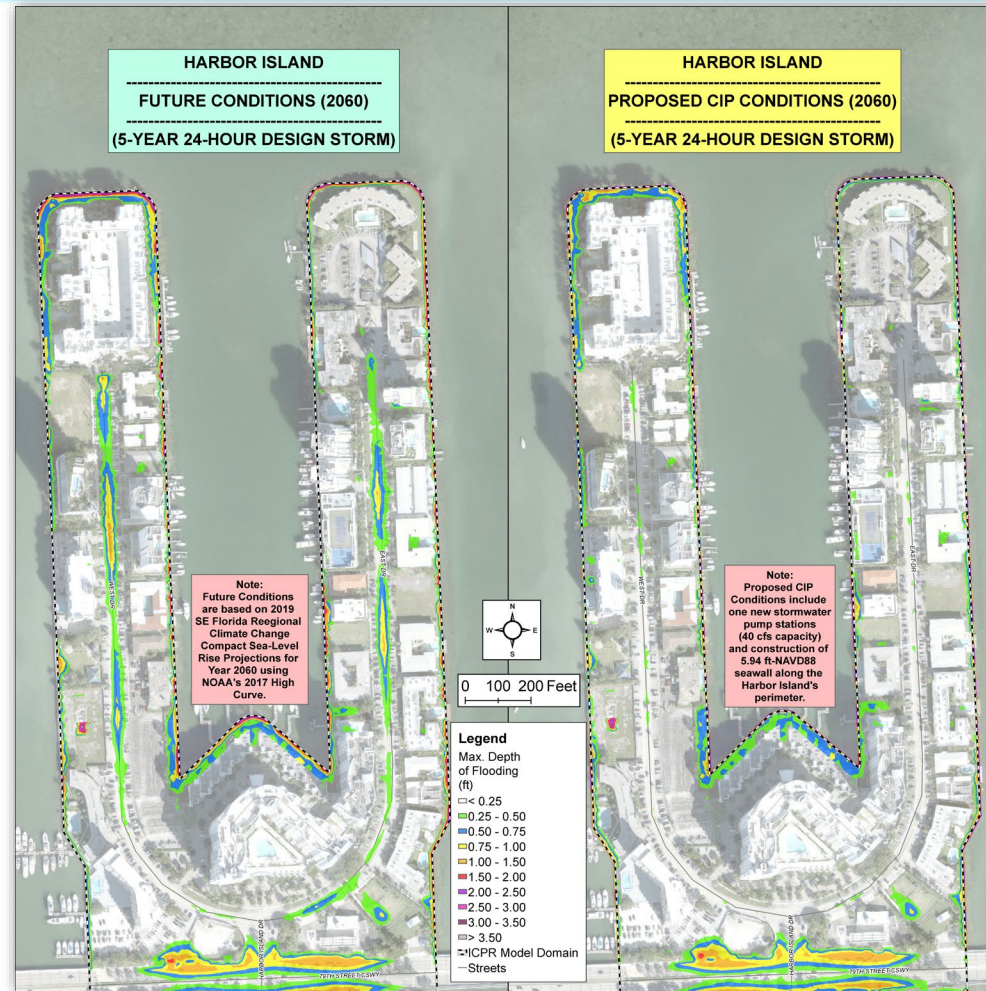






# HARBOR ISLAND CIP

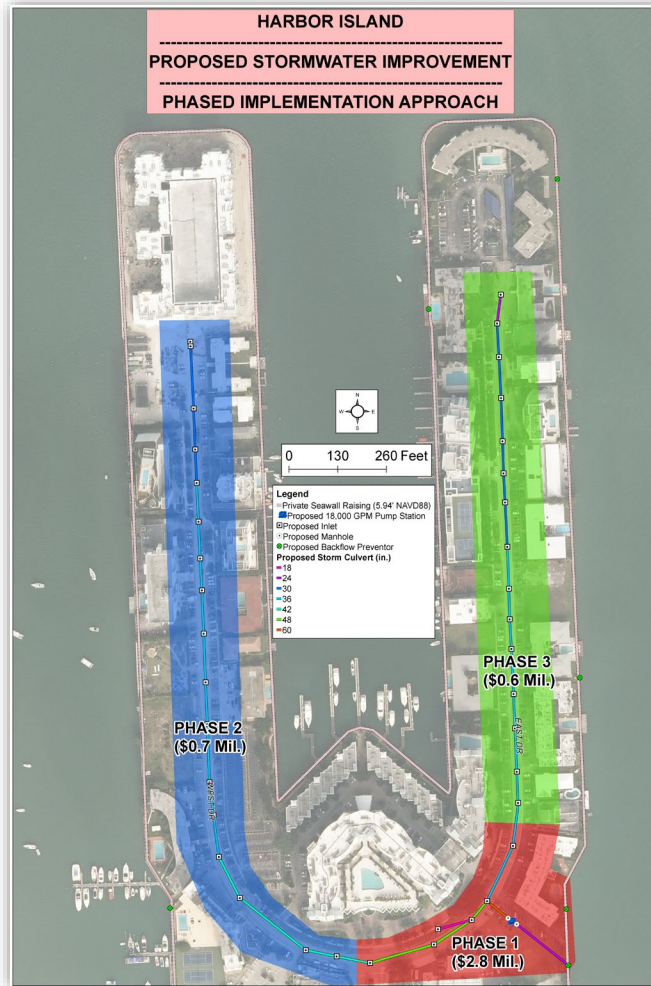
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# HI CIP PHASING – PRIORITIZED IMPROVEMENTS





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# HI CIP PHASING – PRIORITIZED IMPROVEMENTS

Construction Cost Estimate	
<i>Design</i>	\$0.3 million
<i>Construction - Underground Drainage</i>	\$3.8 million
<b>Sub-Total</b>	<b>\$4.1 million</b>
Phase Breakdown	
Phase	Harbor Island
1	\$2.8 million
2	\$0.7 million
3	\$0.6 million
<b>Sub-Total</b>	<b>\$4.1 million</b>



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## POTENTIAL FUNDING SOURCES FOR INFRASTRUCTURE PROJECTS

- **Drinking Water and Clean Water State Revolving Funds – Authorizes \$23.4 billion** to provide below-market rate loans and grants to fund water infrastructure improvements to protect public health and the environment.
- **STORM Act – Authorizes \$500 million** to provide support to local communities facing rising water levels, coastal erosion, and flooding that have put homes and property at risk.
- **FEMA BRIC - \$1 billion is authorized for the FEMA Building Resilient Infrastructure and Communities (BRIC) Program** to support local communities undertaking hazard mitigation.

Stormwater Master Plan [Click Here](#) ×

**\$150,000 grant for NBV Stormwater Master Plan from the State of Florida** 

News / By Helen Roldan

We are pleased to share NBV is the proud recipient of a \$150,000 grant from the state of Florida for our “Vulnerability Assessment and an Adaptation Plan.” This grant will help North Bay Village’s efforts to protect residents’ most valuable asset—their homes, by investing in the stormwater project. In just a few months, 2022 is already the most successful grant year in Village history.



## POTENTIAL FUNDING SOURCES FOR INFRASTRUCTURE PROJECTS

- **Clean Water Infrastructure Resiliency Sustainability Program** – Addresses rising threats to clean water infrastructure from climate change. **Authorizes \$25 million per year from 2022 to 2026** to support projects increasing resiliency or adaptability of water systems to natural hazards, cybersecurity vulnerabilities, or extreme weather events.
- **Sewer Overflow and Stormwater Reuse Municipal Grants** – May be used for planning, construction and design of treatment works for municipal combined sewer overflows, sanitary sewer overflows, or stormwater, and any measures to manage, reduce, or recapture stormwater or subsurface drainage.
- **PROTECT Grant Program** – Supports resilient operations for transformative, efficient, and cost-saving transportation solutions. **The program includes \$1.4 billion in competitive grants** to help States and local agencies improve the resiliency of transportation infrastructure, including evacuation route grants and at-risk coastal infrastructure grants.



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# PUBLIC ENGAGEMENT & COMMUNITY FEEDBACK

Share with us your thoughts, comment cards are available!

Visit the weblink <http://www.bit.ly/swmpcomment>  
to report your flooding concerns or additional comments



Scan the QR code to access  
the digital Comment Card

## North Bay Village Town Hall Comment Card

Provide Your Public Commentary Here:

This questionnaire will help to provide insight for North Bay Village as they work towards making updates and improvements to alleviate flooding and increase the Village's sustainability.

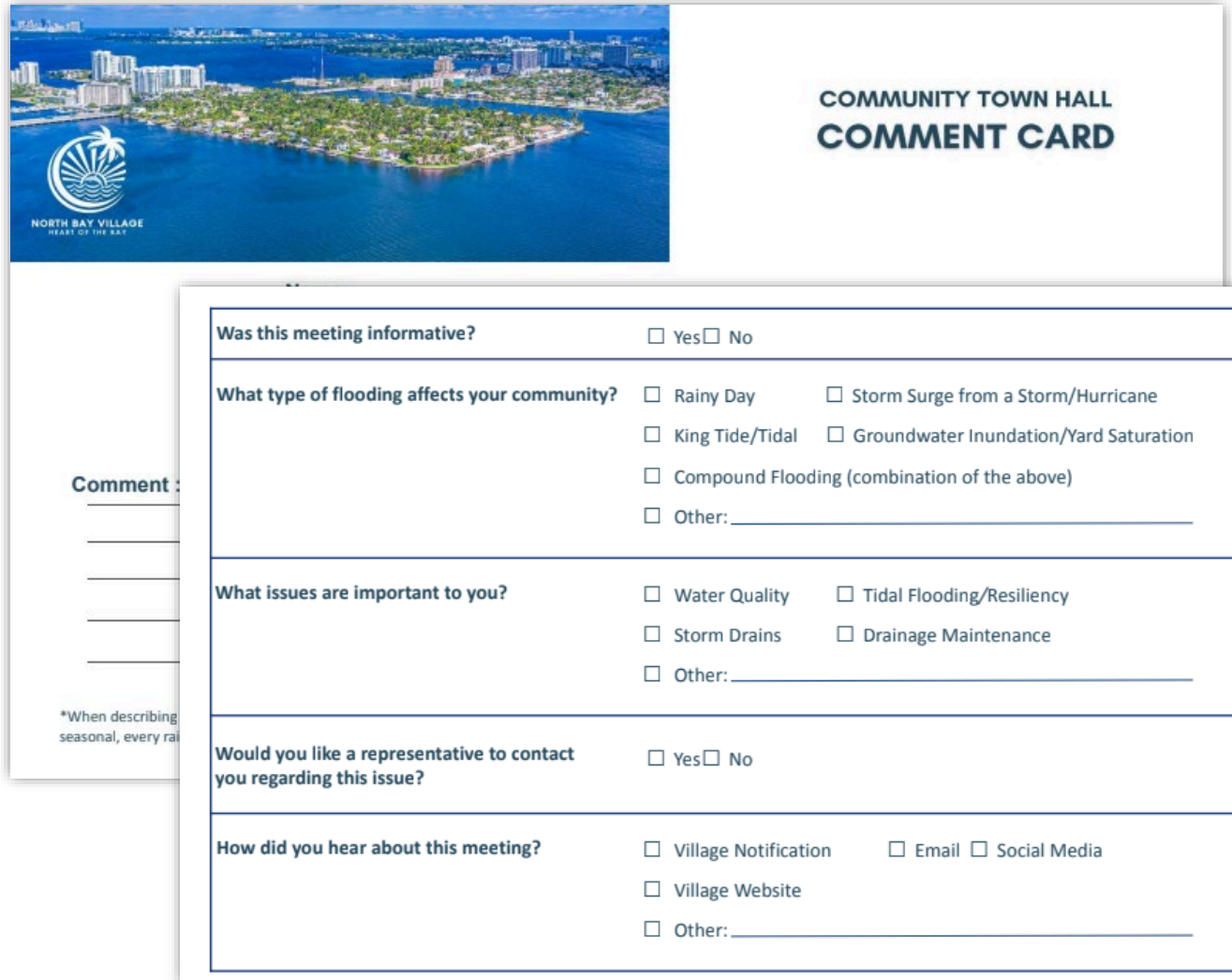
\* 1. Please enter the following information:

Name	<input type="text"/>
Address	<input type="text"/>
City/Town	<input type="text"/>
State/Province	<input type="text"/>
ZIP/Postal Code	<input type="text"/>
Email Address	<input type="text"/>
Phone Number	<input type="text"/>

2. Comment:

\* 3. Was this meeting informative?

Fill out a comment card at the registration table or ask one of us!



The image shows a 'COMMUNITY TOWN HALL COMMENT CARD' for North Bay Village. It features an aerial view of the village on the left and a form on the right. The form contains several sections with checkboxes and text input fields.

**COMMUNITY TOWN HALL COMMENT CARD**

**Was this meeting informative?**  Yes  No

**What type of flooding affects your community?**

- Rainy Day
- Storm Surge from a Storm/Hurricane
- King Tide/Tidal
- Groundwater Inundation/Yard Saturation
- Compound Flooding (combination of the above)
- Other: \_\_\_\_\_

**What issues are important to you?**

- Water Quality
- Tidal Flooding/Resiliency
- Storm Drains
- Drainage Maintenance
- Other: \_\_\_\_\_

**Would you like a representative to contact you regarding this issue?**  Yes  No

**How did you hear about this meeting?**

- Village Notification
- Email
- Social Media
- Village Website
- Other: \_\_\_\_\_

**Comment :**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\*When describing seasonal, every rain

Thank you.

Any Questions?

305-756-7171

actionteam@nbvillage.com



[www.northbayvillage-fl.gov/stormwater](http://www.northbayvillage-fl.gov/stormwater)