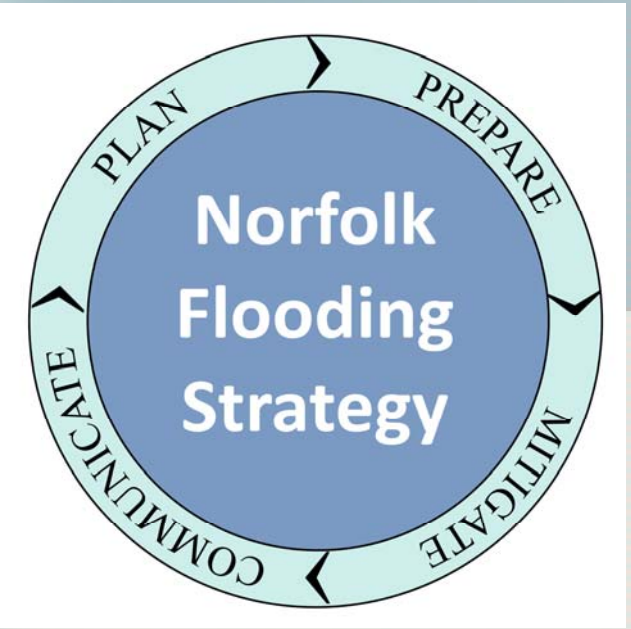


Norfolk Flooding Strategy Update

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.**

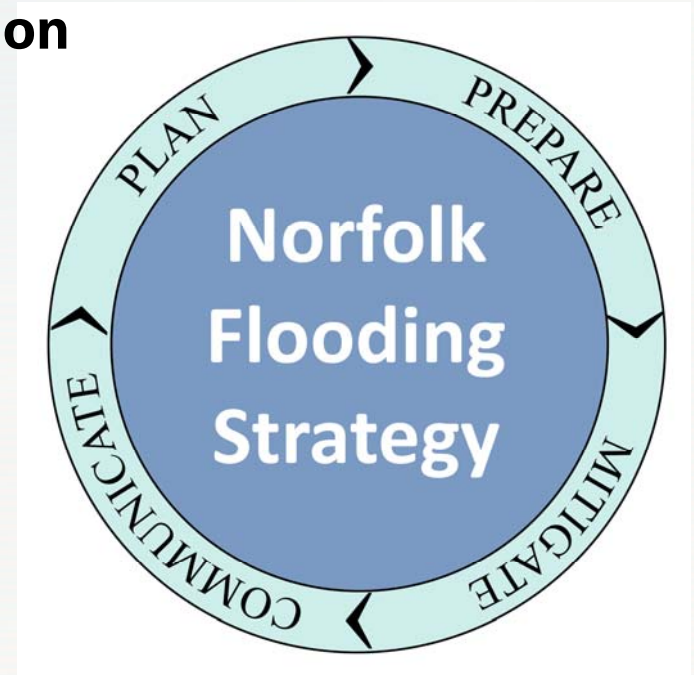
Norfolk Flooding Strategy (Cont'd)

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

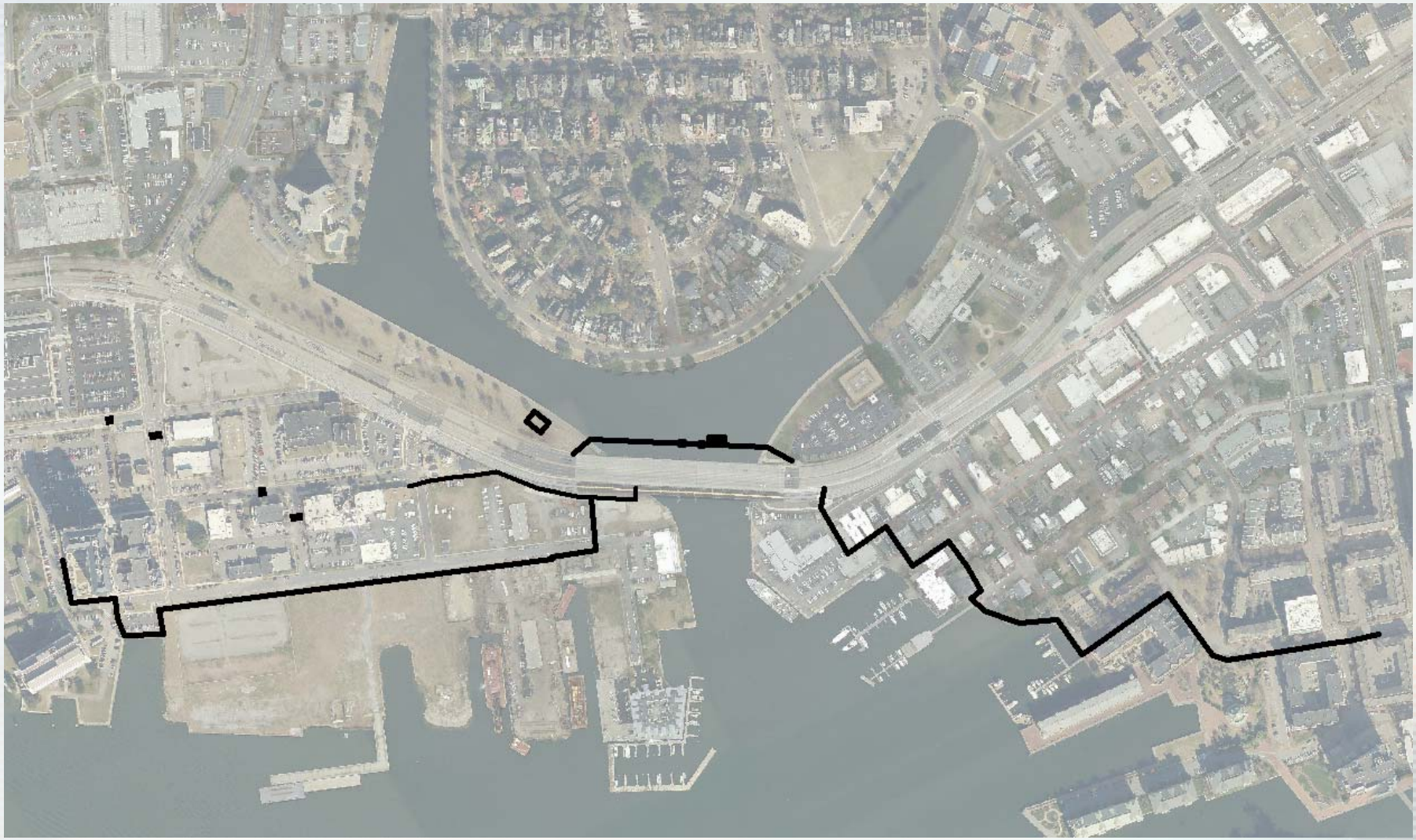
Norfolk Flooding Strategy

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

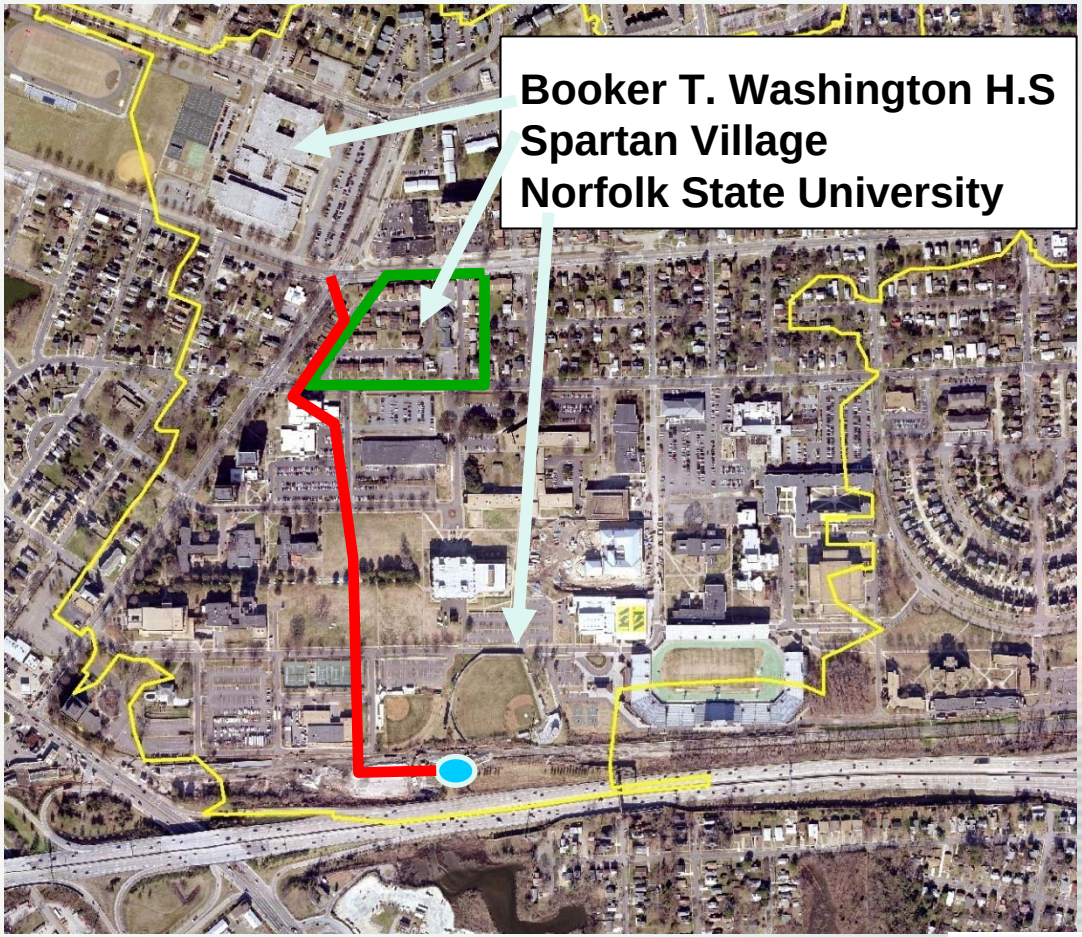
- **CAPITAL PROJECT intended to protect against rainfall runoff (Area protected from Tidal Surge by Existing Tide Gate (operated by Navy) will require:**
  - Pump station **to remove rainfall runoff when gate closed**
  - New Storm Culvert **beneath Navy**
- **OPTIONAL APPROACH**
  - Peripheral walls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

Norfolk Flooding Strategy

Ohio Creek: Project Recommendations

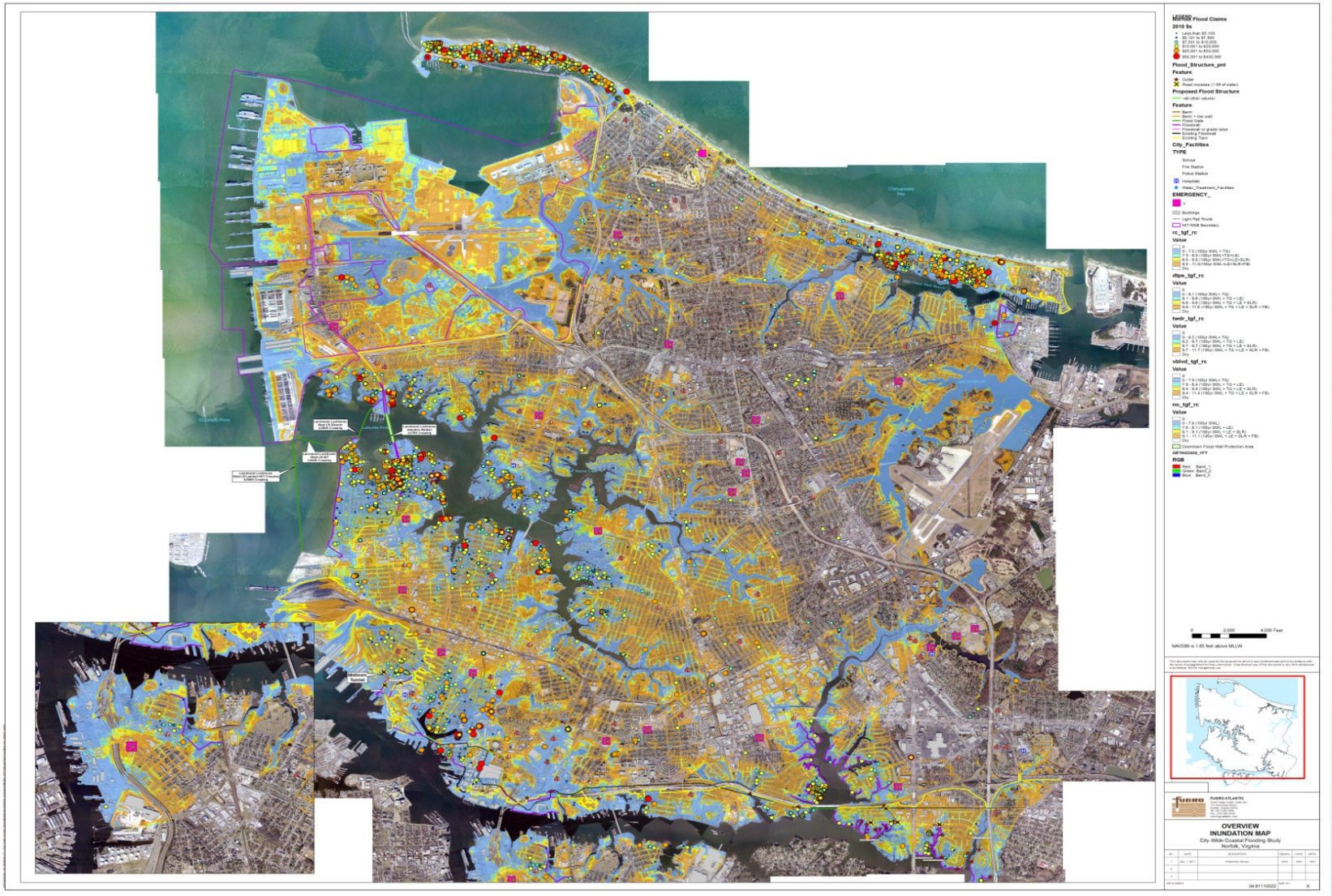
CAPITAL PROJECT Phased as Follows:

- **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**



Norfolk Flooding Strategy

Citywide Risk Analysis & Flood Mitigation



Norfolk Flooding Strategy

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.**