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Learning From Phase I Cities: The Dallas Stormwater Utility

Faced with NPDES Phase II deadlines, smaller communities look for ways to pay for their programs.

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As the March 2003 deadline looms for small municipalities to apply for the United States Environmental Protection Agency's Phase II National Pollutant Discharge Elimination System (NPDES) permits, many lessons can be learned from larger cities that have already had to comply with Phase I of this program. Most notably, Phase II communities can see how Phase I cities went about creating a stormwater utility to fund the permitting objectives: protect citizens from stormwater runoff pollutants.

Perhaps the biggest concern for communities is the cost of the program. EPA estimates that annual permit costs for small, regulated municipalities will average about $10 per household. For a city with a population of 30,000, five-year permit costs could approach $100,000 per year, according to the agency's studies.

However, EPA sometimes has initially underestimated permit compliance costs. For example, the agency severely underestimated both the permit application and implementation costs to Phase I cities. The Phase II estimates appear more realistic but still low.

No city leader wants to burden residents with unreasonably high utility bills or property taxes to help cover the costs. On the other hand, these leaders don't want their residents' health to be adversely affected because of high levels of pollution in local waters. Thankfully, experience shows that it is possible to manage costs *and* maintain safe environments. The key to success is establishing a good stormwater utility.

The dual purpose, from the municipalities' perspective, is to establish a utility that meets both the objectives of the EPA guidelines and the development models of each city. For newer communities, expansion of a storm sewer network to keep up with new growth is a key goal. For older communities, the revenues from utilities offer an opportunity to upgrade and refurbish existing stormwater systems. Regardless, the utility must pay for itself as quickly as possible and be viewed by both the residential and corporate citizens it serves as a worthy benefit for which they are willing to pay.

Fortunately, the Phase I program of the early 1990s provides Phase II communities with numerous

models that can serve as pro forma lessons in the development of their utilities. Though Phase I cities had a broader set of requirements, including more onerous industrial oversight requirements, both phases must address illicit connections and illegal dumping, plans for stormwater runoff from construction sites (and the impact on the stormwater environment once those projects are completed), cleaning up stormwater runoff from their own municipal facilities (service centers, fire stations), public education programs, and ways to involve the public as the programs are being developed.

One of these Phase I model cities to learn from is Dallas, TX. With a population topping 1 million, Dallas has many big city needs, including social obligations, for which it must pay. The city was facing a budget challenge at the time the NPDES requirements were enacted, and the stormwater utility process was seen as a way to identify and establish a new funding source that could pay for traditional floodplain and drainage costs rather than using money from the general fund.

Dallas's program, considered somewhat visionary at the time, serves as an example of how to properly set up and manage a stormwater utility. Though Carter & Burgess continues to work with numerous communities in setting up their utilities, the "Dallas Model" helped establish a baseline formula for success. It can be broken down into five primary categories, which essentially incorporate the successful execution of many NPDES requirements.

Identify the costs
Develop a management organization
Survey and analyze database assets
Establish an equitable rate structure
Educate the public

Identify the Costs

Dallas's total stormwater costs are $25 million–$26 million annually, with about half of the money considered a traditional floodplain and drainage expense, and the rest earmarked for NPDES. The city's utility generates about $21 million in annual revenue, with the balance of its budget coming from the general fund. Therefore, not counting the NPDES expenditure, the utility relieves $12 million–$13 million from the general fund that previously would have paid for floodplain and drainage.

"The unfunded mandate portion of the NPDES requirement is part of the equation," according to Frances Verhalen, program manager for the City of Dallas Stormwater Utility. "But in addition to being responsible for floodplain and drainage issues, the city also has to deal with quality issues, which prior to the edict had not been addressed. These can be expensive when EPA requires sampling, inspections, and other activities in order to comply with the permit. The floodplain issues are very straightforward, but quality issues aren't so clear. For example, if there's a hazardous spill, the cost of the cleanup is very minimal if it's contained before it reaches the system. But if it's not, then those cleanup costs can rise significantly."

So in addition to enabling the city to comply with NPDES obligations, the utility becomes a vehicle for reducing the entire cost of managing water quality.

In Dallas, most of the services that contribute to the utility are left intact in their respective city departments but are funded out of the utility budget. In many cases the utility group is a small corps; in other cases it is large. Support services come from other departments within the city.

Identifying all of the costs relative to stormwater and drainage, regardless of the department in which

they're located, is the logical starting point for establishing a stormwater utility. However, many communities don't initially appreciate or recognize what all those costs are. For example, mowing the grass in the drainage channels within a park is a stormwater cost, although many view it as a park maintenance cost. Hazardous material (HAZMAT) management is another example. In the old days, if a gasoline spill occurred on a road, the fire hoses would come out and it would be washed down the sewer. Today it's also a water-quality issue, so a lot of HAZMAT tasks and duties can be considered stormwater utility responsibilities. It's important to properly identify and then segregate all those costs and establish a baseline for each particular service.

Develop a Management Organization

Experience in developing utilities has proven that establishing a "lean and mean" management structure within the utility works best. Dallas's stormwater utility has a monitoring and management group of about 16 employees, reports Lisa Jowell, water-quality engineer for the utility. This group has the responsibility of delegating tasks to other departments yet retains oversight and monitoring duties.

For example, Dallas's parks and recreation department deals with erosion control on municipal property. By sweeping the streets, the street department removes sediments and pollutants that attach themselves to those sediments. It also manages the pump stations and levees that control stormwater flow. Through a joint program with Dallas County, the city's public works department deals with normal hazardous waste cleanup, while the sanitation department manages citizen drop-off locations for paints, pesticides, and household chemicals. The public works department performs design work for water retention ponds and other erosion control projects, and the water department handles billing and collections.

"Since we're primarily a management office, and other departments are charged to perform most of the tasks relating to stormwater issues, we prioritize these tasks and make as many happen as possible with the funds that are available," states Dallas's Verhalen.

Survey and Analyze Database Assets

The revenue collected by any public stormwater utility is based on property ownership, land area, land use, impervious area, or a combination of these elements. The creation of a revenue stream for a utility requires identifying the watershed inventory for management purposes and establishing a property inventory for billing purposes.

One of the more costly requirements for some communities is developing a storm sewer inventory. We've found that some Phase II cities have good maps of their systems, but most don't.

In some cases, utilities have been developed without performing this inventory, primarily for water-quality management, prior to trying to meet NPDES regulations. For example, Stephenville, TX, a Phase II community southwest of the Dallas/Fort Worth area, had taken no inventory of its stormwater and watershed features before deciding to create a utility to pay for some required system repairs. Creating the utility included developing an updated drainage master plan to include additional areas of localized flooding and to reevaluate previously determined solutions to alleviate flooding and expand capacity of existing channels.

As with Stephenville, most Phase II communities do not have financial and staff resources as ample as

those of Phase I cities. As a result, they must identify the initial and long-term mission of the utility: to manage stormwater quantity, or to address water quality? Stephenville is taking the quantity approach. Its new stormwater utility revenue stream will be used to develop new drainage systems. Water-quality issues likely will be addressed later.

Fortunately there is enabling legislation for Texas (the Municipal Drainage Act) that sets some guidance and terminology regarding stormwater utilities. Many states do not have that yet. On the financial side, the Texas act establishes the guidance and limitations regarding identifying the customer and also a cost-of-service approach for all utilities. It defines benefited property (since this is a new service) and helps create a basic service unit.

Establish an Equitable Rate Structure

Diligent attention to data quality is a primary concern when setting up a billing system for a utility. Those communities that spend time ensuring that the information they maintain is accurate will find their billing systems come together much more successfully. Stephenville is a good example: It has a new information technology system with harmonious software and updated GIS maps that are cross-referenced easily and compatible with its billing database.

Setting up Dallas's billing system, on the other hand, involved working with data in a proprietary system and from different sources. The databases of the water utility, city tax office, and the Dallas County tax appraisal district were merged to create one master database. Since there were no GIS files at the time, it was a challenge. There were more than 200,000 water and wastewater customer accounts that had to be matched to land-use and land-area data in order to determine the number of equivalent billing units for each parcel. More than 40,000 parcels had to be manually matched. This process included matching the customer account address to the parcel characteristics and sometimes included driving out to inspect the property. It took approximately 90 days to create the initial billing database.

Typically there are two basic approaches to setting up a rate structure. Dallas used the engineering design criteria based on runoff coefficient and the area of each tract of land. These criteria help set an adjusted payment formula by determining runoff ratios for land use and developing multipliers to the land area. The result is the equivalent impact of stormwater quantity and quality for each land parcel. By using the engineering design criteria, less individual tract analysis was necessary and the data appear to be more reflective of each individual tract's contribution to stormwater quantity and quality. It is also easier to explain to the public and relatively simple to execute.

Another methodology, used in San Antonio, TX, involves individual tract analysis, including calculation of impervious areas on each parcel. However, this can result in some perceived inequities when it comes to billing (and explaining the policy), depending on the precise differences in impervious areas in each neighborhood. This method requires substantial direct tract analysis and human effort.

Many Phase I cities started off with fairly low rate structures. Because of their size, they didn't need a high rate structure to generate the funds they needed, and they probably didn't want to attract a lot of opposition to a new utility rate.

In contrast, Phase II communities are being fairly aggressive with their initial utility rates. They need to generate the funds to pay for the utility and they don't have such large general fund budgets as the Phase I cities. And there is a level of acceptance of the utility concept that wasn't present when Phase I

began. Residents, for the most part, understand now that this is a good concept. Their acceptance is often a positive ripple effect from the education programs launched by Phase I cities.

Educate the Public

Education during the development of the utility is paramount to public acceptance. The stormwater utility's customer service staff first needs to understand how to explain the legal, water-quality and -quantity aspects of the utility. This is a normal operational function, so all it really requires is time.

Once citizens see the stormwater utility rate added to their water bill, customer service representatives will begin to receive basic questions about the utility and its purpose. As for handling more advanced questions, the utility management group can follow NPDES education requirements, which suggest ways and means of communicating the need for a stormwater utility, such as getting out and speaking to classes at schools. Stormwater utilities in Dallas and San Antonio have done this very effectively.

"We sell the quality as well as the quantity aspects of the program," maintains Dallas's Verhalen. "And over time, we find that we are getting some quality contacts from people who are noticing pollution in their creeks. They see things now that they might not have seen a few years ago, and they know we're the ones to call in order to get action when it comes to water pollution.

"We've done a lot of community outreach for a long time through our - Don't Dump it, Dallas' program that's very attuned to public involvement," she adds. "The general education of the public over the years about the quality issues of stormwater pollution leads to better citizen understanding of who we are, what we do, and why we're necessary. Most now accept that just because there's a drain in front of them, they can't pour any old thing down it."

Other communities have seen the benefits of a well-conceived public education program. Initial public acceptance of San Antonio's stormwater utility was very high, and in Laredo, TX, an annual expenditure of six figures for radio and television public service announcements is credited for generating greater public awareness of the stormwater-quantity and -quality issues and an acceptance of the utility's rate and cleanup enforcement programs.

In Dallas, the number of citizen pollution complaints has increased due to increased education, but the level of enforcement activity is expected to drop as continued education brings more people into compliance. "The city has been recognized as having one of the most proactive enforcement programs in the region, and many consider it one of the most proactive in the nation," declares Dallas's Jowell. "And that's an example of the sort of help available to these Phase II communities - knowledgeable consultants and Phase I communities like Dallas who can share their experiences."