

# Town of Redington Shores SWMP Public Education Workshop

Presented by: Cardno now Stantec  
Date: August 15, 2022



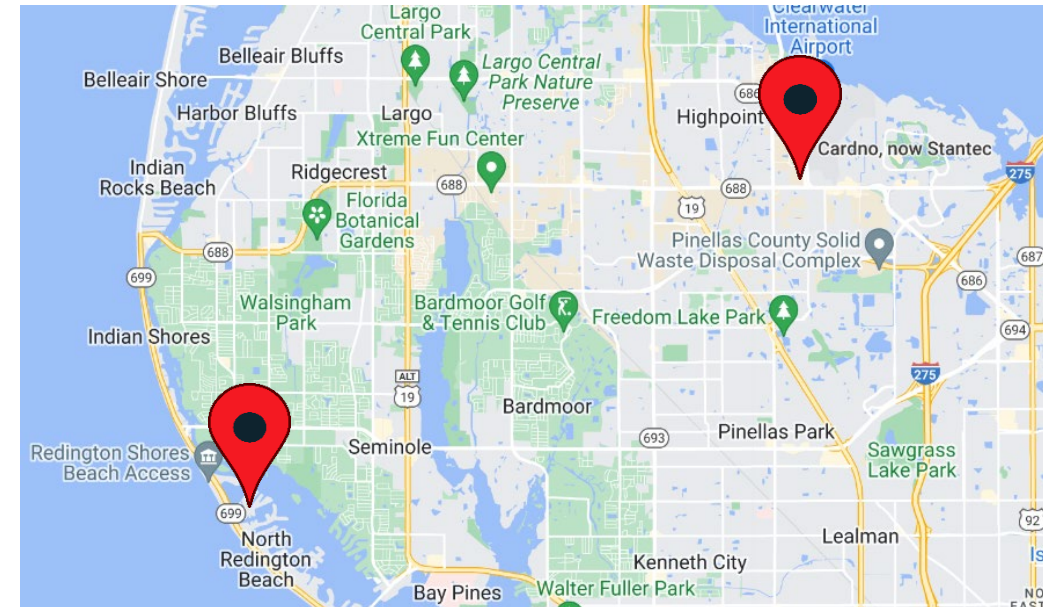
# Agenda

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- Introductions & Project Background
- Project Schedule
- Scope of Work
- Public Workshops & Comment Cards
- Q&A

# Cardno now Stantec History

- Engineer of Record since early 90's
- Founded 1945
- Full Service Civil and Environmental Engineering Firm
- International Firm with Local Community Focus
- Over 80% of Work is Public Sector
- Joined Stantec in December 2021
- Over 200 Staff Locally



# Project Team



**Rick Bowers, PE** | Senior Drainage Engineer / GIS /  
Quality Assurance/Quality Control

- 30+ years of experience
- Drainage Design / Stormwater Management / Watershed Management/ Asset Management / GIS

## ***Representative Project Experience***

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### ***Jumper Creek Watershed, SWFWMD***

- Watershed Master Plan

### ***Bushnell Watershed, SWFWMD***

- Watershed Master Plan

### ***Blue Sink Watershed, SWFWMD***

- Watershed Master Plan

### ***Basin C-51, SFWMD***

- Watershed Master Plan

### ***Town of Redington Shores***

- Stormwater Needs Analysis

### ***Town of North Redington Beach***

- Stormwater Needs Analysis

### ***University of Florida***

- Stormwater Master Plan

# Project Team



## **Tanya Camacho, GISP | GIS**

- 15 years of experience
- Water Resources / NPDES / Asset Management / GIS / Utilities

### ***Representative Project Experience***

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#### ***Jumper Creek Watershed***

- Watershed Master Plan

#### ***Bushnell Watershed***

- Watershed Master Plan

#### ***Hernando County Map Modernization Project, SWFWMD***

#### ***Roosevelt Creek Watershed Management Plan Update, Pinellas County***

#### ***Blue Sink Watershed, SWFWMD***

- Watershed Master Plan

#### ***Wiscon Watershed, SWFWMD***

- Watershed Master Plan

# Project Team



## **Chris Knox, PE | Project Manager, Senior Drainage Engineer**

- 20+ years of experience
- Drainage Design / Stormwater Management / Watershed Management

### ***Representative Project Experience***

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#### ***Jumper Creek Watershed***

- Watershed Master Plan

#### ***Bushnell Watershed***

#### ***Watershed Master Plan***

#### ***Bee Branch Creek Channel Restoration Analysis***

#### ***62<sup>nd</sup> Avenue North Sidewalk Improvements – Pinellas County, FL***

#### ***Starkey Road Sidewalks, Pinellas County, FL***

#### ***District-wide Stormwater Program Management – FDOT District 7 Florida***

#### ***South Wabash Avenue Extension from Harden Blvd. (SR 563) to Ariana Street, Lakeland, FL***

#### ***Edgewood Drive from South Florida Avenue to Harden Blvd, Florida***

#### ***Town of Redington Shores***

- Stormwater Needs Analysis

#### ***Town of North Redington Beach***

- Stormwater Needs Analysis



# Project Background and Schedule

## Milestone

Inventory / GIS Database Development

Public Meeting #1

Draft H&H Model Development

Draft Inundation Mapping / BMP Analysis

Level of Service

Sea Level Rise (SLR) Analysis

Final Report

Public Meeting #2

Signed & Sealed Deliverable



## Due Date After receive the NTP

60 Calendar Days

170 Calendar Days

250 Calendar Days

330 Calendar Days

360 Calendar Days

390 Calendar Days

450 Calendar Days

# Project Location

- 220 ac. with 1.19 mi of shoreline and a total of 6.22 miles of road
- Situated on Sand Key in West-Central Pinellas County
- Bound by the Gulf of Mexico to the west and by Boca Ciega Bay, a protected aquatic preserve, to the east

Location of Project



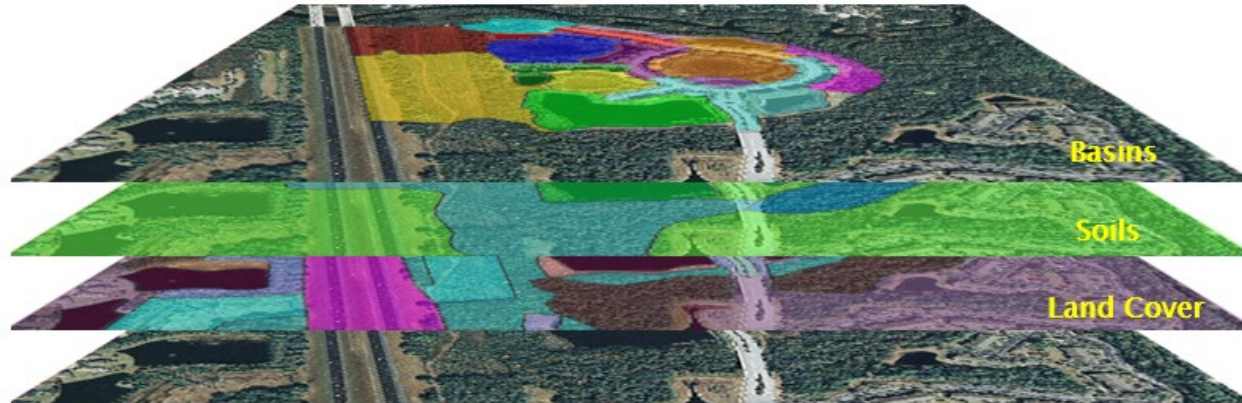


# Scope of Work

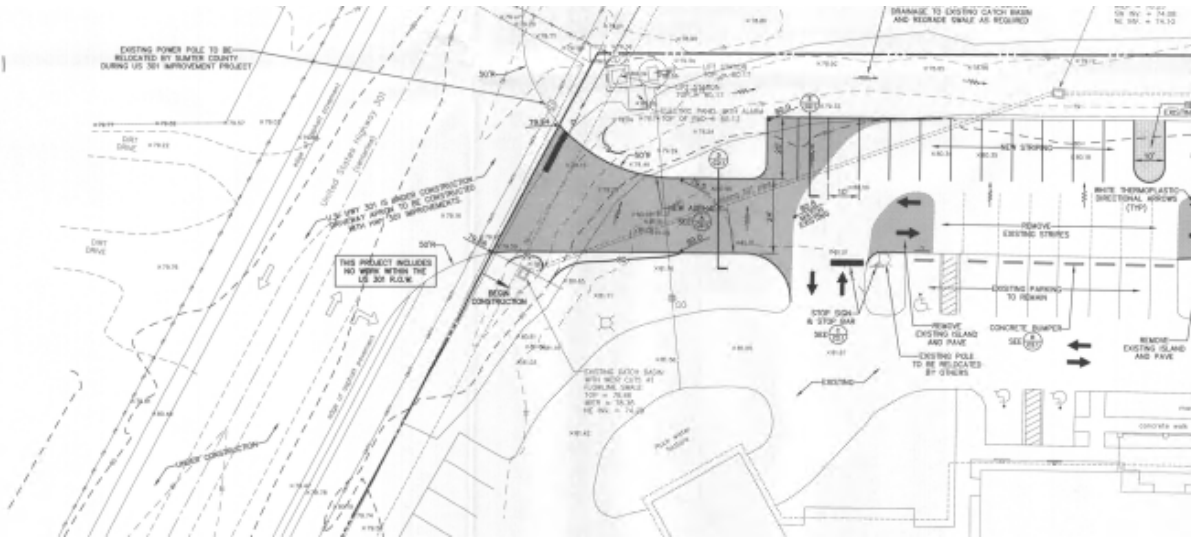
- > Development of a project management plan (PMP) that includes a list of deliverables, schedules, communication protocols, and a quality assurance/quality control (QA/QC) plan.
- > An existing conditions watershed evaluation, which will include field evaluations of the stormwater management system asset inventory.
- > Inundation analyses.
- > Level of Service (LOS) Analysis.
- > Develop responses to Town's Review of the stormwater model and deliverables.
- > Best Management Practices (BMPs) alternatives to minimize flooding and address sea level rise (SLR).



# Model Development



- > Drainage Data Collection
  - SWFWMD Permit Reviews
  - LiDAR (Light Detection and Ranging)
  - Aerial Photographs
  - Landuse / Land Cover
  - Groundwater, Soils, Pervious & Impervious land features
  - Current / Future Tailwater Elevations



# LiDAR



> 2017 Pinellas County  
LiDAR



# Landuse



> 2020 Landuse

- Residential High Density
- Recreational
- Commercial and Services

# Model Development



- > Existing Drainage Structure Inventory
  - Catch Basins
  - Outfalls
  - Pipes
- > Closed-circuit TV (CCTV)
  - Review Video
  - Inspection Reports



# Model Development



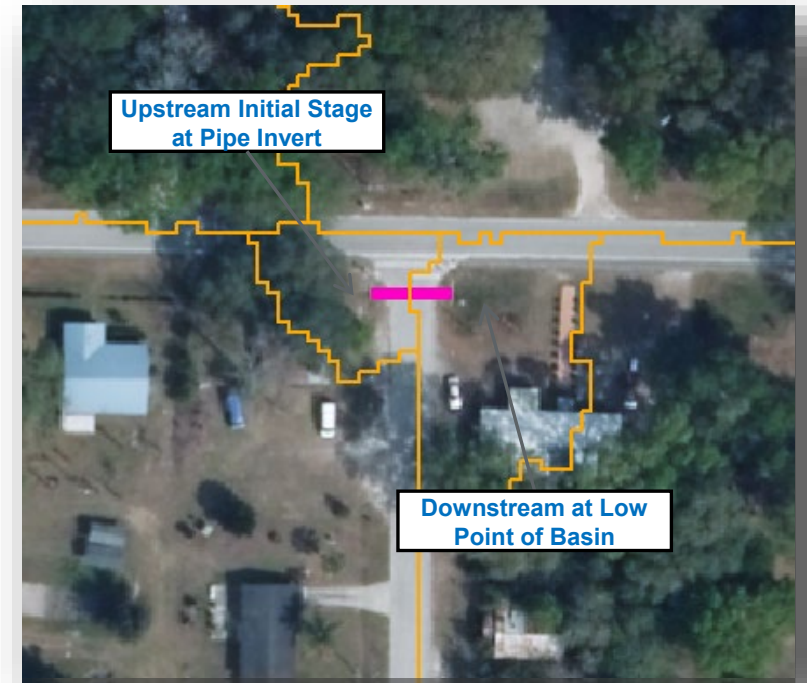
Source: Google Maps, 2022

- > Existing Drainage Structure Inventory
  - Staff will verify locations of existing stormwater inventory and add missing structure locations if needed.
  - Visual condition observations captured
  - Survey if needed
- > Design / Update the GIS



# Storm Pipe Systems

- > 284 Pipes in Database
- > 8 inch and larger pipes to be modeled
- > Upstream and Downstream Inverts provided. Missing data to be estimated from Digital Elevation Model (DEM, from LiDAR) or Upstream / Downstream Culverts

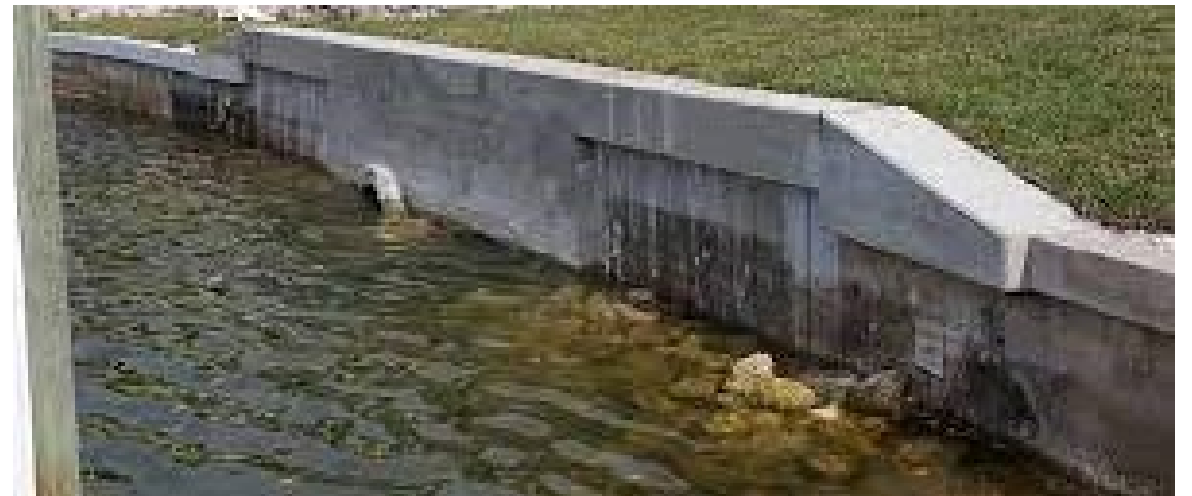


# Structures

- 51 Outfalls
- 236 Catch Basins
- Weirs
- Water Control Structures
- Overland Discharge from Closed Catchments



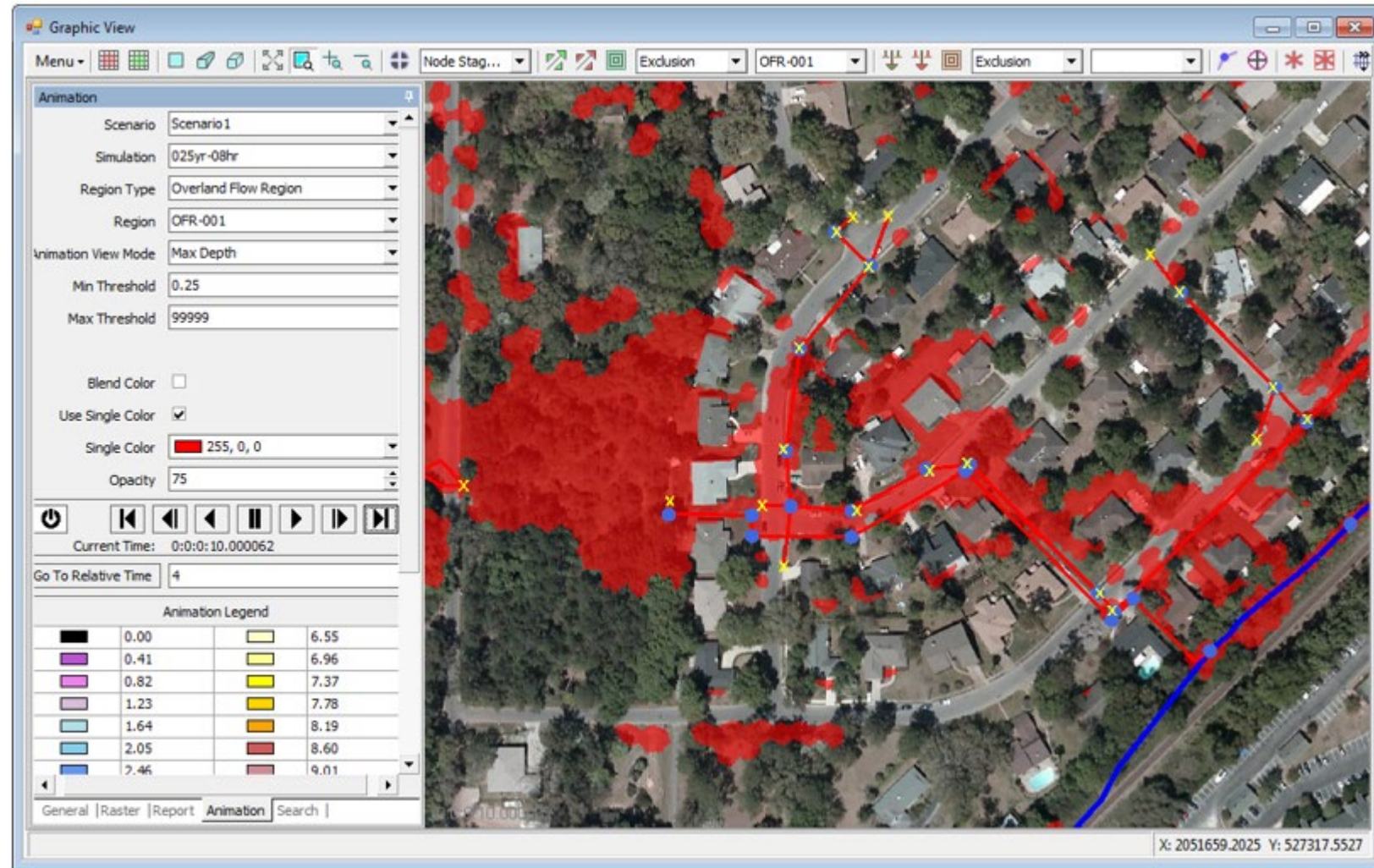
Source: Google Maps, 2022





# Hydrologic and Hydraulic Model Development / Analysis

- > Develop an ICPR4 model of the existing drainage conditions of the Town
- > Town Review
- > BMPs Alternatives Analysis and Recommendations
  - 8 conceptual BMPs to alleviate inundation



# Hydrologic and Hydraulic Model Development / Analysis

- > Development of an ICPR4 model of the existing drainage conditions for the Town of Redington Shores
- > Town Review
- > BMP Alternatives Analysis and Recommendations
  - 8 conceptual BMPs to alleviate flooding

Storm	Duration
2.33 mean-annual	24hr
10yr	24hr
25yr	24hr
50yr	24hr
100yr	24hr

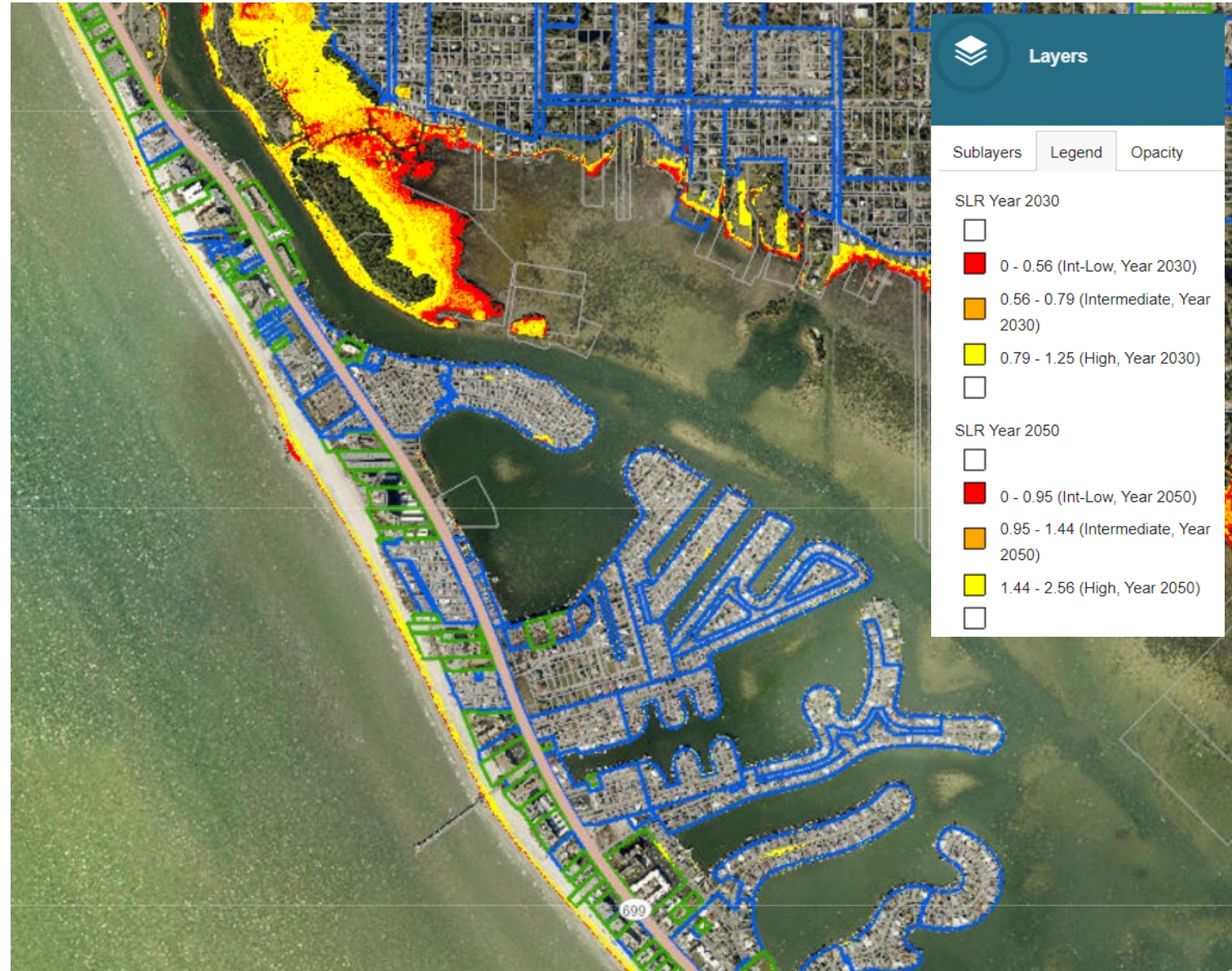


Citation: Google Maps



# Inundation Analysis / Mapping (Existing Condition & SLR Assessment)

- > Evaluate overall performance and capacity of the stormwater system
- > Identify potential flooding problems and create town-wide flood inundation maps (current and future)



Citation: Pinellas County SLR Map Application  
[Sea Level Rise \(arcgis.com\)](https://arcgis.com)

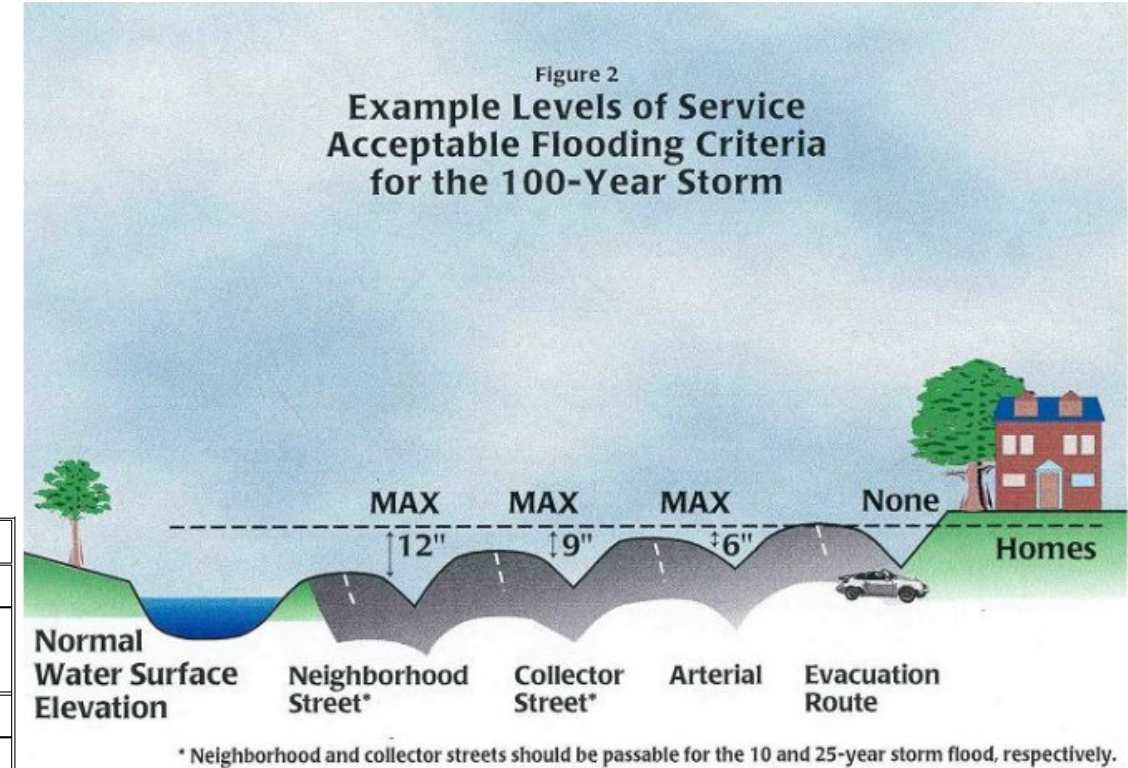
# Level of Service

- > Roadway Level of Service to determine roads affected by flooding
- > BMP Analysis to provide solutions for affected areas identified by FPLOS determination

	Road LOS Classification						
	Evacuation Route	Arterial Road	Collector Road		Local Road		Other Roads
			Major	Minor	Major	Minor	
100-Year (0.01 chance)	E <sup>1</sup>	B <sup>1</sup>	A	A	A	A	A
50-Year (0.02 chance)	E	C	B	B	A	A	A
25-Year (0.04 chance)	E	D	C	B	B	A	A
10-Year (0.1 chance)	E	D	C	C	B	B	B
5-Year (0.2 chance)	E	E	D	D	C	C	B
2.33-Year (0.429 chance)	E	E	E	E	D	D	C

<sup>1</sup>LOS = A if impassable flooding does not occur for the 100-year storm event.

Citation: Hernando County LOS SWRA BMP Approach 20131017.pdf





# Level of Service

- > Roadway Level of Service to determine roads affected by flooding
- > BMP Analysis to provide solutions for affected areas identified by FPLOS determination



Node E0245 (downstream)

Design Event	Pre- Stage (NAVD)	Post- Stage (NAVD)
Mean-annual/24-hr	79.42	79.49
5-yr/24-hr	79.48	79.54
10-yr/24-hr	79.57	79.68
25-yr/24-hr	79.83	79.80
50-yr/24-hr	80.09	79.89
100-yr/24-hr	80.30	80.16

# Public Outreach Meetings

## > Public Outreach Meetings

- Educational Workshop and gather historical flood data
- Stormwater Master Plan Results Workshop



Watershed Management Program Preliminary Floodplains & Maps Public Review and Comment Meeting		
Meeting Date:	4/12/18	Watershed: Jumper Creek
County:	Sumter	Interviewer Name: RJ
Your Name:	NOLA Sutz	Telephone #:
Site Address:		
Parcel ID:	N11-001	Alt ID:
<input checked="" type="checkbox"/> Send Map	<input checked="" type="checkbox"/> US Mail	<input checked="" type="checkbox"/> Email
Email Address:	lynsutz@aol.com	
Mailing Address:	1932 CR 564 Bushnell FL 33513	
Comments:	<p>standing water ? 1998? between my house 1932 &amp; my mom's house in the back 190 CR 564</p> <p>my house was resurveyed 2017 / what it is above Base flood elevation -</p>	

Citation: SWFWMD Public Review & Comment Cards  
Jumper Creek Watershed



# Public Comment Cards

- > Public Comment Cards – submit by Oct 17<sup>th</sup> to Town Hall or [helpdesk@redshoresfl.com](mailto:helpdesk@redshoresfl.com)
- > Leave comment cards with Town Hall receptionist
- > Provide as much information as possible, specifically dates, event names, and photographs, if available.

PLEASE ANSWER THE FOLLOWING QUESTIONS:

Have you experienced flooding on your property or in the area?    Yes     No

Where was the flooding and how high did the water reach? \_\_\_\_\_

Other information:

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When did the flooding occur? (Date or storm event) \_\_\_\_\_

DO YOU HAVE THE FOLLOWING? (Check all that apply)

- |   |   |
|---|---|
| <input type="checkbox"/> Photos of flooding | <input type="checkbox"/> Information on how water flows through your property |
| <input type="checkbox"/> Survey data        | <input type="checkbox"/> Others: _____  |
| <input type="checkbox"/> Soils data         |   |

# Questions



# Seawall Ordinance

- > Sec. 63-15.4. - Seawalls: construction specifications.

C.Cap. The seawall cap shall be poured in place and shall have a minimum width of 22 inches and a minimum depth of 16 inches. Embedment of sheet pilings into the cap shall be six-eighths inches. **Finished seawall cap elevations shall be between seven and one-half feet and eight and one-half feet N.G.V.D.** Expansion joints between one-half inch and three-fourths inch shall be provided at spacings not to exceed 40 feet. Expansion joints shall be located no less than one foot from slab joints, and expansion joints shall be filled with proper expansion material. Seawall caps shall contain four longitudinal reinforcing bars not less than No. 6 size and No. 5 stirrups not more than nine inches on center within a quarter span of anchor rods and 18 inches on center for the remaining span.

# Benefit to Cost Analysis

Each proposed BMP requires a planning level cost estimate and an analysis of the benefit to cost ratio.

Costs associated with implementing a BMP may include:

- Construction cost based on quantities
- Mobilization
- Maintenance of traffic
- Contingency
- Surveying and testing
- Design
- Permitting
- Construction administration and observation
- Anticipated maintenance costs



# Benefit to Cost Analysis

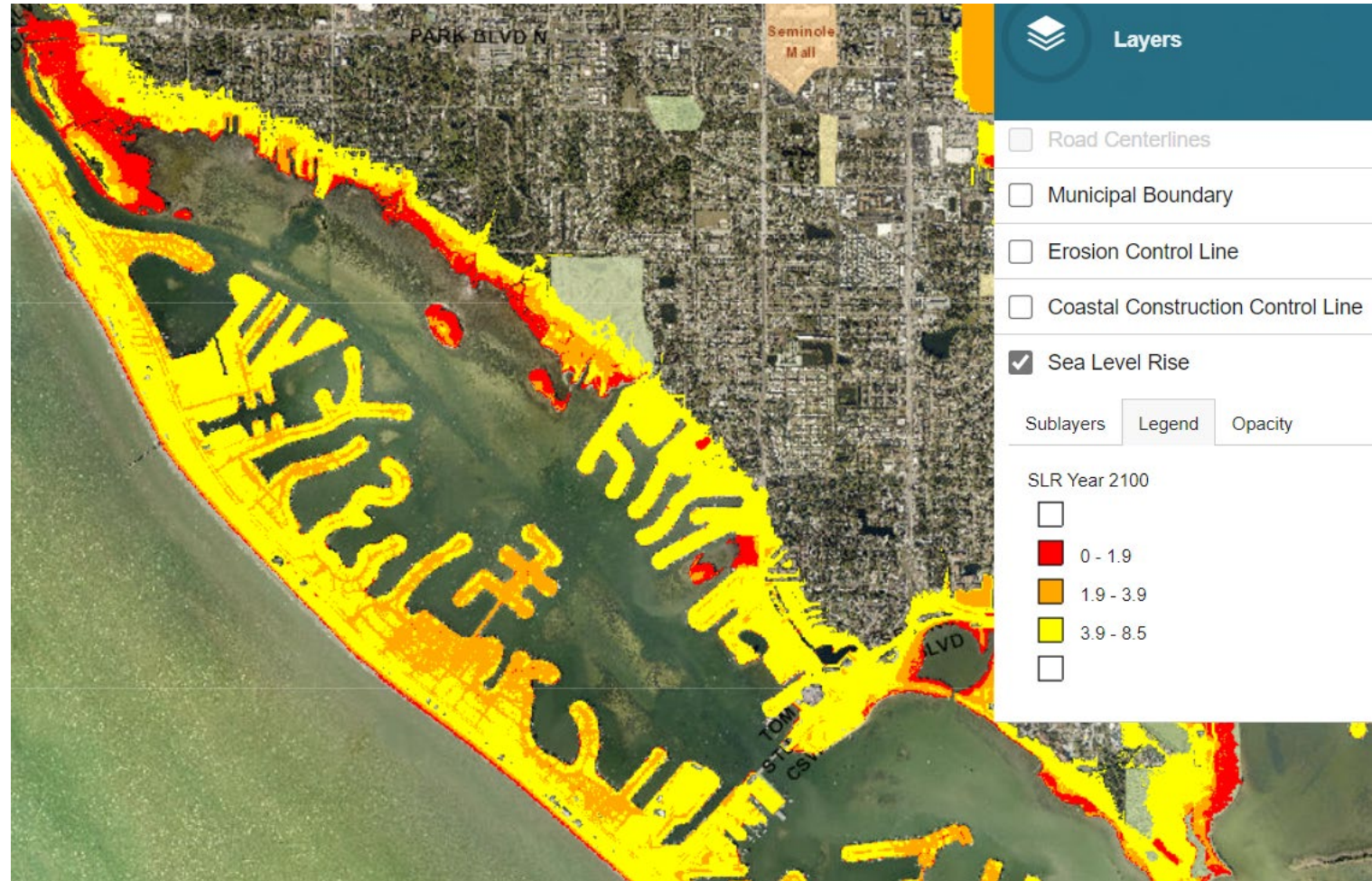
For flood protection BMPs, the benefit to cost ratio measures how well the proposed improvements will reduce flood damage over a predetermined time period (usually the project life). A value above 1 indicates the cost can be well justified by the benefit through BMP implementation. A value of 1 is the “breakeven” point while a value below 1 indicates the implementation is likely more costly than the expected benefit (e.g., reduced flood damage).

$$\textit{Benefit to Cost Ratio} = \frac{\textit{Reduction in total damage costs over evaluation period}}{\textit{Total costs incurred (capital and maintenance) over evaluation period}}$$

BMPs are ranked and evaluated by staff.

# Inundation Analysis / Mapping (Existing Condition & SLR Assessment)

- > Evaluate overall performance and capacity of the stormwater system
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# Surface Water and Groundwater

