Sustainable Stormwater Funding for the Upper Charles River

Steering Committee Meeting #4
DoubleTree-Hilton, Milford, MA
June 29, 2011
1:00-1:10 Welcome and Introduction (EPA)
1:10-1:40 Summarize cost of service assessments (HW).
2:20-2:30 Discuss evaluation scenarios for alternative utility structures.
2:30-2:55 Open discussion to solicit input from potentially regulated DD property owners.
2:55-3:00 Next Steps and review of other activities.
Topics

• Existing program costs
• Future program and operational costs
• Comparison to other studies
• Context of RDA
Stormwater Program Cost Centers

- Administrative;
- Billing and Finance;
- Regulation/Enforcement;
- Engineering/Master Planning;
- Operations and Implementation;
- Monitoring
## Operations and Implementation (for example)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operations and Maintenance Management</strong></td>
<td>construction oversight, project bidding, etc</td>
</tr>
<tr>
<td><strong>CIP/Infrastructure Implementation</strong></td>
<td>construction costs (design and engineering in previous section); could be % of large road project (for example)</td>
</tr>
<tr>
<td><strong>PCP implementation</strong></td>
<td>retrofitting</td>
</tr>
<tr>
<td><strong>Voluntary CMPP/RDA implementation</strong></td>
<td>retrofitting</td>
</tr>
<tr>
<td><strong>IDDE</strong></td>
<td>elimination of IDDEs</td>
</tr>
<tr>
<td><strong>Storm Sewer and Culvert Maintenance/Repair</strong></td>
<td>equipment, labor, transport and disposal</td>
</tr>
<tr>
<td><strong>Inlet, Catch Basin, and Manhole Cleaning</strong></td>
<td>equipment, labor, transport and disposal &amp; repair</td>
</tr>
<tr>
<td><strong>Stormwater BMP Facility Maintenance</strong></td>
<td>equipment, materials, labor, transport and disposal associated with maintenance and repair</td>
</tr>
<tr>
<td><strong>Street Sweeping</strong></td>
<td>equipment, labor, transport and disposal</td>
</tr>
<tr>
<td><strong>Fall Leaf-pickup</strong></td>
<td>equipment, labor, transport and disposal</td>
</tr>
<tr>
<td><strong>Maintenance/Repair/Installation of ESC practices</strong></td>
<td>includes cleanup of sediment and repair of eroded areas</td>
</tr>
<tr>
<td><strong>Stream Restoration/Stabilization</strong></td>
<td>equipment, materials, labor, transport and disposal</td>
</tr>
<tr>
<td><strong>Ditch and Channel Maintenance</strong></td>
<td>equipment, labor, transport and disposal</td>
</tr>
<tr>
<td><strong>Waterfowl &amp; Pet Waste Management Programs</strong></td>
<td>equipment, labor, materials</td>
</tr>
<tr>
<td><strong>Public Assistance Program</strong></td>
<td>equipment, labor, materials for rainbarrel, disconnection, raingarden programs</td>
</tr>
<tr>
<td><strong>Emergency Drainage Repairs</strong></td>
<td>allowance for unexpected repairs</td>
</tr>
<tr>
<td><strong>Land, Easement, and Rights Acquisition</strong></td>
<td></td>
</tr>
</tbody>
</table>
Working Costs for Existing Programs

- Bellingham: $212,400/year
- Franklin: $941,000/year
- Milford: $670,000/year
Future Cost Items

- Update written Stormwater Mgmt Plan;
- Increased reporting/record keeping on annual reports;
- Targeted public education (2 messages to 4 audiences) and report results;
- Illicit discharge priority catchment assessments (including SSOs);
- Detailed outfall monitoring for both dry and wet weather;
- Written IDDE program with mapping and prioritization of problem catchments;
- Complete stormwater system mapping (all pipes/manholes/inlets/structures. Catch basin inspection/cleaning/inspection data;
Future Cost Items (continued)

- Track # of site plan reviews, inspections, enforcement actions;
- ID/rank retrofit opportunities for municipally owned facilities;
- Develop a SWPPP for municipally owned facilities;
- Complete a code review and report;
- Impervious cover/DCIA tracking;
- Street sweeping optimization(2 times/yr);
- Written O&M procedures for municipal activities for trash, pet wastes, leaf litter control, fertilizer use & yard wastes;
- Pet waste & waterfowl mgmt plans;
- Phosphorus Load Reduction to comply with TMDL targets
Phosphorus Control Cost Items

- Phosphorus control plan (PCP);
- Phosphorus control mapping of priority areas;
- Off-site phosphorus management plan (CMPP); and
- Increased/targeted public education on phosphorus control and increased public involvement.

Both structural and non-structural practices can be used to achieve phosphorus reduction.
Draft Program Costs for Operational Expenses

Bellingham: Operational Costs (Current $)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>$212,439</td>
</tr>
<tr>
<td>Year 1</td>
<td>$794,471</td>
</tr>
<tr>
<td>Year 2</td>
<td>$865,563</td>
</tr>
<tr>
<td>Year 3</td>
<td>$730,081</td>
</tr>
<tr>
<td>Year 4</td>
<td>$729,286</td>
</tr>
<tr>
<td>Year 5</td>
<td>$856,235</td>
</tr>
</tbody>
</table>
Draft Program Costs for Operational Expenses

Franklin: Operational Costs (Current $)

- Existing: $940,590
- Year 1: $1,436,307
- Year 2: $1,702,599
- Year 3: $1,704,175
- Year 4: $1,538,908
- Year 5: $1,704,455
Draft Program Costs for Operational Expenses

Milford: Operational Costs
(Current $)

- Existing: $668,241
- Year 1: $1,158,024
- Year 2: $1,244,470
- Year 3: $990,162
- Year 4: $978,042
- Year 5: $988,565
Costs for Phosphorus Reduction Per TMDL Targets

Phosphorus removal requirements:

- Bellingham = 52%
- Franklin = 52%
- Milford = 57%
- DD sites = 65%

Note: DD phosphorus removal is nested within MS4 total removal

<table>
<thead>
<tr>
<th>Town</th>
<th>Area (ac)(1)</th>
<th>Imp Area (ac)(2)</th>
<th>Existing Load (#/yr)</th>
<th>TMDL Allowable Load (#/yr)</th>
<th>Required Load Reduction (#/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellingham</td>
<td>6116</td>
<td>918</td>
<td>2024</td>
<td>975</td>
<td>1049</td>
</tr>
<tr>
<td>Franklin</td>
<td>15539</td>
<td>2364</td>
<td>4650</td>
<td>2228</td>
<td>2422</td>
</tr>
<tr>
<td>Milford</td>
<td>8101</td>
<td>1662</td>
<td>3313</td>
<td>1426</td>
<td>1887</td>
</tr>
</tbody>
</table>

(1) From Attachment 3 to RDA Factsheet (Table 6)
(2) From Optimization Study Table 2-1
What do we mean by “Nested” within Municipality’s Required Reduction

- Municipality Required P Removal
- DD Sites Required P Removal
- 65% P Removal
- Less Required Removal for Municipality
Method to Estimate Cost for Phosphorus Reduction

Assume 15% of Total P Load Reduction achieved through non-structural measures:

- Enhanced street sweeping (3% - already accounted for in operational costs);
- Bi-annual catch basin cleaning (2% - also already accounted for in operational costs); and
- Phosphorus ban on fertilizers (10% - assumed to have no implementation cost).
Remaining P Reduction Through Structural Controls

- Bellingham and Franklin = 37% of P Load
- Milford = 42% of P Load

- Remember we looked at:
  - Optimization analysis from Tetra Tech studies (as modified by EPA/HW staff);
  - Published cost for P removal per lb;
  - Comparison to other studies/other regions/actual implementation plans.
Spruce Pond Brook
Franklin, MA

1.1 Square Mile Watershed;
Mix of land use is representative of the Upper Charles Watershed;

Estimated cost to implement structural BMPs to remove 42% of P = $4.92M ($28,070/Imp Acre; $31,700/lb of P);

Results calibrated by land use and soil type to scale-up to entire Upper Charles within the 3 communities.
Sub-watershed Drainage Areas

51 total drainage areas

DAs selected:

(1) To capture RDA sites (2+ acres impervious cover)
(2) Based on natural topography and existing stormwater infrastructure

Courtesy CRWA
## Land Use Distribution

### Spruce Pond Brook vs Upper Charles

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Spruce Pond Brook</th>
<th>Upper Charles (3 Towns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial:</td>
<td>6.1%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Industrial:</td>
<td>3.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>HDR:</td>
<td>7.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>MDR:</td>
<td><strong>32.1%</strong></td>
<td><strong>16.5%</strong></td>
</tr>
<tr>
<td>LDR:</td>
<td>10.9%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Ag:</td>
<td>0.8%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Forest:</td>
<td>36.9%</td>
<td>56.4%</td>
</tr>
<tr>
<td>Open Land:</td>
<td>8.8%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Highway:</td>
<td>2.4%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>
## Treatment Costs/Acre
(calibrated from Spruce Pond Brook Watershed Plan)

<table>
<thead>
<tr>
<th>Land Use &amp; Soil Type</th>
<th>Cost/IA for 37% P Removal</th>
<th>Cost/IA for 42% P Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture A/B</td>
<td>$8,000</td>
<td>$12,000</td>
</tr>
<tr>
<td>Agriculture C/U</td>
<td>$14,000</td>
<td>$16,000</td>
</tr>
<tr>
<td>Commercial A/B</td>
<td>$36,000</td>
<td>$42,000</td>
</tr>
<tr>
<td>Commercial C/U</td>
<td>$55,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Freeway A/B</td>
<td>$15,000</td>
<td>$18,000</td>
</tr>
<tr>
<td>Freeway C/U</td>
<td>$22,000</td>
<td>$27,000</td>
</tr>
<tr>
<td>High_D_Res A/B</td>
<td>$55,000</td>
<td>$59,000</td>
</tr>
<tr>
<td>High_D_Res C/U</td>
<td>$95,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Industrial A/B</td>
<td>$25,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Industrial C/U</td>
<td>$40,000</td>
<td>$45,000</td>
</tr>
<tr>
<td>Low_D_Res A/B</td>
<td>$15,000</td>
<td>$18,000</td>
</tr>
<tr>
<td>Low_D_Res C/U</td>
<td>$22,000</td>
<td>$27,000</td>
</tr>
<tr>
<td>Medium_D_Res A/B</td>
<td>$18,000</td>
<td>$22,000</td>
</tr>
<tr>
<td>Medium_D_Res C/U</td>
<td>$33,000</td>
<td>$38,000</td>
</tr>
</tbody>
</table>
Comparison to Other Studies/Plans ($/Imp Acre Treated)

- **Mid-Atlantic Retrofit Costs: (Schueler, 2011)**
  - On-Storage Retrofits = $32,500
  - site LID Retrofits = $191,000

- **Long Creek Watershed, Maine (LCWM District - Tamara Lee Pinard)**
  - Centralized Retrofits = $34,000
  - Street-Level Retrofits = $110,000

- **15 North Main Street, Bellingham (HW, 2011 - 65% P removal)**
  - On-site LID Retrofits = $101,800

- **Milford Library Vicinity, Milford (HW, 2011 - 57% P removal)**
  - On-site LID Retrofits = $150,000
Comparison to Actual Construction Projects ($/Imp Acre Treated)

RECENT RETROFIT CAPITAL CONSTRUCTION COSTS

- Chestnut Hill Mall, Newton (HW design, 2006 - 60% P removal +/-)
  - On-site LID Retrofits = $31,500 (with City labor)

- Billington Street Retrofit, Plymouth (HW 2009 - 60% P removal +/-)
  - Larger scale LID Retrofit = $36,200

- East Chop Gravel Wetland, Oak Bluffs (HW 2010 - 45% P removal +/-)
  - Larger scale storage Retrofit = $30,700

- Perkins Street Dry Swale, Peabody (HW 2010 - 60% P removal +/-)
  - On-site LID Street Retrofit = $34,600

- Moran Shipping Parking Lot, Providence RI (HW 2009 - 98% P removal)
  - On-site LID with Infiltration of 10 yr storm = $112,500

- Water Street LID Retrofit, Plymouth (HW 2009 - 60% P removal +/-)
  - Medium scale LID Retrofit = $38,800
## Summary of TMDL Compliance Capital Costs
*(Based on Calibration against Spruce Pond Brook Subwatershed)*

<table>
<thead>
<tr>
<th>Town</th>
<th>Target P Removal from Structural Controls</th>
<th>Capital Construction Costs in 2011 $¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellingham</td>
<td>37%</td>
<td>$23,595,000</td>
</tr>
<tr>
<td>Franklin</td>
<td>37%</td>
<td>$62,810,000</td>
</tr>
<tr>
<td>Milford</td>
<td>42%</td>
<td>$67,363,000</td>
</tr>
</tbody>
</table>

¹ Includes: Design and Permitting, but not land acquisition or legal costs
Comparison to Optimization Costs
Bellingham

Estimated Construction Costs vs. Impervious Areas Treated to Achieve 37% Phosphorus Load Reduction in Charles River Watershed of Bellingham, MA

- Scenario 1: Assume structural controls located in pervious area
- Scenario 2: Assume structural controls located in pervious and impervious areas
- Average of Scenarios 1 and 2 for 37% P Load Reduction

Estimated Construction Cost, $

- $37,682,060
- $26,175,607
- $21,959,002
- $18,264,816
- $16,486,390
- $15,345,302
- $13,804,611
- $7,808,593

Percentage of Impervious Area in CRW of Bellingham, MA assumed to be treated

$23,600,000
Comparison to Optimization Costs
Franklin

Estimated Construction Costs vs. Impervious Areas Treated to Achieve 37% Phosphorus Load Reduction in Charles River Watershed of Franklin, MA

- Scenario 1 - Assume structural controls located in pervious area
- Scenario 2 - Assume structural controls located in pervious and impervious areas
- Average of Scenarios 1 and 2 for 37% P Load Reduction

$62,800,000
Comparison to Optimization Costs
Milford

Estimated Construction Costs vs. Impervious Areas Treated to Achieve 42% Phosphorus Load Reduction in Charles River Watershed of Milford, MA

- Scenario 1 - Assume structural controls located in impervious area
- Scenario 2 - Assume structural controls located in pervious and impervious areas
- Average of Scenarios 1 and 2 - 42% P load reduction

- $67,400,000
## Municipal Costs in the Context of the RDA

Remember the “nested” topic?

<table>
<thead>
<tr>
<th>Town</th>
<th>Target P Removal from Structural Controls</th>
<th>Municipal Capital Costs in 2011 $¹</th>
<th>DD Capital Costs to Achieve 50% P Removal in 2011 $²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellingham</td>
<td>37%</td>
<td>$21,008,000</td>
<td>$2,587,000</td>
</tr>
<tr>
<td>Franklin</td>
<td>37%</td>
<td>$51,916,000</td>
<td>$10,894,000</td>
</tr>
<tr>
<td>Milford</td>
<td>42%</td>
<td>$56,247,000</td>
<td>$11,116,000</td>
</tr>
</tbody>
</table>

¹ Includes: Design and Permitting, but not land acquisition or legal costs
² Assumes cost efficiencies through participation in a CMPP
Two main topics

- How do the costs translate into fees?
- What fee options might there be?
First a Quick Review
How a Fee is Calculated

“the more you pave the more you pay”

This idea directly matches the phosphorous loading calculations

= say a typical house pays $10.00/mo and is 3,200 SF IA

= is 96,000 SF IA

30 * $10.00/mo minus credit
266,000 sq feet = 84 ERU bucket

Fee = 84 * $10.00
= $840.00/mo less any credit

Assume ERU = 3,200 sf
Fee = $10.00/ERU/mo
Every $1/mo per ERU generates $675,000 in annual revenue

A $10/mo fee generates $6.75M annually
Growth of Storm Water Utilities

- 1975: 1
- 1988: 1
- 1999: 600
- 2005: 1200
- 2010: 1200

Horsley Witten Group, Inc.
What Led to SW Utility Popularity?

- Expansion of urban city’s roles
- Shift away from general taxes to fees and demand-based funding
- Other prevailing priorities - police, schools, solid waste
- Proliferation of other enterprise funds - solid waste, waste water
- Changing stormwater programs
- Superior equity, stability, adequacy
- Failure of other methods
Advantages

- Match cost causation to revenue generation
- Primary source for the whole program - not just regulatory
- Credits to encourage good performance
- Can be geographically based
- Can have a number of bases - i.e. phosphorous load
Disadvantages

- Has a billing cost and an initial set up cost
- Is “visible”
- May be perceived negatively - “rain tax”
- Must meet legal requirements not fully tested
For “pure” stormwater programs mostly

**Monthly Fee per Typical ERU for Larger Municipalities**

- **Median = $6.00**
- **Average = $6.65**
There are lots of policy options

• What costs should be paid for by the fee?
• Should DD’s be part of our program?
• Uniform program or variable?
• How should we finance construction?
• Is rate basis IA or something else too?
• How often do we change the rate?
• What credits should we develop?
• How do we send the bill & how often?
• Customer service & admin costs?
• How should we be organized?
• How do we think about roads?
• And about 100 other things
We are going to keep it fairly simple and just look at the “big rocks” now.
Cost Components

1. “Normal” stormwater program costs
   - What you currently do or told us about
   - Increases for Draft Small MS4 General Permit

2. Capital construction for phosphorous control
   - Assume bonding not pay as you go
   - Maintenance costs begin in second year
Options Presented

• **Program Length:**
  - 20, 15, 10 and 5 year program length options

• **Program Expenditures:**
  1. Uniform construction
  2. Back-end loaded
  3. RDA Designated Dischargers separate
Program Length Options

- Change to shorter construction period radically changes the average user fee rate per ERU
- For example: 10-Year average rate increases over 20-year program length
  - 15% for 15-year program
  - 44% for 10-year program
  - 94% for 5-year program
Three Town Annual Costs - Uniform CIP

Three Town Phosphorous Reduction Program Costs

- Structure Maintenance
- Structure Construction
- SWProgram

SW Program fairly accurate
Others: ± 25% maybe
Impact of Program Length

Milford Fee Estimates
Four Option Program Fee Comparison (2011 Dollars)

Monthly User Fee per ERU

Years

2015 2017 2019 2021 2023 2025 2027 2029 2031 2033 2035

- Uniform CIP 5 Years
- Uniform CIP 10 Years
- Uniform CIP 15 Years
- Uniform CIP 20 Years
Estimated 5-Yr Avg. Fees/ERU/Month
Uniform CIP Program

- Milford
- Franklin
- Bellingham
Estimated Monthly Fees for Stormwater Only Costs

Median = $6.00
Average = $6.65
Expenditure Options

Back-End Loaded
• Start off 25-50% lower capital costs/year
• Ramp up to 130% by last 5-year period
• Push bond repayment out
• Fee difference dependant on program period - 8-25% fee reduction initially
• Higher fee beyond end of program period

RDA DD Removed
• Remove both revenue and cost from the equation
• Causes local city rates to increase 35-55% because removes more revenue than cost
Impact of Program Option

Milford Fee Estimates - Three Options
20 Year CIP Program

User Fee per ERU

Years

2015 2017 2019 2021 2023 2025 2027 2029 2031 2033 2035

Uniform CIP Program
Back-End Loaded
RDA DD Removed
Impact of Program Option

Bellingham Fee Estimates - Three Options
15 Year CIP Program (2011 dollars)

- Uniform CIP Program
- Back-End Loaded
- RDA DD Removed
Regional Approach

“Can we gain economies, efficiencies, and effectiveness without sacrificing...?”
Advantages of a Regional Approach

- Some things we do have no geographic boundaries (e.g. education)
- Some things we do benefit from more opportunities to do them (e.g. potential phosphorous reduction sites)
- Some things we do are administrative fixed costs which could be spread across a bigger base
Common concerns about regional approaches:

1. One area “bailing out” another one - “paying for another’s past sins”
2. Losing local control
3. Building a bureaucracy - “fee creep”
4. Consistency in treatment, fairness - “getting my share”
5. Responsiveness - “who controls priorities”
Some Potential Options
What does “regional” mean?

- Regional program
  - “we share some common elements”
- Regional funding
  - “our funding approach looks the same and saves cost”
- Regional organization
  - “our administration is cooperative”
Relationship O’ Meter

- Perfect Strangers
- Neighbors
- Friends
- Cousins
- Siblings
- Triplets
- Siamese Triplets
- Merged Personality
<table>
<thead>
<tr>
<th>Independent Funding</th>
<th>Each Has Similar Fee</th>
<th>One Umbrella User Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move ahead independently</td>
<td>Gain economies in fee development only</td>
<td>Create an organization to collect and disburse funds only</td>
</tr>
<tr>
<td>Each decides how to pay for partially cooperative program</td>
<td>Cooperate on similar fee and shared program where it makes sense</td>
<td>One “look” to citizens with cooperation in parts of program</td>
</tr>
<tr>
<td>Each decides how to pay share of one program</td>
<td>Avoid financial entanglement but gain economy</td>
<td>Each gives program and authority to separate agency</td>
</tr>
</tbody>
</table>

**MGL Ch. 40 Sec. 4A**

**Horsley Witten Group, Inc.**
Potential Organization Structure

- Carries out the cooperative program
- Jointly managed by a board and minimal hired administrative staff
- Could also collect and disburse bills if multiple user fees

Independent programs outside blue circle

Shared Program

Franklin
Milford
Bellingham
A question of “due diligence”

Establishing a successful stormwater user fee requires that you pay attention to five key areas of due diligence:

1. Governance and inter-municipal consensus
2. Program concept and the compelling case
3. Public and political education and support
4. Financial policies and documents
5. Database development & accuracy and customer service