# Sustainable Stormwater Funding for the Upper Charles River

Steering Committee Meeting #5
Municipal Center, Bellingham, MA
10 Mechanic Street
September 12, 2011

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## Agenda

| | |
|---|---|
| **1:00-1:10** | Welcome and Introduction (EPA) |
| **1:10-1:30** | Draft Report Overview<br>Review Sections 1 - 2: Introduction & Context<br>Questions and discussion (Q&D) on Sections 1 – 2 |
| **1:30-2:00** | Review Sections 3 - 4: Alternatives & Cost of Services<br>Q&D on Sections 3 - 4 |
| **2:00-2:30** | Review of Sections 5 - 6: Governance & Funding Options<br>Q&D on Sections 5 – 6 |
| **2:30-2:50** | Review of Sections 7 -8: Billing Options & Recommendations<br>Q&D on Sections 7-8 |
| **2:50-3:00** | Next Steps (submittal of comments and timing for completion of the final report) |

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## Draft Report Content

- List of Acronyms
- Executive Summary
- Section 1: Introduction
- Section 2: Stormwater Context
- Section 3: Implementation Alternatives
- Section 4: Estimated Costs of Existing & Future Services
- Section 5: Governance/Admin
- Section 6: Funding Options/Revenue Alternatives
- Section 7: Billing Options
- Section 8: Recommendation
- Section 9: References
- 4 Appendices
  - Comments
  - Permit summaries
  - CMPP Assessment
  - Cost Spreadsheets
  - EPA Future Cost Memo

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## Section 1: Introduction

- Background and reference to Draft MS4 and RDA General Permits
- Purpose of the project and recommendations for funding options to manage stormwater runoff
- Benefits for the reader (e.g., better understanding of)
  - Permit requirements
  - Estimate of the cost of services
  - Program implementation options
- Steering Committee representation

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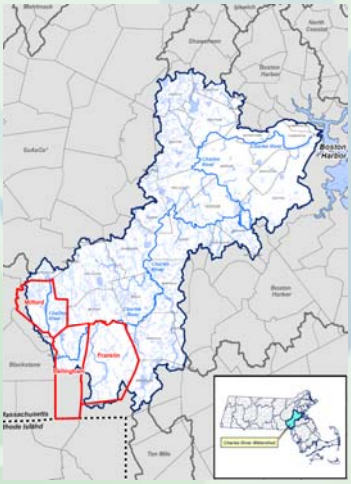
# Section 2: Stormwater Context in the Upper Charles River Watershed



- Impaired waters in each town
- Regulatory drivers (e.g., MS4 and RDA GPs)
- Loading reduction requirements:
  - Bellingham: 52%
  - Franklin: 52%
  - Milford: 57%

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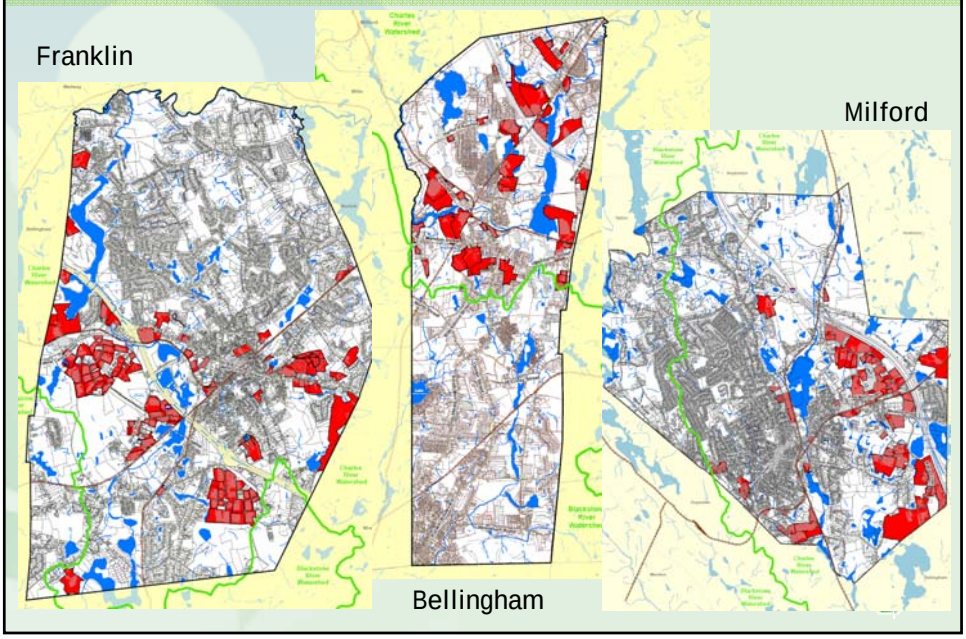
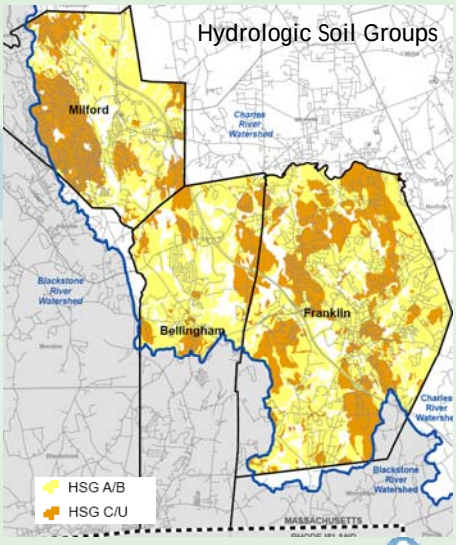
# Designated Discharge Properties



# Local Factors Influencing Program Implementation

- Land use
- Existing impervious cover
- Soils
- Existing BMPs
- Existing stormwater program capacity
- Other related programs (Sewer & Water)
- Governance structure

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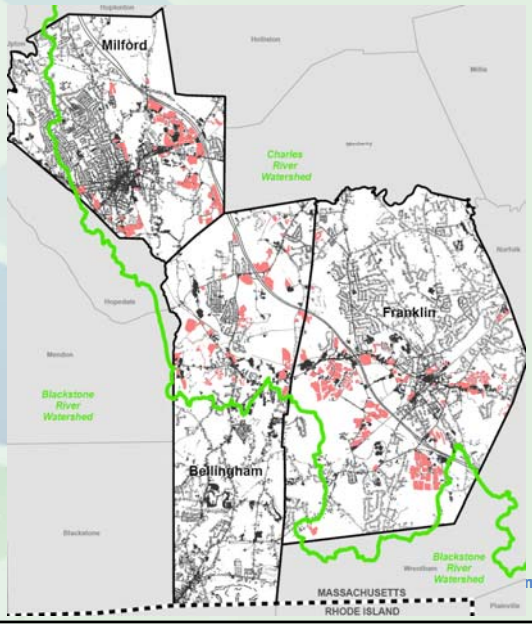
# Sections 1 and 2: Q&D

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# Section 3: Stormwater Management Implementation Alternatives

Variables include:

- Timeframe for implementation (10,15, 20 or 25 years);
- Funding mechanisms (Utility or not); and
- Management approach (town-by-town or regional cooperation).

**Table 3.1:** Stormwater Management Implementation Scenarios Evaluated in this Feasibility Report

| Each Town Manages Stormwater Program Individually | | | **Scenario 4** Regional Stormwater Management Program – DDs fully participate |
|---|---|---|---|
| No Stormwater Utility | | **Scenario 3** Town enacts Stormwater Utility – DDs fully participate in the program | |
| **Scenario 1** DDs on their own | **Scenario 2** DDs participate in a CMPP | | |

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# Funding Option: No Stormwater Utility (DDs on their own)

Advantages*

- No new entity or program;
- Residential property owners could possibly deduct additional expenses;
- Program completely within local control.

Disadvantages*

- Costs may exceed General Fund budgets; requiring Prop 2½ Overrides;
- Lacks equity among property owners;
- Shorter implementation timeframe for DDs with potentially higher costs;
- No opportunities for elimination of duplicative costs;
- No opportunities to apply financial incentives to modify behavior.

* From the perspective of the municipalities

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## Funding Option: No Stormwater Utility (DDs part of a CMPP)

Advantages

- Longer timeframe for DDs to implement controls;
- Allows for P Trading to maximize reductions at the most cost effective sites;
- Centralized entity likely to a more structured approach; and
- Less fiscal impact to DDs

Disadvantages

- Time and expense to set up and manage CMPP; and
- May divert resources from other programs.

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## Funding Option: Stormwater Utility on a Town-by-Town Basis

Advantages

- Equitable distribution of costs across all property owners;
- Consistent & independent funding;
- Longer timeframe for DDs to implement controls;
- P Trading allows for more cost effective implementation;
- Offers potential for fiscal incentives to modify behavior; and
- Compliance with MS4 GP more certain

Disadvantages

- Initial cost to set up and manage utility;
- No opportunities for elimination of duplicative costs;
- Payment of fees will established expectations of increased services;
- Payment of fees likely not deductable by residential property owners.

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## Funding Option: Stormwater Utility on a Regional Basis

Advantages

- Cost savings for administrative and program elements;
- Cost saving potential for BMP implementation across town boundaries;
- Eliminates potential resource conflicts with other municipal programs; and
- Potential for further regionalization and cost savings.

Disadvantages

- Fair share of services debates;
- Potential for loss of control over basic services;
- Potential for new bureaucracy with unnecessary program elements;
- Potential for variable responsiveness.

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## Section 4: Cost Estimates for Existing and Future Stormwater Services

- Existing program annual operational costs;
- Future program annual operational costs;
- Future Capital Cost for Phosphorus Reduction; and
- Alternative methods for estimating capital costs.

* Existing costs as reported by municipality.
Future estimates based on Draft MS4 permit requirements

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# Stormwater Program Cost Centers

- Administrative
- Billing and Finance
- Regulation/Enforcement
- Engineering/Master Planning
- Operations and Implementation
- Monitoring

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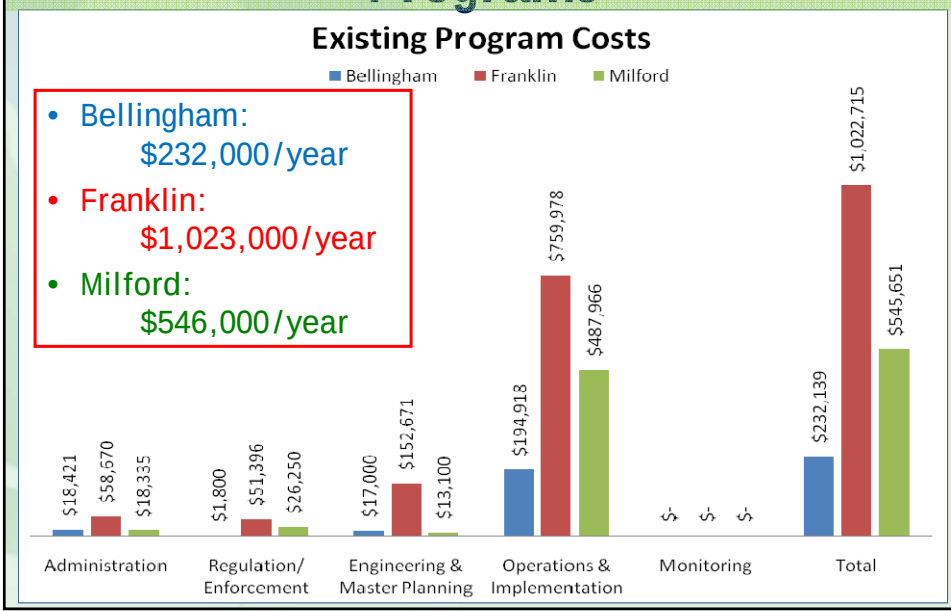
# Operations and Implementation
## (for example)

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

# Operational Costs for Existing Programs




- Bellingham: $232,000/year
- Franklin: $1,023,000/year
- Milford: $546,000/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

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## 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

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## Phosphorus Control Cost Items

- Phosphorus control plan (PCP)
- Phosphorus control mapping of priority areas
- Certified Municipal Phosphorus Plan (CMPP)
- Increased/targeted public education on phosphorus control and increased public involvement

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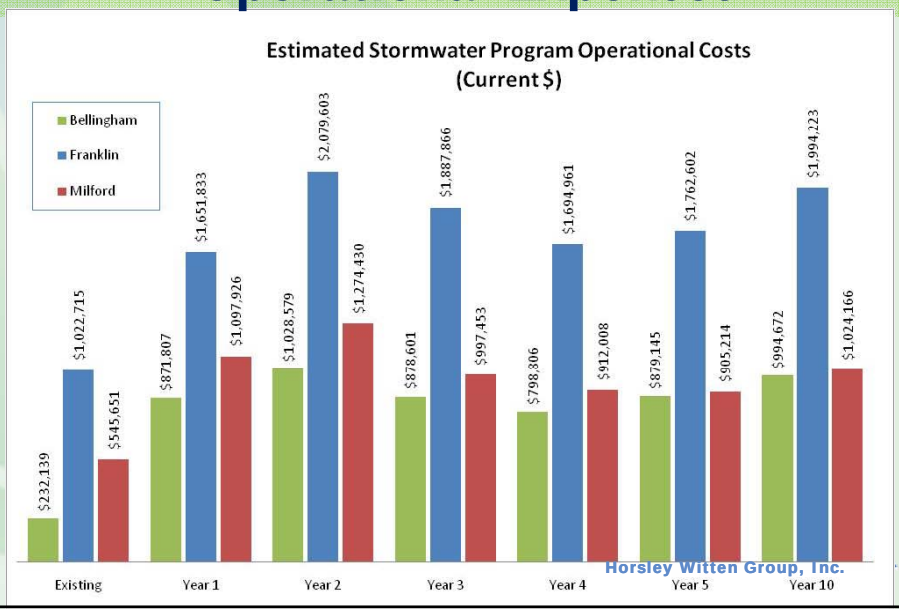
# Future Program Costs for Operational Expenses




# Summary of Operational Costs Annual Average First Five Years

- Bellingham: $ 891,000/year
- Franklin: $ 1,815,000/year
- Milford: $ 1,037,000/year

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# 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 4.10:** Phosphorus Load Reductions Required (Charles River Watershed)

| Town | Area (ac) | IA (ac) | Existing load (lbs/yr) | TMDL Allowable Load (lbs/yr) | TMDL Required Load Reduction (lbs/yr) | % Load Reduction | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Total Required | Assumed met with Non-structural BMPs | Assumed met with Structural BMPs |
| Bellingham | 6,122 | 922 | 2,132 | 1,028 | 1,104 | **51.8** | **15** | **36.8** |
| Franklin | 15,546 | 2,401 | 5,428 | 2,600 | 2,828 | **52.1** | **15** | **37.1** |
| Milford | 8,112 | 1,741 | 3,851 | 1,656 | 2,195 | **57.0** | **15** | **42** |

Sources: Impervious areas and loads from EPA spreadsheet derived from TMDL (Voorhees, 2011); areas for each town are from MassGIS shapefile for Charles River Watershed (2011)

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# Estimated Costs for Phosphorus Reduction

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

- Enhanced street sweeping (2% - already accounted for in operational costs);
- Bi-annual catch basin cleaning (2% - also already accounted for in operational costs);
- Organic Waste and Leaf Litter Control (1% - also already accounted for in operational costs); and
- Phosphorus ban on fertilizers (10% - assumed to have no implementation cost).

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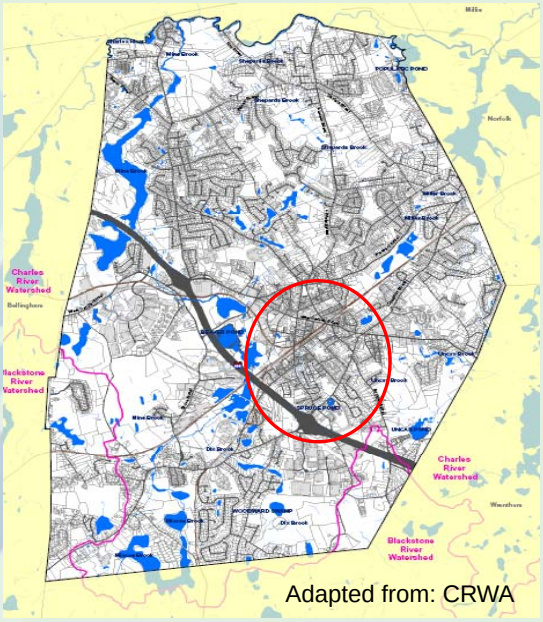
## Spruce Pond Brook Franklin, MA

1.1 Square Mile Watershed;

Mix of land use is representative of the Upper Charles Watershed;

Estimated cost to implement structural BMPs to remove 43.1% 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.




Adapted from: CRWA

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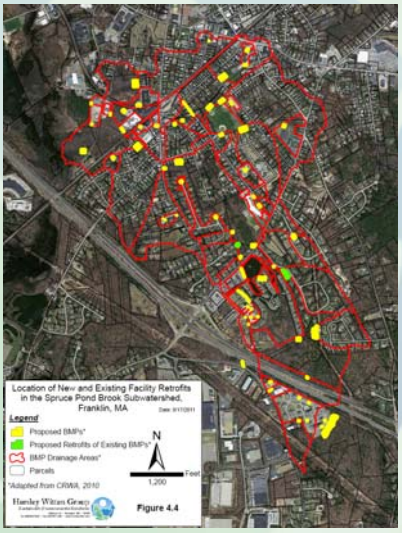
## Spruce Pond Brook Subwatershed




- 51 catchments;
- 28 catchments with proposed control practices;
- 2 existing BMPs to be retrofitted
- Management units created based on land use and soil type
- Costs include land acquisition but not design & permitting
- Scaled up to target removals then added 35% for design, permitting and const admin.

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# Land Use Distribution
## Spruce Pond Brook vs Upper Charles

| Land Use | Spruce Pond Brook | Upper Charles (3 Towns) |
|---|---|---|
| Commercial: | 6.1% | 4.1% |
| Industrial: | 3.0% | 4.2% |
| HDR: | 7.0% | 4.2% |
| MDR: | 32.1% | 16.5% |
| LDR: | 10.9% | 7.9% |
| Ag: | 0.8% | 1.7% |
| Forest: | 36.9% | 56.4% |
| Open Land: | 8.8% | 1.4% |
| Highway: | 2.4% | 2.1% |

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# Treatment Costs/Acre
## (calibrated from Spruce Pond Brook Watershed Plan)

**Table 4.11:** Management Unit Treatment Costs for Target Phosphorus Removal

| Management Unit (Land Use and Soil Type) | Cost per IA for 37% TP Removal | Cost per IA for 42% TP Removal |
|---|---|---|
| Agriculture A/B | $11,000 | $14,000 |
| Agriculture C/U | $19,000 | $22,000 |
| Commercial A/B | $49,000 | $56,000 |
| Commercial C/U | $74,000 | $81,000 |
| Freeway A/B | $20,000 | $24,000 |
| Freeway C/U | $30,000 | $36,000 |
| Industrial A/B | $34,000 | $41,000 |
| Industrial C/U | $54,000 | $60,000 |
| High Density Res A/B | $74,000 | $80,000 |
| High Density Res C/U | $128,000 | $135,000 |
| Medium Density Res A/B | $24,000 | $30,000 |
| Medium Density Res C/U | $46,000 | $51,000 |
| Low Density Res A/B | $20,000 | $24,000 |
| Low Density Res C/U | $30,000 | $36,000 |

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## Remaining P Reduction Through Structural Controls

- Bellingham and Franklin = 37% of P Load
- Milford = 42% of P Load
- Comparison to other methods/data:
  - 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.

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## Summary of Capital Costs for Target Phosphorus Reduction

**(Based on Calibration against Spruce Pond Brook Subwatershed )**

| Town | Target P Removal from Structural Controls | Capital Construction Costs in 2011 $[1] |
|---|---|---|
| Bellingham | 37% | $29,700,000 |
| Franklin | 37% | $74,600,000 |
| Milford | 42% | $75,800,000 |

[1] Includes: Design, permitting, const. admin., land acquisition costs, & # of existing BMPs

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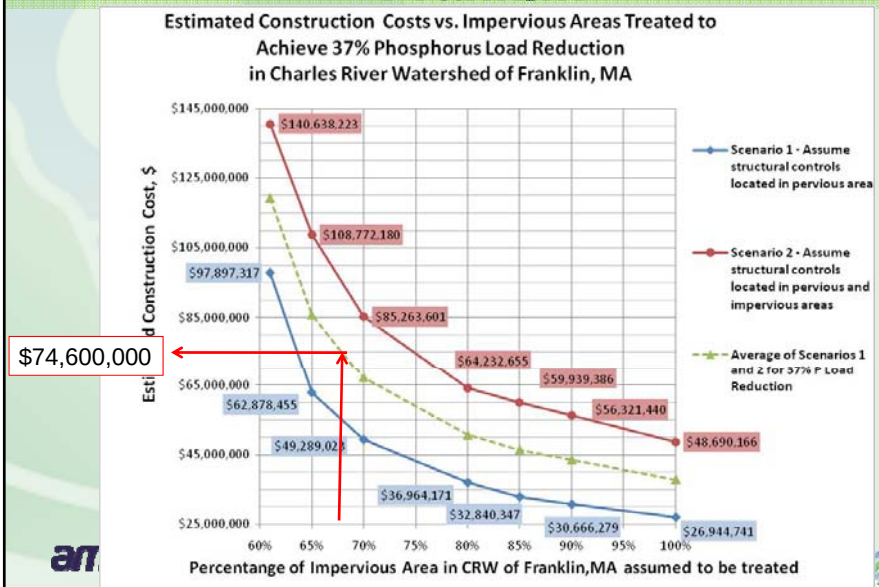
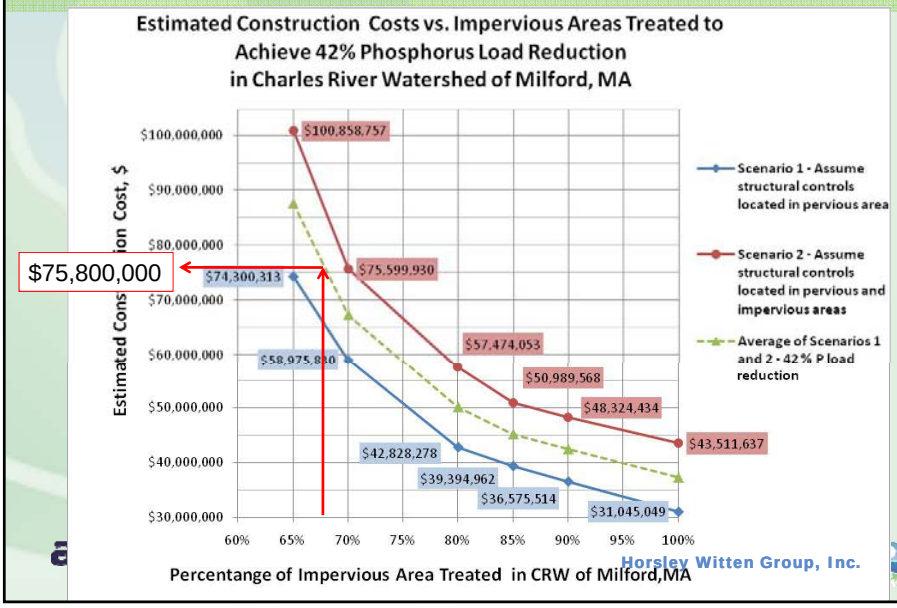
# Comparison to Optimization Costs
## Bellingham


# Comparison to Optimization Costs
## Franklin



# Comparison to Optimization Costs Milford

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# 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 (Maine Mall) = $82,000
  - Street-Level Retrofits = $137,000
- 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

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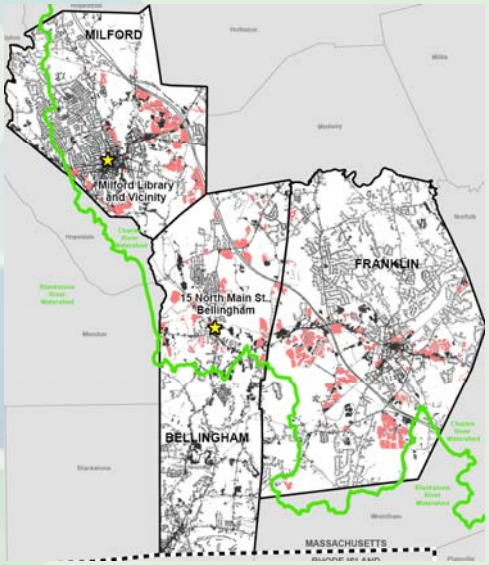
# Municipal Costs in the Context of the RDA

## DD cost nested within total cost

| Town | Target P Removal from Structural Controls | Municipal Capital Costs in 2011 $[1] | DD Capital Costs to Achieve 50% P Removal in 2011 $[2] |
|---|---|---|---|
| Bellingham | 37% | $27,100,000 | $2,600,000 |
| Franklin | 37% | $63,700,000 | $10,900,000 |
| Milford | 42% | $64,700,000 | $11,100,000 |

[1] Includes: Design, permitting, const. admin. & land acquisition costs
[2] Assumes cost efficiencies through participation in a CMPP


# Sections 3 and 4 Q&D

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## Section 5: Governance and Administration

- Governance Options
  - Regional Utility approach;
  - Multi-municipal approach (several examples of program sharing already exist); and
  - Independent municipality approach.
- Organizational Assessment Options
  - Governance and administration;
  - Organizational gap analysis;
  - Service area; and
  - Extent and level of service.

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## Existing Legislation & Legal Considerations

- MGL Ch 83 Sec.16 - Enabling Legislation for Stormwater Utility
  - Specifies uniform fee structure for residential properties;
  - Allows for a "system of credits."
- MGL Ch 21, Sec. 28 – Water Pollution Abatement Districts
- MGL Ch 40, Sec. 4A – Inter-Municipal Agreements
- MGL Ch. 40N, Section 4 – Creation of Municipal Water & Sewer Commissions
- MGL Ch 83, Sec. 1A – Regional District for Nutrient Management

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## Section 6: Funding Options/Sources

- Resources/Money/Revenue
- Revenue options include:
  - Taxes;
  - Service Charges;
  - Exactions;
  - Assessments.
- Other Sources: Grants & loans, Permit fees, Ch 90 funds, bonds, cost sharing, etc.

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## Stormwater Utility (User Fee)
### a type of service charge

- Rate structure options
- Rate modifiers and class exemptions
- Equivalent Residential Unit (ERU)
  - Values estimated for each town
  - Calculated using MassGIS data as modified based on analysis of Franklin data (more on this in a moment)
  - Total number of ERUs calculated for each town
  - Used as the basis to generate revenue

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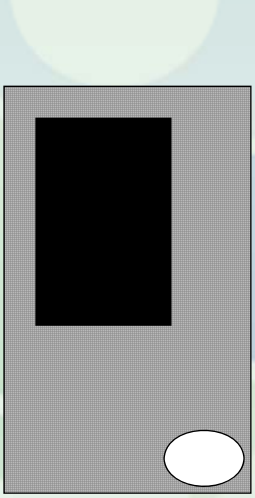
# How a Fee is Calculated

*"the more you pave the more you pay"*



**= 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**

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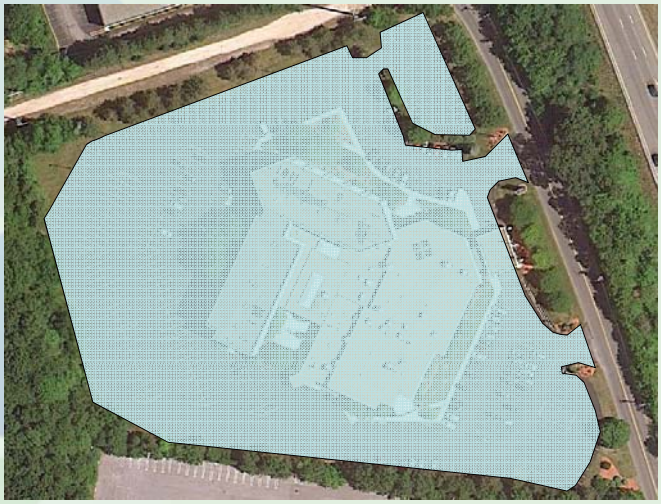
# DoubleTree Hotel Example

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



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# IA Adjustments for MassGIS: Franklin's Correction Factor

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# Utility Funding Options

**Table 6.2**: Equivalent Residential Unit (ERU) Values for Each of the Three Towns

| Towns & ERU Values in SF | Satellite ERU Value | Manual ERU Value* | Calculated ERU Value |
|---|---|---|---|
| Bellingham | 2,693.6 | - | 3,260 |
| Franklin | 2,687.6 | 3,252.3 | - |
| Milford | 2,503.4 | - | 3,029 |

*The manually derived ERU for Franklin was used to reconcile discrepancies in the satellite ERU computations for Bellingham and Milford.

- Timeframe for implementation (10, 15, 20 or 25 years from initial permit);
- Inclusion and exclusion of DDs; and
- Delay in capital construction (i.e., "back-end loaded" construction program).

Assumed to include all ERUs within each town (both inside and outside the CR Watershed)

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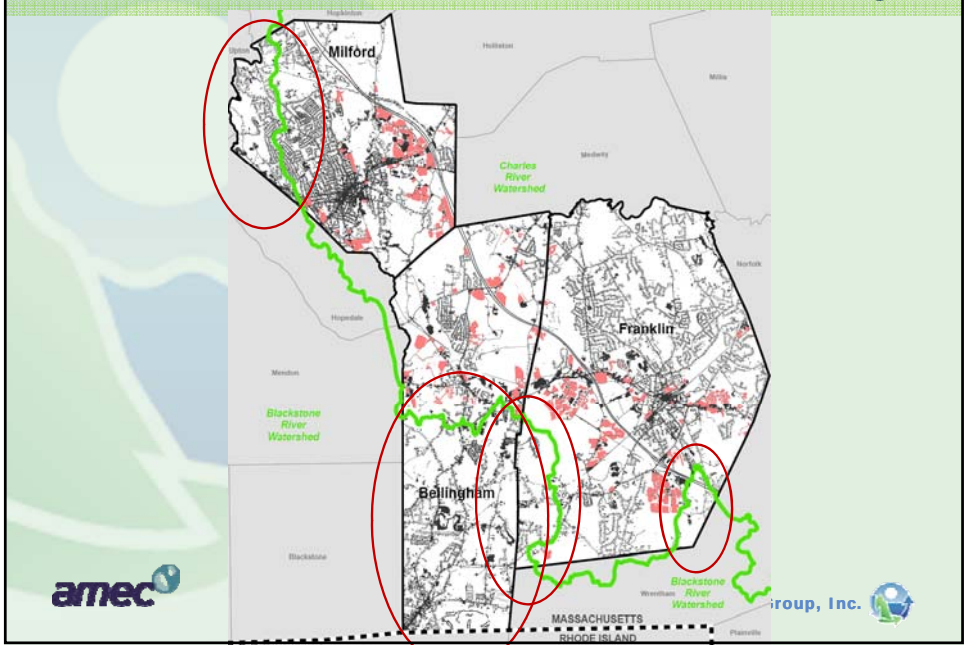
# Town-wide vs CR Watershed Only




# Resulting ERUs

## Town-wide vs CR Watershed only

**Table 6.3**: Basic Revenue Capacity Information – ERUs within Each Town and Total for 3 Towns

| Town | DD ERUs | Other IA ERUs | Local Road ERUs | State/Fed Roadway ERUs | TOTAL ERUs |
|---|---|---|---|---|---|
| Bellingham | 3,594 | 11,205 | 5,642 | 748 | 21,189 |
| Franklin | 6,291 | 15,074 | 10,903 | 1,501 | 33,769 |
| Milford | 5,821 | 14,431 | 6,997 | 1,274 | 28,523 |
| TOTALS | 15,706 | 40,710 | 23,543 | 3,522 | 83,481 |

**Table 6.4:** Basic Revenue Capacity Information – ERUs (Charles River Watershed Only)

| Town | DD ERUs | Other IA ERUs | Local Road ERUs | State/Fed Roadway ERUs | TOTAL ERU |
|---|---|---|---|---|---|
| Bellingham | 3,594 | 5,139 | 2,934 | 389 | 12,055 |
| Franklin | 6,291 | 14,182 | 9,889 | 1,361 | 31,724 |
| Milford | 5,821 | 12,715 | 6,004 | 1,093 | 25,633 |
| TOTALS | 15,706 | 32,036 | 18,827 | 2,843 | 69,412 |

# Final # of ERUs Used for Revenue Calculations
## (Roads Removed)

| Town | Total # of ERUs | # of Road ERUs | # of ERUs used for Revenue Calcs. |
|---|---|---|---|
| Bellingham | 21,189 | 6,390 | 14,799 |
| Franklin | 33,769 | 12,404 | 21,365 |
| Milford | 28,523 | 8,271 | 20,252 |

**Table 6.7:** Basic Revenue Capacity Information within Each Town (with Roads Removed) – Annual Revenue for One Dollar/ERU/Mo Including DDs

| Town | DD $$ | DD % | Other IA $$ | Other IA % | TOTAL $$ |
|---|---|---|---|---|---|
| Bellingham | $43,128 | 24% | $134,460 | 76% | $177,588 |
| Franklin | $75,492 | 29% | $180,888 | 71% | $256,380 |
| Milford | $69,852 | 29% | $173,172 | 71% | $243,024 |
| TOTALS | $188,472 | 28% | $488,520 | 72% | $676,992 |

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# Total Costs

**Table 6.8:** Estimated Operational and Capital Costs – Charles River Watershed (2011 dollars)

| Town | DD CIP | Town CIP | Total CIP | Operating Costs* | Billing and Admin Costs |
|---|---|---|---|---|---|
| Bellingham | $2,600,000 | $27,100,000 | $29,700,000 | $891,000 | $14,000 |
| Franklin | $10,900,000 | $63,700,000 | $74,600,000 | $1,815,000 | $24,000 |
| Milford | $11,100,000 | $64,700,000 | $75,800,000 | $1,037,000 | $24,000 |
| TOTALS | $24,600,000 | $155,500,000 | $180,100,000 | $3,744,000 | $65,000 |

*Annual Average for first five years
Costs are rounded to the nearest $1,000 (totals may not add up due to round-off error)

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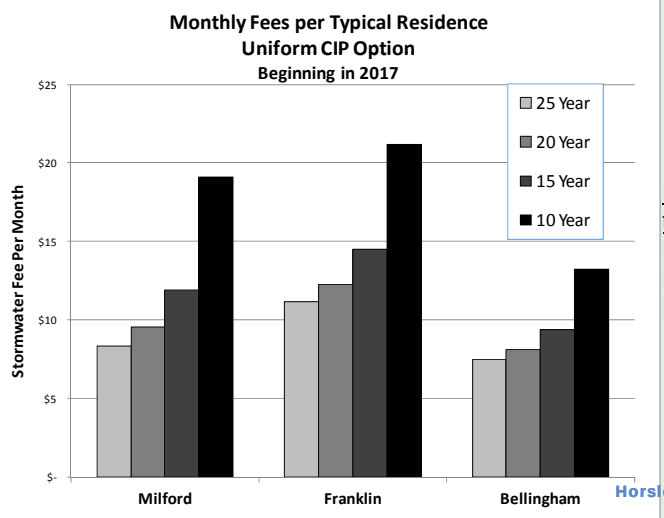
# ERU Rate Beginning in Year 5 of the Permit Phase
## (Entire Town – DDs Included)




Initial avg. rate first 5 years to cover operational costs:

| | |
|---|---|
| Bellingham: | $ 5.10 |
| Franklin: | $ 7.20 |
| Milford: | $ 4.40 |

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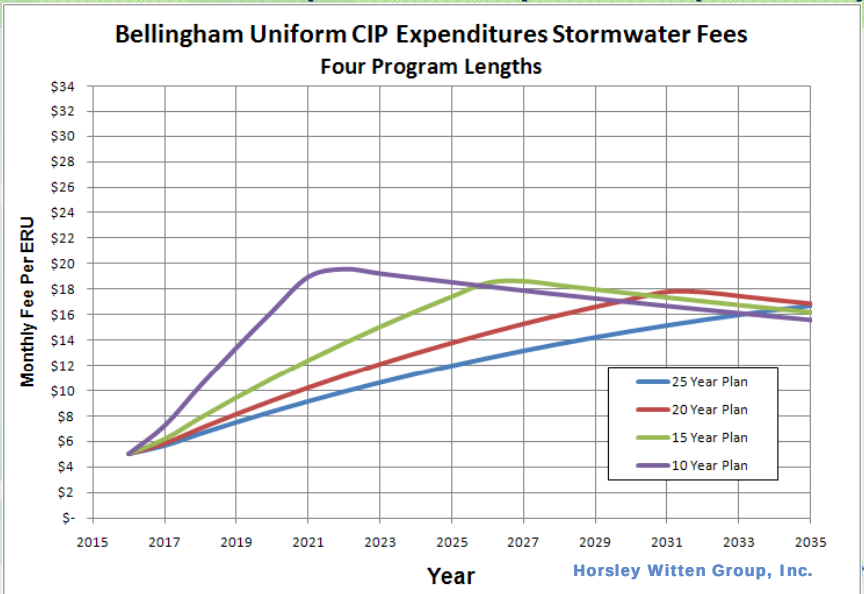
# Bellingham ERU Rate Structure
## 4 Timeframes for Implementation (Uniform Expenditures)

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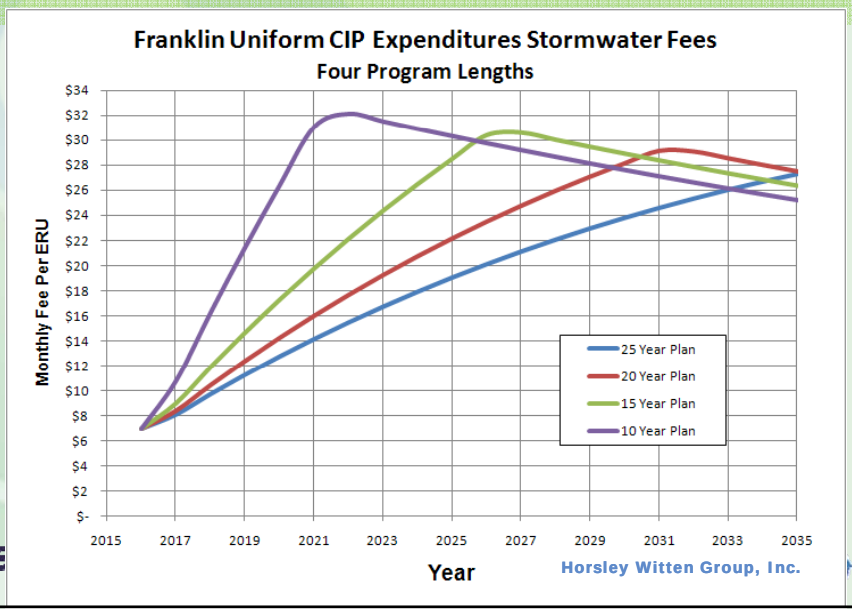
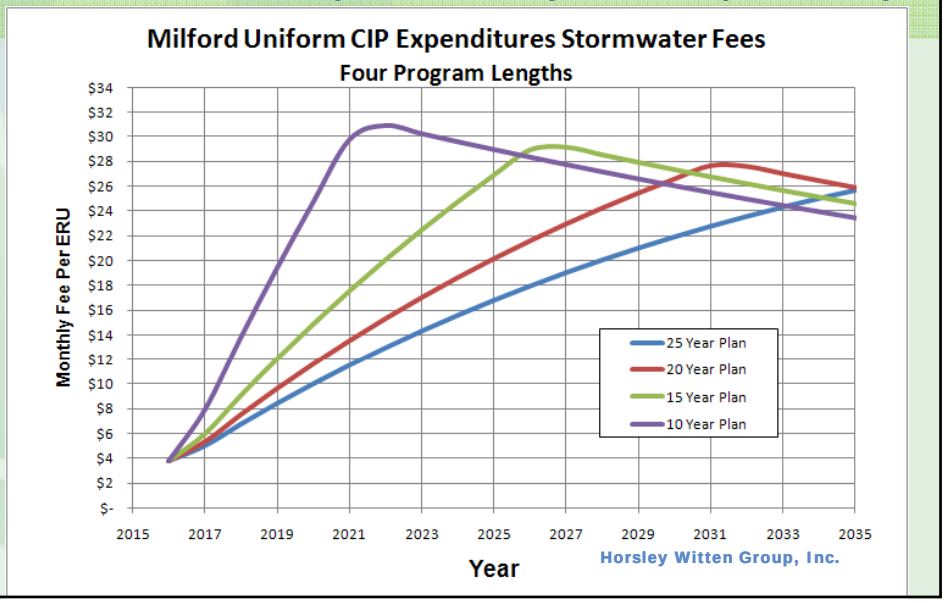
# Franklin ERU Rate Structure

## 4 Timeframes for Implementation (Uniform Expenditures)

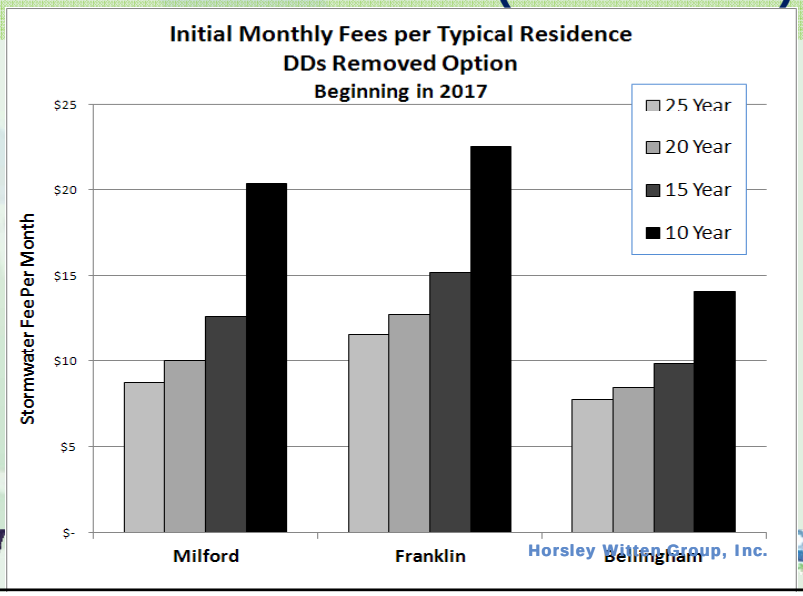



# Milford ERU Rate Structure

## 4 Timeframes for Implementation (Uniform Expenditures)



# ERU Rate Beginning in Year 5 of the Permit Phase (DDs Excluded)

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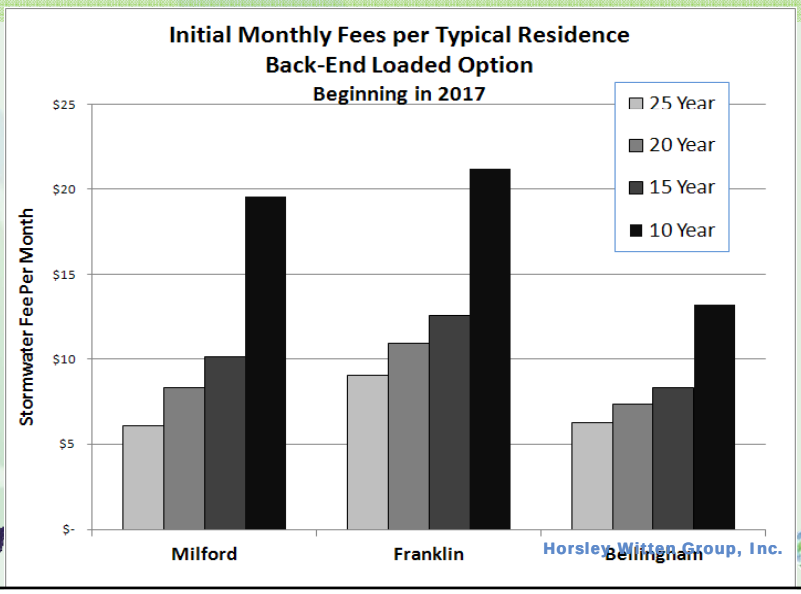
# ERU Rate Beginning in Year 5 of the Permit Phase (Back-End Loaded Option)

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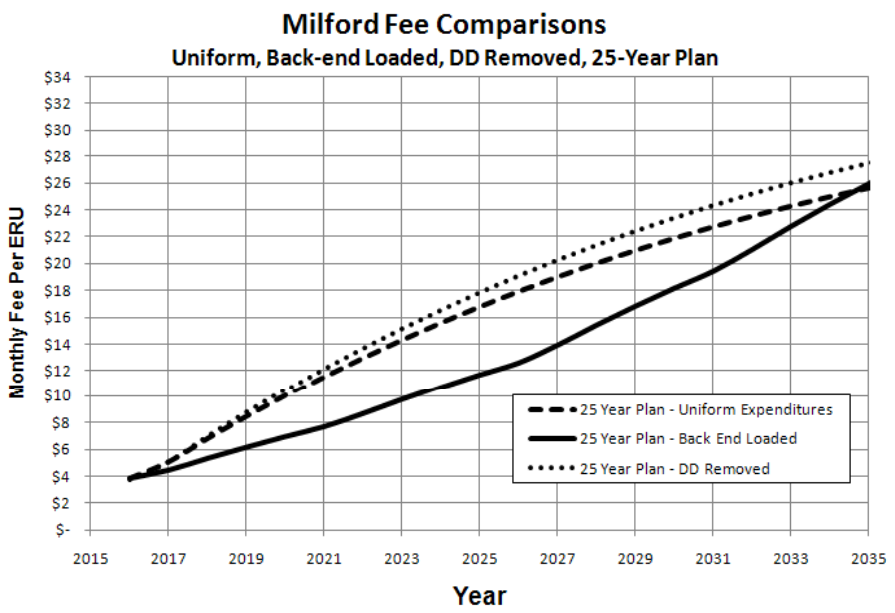
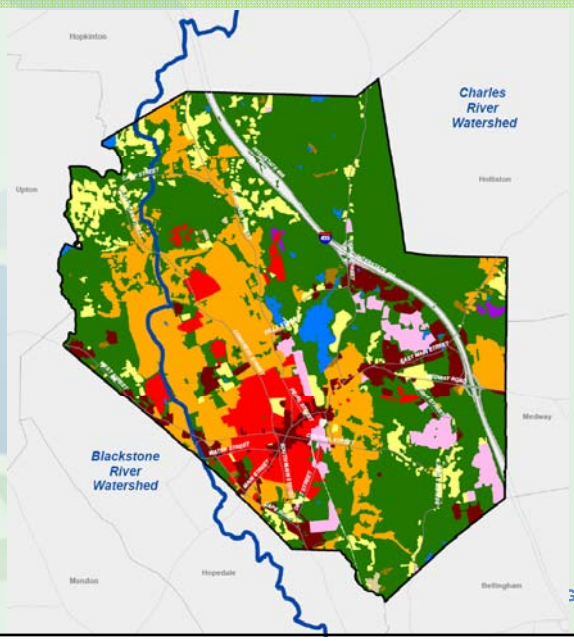
# ERU Comparison for Milford




# Sections 5 and 6 Q&D



## Section 7: Billing Options

- Master Account File
- Billing System Options
  - Tax bill;
  - Public utility bill (water/wastewater);
  - Private utility bill;
  - New stand-alone bill.

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## Available Billing Data

- Bellingham
  - Already operates water & wastewater;
  - MassGIS derived impervious layer only;
  - Absolute parcel area not very accurate in GIS;
  - Parcel data contains numerous property ID errors.
- Franklin
  - Already operates water & wastewater;
  - Impervious area derived from aerial photo, but has some errors;
  - Absolute parcel area is relatively accurate in GIS;
  - Relatively few property ID errors.

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## Billing Data

- Milford
  - Water operated by Milford Water Co; town does billing with existing property database;
  - Operates a wastewater utility;
  - MassGIS derived impervious data only;
  - Absolute parcel area not very accurate.

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## Billing Considerations

- Feasible to add to existing water/wastewater bills;
- Will require linking billable land parcel data with existing utility accounts (address matching)
- Data and billing account maintenance – requires monitoring and updating changed information (e.g. new impervious cover, changes in fees, credits, etc.)
- Customer service considerations – billing questions, phone hotline, GIS manager, etc.

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## Section 8: Recommendations

Conclusions:

1) Costs of future programs will be significantly higher than current costs;
2) Phosphorus reduction will require a combination of structural and non-structural controls, implemented over time through a comprehensive strategy; and
3) Likelihood that the towns' general funds can support implementation is low.

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## Six General Recommendations

1. Implement a suite of non-structural controls (e.g., phosphorus ban, enhanced street sweeping, organic waste collection);
2. Periodically petition EPA to review and update P reduction values for non-structural credits;
3. Implement structural controls within the context of a watershed management plan, periodically petition EPA to review and update P removal efficiencies for structural controls;

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## Six General Recommendations
### (Continued)

4. Communities should seek EPA approval for a longer implementation timeframe then currently proposed in the draft General Permits;
5. Communities should seek EPA approval for a back-end loaded implementation approach; and
6. Pursue the implementation of a Stormwater Utility at the individual municipal level, but structured for expansion.

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## 5 Short-Term Recommendations

1. Review and refine cost estimates and implementation options from this report;
2. Convene an inter-municipal working committee to document areas of agreement – decide to move forward together or separately;
3. Poll DD properties to gage interest in participation in CMPP and/or Utility;
4. Fund the development of a regional watershed management plan; and
5. Fund a public education and engagement project

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# Moving Forward

- Watershed Approach and Adaptive Management
- "The most equitable, adequate, flexible & stable source of funding…is a stormwater utility"
- Roadmap for utility implementation

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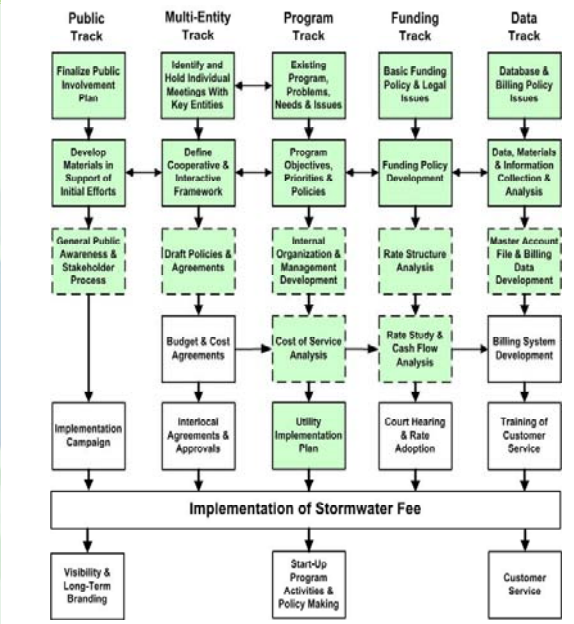
# Utility Implementation Flow Chart

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## Utility Implementation Steps

- Refined program development;
- Update cost of service;
- Updated financial funding analysis;
- Detailed credit analysis;
- Updated rate structural analysis;
- Budget & cash flow model;
- Final organization and governance;
- Final billing analysis;
- Public outreach/education;
- Ordinance/bylaw passage;
- Master account file & billing data; and
- Billing.

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## Sections 7 and 8 Q&D

Also:

Does the Executive Summary adequately convey the content of the report?

Do the appendices provide sufficient supporting information?

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