Southeast Atlanta Green Infrastructure Initiative: Permeable Paver Roadways

Cory Rayburn, CPESC, CFM, EnvSP
Construction Project Manager

SESWA Spring Seminar
April 15, 2016
Background

- City’s Department of Watershed Management
  - Serves 1.2 million (450,000 night)

- Consent Decree
  - CSO – completed 2008
  - SSO – extension granted 2027

- 2nd highest W&S rates in the country

- Stormwater Utility Fee
  - Adopted in 1999
  - Overturned - $7 million refunded
Custer CSO Basin Location

- Heart of Atlanta
- Highly impervious
- Piped Streams
- Repeated Flooding

Map showing Custer Basin with locations of Tanyard Creek, Proctor Creek, Clear Creek, Greensferry, Stockade, McDaniel, and Custer.
# Top ten wet weather events in Custer Ave Basin 2000 – 2012

<table>
<thead>
<tr>
<th>Rank</th>
<th>Date</th>
<th>Recurrence Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7/9/2012</td>
<td>10-25 year</td>
</tr>
<tr>
<td>2</td>
<td>8/31/2006</td>
<td>5-10 year</td>
</tr>
<tr>
<td>3</td>
<td>7/11/2012</td>
<td>2-5 year</td>
</tr>
<tr>
<td>4</td>
<td>9/29/2009</td>
<td>2-5 year</td>
</tr>
<tr>
<td>5</td>
<td>7/3/2012</td>
<td>2-5 year</td>
</tr>
<tr>
<td>6</td>
<td>5/5/2003</td>
<td>2-5 year</td>
</tr>
<tr>
<td>7</td>
<td>7/20/2011</td>
<td>2 year</td>
</tr>
<tr>
<td>8</td>
<td>8/20/2000</td>
<td>2 year</td>
</tr>
<tr>
<td>9</td>
<td>6/3/2001</td>
<td>2 year</td>
</tr>
<tr>
<td>10</td>
<td>8/28/2009</td>
<td>2 year</td>
</tr>
</tbody>
</table>
Contributing Conditions

Point of Surface Flooding
July 2012 (Peoplestown)

<table>
<thead>
<tr>
<th>Drainage Basin</th>
<th>Total Area (acres)</th>
<th>% Impervious</th>
<th>Impervious Area (acres)</th>
<th>Roadway Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanicsville / Peoplestown</td>
<td>900</td>
<td>65%</td>
<td>582</td>
<td>220</td>
</tr>
<tr>
<td>Summerhill</td>
<td>505</td>
<td>58%</td>
<td>293</td>
<td>110</td>
</tr>
<tr>
<td>Grant Park</td>
<td>380</td>
<td>42%</td>
<td>162</td>
<td>55</td>
</tr>
<tr>
<td>Englewood Manor</td>
<td>715</td>
<td>42%</td>
<td>301</td>
<td>62</td>
</tr>
</tbody>
</table>
Mayor’s Commitment to the Community

- Assessment of drainage/capacity issues
  - Caused by capacity limits in the combined sewer system (CSS)
  - Multiple areas affected; Peoplestown, Summerhill, and Mechanicsville

- Long-term solution to reduce flooding
  - Assessment of issues
  - Phased approach
  - Follow-up community meetings
Assessment of Issues

- Exceed capacity in the Combined Sewer System
Overview of Solutions - Phased Approach

- **Immediate Response – Completed**
  - Catch basin & inlet cleaning
  - Raising curbs

- **Phase 1 Projects – Completed**
  - Green Infrastructure Projects (bioswales, rain gardens, revegetation)

- **Phase 2 Projects**
  - Media Lot CSS storage vault – Completed
  - Permeable pavers – Under Construction

- **Phase 3 Projects – In progress**
  - Connally Trunks CSS storage vaults
  - Capacity Relief Project
Immediate Response

- Begin tangible solutions in 30 days
Phase 1 Projects - Completed

- Use of Green Infrastructure; mimics nature

**Southeast Atlanta Green Infrastructure Initiative**
*Phase 1 - Peoplestown, Mechanicsville and Summerhill*

1. Crumley Street between Windsor Street and Ira Street at Rosa Burney Park
   (expanded detention pond to collect water from parking lots and surrounding streets)

2. Whitehall Terrace near Dunbar Elementary School
   (converted parking spaces into rain gardens)

3. Ira Street near Fulton Street and Windsor Street at Rosa Burney Park
   (rain garden installation to capture runoff from parking lots and surrounding streets)

4. Rosa Burney Park
   (expansion of the existing detention pond to collect stormwater runoff from parking lots and surrounding streets)

5. Sydney Street between Fulton Street and Connolly Street
   (rain garden installation to collect and treat Fulton Street runoff)

6. Kelly Street at Cherokee Street
   (construction of a bioswale to capture runoff from pond to capture runoff from pond to capture runoff from pond)
Phase 2 Project – Media Lot Vault Completed

During Construction

View Inside Vault

Media Lot Storage Vault (Complete)
Phase 2 Project – Pavers Under Construction

- Approximately 6 miles Permeable Pavers
Construction Sequence

- Excavation
- Aggregate reservoir
- Paver Installation
General Challenges

- Utilities (water, sewer, gas, etc.)
- GDOT
- Road Closures & MARTA
Notable Challenges

- Concrete wash-off, sedimentation from adjacent development, utility tie-in protocols, & historic street car tracks
Unique Design Considerations

- Ideal roadway paver shape and configuration – L-shaped bricks selected
Unique Design Considerations

- Steep slopes - impermeable liner check dams used
Unique Design Considerations

- Roads designed to maintain crown
Unique Design Considerations

- Vegetated Stormwater Planters in conjunction with pavers
Monitoring efforts

- Underdrain flow monitoring and infiltration wells
Community Outreach Efforts

- Road closures, utilities affected, temporary access, sanitation pickup, etc.
All in all…

- Overall Success
Effectiveness (25 Yr - 4 Hr Storm) – 3.86” rainfall

- Model simulation indicates flood reduction but not elimination of localized flooding
Phase 3 Projects – Design Phase

- Additional capacity relief needed for localized flooding

[Map with marked locations: Connally Storage Vault and Capacity Relief Pond]
Peoplestown Capacity Relief Ponds

- Detention ponds & Bioretention provides 2MG of storage
- Provides a controlled area for combined sewer spill containment
- Provide aesthetic and passive recreational enhancement
Questions?  www.AtlantaWatershed.org/GreenInfrastructure

Cory Rayburn, CPESC, CFM, EnvSP
City Of Atlanta | Department of Watershed Management
CRayburn@AtlantaGA.gov