Greening the Maine Mall – A Comprehensive Approach to Managing One of the Largest Sites in Long Creek.

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Three Major Greening Elements

• Retrofit of existing detention pond for approximate 1/3 of the Mall;
• Evaluating “green parking” for remainder of the Mall; and
• Assessing and quantifying the value of trees now and in the future based on species, size, orientation, and location (iTree)
Long Creek Watershed Study Area

3.6 sq mi watershed
~ 29% Imp
Retrofits Identified and Ranked in the LCWMP
Thomas Drive, Westbrook

2011 streamside plantings

• 50 trees, 604 shrubs, and 2098 herbaceous plants
Fairchild Semiconductor, South Portland

2013 Impervious Cover Treated: 13.23 acres
Effective Impervious: 35%

Nearly 75 Imp Acres Managed through 2014
Hydraulic Profile

Figure 9. Hydraulic Flow Path through Gravel Wetland System
Harvard, MA Gravel Wetland
Gravel Wetland: Greenland NH
Performance

• Captures 33.9 Acres (28.3 imp acres)
• Reduces peak flow rates of existing pond for all storms up to 25 year event (modest increase for larger events – but still substantial attenuation
• Exceeds S. Portland WQ Treatment Std; Provides .69” of WQ volume (< Ch 500 req.)
• Meets Ch 500 Channel Protection Criteria (1.25” Precip: \( Q_{in} = 33.1 \text{ cfs} \) \( Q_{out} = 4.23 \text{ cfs} \)
Retrofitting an existing site is not the same as designing a new development
Greening the Parking Lots

General Approach

1. What are existing conditions and constraints?
2. What are restoration opportunities?
3. What are the costs/benefits of those options?
4. How can selected facilities be constructed and what is the long term management plan?
Goals:

• Work within existing conditions;
• Need to balance water quality improvement with other objectives; and
• Combine discreet BMPs into a coherent package.
Construction feasibility and disturbance are major factors for consideration.
Options need to meet parking demand and traffic flow requirements
Porous Pavements/Pavers Considered
“iTee Design” v6.0 for Initial Assessment

- Existing based on site survey
- iTee-Species, HW bio list, and AKD recommendation
- Applied Red Maple and Green Ash, 3.5” DBH plantings
- Replace only dying trees unless completely removing ex. landscape island
- iTee-Design 6.0 for preliminary comparisons between existing and proposed
  - Total projected benefits 20 yrs
  - Stormwater runoff savings
  - Gallons intercepted
i-Tree Design v6.0

Get started with these easy steps:

1. Draw Structures
2. Place Trees

Describe your tree:
- Tree species: Ash, Green
- Tree diameter: 3.5 Inches
- Tree condition: Excellent
- Tree exposure to sunlight: Full sun

Tree benefit zones:
- The colored zones surrounding the structure, which appear as you describe your tree, illustrate the relative monetary value of energy savings that the tree would provide in each zone.
- Hover over each zone to see that energy benefit information displayed below the map.

To place a tree:
- Drag this icon to the location on the map where you would like to place your tree.
- Repeat to place additional trees.
- Hover over any tree you have placed on the map to display its benefits.

Model the tree(s) future crown growth over time:
Model Crown Growth

3. Estimate Benefits

Existing

Proposed
Sports Authority

Figure 1. Tree benefit forecast for 20 years

Existing

Proposed
Expected Results

- Total IC managed with BMPs = 39.4 ac (28.3 GW + 11.1 parking lots)
- Total Mall area greened: 46.2 ac
- Trees projected to add ~ 1,000 cf runoff reduction/ year
- Costs:  
  - Gravel Wetland ~ $600,000 ($21k/IA)  
  - Parking Lots ~ $1.3M ($120k/IA)  
  - Trees $ (maybe $200k)*