CITY OF ATLANTA DEPARTMENT OF watershed management

Andre Dickens, Mayor
Mikita K. Browning, Commissioner

City Utilities Committee & Community Development/ Human Services Committees

Joint Work Session - Stormwater Management Briefing

December 7, 2023

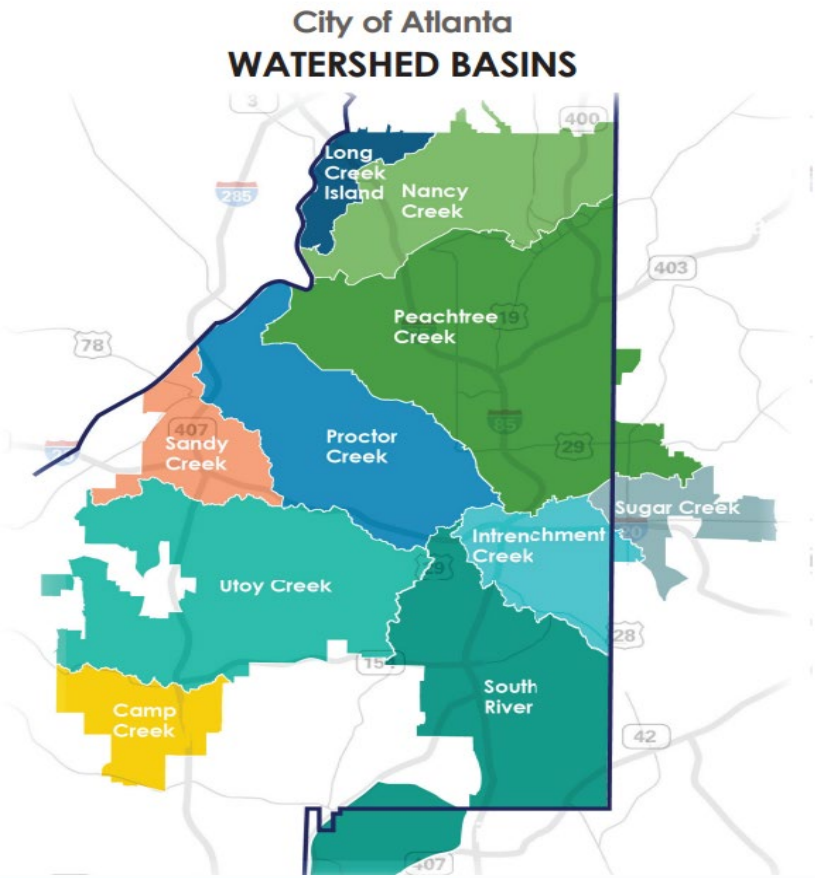
Agenda

- Atlanta's Watershed Development
- Atlanta's Growth and Development
- Rainfall Trends & Flooding Impacts
- Stormwater Impacts September 14, 2023
- Solutions Approach
- Stormwater Legislation & Future Efforts

Atlanta's Watershed Development

Atlanta Located on Eastern Continental Divide

- 7 Watersheds – Western
- 3 Watersheds - Eastern

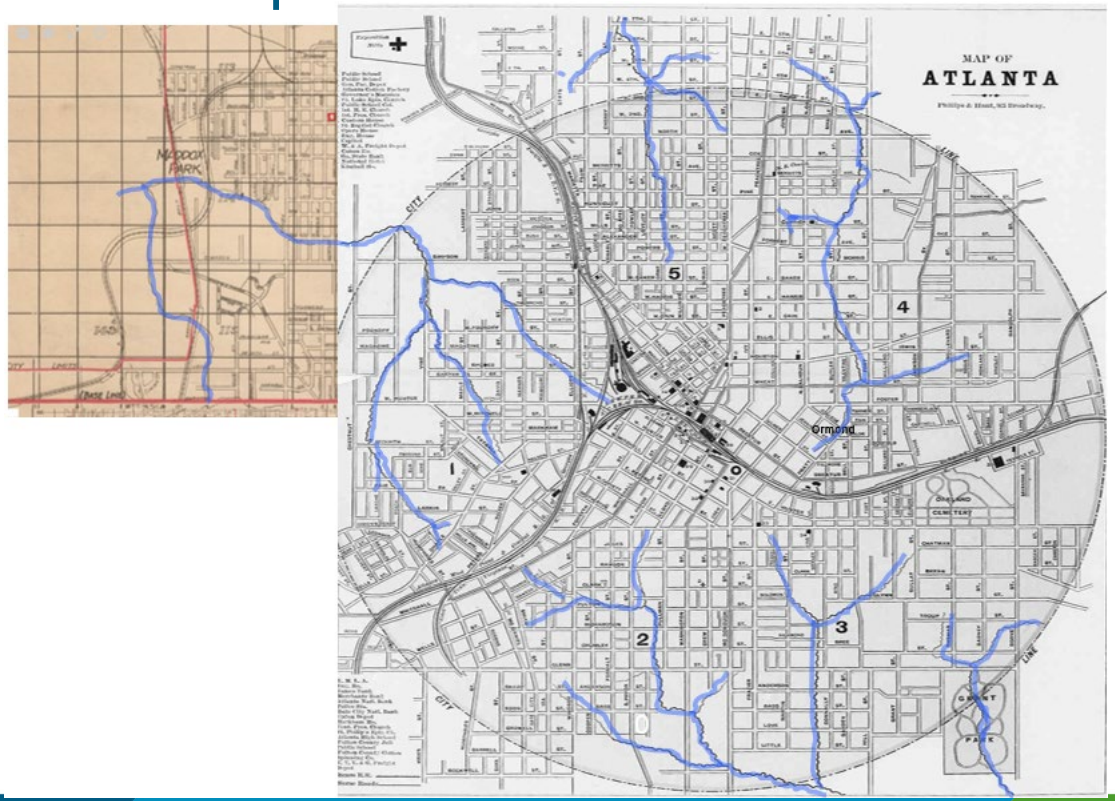


City of Atlanta Facts

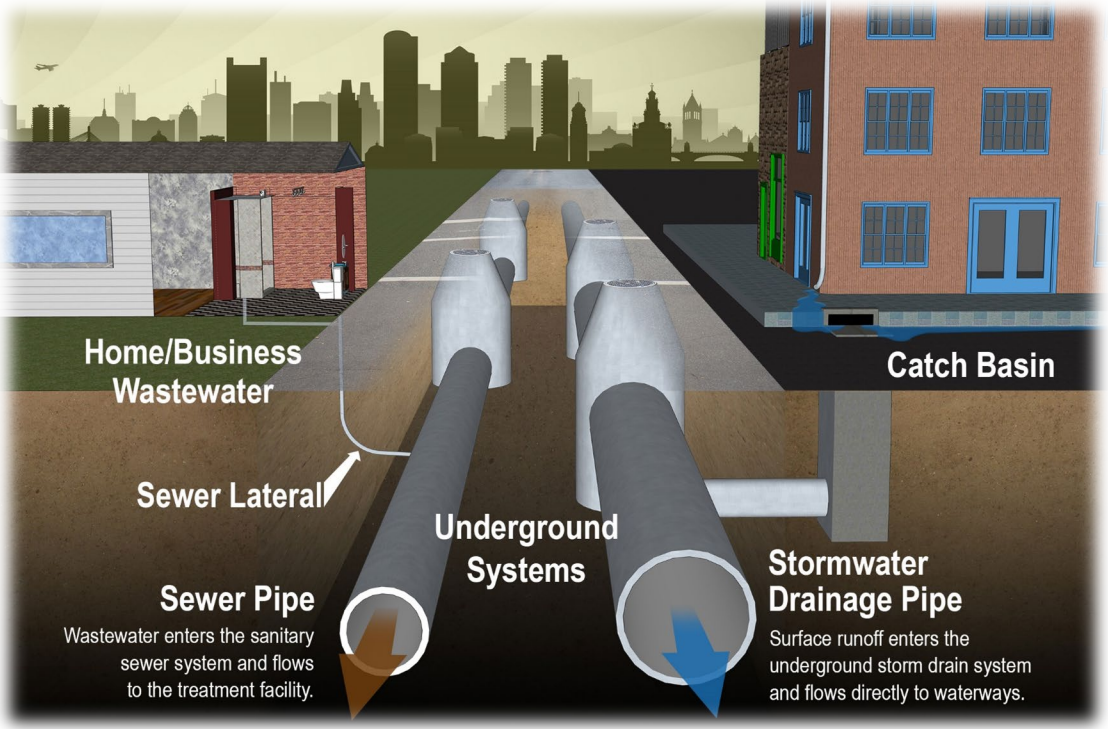
- 133 square miles
- Atlanta Population – 510,885
- Regional Population - 6,013,000
- Substantial commuter population and visitors

Historical Perspective

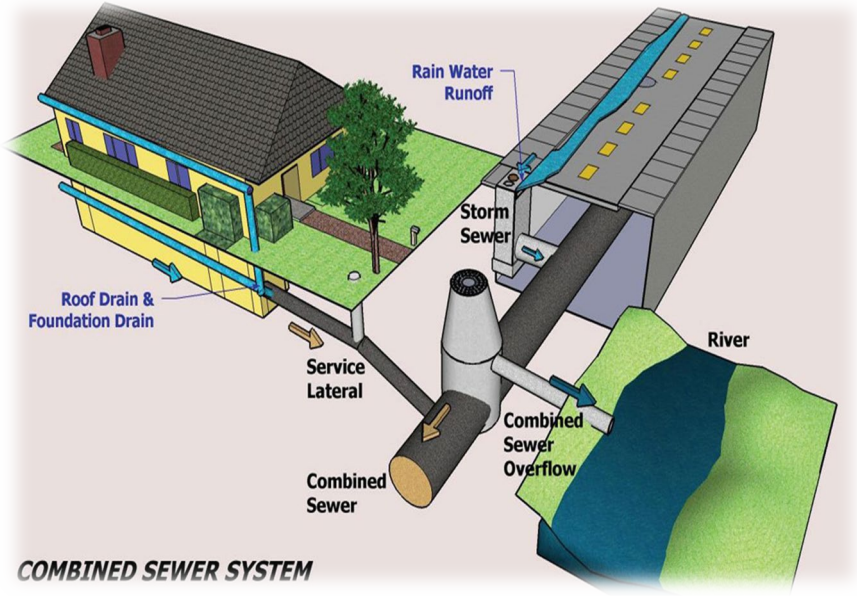
Map of Atlanta
1886

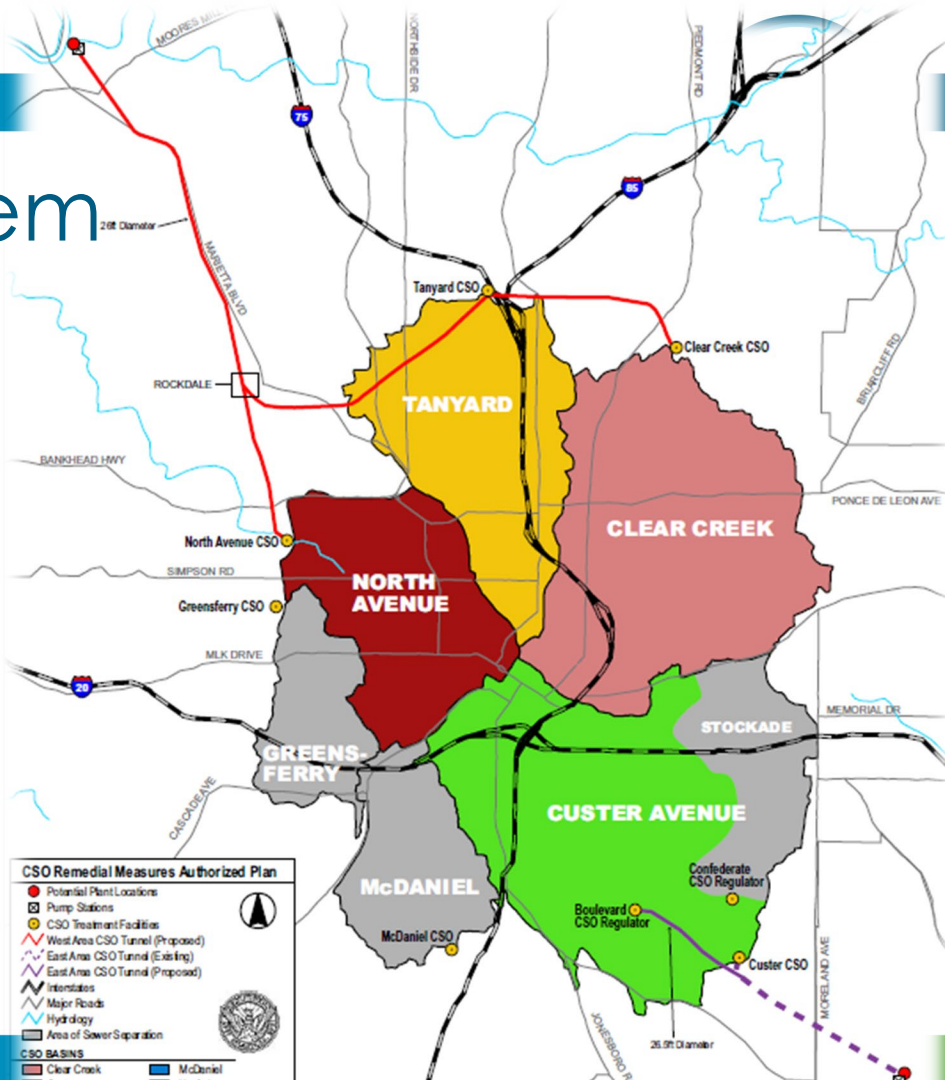


Separate Stormwater System



Combined Sewer System

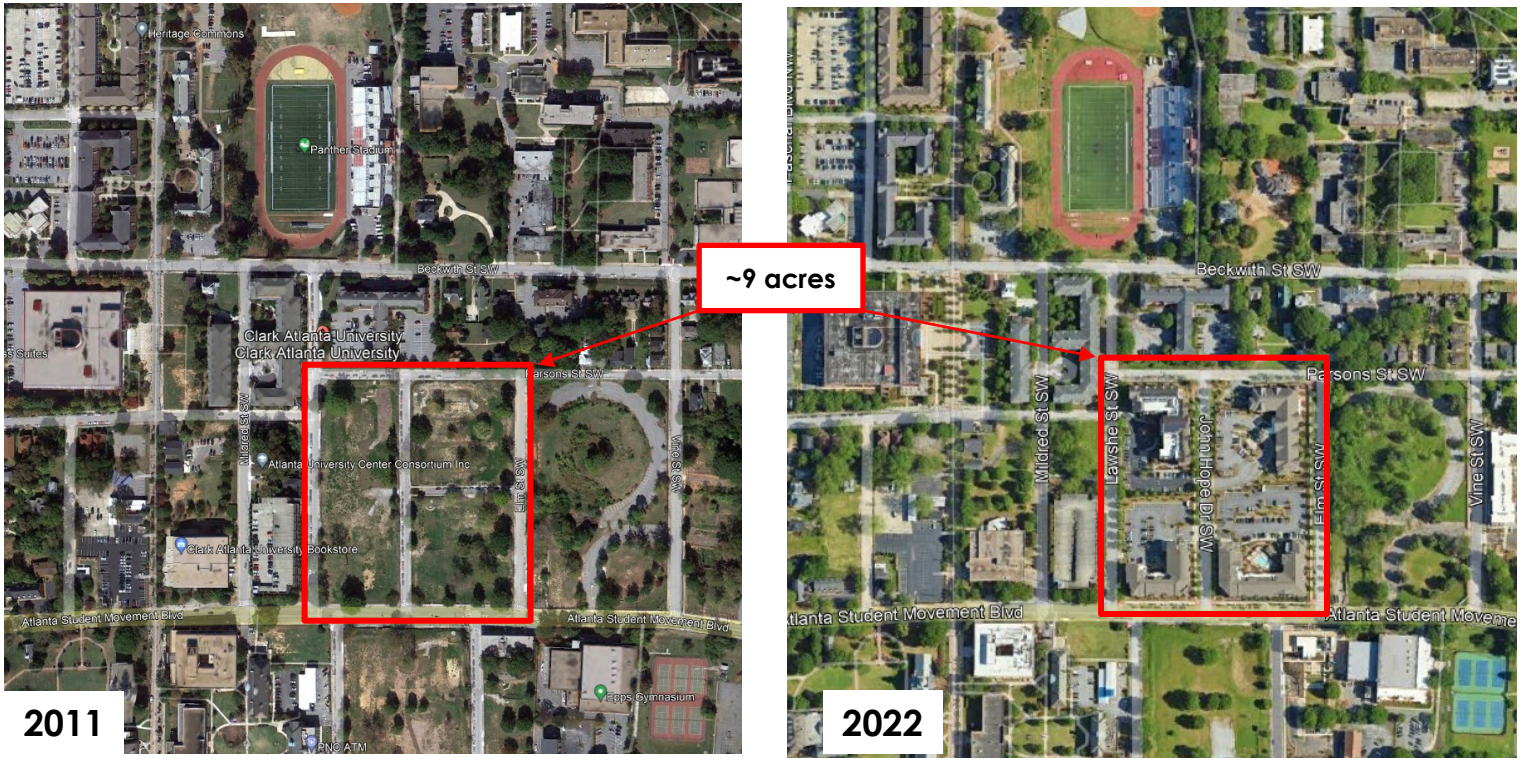




Atlanta's Growth and Development

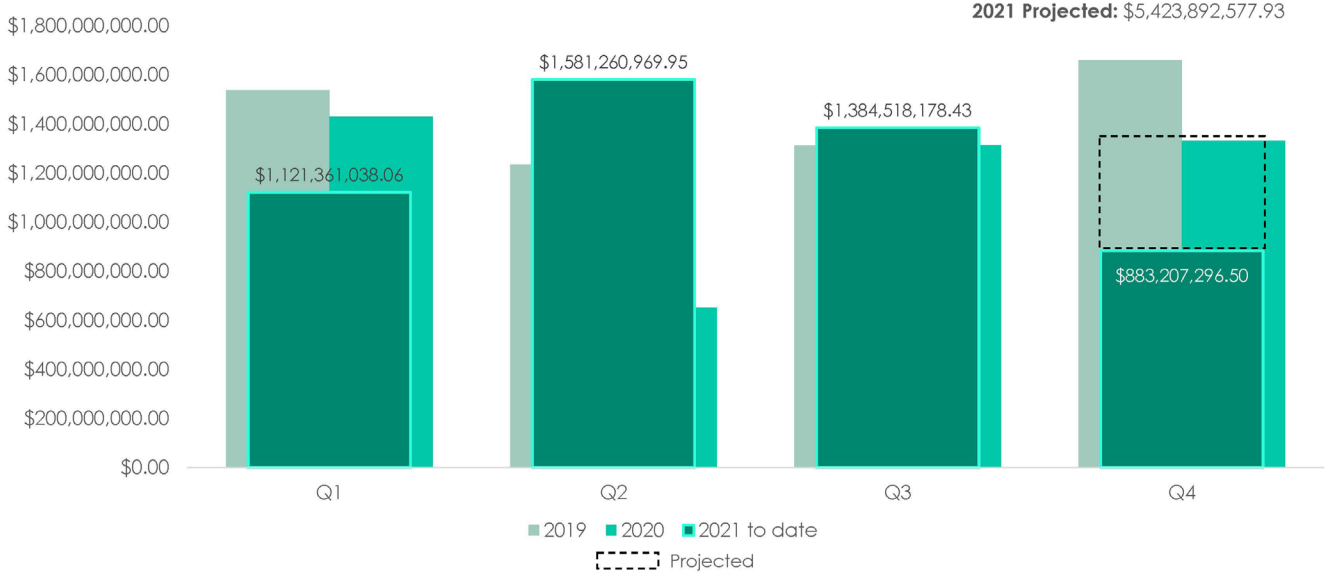
Atlanta's Growth - Typical

Land Development Example



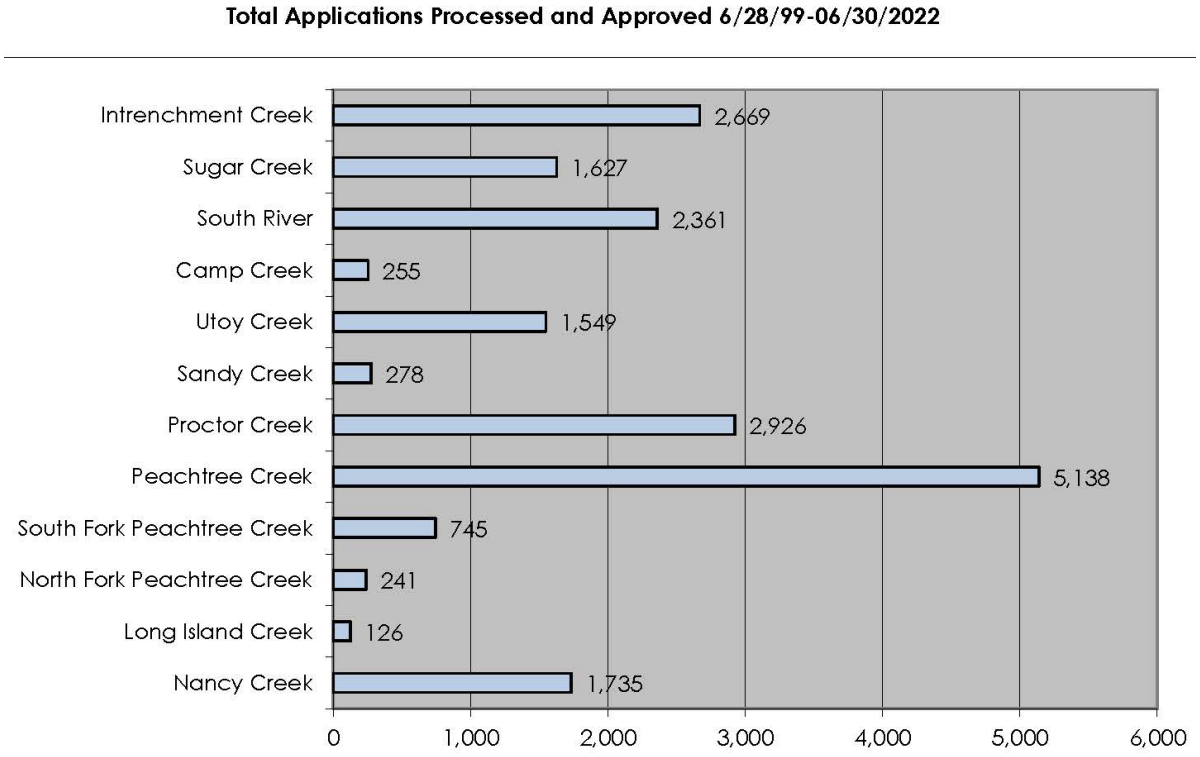
Construction Valuation

2019: $5,740,922,038.33
2020: $4,727,433,840.58
2021 YTD: $4,970,347,482.94
2021 Projected: $5,423,892,577.93

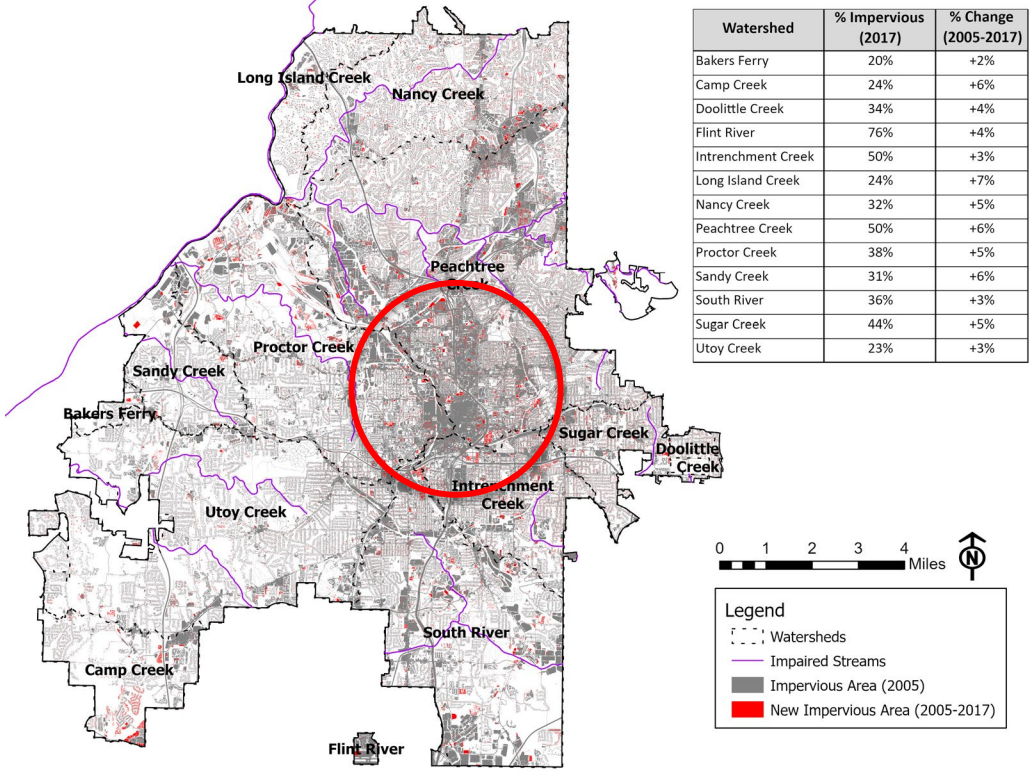


Department of CITY PLANNING

Developer Applications Approved – 19,650 Total



Increase in Impervious Area



Watershed	% Impervious (2017)	% Change (2005-2017)
Bakers Ferry	20%	+2%
Camp Creek	24%	+6%
Doolittle Creek	34%	+4%
Flint River	76%	+4%
Intrenchment Creek	50%	+3%
Long Island Creek	24%	+7%
Nancy Creek	32%	+5%
Peachtree Creek	50%	+6%
Proctor Creek	38%	+5%
Sandy Creek	31%	+6%
South River	36%	+3%
Sugar Creek	44%	+5%
Utoy Creek	23%	+3%

Custer Basin (INC)
53.8 % impervious
46.2 % pervious

North Ave Basin
66.1 % impervious
33.9 % pervious

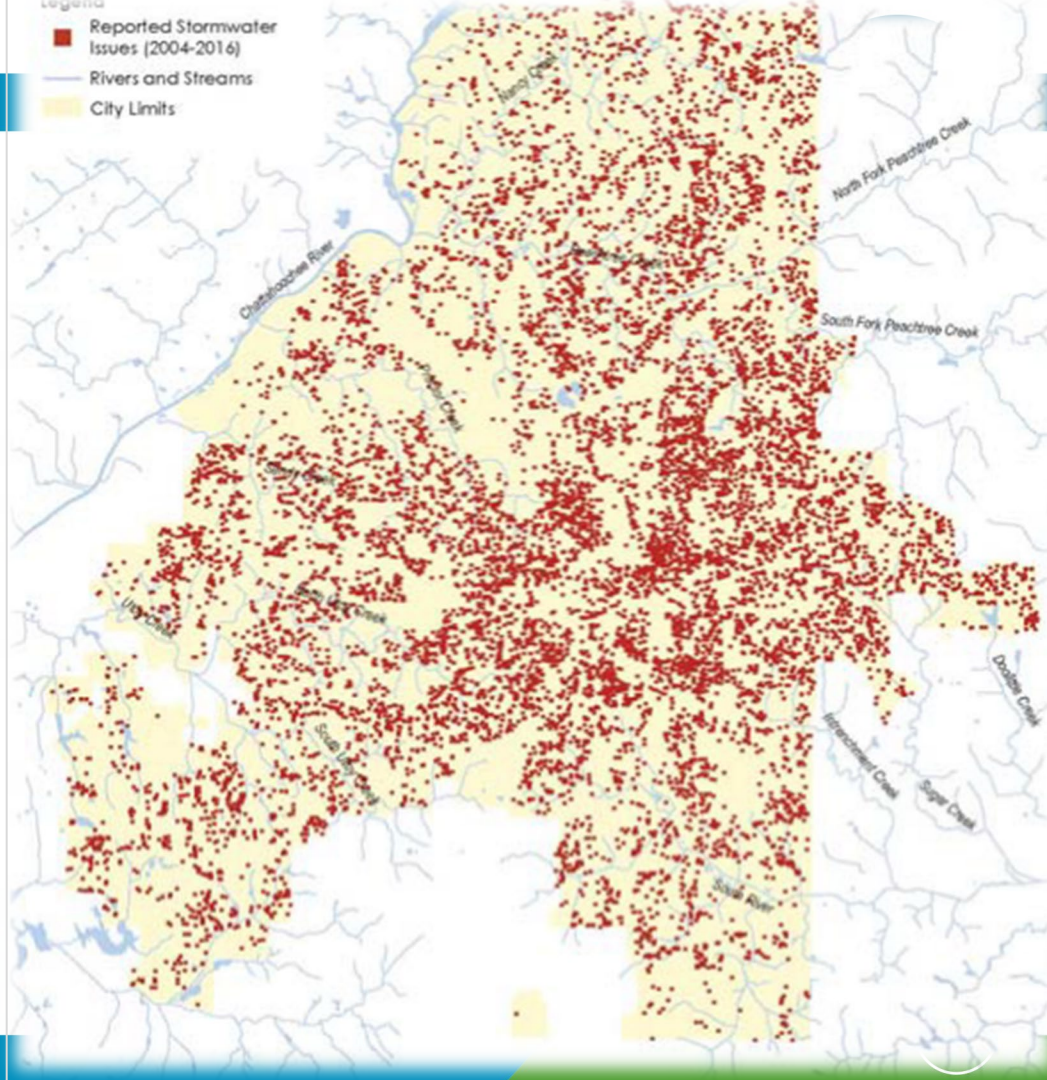
Clear Creek Basin
60.0 % impervious
40.0 % pervious

Tanyard Basin
70.1 % impervious
29.9 % pervious

Rainfall Trends & Flooding Impacts

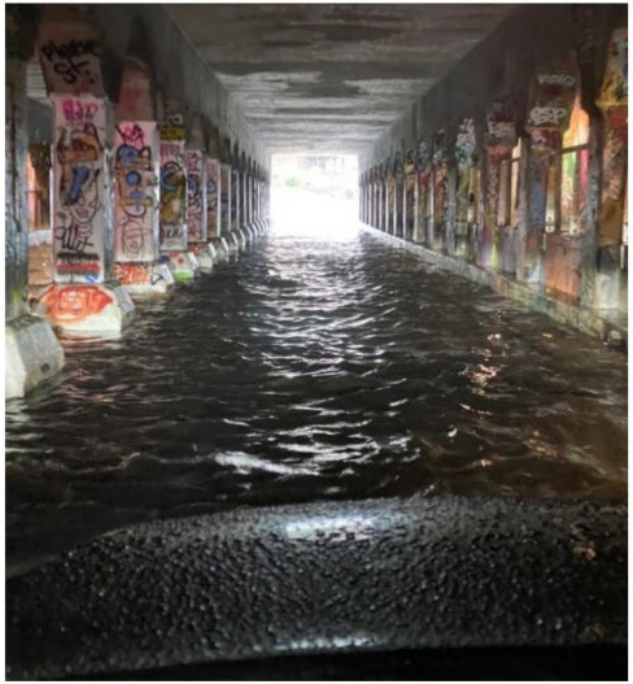
Stormwater Related Complaints

- Citywide Issue
- No communities and area are immune!

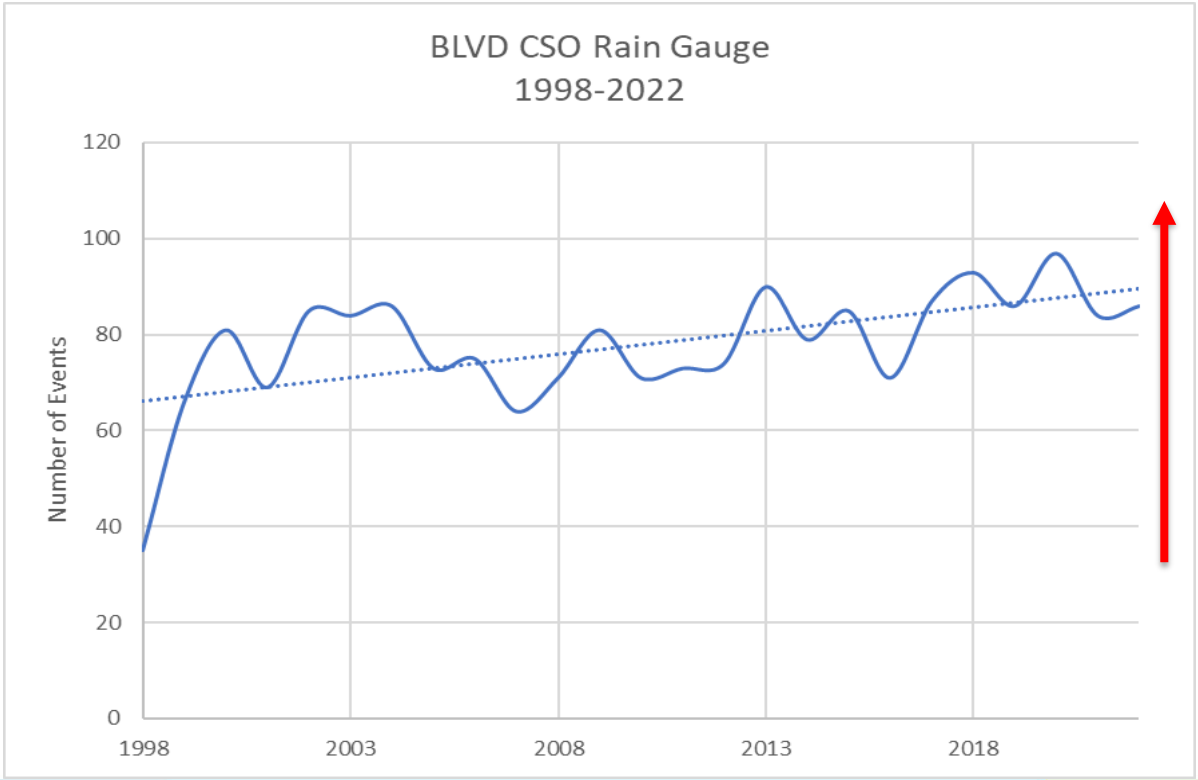


Stormwater Runoff - Persistent Problem

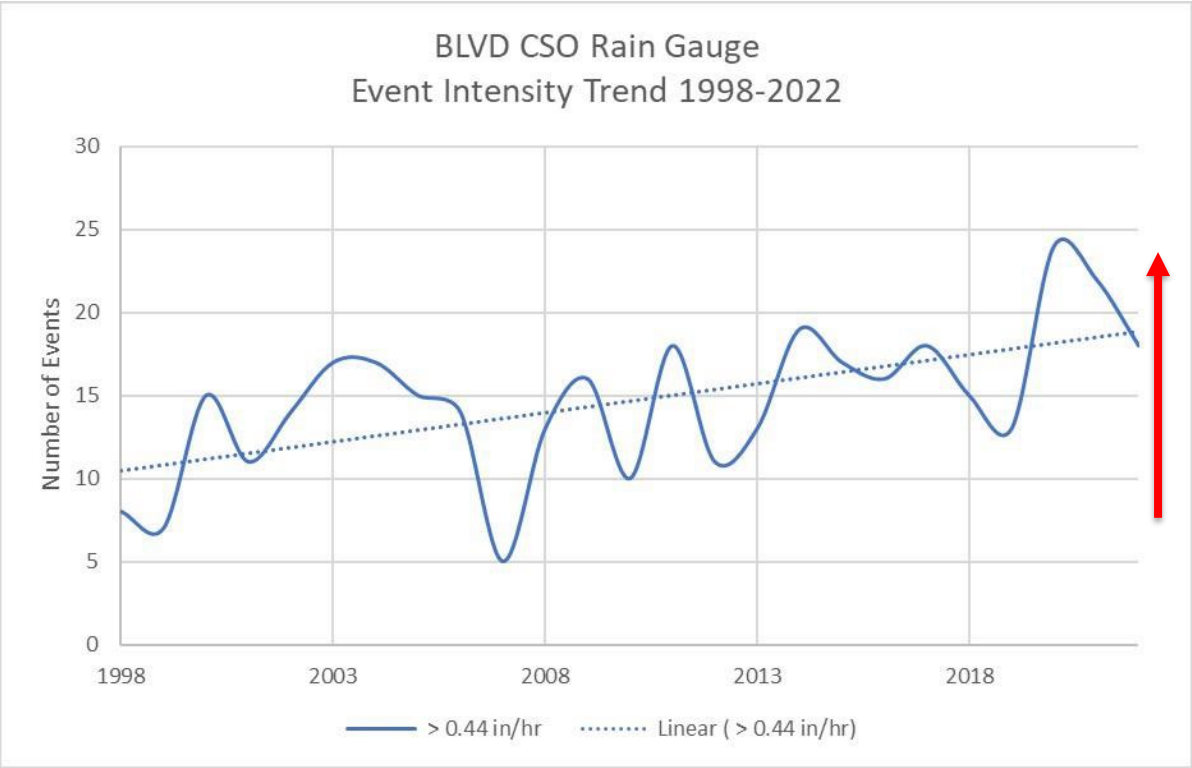
Street Flooding



Historical Storm Frequency Trend



Historical Storm Intensity Trend



Historical Storm Events

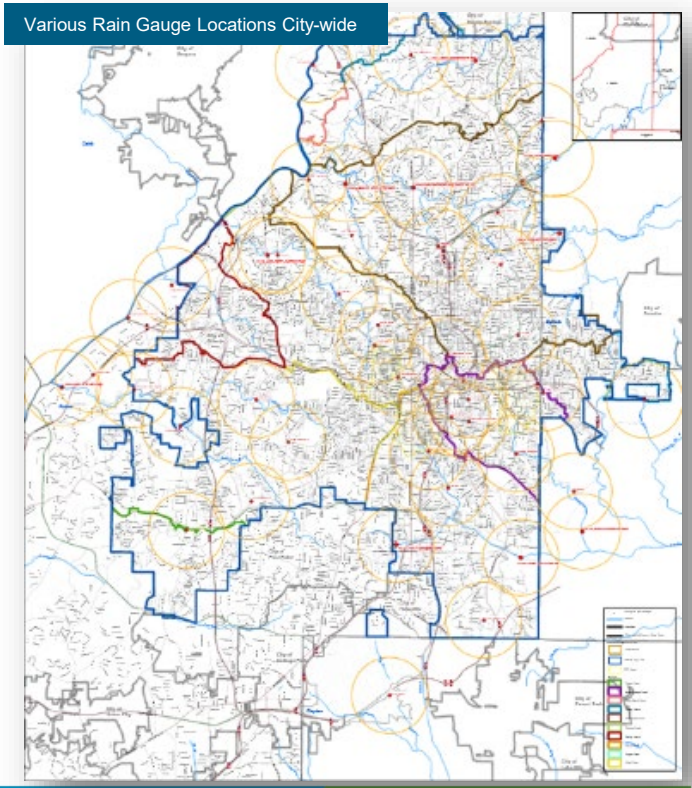
Rank	Date	Recurrence Level
1	9/14/2023	50 year
2	7/9/2012	10-25 year
3	6/30/2020	10-25 year
4	6/20/20	5-10 year
5	10/10/20	5-10 year
6	8/31/06	5-10 year
7	7/11/12	2-5 year
8	9/21/09	2-5 year*
9	7/3/12	2-5 year
10	5/5/03	2-5 year

Other Historic Event - September 21, 2002. Tropical Storm Hanna | Vine City

*estimated 10 to 20 inches of rain occurred in less than 24 hours across the metro Atlanta region *(National Weather Service)*

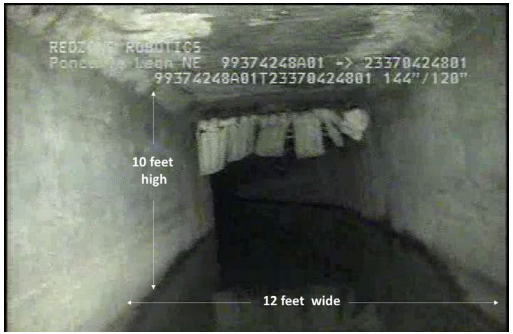
Robust 2-D Model Characterizes Atlanta's Collection System & Stormwater Overland Flow Impacts

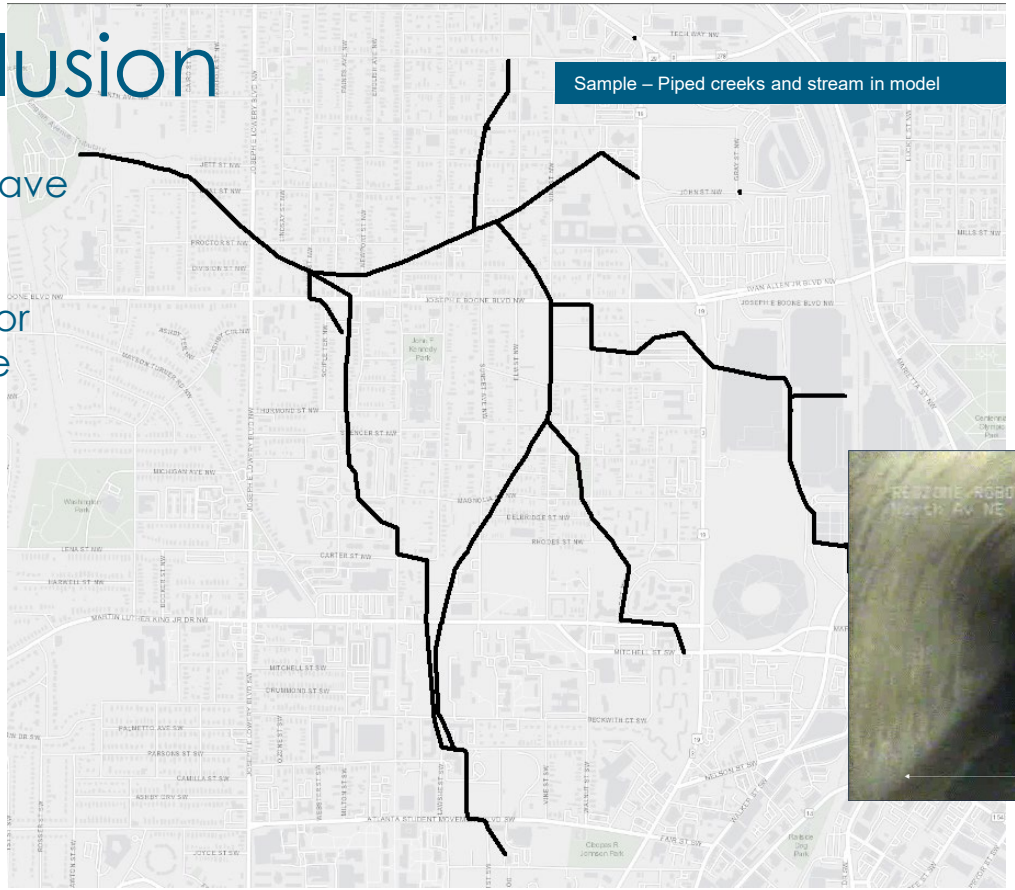
- Model includes Combined and Separate Basins
- Topographic 2-D Mesh
- Supported by Data Enhancements including;
  - 247 Flow Meters distributed city-wide
  - 39 City-Owned Rain Gauges
  - 4 Active Weather Stations
  - 10 Active Camera Sites

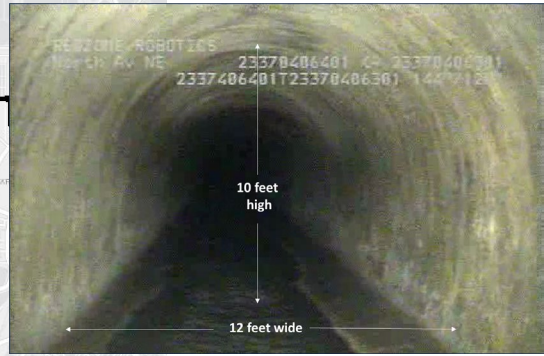


Model Inclusion

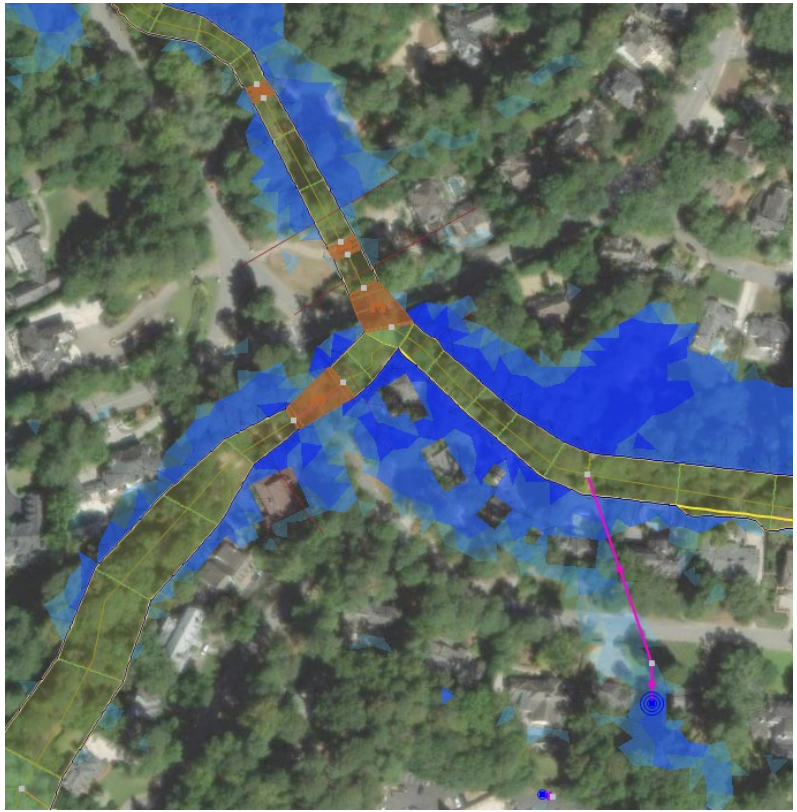
- Combined sewers that have replaced creeks
- Collection system data for sewers 8-inch and above



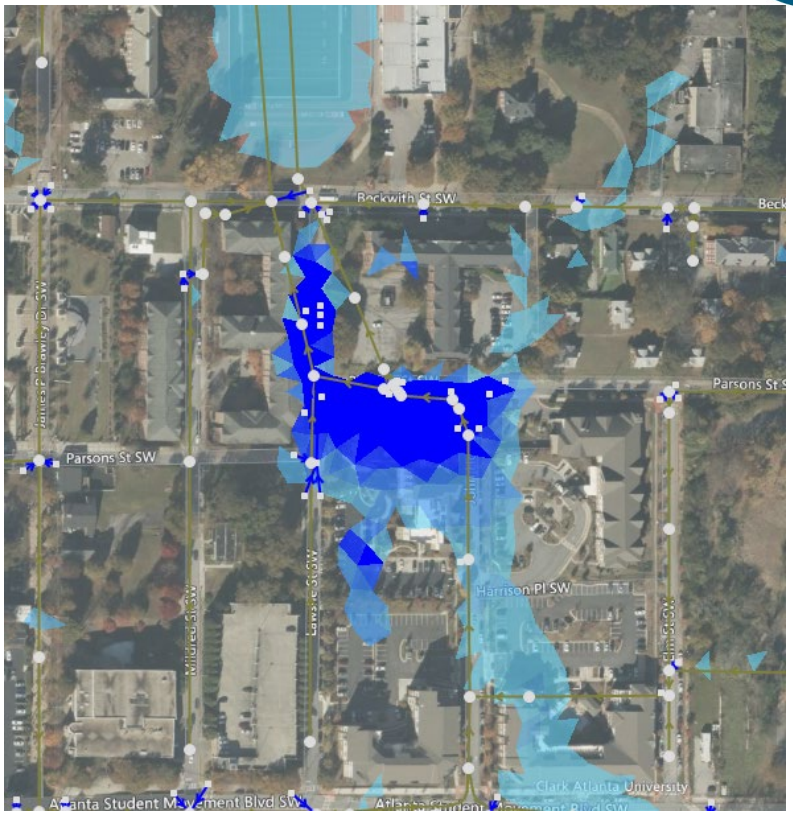




Separated Basin 2-D Model



Combined Basin 2-D Model



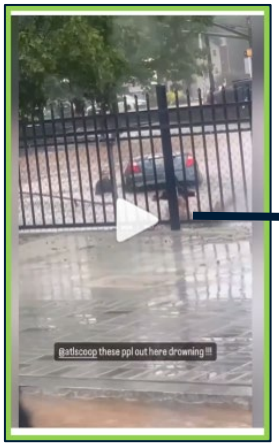
Stormwater Impacts
September 14, 2023

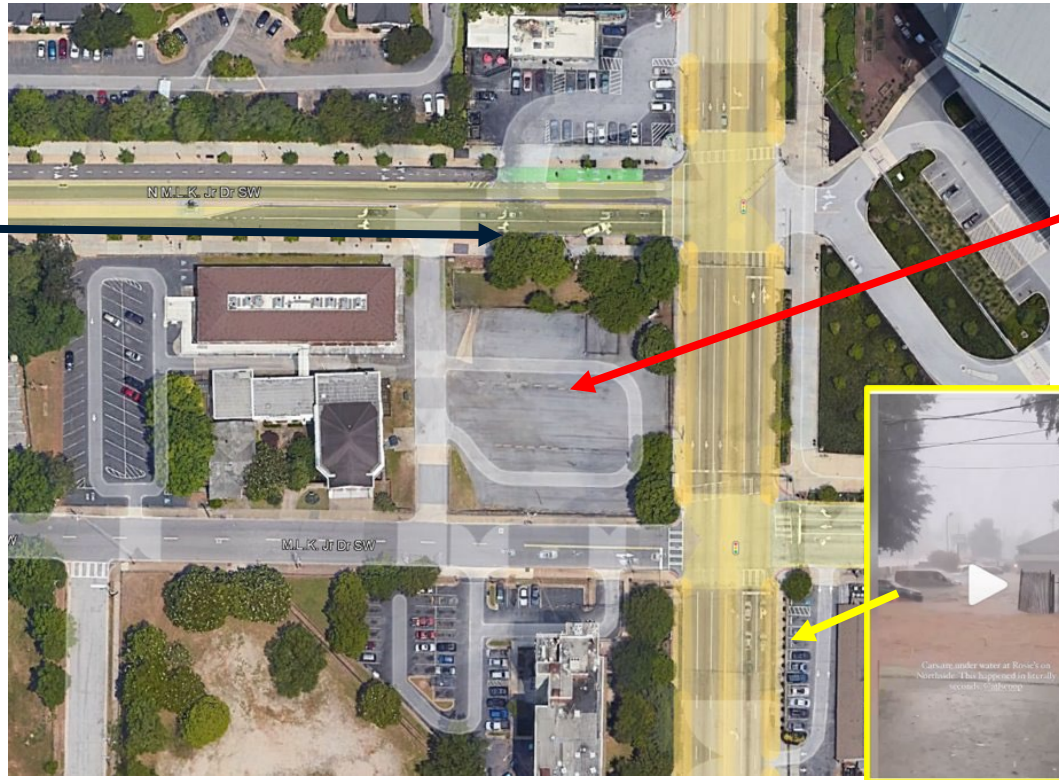
September 14, 2023

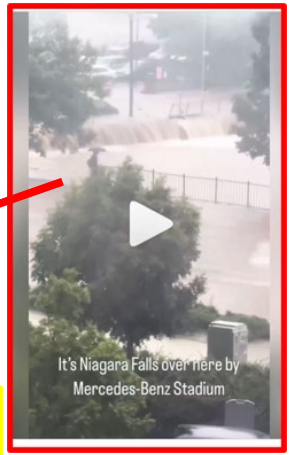
- North Ave Basin severely impacted
  - Clark Atlanta University

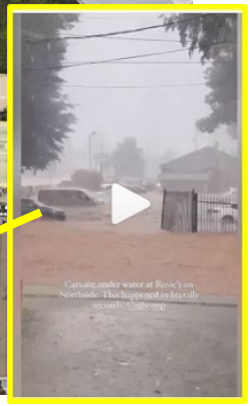
Rainfall Characteristic	September 14	Design Storm Equivalent
Volume	2.82 – inch	10 to 25 – year
Peak Intensity	5.36 – inch/hour	50 – year
Duration	1 hour	1 hour

Northside Drive & ML King Boulevard

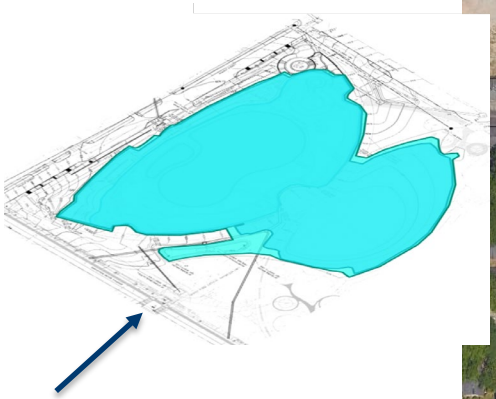




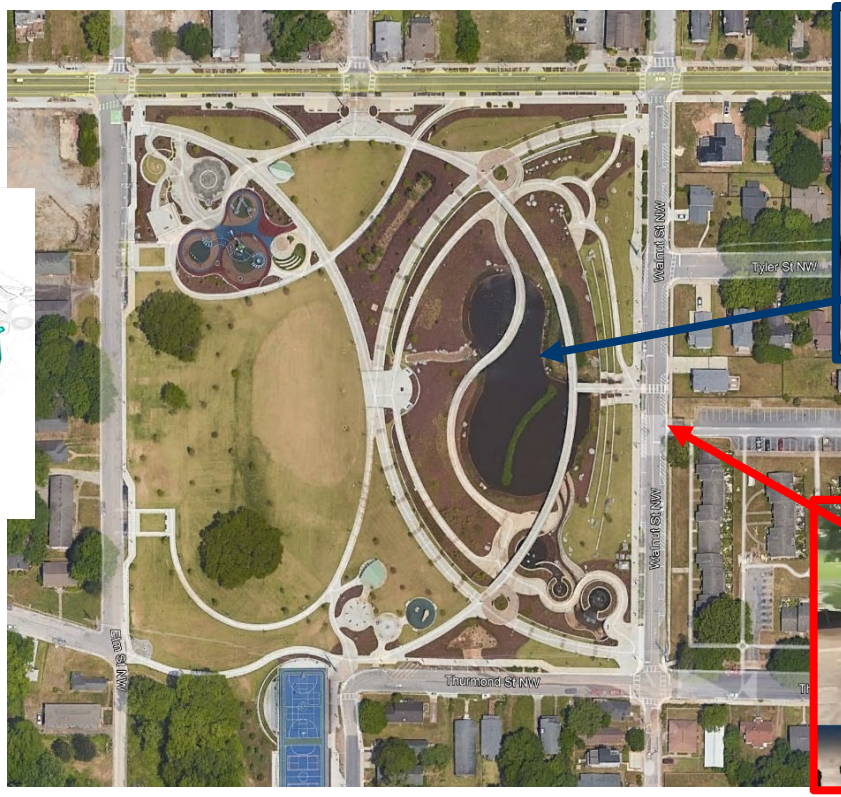




Rodney Cook Park

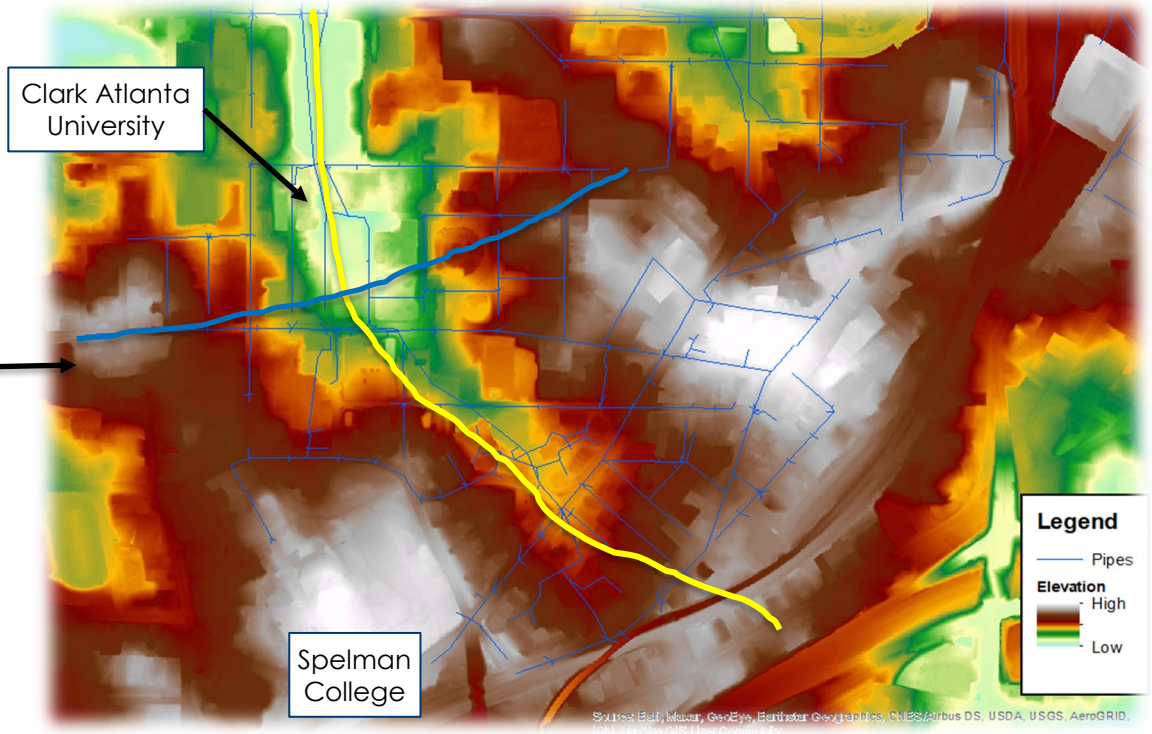


Designed for Stormwater Capture/Detention



Parsons & Lawshe Streets – Atlanta University Center

E/W profile
N/S profile

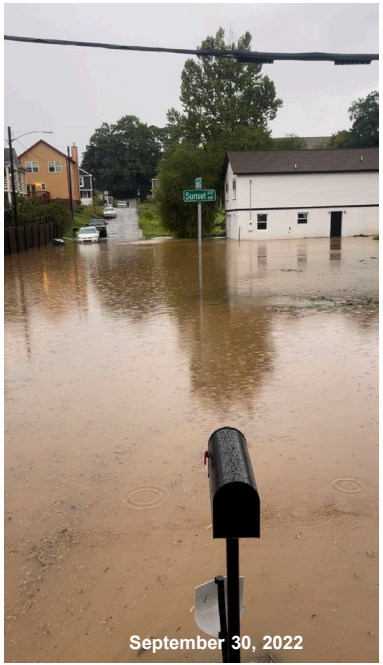


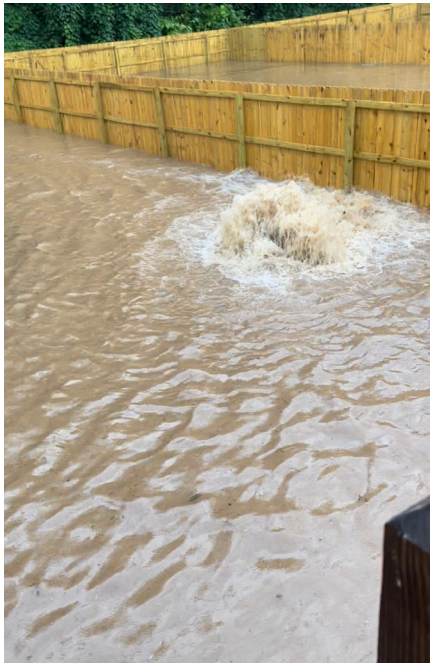
North - South profile (Yellow)

East - West profile (Blue)

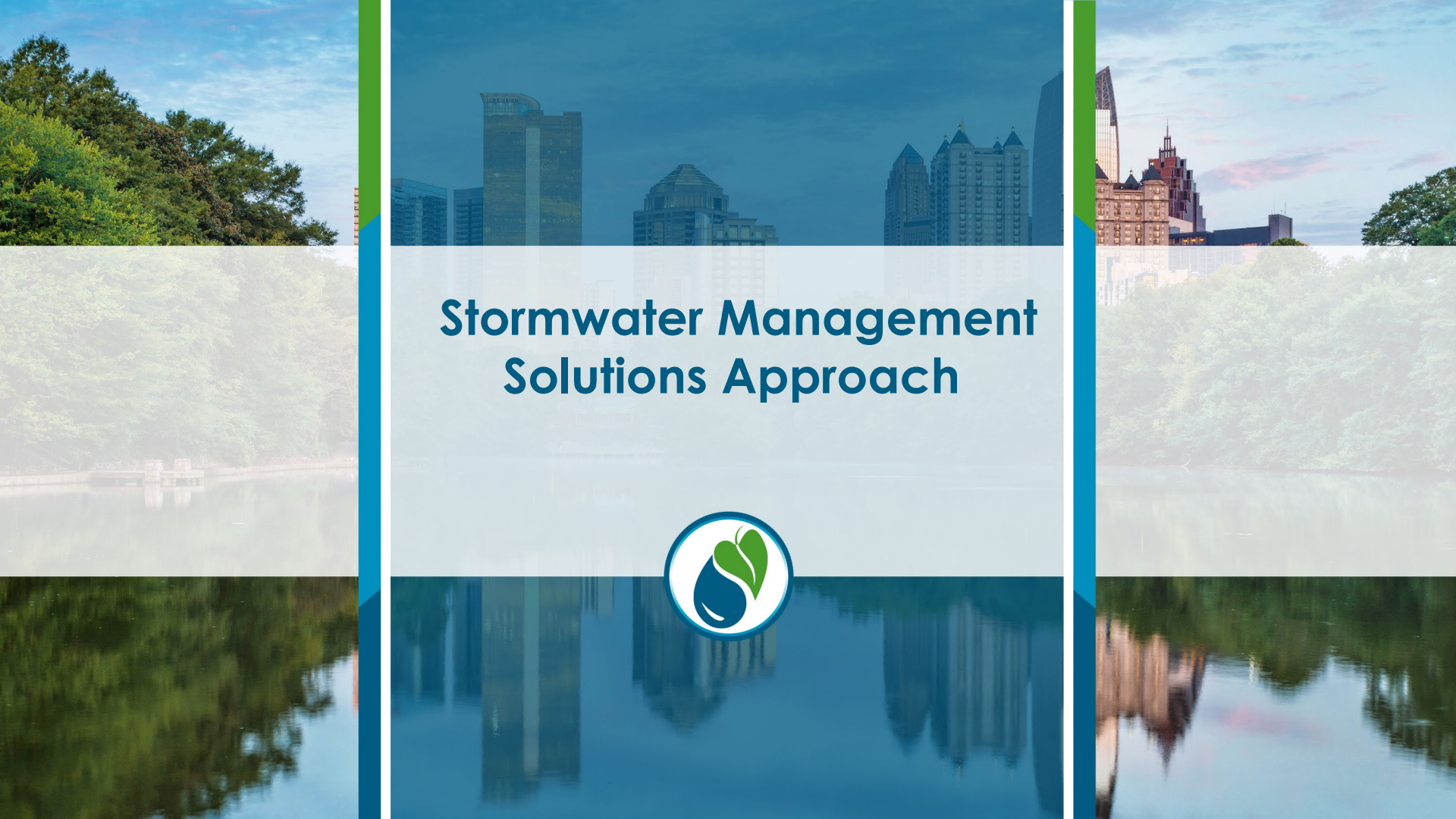
Other Areas of Urban Flooding

- 117 claims filed for 9/14/2023

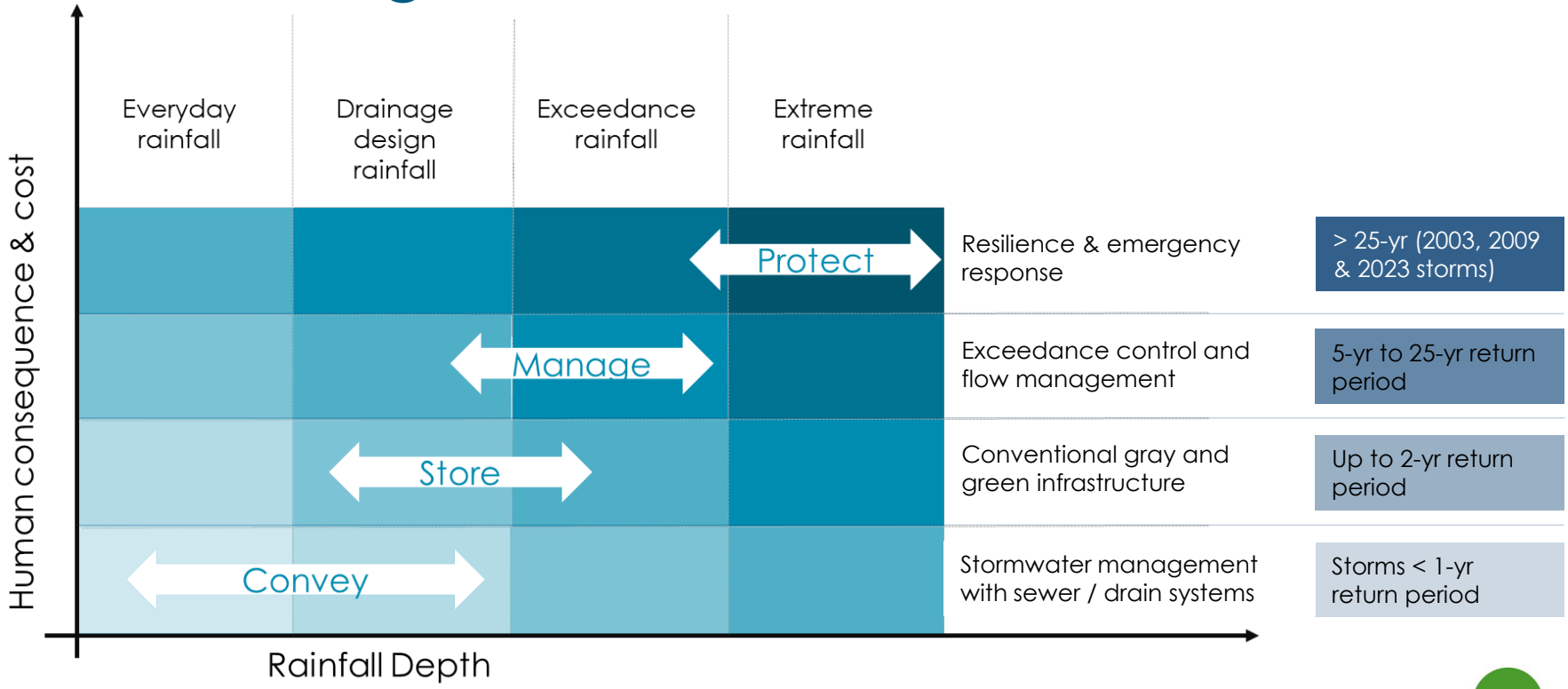




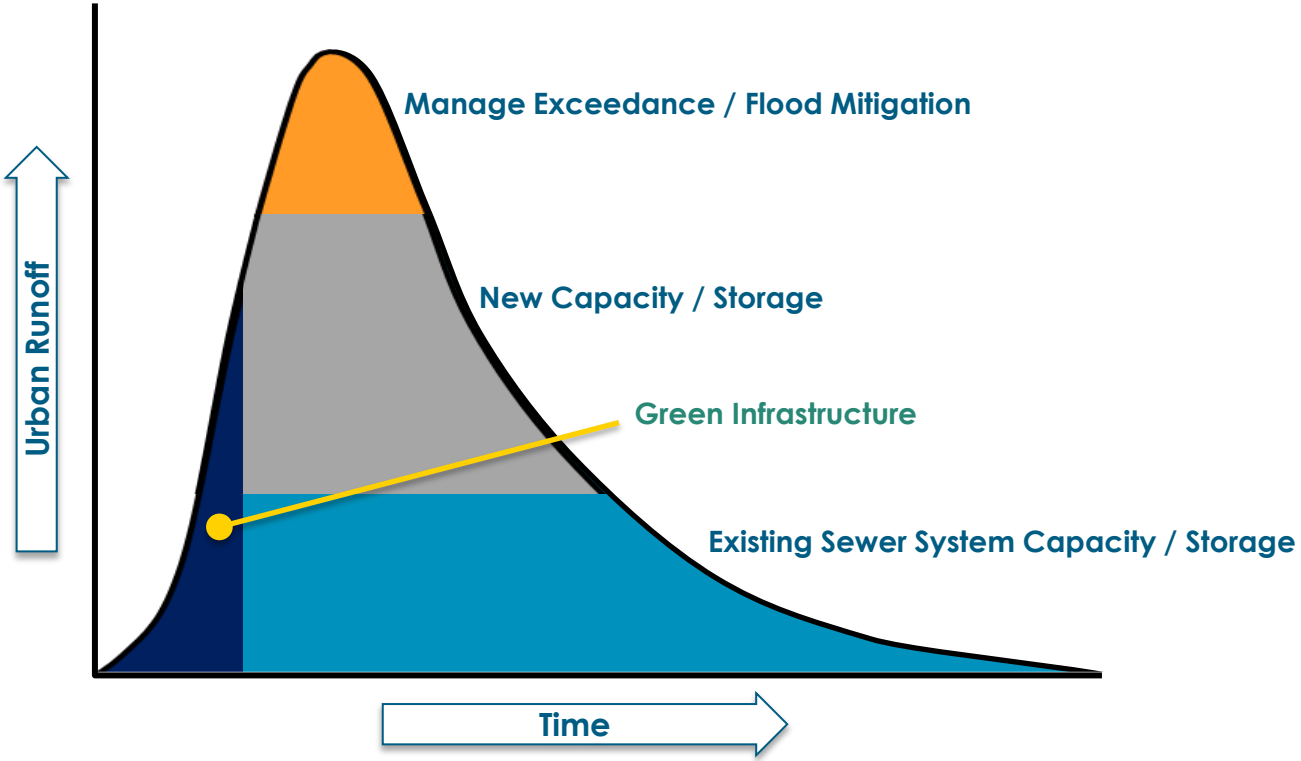
Stormwater Management Solutions Approach



Rainfall Design Criteria

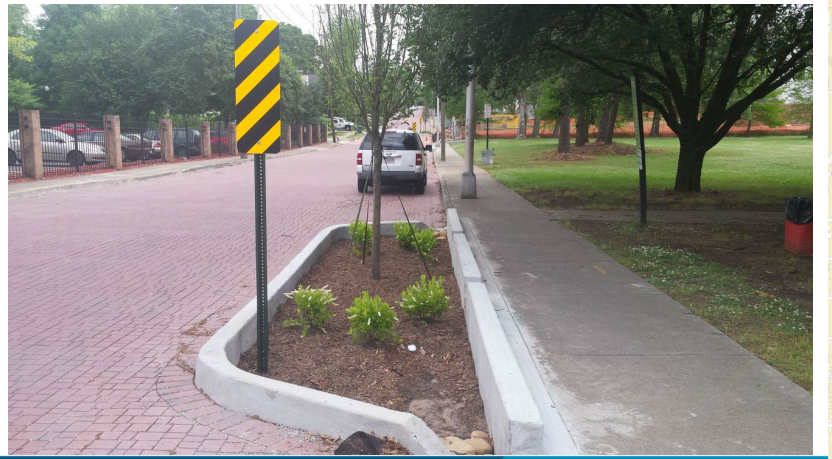


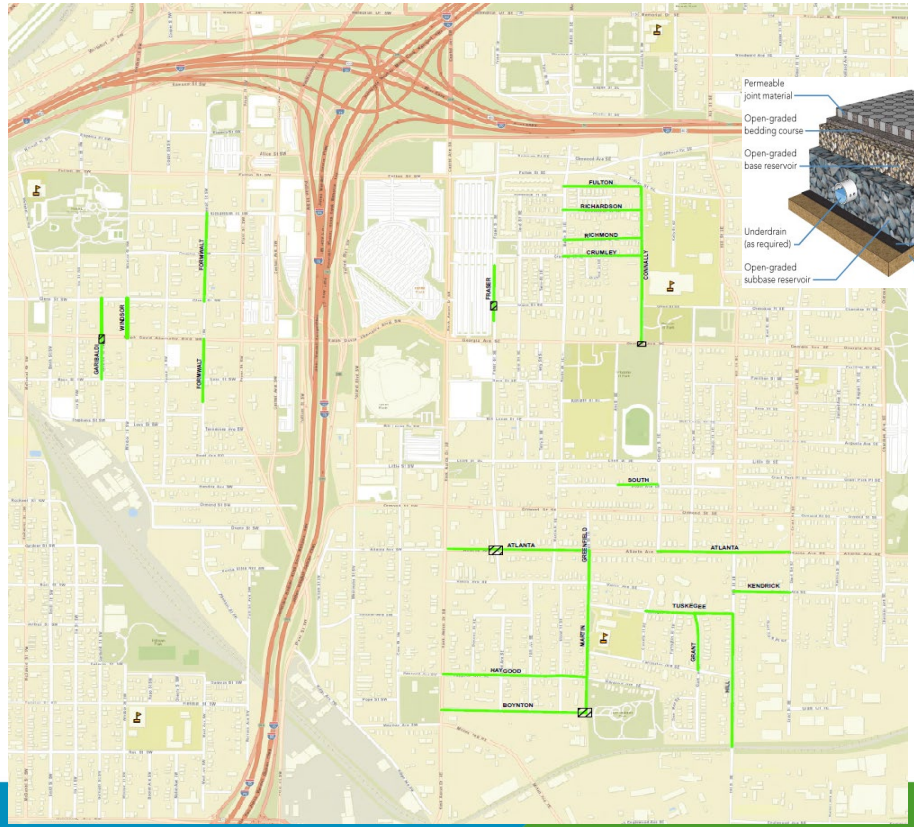
DWM Solutions Approach



Permeable Paver Roadways – Southeast Atlanta

- 4+ miles of Permeable Paver Roads
- 2 MG capacity relief via surface flow capture
- Capital Cost - $15.8M
- Completed Dec 2016





Green Infrastructure Measures

Rain Garden – Adair Park

Bioswale - Edgewood Townhomes

Permeable Pavers - Urban Market on Howell Mill

Stormwater Planter - Whitehall Terrace SW

McDaniel Branch Wetlands – Bowen Cir SW

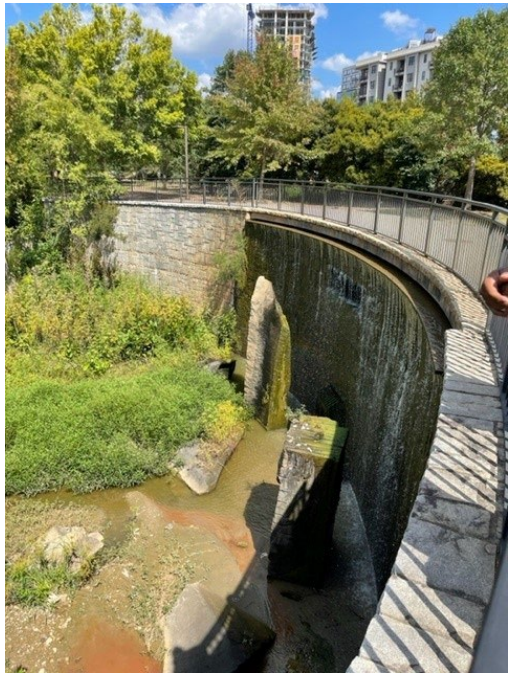
Bioswale – GT Klaus Building

Combined System Capacity Relief w/ Green Infrastructure

Old Fourth Ward

- Combined Sewer Capacity
- Stormwater Capture/Detention
- Re-imaged from Gray Solution

- 500-Year Event
- Drainage area – 45+ acres



Combined System Capacity Relief w/ Green Infrastructure

Rodney Cook Park

- Combined Sewer Capacity
- Stormwater Capture/Detention
- Re-Imaged from Gray Solution

- 100-Year Event
- Drainage area - 130 acres

Custer CSO Basin Capacity Relief

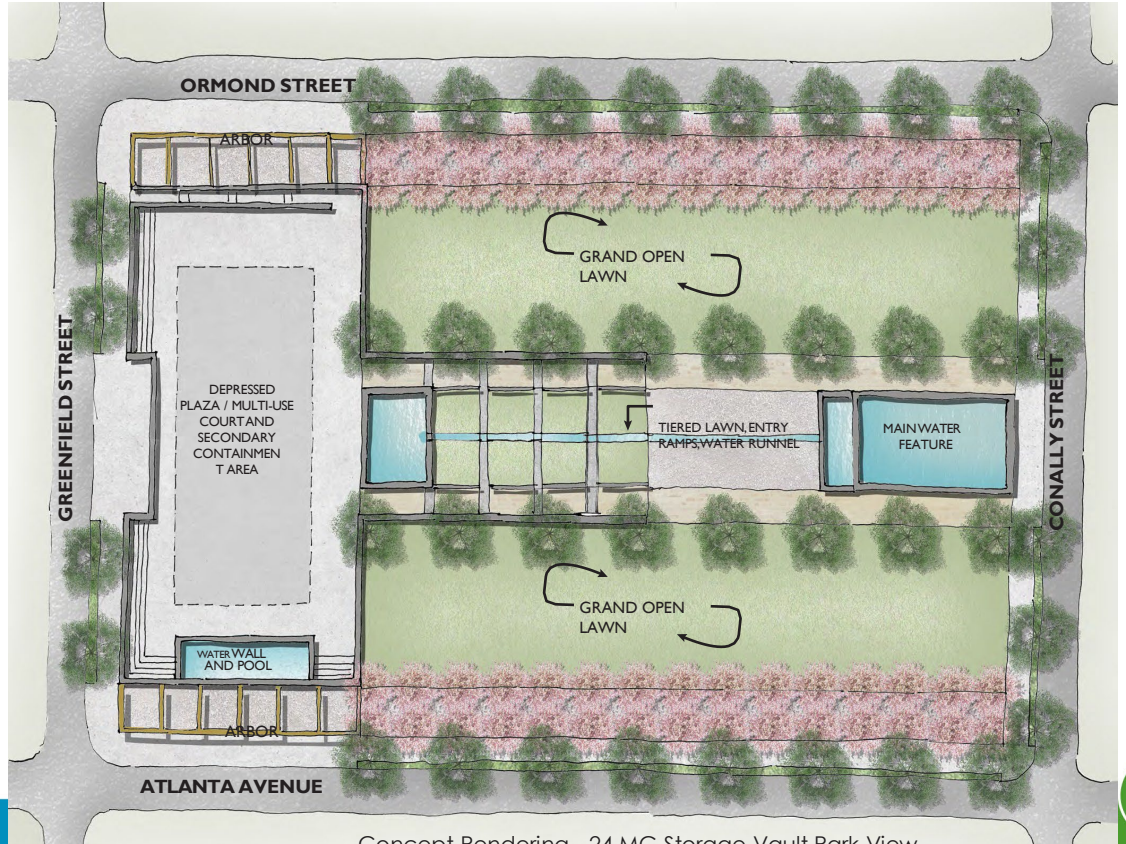
Media Lot Combined Sewer System Storage Vault

- Capacity - ~5.9 MG
- Located in media parking area of Georgia State Stadium
- Completed February 2014
- Construction Cost - $19.6 M

Construction – Media Lot Vault 5.9 MG

Custer Multi-Benefit Project

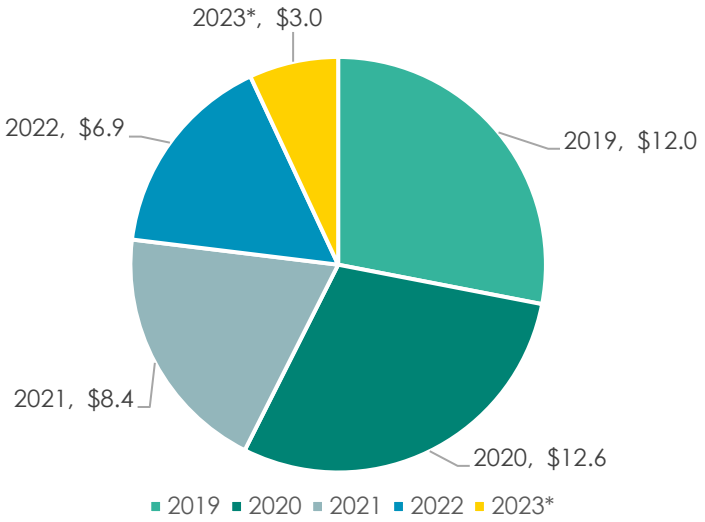
- Combined Green/Gray Solution
- Provides Combined Sewer System Capacity – 18 to 24 MG
- Above ground multi-use area with greenspace and stormwater capture/detention
- Design/Build Delivery – Phase 1 Commencing 1st Qtr 2024
- Est. Construction Cost - $72 M



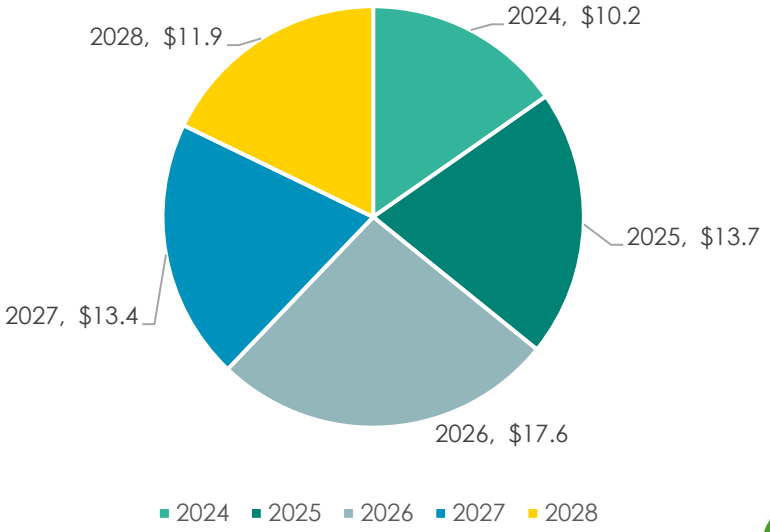
Concept Rendering - 24 MG Storage Vault Park View

Stormwater Management Investments Supported by the Municipal Options Sales Tax (MOST)

Stormwater Related Spending 2019-2023* ($MIL)



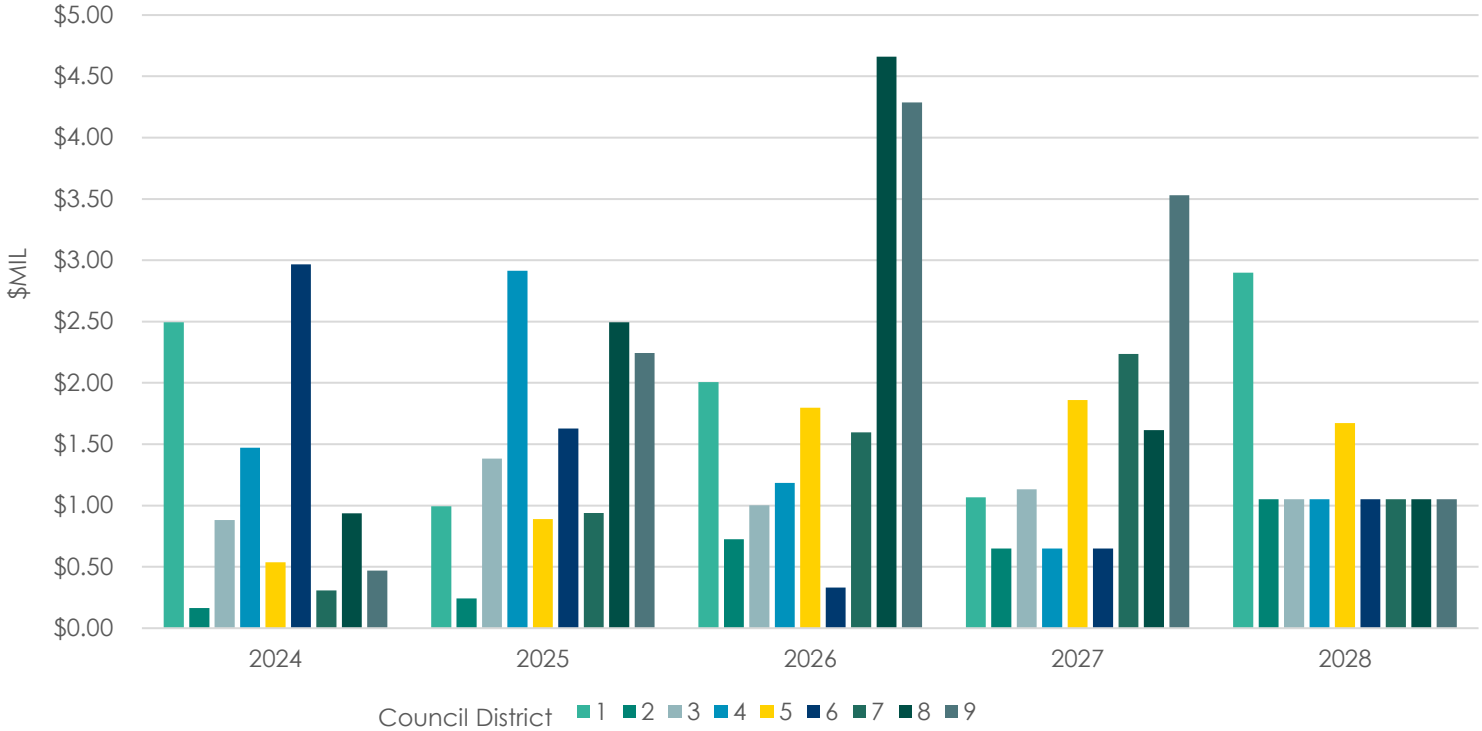
Anticipated Stormwater Related Spending 2024-2028 ($MIL)



** Year 2023 funding not fully utilized due to limited contractor availability.*

Anticipated Stormwater Management Investment Per District

Based on Identified Projects



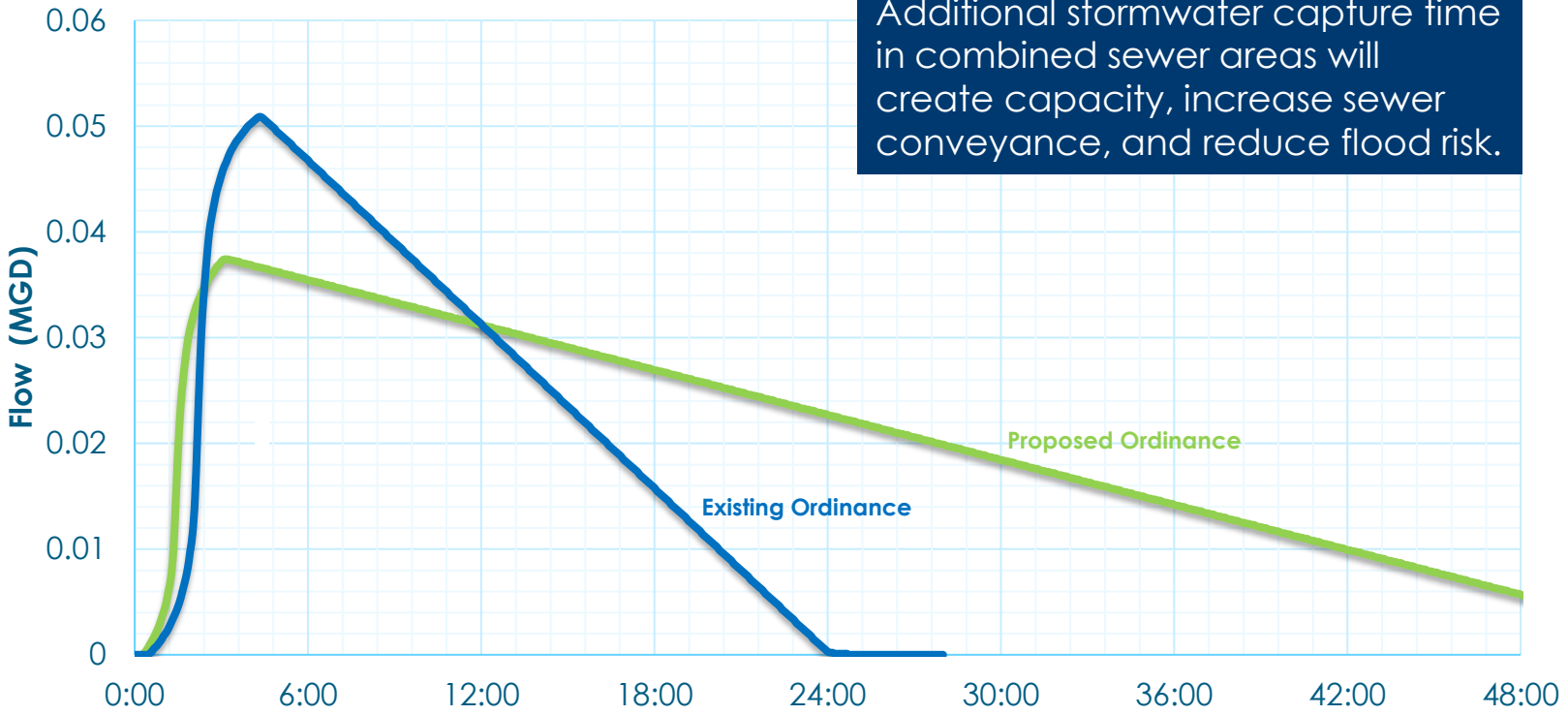
Stormwater Legislation
&
Future Efforts

Defining Imperviousness Supports 2-D Model

This industry leading approach embraces the latest in AI technology to calculate impervious areas from high resolution aerial images.

Extended Detention

Additional stormwater capture time in combined sewer areas will create capacity, increase sewer conveyance, and reduce flood risk.



Stormwater Utility Provides Relief

Stormwater Utility will generate funds to support the Stormwater Management Program including:

- Maintenance of stormwater infrastructure.
- Storm drain cleaning and Street sweeping
- Response to drainage complaints.
- Repair of drainage system failures.
- Capital Improvement Projects for drainage problems.
- Capital projects for watershed protection and channel restoration.
- Administration of the Stormwater Management Program.

Stormwater Utility Implementation

- Determine the effective and beneficial approach for establishing a Stormwater Utility and Fee
- Frameworks must consider;
  - Public outreach/external and internal stakeholder participation from inception to implementation
  - Current and future cost of managing stormwater
  - Rate structure & Affordability
  - Billing
  - Customer service

Q&A