

Norfolk Flooding Strategy Update

Presentation to
Norfolk City Council
March 27, 2012

Presentation Overview

- The purpose of this presentation is to provide City Council an update on activities carried out under the City's **Flooding Strategy**
- **Items include:**
 - **Flooding Strategy Overview**
 - **Update on Mitigation Studies**
 - **Update on Legislative Initiatives**



Norfolk Flooding Strategy

- **Over the course of the past year, the City has undertaken a comprehensive approach to address precipitation and tidal flooding across the entire City.**
- **Realizing the magnitude by which we must address this issue, our work plan has evolved into a four-pronged strategy.**



Norfolk Flooding Strategy (Cont'd)

Plan

- City planning
- Study and analysis
- Modeling & simulation

Prepare

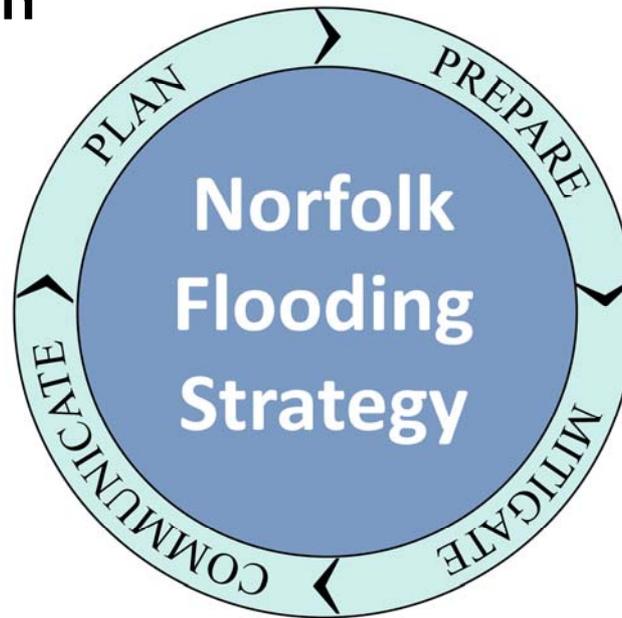
- Emergency Preparedness & Response
- Education & Training

Communicate

- Citizen outreach
- Partnerships
- Online resources

Mitigate

- Infrastructure development
- Flood remediation and mitigation



Plan

- **City Flood Prevention Committee**
 - Meets weekly
 - Cross collaboration amongst City departments
- **Long term tidal & precipitation flooding analysis**
 - Fugro & Moffat-Nichol Studies
- **Shoreline Protection analysis**
 - U.S. Army Corps – Willoughby & Ocean View study
- **Federal & State legislative initiatives**
- **Partnerships for information & Analysis**
- **Analysis and Revision of City Codes**



Prepare

- **National Incident Management System**
 - Certification of staff by FEMA
- **National Flood Insurance Program**
 - City participation to benefit residents
- **StormReady® Community**
 - National Weather Service approved
- **Community Emergency Response Team**
 - All Risk – All Hazard Training
- **Transportation Alternatives**
 - Evacuation strategies



Mitigate

- **Storm Water Infrastructure**
- **Shoreline Protection & Stabilization**
- **Property Acquisition**
- **Tidal Flooding Mitigation Projects**
- **FEMA Hazard Mitigation Grant Program**
 - Home elevations
- **National Flood Insurance Program**
 - Increased Cost of Compliance Participation



Communicate

- **Citizen Focus Group**
 - Civic League participation
- **Experts Advisory Committee**
 - US Army Corps, US Navy, VPA, HRSD, HRPDC, VIMS, ODU, NOAA, NASA
- **HRUBS Bill Inserts**
- **Council Updates**
- **Flooding Website**



Norfolk Flooding Website – April 2012



A to Z | Questions? | Staff

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Home | Department Home | Breadcrumb



IS MY HOME OR NEIGHBORHOOD IN A FLOOD ZONE?



FLOOD PRONE AREAS



FLOOD MITIGATION PROJECTS

CITY DEPARTMENTS

Select a Department

- STORM MAPS
- FLOODING Q & A
- REPORTS & STUDIES
- FLOODING TERMS
- WHAT THE CITY IS DOING
- HOMEOWNER'S ROLE
- RESOURCES/PARTNERS
- FLOOD INSURANCE
- HISTORICAL PHOTOS
- BROCHURES
- HELPFUL LINKS

FOLLOW US ON FACEBOOK & TWITTER



CURRENT TIDES



CURRENT WEATHER



FLOOD PREVENTION & MITIGATION

Welcome to the official website for information related to the City of Norfolk flood prevention and mitigation efforts. Living in Norfolk allows us to work and play in, on, under and around water all year long.

Norfolk's low elevation and its proximity to the Chesapeake Bay and several rivers make it susceptible to flooding. Nearly every year, and sometimes several times throughout the year during periods of heavy rain, hurricanes or nor'easter storms, residential and commercial properties are threatened with the potential of precipitation, tidal and wind-driven flooding and/or low-land flooding, particularly in neighborhoods around Norfolk's many waterways.

TYPICALLY NORFOLK EXPERIENCES THREE FLOODING TYPES

PRECIPITATION FLOODING

Occurs when rain intensity exceeds capacity of our storm drain systems due to blockages or naturally depressed elevations.

TIDAL FLOODING

Is caused by tidal variations and is directly related to land elevation and proximity to coastline. Tidal flooding may occur on a regular basis due to normal moon cycles and is exacerbated by wind speeds and directions, sea level rise, and other types of flooding.

STORM FLOODING

Is caused by storm surges resulting from events such as hurricanes and nor'easters and is directly related to land elevation and proximity to coastline. High tides magnify this storm damage.

CLICK HERE FOR MORE INFORMATION DURING SEVERE WEATHER EVENTS



FOR MORE INFORMATION, VISIT THESE WEBSITES



Storm-Wise Tips:

- Do not drive through standing water
- Be prepared. Visit ready.gov before a storm
- Have a Plan and Emergency Kit
- Make sure your gutters and downspouts are clean
- Maintain the grade around your house so that rainwater drains away from the foundation
- Consider installing a backup, battery-powered or water-powered sump pump

Water can leak into crawl spaces and/or basements through foundation cracks, pipe holes, vents, doors or windows. Use cement to fill cracks in the foundation, seal openings around pipes with cement or caulk; and seal the joint between siding and foundation with caulk.

Information on this site is as accurate as possible based on available data. The City of Norfolk is not responsible for any information posted on linked partner sites.

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810 Union Street, Norfolk, VA 23510 757-864-4100

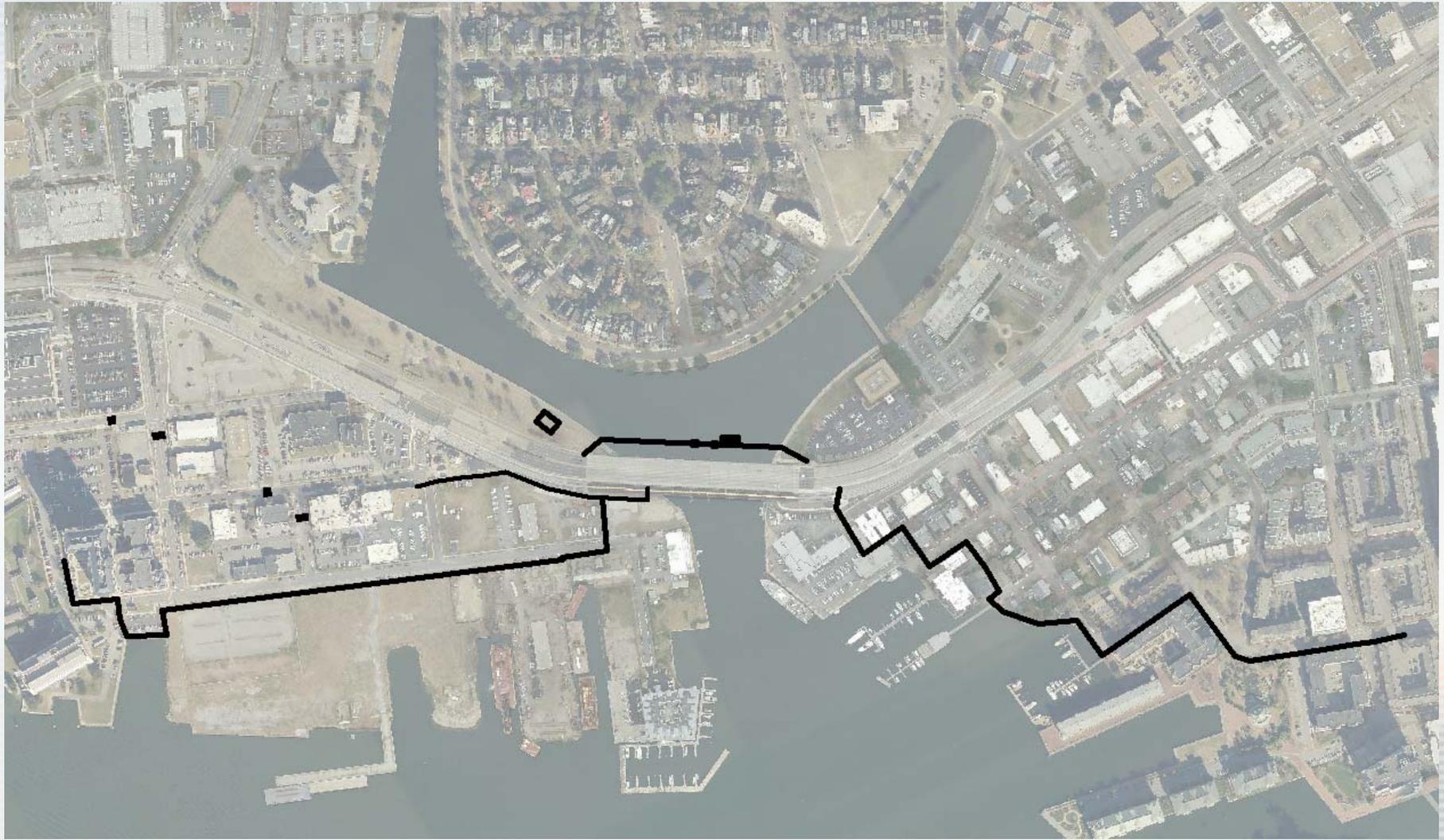
Update on Mitigation Studies

Fugro Study Final Recommendations

- Hague Floodwall – Preliminary Design Received
 - **Estimated Cost \$60M**
- Pretty Lake Floodwall – Preliminary Design Received
 - **Estimated Cost \$50M**
- Masons Creek – Pump Station – Preliminary Design to be completed in 2-3 Weeks
 - **Estimated Cost \$30M**
 - **Complimentary Water Quality Analysis.**
- Ohio Creek – Implementing Recommendations
- City Wide Review – Analysis of other areas of the City in Progress
 - **Tidal flooding**
 - **Rainfall Flooding**



The Hague – Project Recommendations



Pretty Lake – Project Recommendations



Mason Creek – Project Recommendations

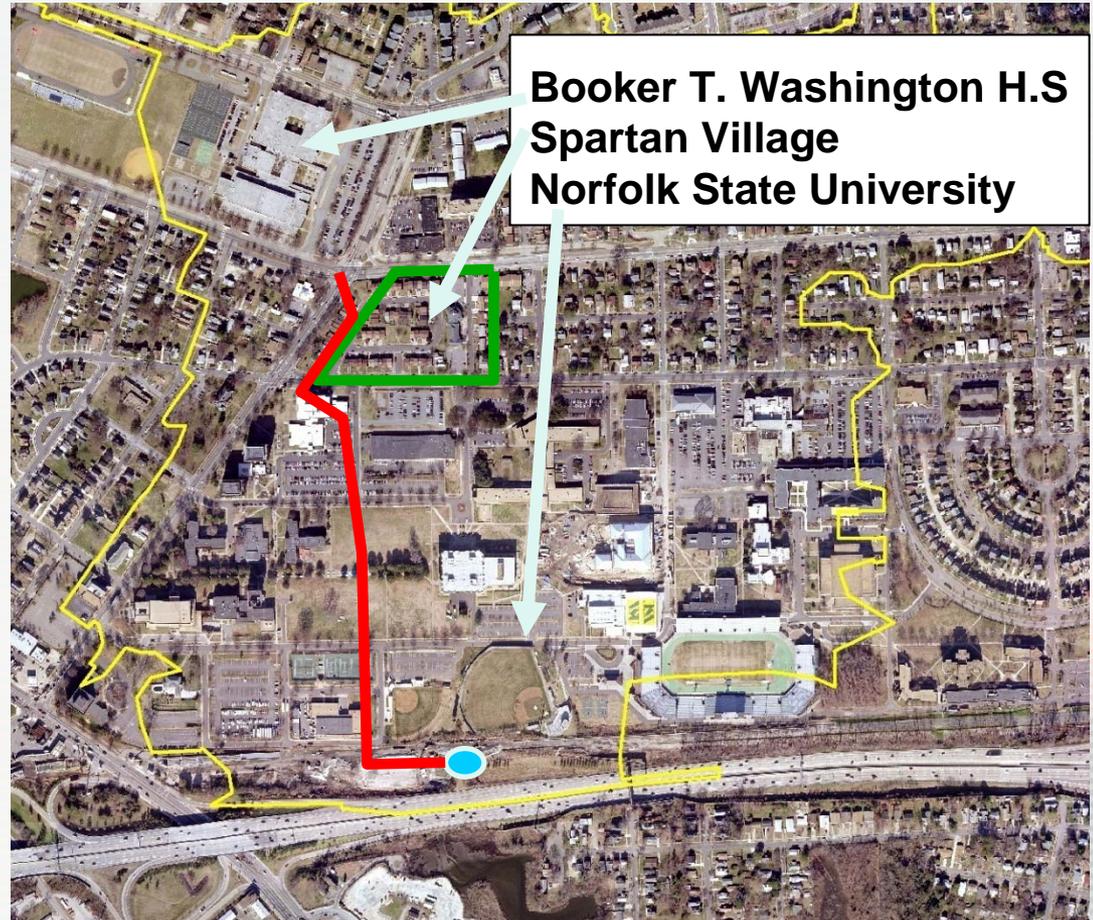
- **CAPITAL PROJECT** intended to protect against rainfall runoff (Area protected from Tidal Surge by Existing Tide Gate (operated by Navy) will require:
 - Pump station to **remove rainfall runoff when gate closed**
 - New Storm Culvert **beneath Navy**
- **OPTIONAL APPROACH**
 - Peripheral walls (or berms) **where land surface is low around Creek**
 - **Structure elevation**
 - **Future building requirements**



Ohio Creek: Project Recommendations

CAPITAL PROJECT Phased as Follows:

- **Phase 1** – Acquisition of most vulnerable properties in planning state
- **Phase 2** - Installation of new tidal gate planned for 2012 including capacity for small pump
- **Phase 3** – Expansion of existing box culvert or new culvert is proposed for future improvement



Next Steps for Mitigation Studies

- **Make project reports available to public**
- **Coordinate with Army Corps of Engineers and Congressional Delegation for inclusion of Fugro analysis in Federal studies**
- **Review environmental requirements**
- **Continue Citywide study and analysis of all watersheds**



Update on Legislative Initiatives

- **The City has undertaken a complete intergovernmental approach to seek assistance and collaboration with all levels of government including:**
 - **Federal Government**
 - Congress
 - Federal Agencies
 - **Commonwealth of Virginia**
 - General Assembly
 - State Agencies
 - Institutions
 - Universities
 - **Local Governments**



Federal Legislative Initiatives

- **The City initiated efforts to seek Federal assistance through our Congressional Delegation and the U.S. Army Corps of Engineers (USACE).**
- **The City coordinated a Citywide tour of flood prone area for Federal representatives.**
- **The City hosted community meetings with Representatives Rigell and Scott.**
- **In March 2012 the USACE proposed to reprogram \$100,000 of Section 205 funding to begin a Reconnaissance Study.**



Federal Legislative Initiatives (cont'd)

Next Steps

- **Seek Congressional Authorization & Funding to complete:**
 - Reconnaissance study – FY13
 - Feasibility study – FY14
 - Environmental Impact Statement – TBD
 - NEPA Coordination - TBD
 - Construction - TBD



State Legislative Initiatives

- **At the request of the City of Norfolk the General Assembly approved a joint resolution requesting the Virginia Institute of Marine Science to study strategies for adaptation to prevent recurrent flooding in Tidewater and the Eastern Shore Virginia localities.**
 - **The study will (i) review and develop a comprehensive list of ideas and examples of strategies used in similar settings around the United States and the world; (ii) convene a stakeholder advisory panel for the purpose of discussing and assessing the feasibility of employing these strategies in Tidewater and Eastern Shore; and (iii) offer specific recommendations for the detailed investigation of preferred options for adapting to relative sea-level rise.**



State Legislative Initiatives (cont'd)

Next Steps

- **Governor signs study resolution – March/April 2012**
- **W&M VIMS, in partnership with ODU, commence study in earnest in April 2012.**
- **W&M VIMS complete Study by January 2013.**
- **Request that the 2013 General Assembly create and appropriate funding for:**
 - **A state flood mitigation fund that Virginia Coastal and Shoreline Communities can subscribe to for assistance with federal match share.**



Summary

- **The City has a comprehensive strategy to address precipitation and tidal flooding.**
- **The City has established enhanced communication and collaboration efforts to increase awareness about our flood prone areas.**
- **The City has identified specific mitigation projects that will require significant public investment and intergovernmental coordination.**

