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Past, Future Of Wastewater Management Explored

By Michael C. Bailey

Gloucester's past and Narragansett's future provided attendees of the second annual SmarterCape Summit with food for thought on the ever-thorny issue of wastewater management.

The two-day conference at the Sea Crest Beach Hotel explored how new technology could be applied to monitoring and managing the environment, the economy, development, education, health care, transportation, and government. One of Monday's breakout discussions focused on wastewater and how two different communities approached the issue.

Bruce H. Tobey, senior counsel with the Boston-based law firm Pannone Lopes Devereaux & West and a member of the firm's municipal infrastructure team, spoke about the city of Gloucester's experiences in creating a citywide wastewater infrastructure—somewhat under duress, thanks to the passage of the Clean Water Act in 1972.

Speaking in his capacity as a lifelong Gloucester resident, and that city's former mayor and current city council member, Mr. Tobey drew comparisons between the Cape Ann region—"the other Cape," he called it—and Cape Cod, noting both areas' similar maritime cultures, tourism-based economies, and proximity to and dependence on water resources.

Mr. Lopes also noted that Gloucester, like Cape Cod, consists of a number of denser population clusters and less densely populated outlying areas, mostly along the coastline.

At the time of the Clean Water Act's passage, Gloucester had little existing wastewater infrastructure, Mr. Tobey said. In the mid-1970s central Gloucester, in which lives 40 percent of the city's residents, allowed its residential and commercial wastewater to spill directly into Gloucester Harbor.

The Clean Water Act forced the city to rethink its methods to include wastewater treatment and expanded wastewater collection. Work on a treatment plant began in the late 1970s and the plant was operational in 1984.

At the time, the city was able to tap "substantial federal and state grants" to mitigate the cost impact to residents; 75 percent per unit of the cost was assessed on homeowners to the tune of \$3,000.

"What we would give for that now," Mr. Tobey said, explaining that as work continued throughout the city, the cost per homeowner increased to \$8,000, then to \$18,000, then to \$20,000—with the costs again mitigated by federal and state grants.

To avoid per-homeowner betterments of \$30,000 or higher, Mr. Tobey said the city began exploring alternatives to conventional gravity systems with "behemoth pumping stations that would have been required to make them work."

The Massachusetts Department of Environment wound up signing off on on-site septic tank effluent pump systems for 1,600 homes and decentralized treatment systems.

"Thirty years later, the job's not done," Mr. Tobey said. "We continue down the road, and it's a road that has changed from the struggle of a single community to an effort that's become increasingly regional."

That regional approach was motivated in part by the fact Gloucester is "one great big drainage basin" for the area; water drains into Gloucester from the neighboring communities of Essex, Ipswich, Manchester, and Rockport, which also share key bodies of water: Gloucester Harbor,

Ipswich Bay, and the Annisquam River.

In later years Essex and Rockport tied into Gloucester's infrastructure, Mr. Tobey said. Both towns installed sewer mains that connect to Gloucester's treatment facilities, but are maintained by their respective communities of origin—in essence, expanding Gloucester's infrastructure without adding to the cost burden.

"Regionalization became a big part of what we did," Mr. Tobey said, adding that learning to work cooperatively and coordinate efforts with other communities was one of the takeaway lessons from Gloucester's experience.

Holistic Solutions

While Gloucester utilized a mix of traditional methods for dealing with water quality issues, the Narragansett Bay area could prove a successful test case for wastewater management planning that predicts the impacts of newer and alternative approaches.

Ken Moraff, deputy director of the Office of Ecosystem Protection at the Environmental Protection Agency's New England regional office, demonstrated a new pilot technology that embraces a holistic philosophy to wastewater treatment: the Watershed Multivariate Planner (MVP) tool.

Mr. Moraff explained that the EPA has historically broken its areas of interest down into categories such as air pollution, and sub-categories such as pollution caused by automobile emissions, by industrial emissions, et cetera. While that approach allows the EPA to develop focused solutions, "one thing that you lose when you do that is, you miss a lot of the connections," he said.

"You miss, first, promising strategies to address a problem that don't lie in the narrow area you've divided things up into," Mr. Moraff said, citing as an example addressing mercury content in bodies of water by addressing the source of that mercury: industrial emissions, which falls in the area of air quality.

Second, he said, "you might not realize the effects of your solution. You might be creating problems

in another area,” and the MVP tool was designed to address that issue by allowing communities to project the impacts of its efforts in indirectly related areas of concern.

Those concerns led to the development of the MVP tool, which allows users to enter data in a wide range of categories, from population to water quality to existing water quality management techniques, and apply different methods of addressing water quality issues such as investments in infrastructure and reducing nutrient outputs at their sources.

The tool then predicts how a particular approach will affect not only local water quality, but related issues such as tourism, agricultural businesses, beach visits, and fish landings.

The prototype MVP tool is about 50 percent complete, Mr. Moraff said, but when fully developed, he said the data generated would be useful to communities as they plan their water quality management strategies.

“This is designed to start letting you analyze some of the big policy choices when you go to attack one of these problems,” he said. “It gives you promising policy paths that then need more detailed investigation” that can be handled by local and regional planning agencies.