Getting Started with Stormwater Asset Management in Westford, MA

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Presentation Outline

■ Intro: Westford’s MS4 Program & Stormwater Management Master Plan

■ The Drainage System Asset Management Gap

■ Water Infrastructure and Technical Assistance Grant
  – Representative condition assessment
  – Field work with zoom camera

■ Findings, Conclusions, and Lessons Learned
Westford’s MS4 Program

- **Kept the momentum going since 2003**
  - Steady progress to meet *all of 2003 requirements* and many new requirements
  - Westford’s Stormwater Budget: $90K (PY10 &11)
  - Staff Time: Town Engineer, Assistant Engineer, GIS Director, Highway Department
  - Overlapping goals with Water Department, Healthy Lakes and Ponds Committee, Stream Team, and Westford Conservation Trust initiatives

Slow and steady wins the Stormwater Race
Why a Stormwater Management Master Plan?

- Anticipation of the new MA Small MS4 General Permit
- Be sensible and strategic with the Town’s natural and financial resources
- Meet multiple Town objectives for water resources and infrastructure simultaneously
- Develop an equitable, adequate long-term funding mechanism
Stormwater Management Master Plan

Scope of Work

Water Quality

Task 1: Data information gathering and development

Water Quantity & Drainage

Task 2: Identification of long term needs and costs

Task 3: Evaluation of ability to provide for needs and costs

Task 4: Funding and financing alternatives

Operation & Maintenance

Task 5: Public outreach program

Measure Success Against Goals (See Project Understanding) and Modify Plan as Needed

Task 6: Stormwater Management Master Plan
- Water Quality: Stormwater Management Plan
- Water Quantity & Drainage: Long-Term Capital Improvement Plan
- Operation & Maintenance Plan
The Asset Management Gap

Collection System O&M Plan

Capital Improvement Plan (CIP)

Information on infrastructure age, material, condition

Drainage System Asset Management
Why Asset Management?

- Improved performance
- Consistency
- Lower costs
- Increased confidence and credibility
- Do more with existing resources
- Proactive approach, long-term view
- Better use of capital and operating budgets
- Sustainability
- Consistency

Planned renewal investments save money

1/3 of O&M budget
We got a grant!

- Massachusetts Department of Environmental Protection’s Water Infrastructure Planning and Technical Assistance Grant

- $30,000

- Town committed over 82% match
  - $20,000 cash match from SWMMP
  - $4,700 of in-kind services
Asset Management Steps

1. Develop Asset Inventory
2. Assess Performance
3. Determine Residual Life
4. Determine Life Cycle & Replacement Costs
5. Set Target Levels of Service (LOS)
6. Determine Criticality
7. Optimize O&M
8. Optimize CIP
9. Determine Life Funding Strategy
10. Build Plan
1. Add drainage system mapping to GIS from record plans
2. Complete cost-effective rapid condition field assessment of drainage
3. Correlate observed field conditions to mapped information
4. Characterize overall drainage system condition, O&M needs, and risk of failure
5. Enhance SWMMP with Good Engineering Practices for Asset Management
Field Work

Planned Locations

- Areas where we digitized as-built plans
- Corrugated Metal Pipe
- Oldest areas of Town from USGS 1941 map and accepted streets dates

Graniteville
Nabnasset Village
Forge Village
Westford Center
Why use a Zoom Camera?

■ **Pros**
  – Screening tool to quickly inspect many locations
  – $2,000 for the week vs. CCTV upwards of $2,800 per day.
  – No line cleaning!

■ **Cons**
  – Lots of wires!
  – Stability pole too short for 4’ drain sump
  – Challenging to hold steady without the tripod
  – Issues when pipe alignments are not straight

“75-250' view range in lines 6-60" dia.”

Field Work

Envirosight QuickView Camera
Charlie is PACP/MACP Certified by the National Association of Sewer Service Companies Pipeline Assessment and Certification Program.
### What did we inspect in 5 days?

- 74 Catchbasins or manholes
- 219 pipe segments (4 of 223 duplicates)
- We inspected the full range of pipe sizes, material, and age

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<table>
<thead>
<tr>
<th></th>
<th>Pipes</th>
<th>Structures</th>
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<tr>
<td>Total objects mapped</td>
<td>4,194</td>
<td>5,631</td>
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<tr>
<td>Total objects inspected</td>
<td>219</td>
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<tr>
<td>% drainage system inspected</td>
<td>5.2%</td>
<td>1.3%</td>
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What we found

- Condition of pipes is generally good
- Debris/sediment in some pipes.
- Some CMPs are rusting
- Condition of structures is generally good
- But some structures have issues
What we found

- Raccoon defense is alive and well!

https://www.youtube.com/watch?v=3gvPL3X32nw
Water Infrastructure and Technical Assistance Grant

Scope of Work

1. Add drainage system mapping to GIS from record plans
2. Complete cost-effective rapid condition field assessment of drainage
3. Correlate observed field conditions to mapped information
4. Characterize overall drainage system condition, O&M needs, and risk of failure
5. Enhance SWMMP with Good Engineering Practices for Asset Management
Town-wide Conclusions

- **Pipe Material and Diameter**
  - RCP: 72% of Westford’s 4,194 mapped pipe segments
  - 12” Diameter: 70% of pipe segments
Town-wide Conclusions

- Still wrestling with age attributes and estimated service life remaining
  - Only about 5% of structures have an “age”
Town-wide Conclusions

- The condition of drainage infrastructure was generally good.
- Older areas (10-15% of system), clay and CMP pipes (10%) will require additional assessment and surveillance.
- Clean and reinvestigate drainage areas with heavy debris (20% of inspected pipes).
Future of Westford’s Stormwater Asset Management

Programmatic Recommendations:

- Continue to improve stormwater asset inventory
- Improve tracking of O&M activities and field observations
- Increase use of GIS for data collection and data management

Westford’s drainage is very decentralized – minimal consequence of failure

Iterative process to improve data collection and reevaluate planned maintenance and capital projects.
Next Steps

- Task 5 of Scope: Enhance SWMMP with Good Engineering Practices for Asset Management
  - Town Wide Operation & Maintenance Plan
  - Capital Improvement Plan
**Take Aways**

- **Was this project worth it? Yes!**
  - Gained a better understanding of general condition of drainage infrastructure, particularly pipes
  - Liked the zoom camera as a cost-effective screening tool for drainage.
  - Prioritized ongoing mapping, data collection, and O&M

- **Other potential uses for zoom camera in storm drain**
  - Illicit discharge detection (screening)
  - Deep drainage manholes (no confined space entry)