



15th Annual Clean Rivers, Clean Lake Conference

Known for excellence. Built on trust.



Going **Green**...Saves **Green**

*Reducing Operating Costs and
Increasing Profits With Sustainable Designs*

November 14th, 2019

Alverno College

4:15 PM – 5:15 PM

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Presentation Outline

- Think About the Client
- Expand Your Toolbox
- Prairie Treatment Systems – A Valuable Tool
- What is the Potential Return on Investment

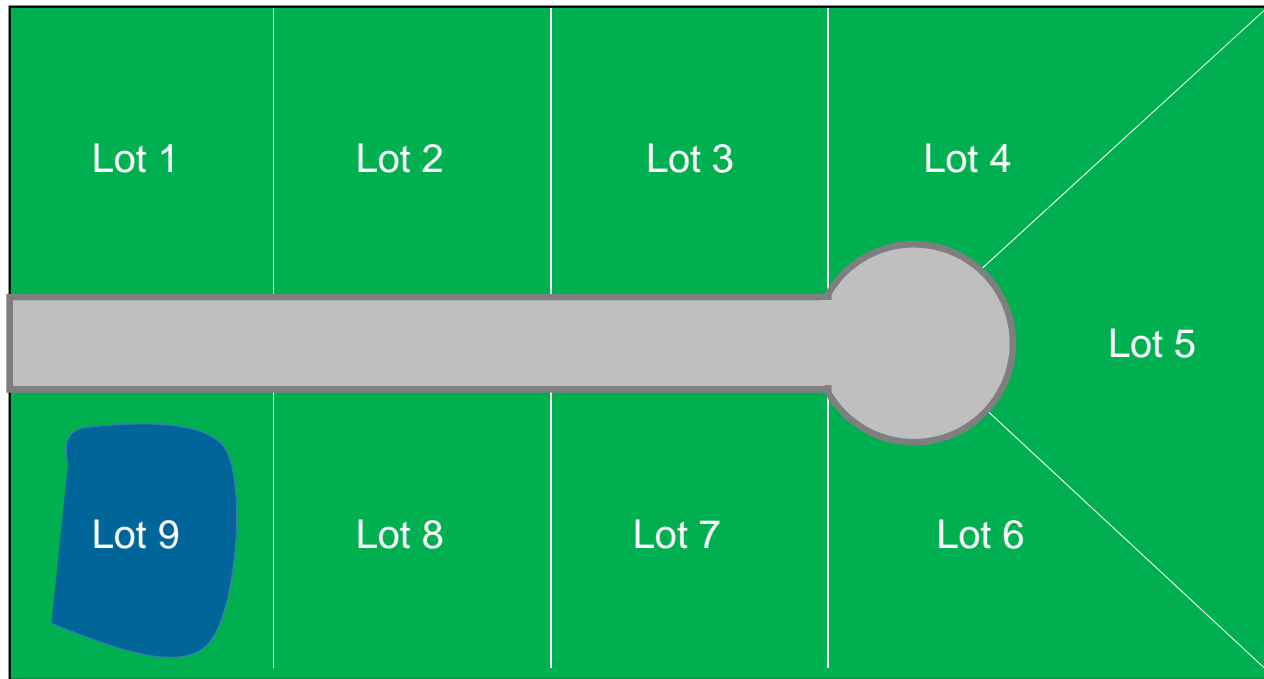


Current Practices





Stormwater, an Afterthought



Conventional System **\$150,000**
Sale of 8 Lots \$400,000
Profits **\$250,000**

Alternative Green System **\$175,000**
Sale of 9 Lots \$450,000
Profits **\$275,000**

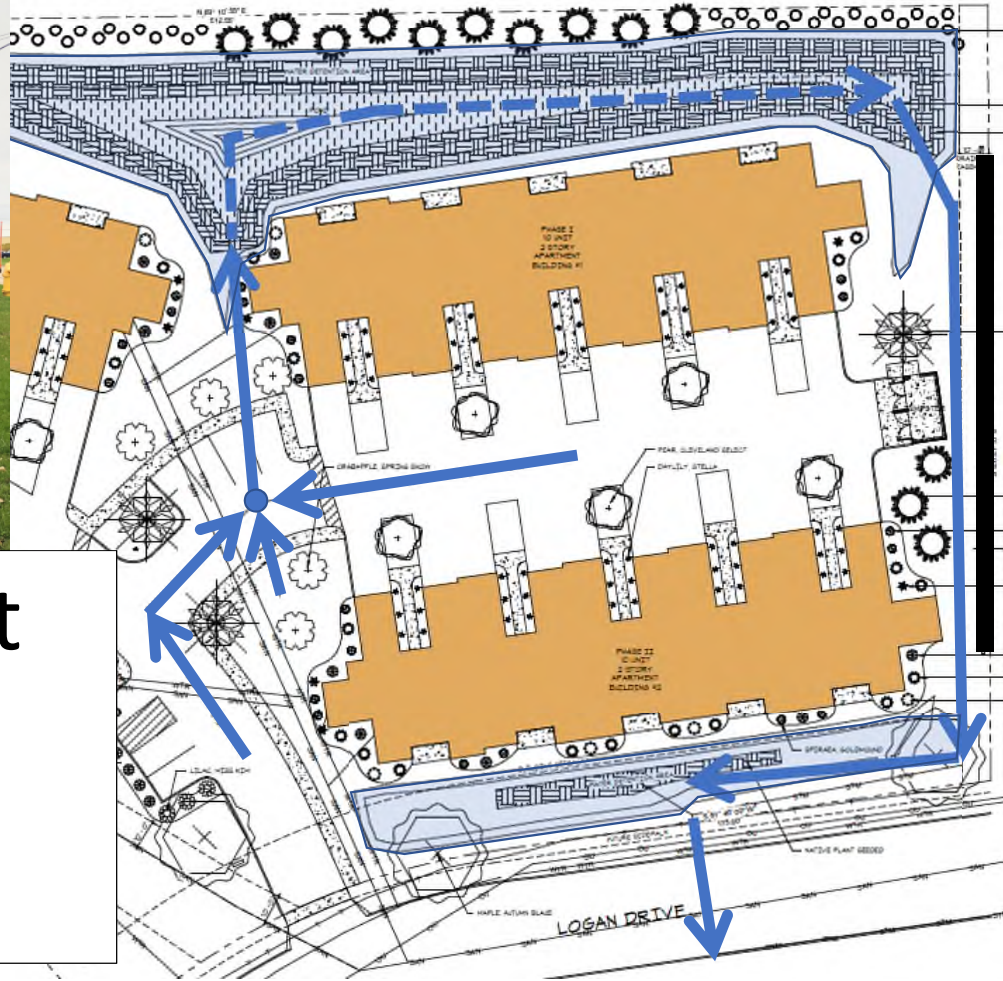




Designed Impairment



Think About Owner & Who Comes Into Contact



- Maintenance Cost
- Aesthetics
- Impact on Rents



Added Cost to Make it Work



\$50,000 - \$100,000



Added Cost to Make Beautiful

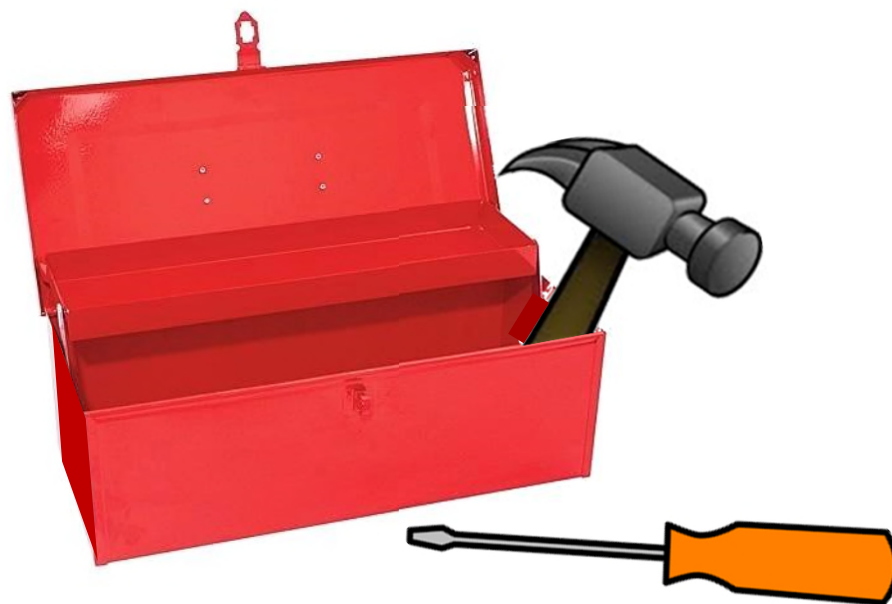


KWIK TRIP



Increasing the Return on Investment

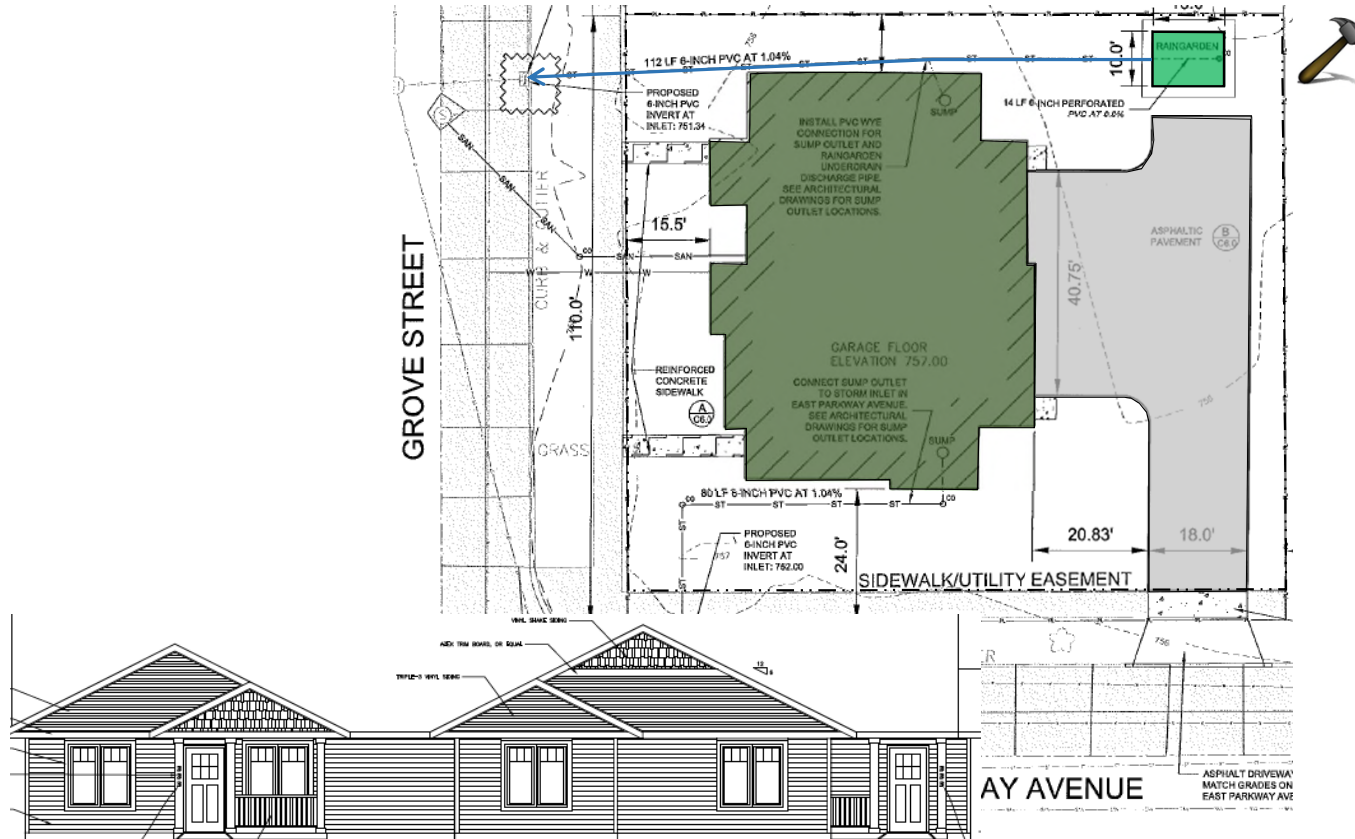
We Can Do Better





Intentional Increased Costs & Challenges

Do Owners Have Skills, Finances & Knowledge?

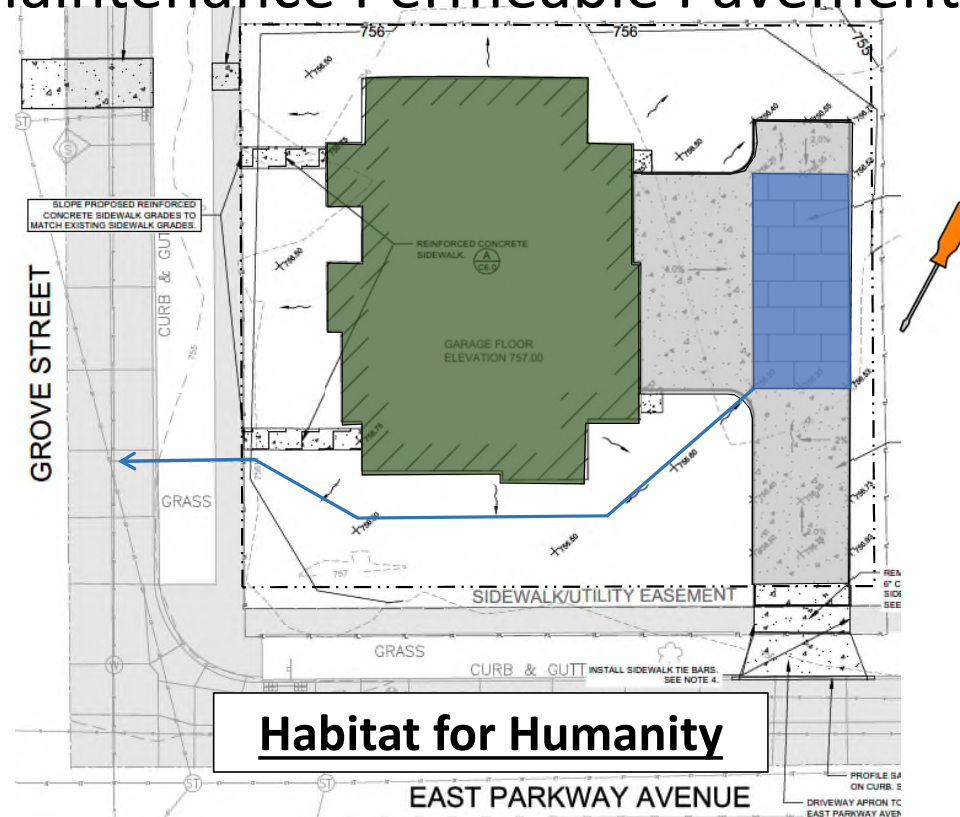


Habitat for Humanity



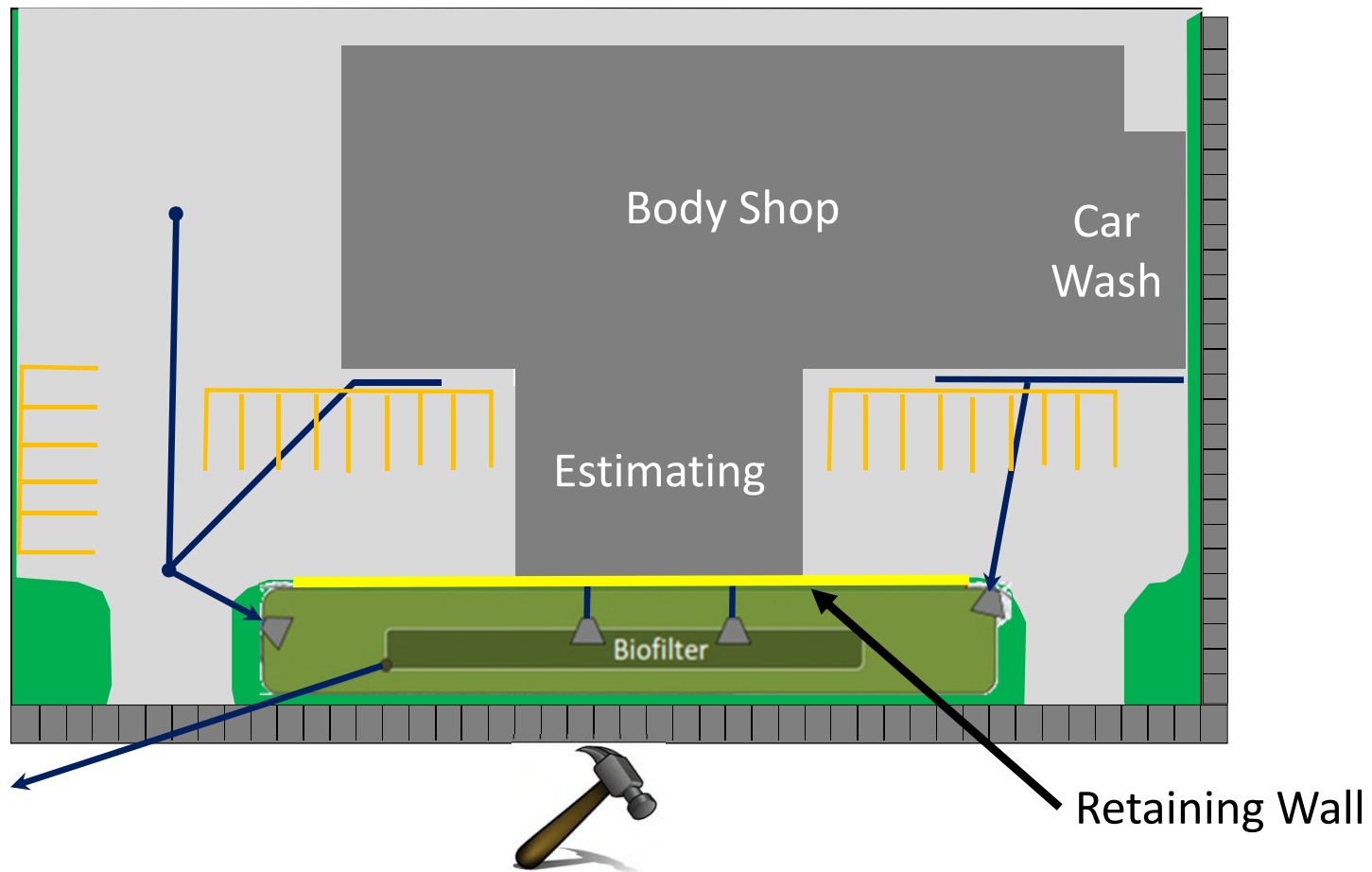
Consider Who and How People will Encounter BMP

Lower Maintenance Permeable Pavement System



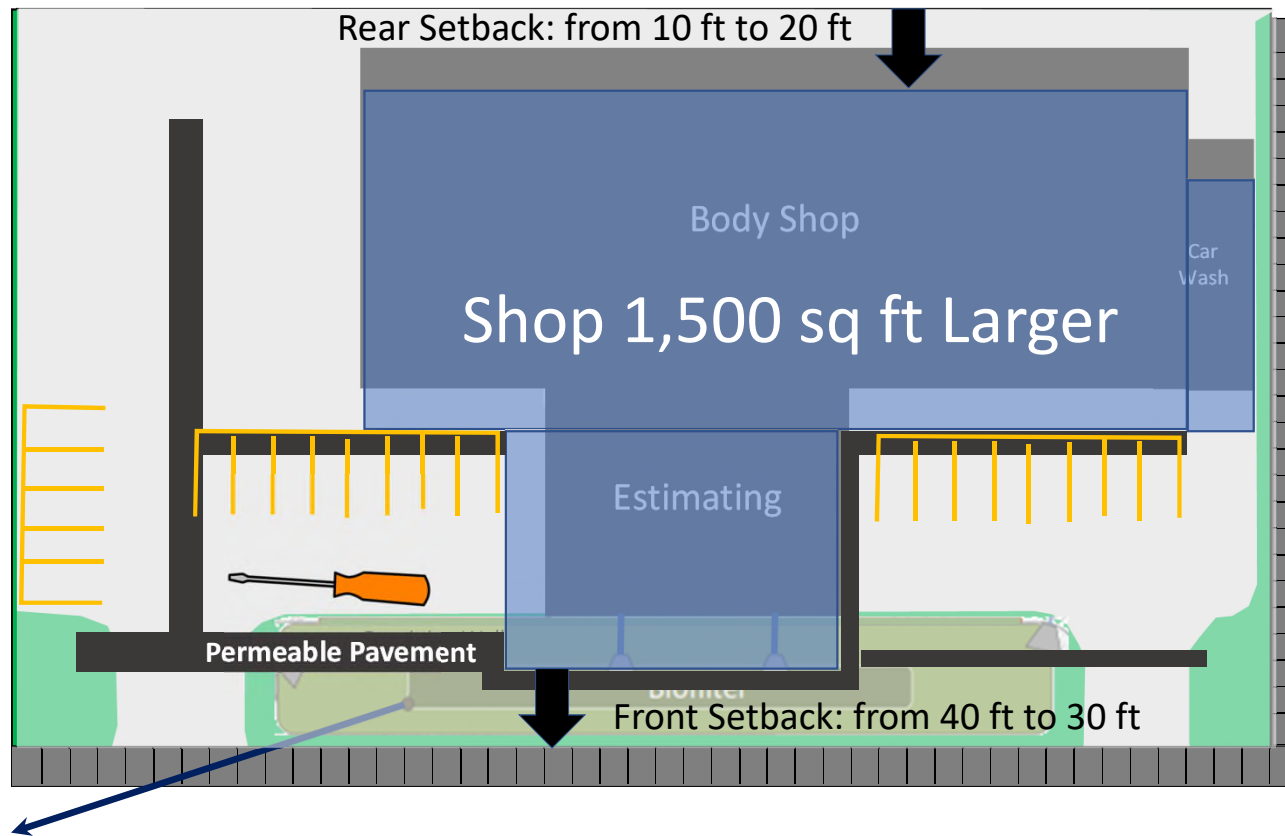


Auto Body Shop Cost of Stormwater





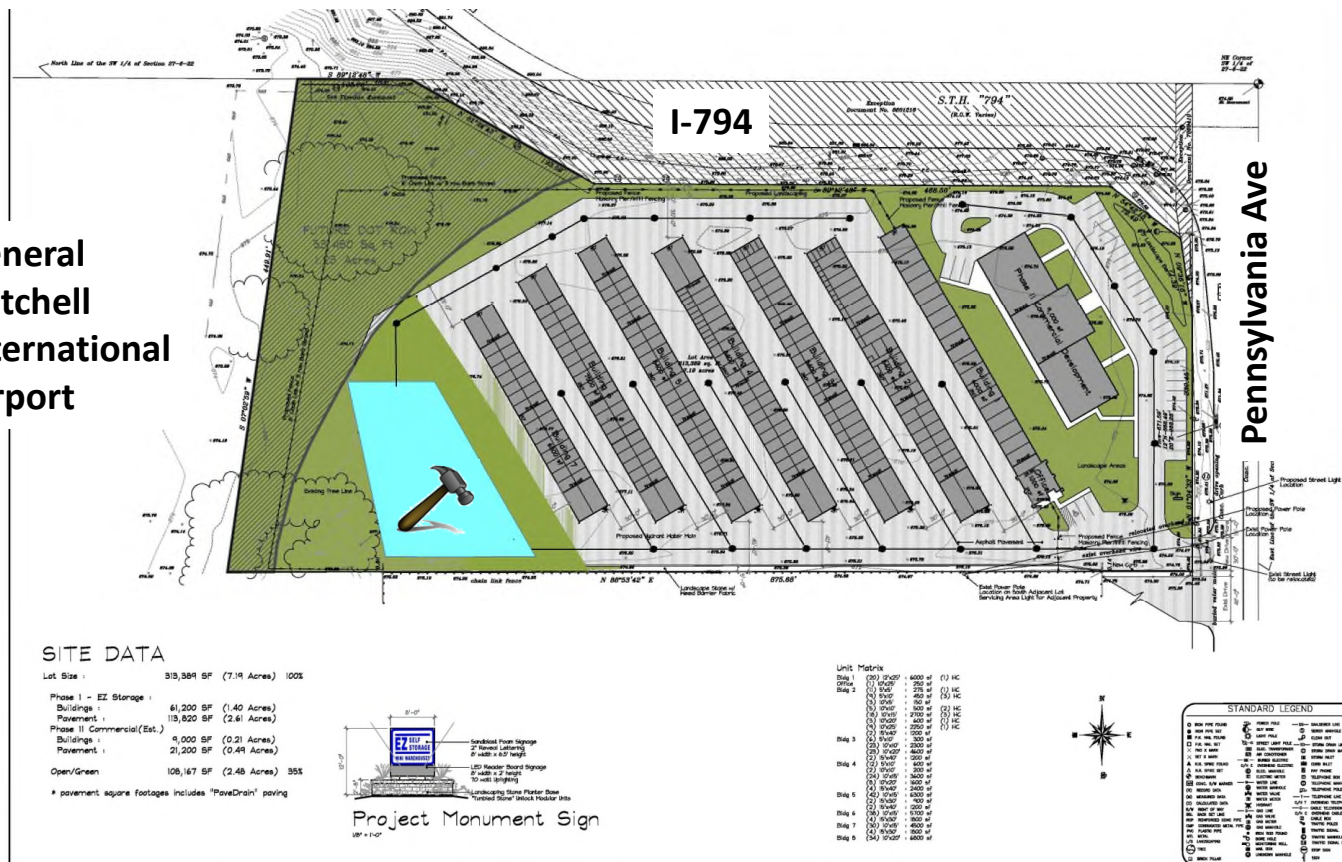
Auto Body Shop Cost of Stormwater





Unpermittable Traditional Design

General
Mitchell
International
Airport



414-52
SUNSET II
REAL ESTATE / DEVELOPMENT
10935 N. Col
Franklin

EZ SELF STORAGE
MINI WAREHOUSES

EZ STORAGE
CUDAHY
5193 S. Pennsylvania Ave.
Cudahy, Wisconsin 53110

0 20' 40' 80'
Scale 1" = 40'-0"

Sheet Title
PROPOSED SITE PLAN

Revisions

Date: May 07, 2013
Job No.: -
Drawn By: -
Sheet No.: C101

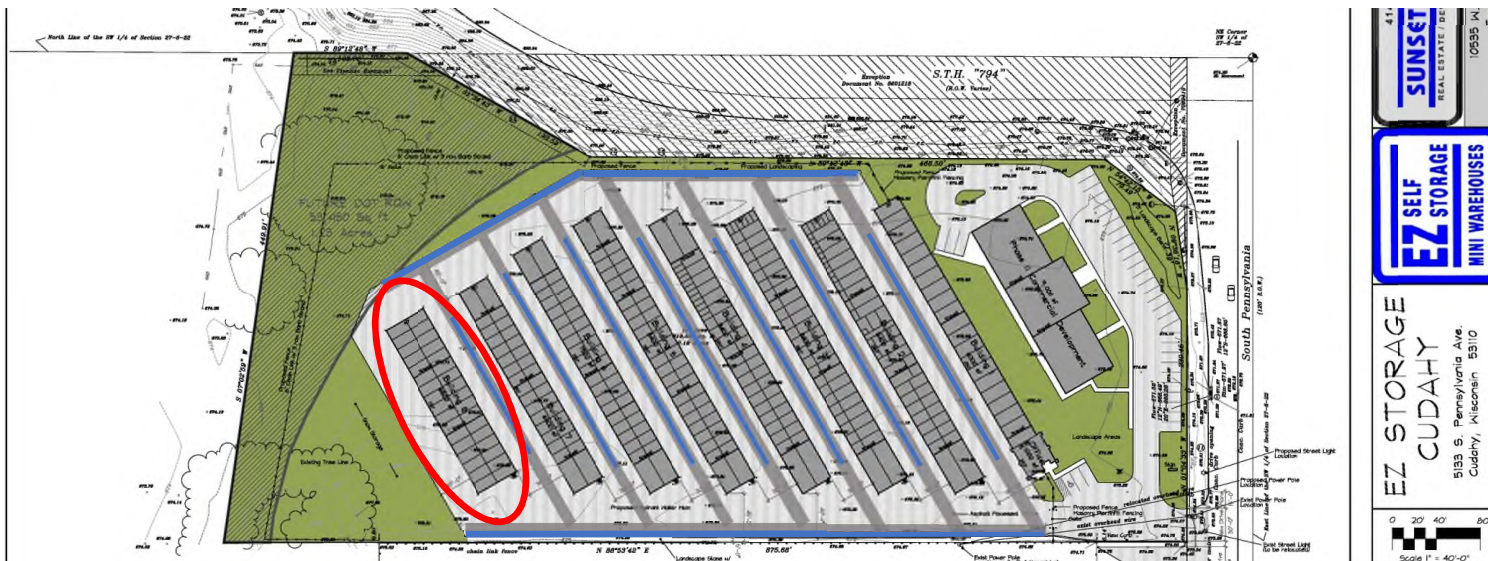


Bring More to Owner's Bottom Line





Bring More to Owner's Bottom Line



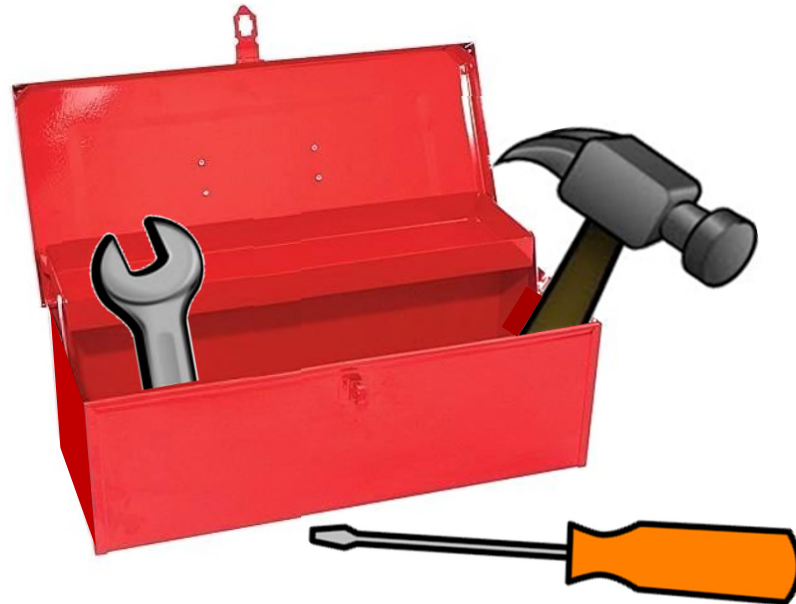
- Permittability of Project
- Additional building of 34 rental units
- \$53,000 in additional annual revenue
- \$4,000 reduction in the annual stormwater utility fee
- \$75,000 one-time grant from the MMSD



Increasing the Return on Investment

We Can Do Better

We Have the Tools





Bioswale Complaints - Performance

- Collects trash / litter
- ROW width – impedes pedestrian egress
- Mulch floats (adding to maintenance)
- Trip-fall hazard
- Sometimes deep
- Long term permeability
- Soil Permeability Impacted by Salt





Bioswale Complaints - Maintenance

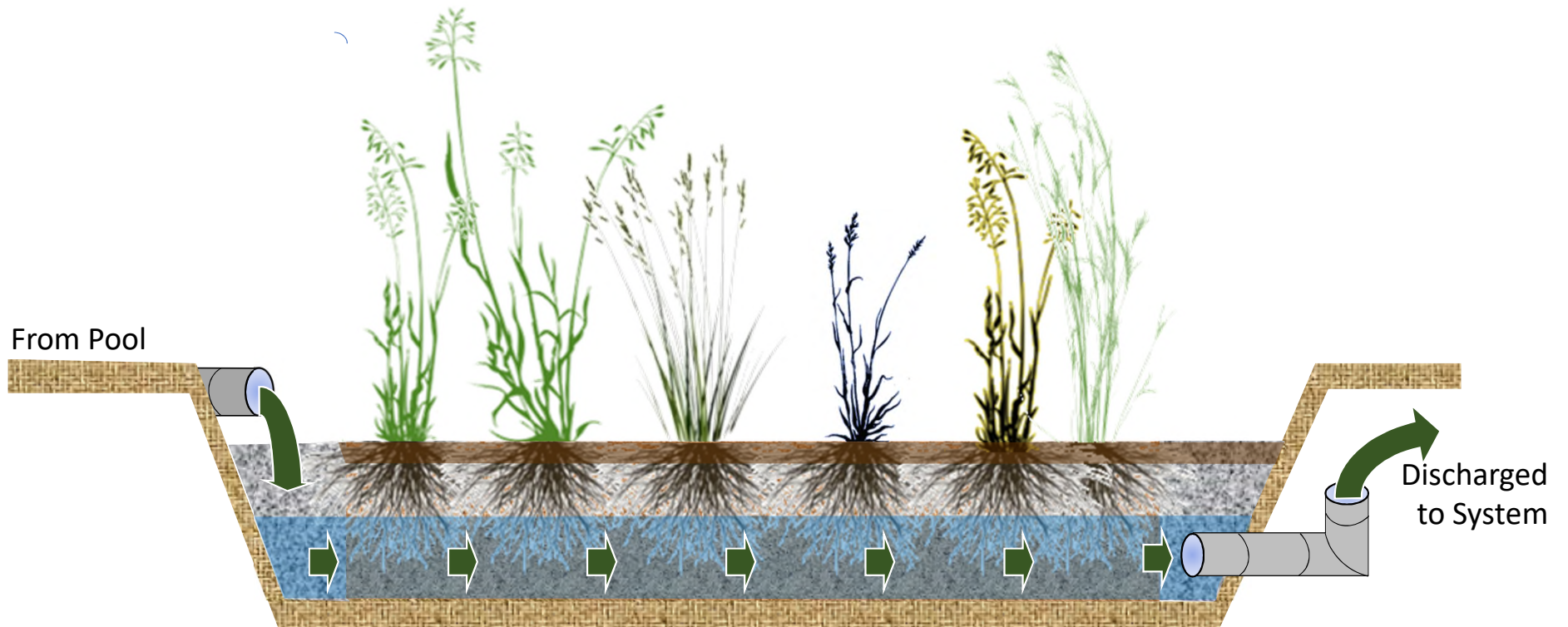
- Inspect Frequently and Repair When Necessary
- Removed/Replace Top 2 - 3 inches as Needed.
- Vegetation Checked for Growth and Weeds
- Removal of Litter and Debris
- Inspection of Underdrain Clogging
- Routine Remove Accumulated Sediment
- Remove Rocks and Debris From High Flows
- Annual Totals 130 - 150 hr \$5,000 – \$5,500





New Tool – Subsurface Horizontal Flow Wetland

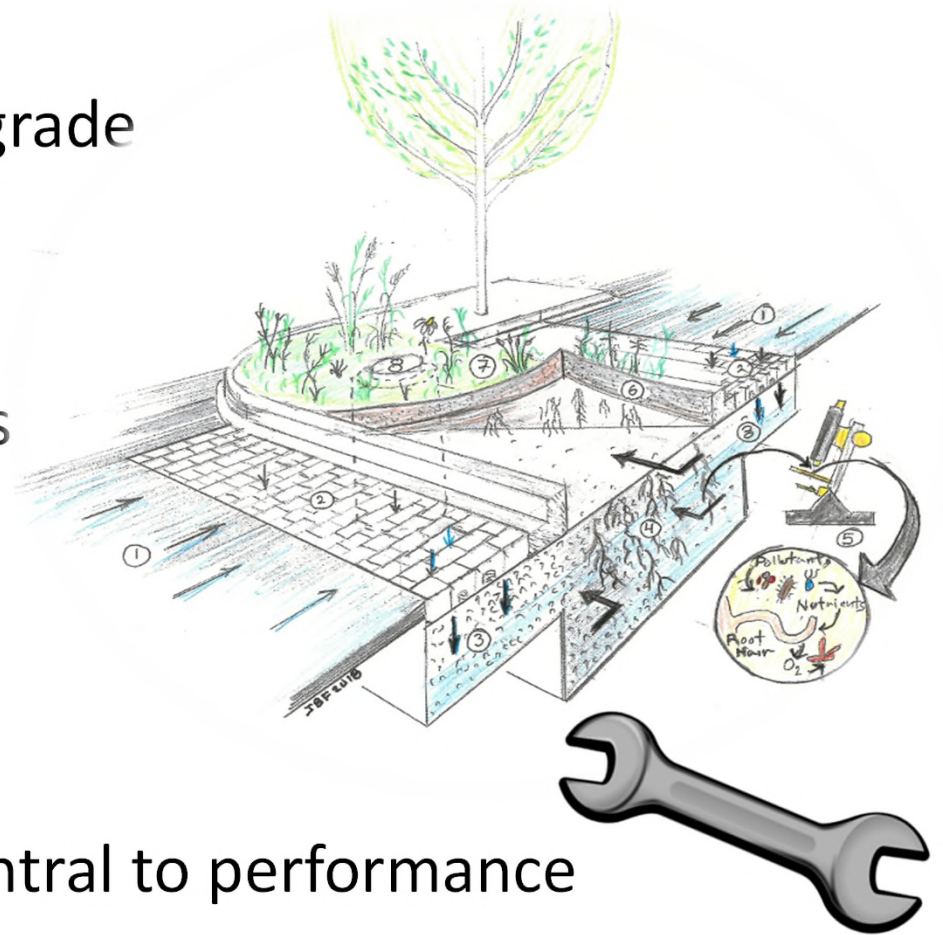
Prairie Treatment System





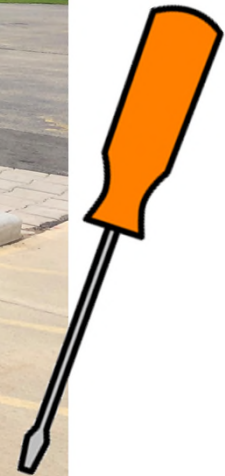
Improvements to Green Infrastructure

- Stormwater plantings at or above grade
- Trash / litter remains on street
- Does not impede pedestrian egress
- No standing water
- Not Impacted by Salt
- Long term soil permeability not central to performance





New Tool – Subsurface Horizontal Flow Wetland

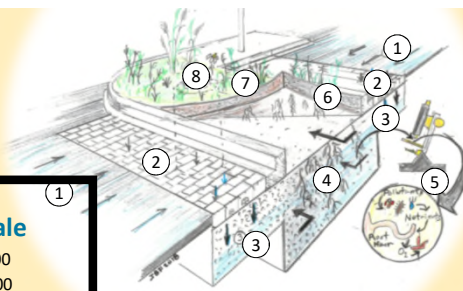




Save Money By Integrating Construction

• Pavement and a landscaped parking island costs	\$6,000
• Cost to add the Prairie Treatment System	\$24,000
• Cost of the extra land for the Prairie Treatment System	<u> \$0</u>
Total cost of this Prairie Treatment System	\$30,000
Cost savings	\$27,000

- Reduces the peak runoff rate for a 10-year rainfall to runoff rates equal to undeveloped land.
- Is able to capture rainfall as high as 2.5 inches per hour without ponding.
- Is crossed by 4 buried communication conduits and one electrical conduit without interference.



- microbes.
- 5. Microbes living on gravel and plant roots breakdown pollutants.
- 6. Soil cover insulates the gallery and absorbs odors from decomposition.
- 7. Native prairie plant's deep roots absorb released nutrients.
- 8. A ¾-inch hole in manhole drains the rain water from the gallery in approximately 20 hours. When the gallery is full a second 10-inch hole keeps the gallery from overflowing into the parking lot.

Conventional Parking Lot With Bioswale

• Pavement and a landscaped parking island costs	\$6,000
• Drainage infrastructure costs	\$8,000
• Cost of an equivalent bioswale	\$30,000
• Cost of the extra land for the bioswale	<u>\$13,000</u>
• Total cost	\$57,000

Save Money By Integrating Construction

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Why Build A Prairie Treatment System?

- Allows land to be more productively used for larger developments with retail, manufacturing, parking, warehousing, or leasing instead of dedicating land for stormwater detention ponds.
- Reduces the amount of land required for development.
- Has no standing water to turn green or attract mosquitoes
- Requires no specialized skills to maintain vegetation or permeable pavement.
- Allows space to be used for multiple purposes: paths/sidewalks, utilities, temporary snow storage, outdoor recreation, etc.).

Maintenance Requirements

- Maintenance of vegetation can be performed by standard landscapers/grounds keepers.
- Maintenance of pavement can be performed by standard vacuum pavement sweepers.
- Requires less deicing material.
- Standard snow plows and snow storage practices can be used.
- Pavement will not heave due to ground freezing.
- Pavement will not crack and shift.



Missed Opportunity Typical Big Box Development



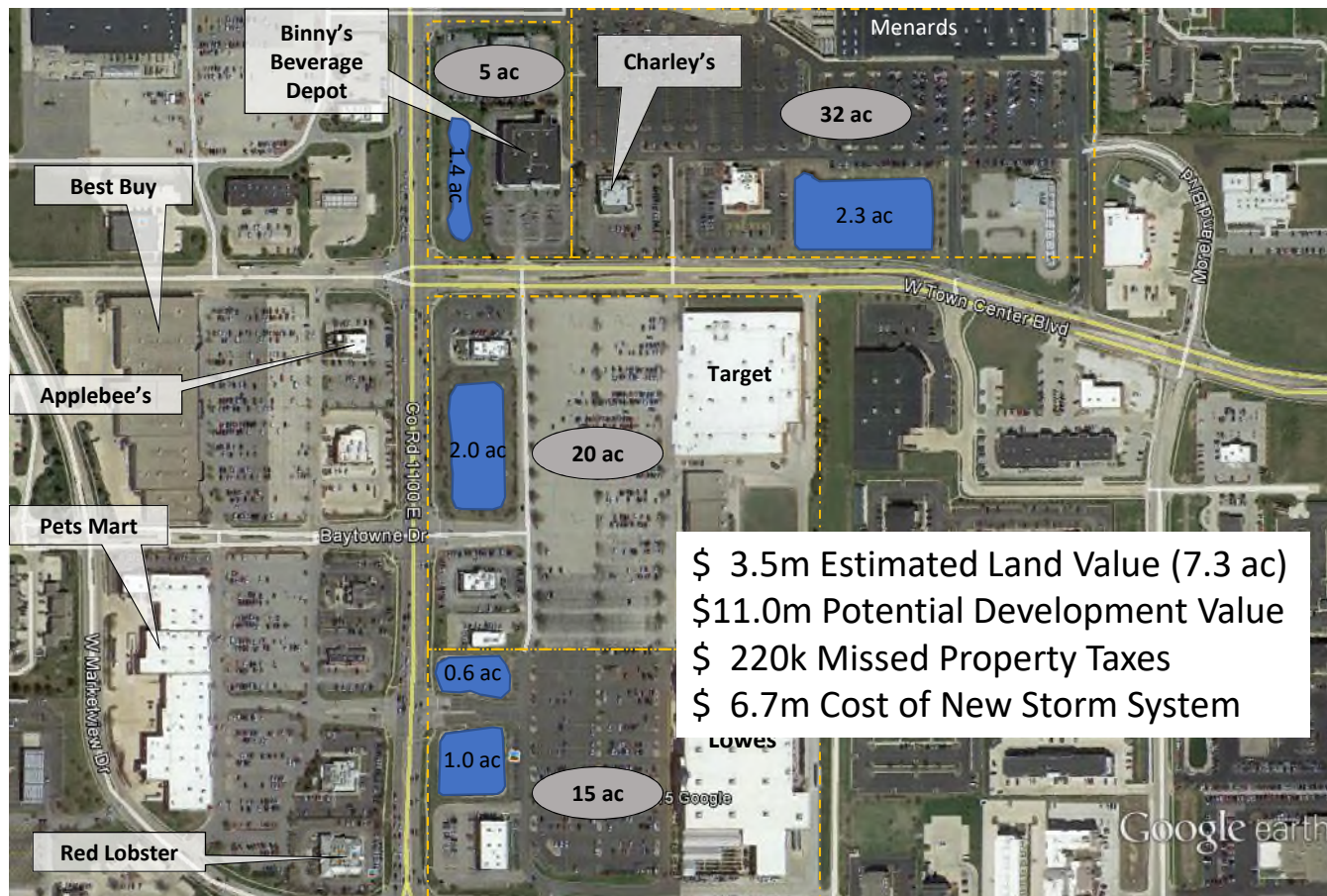
- Land Purchase Price
\$500,000
- Traditional Storm System
\$1,000,000
- Value of Potential Development
\$3,000,000 to \$4,000,000
- Missed Property Taxes
\$60,000 to \$80,000
- Cost of Green Stormwater System
\$1,500,000





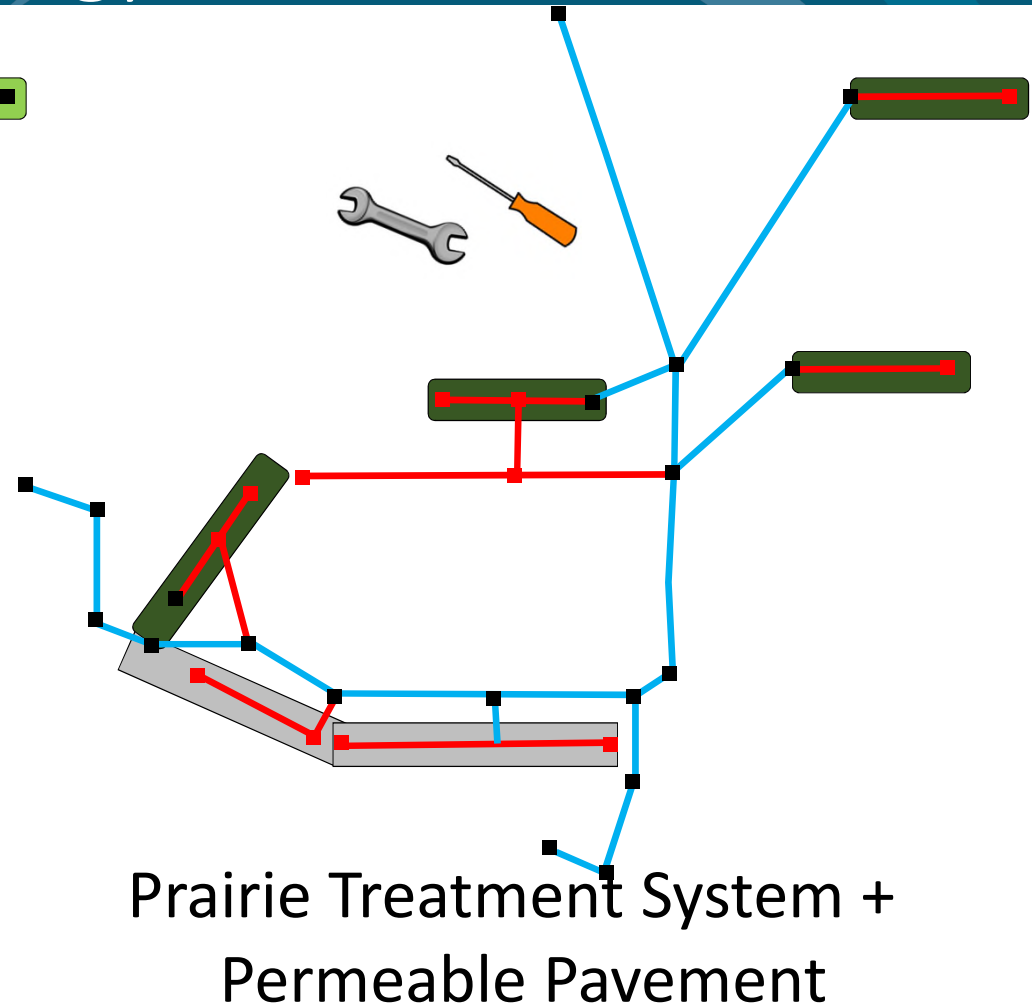
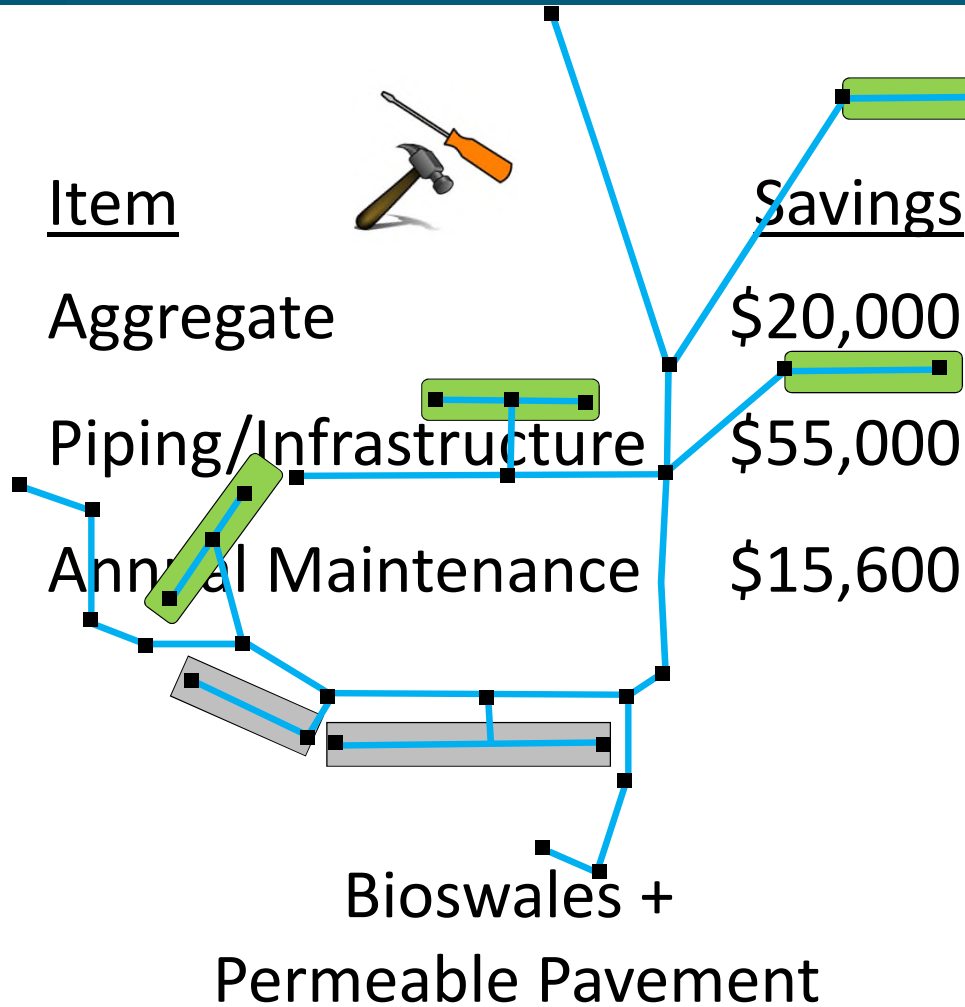
Missed Opportunities

W. Town Center, Champaign, IL





Different Technology Lowers Costs





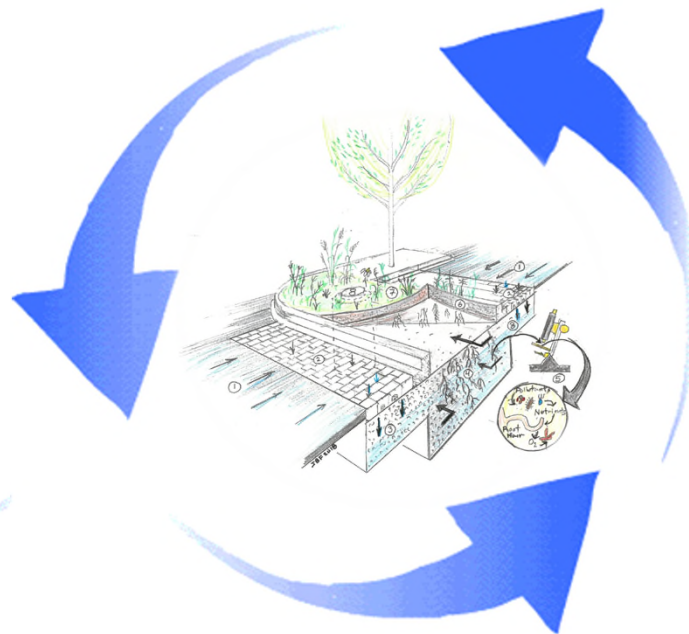
We Can Do Better

Think How to Save Costs

Think How to Generate More Revenue

Think and act in
client's best interest

Consider how people
will be exposed to the
practice



Expand your "toolbox"
beyond pipes, pond
bioswales.

Factor in Cost of
Maintenance



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Thursday, November 14, 2019 4:15pm – 4:45pm

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