RVAH2O Technical Stakeholder Meeting

Tuesday, March 29, 2022

Welcome to the Discussion!

Please put questions or comments in the chat as we go.

We'll have Q&A at the end of the meeting today.


DEQ
Virginia Department of Environmental Quality


Richmond City
Health District


PlanRVA
The Regional Commission


neighborhood
NRC
resource center


RPS
Richmond Public Schools


Richmond
Green
City
Commission


Reforest Richmond


City of Richmond
Established 1737


Department of
City of Richmond
Public Works
Virginia


City of Richmond
RVAgreen
2050


Richmond Planning &
Development Review
PDR


Parks • Recreation
PRCF
& Community Facilities


RPL


Groundwork
Changing Places
Changing Lives
GROUNDWORK
RVA


SOUTHSIDE
ReLEAF


Save the Bay


Chesapeake Bay
Foundation
Saving a National Treasure


James
River
Association


Capital Region
Land Conservancy


Richmond


FOJRP
Friends of the
James River Park


Falls of The James
A State Scenic River


James River
JROC.net
Outdoor Coalition
Supporting the park since 1997


capital trees


VCU


ALLIANCE
for the Chesapeake Bay


ARCADIS


Brown AND
Caldwell


LimnoTech


xylem
Let's Solve Water


troutman
pepper


Science
Museum of Virginia


Chesterfield County
1749
Virginia

Welcome, DPU Director April Bingham!

Today's Agenda

RVA Clean Water Plan

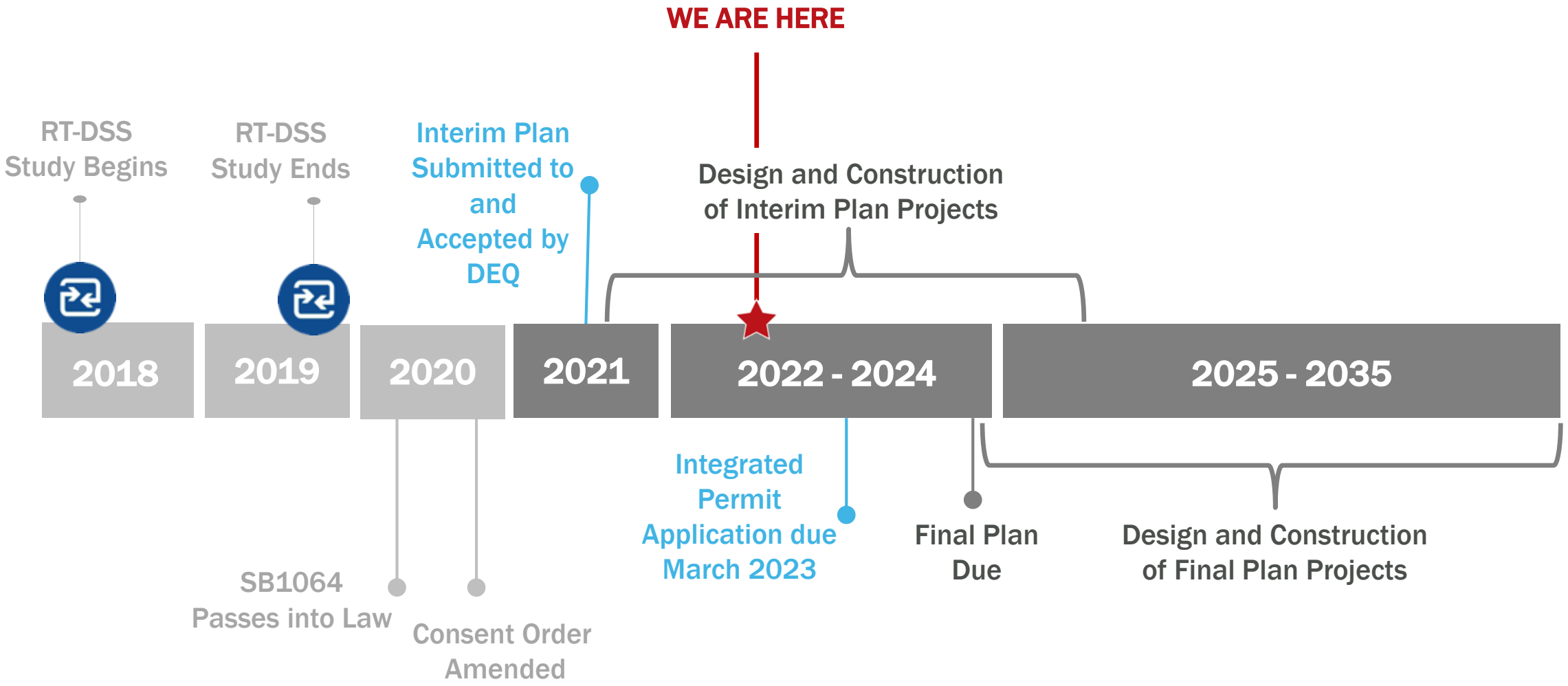
Interim Plan Projects Update

Final Plan Update

Green Infrastructure Master Plan

Partner Project Funding

Timeline


WE ARE HERE
RT-DSS Study Begins
RT-DSS Study Ends
Interim Plan Submitted to and Accepted by DEQ
Design and Construction of Interim Plan Projects
2018
2019
2020
2021
2022 - 2024
2025 - 2035
Integrated Permit Application due March 2023
Final Plan Due
Design and Construction of Final Plan Projects
SB1064 Passes into Law
Consent Order Amended

RVA Clean Water Plan
&
Richmond's Integrated Permit

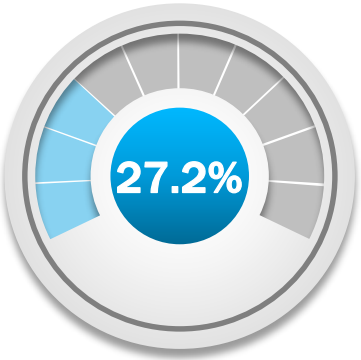
2017 – 2022 YTD

CSS Infrastructure

- WWTP Nutrient Removal
- CSO Separation
- WWTP Flow Upgrade

GI in MS4

- Target: 104 acres
- Achieved: 19.6 acres



GI in CSS

- Target: 18 acres
- Achieved: 4.9 acres

2017 – 2022 YTD

Stream Restoration

- Target: 2,500 linear feet
- Achieved: 11,608 linear feet

Tree Canopy

- Target: 80 acres; 24,000 trees
- Achieved: 117.4 acres; 35,231 trees

Land Conservation

- Target: 10 acres of City property
- Achieved: 113 acres

2017 – 2022 YTD

Natives & Invasives

- Target: 80% of plantings
- Achieved: 86.5% of tracked plants (16,553 native plants)

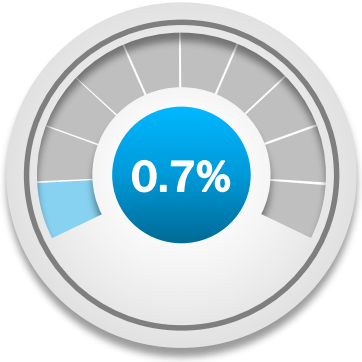
Water Conservation

- Target: 10% reduction of potable water consumption

Pollution Identification & Reduction

- Will be quantified in 2022

2017 – 2022 YTD



Riparian Area Restoration

- Target: 10 acres
- Achieved: 0.07 acres

Your projects help us all to reach these RVA Clean Water Plan goals!

Interim Plan Projects Update

Interim Plan Projects

10 Projects

- Control overflows by **maximizing and using existing capacity** in the combined sewer system
- Estimated 182.3 MG capture

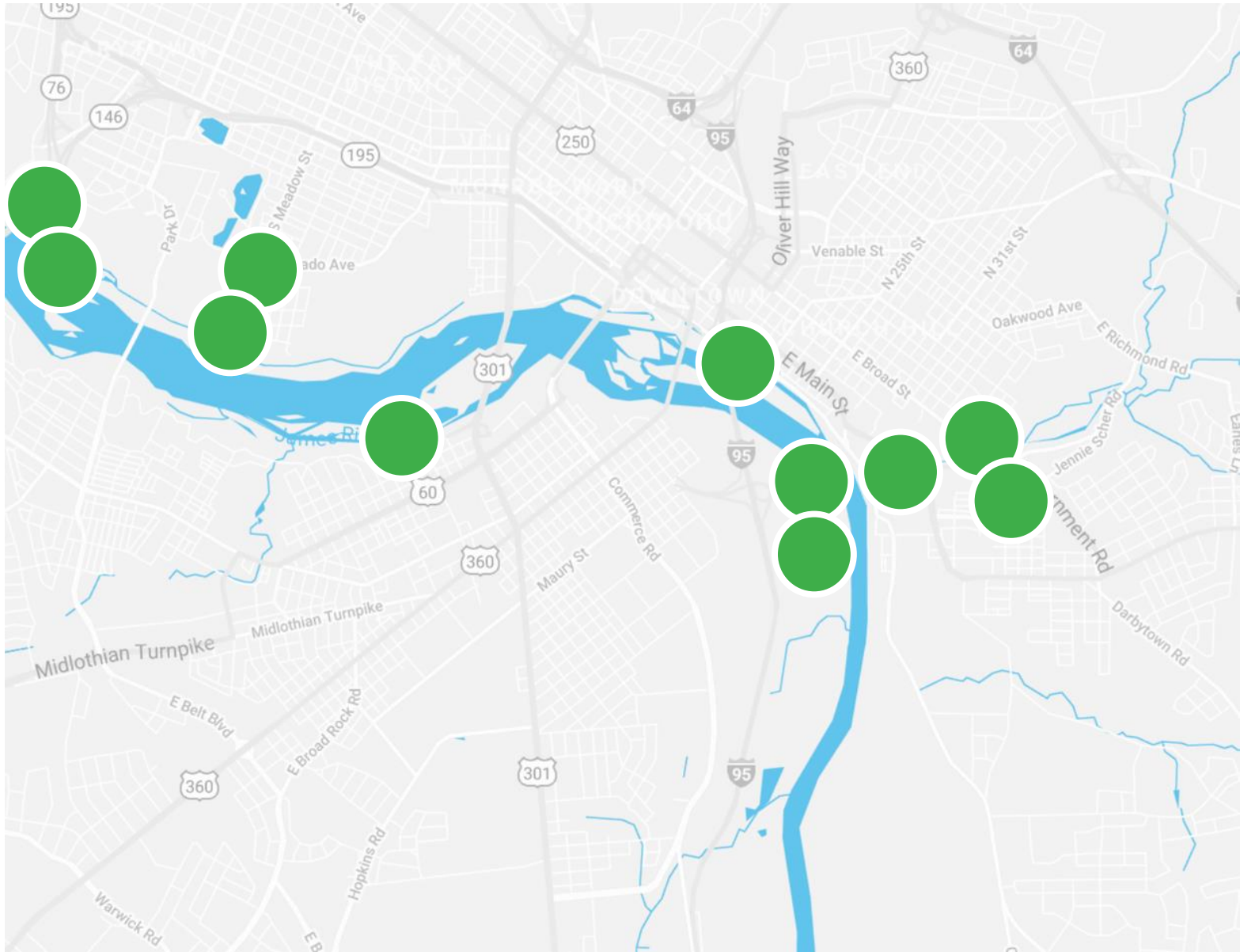
92% CSO Capture

Estimated Annual Basis

$33.1M*

*in 2021 dollars

July 1, 2027 Construction Deadline



Interim Plan Project – Level 1 Controls

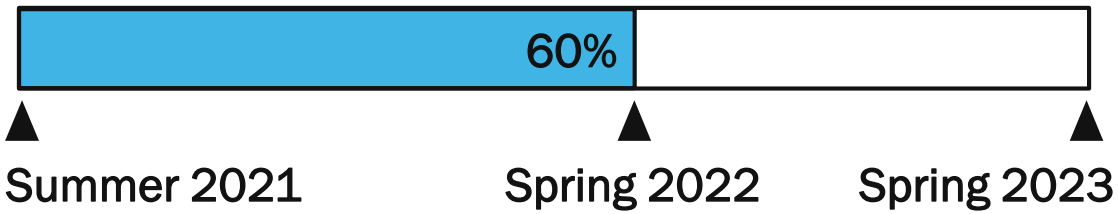
Automate Shockoe Retention Basin drainage (35 MG Storage)

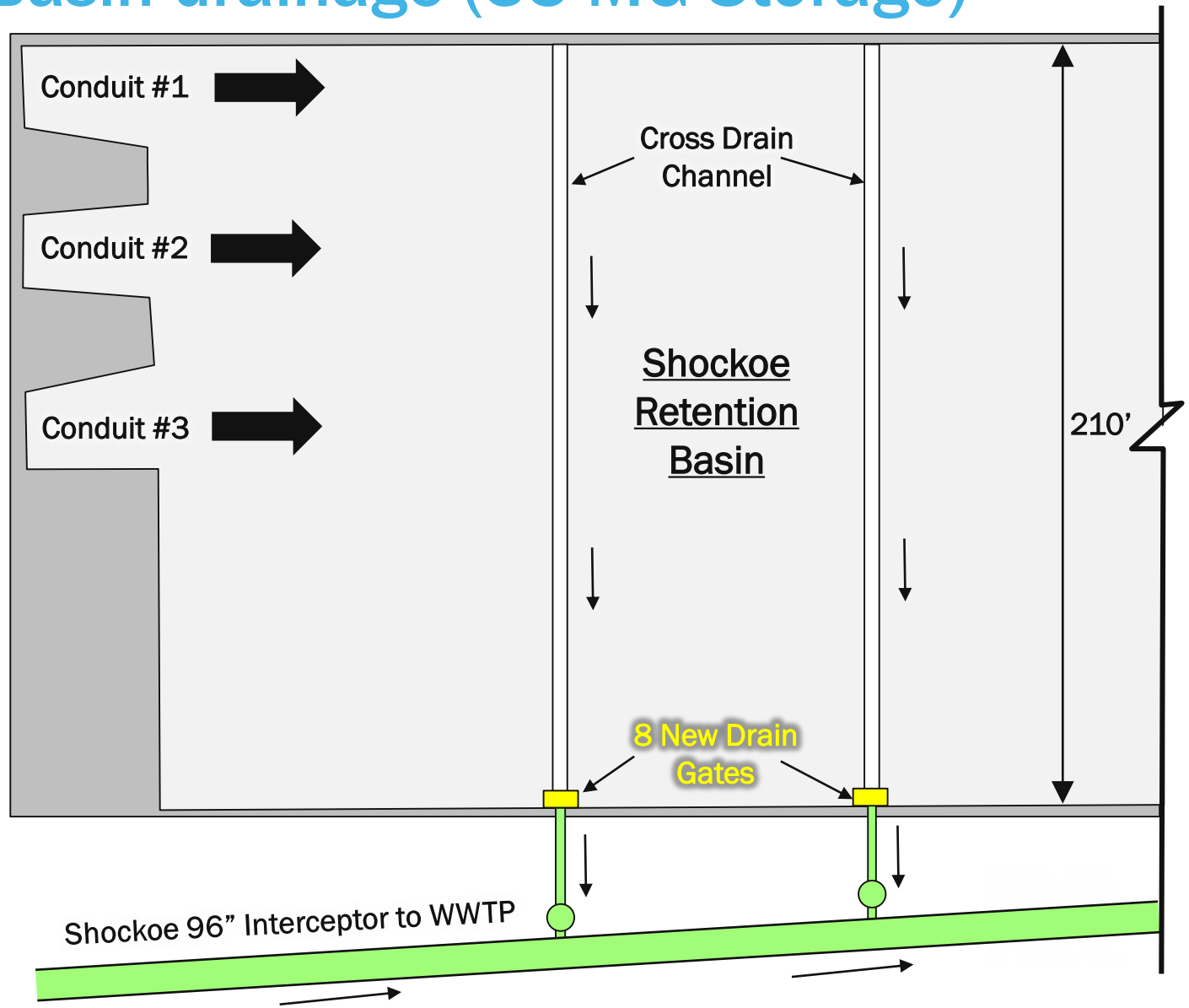
Overflow Volume Reduction (MG)	78.8
Overflow Event Reduction (#)	7
Estimated Capital Cost	$1.3M

Design Update

- ❑ Developing design criteria for replacement gates
- ❑ Evaluating other electrical and mechanical improvements at Shockoe Retention Basin
- ❑ Designing control system

Design Schedule





Interim Plan Project – Level 2 Controls

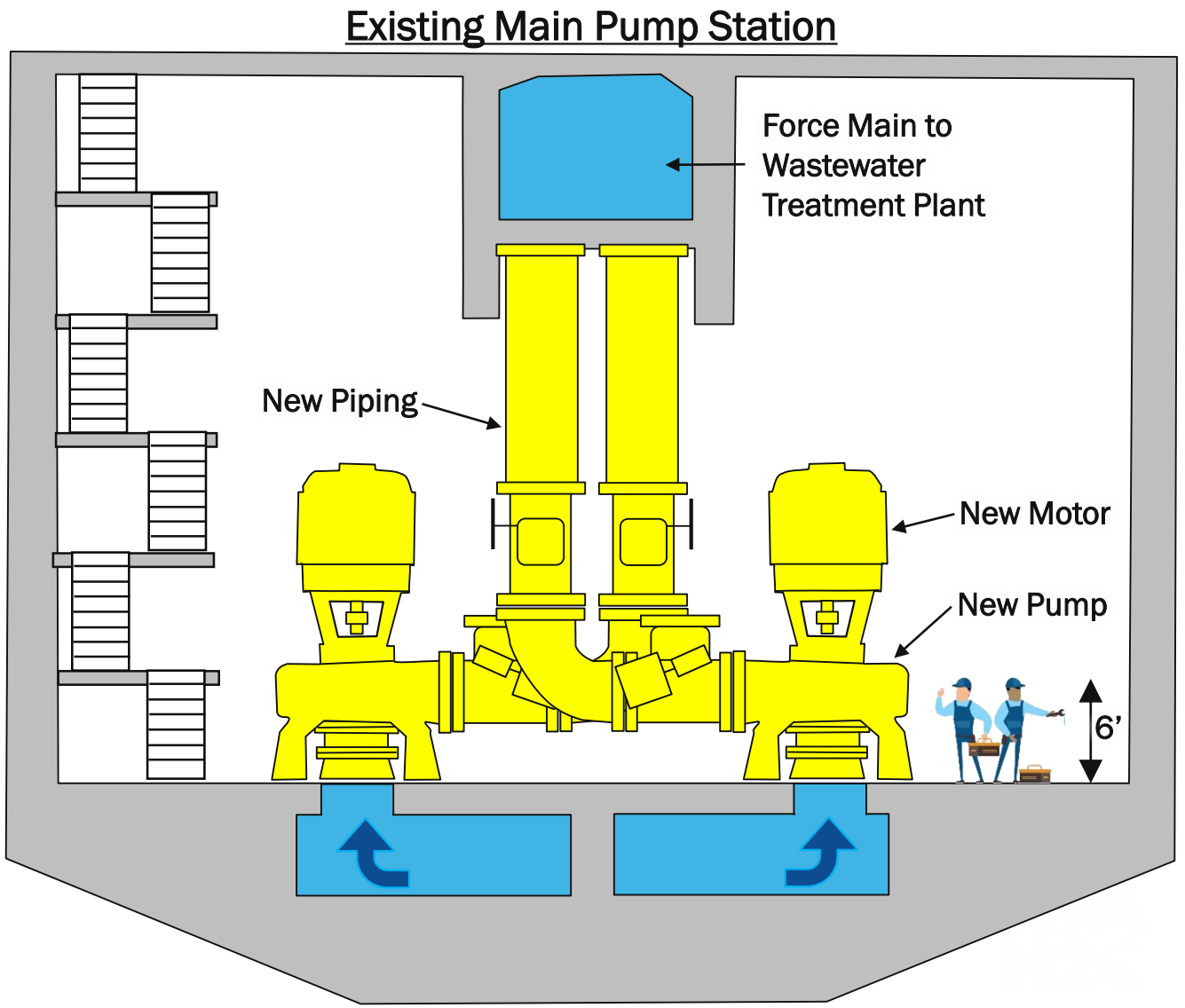
Maximize flow to Wastewater Treatment Plant (140 MGD)

Overflow Volume Reduction (MG)	41.2
Overflow Event Reduction (#)	7
Estimated Capital Cost	$11M

Design Update

- Evaluating whether to rehab existing 70-year-old Main Pump Station or to construct a new Main Pump Station in Preliminary Engineering Report
  - Cost
  - Performance
  - Schedule

Design Schedule



Interim Plan Project – CSO 21

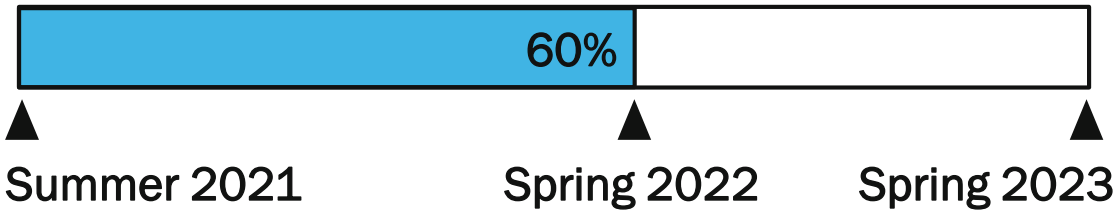
Store wet weather flow in existing 120” Gordon Avenue Sewer

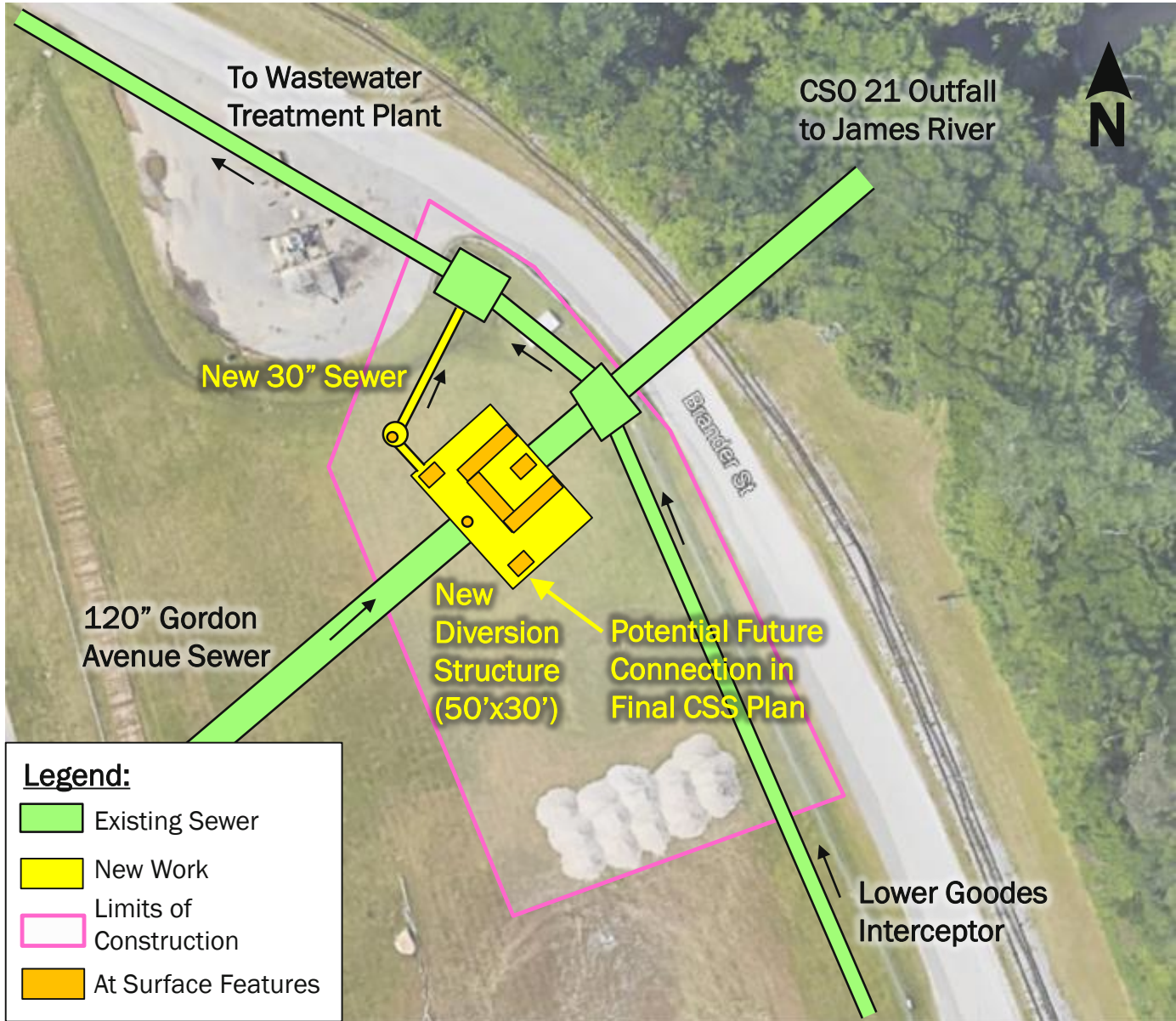
Overflow Volume Reduction (MG)	16.2
Overflow Event Reduction (#)	17
Estimated Capital Cost	$5.4M

Design Update

- ☑ Survey
- ☐ Subsurface investigation
- ☐ Locating the Diversion Structure on the site
- ☐ Designing the Diversion Structure:
  - Overflow weir height and length
  - Trash rack
  - Planning for future connections

Design Schedule





Interim Plan Project – CSO 40 #1

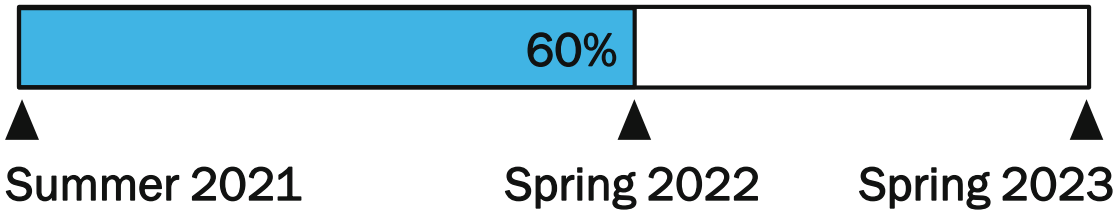
Store wet weather flow in existing 78” CSO Conveyance Pipe

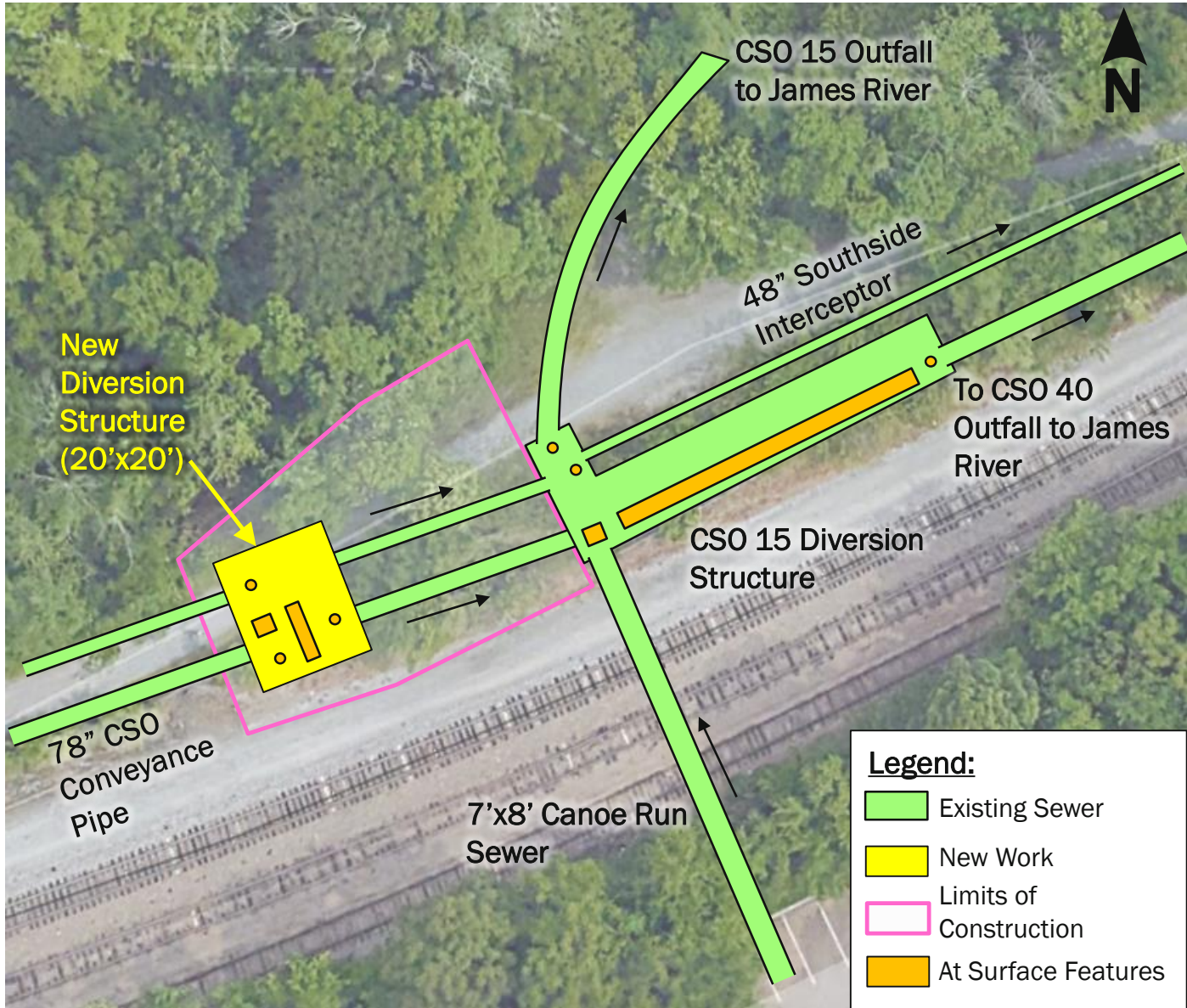
Overflow Volume Reduction (MG)	12.3
Overflow Event Reduction (#)	1
Estimated Capital Cost	$3.8M

Design Update

- ☑ Survey
- ☐ Subsurface investigation
- ☐ Locating the Diversion Structure on the site
- ☐ Designing the Diversion Structure:
  - Overflow weir height and length
  - Drain pump design criteria

Design Schedule





Interim Plan Project – CSO 19A

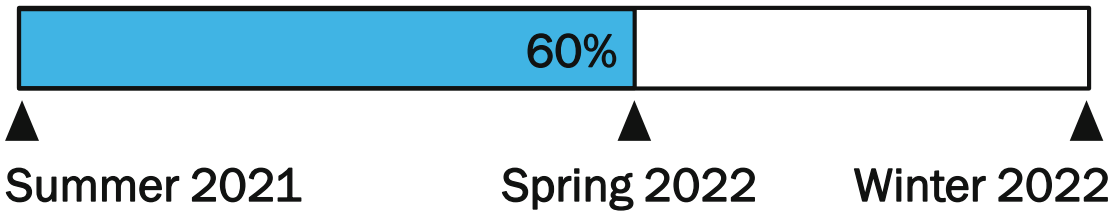
Divert flow to existing Hampton-McCloy Retention Tunnel

Overflow Volume Reduction (MG)	10.3
Overflow Event Reduction (#)	2
Estimated Capital Cost	$0.8M

Design Update

- ❑ Developing design criteria for gate
- ❑ Evaluating other structural improvements at the CSO 19A Diversion Structure
- ❑ Designing control system

Design Schedule



Interim Plan Project – CSO 19B

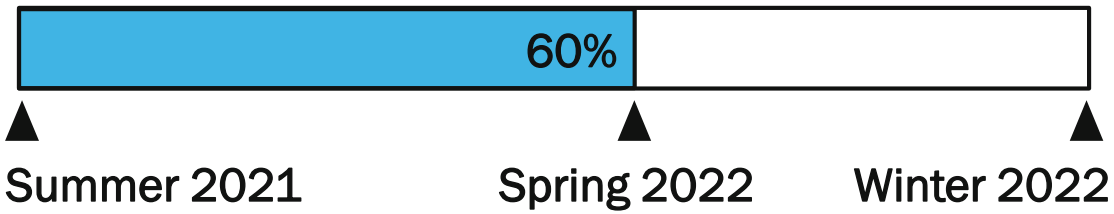
Divert flow to existing Hampton-McCloy Retention Tunnel

Overflow Volume Reduction (MG)	2.2
Overflow Event Reduction (#)	2
Estimated Capital Cost	$0.3M

Design Update

- ❑ Developing design criteria for replacement gate
- ❑ Evaluating other electrical and mechanical improvements at the Hampton Street Pump Station
- ❑ Designing control system

Design Schedule



Interim Plan Project – CSO 20

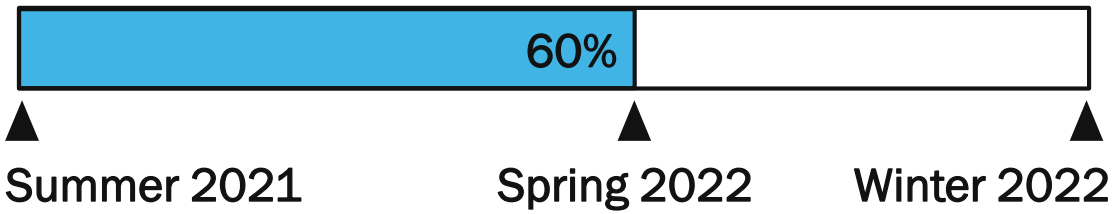
Divert flow to existing Hampton-McCloy Retention Tunnel

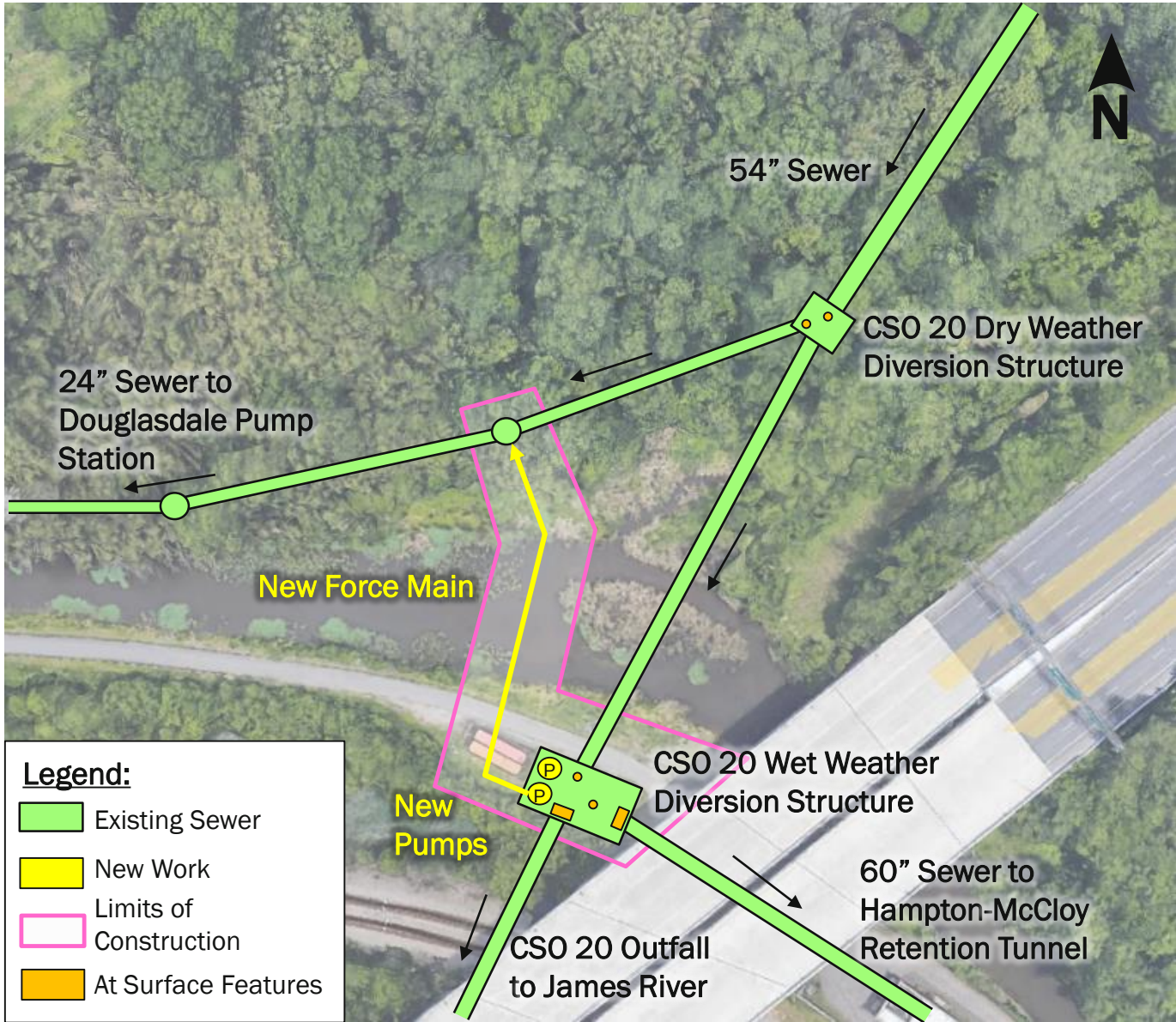
Overflow Volume Reduction (MG)	8.9
Overflow Event Reduction (#)	1
Estimated Capital Cost	$0.8M

Design Update

- ❑ Developing design criteria for new pumps
- ❑ Evaluating other improvements at the CSO 20 Diversion Structure
- ❑ Designing control system

Design Schedule





Interim Plan Project – CSO 04

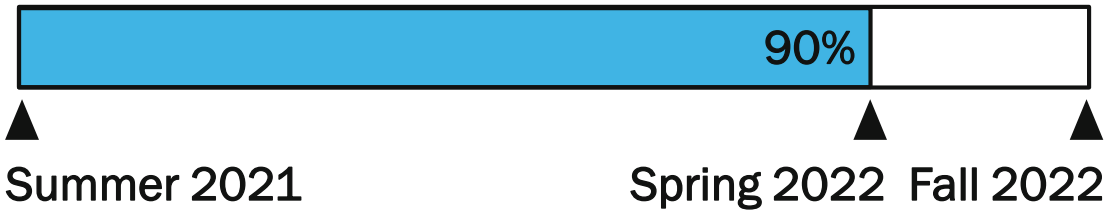
Divert additional wet weather flow to the Fulton Bottom Interceptor

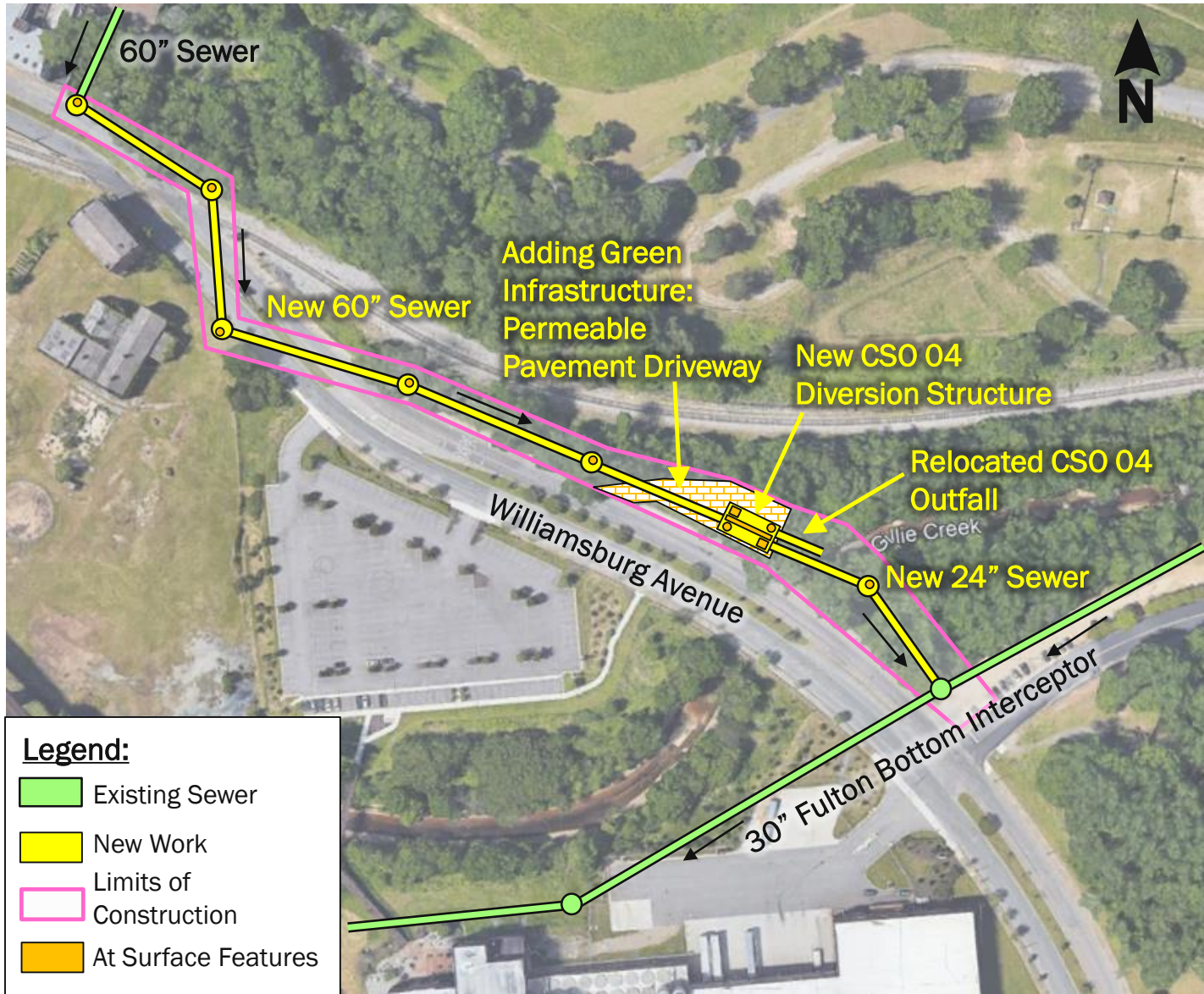
Overflow Volume Reduction (MG)	5.1
Overflow Event Reduction (#)	48
Estimated Capital Cost	$8.7M

Design Update

- ❑ Finalizing alignment of influent/effluent sewer
- ❑ Finalizing the design of new Diversion Structure
- ❑ Designing control system

Design Schedule





Interim Plan Project – CSO 24

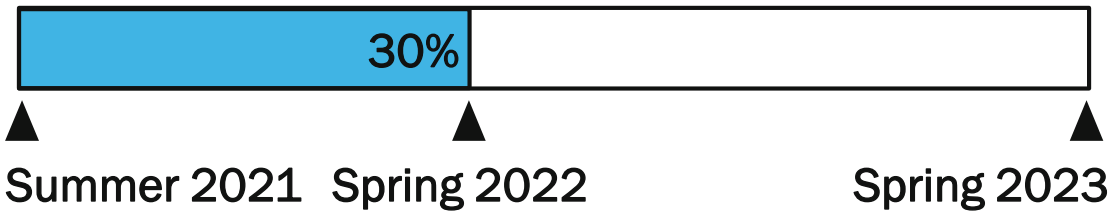
Divert additional wet weather flow to the Gillies Creek Interceptor

Overflow Volume Reduction (MG)	3.8
Overflow Event Reduction (#)	26
Estimated Capital Cost	$0.4M

Design Update

- ☑ Survey
- ☐ Developing design criteria for new gate

Design Schedule



Interim Plan Project – CSO 39

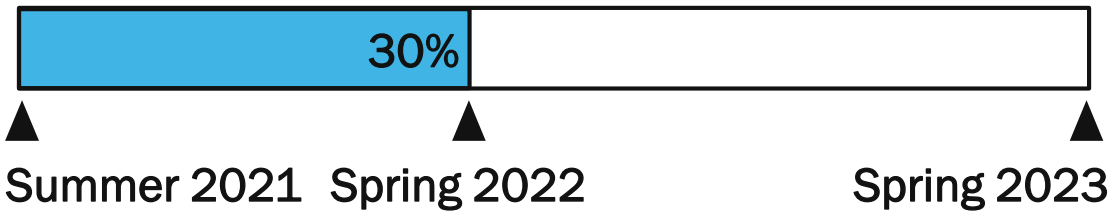
Divert additional wet weather flow to the Gillies Creek Interceptor

Overflow Volume Reduction (MG)	3.6
Overflow Event Reduction (#)	13
Estimated Capital Cost	$0.8M

Design Update

- ☑ Survey
- ☐ Developing design criteria for new gate
- ☐ Designing control system

Design Schedule



Interim Plan Projects

10 Projects

- Control overflows by **maximizing and using existing capacity** in the combined sewer system
- Estimated 182.3 MG capture

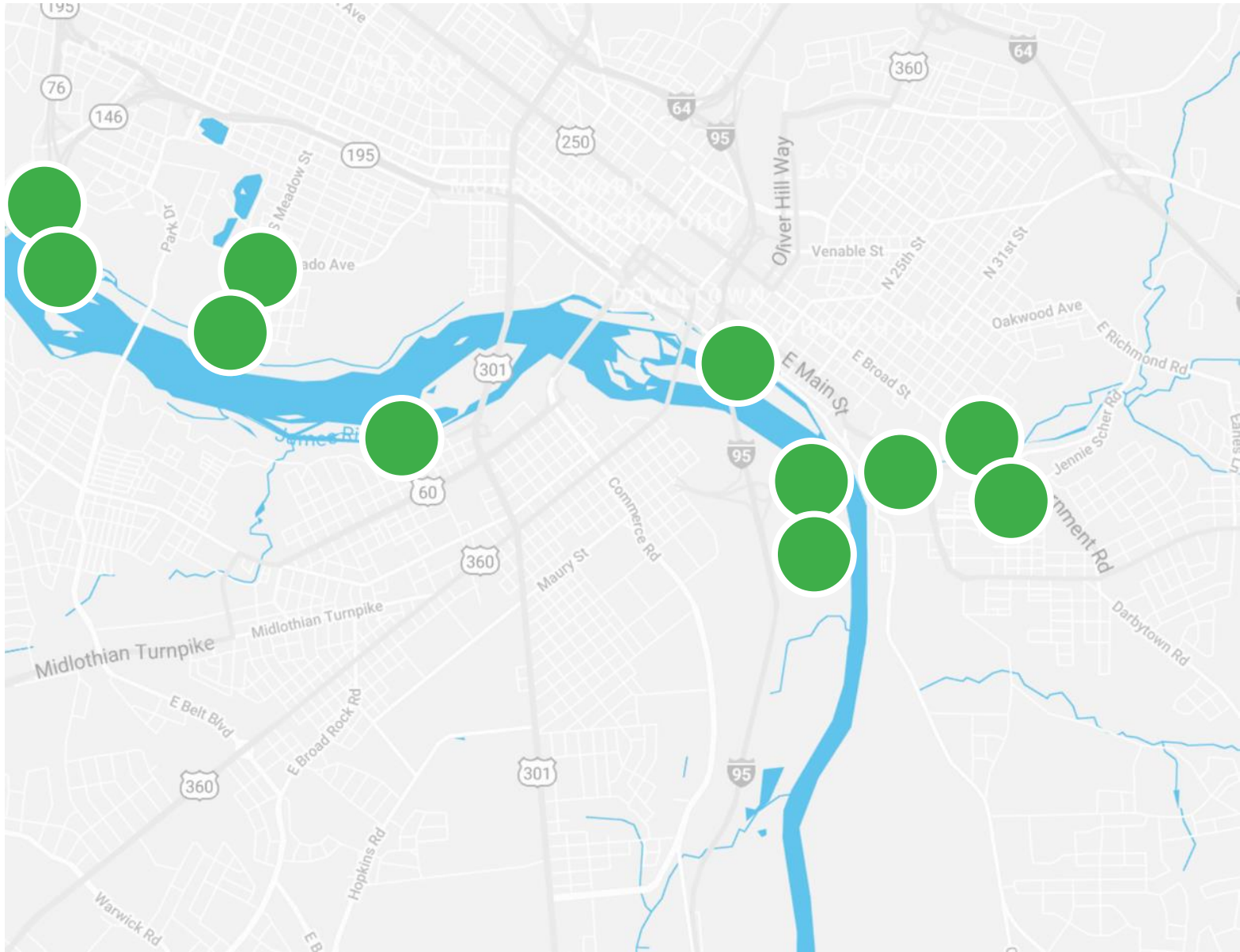
92% CSO Capture

Estimated Annual Basis

$33.1M*

*in 2021 dollars

July 1, 2027 Construction Deadline



Final Plan Update

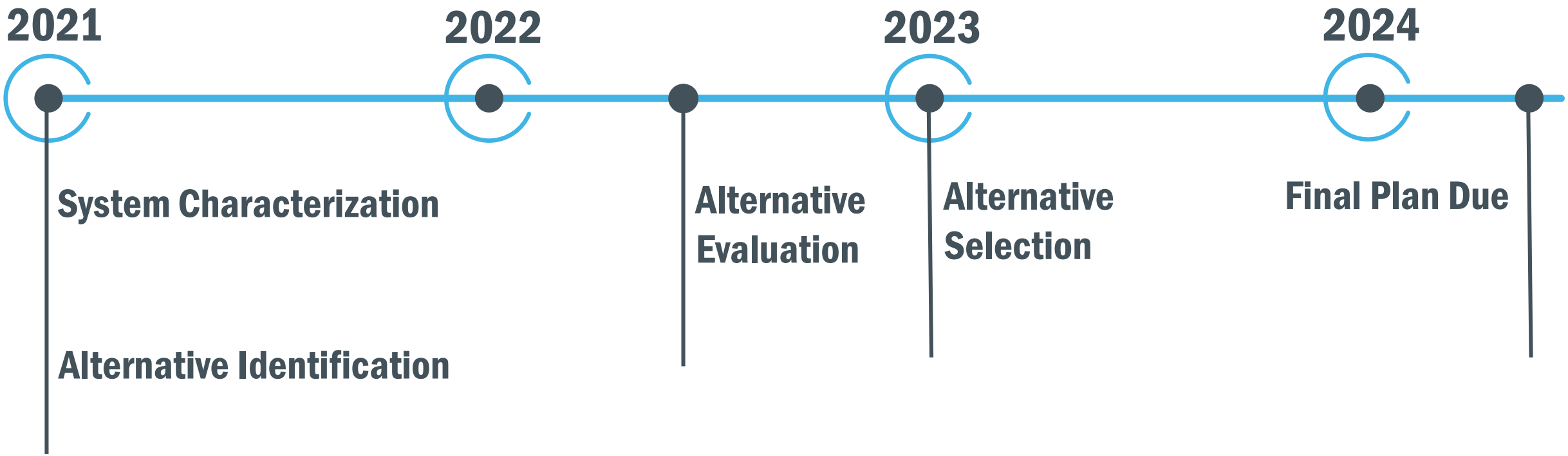
Final Plan – Three alternatives being evaluated

Must capture, convey, and treat up to 5 billion gallons per year

99% CSO Capture
Estimated Annual Basis

$1.3B*
*in 2021 dollars

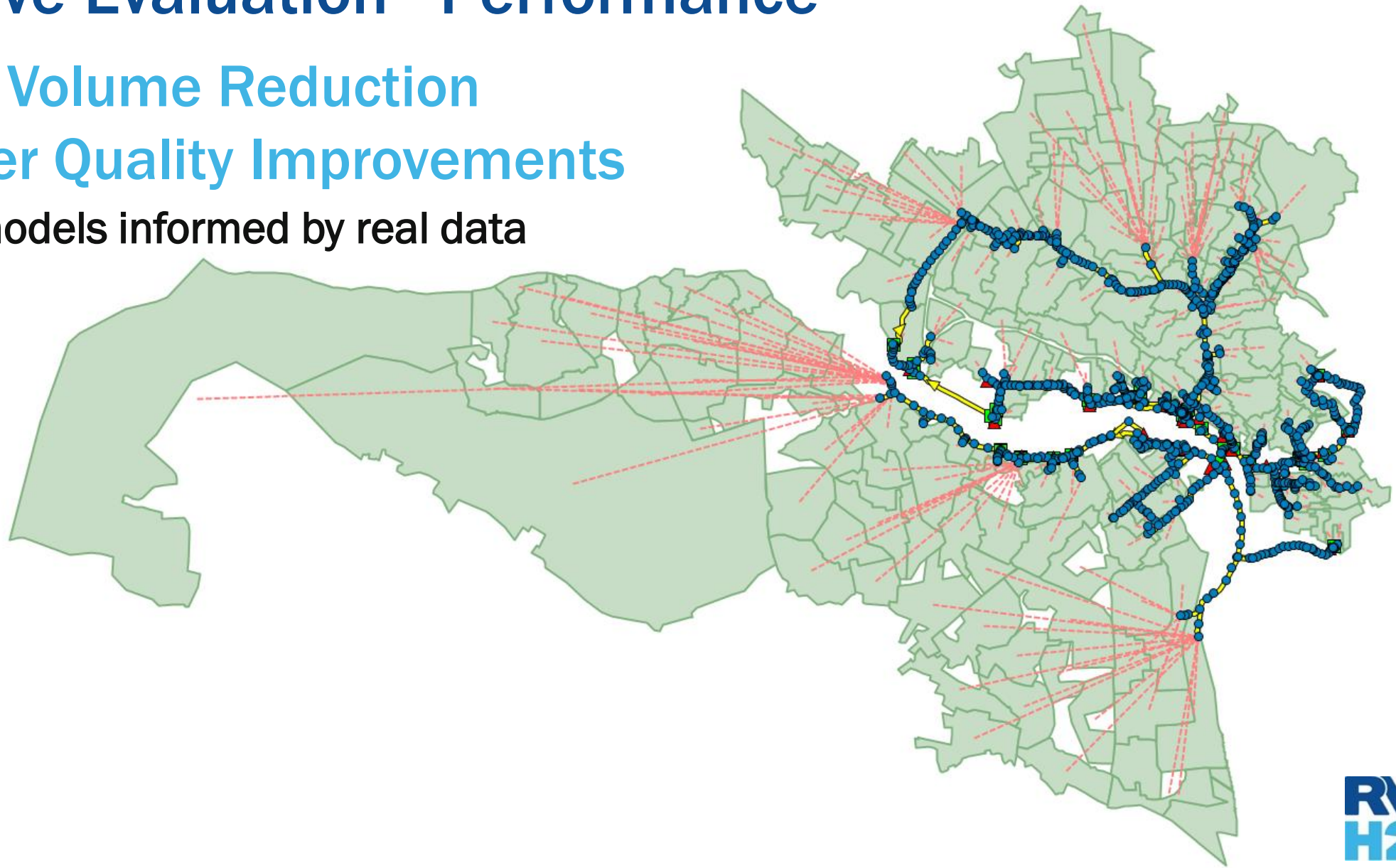
Schedule Update



Alternative Evaluation - Performance

CSO Volume Reduction
Water Quality Improvements

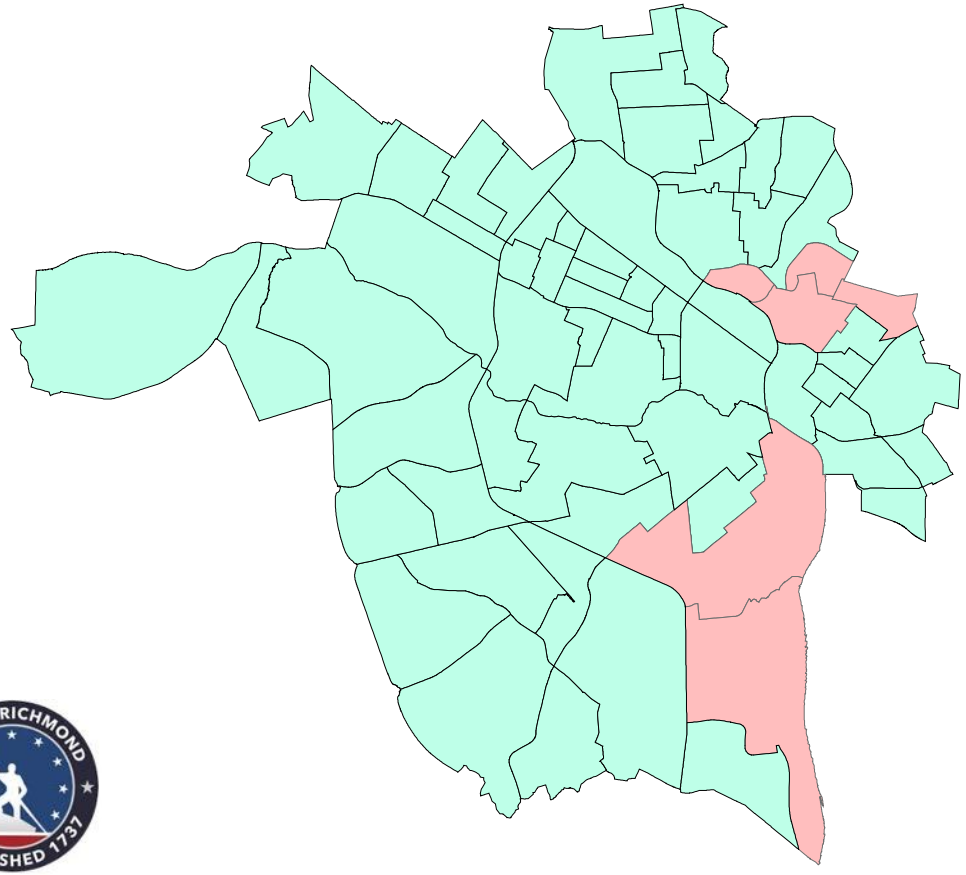
Use models informed by real data



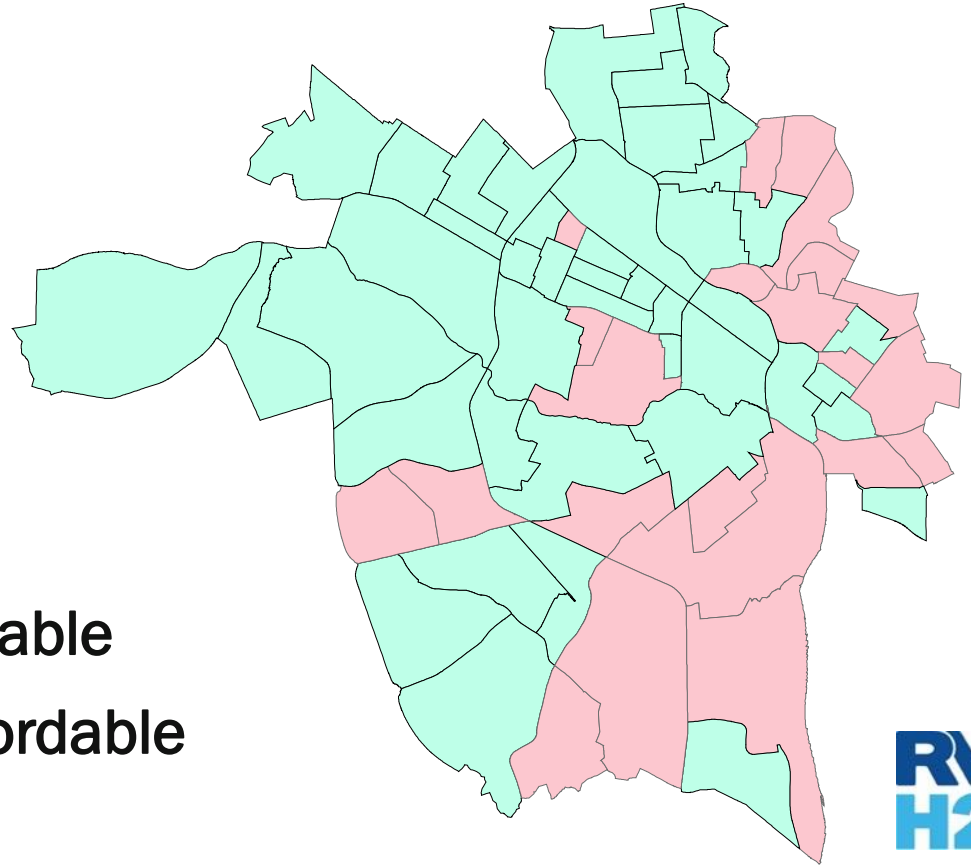
Alternative Evaluation - Cost

$ Construction Cost Life-Cycle Cost

2020 Census Tracts
Current Wastewater Rates



2035 Census Tracts
Wastewater Rates with Final Plan Implementation



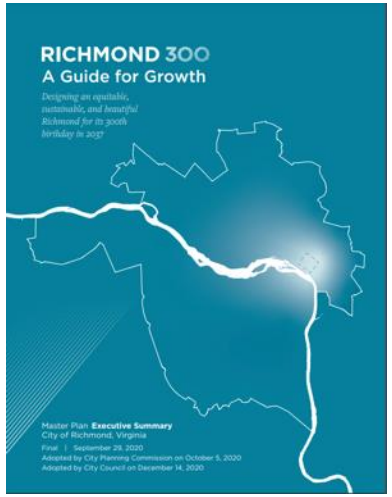
Affordable

Unaffordable

Alternative Evaluation - Qualitative

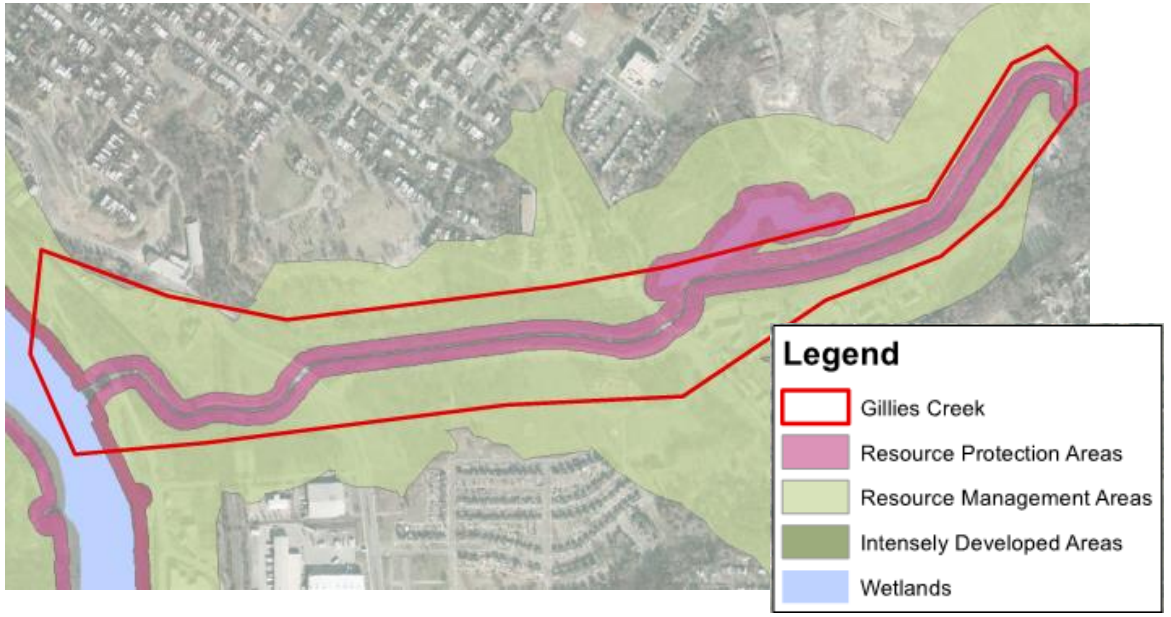
Community

Identify coordination opportunities with previous plans



Environmental

Identify environmental and historical features



Public Stakeholder Group

Formation of the Public Stakeholder Group is underway!

Purpose

18 members providing community representation – 2 from each of Richmond's 9 Council Districts

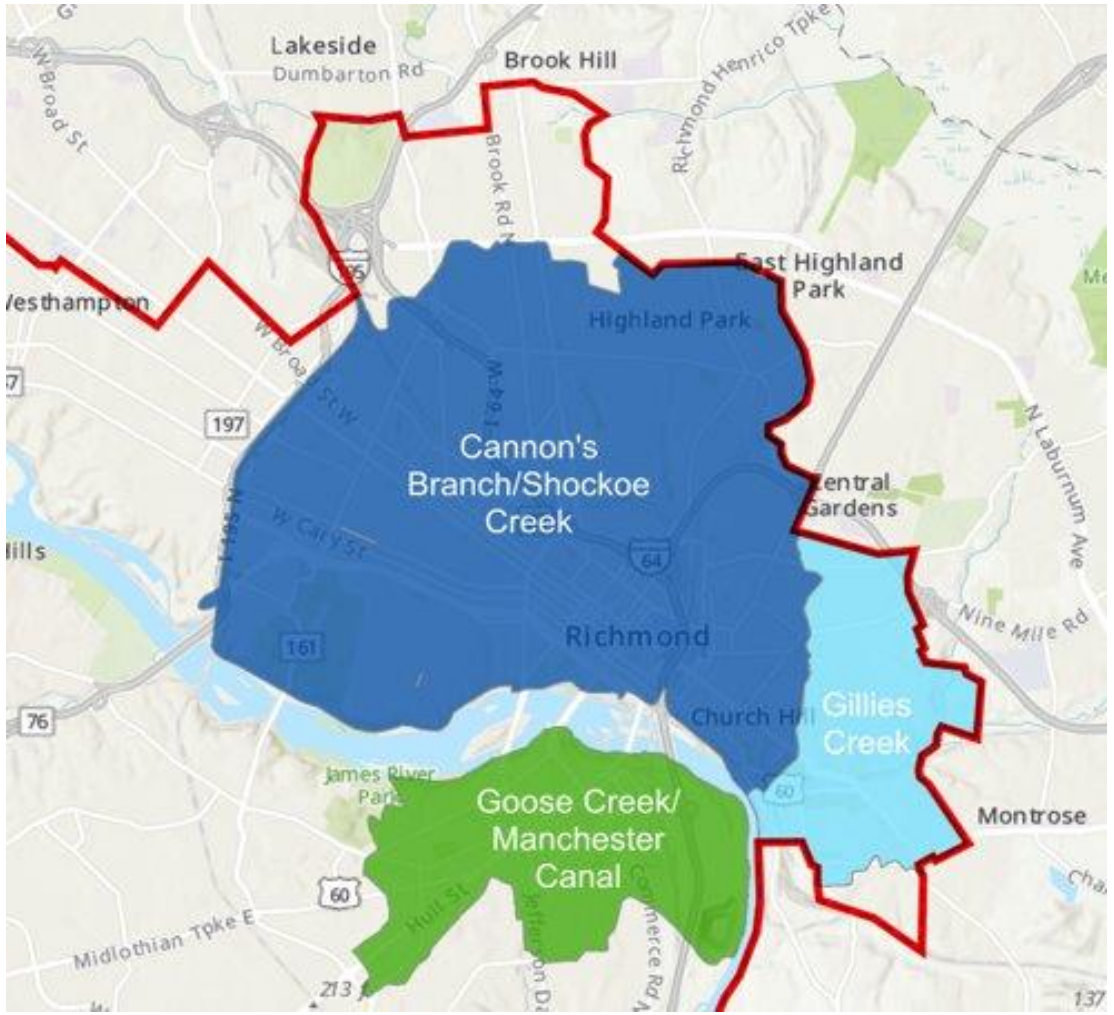
Hearing new perspectives and insights

Helping Richmond understand why this effort and work is vital

Green Infrastructure Master Plan Update

Green Infrastructure Master Plan

- $1M NFWF INSR grant
- 2019 - 2023 timeframe
  - Extension approved through 2023
- Outcomes:
  - Green Infrastructure Master Plan
  - Green Infrastructure Ranking Tool
  - One Green Infrastructure Project
- Locations: Three Priority Watersheds
  - Gillies Creek
  - Shockoe Creek
  - Manchester Canal/Goose Creek



Project Team

ALLIANCE for the Chesapeake Bay

RVA H2O

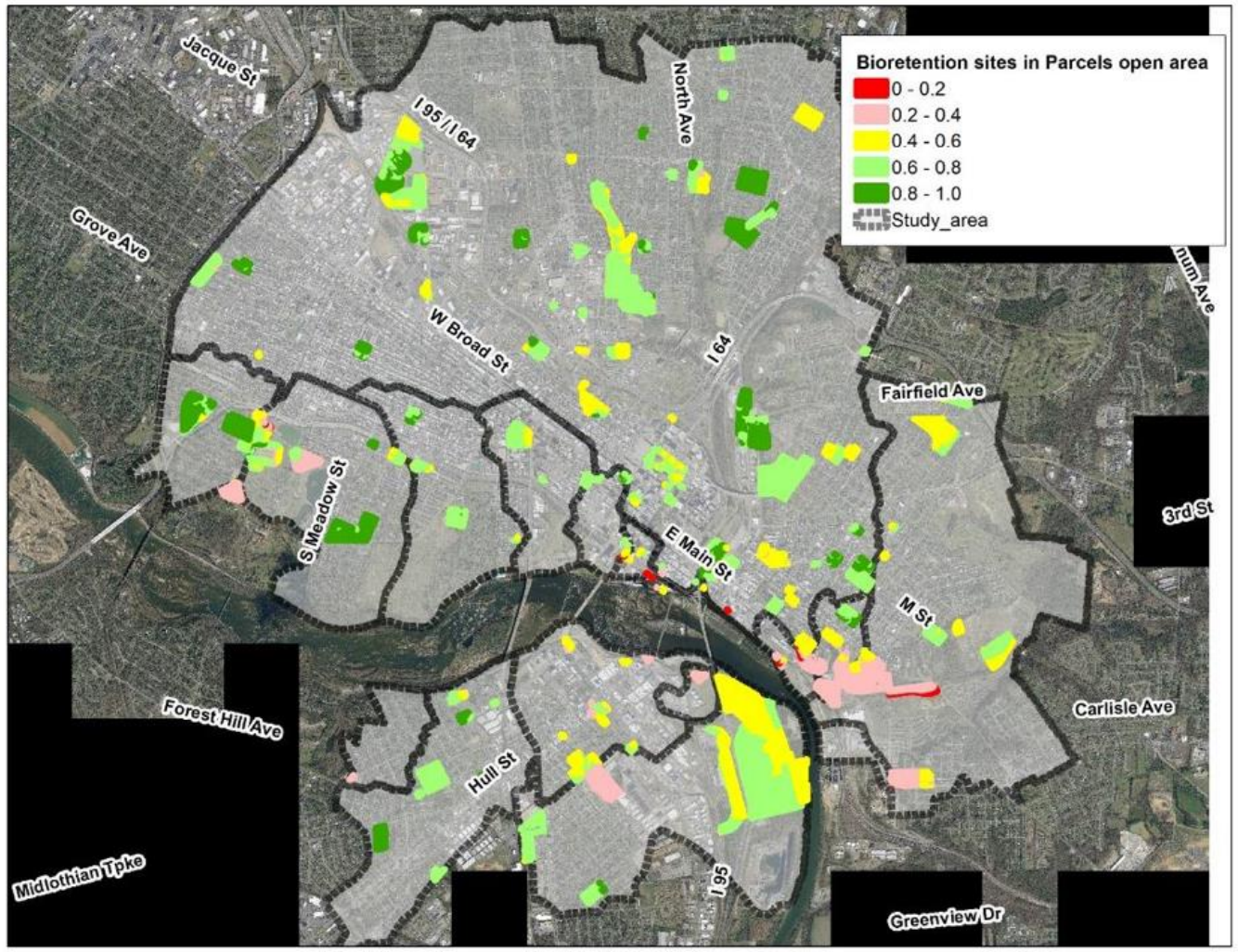
University of Virginia | Institute for Engagement & Negotiation
Shaping Our World Together

ARCADIS

Green Infrastructure Master Plan

- Forward and Acknowledgements
- Executive Summary
- 1.0 Introduction
- 2.0 Existing Conditions/Review of Existing Information
- 3.0 Identification of Green Infrastructure Opportunities and Evaluation Criteria
- 4.0 Evaluation of Three Priority Watersheds
- 5.0 Project Ranking and Prioritization of Green Infrastructure Solutions
- 6.0 Conceptual Designs of Recommended Solutions/ Projects
- 7.0 Project Implementation Considerations
- Appendices

Types of Green Infrastructure Included in Ranking Tool



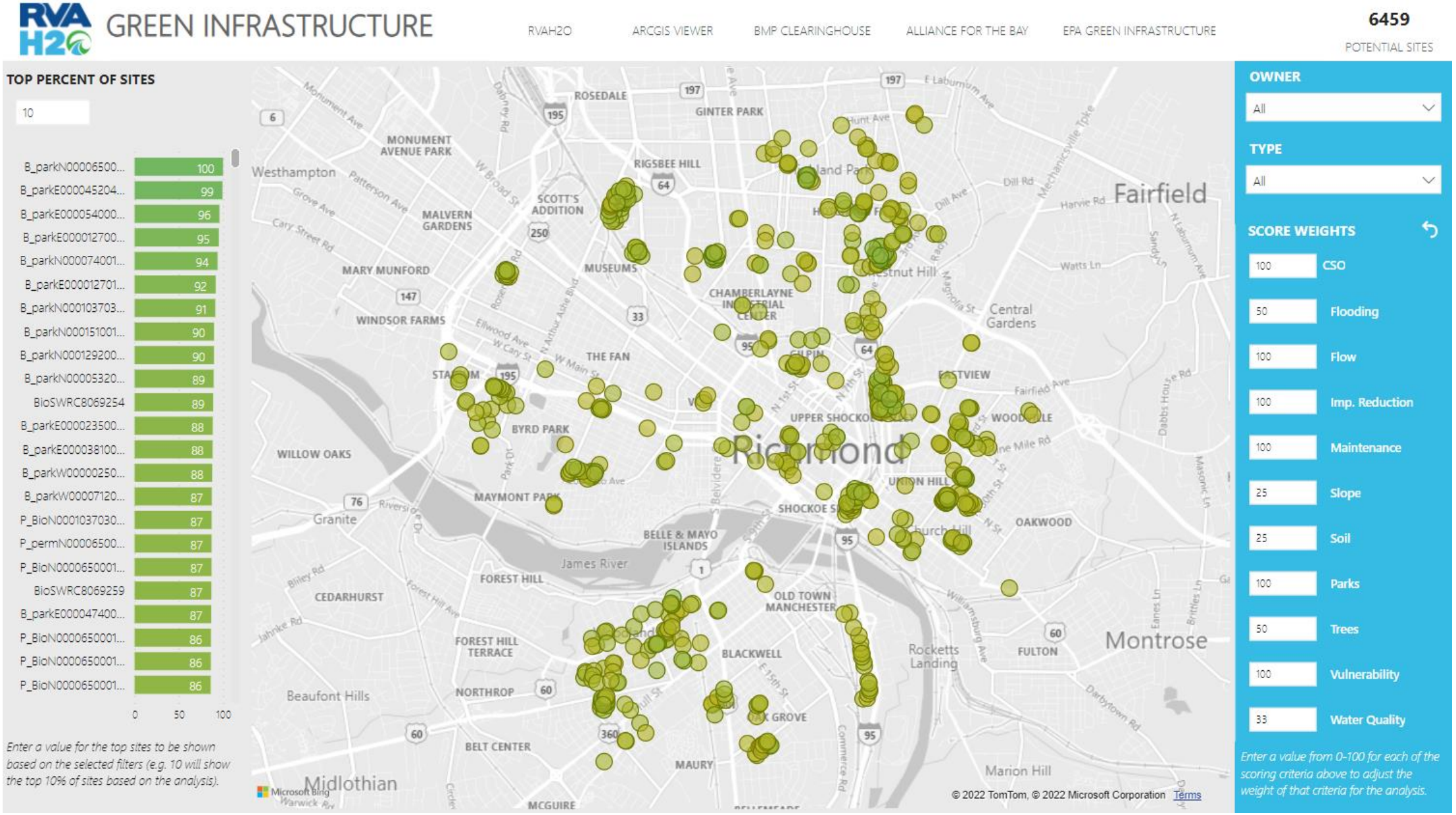
- Permeable pavement in parking lots
- Permeable parking lanes in local and collector roads
- Permeable parking lanes in major roadways
- Permeable pavement in local roads
- Bioretention in parking lots
- Bioretention in open areas
- Bioretention in right-of-way
- Green alleys

Ranking Tool Performance Criteria Scoring

GI Ranking Tool Performance Criteria Scoring

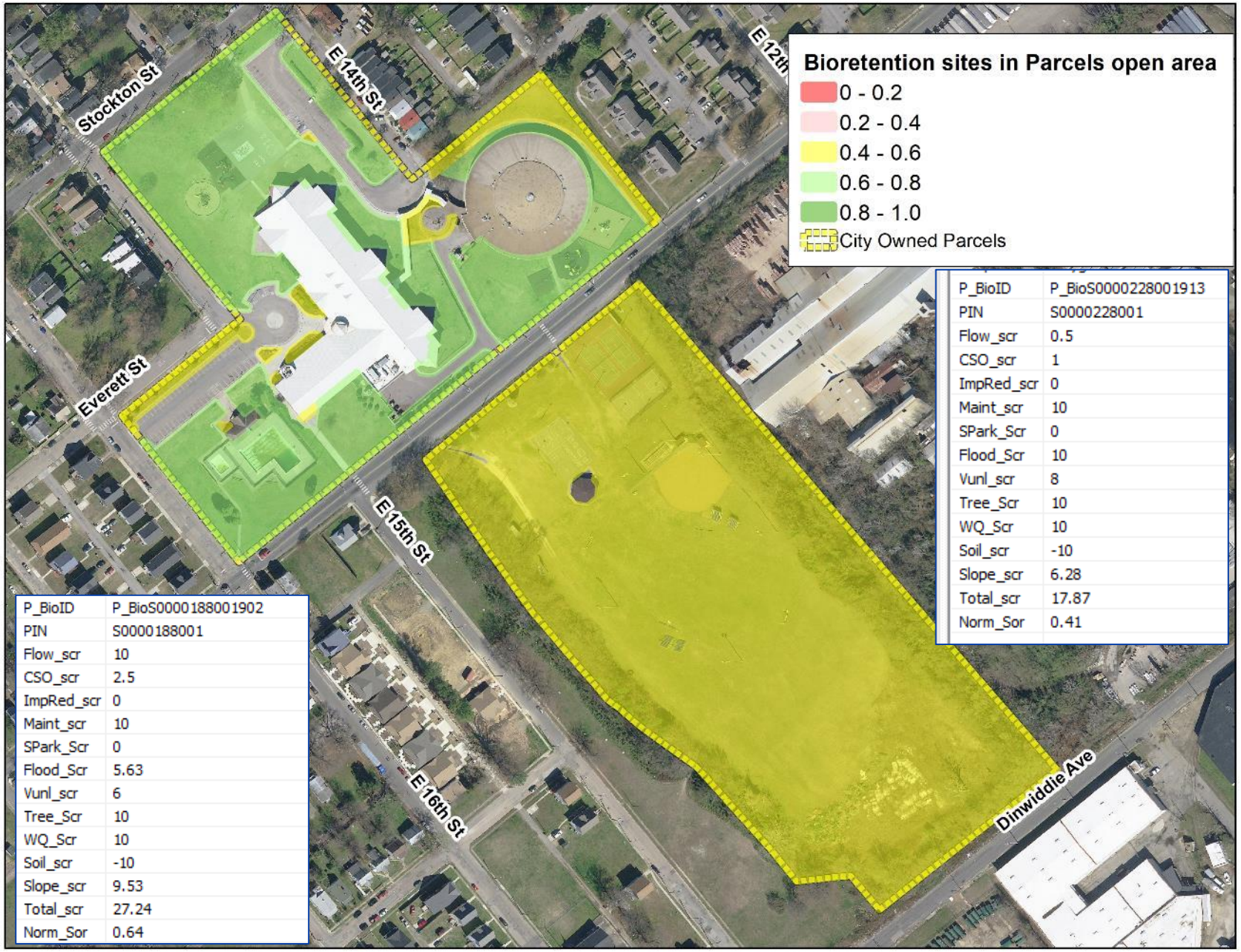
Metric	Description	Tier	Max Score	Min Score	Weight %	Scoring
Runoff/Flow Reduction	Flow reduction	1	10	1	100%	Proportional to runoff volume
	CSO activation reduction	1	10	1	100%	CSO threshold for overflow
Impervious Area Reduction	Permeable pavement or bioretention in parking lots	1	10	1	100%	Impervious area removed
Low Maintenance	-	1	10	5	100%	BMP type
Socioeconomic Benefit	Near open space	1	10	0	100%	Within 0.10 mile
	Social equity	1	10	1	100%	City Social Vulnerability Analysis
Minimize Existing Flooding	-	2	10	0	50%	-----
Improve Urban Tree Canopy	-	2	10	0	50%	Area to be used
Improve Water Quality	-	3	10	0	33%	Proportional to area to be used
Slope Suitability	In open areas (<5%, 5% to 10%, 10% to 15%, 15% to 20%, >20%)	4	10	-10	25%	10,7.5,2.5,0,-10
Soil Infiltration		4	10 or 5	-10	25%	Soil A or B (10), Soil C (5), Soil D or urban (-10)

Green Infrastructure Ranking Tool PowerBI Interface



Charlie Sydnor/ Blackwell Playground

- Bioretention and permeable parking



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PIN	S0000188001
Flow_scr	10
CSO_scr	2.5
ImpRed_scr	0
Maint_scr	10
SPark_Scr	0
Flood_Scr	5.63
Vunl_scr	6
Tree_Scr	10
WQ_Scr	10
Soil_scr	-10
Slope_scr	9.53
Total_scr	27.24
Norm_Sor	0.64

P_BioID	P_BioS0000228001913
PIN	S0000228001
Flow_scr	0.5
CSO_scr	1
ImpRed_scr	0
Maint_scr	10
SPark_Scr	0
Flood_Scr	10
Vunl_scr	8
Tree_Scr	10
WQ_Scr	10
Soil_scr	-10
Slope_scr	6.28
Total_scr	17.87
Norm_Sor	0.41

Green Infrastructure Master Plan Update

Partner Project Funding

Partner Project Funding

Annual $200,000 budget for Green Infrastructure Partner Project Funding

Project Narrative

- Scope of Proposed Work
- Location Details
- Collaborating Partners & Roles
- Budget Summary
- Community Scale Benefits
- Metrics & Pollutant Reductions
- Maintenance Plan *(in perpetuity!)*
- Timeline

Questions?

Please comment in the chat box or unmute!

Resources

A PDF of this presentation will be distributed.
Visit RVAH2O.org!

NEXT MEETING
FALL 2022

Grace.LeRose@rva.gov