Street Makeover: Gray to Green

Giselle Rodriguez, PE – City Engineer

LID Summit

Raleigh Convention Center

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At a Glance

- Background
- Unique attributes
- Exclusive rewards
- Innovative stormwater design
- Impressive quality gain
- Estimated project cost
- A look at the future
- What if…
- Why bother…
- Bringing innovation to the streetscape
- Lessons learned

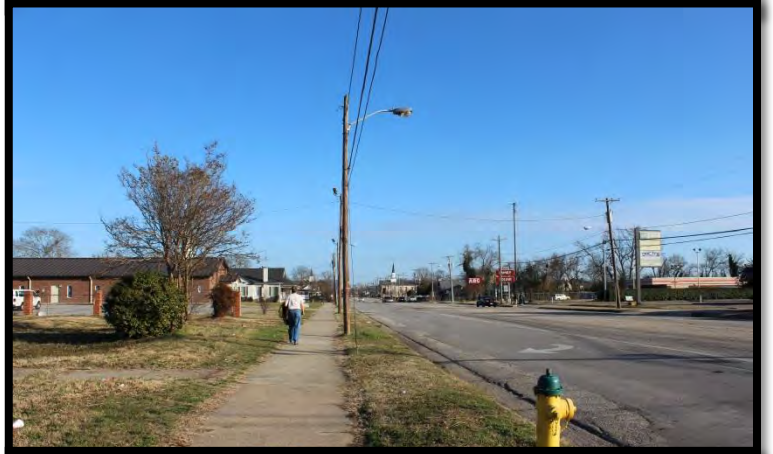
Background

- Approved CIP
  - Recurring allocation
- Conventional streetscape project

Downtown Today

Aerial View


Improved section
Area in NEED
N COOL SPRING ST
S COOL SPRING ST
PERSON ST
ADAM ST

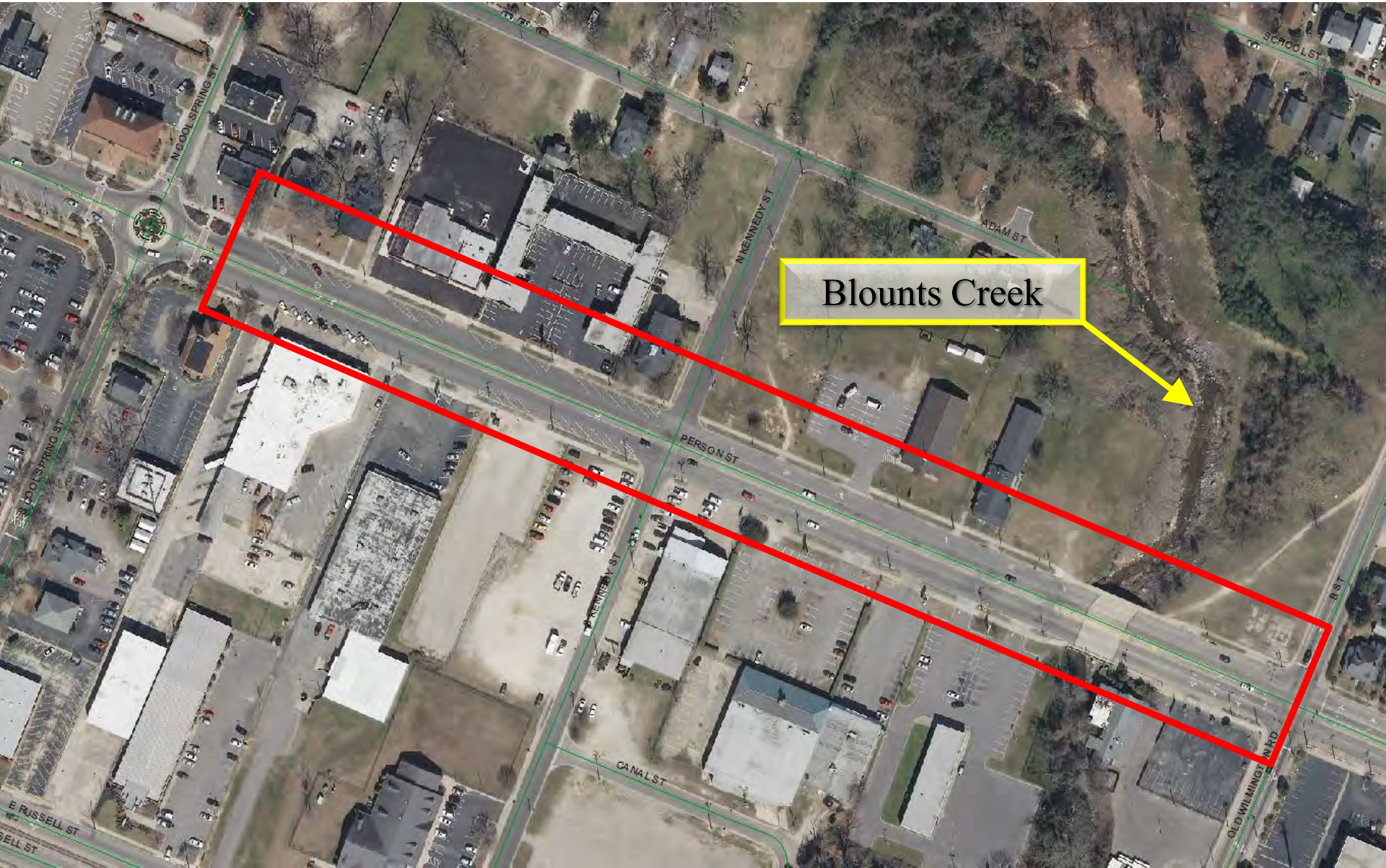


Person Street

Blounts Creek

Makeover Needed!!!

Project Limits



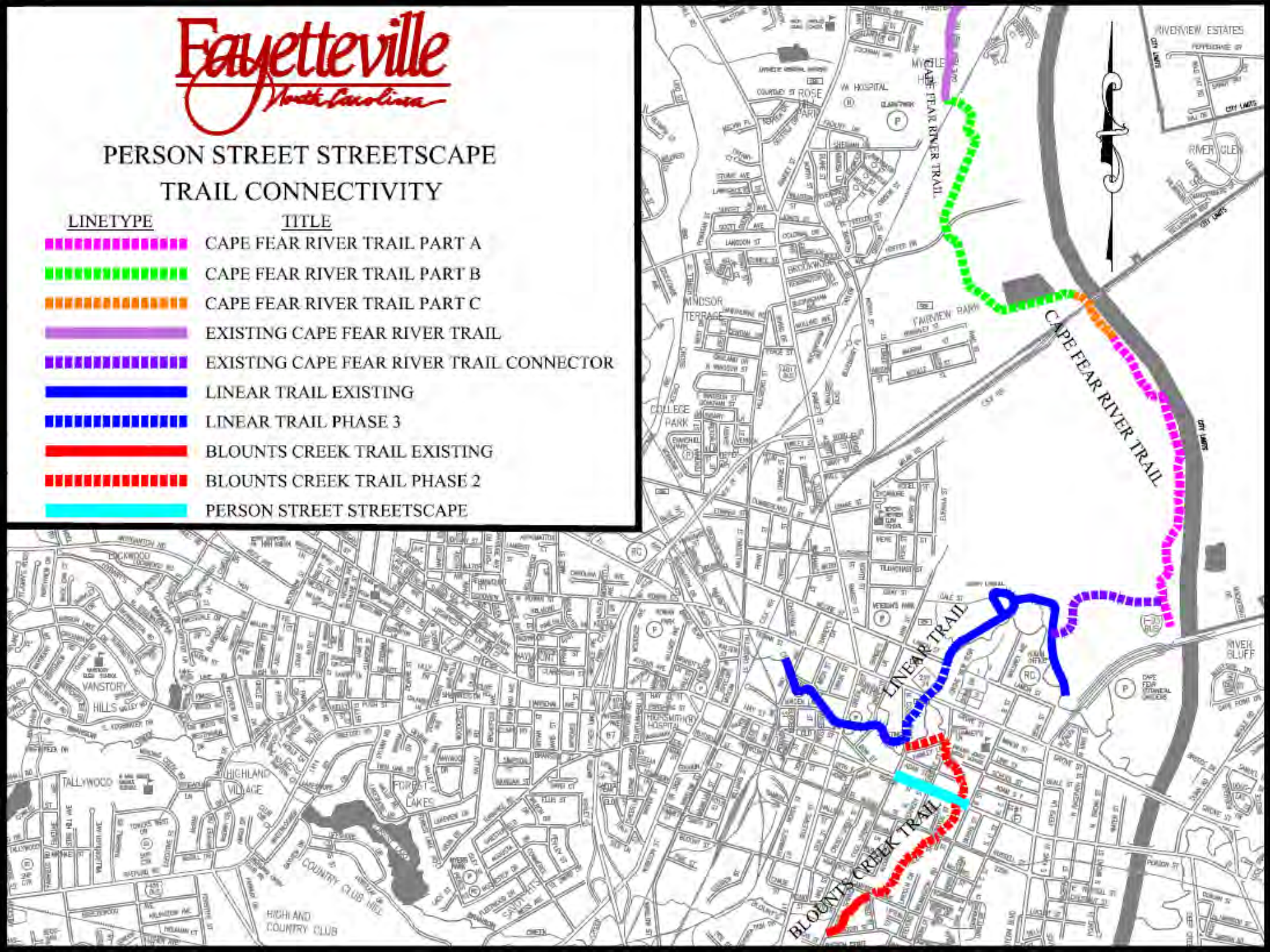
Unique Attributes

- Major corridor to downtown
- Strategic Planning – Downtown Beautification
- Urban area
- NO land acquisition
- Connection with multi-use trail system
- Great asset: stormwater runoff
- Sandy clay loam texture
- 0.38 inches per hour saturated hydraulic conductivity
- Gray to Green conversion

Fayetteville
North Carolina

PERSON STREET STREETSCAPE TRAIL CONNECTIVITY

LINETYPE	TITLE
	CAPE FEAR RIVER TRAIL PART A
	CAPE FEAR RIVER TRAIL PART B
	CAPE FEAR RIVER TRAIL PART C
	EXISTING CAPE FEAR RIVER TRAIL
	EXISTING CAPE FEAR RIVER TRAIL CONNECTOR
	LINEAR TRAIL EXISTING
	LINEAR TRAIL PHASE 3
	BLOUNTS CREEK TRAIL EXISTING
	BLOUNTS CREEK TRAIL PHASE 2
	PERSON STREET STREETSCAPE

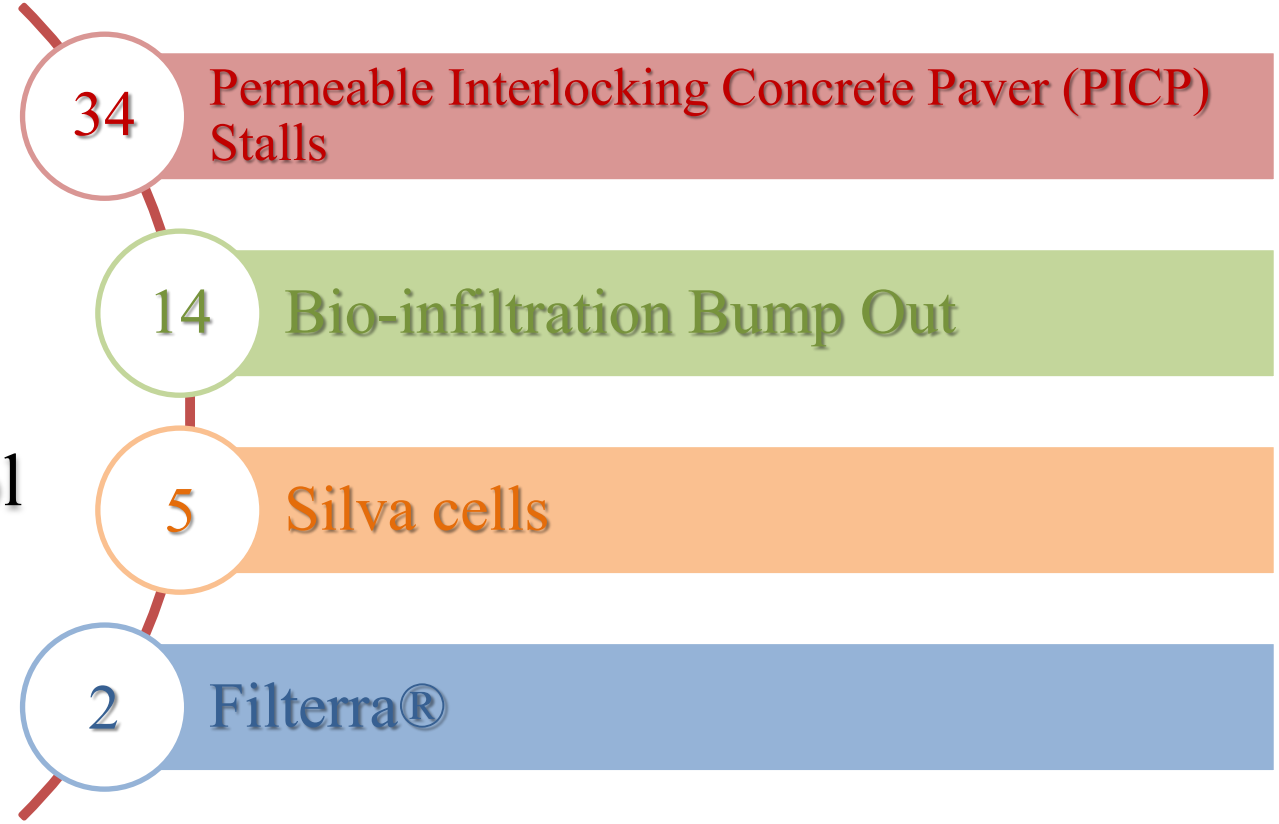


Exclusive Rewards

- Connection with multi-use trail system
- Improve access and mobility
- Increase economic activity
- Enhanced downtown character
- Safer and more secure
- Greater community engagement
- Stormwater quality & quantity control
  - Urban area exempt by current ordinances
- LID encouragement
- Improve quality to an impaired stream – Blounts Creek
- Research by NC State – Bio & Ag
- Educational opportunity

Innovative Stormwater Design

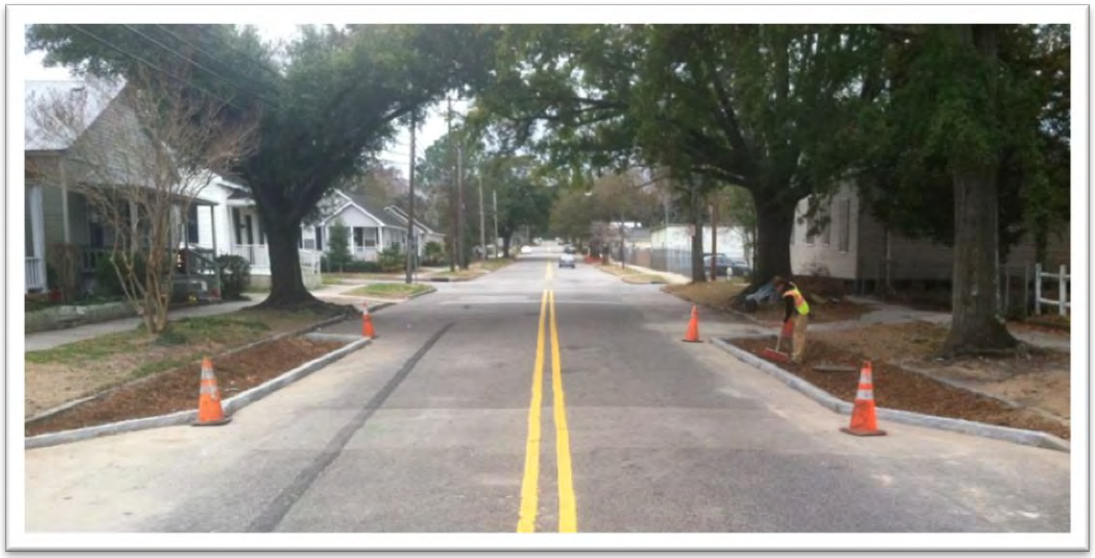
87 % of the roadway will be treated by volume control and filtration



Infiltration can be accomplished because of soil drainage:

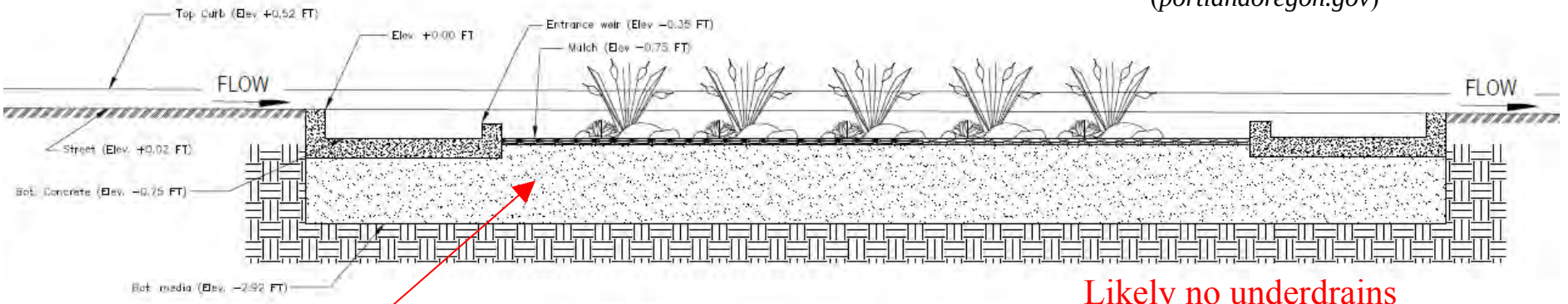
- Sandy clay loam texture
- 0.38 inches per hour saturated hydraulic conductivity

Bio-infiltration Bump-Out



Wilmington, NC

Siskiyou Green Street Project, Portland, OR
(*portlandoregon.gov*)



Likely no underdrains

Engineered soil media

Sample Cross Section
(not to scale)

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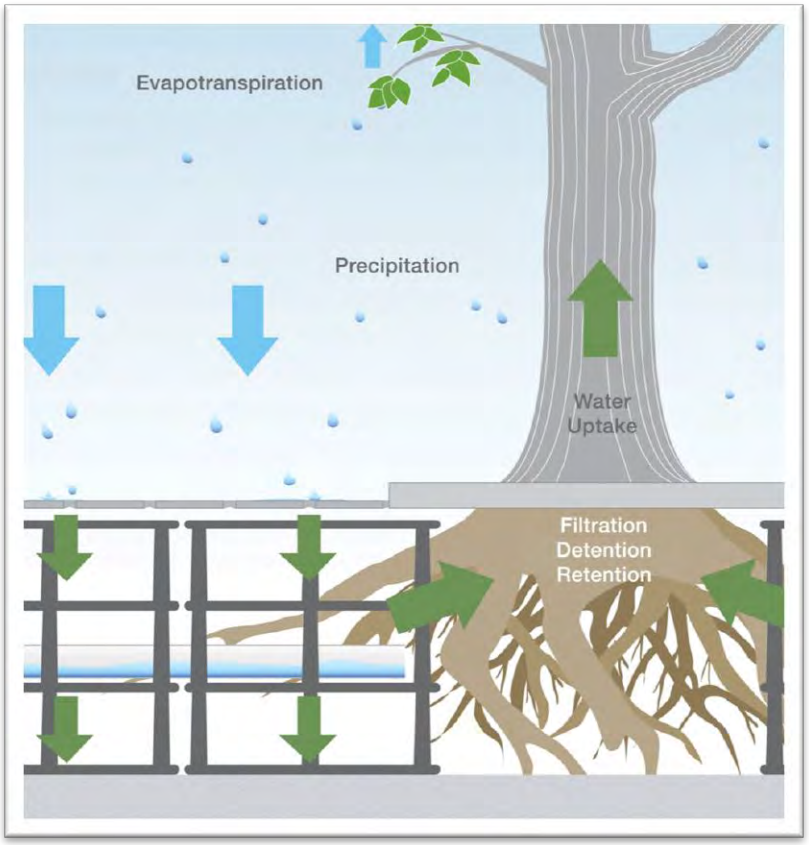
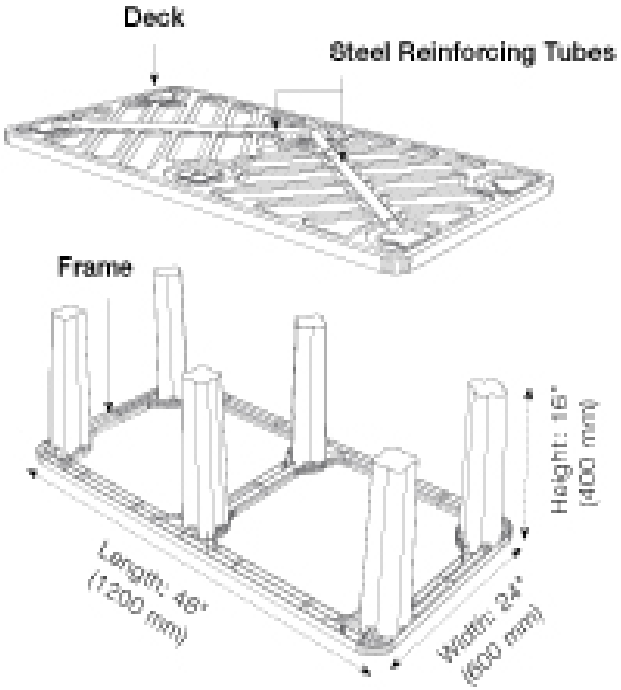
Silva Cell Tree and Stormwater System





Typical cross-section of the Silva Cell™ suspended pavement system

(*image courtesy of Deep Root Partners, LP*)

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Silva Cell Tree and Stormwater System

Wilmington, NC Installation
(Photos: NCSU)

Silva Cell frames

Load-bearing decks

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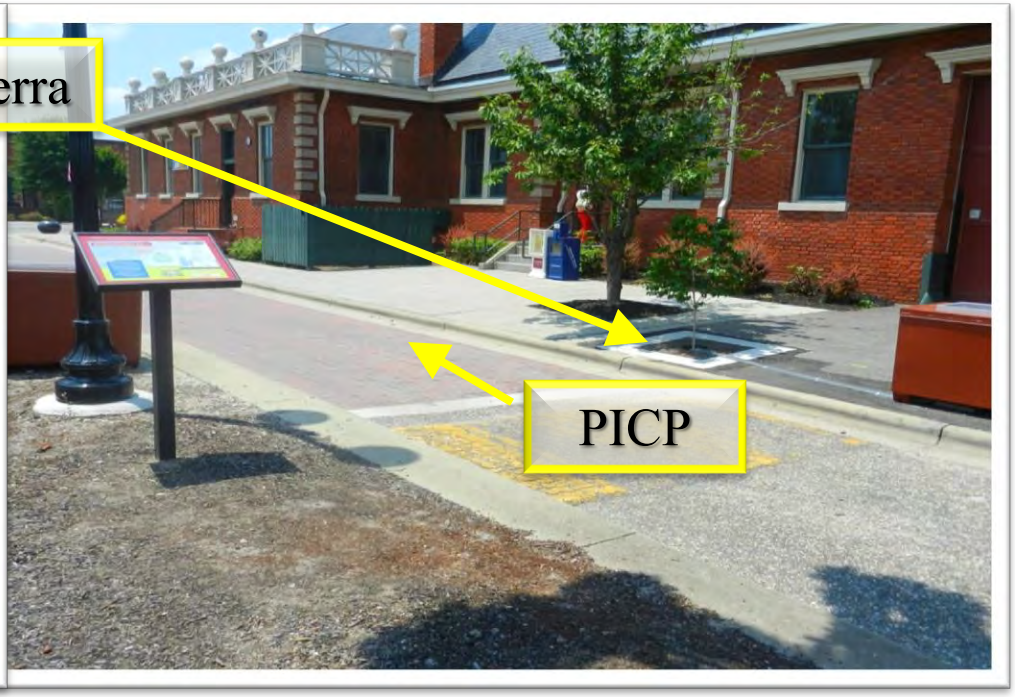

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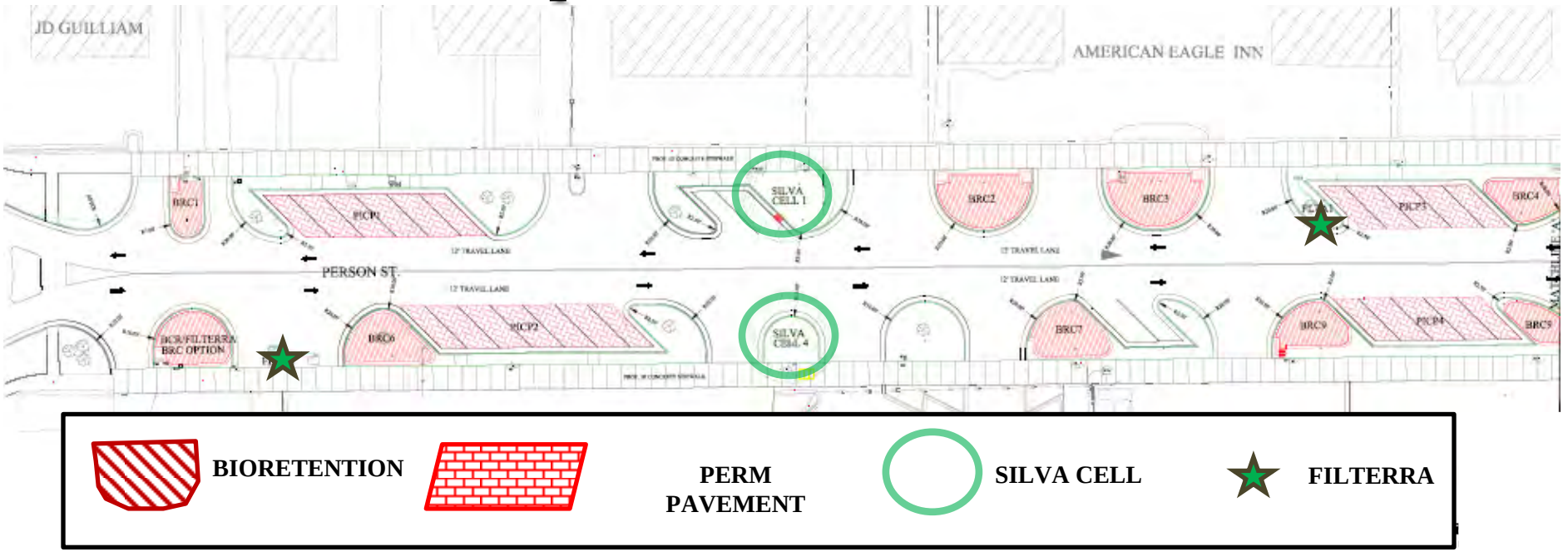
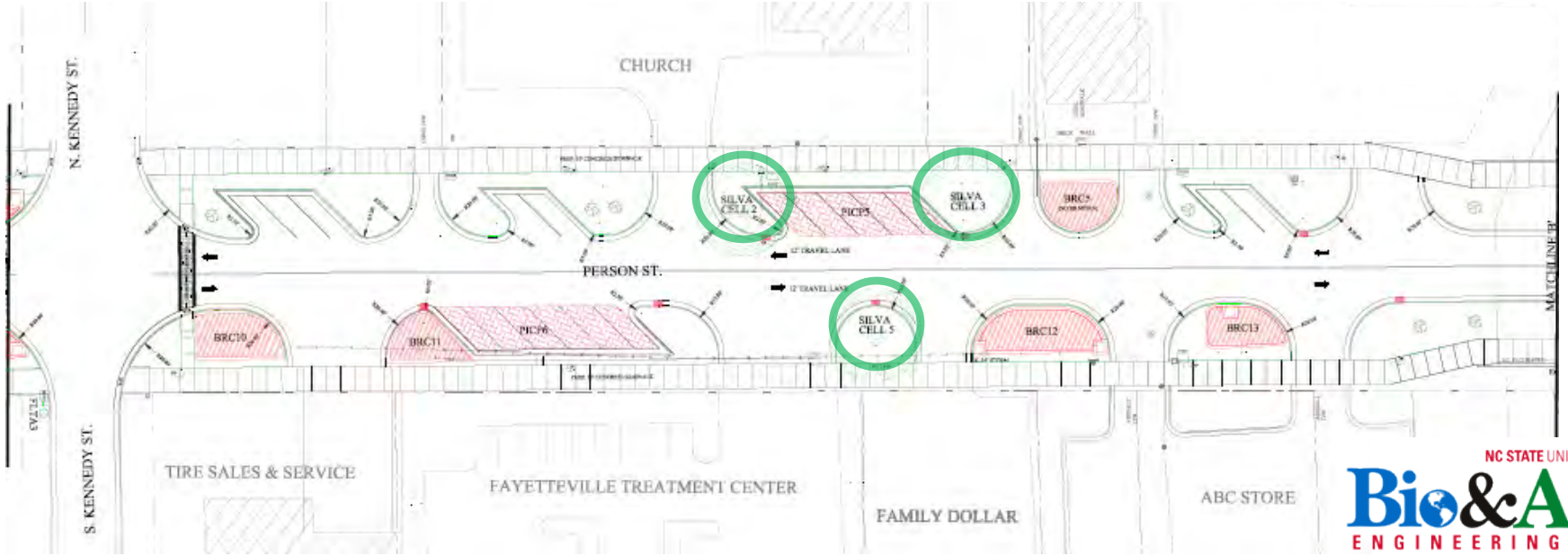
Proposed Street Corridor





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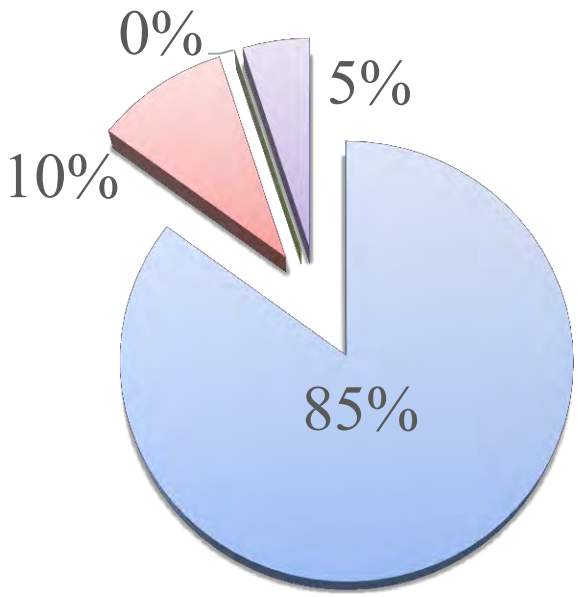
Impressive Quality Gain

Estimate of Person Street Infiltration BMPs

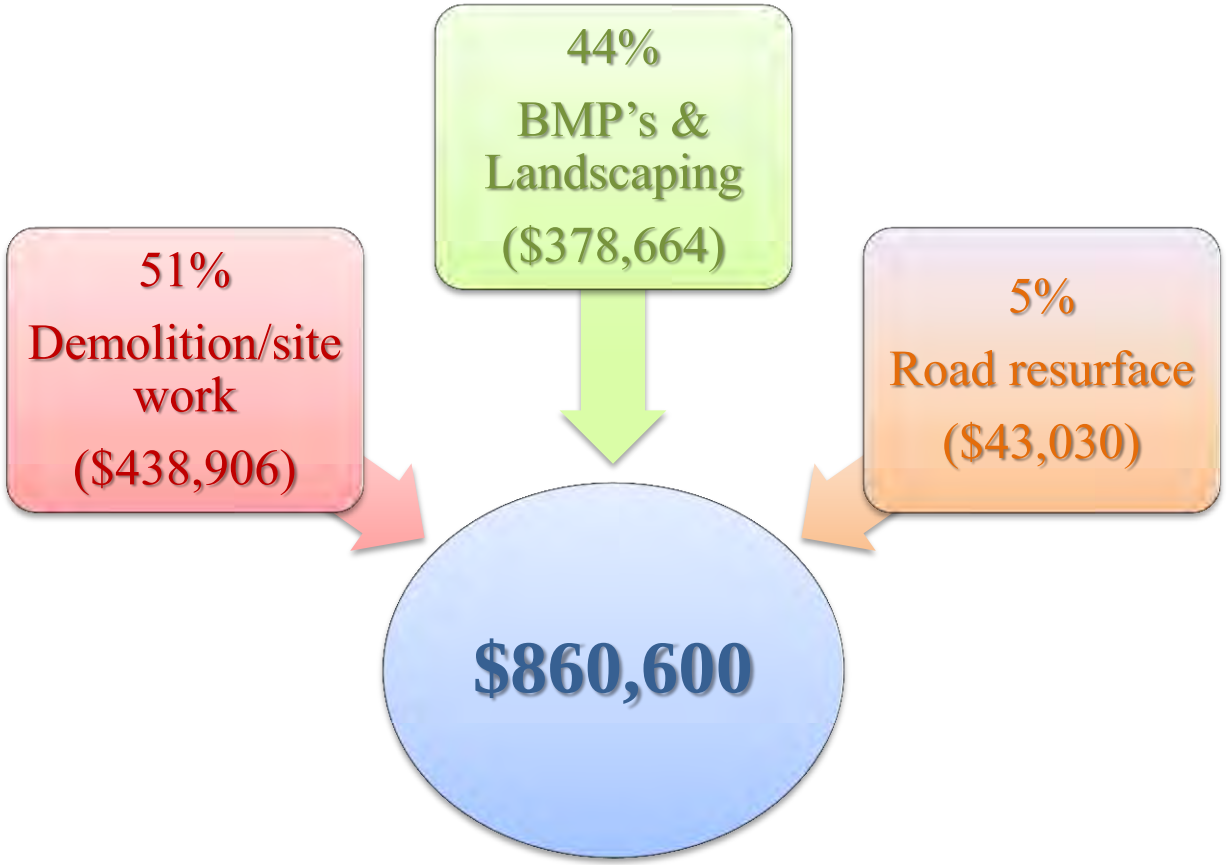
Annual Fate of rainfall



Reduction in impervious area	- 36%
Percent of street volume captured (1.0” design storm)	75%
Nitrogen removal	>21 lbs / year
Phosphorus removal	>2.6 lbs / year
TSS removal	>770 lbs / year

Less volume = Less pollutants entering degraded stream

Estimated Project Cost



* Utility work by utility providers

BEFORE

AFTER

BEFORE

AFTER

What if…

Conventional Streetscape Project

- Cost saving $200,000
- Impervious area increase – 15,903 sf
- Peak flow increase
- Increased volume
- Less shade, higher temperature runoff
- No nutrients removal

Why Bother???

- Can you get a water quality project with similar rewards for $200,000???
- The real trade-offs are not easily monetized.
- No training will provide such an educational opportunity.
- No encouragement is greater than doing it yourself.
- Commitment as stewards of our environment: time to give back.
- Improve environmental resiliency.
- Enjoy ecosystem services.

The right thing to do!!!

Bringing Innovation to the Streetscape

- Potential for long-term water quality and hydrology monitoring to show the effects of the project will give future municipalities more confidence
- New design configurations of Silva Cell and bio-infiltration configurations
- Holistic approach, not just piece-meal retrofits, to solve problems on the **macro scale**
- Economic efficiency on LID scale by taking advantage of labor already committed to streetscape repair!

Lessons Learned

- Need for a purpose
- Everybody understands goals
- Stormwater runoff as asset
- Buy-in
- Change mind set – mud holes in R/W
- Stakeholders
- Retrofit – utility conflicts
- To be learned
  - Maintenance
  - Train staff

Giselle Rodriguez, PE
City Engineer
(910)433-1303
grodriguez@ci.fay.nc.us

City of Fayetteville North Carolina

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