

Integrated Planning in Action

2017 Long Term CSO Control and Integrated Capital Improvements Plan

New Bedford, Massachusetts

New Bedford's wastewater treatment facility at Fort Rodman.
Photo courtesy of Shoreline Aerial Photography LLC, provided by CDM Smith.

Located on Buzzards Bay in southeastern Massachusetts, New Bedford is a city with a rich maritime history and a population of nearly 100,000. New Bedford owns and operates combined and separate sanitary sewers that transport wastewater to the city's wastewater treatment facility¹, which discharges into Buzzards Bay. The city's storm sewers² and combined sewer overflow (CSO) outfalls discharge into the Acushnet River estuary, Clarks Cove, and New Bedford Harbor. Buzzards Bay supports tourism, marinas, and recreational fishing.

Challenges

In 1987, New Bedford agreed to reduce CSOs and build a new secondary wastewater treatment facility under a consent decree with the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection. The consent decree was updated in 1990 and 1995 to address cited affordability constraints and allow the city to prioritize wastewater treatment facility improvements and delay CSO abatement activities.

By 2012, New Bedford had reduced CSO volumes by 91 percent since 1990, but it still discharged 284 million gallons of sewage into waterways that year. That same year, EPA issued an administrative order that required the city to address sanitary sewer overflows (SSOs) and develop a scope for updating its long-term control plan (LTCP) for managing CSOs. In addition to these requirements, New Bedford anticipated new nitrogen effluent limits that could require costly upgrades to its wastewater treatment facility. The city also has a stormwater discharge permit that includes a total maximum daily load (TMDL) for pathogens in Buzzards Bay.

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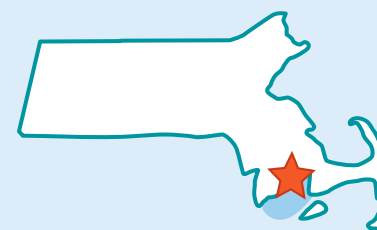
By 2016, New Bedford met all the deadlines in EPA's 2012 administrative order and submitted a scope of work to integrate the LTCP with a capital improvement plan in lieu of the more traditional LTCP that the order required. The city asked to use the proposed integrated planning approach to prioritize projects that would address overarching issues.

New Bedford staff held meetings with various stakeholders, city departments, and the public and identified more than 150 concerns and impacts. For example, bacteria reduction and system failure prevention were the city's priorities in addition to CSO abatement. The city then distilled this input into six core issues to address through integrated planning (see box at right) and established goals for each. For example, the city set the following six project goals for addressing water quality impairments: 1) address management goals in the TMDL; 2) reduce nitrogen and



EPA Region 1

100,000 population



Core Issues Addressed Through the Integrated Planning Process

- Water quality impairments
- Public health and safety
- Existing infrastructure reliability
- Climate change
- Sustainability
- Need for economic development

¹ "Wastewater treatment facilities" (WWTFs) is a generic term for facilities that treat or manage wastewater, including publicly owned treatment works.

² Storm sewers and storm sewer systems can also be referred to as municipal separate storm sewer systems (MS4s). Stormwater discharge permits can be referred to as MS4 permits.

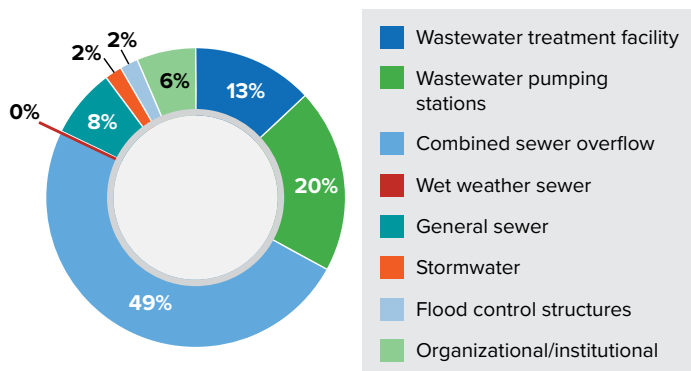
phosphorus to increase dissolved oxygen concentrations; 3) control/reduce discharges of oil, grease, and trash; 4) ensure the wastewater treatment facility is operated to reduce nitrogen discharges; 5) prioritize control of CSOs in sensitive areas; and 6) meet the requirements of the city's stormwater permit.

New Bedford identified locations within the city where systems were not performing optimally or needed improvement to meet plan goals through a series of internal workshops, public meetings, document reviews, modeling, system assessments, and site investigations. The city proposed projects to address all identified problems in these specific locations; however, the full suite of projects would have cost \$1.2 billion, which the city deemed unaffordable. Therefore, the planning team focused on how best to prioritize and select projects to include in the integrated plan.

New Bedford first divided the full suite of projects into eight categories (see box below). It then prioritized the projects within each category, considering how critical the associated infrastructure was, the water quality benefits, how well each project supported compliance with permits and the administrative order, social impacts, administrative considerations, and anticipated construction costs. The city also conducted modeling to determine how much wastewater treatment facility, pumping station, and CSO control projects would reduce CSO volume and flooding, as well as how much infrastructure would be renewed.

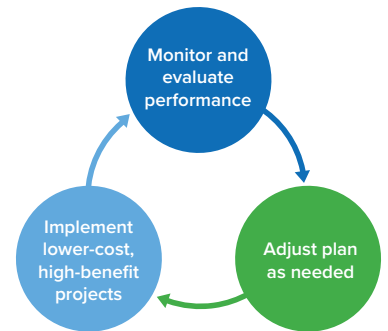
From the prioritized category-specific lists, New Bedford then chose projects for its integrated plan based on affordability, alignment with other city initiatives or projects, and necessity for maintaining reliable operation of the sewers and wastewater treatment facility. The city selected projects from all eight categories. The city also proposed a schedule that equitably distributed projects across 20 years (2017–2036) to avoid large rate increases in any given year.

Projected Distribution of 20-Year Integrated Capital Plan Costs by Category



The capital budget for New Bedford's final recommended plan totaled about \$260 million over 20 years (see graphic below). More than half of the total cost (i.e., \$143 million) was for combined sewer projects; another third was for wastewater infrastructure renewal projects. The schedule focused first on infrastructure repair and renewal to eliminate illicit connections to the storm sewer system, reduce infiltration and inflow into the combined sewer system, and eliminate a CSO outfall. New Bedford's recommended plan included optimizing the existing wastewater treatment facility to maintain low nitrogen effluent levels, rather than installing new equipment.

Approach to Project Implementation and Monitoring



New Bedford projected that the plan would reduce CSO volume by an additional 82 million gallons from the city's 2016 levels, resulting in a 97 percent reduction from its 1990 levels. It prioritized CSO reduction to Clarks Cove, which is the most sensitive receiving water. At the time of plan completion, New Bedford expected to achieve a 48 percent reduction in total nitrogen discharge and a substantial reduction in bacteria discharged during rain events to the Acushnet River, Clarks Cove, and New Bedford Harbor.

Results

New Bedford submitted its *Long Term CSO Control and Integrated Capital Improvements Plan* to EPA in 2017. A 2019 consent order formally implemented the first phase of the plan that included projects for the first seven years. The city started several integrated plan projects before the 2019 order, including equipment upgrades at the wastewater treatment facility, two sewer separation projects, two pumping station upgrades, and a flow monitoring program.

Project Categories

- Wastewater treatment facility
- Pumping stations
- CSO controls
- Wet weather sewer
- General sewer
- Stormwater controls
- Flood control structures
- Organizational/institutional

