City of Portland, Maine

Portland Water District

Combined Sewer Overflow
Long Term Control Plan Update

City Council Workshop
November 8, 2010
Workshop Objectives

- Review Multi-tier CSO Program And Progress
- Update On Tier 2 Progress, Suggested Tier 2 Modifications And Preliminary Tier 3 Actions
- Timeline For Council Actions
  - January: Approval Of Tier 2 Modifications
  - Late Spring: Approval Of Future Plan
  - LTCP Due To MEDEP: June 2011
- Agenda
  - Planning To Date
  - Preliminary Findings And Recommendations
Background

- Combined Sewers:
  - Common Practice
  - 772 US Cities

- Portland Sewers
  - Date Back To 1870’s
  - Virtually All Built As Combined Sewers
  - 4,200 Acres Total
  - Distinct Catchment Areas
CSO Regulatory Compliance

- EPA/DEP Requirements
  - CSO’s Are Violations Of Clean Water Act
  - Put Communities On Schedule
  - Update Every 5 Years
- Portland Consent Order History
  - 1991 – Order Entered
  - 1993 – Master Plan Submitted
  - 1997 - Approved CSO Master Plan Goals
Overall Goals of 1993 LTCP Program

- Elimination Of 33 Of The 39 CSOs
- Reduce CSO Events By 85 Percent
- Reduce CSO Discharges From 720 MG/YR To 87 MG/YR –
  - From 11 % Of Total System Flow (6.6 BG/YR)
  - To 1.3 % Of Total Flow
- Eliminate CSO Discharges To Capiscic Brook, Fore River, Presumpscot Estuary, Casco Bay
- Minimize CSO To Back Cove, Portland Harbor

1993 Status and Goals

- Treated at EEWWT
- CSO to be Removed by LTCP
- CSO Remaining

- 89.0%
- 9.6%
- 1.3%
CSO Abatement History Timeline

- 1993 – Master Plan Submitted
- 1997 – 5 Yr Update – 45 Tier I Projects
- 2003 – 5 Yr Update – 75 Tier II Projects
- 2007 – Tier II Implementation Plan -
  - 2009 – 2013 Yearly Compliance Deadlines
  - $61 Million Bond Issue
- 2011 – Tier III LTCP Update Plan
- 2013 – Tier II Complete
Current Study Purpose

- Enhance System Model
- Assess/Review Tier II Work To Date
- Develop Tier III plans
  - Consider Impacts of Emerging Stormwater Requirements
  - Done In Conjunction with Portland Water District
  - Regular Consultation with Stakeholders
Tier II Review

- **Capisic Brook** –
  - Stay the course
- **Fall Brook** –
  - Plan Falls Short Of Objectives
  - Requires $35 Million More Separation Work To Meet Goal
  - Priority Separation/Storage Alternative Meets Objective Less Cost
  - Enhances Pollution Control Vs Separation
Baxter Blvd North Storage Conduit

- Built in Roadway
- Coordinate with others
  - Neighborhood
  - Utilities
  - Parks/Trails
  - Other Stakeholders
- Schedule:
  - DEP Approval – January 2012
  - Complete Design/Permitting – Spring 2012
  - Construction complete 2013
<table>
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<tr>
<th>Year</th>
<th>Project Details</th>
<th>Deferred Value</th>
<th>Cost</th>
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<td>2011</td>
<td>Ocean Avenue - Read Street to Carlyle Road, Loring Avenue Area</td>
<td>$1,240,200</td>
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<td>2012</td>
<td>Malilley Road, Allen Ave - East of PATHS, Fall Brook Street, Allen Ave - Harvard to Plymouth, Woodlawn Avenue Area</td>
<td>$2,599,200</td>
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<td>Auburn Street @ Sanborn Street, Washington Ave &amp; Auburn Street, Washington Ave @ Skylark, Washington Ave - Greenwood to Coolidge</td>
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<td><strong>Grand Total Deferred Value</strong></td>
<td><strong>$7,145,100</strong></td>
<td><strong>$7,145,100</strong></td>
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Tier III

◆ Focus Areas
  ◆ Back Cove West/South
    – Reduce Total CSO’s In Back Cove To 70 MG/YR From 416 MG/YR
  ◆ Fore River
    – Eliminate CSO’s
  ◆ Portland Harbor
    – Reduce CSO’s To 17 MG/YR From 145 MG/YR
Alternatives Considered

- Storage
- Separation
- Treatment
- Green Solutions
EEWWTF/NEPS Wet Weather Improvements

- New Wet Weather Pump Station
- Existing Outfall
- New force main
- Treatment Facility
- New Outfall
Green Infrastructure

- Objective: Manage stormwater before it enters sewer system to reduce downstream CSOs
- Potential Locations
  - Deering Oaks (Back Cove South)
  - Baxter Woods (Back Cove West)
  - Ocean Avenue (Back Cove North)
- Potential Technologies
  - Infiltration Basins
  - Rain gardens
  - Porous Pavement
Recommendations

- No Single Option Provides Practical Solution
  - Separation At $525 Million
  - Storage At $250 Million
  - Green Options And Treatment Not Practical For Complete Solution

- Recommend Mix Of Solutions
  - High Reliance On Storage
  - Supplemental Separation/Rehabilitation/Green Projects
  - Treatment As Necessary For Final Component
Recommendations

- **Back Cove South/West Storage Conduits**
  - $55 Million, Including $10 Million Separation /Green Projects
  - 5-10 Years;
- **Fore River/Harbor Storage**
  - $70 Million Including $15 Million Separation /Green Projects
  - 5-10 Years;
- **Upgrade Treatment Facility**
  - $45 Million
  - 5-10 Years
- Sequencing Open For Discussion
Fiscal Implications

- **Focus:** Impact On Homeowner Charges And Income
  - **Assumed:**
    - City CIP For Sewer
    - PWD CIP For WWTF And Improvements
    - Flat Sales
    - Some SRF, Some Market Financing
  - Looked At Both 15 And 30 Year Schedules

**Construction Cashflow of Aggressive Schedule**
Impact of Tier 3 on Total Expenses

The graph shows the impact of Tier 3 on total expenses over a period from 2010 to 2040. It compares three scenarios:

- **No Tier 3**
- **15-year implementation**
- **30-year implementation**

The graph indicates that the expenses increase over time, with the 30-year implementation showing a higher trajectory compared to the other two scenarios.
Impacts on Household Charges
Affordability Consequences of Proposed Tier 2/3 Program—Household Burden Index

- No Tier 3
- 2% threshold
- 15-year implementation
- 30-year implementation
Financial Summary

- **Total Capital Investments**
  - $170 million CSO
  - $45 - $90 Million Sewer repair/rehabilitation
  - $60 Million PWD Treatment Expense

- **Annual Sewer Rate Increases Through First 10 Years Tier III**
  - Baseline: 4.7 %
  - 15 Year Schedule: 7.5 %
  - 30 Year Schedule: 6.3 %

- **Median Household Income:**
  - Burden Approaches, Not Exceed EPA “Affordability” Measure
Next Steps

- Continue to Refine Tier III
- Modify Consent Decree/Permit by January
- Council Briefings, Deliberations in Spring
- Submit Plan by End of June
- Continue Tier II Design and Construction
- Commence Tier III Design and Construction
- Complete Tier II 2013
- Begin Tier III Construction