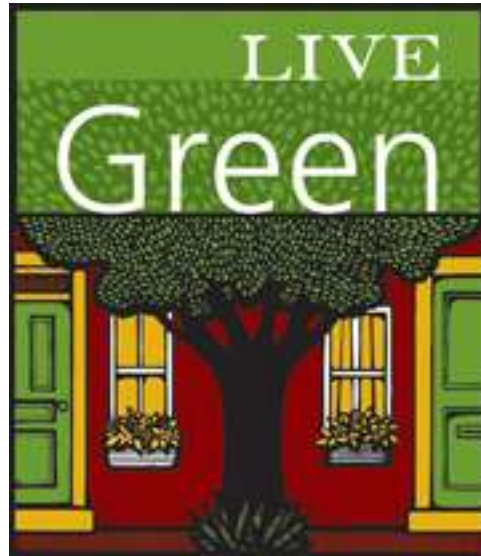


**Session C:
Urban Storm Water and the Restoration of
Hydrologic Function in the Urban Landscape
Auditorium - 10:35-11:35
Fritz Schroeder, LIVE Green
Stuart Schwartz, University of Maryland**

Sponsors:

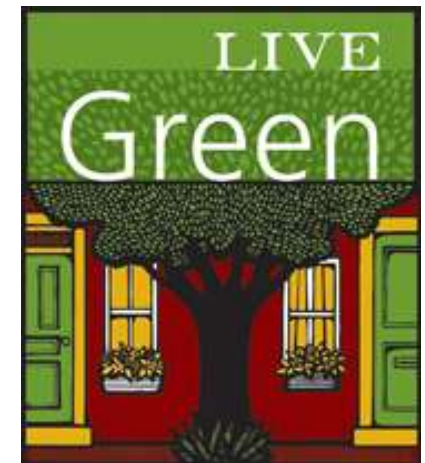


An Urban Greening Initiative



Live Green: Organizational Overview

- Founded in 2004
- LIVE to Live Green
- New Mission: To build stronger, healthier communities through environmental projects
- 1.5 staff, approx. 150K budget
- Focus areas: ENERGY
GREEN FACILITIES
WATER



What We Do: Water

- Began with:
 - Rain barrel workshops
 - Green roof project
- Evolved to become Urban Watershed Initiative



Urban Watershed Initiative

- Development of City wide Green Infrastructure Plan
 - Assessment of impervious surface, identification of high impact projects, balance between green and gray
- Residential Education/Outreach
 - Rain barrels, green infrastructure “clinics,” native tree/shrub planting
- Institutional Education/Outreach
 - Green facilities, green roofs

Why Green Infrastructure?

- Environmental, social and economic impacts
- High return on investment
- Less costly than “gray” infrastructure

Infiltration basin at Villanova University that collects rain water from 7 acres of parking lot



Green Infrastructure Technologies

- Rain Barrels / Cisterns
- Porous Pavement
- Green Roofs
- Green Streets/Green Alleys



Rain Barrels

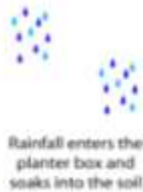
Residential Green Infrastructure Workshops



Planter Box

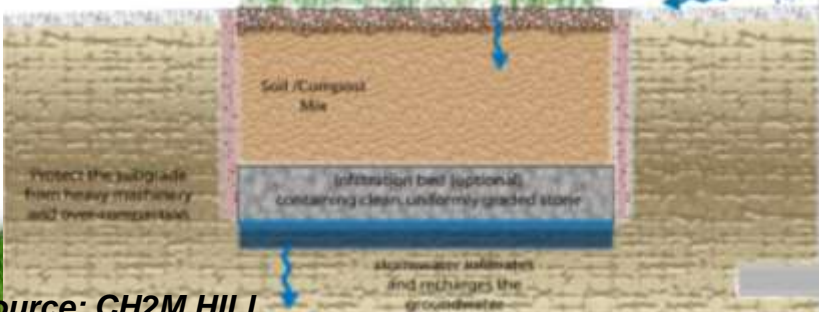


Rainwater flows off the rooftop and into the downspout...



Rainfall enters the planter box and soaks into the soil

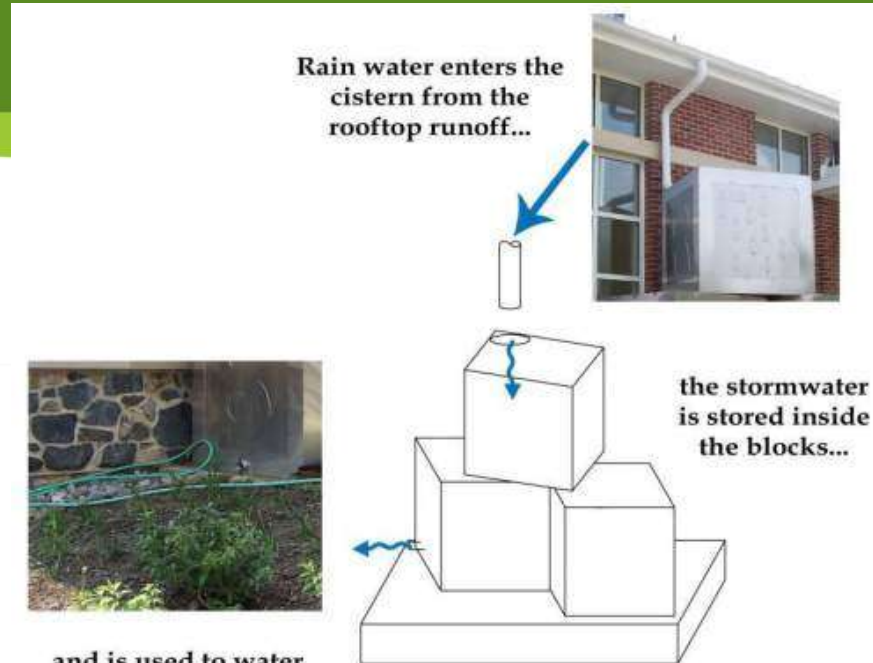
...and across the pavement...



Protect the subgrade from heavy machinery and over-compaction

stormwater infiltrates and recharges the groundwater

Decorative Cisterns



Rain water enters the cistern from the rooftop runoff...

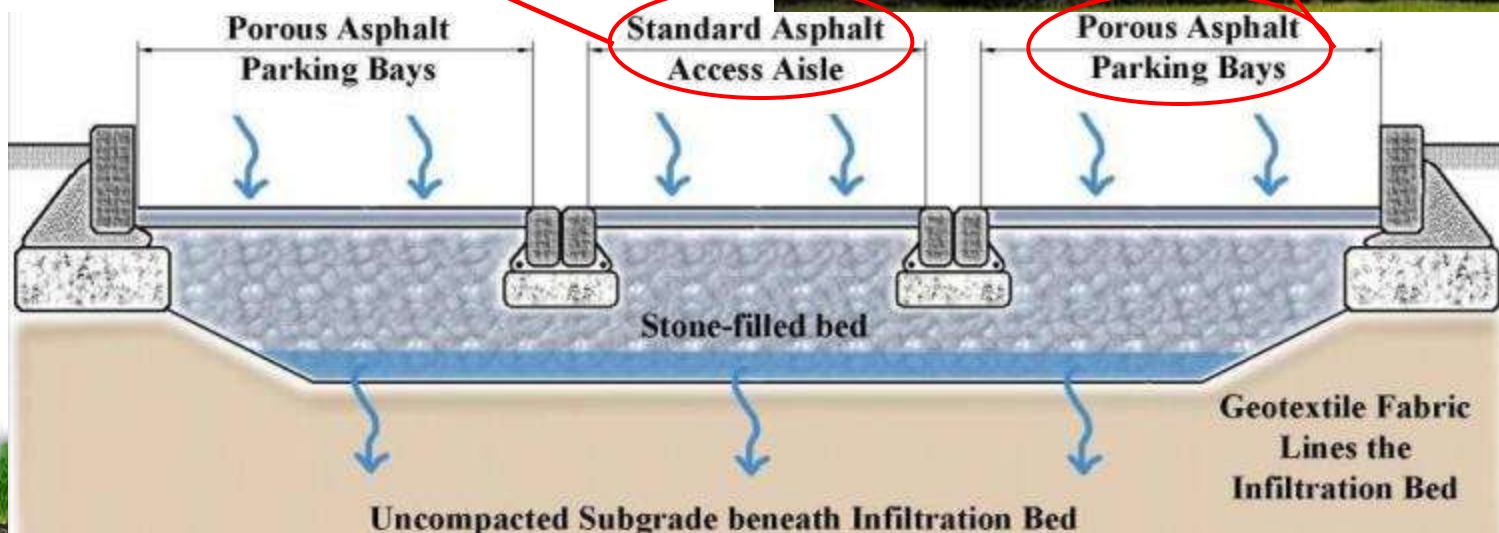
the stormwater is stored inside the blocks...

... and is used to water the landscaping around the library



Porous Parking Lots

Morris Arboretum - Philadelphia, PA - 1984



What is a green roof ?

- A **green roof** is a vegetated roof cover that is installed on top of an otherwise conventional roof, giving the roof characteristics that more closely resemble a natural environment



Lancaster County Roof Greening Program

- Lancaster County Planning Commission received a grant from the Department of Environmental Protection Energy Harvest Fund in 2008
- The goal of this project is to demonstrate the many benefits of roof greening while developing the capacity of local businesses to respond to increased demand for this innovative technology



Benefits of Roof Greening

Energy Conservation / Storm Water Management

- Green Roofs provide additional insulation for the building
- They decrease heating and cooling loads
- They decrease summer temperatures on a roof
- They reduce the “urban heat-island effect”
- Reduces stormwater run-off from 70 to 90 percent
- Delays run-off
- Filters toxins and pollutants from run-off
- Reduces combined sewer overflows
- Minimizes amount of land needed for development

Green Streets: Before...



After...

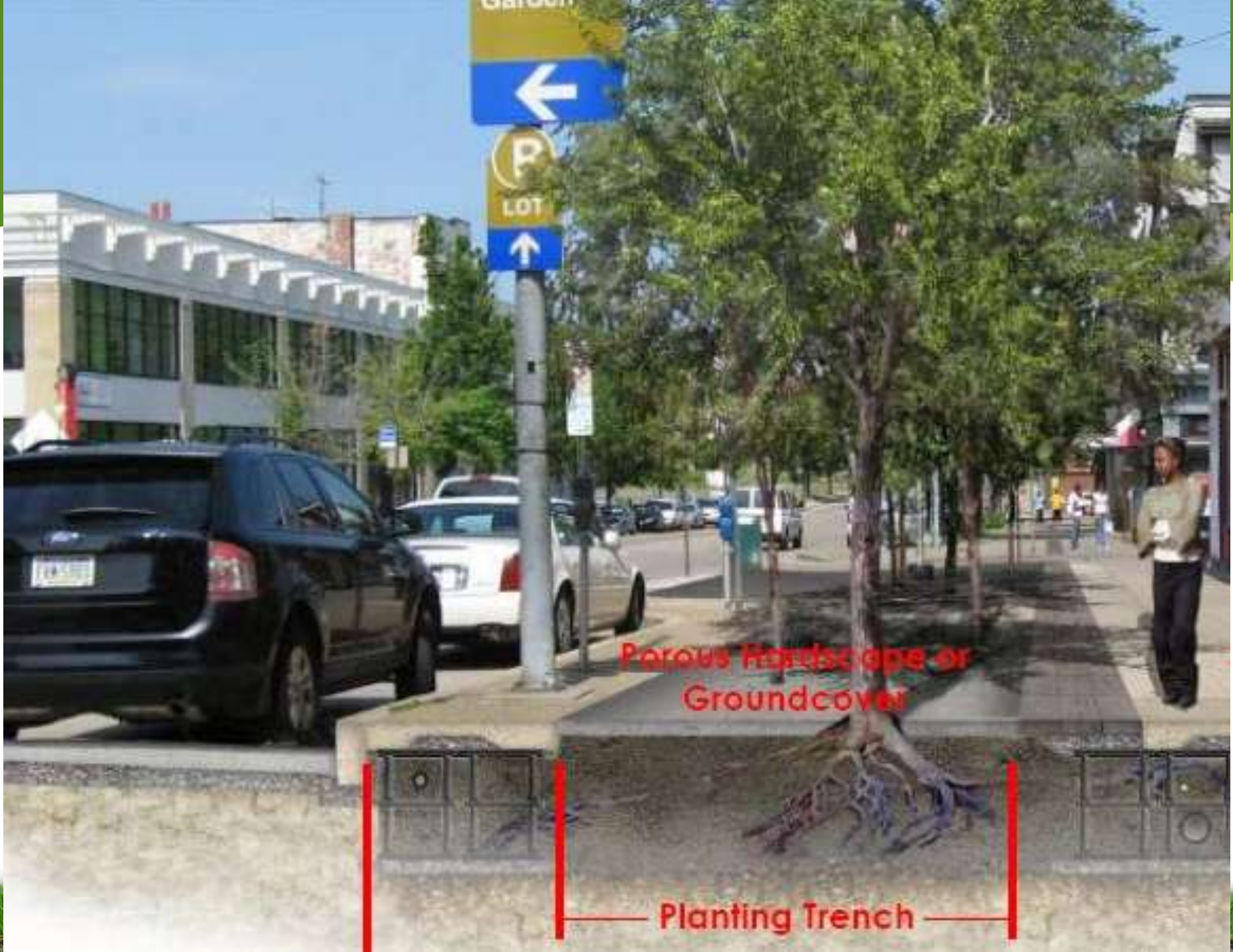


Commercial Green Street: Before...



Commercial Green Street: After...





Porous Hardscape or
Groundcover

Planting Trench

Lancaster Green Infrastructure Plan Overview

- Site Reconnaissance
- GIS mapping of land use & impervious cover to determine GI opportunities
- Demonstration project conceptual plans
- Cost analysis
- Runoff / CSO reduction & benefit analysis
- Grant Acquisition Assistance
- Green Infrastructure Fact Sheets

Combined Sewer Outfalls



GI Benefit Calculator

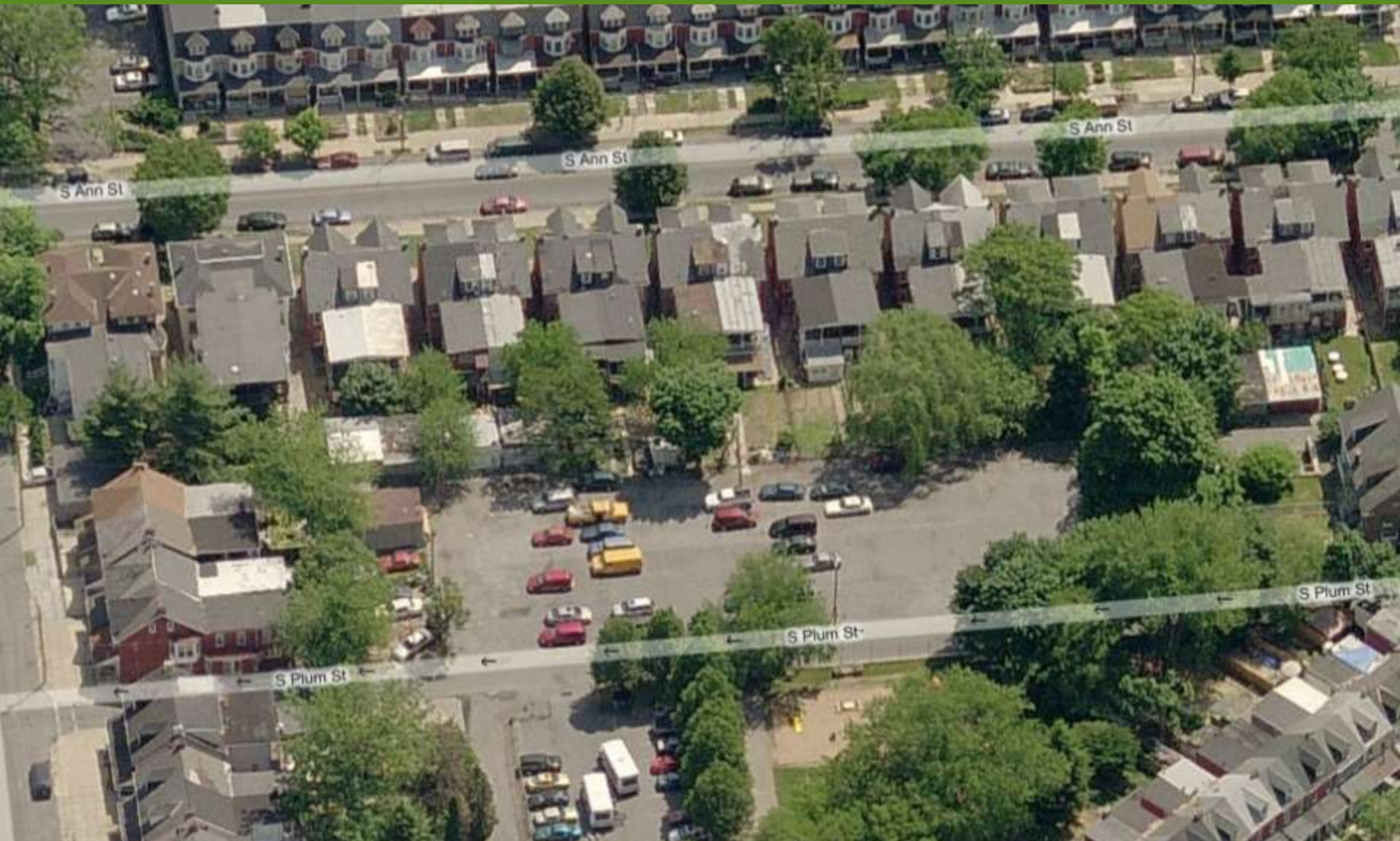
Estimates Runoff Reductions

	Area / Impervious Source	Impervious/Contributing Area (acres)	Green Infrastructure Project / Program Type	Assumed Percent of Impervious Area Managed	Impervious Area Managed (acres)	Total SW Runoff (MG/yr)	Assumed WQ _v or BMP Capture Volume (in.)	Runoff Reduction (MG/yr)
PUBLIC PROPERTY	Roads	481	Green Street	10%	48.1	467	1.0	40.1
	Drives	44	Disconnection	10%	4.4	43	1.0	3.7
	Parking Lots	544	Porous Pavement, Bioretention	3%	16.3	528	2.0	15.3
	Flat Roofs	438	Vegetated Roofs	3%	13.1	425	1.0	11.0
	Vacant Lots	100	Vacant Lot Greening	10%	2.5	24	1.0	2.1
	Street Trees	N/A	Enhanced Tree Planting	N/A	7.2	7	0.2	2.6
	Other 1	0		10%	0.0	0	1.0	0.0
	Other 2	0		33%	0.0	0	1.0	0.0
	Various (Ordinance)	1853	New Stormwater Ordinance	0%	0.0	1798	1.0	0.0
Total					91.7			74.7
								52.3

Scaling up individual projects – 649 acres of Parking Lots (13% of City)



Parking lot at South Plum St



Demonstration Project - Concept Plan



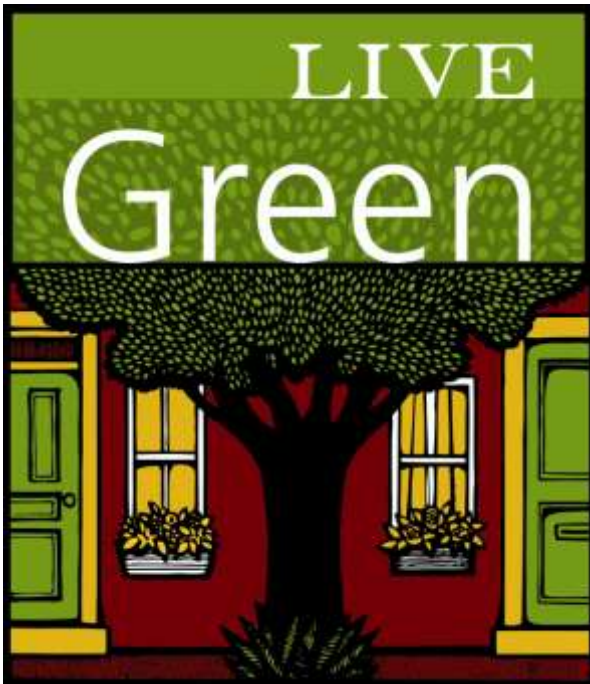
Green Alley: Reo Ave/Reiker Ave adjacent to Crystal Park



Next Steps

- Complete green infrastructure plan: clarify potential for CSO reduction in Lancaster
- Develop viable demonstration projects for the downtown & neighborhoods to further public education and acceptance
- Move ahead with residential and institutional education
- Increase tree canopy, develop tree management plan

Questions ?



www.livelancaster.org

Fritz@livelancaster.org



KEY

Regional Park:

R-1 Lancaster Central Park

Community Parks:

C-1 Conestoga Pines Park

C-2 Long's Park

Neighborhood Parks:

N-1 Brandon Park

N-2 Buchanan Park

N-3 Conestoga Creek Park

N-4 Conlin Field/Farnum Park

N-5 Crystal Park

N-6 Musser Park

N-7 Northwest Corridor Linear Park

N-8 Reservoir Park

N-9 Roberto Clemente Park

N-10 Rodney Park

N-11 Sixth Ward Memorial Park

Mini Parks:

M-1 Binns Park/Lancaster Square

M-2 Case Commons

M-3 Ewell/Gantz Playground

M-4 Joe Jackson Tot Lot

M-5 Market Street Kids Park

M-6 Milburn Playground

M-7 Penn Square

M-8 Rotary Park

M-9 South End Park

M-10 Triangle Park

Other Public Open Spaces:

P-1 Cabbage Hill Veterans Memorial

P-2 Camba Park

P-3 Holly Pointe Park

P-4 Intersection of W. King & W. Orange Sts.

P-5 South Duke Street Mall

P-6 Walnut Street Fishing Area

--- City/Municipal Boundary

Existing Park Site

Existing School Site

Existing Cemetery Site

Inner Greenway Loop (1.7+/- Miles)

Outer Greenway Loop (6.8+/- Miles)

Other Radial Corridors

Conestoga Greenway



