Athens Alley Stormwater Infrastructure Improvements Public Meeting 2

April 24, 2013

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Agenda

- Background
- Alternatives Evaluation
  - Grey Infrastructure Alternatives
  - Green Infrastructure Opportunities
- Downstream Impacts
- Public Involvement
- Next Steps

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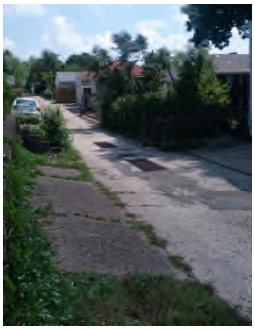
Background

- Regular flooding occurring
  - Athens Alley between Texas & Annex



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- Leading to property damage

Study Objectives

- Identify potential solutions to reduce or eliminate drainage issues
- Multiple alternatives to be considered
- Council will decide **if** any alternatives are implemented

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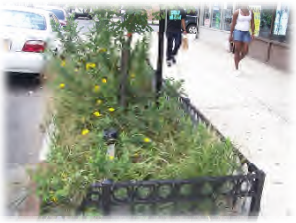
Alternatives Evaluation

- Survey
- Grey Alternatives
  - Site Visits
  - H&H Modeling
  - Cost Estimates
- Green Alternatives
  - GIS Review
  - Site Visits



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Drainage Issues

- Existing Inlets Poorly Located
- Too Few Inlets
- Storm Sewer Undersized
- Sewer Between Athens & Kelton Reverse Grade

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Alternatives

- Developed Alternative Storm Sewer Alignments
- Evaluated Inlet Locations
- Evaluated Source Reduction (GI)

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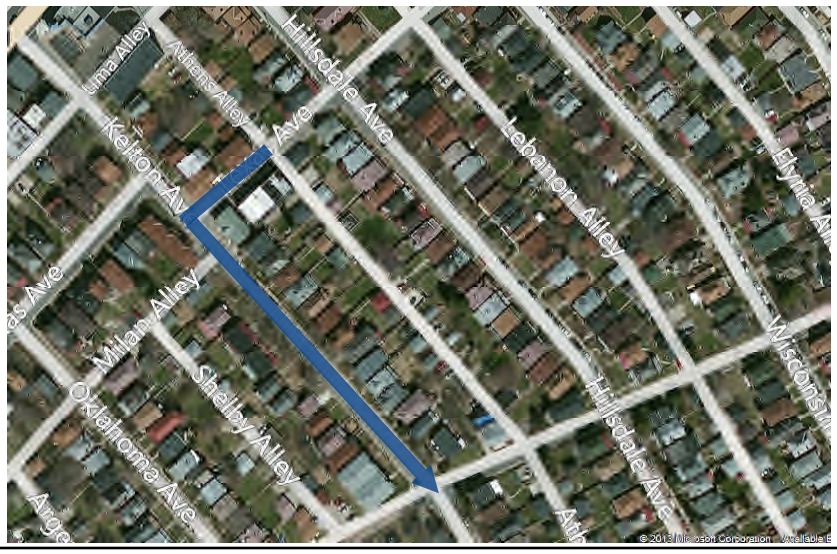
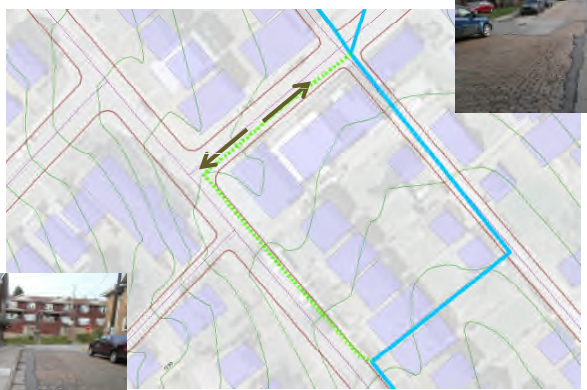
Grey Alternative
Texas to Kelton



Constructability Challenges

- Neighborhood Disruption



- Traffic Control

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Constructability Challenges

- Deep Excavation at Kelton & Texas
- Complete Closure of Texas & Kelton Likely
- Street Parking in Area of Construction will be unavailable

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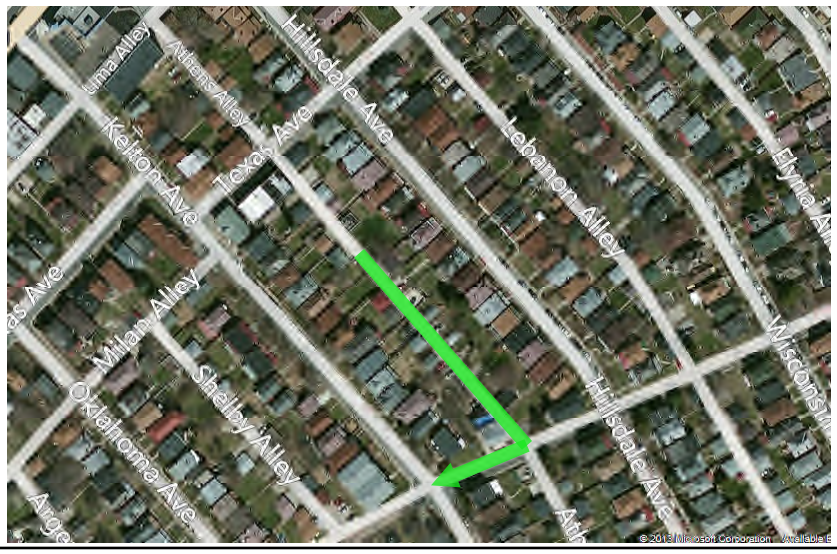
Grey Alternative
Athens to Annex



Constructability Challenges

- Deep Excavation at Athens & Annex
- Complete Closure of Athens & Annex Likely
- Access to Garages on Athens Will be Affected for Some Residents
- Utility Protection Will be a Concern

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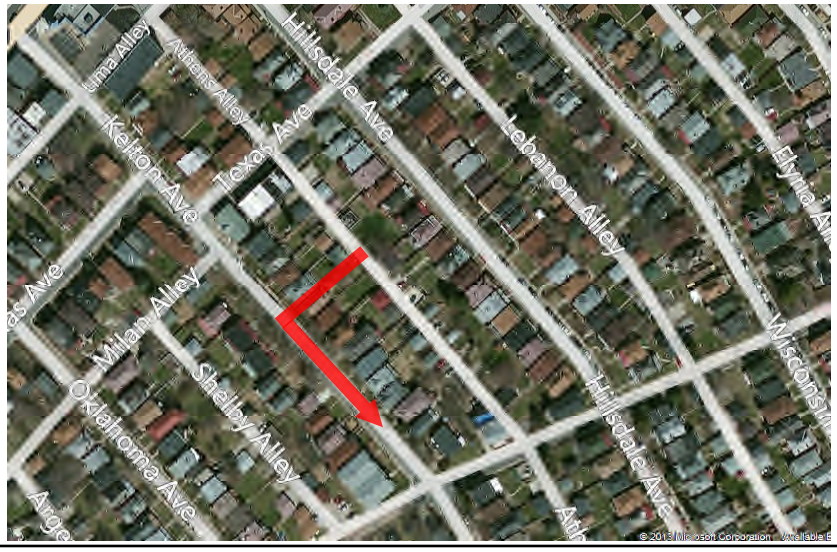
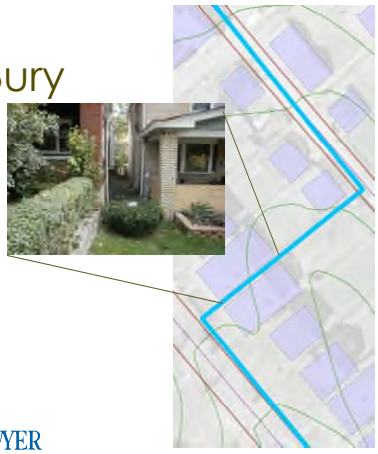
Grey Alternative
Athens to Texas



Constructability Challenges

- Distance Between Houses is Approximately 5-feet
- Cannot Utilize Direct Bury
- Moves Bottleneck Downstream
  - 48-Inch Pipe Required
  - 30-Inch Pipe in Kelton



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Grey Infrastructure Costs

- Preliminary Estimate

	10-YR	100-YR	2-YR
Texas to Kelton	$431k	$464k	$412k
Athens to Annex	$303k	$331k	$289k
Athens to Texas	$306k	$357k	$276k

- Prelim. Estimate w/o Roadway Costs

	10-YR	100-YR	2-YR
Texas to Kelton	$242k	$275k	$223k
Athens to Annex	$192k	$220k	$178k
Athens to Texas	$276k	$328k	$247k

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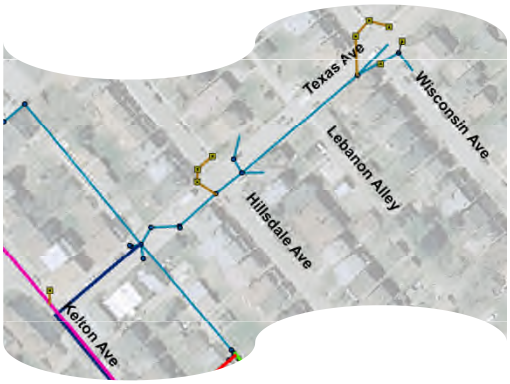
Grey Infrastructure Costs

- Catch Basins & Yard Inlets:
  - Additional $76k



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Downstream impacts

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Green Infrastructure Opportunities

- Runoff Reduction (Water Quantity)
  - Particularly Smaller Events
- Water Quality Improvements
  - Saw Mill Run on 303(d) List
- Aesthetic and Environmental Benefits
- Green Infrastructure Funding Ops
- But… Minimal Reduction in Athens Alley Flooding

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High Slope Bioswale with Check Dams
Implemented Examples
Borough of Dormont, PA
THE BOROUGH OF DORMONT
INCORPORATED 1909
Bump Out Retention:
In more commonly seen in highly urbanized areas where there is limited surface availability due to condensed development of the existing land. In the case of Dormont, there were several recognizable opportunities within the public right of way where a bump out could be beneficial. The bumps outs provide opportunity for bio retention, while giving the community an aesthetically pleasing attraction without encroaching on private property. This technique is similar to street side retention seen in the Bioretention fact cards.
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BMP TYPE:
BUMP OUT RETENTION
Dormont Green Infrastructure Opportunities

Porous Asphalt
Standard Asphalt
FilterPave
Paver Blocks
Design Concept:
While the Country Lane concept is aesthetically pleasing, there are many other types of permeable pavers that can be substituted. Permeable paver blocks/grids can reduce cost, while maintaining the functionality of the roadway and decreasing stormwater runoff entering the sewer system. Effectiveness increases when a suitable permeable sub-layer is provided, and openings in the pervious material used are maximized.
Implemented Examples
Borough of Dormont, PA
THE BOROUGH OF DORMONT
INCORPORATED 1909
Country Lane:
Asphalt lanes are replaced with two concrete or gravel strips surrounded by structural grass (structural grass is supported by a grid and soil structure that prevents soil compaction and root damage). Connections from the county lane to residences are constructed of permeable materials, including paving blocks, broken concrete sections, and structural grass or gravel.
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BMP TYPE:
COUNTRY LANE
Dormont Green Infrastructure Opportunities

Glenmore Ave
Southern Ave
Potential Location: Glenmore Avenue
Tree Box Opportunity
Implemented Example
Borough of Dormont, PA
Rank - # of Opps
Low – 1
Note: Only opportunities within the "Athens Alley Stormwater Improvements" Watershed have been considered.
Tree Box:
A minor opportunity to provide bio-retention and promote the use of green infrastructure, while providing aesthetic benefit to the community. Sub-drains can be conveniently connected to the storm sewer network beneath.
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BMP TYPE:
TREE BOX
Dormont Green Infrastructure Opportunities

Implemented Examples
Modified Inlet
Check Dams
Green
Blue
Borough of Dormont, PA
Green or Blue Roofs:
Are a method of attenuating peak storm runoff, and in the case of a green roof, providing evapotranspiration via a growing media from which plants and light vegetation can thrive. Blue roofs can be slightly lighter and require less maintenance, but lack the aesthetic and thermal benefits offered through green roofs. Green roofs also provide added benefits of reducing pollutants in stormwater runoff, and providing a natural habitat for wild life in urban areas.
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BMP TYPE:
BLUE/GREEN ROOF
Dormont Green Infrastructure Opportunities

Borough of Dormont, PA
Porous Asphalt
Standard Asphalt
FilterPave
Implemented Examples
POROUS PAVEMENT DETAIL
Pervious Pavement is a growing method of reducing surface runoff by infiltration of the soils in place beneath paved areas which are otherwise not effectively used in their full capacities when typical paving is in place. By constructing and retrofitting as illustrated in the detail provided, the pervious pavement systems can be easily connected to adjacent storm sewer catch basins, and thereby maximizing inlet capacity of the existing storm systems in addition to reducing runoff. Several streets within the study area are good candidates, having minimal slopes, recognizably sized contributory areas, and easy connection locations to the existing storm network.
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BMP TYPE:
PERVIOUS PAVEMENT
Dormont Green Infrastructure Opportunities

Implemented Examples
Borough of Dormont, PA
Cistern is a similar concept to a rain barrel. The installation of a cistern provides benefit by minimizing/eliminating storm water runoff, and allows for water storage until such time that it is needed for irrigation purposes. In the first proposed location, the borough would be able to water the vegetation at the corner parkette at W. Liberty and Hillside Avenue, by routing the adjacent rooftops from nearby rental properties to a cistern. Similarly, the large surface area covered by the church's roof located on Alabama Avenue would allow for watering of plants/vegetation if a cistern were to be installed.
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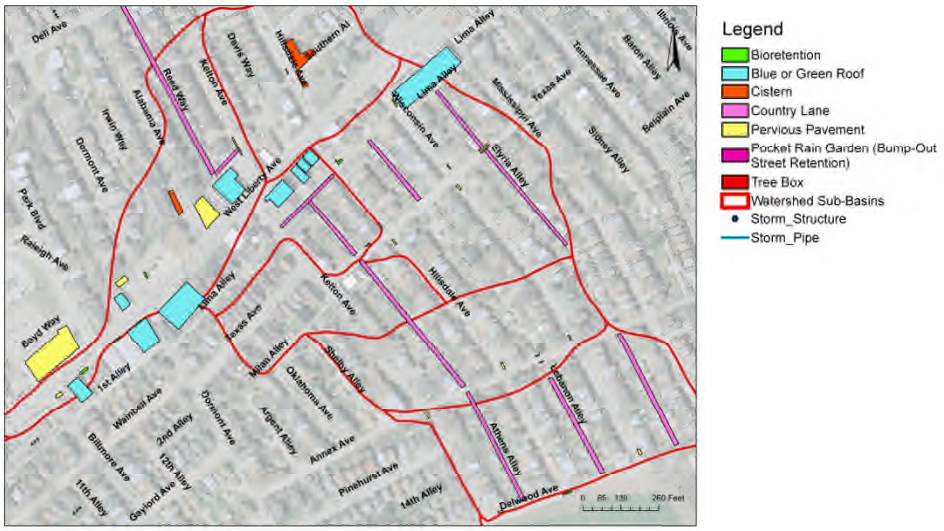
BMP TYPE:
CISTERN
Dormont Green Infrastructure Opportunities

GI Opportunities By Type



GI Ranking Factors

- Ease of Implementation
  - Flatter Slopes
  - Proximity to Existing Storm Inlets
  - Size of Contributing Area
- Planned Road Reconstruction
- Direct Impact on Flooding Area

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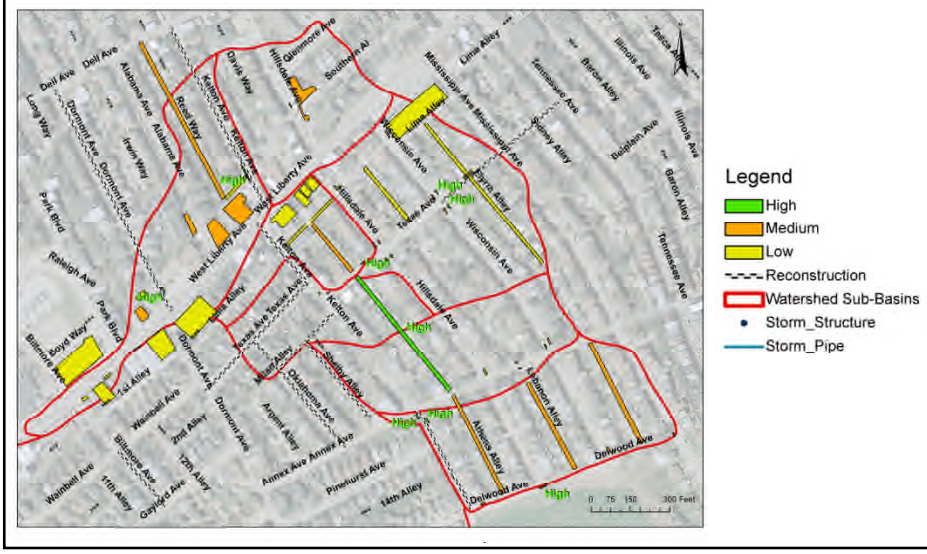
GI Opportunities By Rank



Green Infrastructure Cost

GI Type \ Priority	High	Medium	Low
Bioretention	$12k	$14k	$21k
Blue Roof	N/A	$225k	$1,305k
Cisterns	N/A	$8k	N/A
Country Lane	$328k	$1,227k	$630k
Permeable Pavement	$21k	$229k	$708k
Bump Outs	$17k	$13k	$10k
Enhanced Tree Pit	N/A	N/A	$1k

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GI Funding Alternatives

- LGA Community Sustainability Grant
  - $8,500 Received
- ACCD Grant Fund
  - Application Submitted
- The Charrette Program
- CFA Watershed Restoration Protection Program
- Several Others

Submitted grant requests of nearly $400k for Green Infrastructure to date

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Discussion

- Grey Alternatives
- Green Alternatives
- Financing

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Next Steps

- Finalize Tech Memo to Incorporate Borough and Public Comments
- Present Conclusions and Recommendations to Council on June 3rd

Thank You!

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