



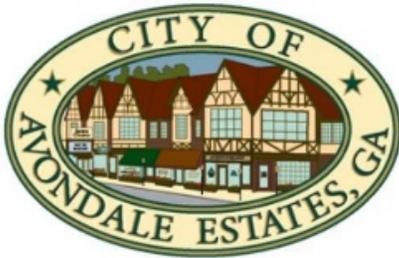
Public Information Meeting for the
Avondale Estates
Stormwater Master Plan

February 3, 2021





Meet the Facilitators



Shannon Powell
Assistant City Manager

Paul Hanebuth
Assistant City Manager

Rebecca Long
Communications Manager

Lori Visone, PE
Project Manager

David Elliott, PE, CFM
Senior Technical Advisor





Background

- ▶ City of Avondale Estates became responsible for the maintaining an aged stormwater infrastructure in 2004.
- ▶ Stormwater infrastructure is important
 - ▶ Transportation
 - ▶ Water Quality
 - ▶ Flooding
- ▶ Proper maintenance of stormwater infrastructure is required by state and federal regulations (MS4)



Need for Master Planning

- ▶ Maintaining citywide stormwater infrastructure is complex
 - ▶ Restricted visibility (underground)
 - ▶ Various age
 - ▶ Various condition
 - ▶ Large number of assets
- ▶ Limited Funding / Competing Needs
- ▶ Equitable Allocation of Resources

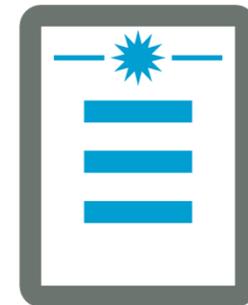


Stormwater Master Plan

...will provide Avondale Estates with a roadmap to proactively implement its stormwater program within the available funding.

▶ Key Tasks

- ▶ Public Outreach
- ▶ Data Gathering
- ▶ Plan Development
 - ▶ Asset Scoring
 - ▶ Conceptual Solutions
 - ▶ Implementation Plan



Data Gathering

...focuses on an inventory and assessment of the stormwater sewer system

- ▶ Key Components of Data Collection:
 - ▶ Stormwater structures – drop inlets, catch basins, headwalls, junction boxes/manholes
 - ▶ Stormwater conveyances – pipes, culverts, and flumes
 - ▶ Stormwater detention basins – facilities that store water during and after storm events.



stormwater structure



stormwater detention basin



stormwater conveyance



Summary of Data Collection

602 structures, 604 conveyances and 15 basins

Stormwater Structures - Count by Type		
Structure Type Code	Structure Type Description	Count
BRG	Bridge	3
CB	Catch Basin	166
CNL	Cannot locate	23
DI	Drop inlet	151
FL	Flume	18
HW	Headwall	85
JB	Junction Box	53
MH	Manhole	39
NA	Not Accessible	6
OCS	Outlet Control Structure	15
PPE	Plain Pipe End	44
Total		603 ^a

a. An additional 36 virtual structures are included in the geodatabase. These structures are not actual physical structures but are included to provide linkage between the conveyances at junction points.

Stormwater Conveyances- Count by Type		
Conveyance Type Code	Conveyance Type Description	Count
AS	Assumed ^a	47
CC	Closed conduit	437
OC	Open channel	74
OT	Other	25
ST	Stream	21
Total		604

a. Assumed conveyances were not assessed during the inventory due to accessibility or other issues which precluded assessment. These conveyances are assumed to be existing closed conduits based on existing documentation, inventoried structure, and/or observed field conditions.



Score Assets

...each inventoried asset was scored using weighted prioritization criteria.

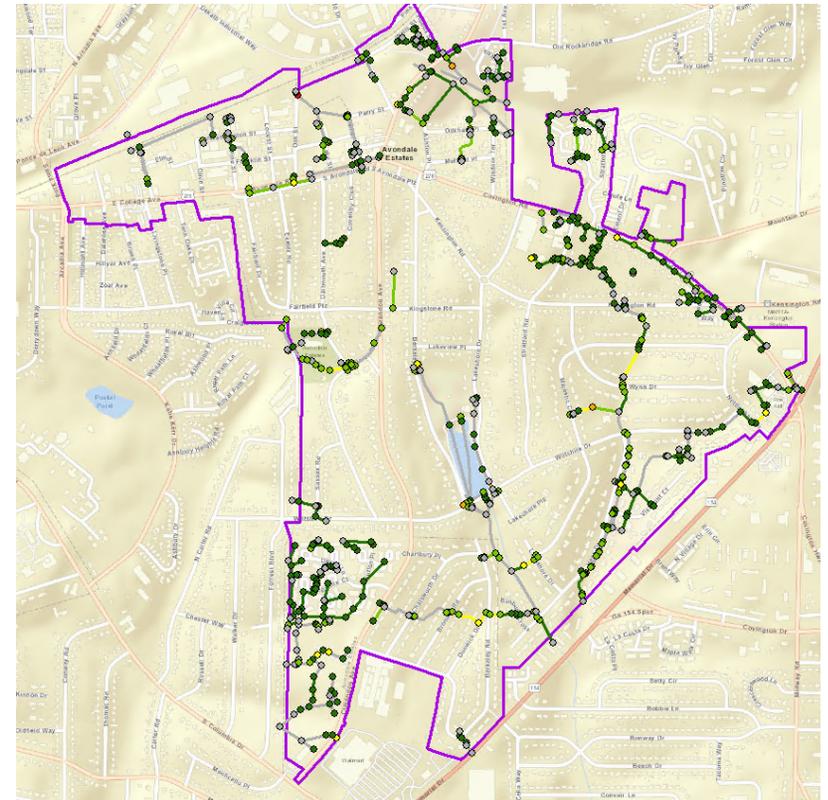
Prioritization Criteria							
Criterion	Criterion Score					Weight	Score Range
	1	2	3	4	5		
Capacity	<10% flow area, Limited to no impact on function	10-20% flow area, Minor impact on function	20-30% flow area, Moderate impact on function	30-50% flow area, Significant impact on function	>50% flow area, Severe impact on function	4-6 ^a	4-30
Structural Integrity	Minor to No Defects	Moderate Defects	Moderate Deterioration	Significant Deterioration	Partial to Full Failure	4-6 ^a	4-30
Flooding	No known flooding	100-yr	-	Less than 100-yr but more than 5-yr	5-yr or less	1-3 ^a	3-15
Safety/Potential Failure Impact	All other areas	Other transportation routes	Other public facilities	Critical public facilities	Major transportation routes	1-3 ^a	3-15
Public Feedback	1 comment	2 comments	3 comments	4 comments	5 or more comments	2	0-10
						Evaluation Score	10-100

a. Refer to Weighting Assessment Table

Weighting Assignment		
Conveyance Size (inches)	Capacity and Structural Weight	Flooding and Safety Weight
<18	4	1
18"	4.5	1.5
>18 and ≤ 30	5	2
>30 and ≤ 42	5.5	2.5
>42	6	3

Conceptual Solutions

- ▶ Stormwater Assets were ranked by prioritization score
- ▶ *The higher the score the more likely that the asset is in need of repair, replacement, or maintenance*
- ▶ The top scoring stormwater assets were reviewed and compiled into 5 concept plans



Concept Plan #1 Stormwater Asset Cleaning

- ▶ Review of all stormwater assets with a 4 or 5 for the siltation score along with adjacent connected assets.
- ▶ 18 priority areas developed
- ▶ 6 priority areas cleaned and CCTV has part of the SWMP
- ▶ 12 areas to be cleaned and CCTV at a later date



Exterior View



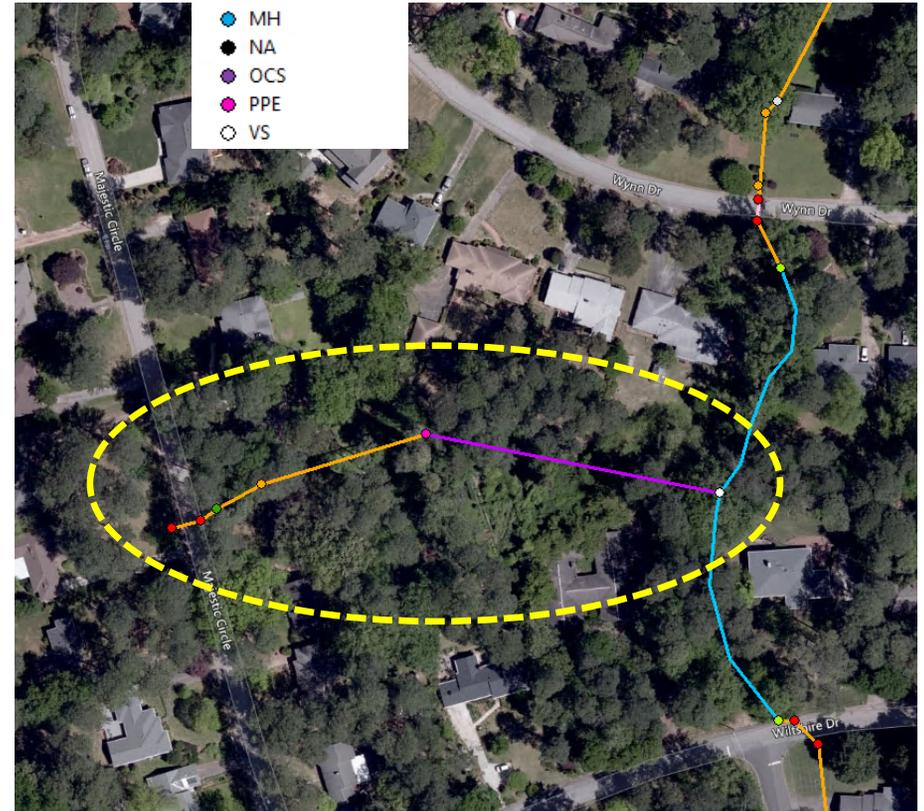
Interior View



Concept Plan #2 Majestic Circle

- ▶ Stormwater asset CC-4072-C located under Majestic Circle
 - ▶ Second highest prioritization score
 - ▶ One of the key drivers for the high score is due to a collapsed segment of pipe
- ▶ Plan includes:
 - ▶ Replacement of the pipe under Majestic Circle and additional segments downstream for a total pipe replacement length of approximately 280 feet.
 - ▶ Installation of curb at strategic locations along the east side of Majestic Circle to guide stormwater flow
 - ▶ Improvements to the downstream open channel conveyance.

StructureType	Conveyance Type
BRG	AS
CB	CC
CNL	OC
DI	OT
FL	ST
HW	
JB	
MH	
NA	
OCS	
PPE	
VS	



Concept Plan #3 Dunwick Drive

- ▶ Short term
 - ▶ Temporary repairs to prevent sink holes or other public hazards at CC-4317-C near 1133 and 1141 Dunwick Drive
 - ▶ Start a downspout disconnection program
- ▶ Long term solution
 - ▶ A watershed model to determine the drivers for flooding and possible solutions
 - ▶ Engineering design and survey

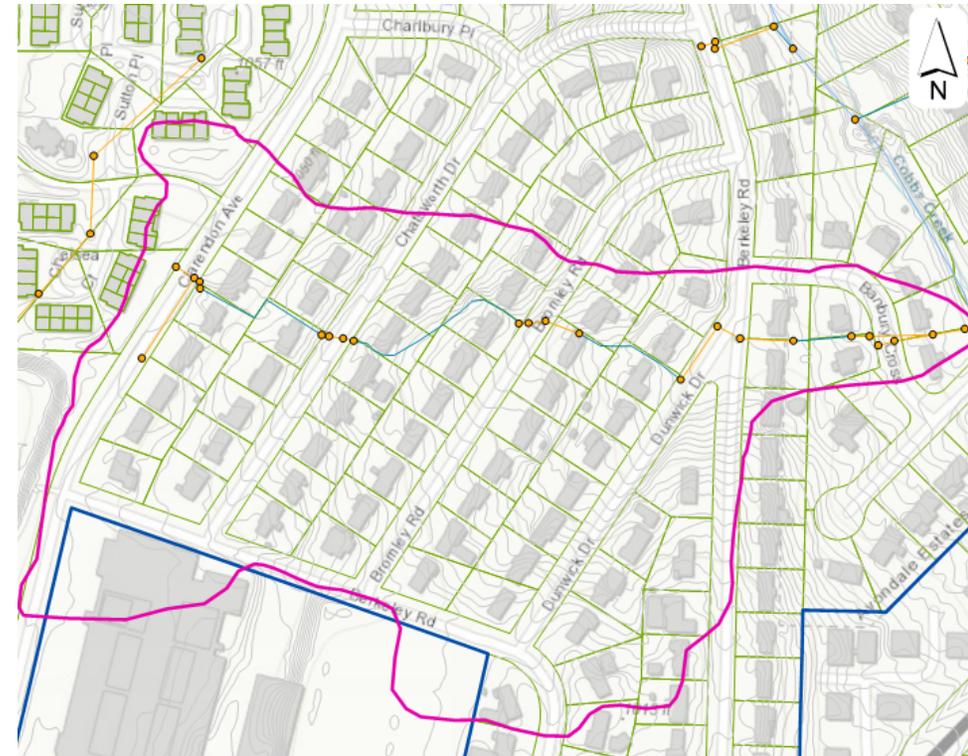


Brown and Caldwell

July 27, 2020



October 28, 2020

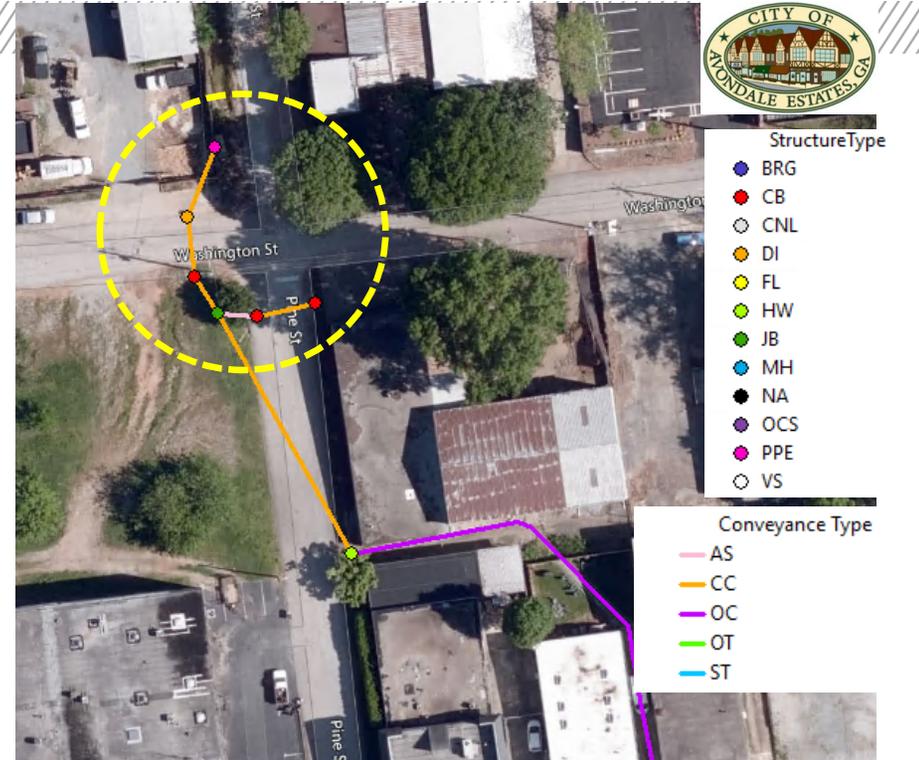


Concept #3 - Dunwick Drive Watershed

Concept Plan #4 Washington Street

Two options

1. Replace/CIPP the pipes and maintain the current pipe size and design GI to detain stormwater volumes so that pipes may meet the desired return interval capacity
2. Develop a stormwater model for the entire drainage system flowing to the project area, determine the size of pipes needed to convey desired return interval, and confirm no downstream impacts.



From upstream end, pipe appears collapsed since debris from cleaning process cannot move downstream

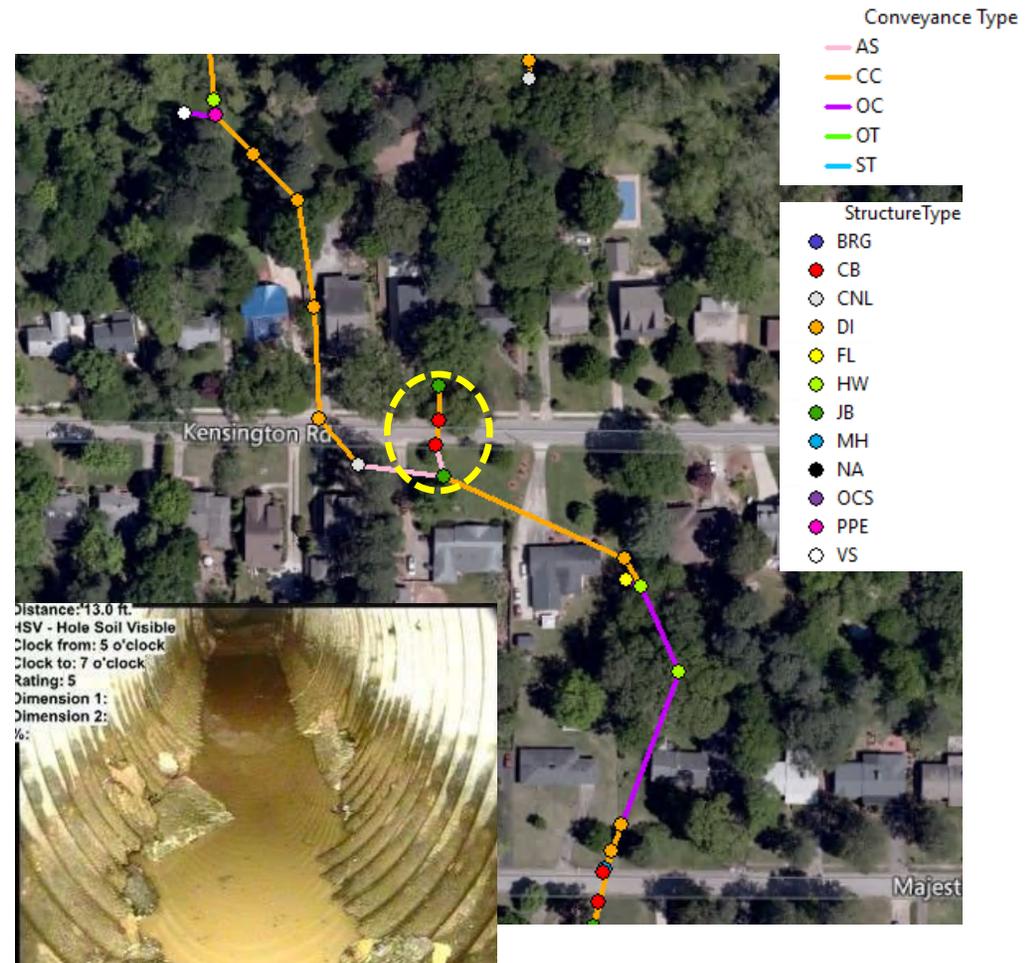


From downstream end, some water from cleaning process gets through the pipe. TV crawler could move no further upstream due to constricted size of pipe.



Concept Plan #5 Kensington Road

- ▶ Proposed improvements include:
 - ▶ Abandon CC-4235-C in place and fill with flowable fill (north side of Kensington Road)
 - ▶ Remove and replace CC-4004-C, and CC-4005-C with concrete pipe
 - ▶ Replace structure CC-1008-S, located on the south side of Kensington
 - ▶ Add risers to enable structure access for structure CC-1050-S, located at 3221 Kensington, which is currently buried



Missing Bottom at Pipe CC-4004-C at Kensington Road

Implementation Recommendations

▶ Short Term

- ▶ Concept Plan Implementation
- ▶ Addressing Additional Priority Areas
- ▶ Stormwater Asset Cleaning Program
- ▶ Extent of Service Policy Development
- ▶ Downspout Disconnection Program and GI Advocacy
- ▶ Stormwater Staffing

▶ Long Term

- ▶ Watershed Modeling
- ▶ Plan for Unscored Stormwater Assets
- ▶ Lake Avondale Dam Evaluation
- ▶ GI Incentive Program
- ▶ Update the SWMP
- ▶ Current Stormwater Utility collections
~\$130,000 per year

Estimated Cost for Short-Term Recommendations					
	2021	2022	2023	2024	2025
Capital	\$106,000	\$265,000	\$270,000	\$250,000	\$250,000
Operational	\$186,000	\$160,000	\$160,000	\$160,000	\$160,000
Total	\$292,000	\$425,000	\$430,000	\$410,000	\$410,000



Downspout Disconnection Program and GI Advocacy

- ▶ Often downspouts drain directly to an impervious surface (driveway) which flows into the storm drain
- ▶ Directly connected impervious surfaces increase flooding by quickly conveying runoff into the storm system
- ▶ Disconnecting downspouts or adding other GI measures can reduce flooding and also provides water quality improvements
- ▶ Implementing GI on multiple parcels through out the city can have significant impacts



Examples of Directly Connected Impervious



Downstream impact of Directly Connected Impervious

Disconnected Downspout Examples



Photo from Lake County, IL



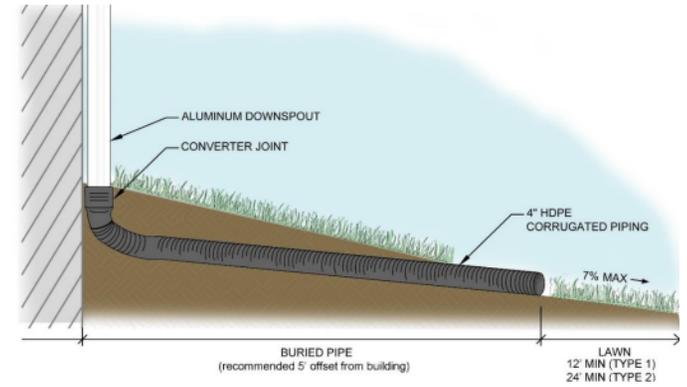
Photo from tedsgardens.com



Photo from pacscape.com

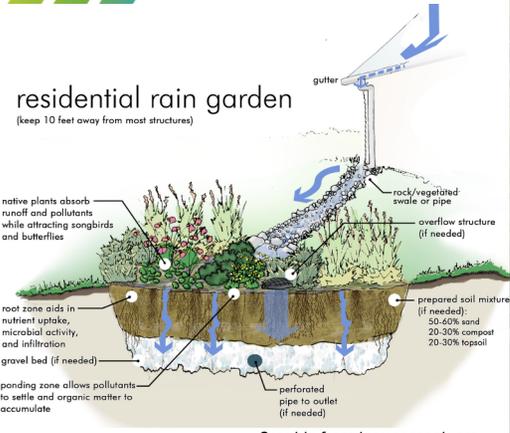


Photo from Improvementscatalog.com



Graphic from NCDEQ Stormwater BMP Manual

Other GI Examples



Graphic from lagunacreek.org



Photo from raingardenarts.files.wordpress.com



Photo from rainbarrelman.com



Photo from landscapeeast.com



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Photo from nianticriverwatershed.org



Photo from watershedcouncil.org



Photo perfectpavers.com



Questions

