City of Portland, Maine

Portland Water District

Combined Sewer Overflow Long Term Control Plan Update

City Council Workshop

November 8, 2010

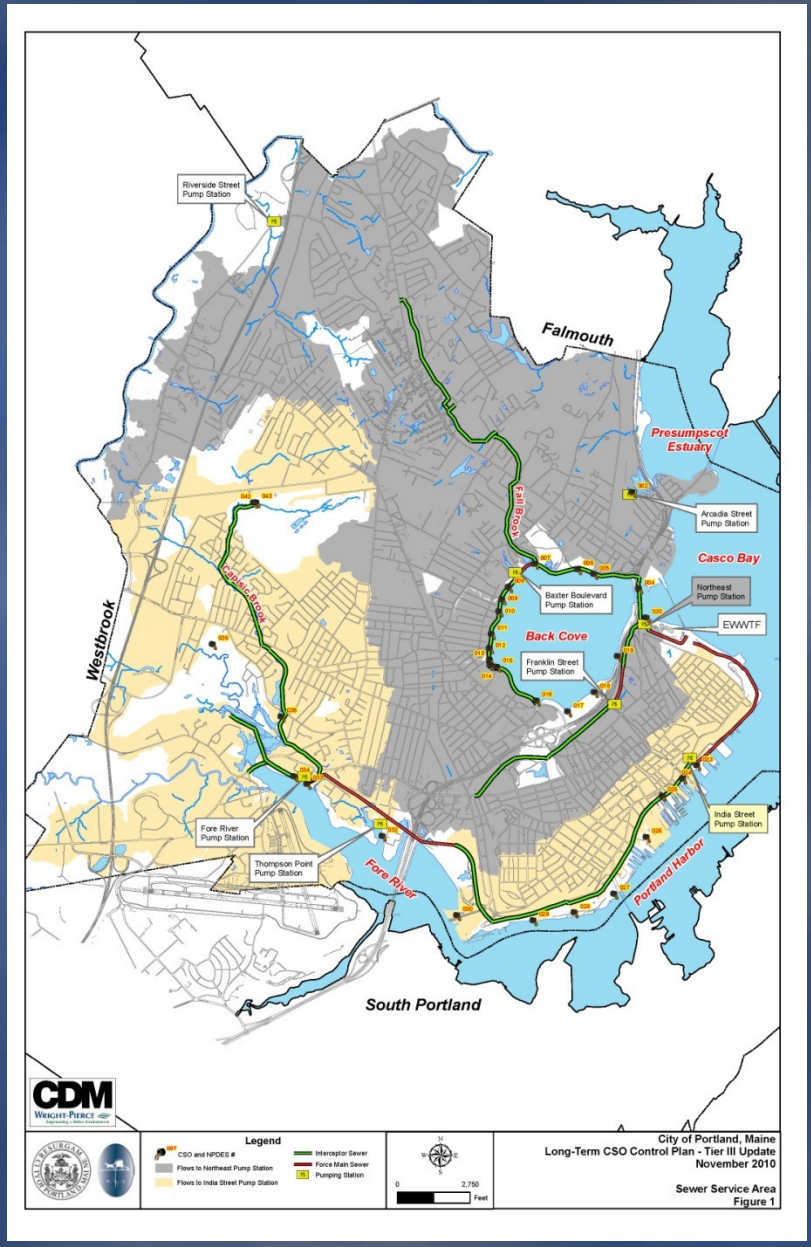
WRIGHT-PIERCE

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

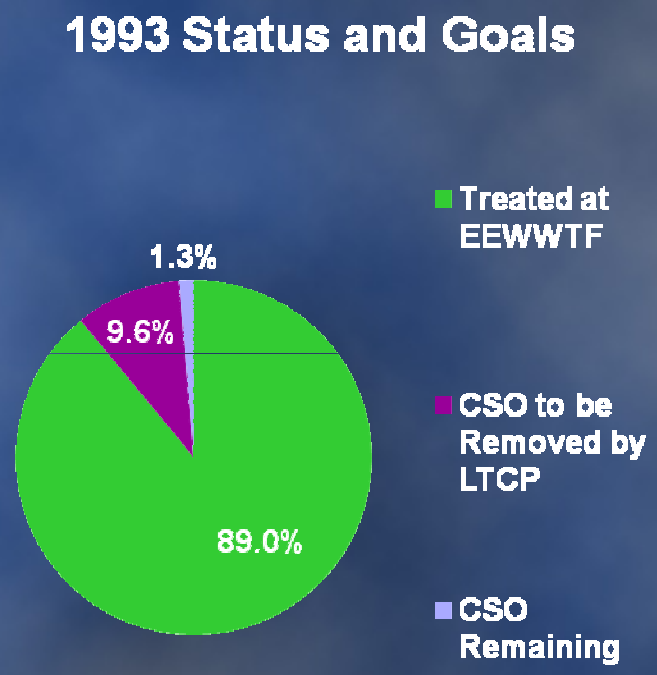


CSO Regulatory Compliance

- 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

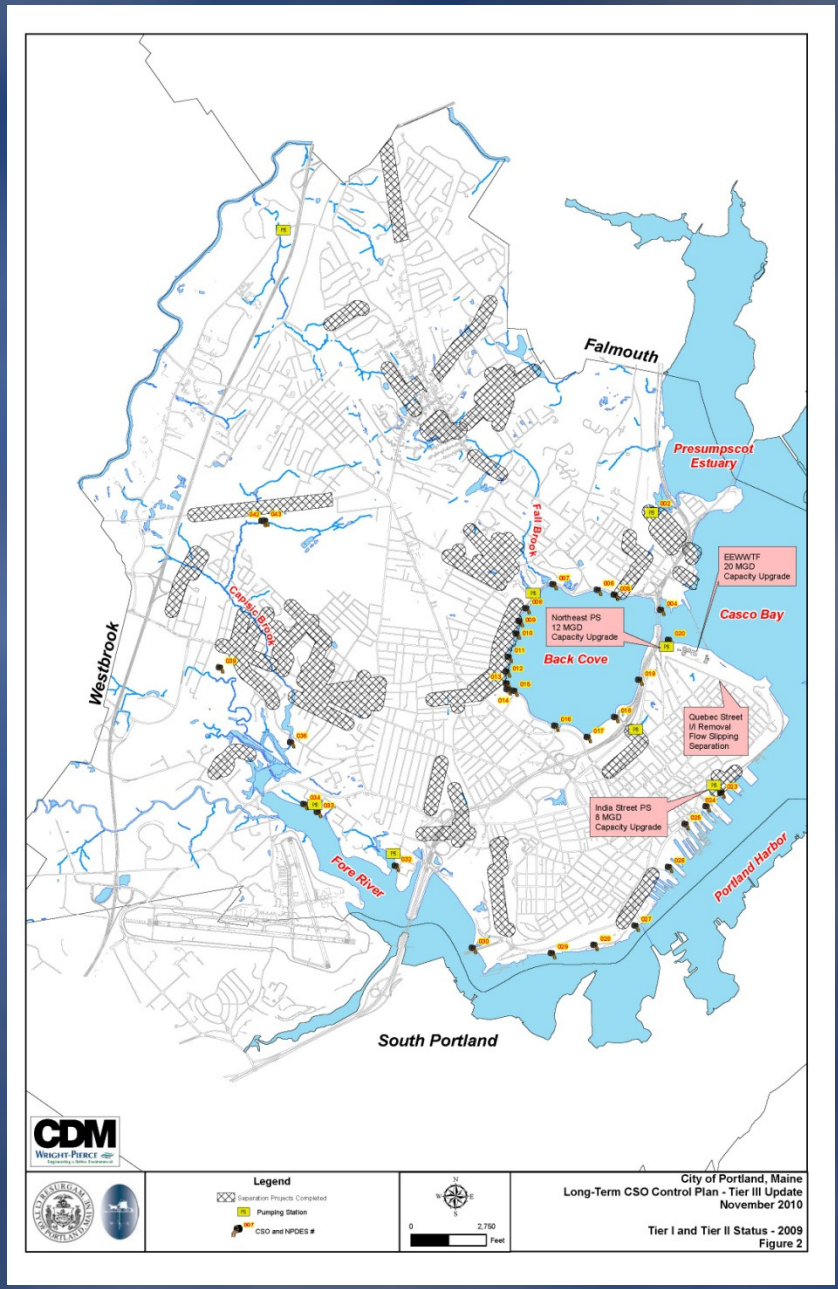
Overall Goals of 1993 LTCP Program

- 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 Capisic Brook, Fore River, Presumpscot Estuary, Casco Bay
- Minimize CSO To Back Cove, Portland Harbor



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

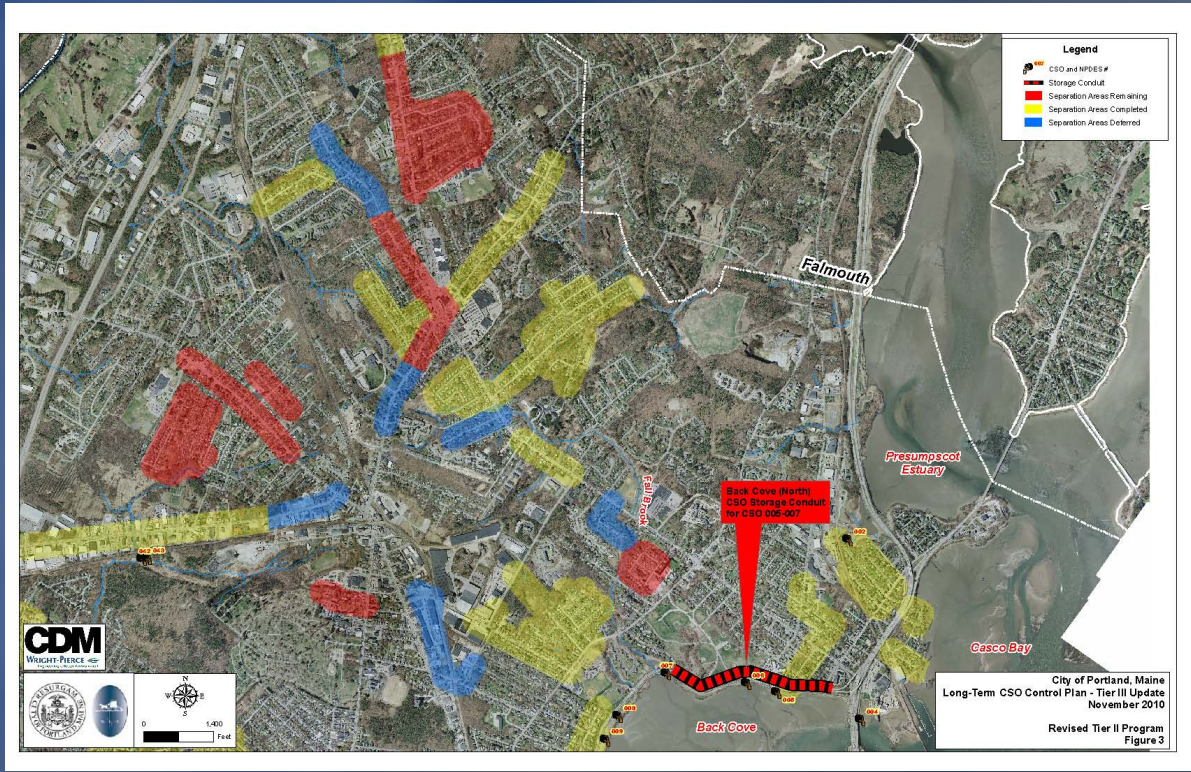


Current Study Purpose

- 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

Tier II Projects Deferred

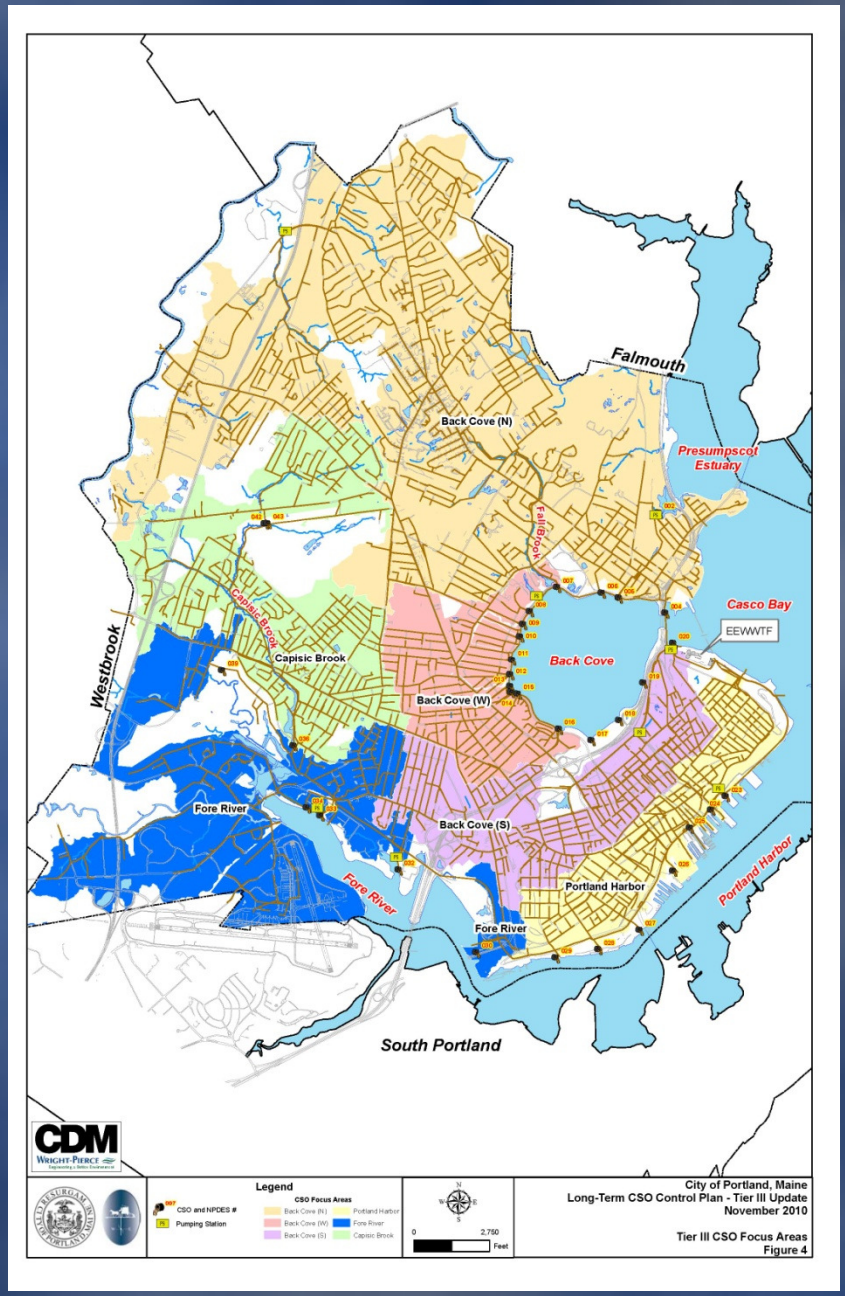
2011 Construction	Projected Cost
Ocean Avenue - Read Street to Carlyle Road	
Loring Avenue Area	
Total Deferred Value =	$1,240,200

2012 Construction	Projected Cost
Malilly Road	
Allen Ave - East of PATHS	
Fall Brook Street	
Allen Ave - Harvard to Plymouth	
Woodlawn Avenue Area	
Total Deferred Value =	$2,599,200

2013 Construction	Projected Cost
Auburn Street @ Sanborn Street	
Washington Ave & Auburn Street	
Washington Ave @ Skylark	
Washington Ave - Greenwood to Coolidge	
Total Deferred Value =	$3,305,700
Grand Total Deferred Value =	$7,145,100

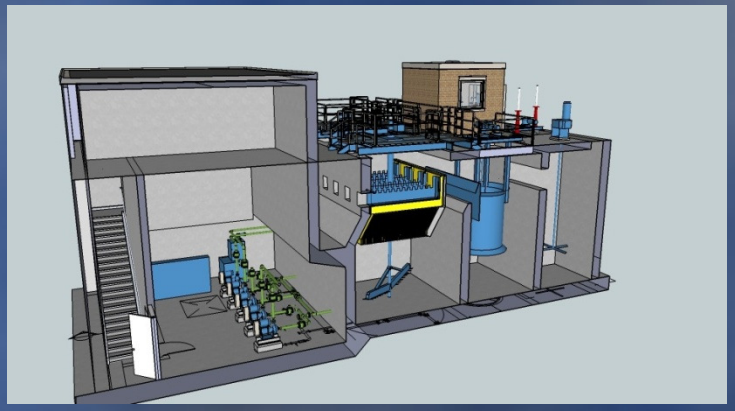
Tier III

- 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

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

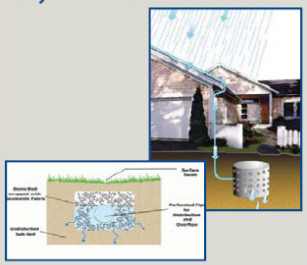
Bioretention System

Rain Garden

Vegetated Swale

Vegetated Buffer/Filter Strip

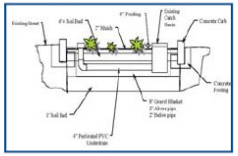
Dry Well/Infiltration Trench



Permeable Pavement

Stormwater Planter/Tree Box Filter

Micro-Bio Inlet

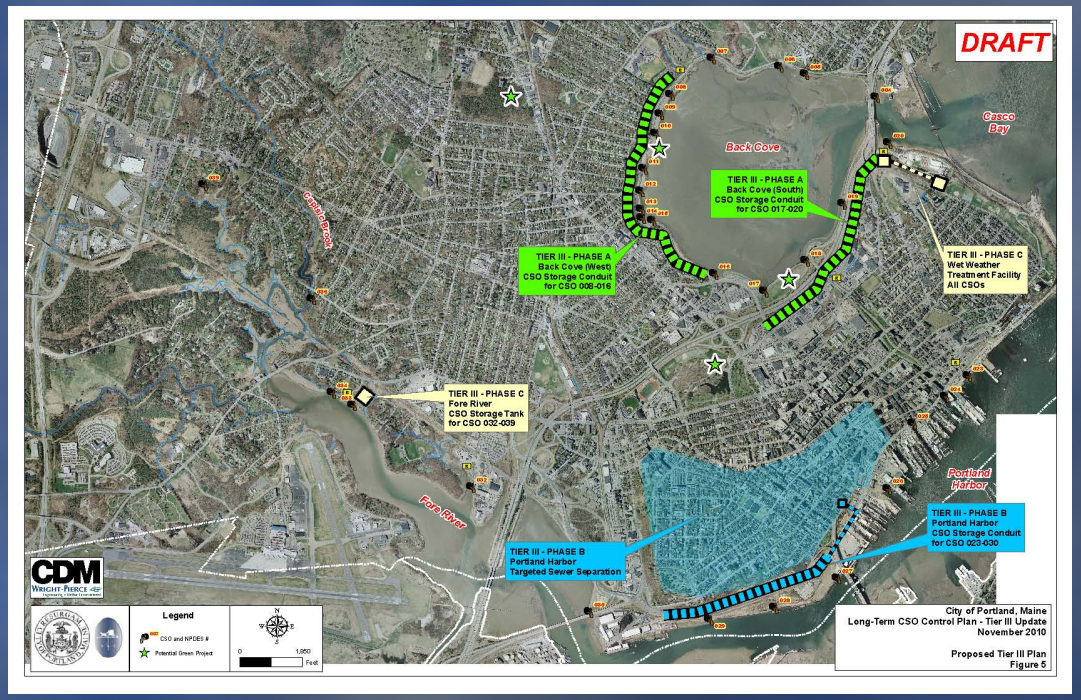


Recommendations

- 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

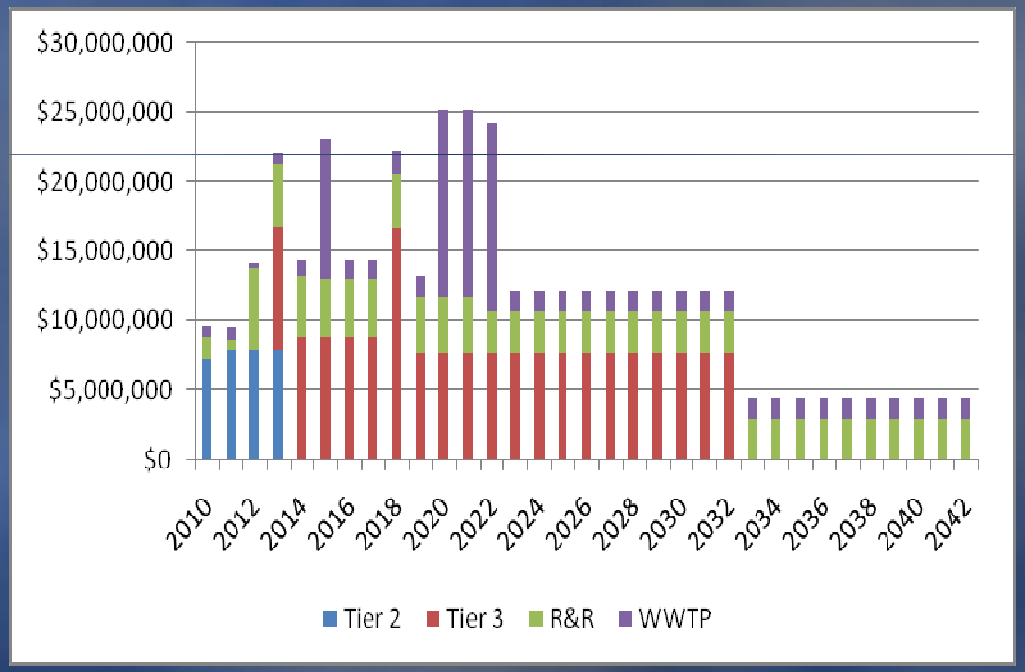
- **Back Cove South/West Storage Conduits**
  - $55 Million, Including $10 Million Separation /Green Projects
  - 5-10 Years;
- **Fore River/Harbor Storage**
  - $70 Million Including $15 Million Separation /Green Projects
  - 5-10 Years;
- **Upgrade Treatment Facility**
  - $45 Million
  - 5-10 Years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



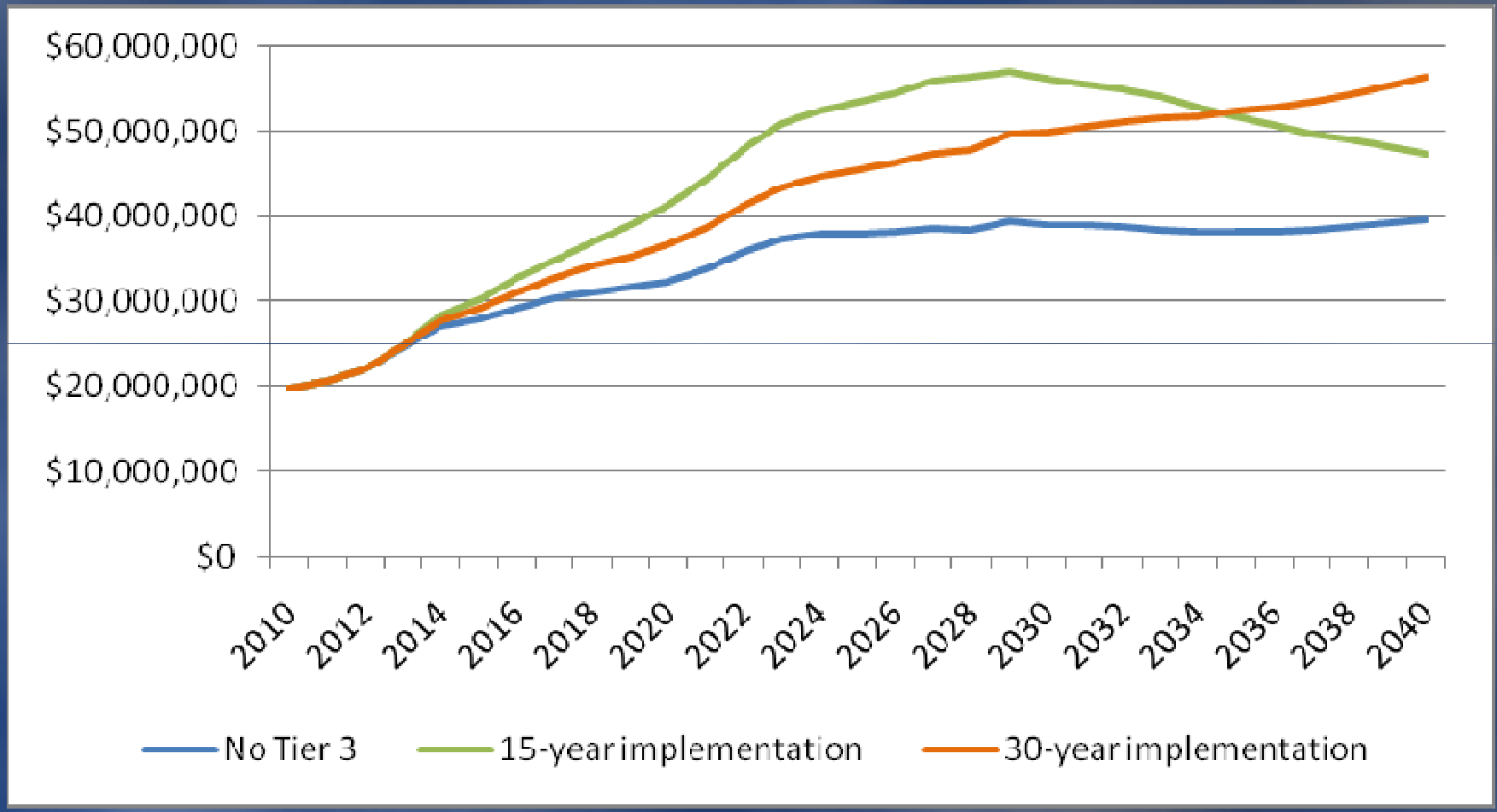
Fiscal Implications

- 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

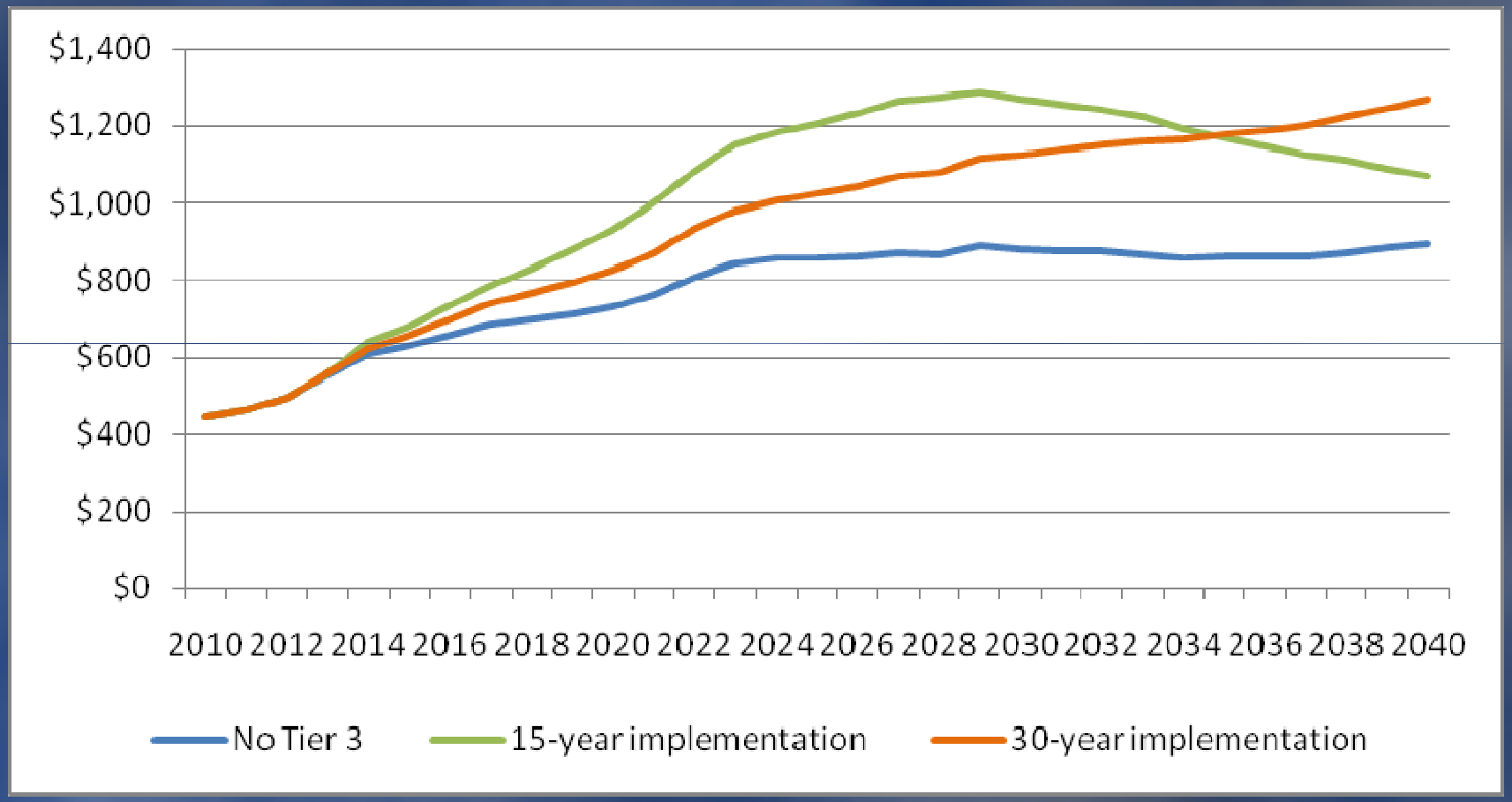
- Construction Cashflow of Aggressive Schedule



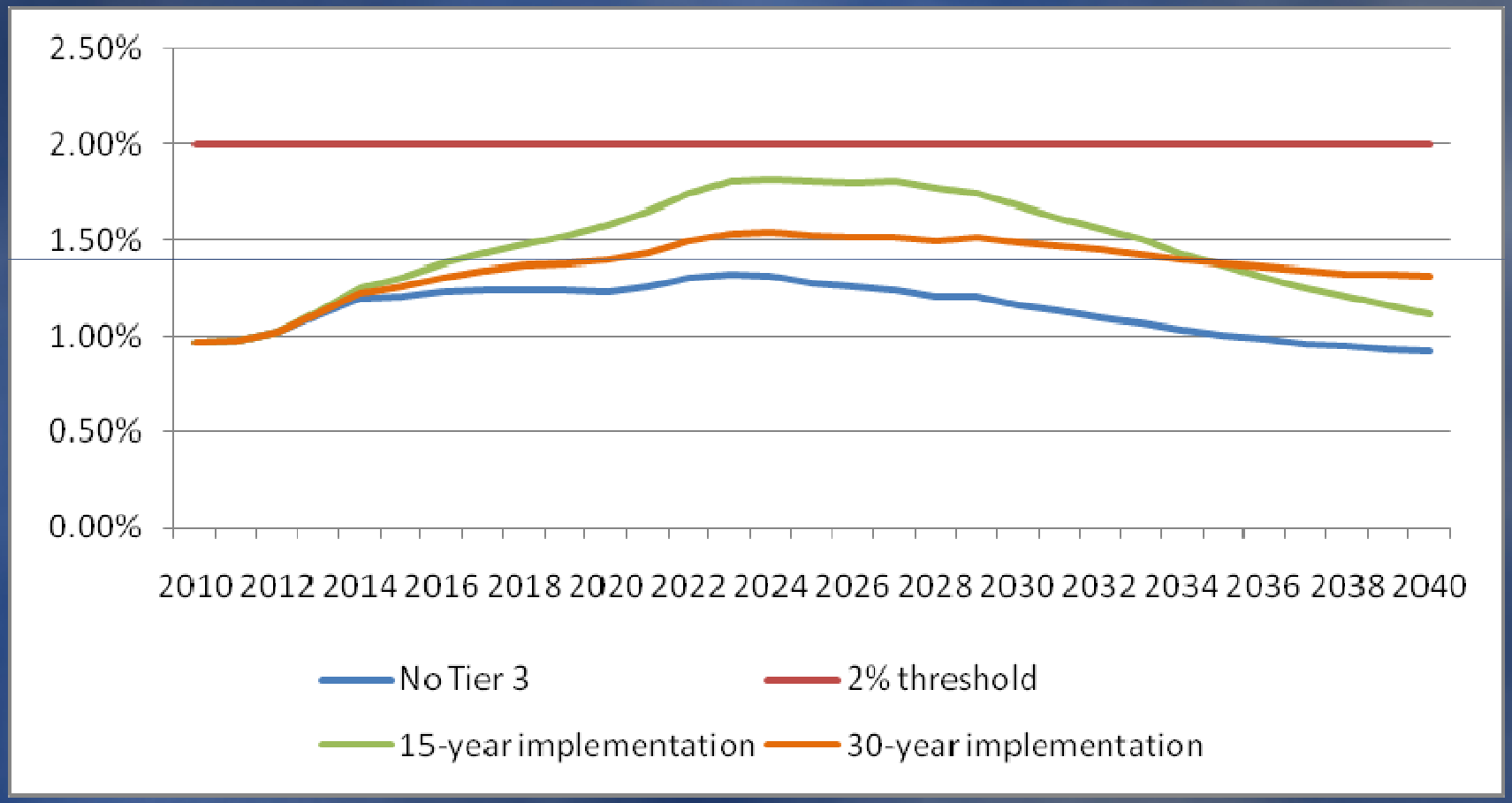
Impact of Tier 3 on Total Expenses



Impacts on Household Charges



Affordability Consequences of Proposed Tier 2/3 Program—Household Burden Index



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