

# Lake Bradford / Chubb Lake Pump Station and Outfall Project (CIP 100595)

Public Meeting

August 4, 2025



CITY OF  
**VIRGINIA  
BEACH**

# AGENDA

- Lake Bradford/Chubb Lake Flood Protection Master Program Overview
- Lake Bradford/Chubb Lake Pump Station and Outfall Project Background
- Next Steps
- Design-Builder Introduction

# Lake Bradford/Chubb Lake Flood Protection Master Program Overview

# LAKE BRADFORD/CHUBB LAKE FLOOD PROTECTION MASTER PROGRAM BACKGROUND



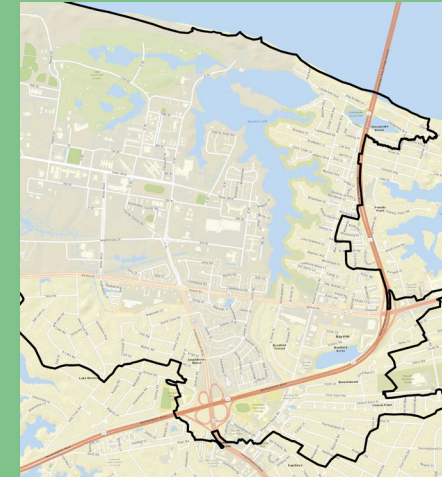
Program area has experienced a history of flooding (Church Point 2006).



Rainfall from Hurricane Matthew (October 2016) resulted in the initiation of the program.



Frequent flooding on Shore Drive and Pleasure House Road.



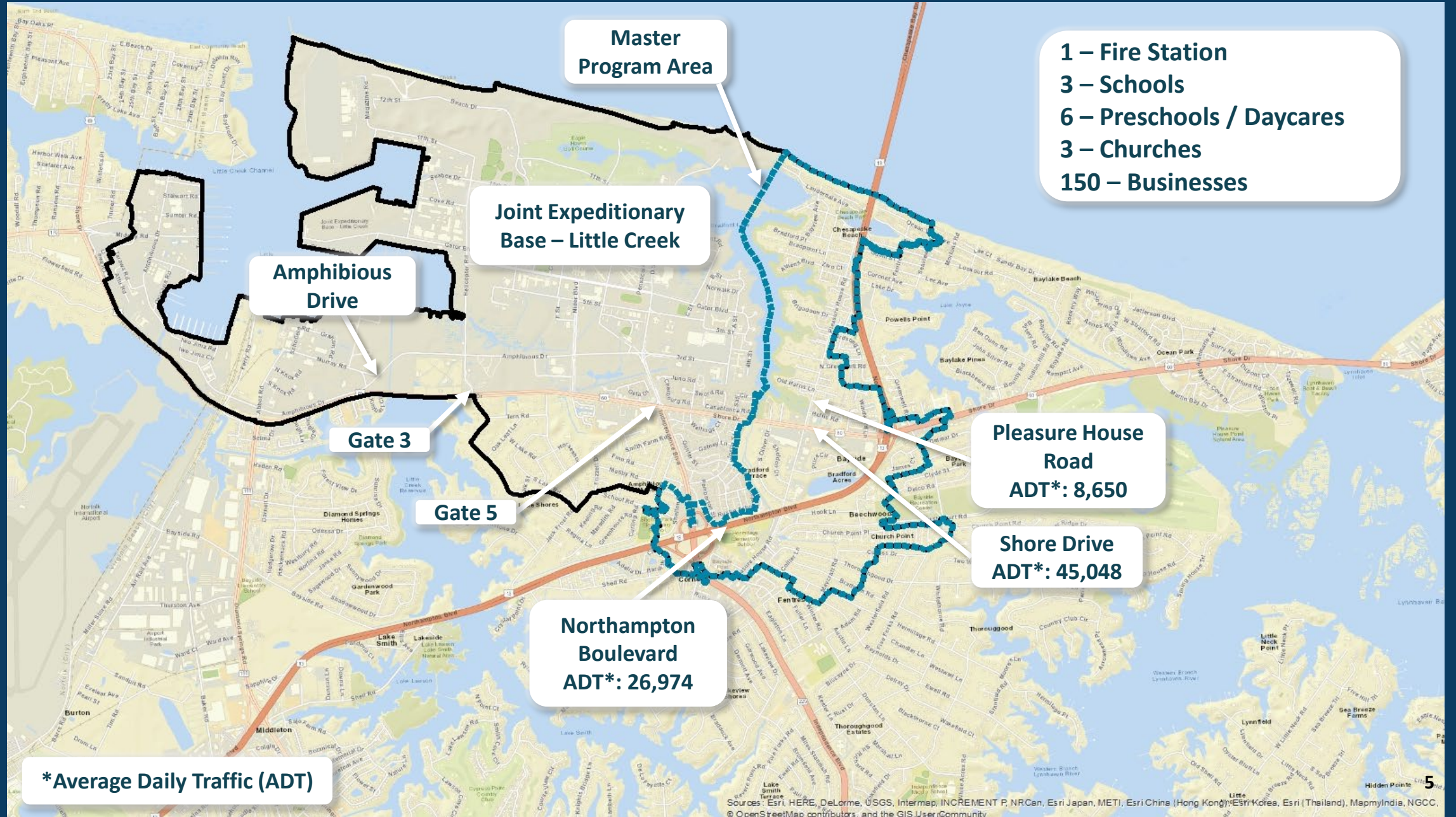
The City selected RK&K to develop a preliminary engineering report (PER) of recommendations. The PER was completed in February of 2022.



The citizens of Virginia Beach passed a bond referendum on November 2, 2021. \$114.1M was allocated for two initial projects identified in the program's PER.



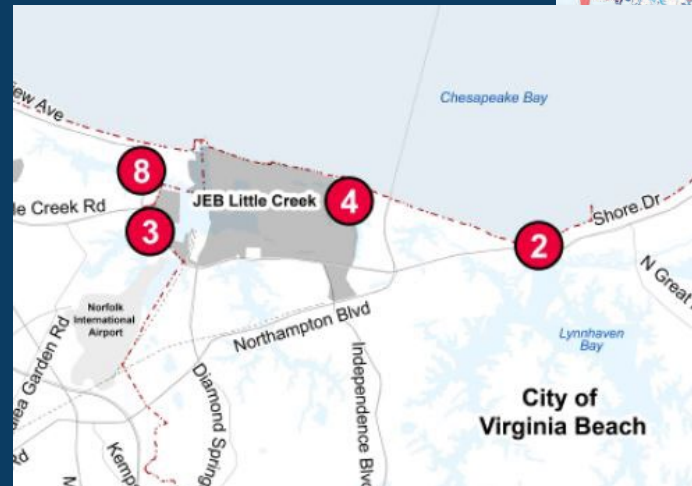
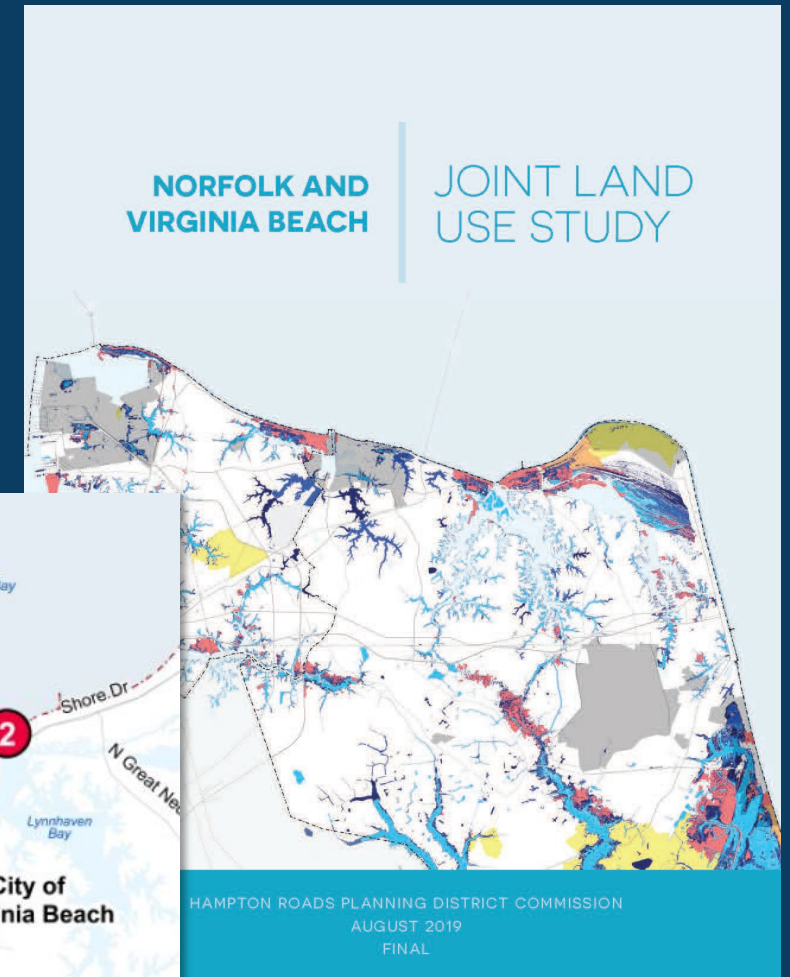
# ADDITIONAL IMPACTED AREAS





# NORFOLK-VIRGINIA BEACH JOINT LAND USE STUDY (JLUS)

- The Hampton Roads Region - Norfolk and Virginia Beach Joint Land Use Study (JLUS) was a joint effort between Norfolk, Virginia Beach, the Hampton Roads Planning District Commission, and several U.S. Navy installations in South Hampton Roads. More frequent flooding is affecting military operations and access to military facilities. This study focused on identifying specific conditions, including **recurrent flooding, coastal storms**, and erosion, outside of the military footprint that have the **potential to impact Navy operations in Hampton Roads**.
- Two of the Priority Actions pertain to the Lake Bradford-Chubb Lake Flood Protection Master Program Area:
  - 4 – East Amphibious Drive, Chubb Lake, and Lake Bradford Flood Mitigation and Stormwater Management Strategy
  - 2 – Shore Drive Comprehensive Flood Mitigation and Stormwater Management Strategy



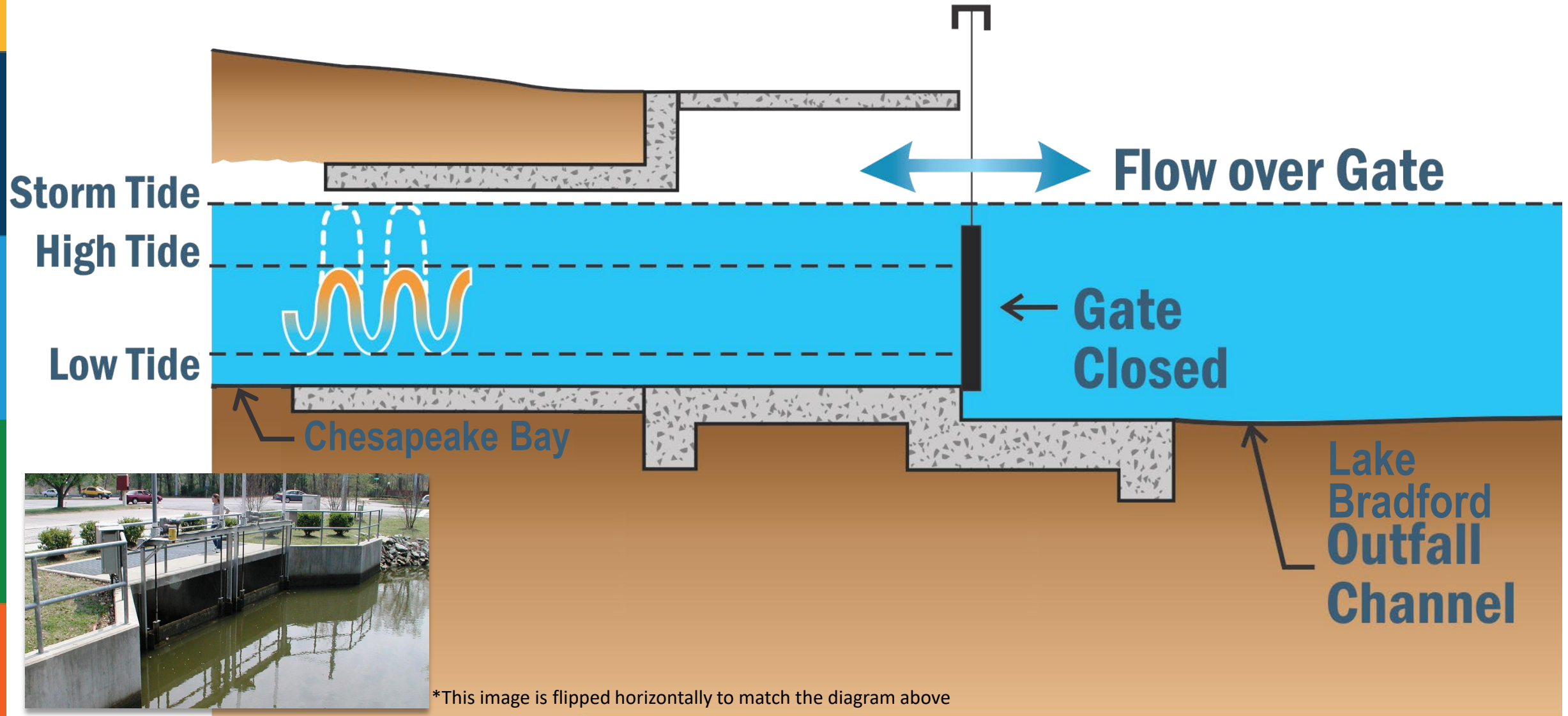


# DRAINAGE BASIN





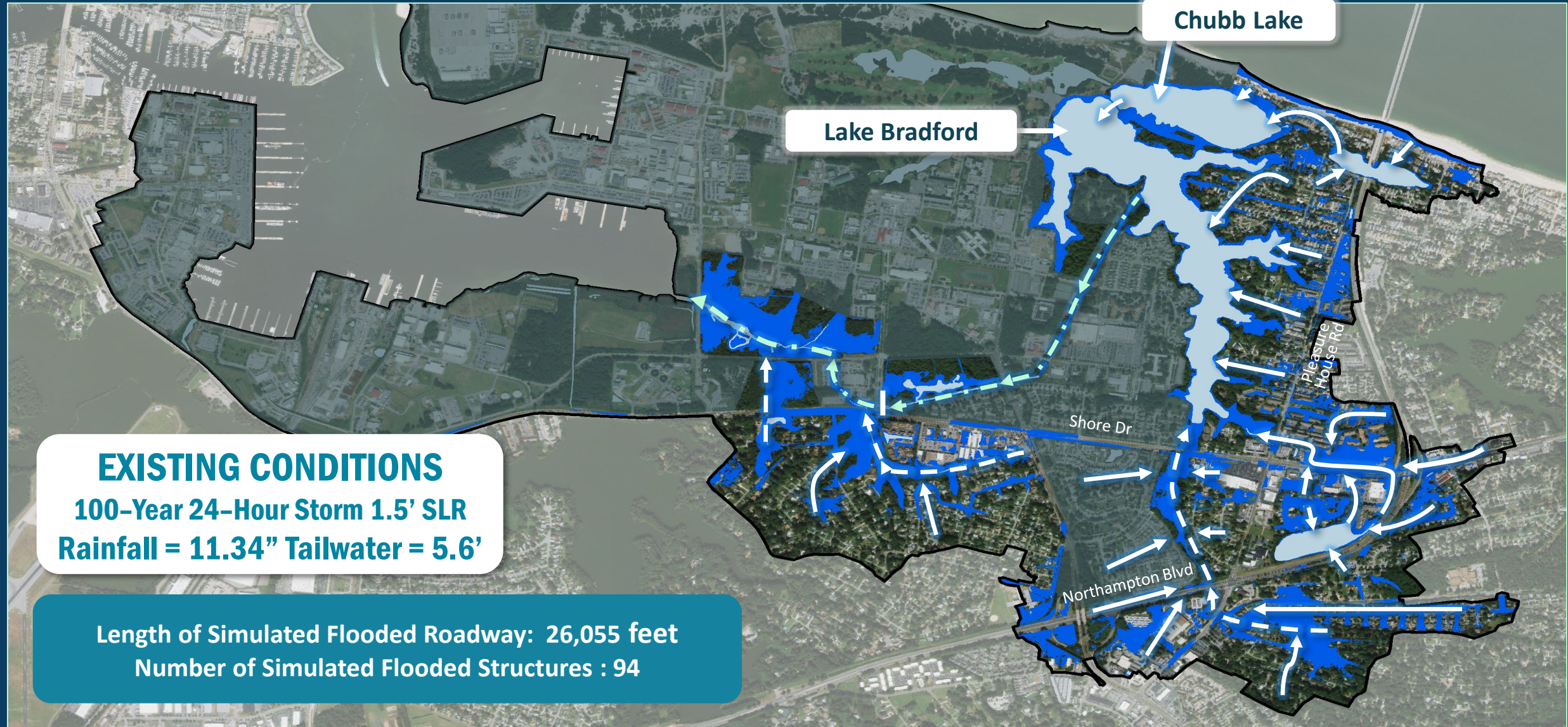
# EXISTING CONDITIONS (WEIR GATE – CLOSED)



\*This image is flipped horizontally to match the diagram above



# INTEGRATED SYSTEMATIC APPROACH





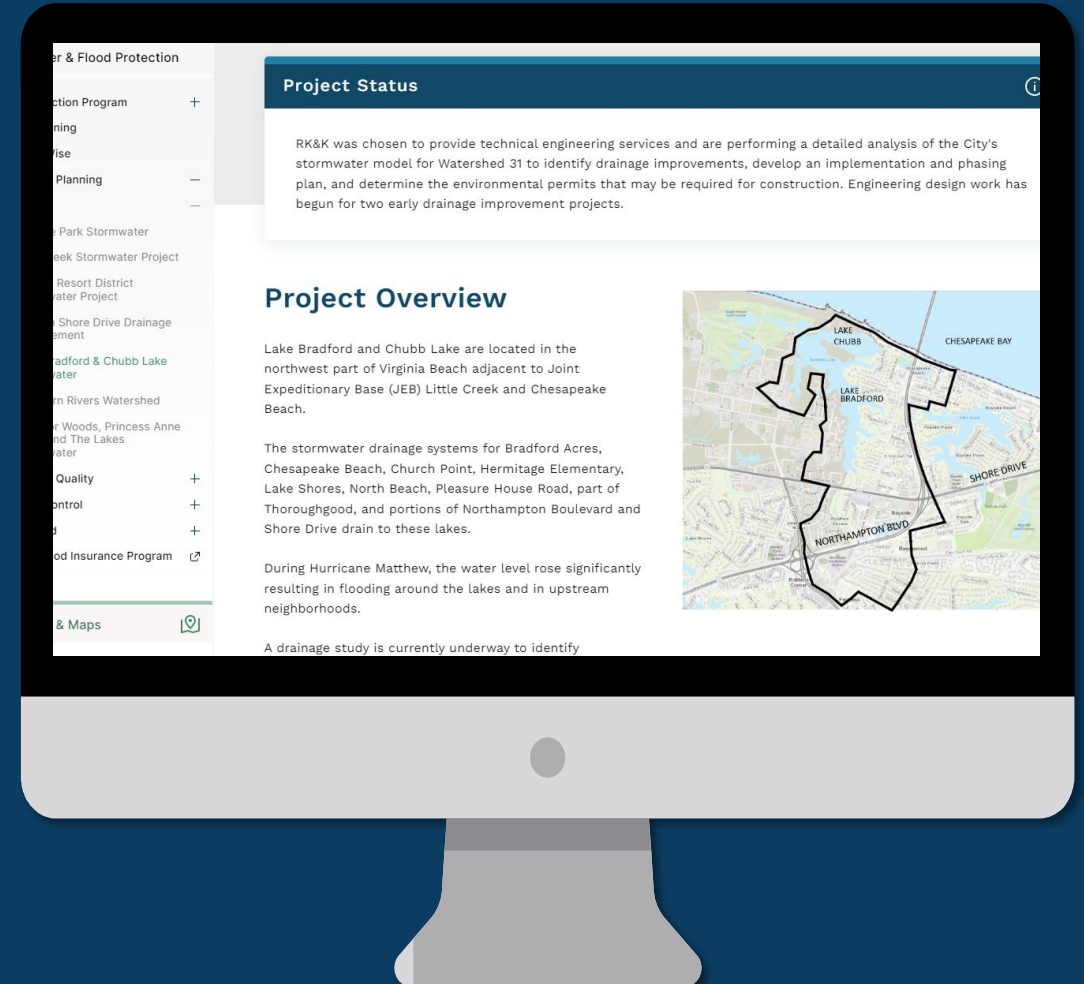
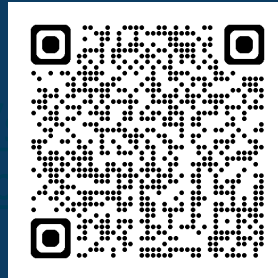
# PUBLIC INVOLVEMENT SUMMARY

- Preliminary Engineering Report Public Meetings
  - November 14, 2019
  - November 12, 2020
  - November 10, 2021
- Lake Bradford/Chubb Lake PS Public Meetings
  - November 1, 2023
    - Recording available on City of Va Beach YouTube Channel @AccessVirginiaBeach

## • Project Website

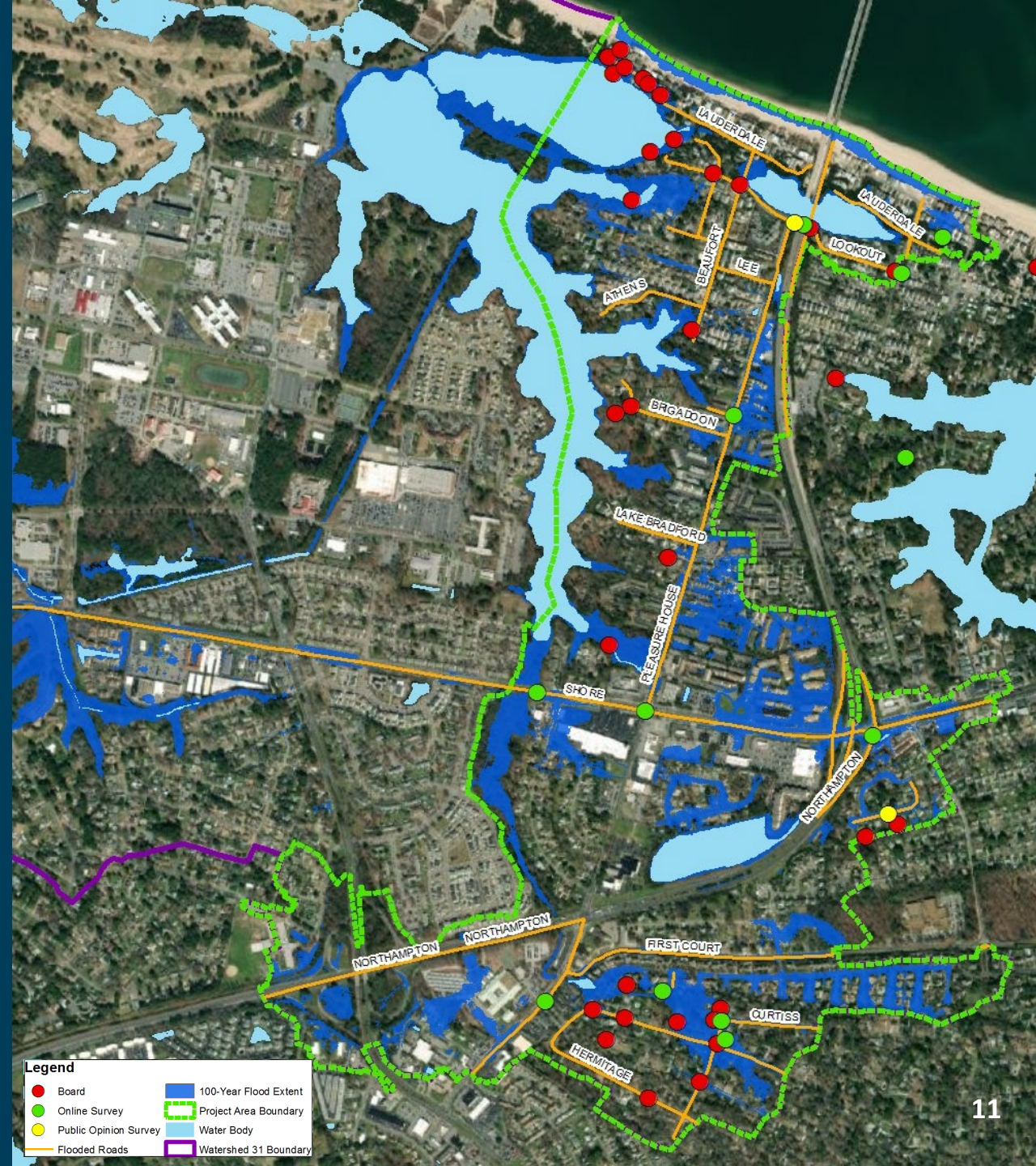
For More Information Visit:

[pw.virginiabeach.gov/stormwater/stormwater-planning/projects/lake-bradford-lake-chubb](https://pw.virginiabeach.gov/stormwater/stormwater-planning/projects/lake-bradford-lake-chubb)





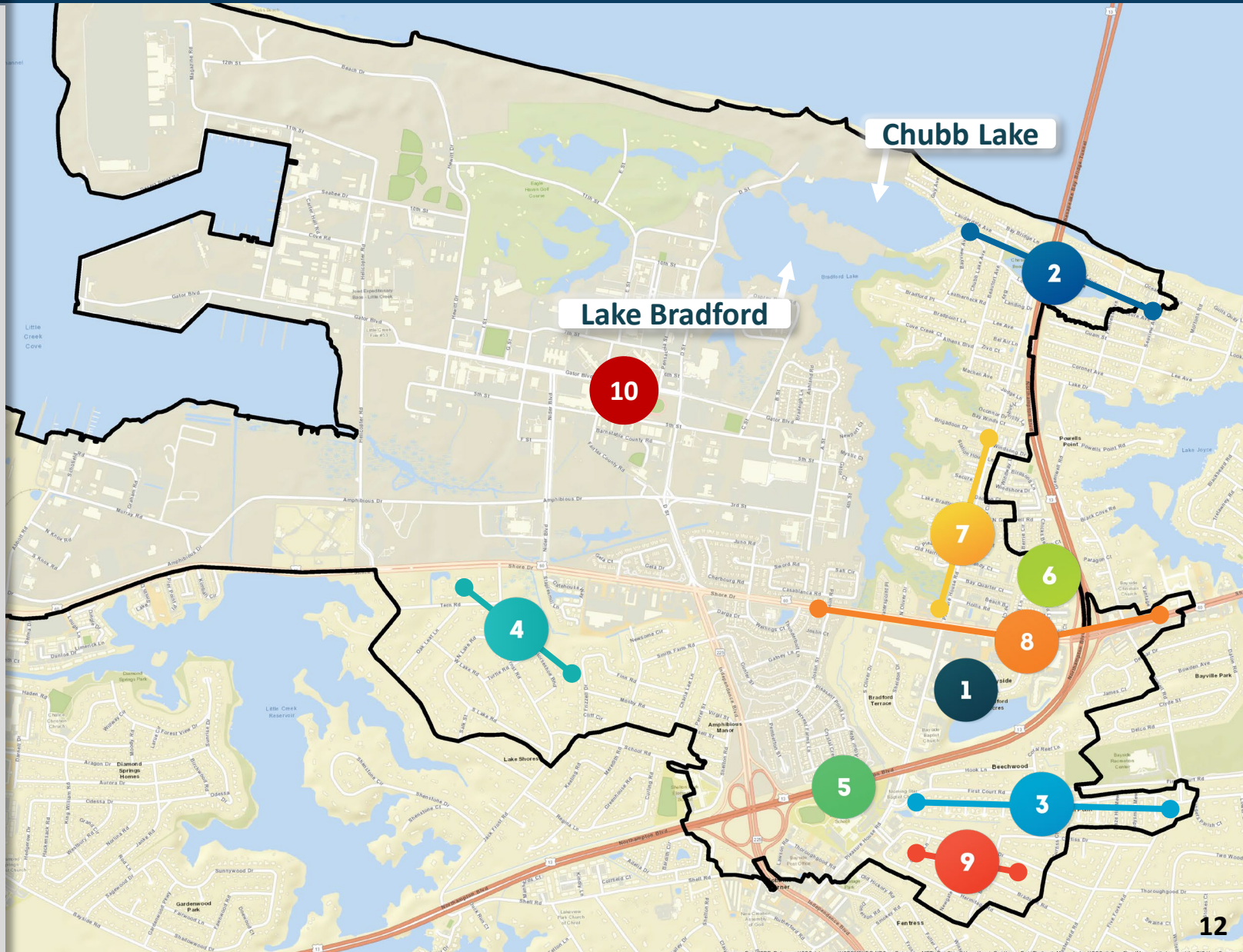
# November 14, 2019 Public Meeting Survey Results





# AREAS EXPERIENCING MAJOR FLOODING

- 1 BRADFORD ACRES
- 2 CHESAPEAKE BEACH
- 3 CHURCH POINT
- 4 LAKE SHORES
- 5 NORTHAMPTON BOULEVARD
- 6 NORTH BEACH
- 7 PLEASURE HOUSE ROAD
- 8 SHORE DRIVE
- 9 THOROUGHGOOD
- 10 JOINT EXPEDITIONARY BASE  
LITTLE CREEK

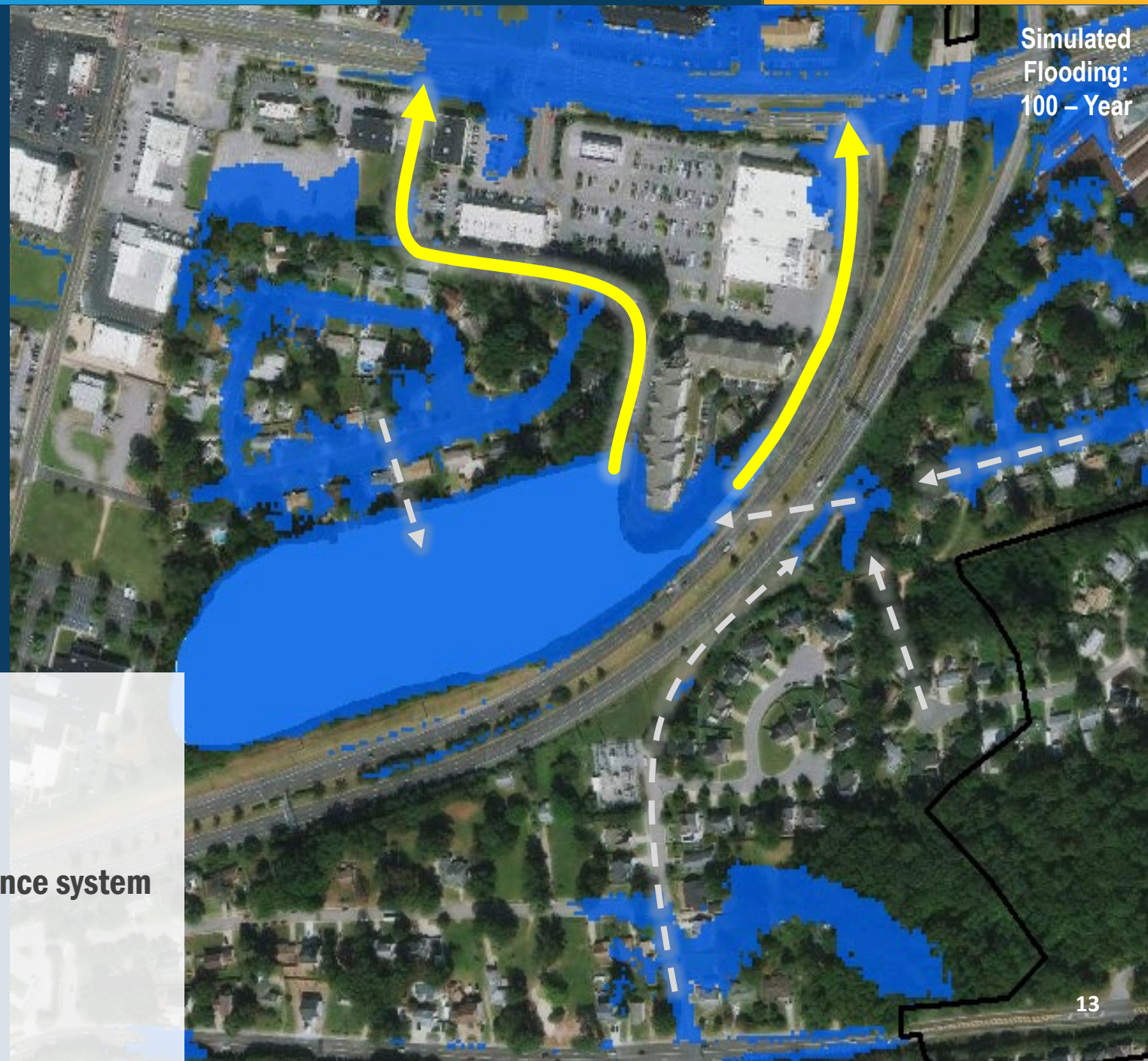




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## BRADFORD ACRES

- Impacted by flooding on Shore Drive
- Part of the Shore Drive / Hollis Road conveyance system
- Second Outfall through shopping center
- Primary & Secondary Outfall undersized







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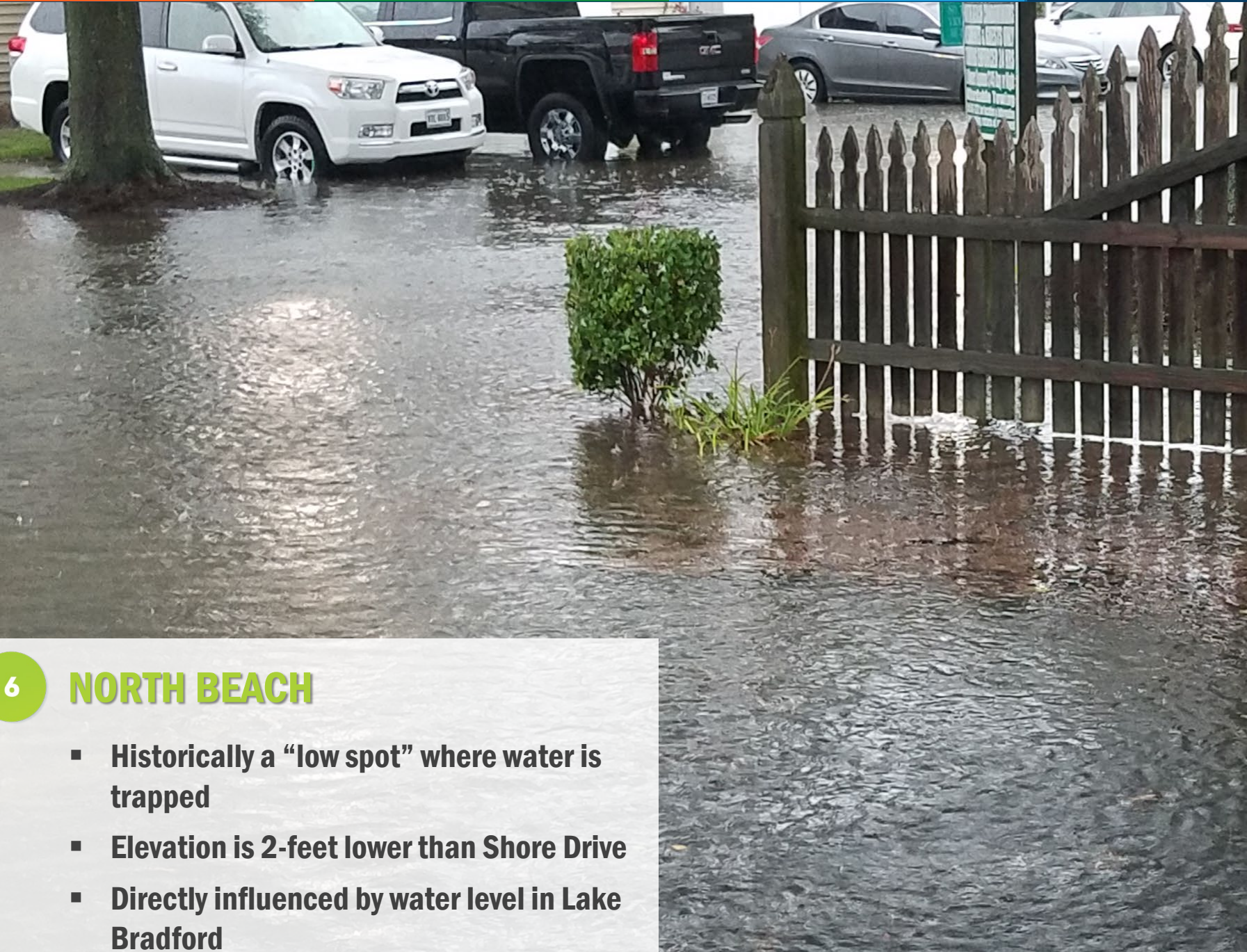
## CHESAPEAKE BEACH

- Low elevations of homes along Chubb Lake
- Minimal conveyance systems
- Lakes used for recreational purposes
- Duration of flooding

OCTOBER 9, 2016



AUGUST 7, 2019



6

## NORTH BEACH

- Historically a “low spot” where water is trapped
- Elevation is 2-feet lower than Shore Drive
- Directly influenced by water level in Lake Bradford





MAY 13, 2017

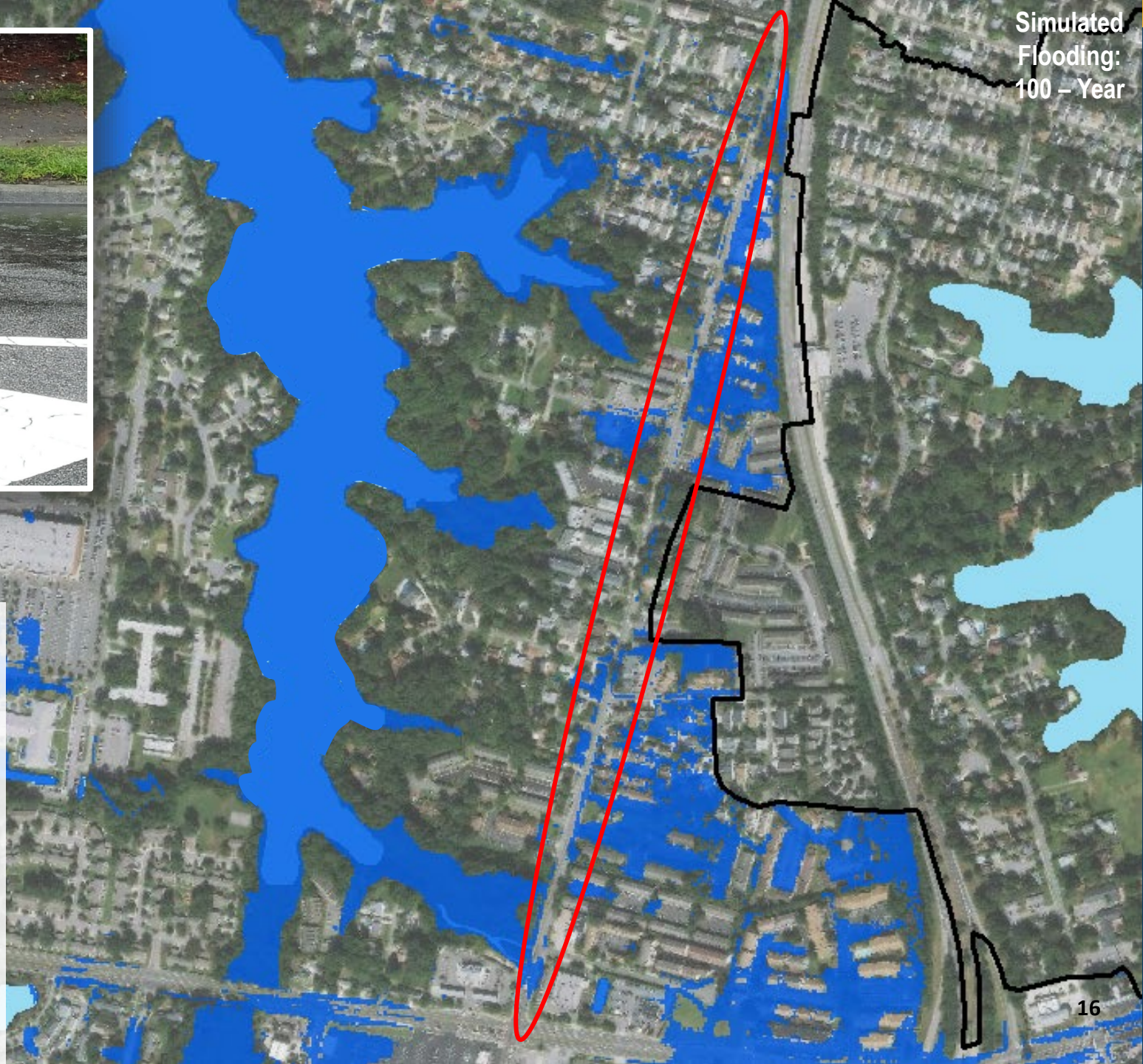


Simulated  
Flooding:  
100 – Year

7

## PLEASURE HOUSE ROAD

- Average Daily Traffic (ADT): 8,650
- Major outlet for the Chesapeake Beach neighborhood
- Provides access to numerous homes and businesses
- Low spot near Shore Drive
- Utility Conflicts





JULY 31, 2016



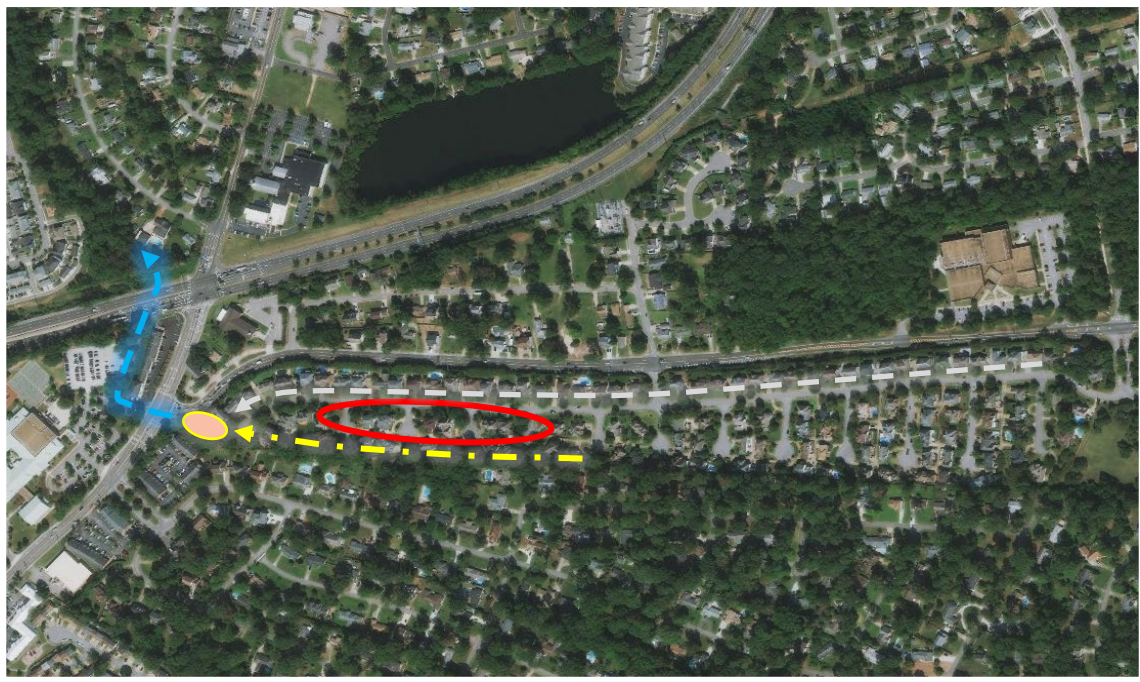
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## SHORE DRIVE

- Average Daily Traffic (ADT): 45,048
- Provides access to JEB Little Creek Fort Story
- Provides access to numerous homes and businesses
- Fire & EMS Station 4 – Chesapeake Beach
- Duration of flooding
- Utility conflicts







SEPTEMBER 2011

3

## CHURCH POINT

- Existing drainage system lacks capacity
- Cul-de-sacs are the lowest points in the neighborhood
- 107 acres drain to Church Point small pond (¼ acre)
- Undersized pipes at Pleasure House Road
- Historically a “low spot”



SEPTEMBER 2011



SEPTEMBER 2011

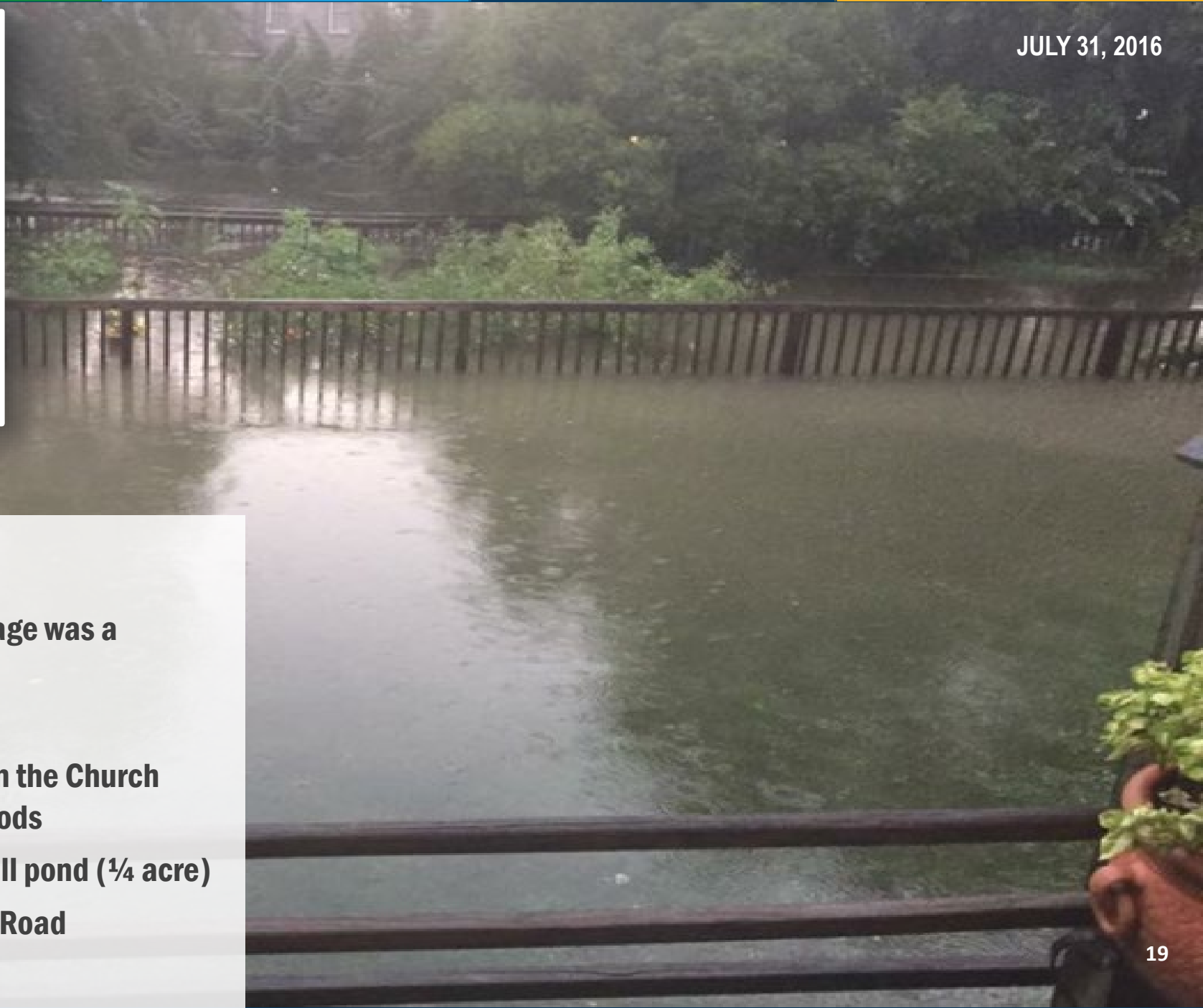
JULY 31, 2016



AUGUST 19, 2016



JULY 31, 2016



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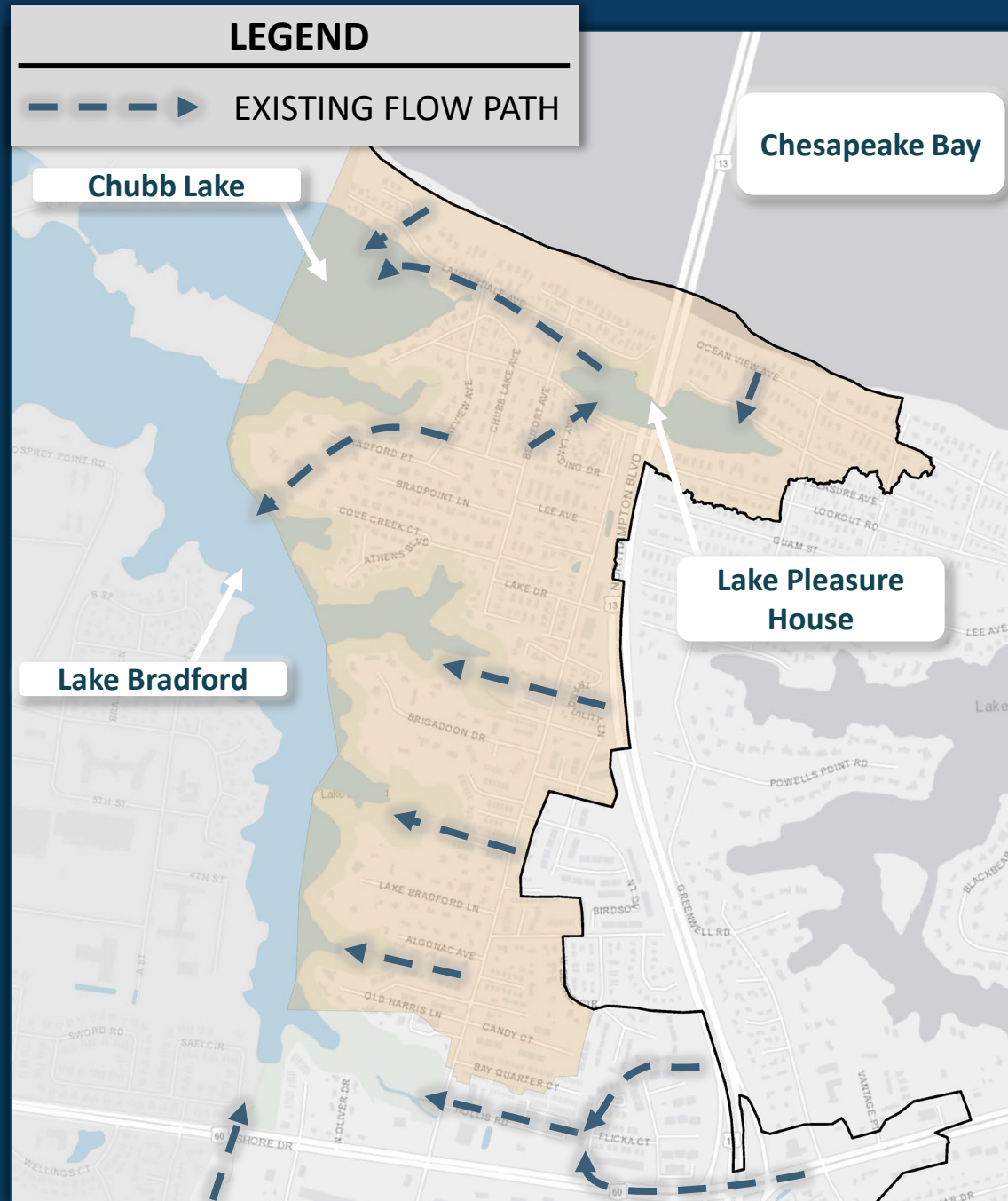
## THOROUGHGOOD

- Constructed before stormwater storage was a required design element
- Designed with no storage facility
- Outfalls to the existing ditch between the Church Point and Thoroughgood neighborhoods
- 107 acres drain to Church Point small pond ( $\frac{1}{4}$  acre)
- Undersized pipes at Pleasure House Road
- Historically a “low spot”



# Lake Bradford/Chubb Lake Pump Station and Outfall Project Background

# LAKE BRADFORD/CHUBB LAKE EXISTING CONDITIONS



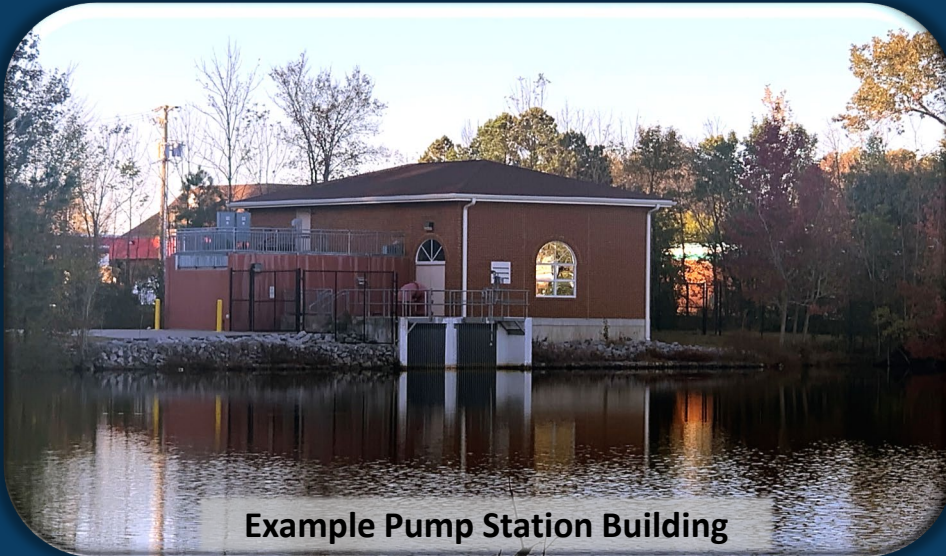
- LOW ELEVATIONS OF HOMES ALONG CHUBB LAKE
- SOME ROADWAYS, SUCH AS LAUDERDALE AVE AND PLEASURE HOSUE ROAD HAVE LOW ELEVATIONS
- PLEASURE HOUSE ROAD PROVIDES ACCESS TO NUMEROUS HOMES AND BUSINESSES



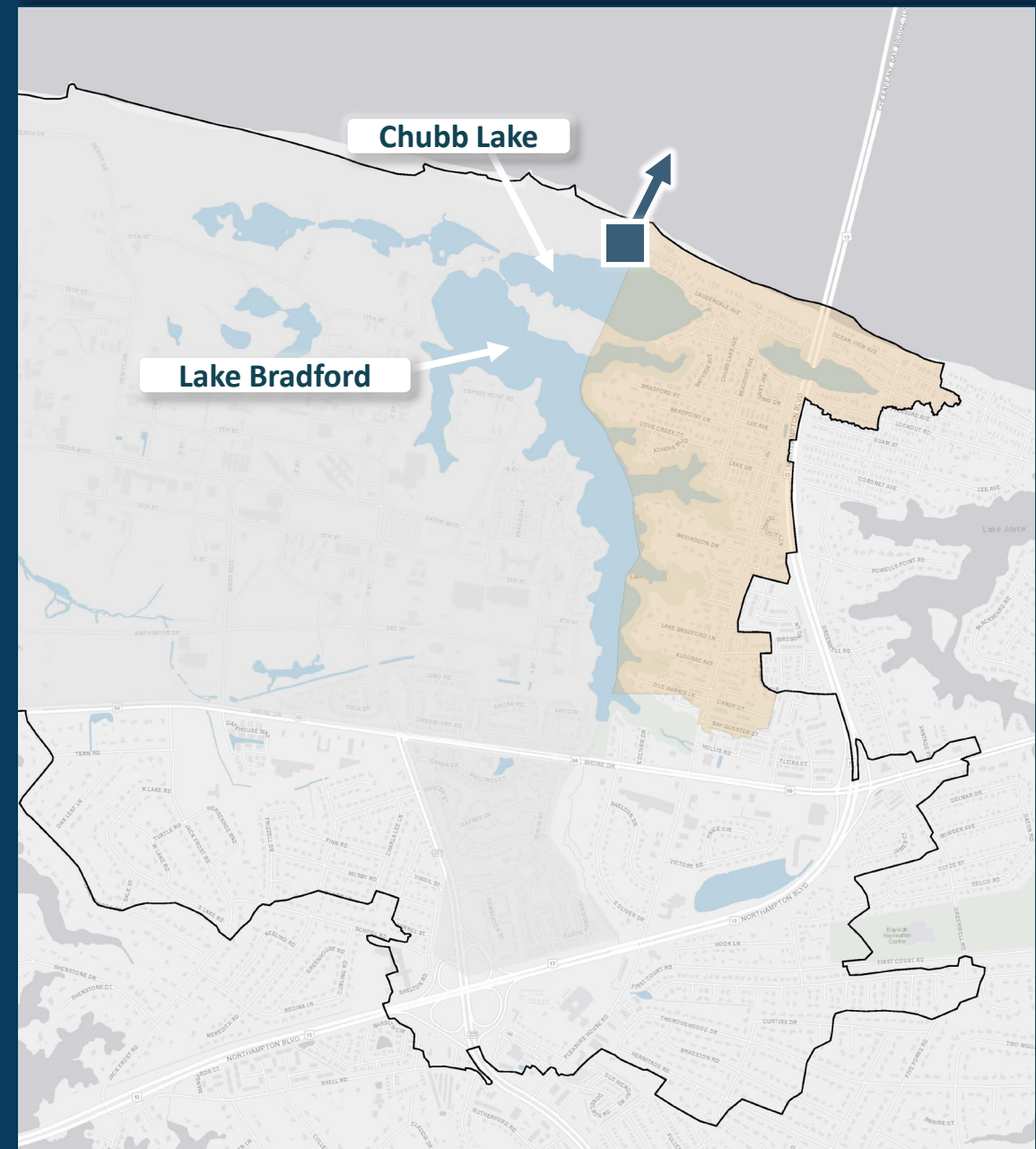
# RECOMMENDED SOLUTION LAKE BRADFORD / CHUBB LAKE

## PRELIMINARY ENGINEERING REPORT RECOMMENDED SOLUTION

- STORMWATER PUMP STATION ON CHUBB LAKE
- DISCHARGE OUTFALL TO THE CHESAPEAKE BAY
- STORMWATER PUMP STATION MUST BE OPERATIONAL BEFORE OTHER UPSTREAM PROJECT CAN BE IMPLEMENTED



Example Pump Station Building

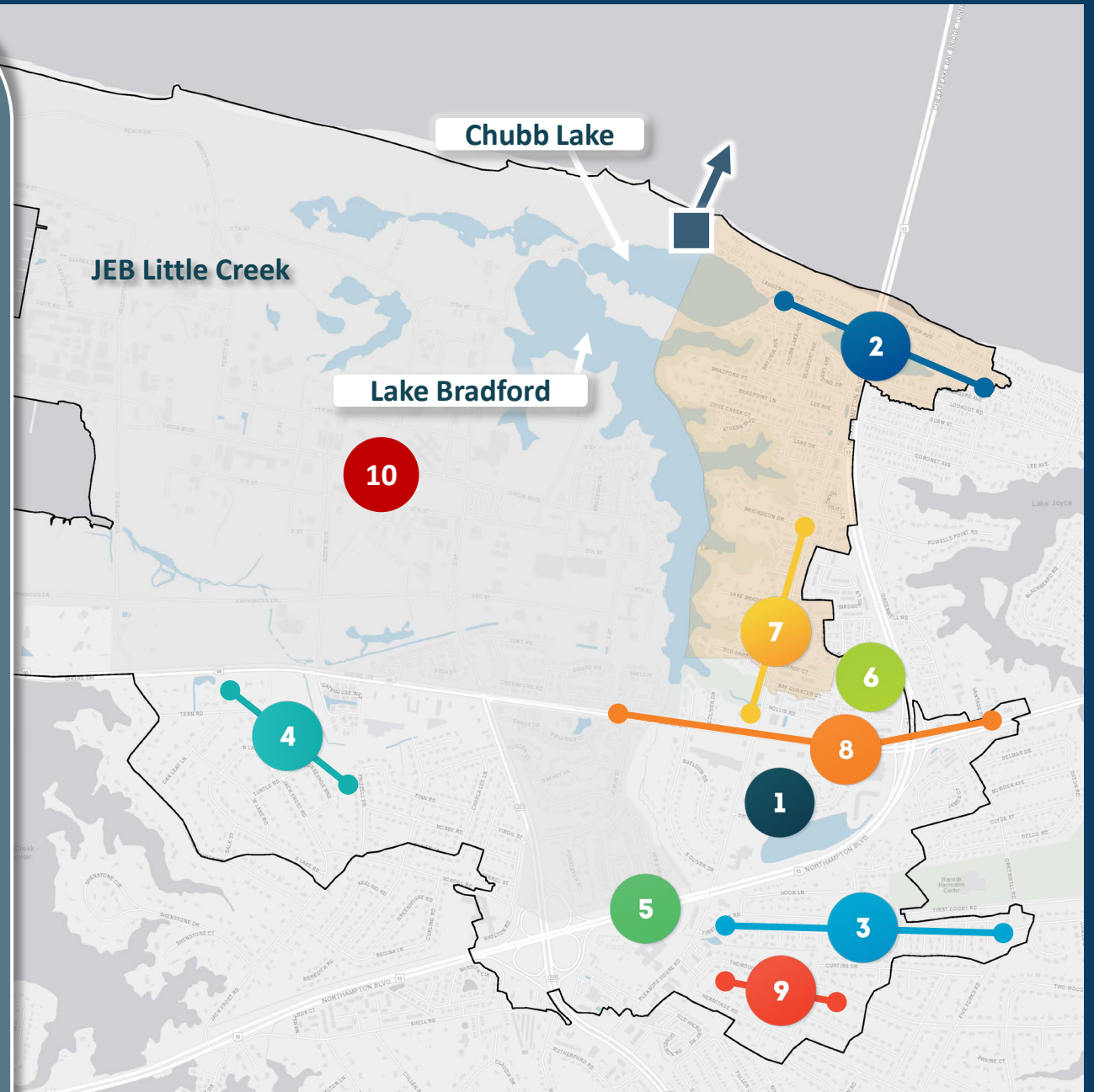




# LAKE BRADFORD / CHUBB LAKE PUMP STATION AND OUTFALL

## AREAS BENEFITED

- 1 BRADFORD ACRES
- 2 CHESAPEAKE BEACH
- 3 CHURCH POINT
- 4 LAKE SHORES
- 5 NORTHAMPTON BOULEVARD
- 6 NORTH BEACH
- 7 PLEASURE HOUSE ROAD
- 8 SHORE DRIVE
- 9 THOROUGHGOOD
- 10 JOINT EXPEDITIONARY BASE  
LITTLE CREEK



# LAKE BRADFORD / CHUBB LAKE STORMWATER PUMP STATION AND OUTFALL

- 375 cfs stormwater pump station located along Chubb Lake
- Discharge outfall to Chesapeake Bay
- Tide control structure located at the upstream end of the existing outfall channel
- Design-Build Notice to Proceed Phase 1 Design: June 2025  
Construction: 2027-2030
- Total Estimated Project Cost: \$102.4M



Example Pump  
Station Building



# CANDIDATE SITE LOCATIONS



# PUMP STATION LOCATION - SITE COMPARISON

Alternative	Advantage	Disadvantage
Candidate Site 1 – JEB LC – Lake Bradford North	<ul style="list-style-type: none"> <li>Least site/roadway upgrades required</li> <li>Least utility improvements</li> </ul>	<ul style="list-style-type: none"> <li>Parcel on JEB LC</li> <li>Access across flooded roads</li> <li>Longest force main length</li> <li>Long-term site access requires JEB LC access</li> <li>Restricted access affected by JEB LC security status</li> <li>Requires utility agreements with JEB LC</li> <li>High cost</li> <li><b>Dune and tree impacts</b></li> </ul>
Candidate Site 2 – JEB LC – Lake Bradford South	<ul style="list-style-type: none"> <li>Shorter discharge force main length than Site 1</li> <li>Lower cost than Site 1</li> <li>Least utility improvements</li> </ul>	<ul style="list-style-type: none"> <li>Parcel on JEB LC</li> <li>Adjacent to JEB LC firing ranges</li> <li>Access across flooded roads</li> <li>Long-term site access requires JEB LC access</li> <li>Restricted access affected by JEB LC security status</li> <li>Requires utility agreements with JEB LC</li> <li><b>Dune and tree impacts</b></li> </ul>
Candidate Site 3 – Neighborhood	<ul style="list-style-type: none"> <li>Construction and maintenance access from public right-of-way</li> <li>Access to public and private utilities</li> <li>Least federal property impacts</li> </ul>	<ul style="list-style-type: none"> <li>Pump station adjacent to residential structures</li> <li>Purchase residential property</li> <li>Force main alignment would cross Lake Bradford and Chubb Lake to reach Chesapeake Bay outfall</li> <li>Large amount of utility coordination requirements</li> <li>Construction access through neighborhood</li> <li>Largest amount of roadway / temporary pavement access</li> <li>High cost</li> <li><b>Dune and tree impacts</b></li> </ul>
Candidate Site 4 – JEB LC – Chubb Lake	<ul style="list-style-type: none"> <li>Shortest discharge force main length</li> <li>Potential reduction in force main size and pump horsepower</li> <li>Separation from JEB LC firing ranges Danger Area Limits</li> <li>Construction and maintenance access from public right-of-way</li> <li>Access to public and private utilities</li> <li>Lowest cost</li> </ul>	<ul style="list-style-type: none"> <li>Parcel on JEB LC</li> <li>Pump station adjacent to residential structures</li> <li>Construction access through neighborhood</li> <li>Roadway / temporary pavement access</li> <li>Public and private utility coordination</li> <li><b>Dune and tree impacts</b></li> </ul>



# DISCHARGE LOCATION





# EXAMPLE INTAKE & DISCHARGE STRUCTURES

Example Discharge Structure



Example Discharge Structure



Intake Structure





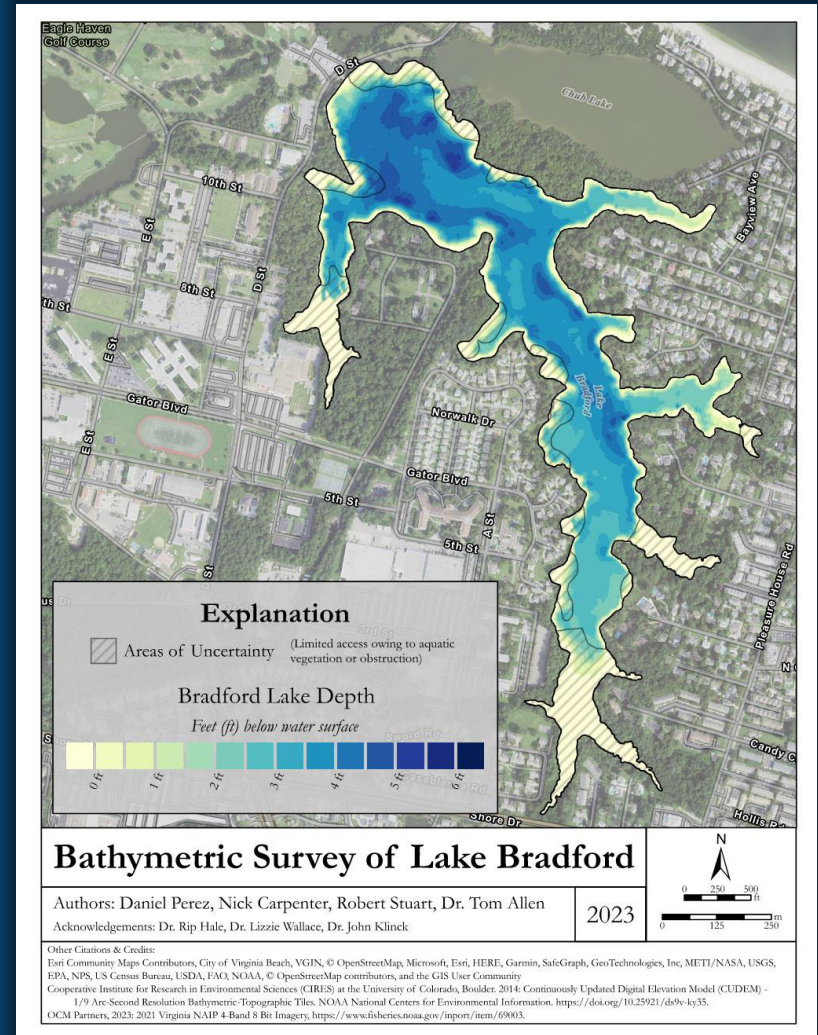
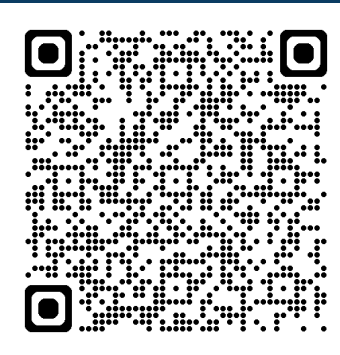
# PUMP STATION PERFORMANCE COMPARISON

	CURRENT PERFORMANCE (WEIR GATE)	PROPOSED PERFORMANCE (PUMP STATION)
NORMAL WATER ELEVATION BETWEEN	4.06' (NAVD88)   4.80' msl to 3.46' (NAVD88)   4.20' msl	4.50' (NAVD88)   5.24' msl to 4.00' (NAVD88)   4.74' msl
COASTAL STORM PREPARATION DRAWDOWN DURATION	~10 days	16 hours

# LAKE BRADFORD WATER QUALITY

- Old Dominion University Research Foundation evaluation in 2023 included:
  - Measuring the depth of the water
  - Measuring the depth of the accumulated lake sediment
  - Analyzing specific constituents in the sediment
  - Analyzing specific water quality parameters

Additional information can be found at:  
[pw.virginiabeach.gov/stormwater/stormwater-quality/projects/lake-bradford-great-neck-lake-monitoring](https://pw.virginiabeach.gov/stormwater/stormwater-quality/projects/lake-bradford-great-neck-lake-monitoring)





# LAKE BRADFORD BASELINE WATER QUALITY RESULTS

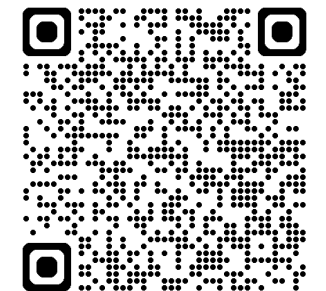
- Baseline water quality monitoring results (July 2023-Sept 2024)

## Monitoring Data Results

Lake	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Specific Conductivity (µs/cm)	pH Levels	Total Nitrogen (mg/L)	Total Phosphorus (ug/L)
Ranges for Urban Lakes*	Greater than 3	Less than 100	0-400 for freshwater	6.5-9	Less than 4	Less than 50
Bayville Lake	5.7-16.0	4-53	93-185	7.1-9.9	0-0.27	19-184
Chatham Hall Lake	1.0-15.4	8- 43	87-144	6.4-7.6	0-1.47	62-427
Great Neck Lake	3.2-14.8	3-63	37-140	6.2-8.9	0-0.41	19-605
Lake Conrad 2	3.6-13.7	0-60	33-102	6.0-8.6	0-1.00	19-300
Kemps Lake	6.5-15.1	8-32	425-4555	7.0-8.5	0-0.32	19-624
Lake Bradford	5.3-14.2	4-54	135-165	6.5-9.8	0-0.45	19-90

\* **Note:** Normal ranges in natural lakes referenced from [DataStream Monitor's Guide to Water Quality](#).

Additional information can be found at:  
[pw.viriniabeach.gov/stormwater/stormwater-quality/projects/lakes-water-quality-monitoring-study](http://pw.viriniabeach.gov/stormwater/stormwater-quality/projects/lakes-water-quality-monitoring-study)



# TREE REMOVAL MITIGATION

The City of Virginia Beach is committed to mitigating all trees that are removed for this project.

SITE

CHUBB LAKE





# Next Steps

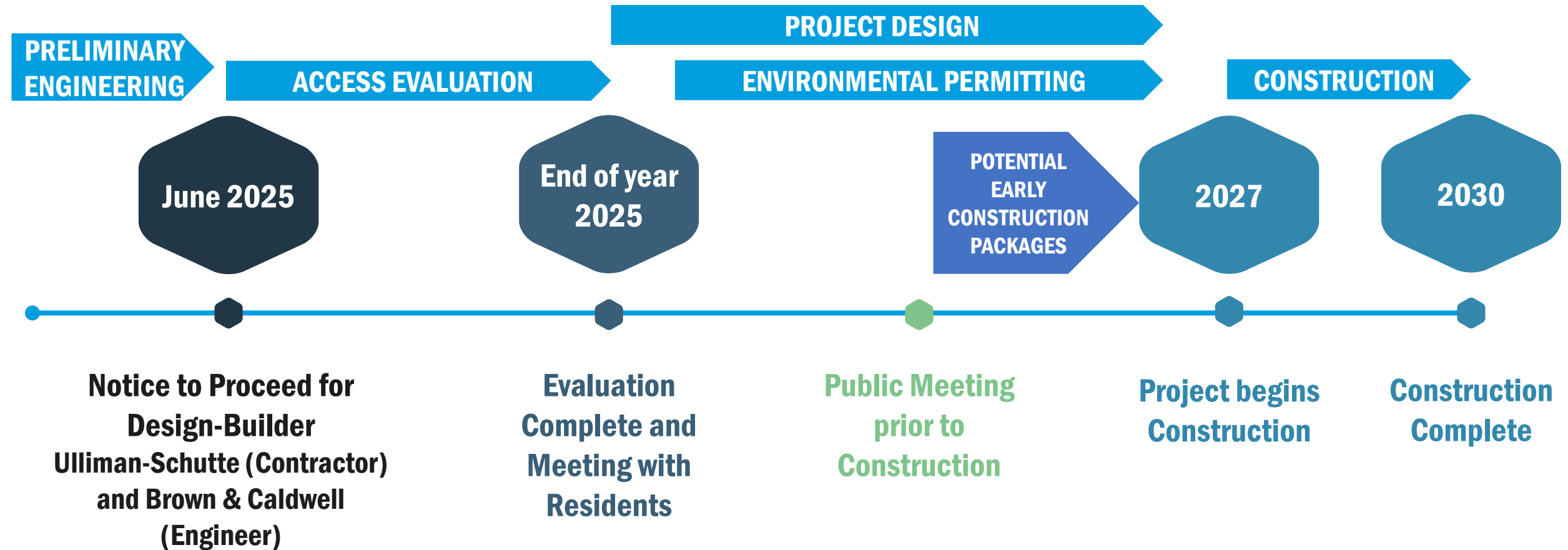
# ACCESS EVALUATION



- Access is required for construction as well as long-term maintenance and operations of the facility.
- Each route has various challenges.
- The first design effort will be to identify what would be required for each route.



# ESTIMATED PROJECT SCHEDULE



# ONLINE SERVICE REQUESTS VB311



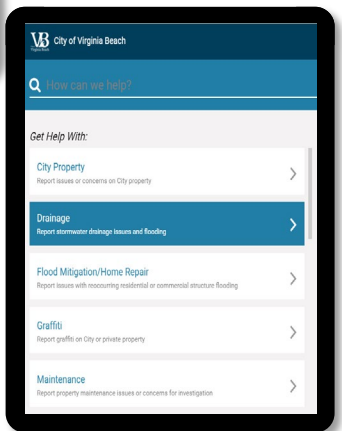
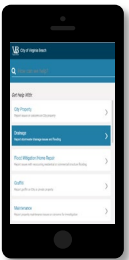
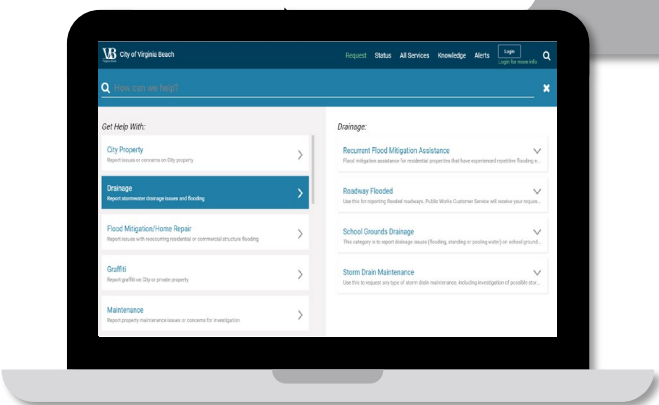
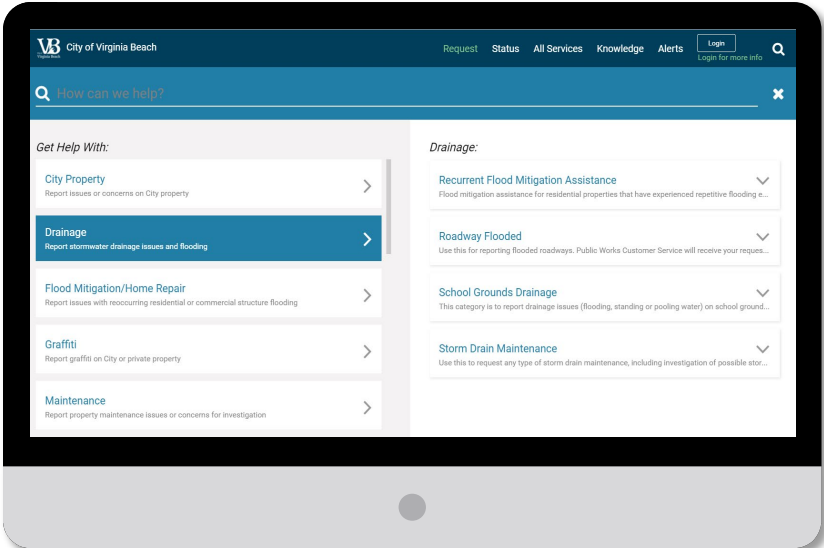
757-385-3111



SCAN ME!



[vb311.virginiabeach.gov](http://vb311.virginiabeach.gov)





# THANK YOU

Please send questions to the Lake Bradford-Chubb Lake Flood  
Protection Master Program email address  
[LakeBradford@vbgov.com](mailto:LakeBradford@vbgov.com)

If you have any pictures of flooding, please e-mail them to  
[stormpics@vbgov.com](mailto:stormpics@vbgov.com)

Please include the location, date and time the  
picture was taken.



For More Information Visit:

[pw.virginiabeach.gov/stormwater/stormwater-planning/projects/lake-bradford-lake-chubb](http://pw.virginiabeach.gov/stormwater/stormwater-planning/projects/lake-bradford-lake-chubb)



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