



Waterfront Flood Mitigation Parks and Recreation Department Meeting – September 23, 2021

Terry Suehr, PE, PMP, DBIA
Department of Project Implementation, Director

Matthew Landes, PLA, ISA
Department of Project Implementation, Division Chief / Waterfront Program Manager




Introductions

- City Staff
 - Terry Suehr – Director, Project Implementation
 - Matthew Landes – Project Manager, Project Implementation
 - Jack Browand – Recreation, Parks, and Cultural Activities
- Carollo Engineers – Owner's Advisor
 - Michael MacPhee, Jenna Manuszak, Sara Igielski

Meeting Agenda

- ✓ **Background:** Why are park spaces an opportunity for a modernized, more resilient Waterfront Project?
- ✓ **Big Picture Overview**
- ✓ **Key Benefits** of park space attenuation solutions
- ✓ **Cost Update**
- ✓ **Feedback Requested**
- ✓ **Lookahead**

Meeting Objectives

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- A yellow pencil with a pink eraser and a silver spiral binding is positioned vertically on the left side of a white spiral-bound notebook. The notebook is open, showing three lines of text, each preceded by a green checkmark.
- ✓ Share how we can incorporate underground storage into the Project without affecting the current programming and use of space, and potentially identify opportunities to enhance the user experience.
 - ✓ Demonstrate how bioretention in park spaces can change and enhance the current programming and use of space, and to understand what extent is acceptable.
 - ✓ Open and honest dialogue about potential elements and common benefits under consideration.



Can we add value to the project AND ensure flood mitigation?

MODERNIZE AND ADAPT

to today's best practices
and the storms of
tomorrow

ADD
SUSTAINABILITY
& RESILIENCY

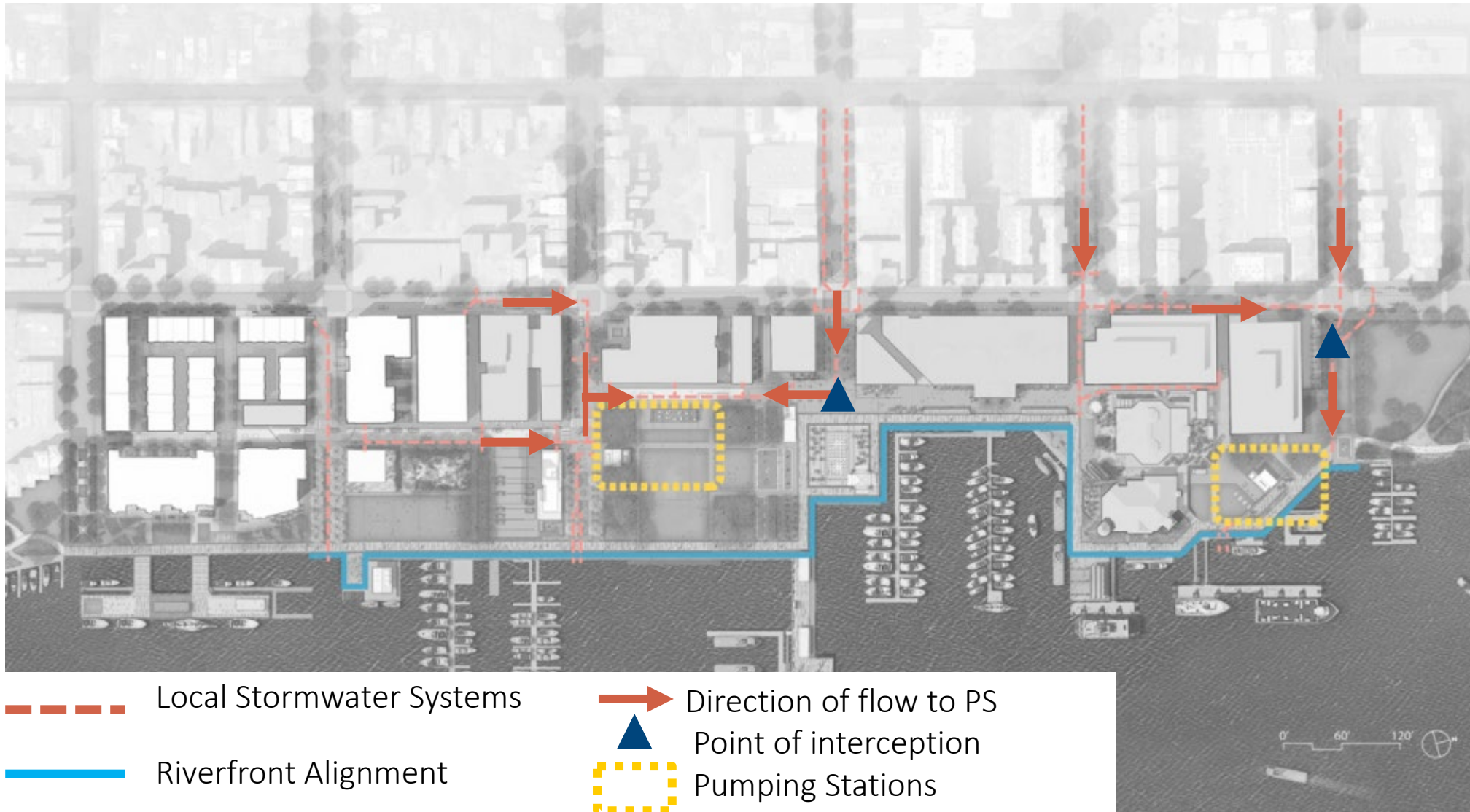
WITHOUT
ADDING COST



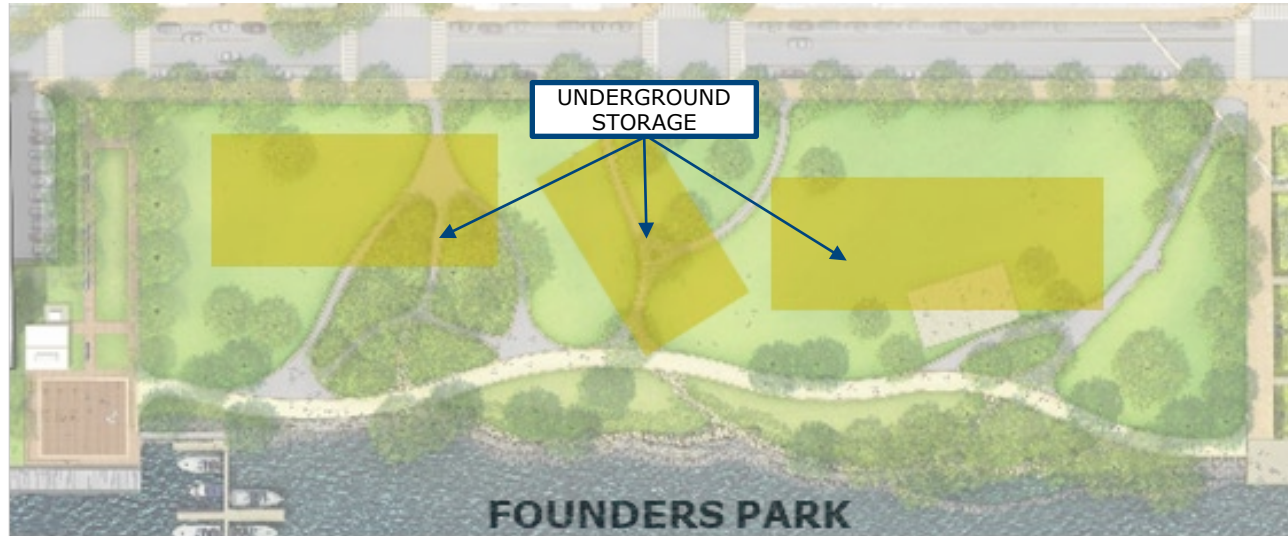
Understanding the improvements with a more sustainably-focused and resilient project

Criteria	Baseline	Added Sustainability/Resiliency
Flood Mitigation	Effectively eliminate “nuisance” flooding and mitigate all historical storms on record	
Climate Change	Considers increased peak rainfall intensity and sea level rise through project lifecycle	
Cost	Exceeds the City’s current CIP budget	
Resilient	Relies on grey infrastructure for immediate flooding response	Reduced reliance on grey infrastructure and incorporates passive, attenuation solutions for immediate flooding response
Water Quality Improvements	None	Solutions provide proven water quality benefits in accordance with VDEQ and to meet regulatory requirements

Park spaces are an opportunity to intercept and attenuate stormwater

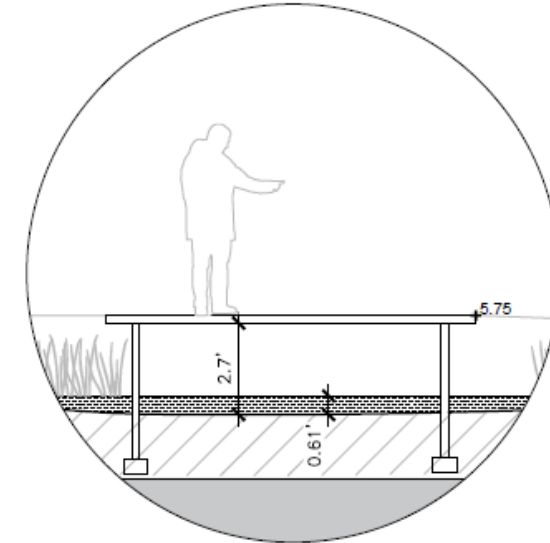
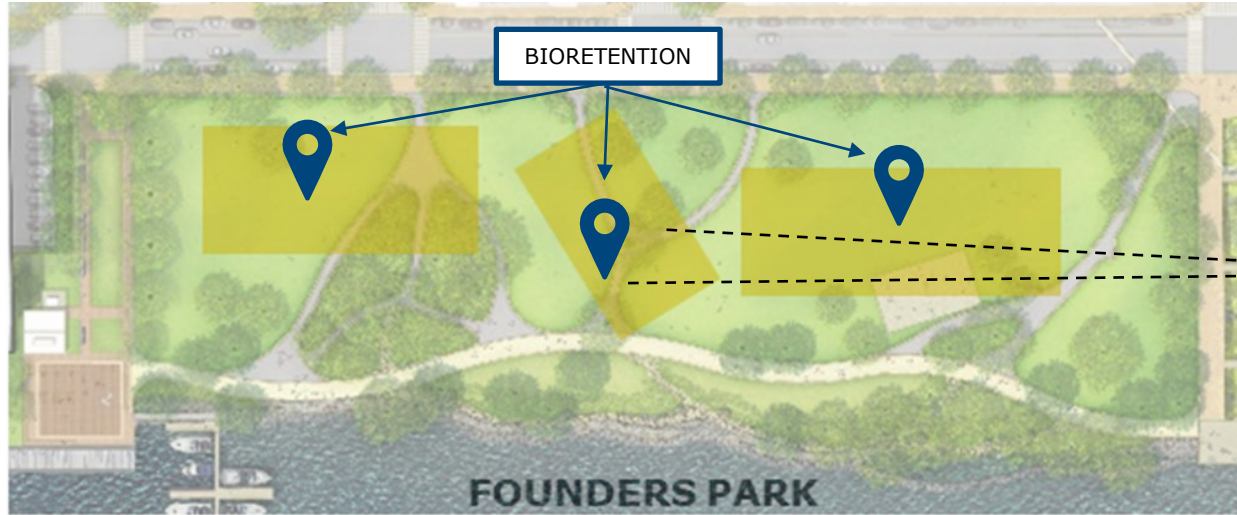


Underground stormwater chambers offer an opportunity to attenuate stormwater and restore park to existing condition

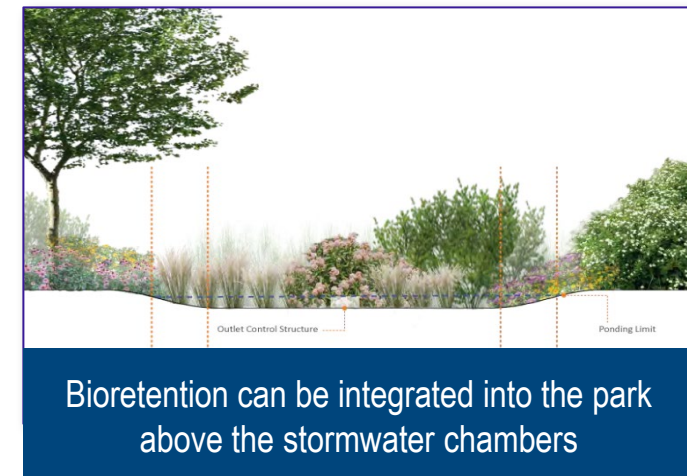


Sources:
<https://www.youtube.com/watch?v=-PZ9P2NyD44>
<https://www.triumphgeo.com/product/3-stormtech-treatment-systems/>

Bioretention can attenuate stormwater, offer educational programming, and provide water quality benefits



ELEVATED BOARDWALK AT BIORETENTION



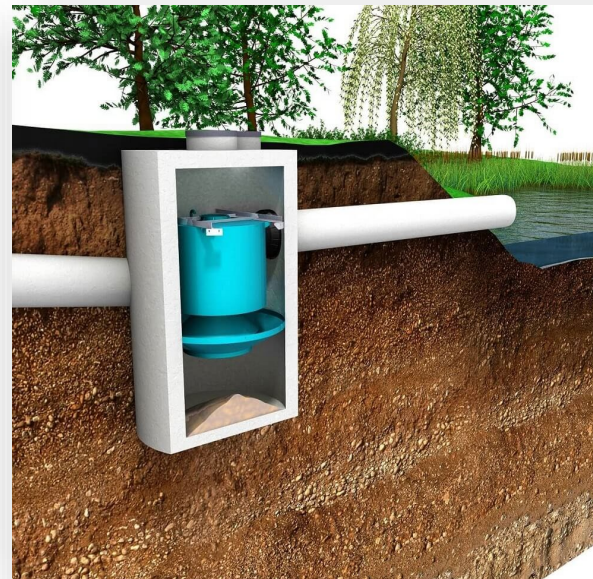
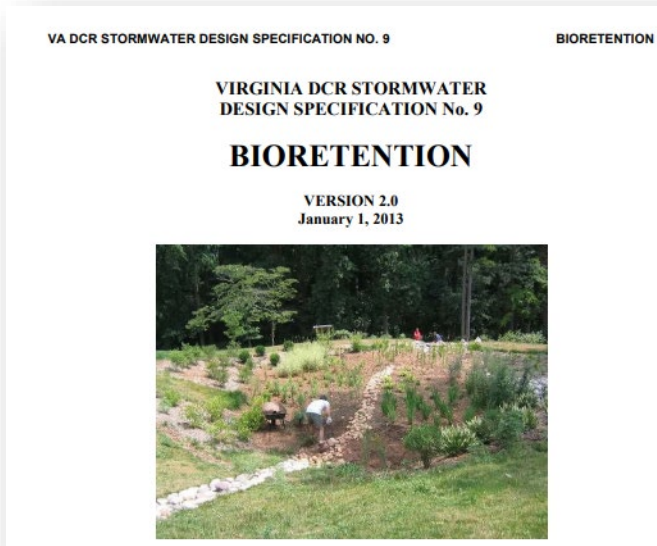
Bioretention can be integrated into the park above the stormwater chambers

New solutions in park spaces support: Eco-City Alexandria, Green Building Policy, Environmental Action Plan 2040, and VDEQ Regulatory Compliance

Water Resources

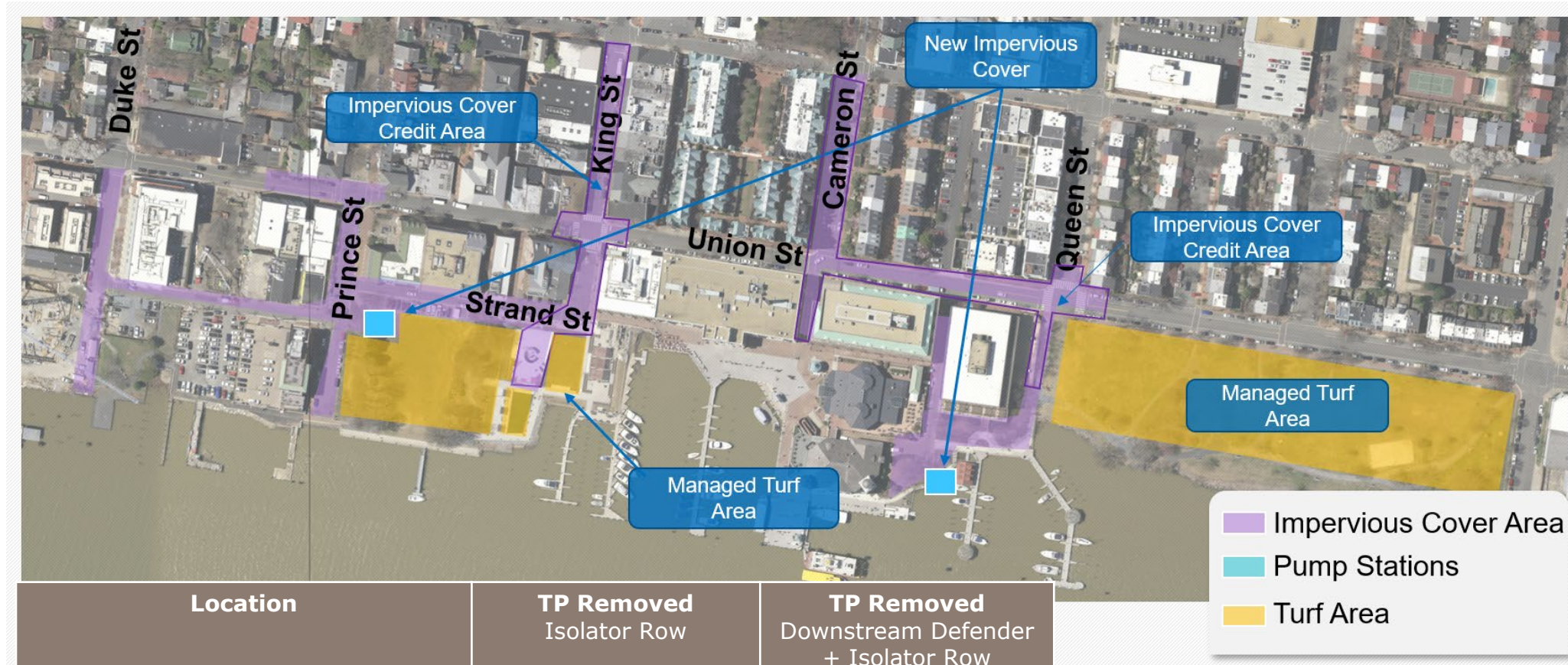
Reduce stormwater phosphorus concentrations

- Chambers with an Isolator Row are proven to **remove total phosphorus by 40%**
- Opportunity to comply with water quality regulatory requirements without the purchase of credits



- VA DEQ has approved these solutions for stormwater pollutant removal and water quality improvements
1. Bioretention
 2. Downstream Defender, a hydrodynamic separator
 3. Isolator Row, a pretreatment for the StormTech Stormwater Chambers

Preliminary calculations suggest that supporting technologies for chambers can help us meet and **exceed** water quality goals



Location	TP Removed Isolator Row	TP Removed Downstream Defender + Isolator Row
King St Drainage (PS1)	0.8 lb/yr	1.1
Queen St Drainage (PS2)	1.9 lb/yr	2.5
Total TP Removed	2.7 lb/yr	3.6 lb/yr
Regulatory Requirement	3.3 lb/yr	

WQ = water quality
TP = total phosphorus
lb/yr = pounds per year

Increasing our stormwater storage capacity is an investment in more resilient infrastructure

- **Less reliance on pumping** at peak times with a more flexible operating schedule
 - Mechanical equipment and moving components always vulnerable for failure
 - Minimize potential failure mechanisms and number of failure points
- Pumping at lower rate for a longer duration **reduces peak energy demand**
- Stormwater chambers are **more sustainable and resilient measures for reducing risk and increasing reliability**
 - For example, the Founders Park stormwater chambers fill by gravity (storing the entire volume from design storm) and attenuate the peak flow such that the northern Pump Station (No. 2 in Thompsons Alley) is only sized for dewatering

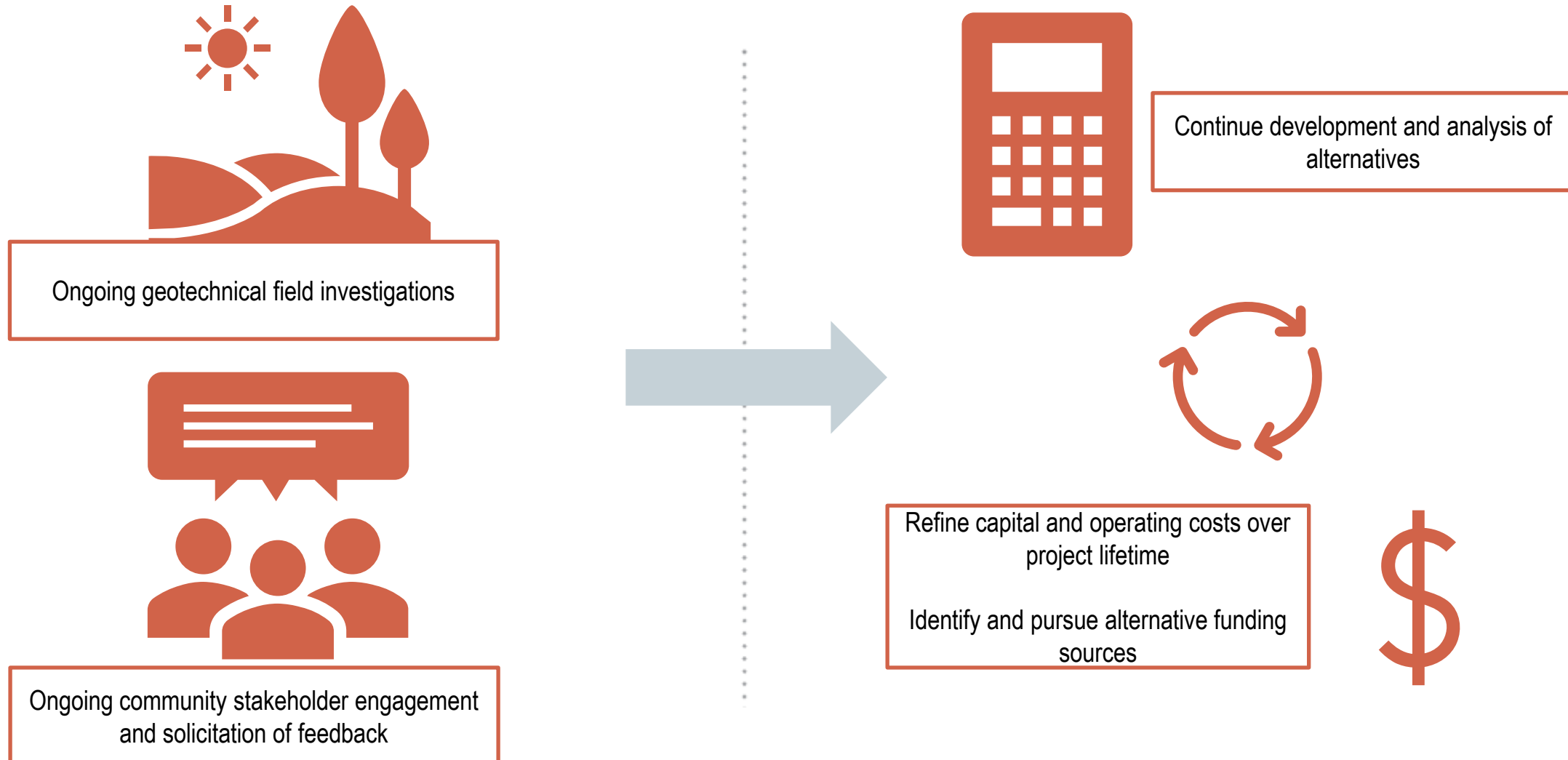
Note: Regardless of pump sizing, the stormwater pumping station will have similar noise abatement.

Conceptual Cost Estimate Comparison

Cost Type	Baseline	Strengthened Sustainability / Resiliency
Estimated Cost	\$200M	\$215M
Low Range	\$140M	\$150M
High Range	\$300M	\$322M

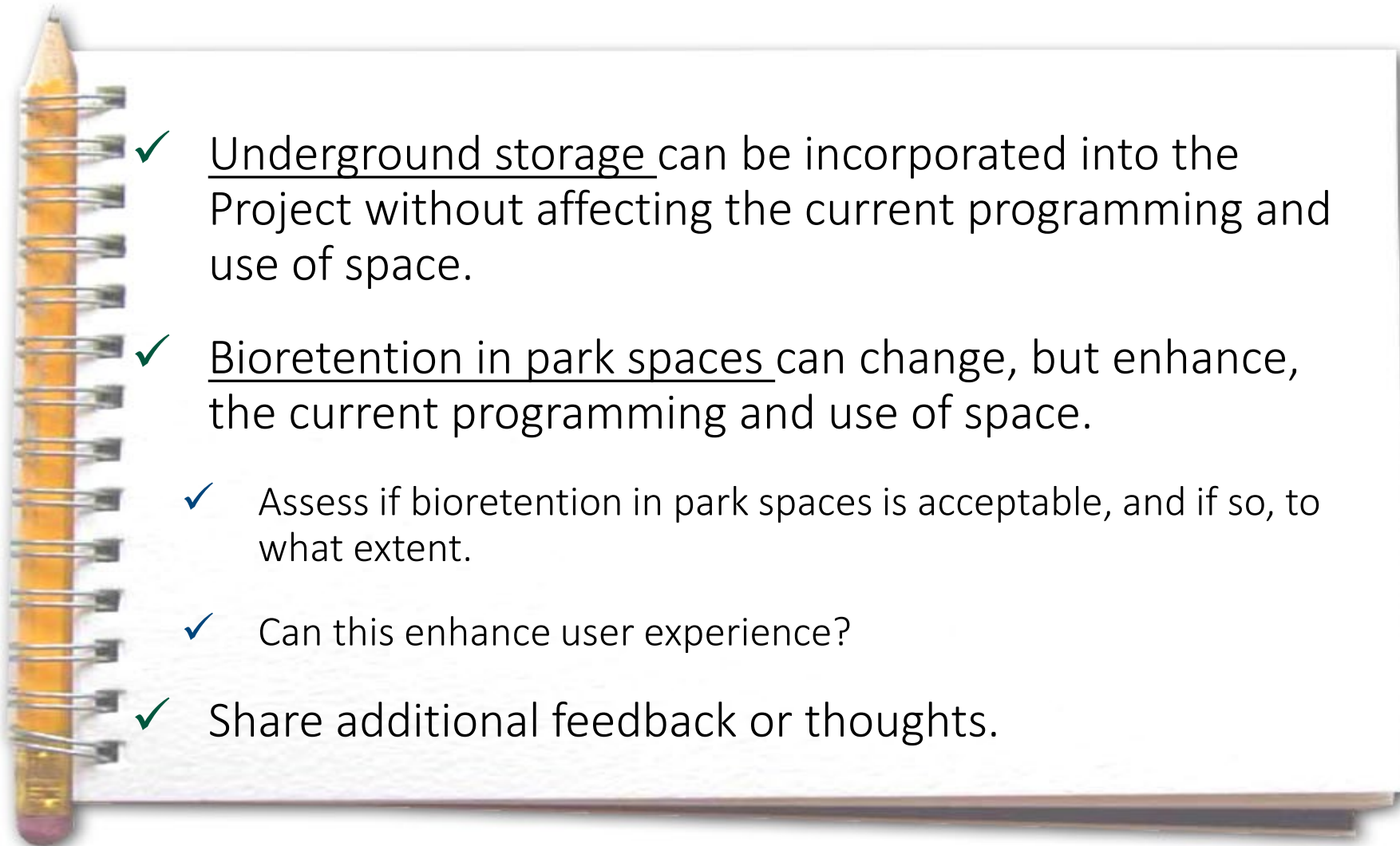
- We can strengthen the Waterfront Plan with more sustainable and resilient project elements without adding substantially to the project cost
- Class 4 Cost Estimate provides a -30% to 50% level of accuracy
- Both approaches exceed current CIP funding:
 - Cost-based alternatives will be presented at next Subcommittee Meeting
 - City applying for external grant funding
 - Ongoing field investigations will assess further opportunities to reduce costs, e.g., bulkhead option, foundations, backfill, and material hauling and disposal

We are in the planning phase and want feedback before any decision is made!



Summary



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- A graphic of a spiral-bound notebook with a yellow pencil resting on the left side. The notebook is open to a white page with a list of four items, each preceded by a green checkmark.
- ✓ Underground storage can be incorporated into the Project without affecting the current programming and use of space.
 - ✓ Bioretention in park spaces can change, but enhance, the current programming and use of space.
 - ✓ Assess if bioretention in park spaces is acceptable, and if so, to what extent.
 - ✓ Can this enhance user experience?
 - ✓ Share additional feedback or thoughts.

Commission Feedback Requested:

Requesting specific feedback and support of alternative concepts and approaches to:

- **Stormwater management - Low Impact Development Strategies:**
 - **Underground storage** – Waterfront Park / Founders Park
 - **Stormwater feature as Public Amenity** – Founders Park
 - Are some changes to site programming and visual aesthetic acceptable?
 - **Park Restoration and Improvements** – Founders Park
 - What would you recommend we change or improve in Founder Park?
- **May provide feedback now, at next Subcommittee meeting, or via email to: Matthew Landes via email: Matthew.Landes@AlexandriaVA.gov**

Immediate Next Steps

- **WF Commission Subcommittee meeting – October 4**
 - Present Project Alternatives, some of which include the project elements shared today
- **Ongoing field investigations**
 - Geotechnical testing and structural analysis
 - Survey
- **Evaluation and Refinement of Project Alternatives**
 - Community feedback
 - Field investigation data reports and engineering design recommendations
- **External funding opportunities**
 - FEMA – VDEM Building Resilient Infrastructure and Communities (BRIC) Program
 - DCR - Virginia Community Flood Preparedness Fund



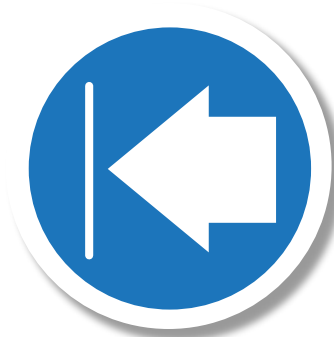
Engagement Plan

- Collaborative engagement with Waterfront Commission Subcommittee and other stakeholders
- Waterfront Subcommittee recommendation(s) to the Waterfront Commission
- Waterfront Commission's consideration and response to Subcommittee's recommendation
- Parks and Recreation Commission recommendations/endorsement
- Waterfront/Parks and Rec. Commission Recommendation to Council
- City Council consideration / feedback
- Endorsement/Direction from Council

We'd like to learn more about your key concerns and questions



Sources of
Flooding



Backflow



Overtopping



Stormwater
Runoff across
the Watershed



Collection
System



Pumping
Stations



Why Founders
Park?

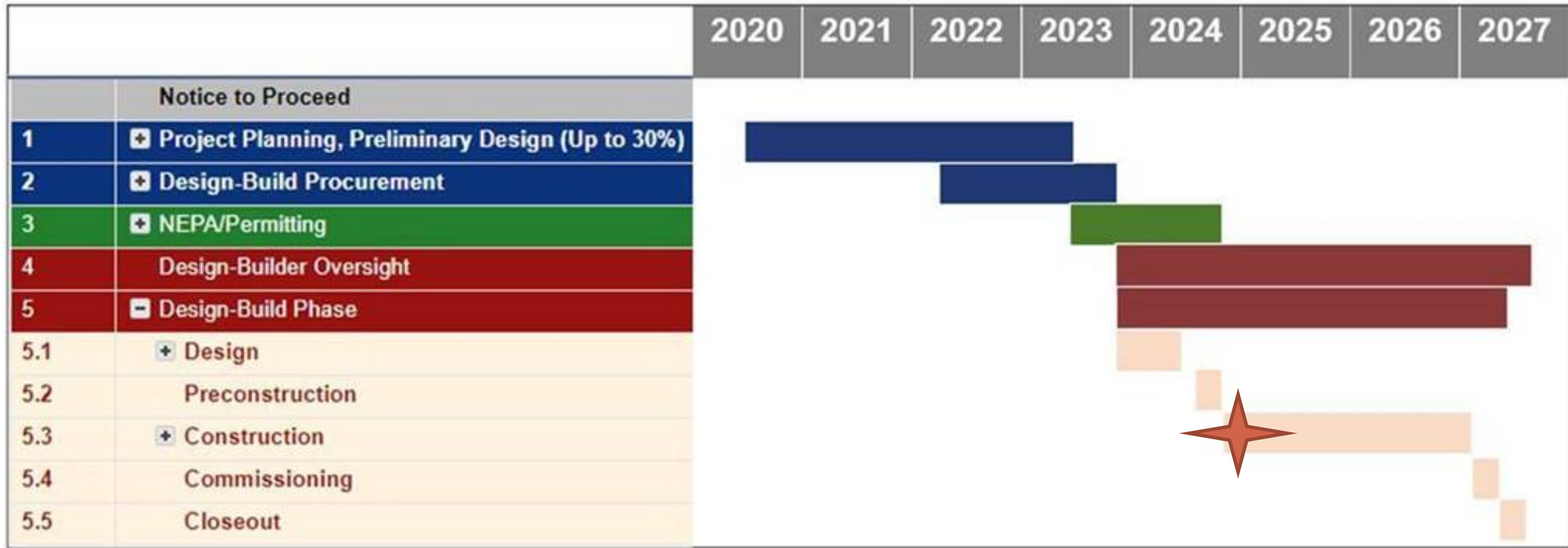


Resilient
Solutions



An Integrated
Solution

Timeline



Construction will commence AFTER City's 275th birthday celebration