

Comparative Analysis of Stormwater Programs

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The purpose of this technical memorandum (TM) is to provide a summary of information gathered from a number of cities across the United States regarding their storm water programs for compliance with the National Pollution Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) requirements. Six Phase 1 cities (population of 100,000 or more) and a single representative Phase 2 city (population less than 100,000) were contacted to research these cities' stormwater programs and effectiveness of implementing their stormwater permit requirements. The cities researched and evaluated include the following:

- Abilene, Texas
- Austin, Texas
- Oklahoma City, Oklahoma
- Oro Valley, Arizona (Phase 2 City)
- Phoenix, Arizona
- Salt Lake City, Utah
- Seattle, Washington

An overview of stormwater fee programs for thirteen communities (cities and counties) in the mid-Atlantic area, which has been a very active area for the development of utilities and utility fee structures, is also provided.

Individual City Summaries

The cities researched were selected based on similarities to Albuquerque, program features, representation of a variety of approaches to stormwater management for both quantity and quality, and methods used to establish their programs. This TM summarizes information gathered about the cities contacted with a specific focus as to elements that may best apply to the City of Albuquerque (COA). The information contained in the following city-by-city summaries is specific to each city, as each city has slightly different situations and solutions to their stormwater programs. A matrix table provided at the end of this section summarizes more details for each city researched.

Abilene, Texas

The City of Abilene, Texas has a population of over 115,000. In 2003, the Abilene City Council voted to create a Stormwater Utility Division for the purposes of assisting the City in complying with state and federal regulations regarding water quality and to mitigate flooding problems. A 24-page ordinance was adopted that authorizes creation of the utility

and assessment of fees. The Abilene Stormwater Utility Division serves an area of approximately 110 square miles with 40,000 accounts assessed both a Stormwater Utility Fee and an Environmental Charge. These charges are billed monthly with the water utility bill, labeled as "Stormwater and Environmental Charge."

Abilene generates close to \$1.5 million annually from assessment of the Stormwater Utility fee, which is used for maintenance activities including cleaning creeks and drainage ways. From the Environmental Charge, almost \$350,000 is generated annually and is applied to administration of the City's MS4 permit.

The rates for the Stormwater Utility fee are based on imperviousness of the subject property. Table 1 provides a summary of the Stormwater Utility rates obtained from the Abilene web page at www.abilenetx.com/StormwaterServices/StormwaterUtilityFeeRate.htm.

TABLE 1
Stormwater Utility Rates

Residential Fees	
Rate	Under Roof
\$1.85 Per Month – Per Water Meter	< or = 1,280 Sq. Ft.*
\$2.45 Per Month – Per Water Meter	> 1,280 and or = 2,880 Sq. Ft.
\$2.95 Per Month – Per Water Meter	> 2,880 Sq. Ft.
Commercial Fees	
Rate	Under Roof + Parking
\$.00050 Per Sq. Ft. – Per Month- Per Property Parcel*	Rate times area (Sq. Ft.) Example: (\$.00050 X 14,000 sq. ft. = \$7.00)
\$5.00 Minimum Monthly Rate (Per Parcel)	10,000 Sq. Ft. or Less
\$25.00 Maximum Monthly Rate (Per Parcel)	50,000 Sq. Ft. or More

*Sq. Ft.: Square Feet (Square footage is calculated on all impervious cover; for example roof, asphalt, concrete, patio, sheds, barns, etc.)

**Parcel: Contiguous properties under the same ownership that is not separated by property owned by another or separated by public right of way (street, alley, easement).

For more information about the Stormwater Utility Division of Abilene, Texas please see the following web site: <http://www.abilenetx.com/StormwaterServices/index.htm>.

Austin, Texas

The City of Austin, Texas has a population of over 650,000. In the early 1990s, state legislature authorized creation of a revenue-generating stormwater utility. Austin manages stormwater quantity and quality according to watersheds within which ordinances have been adopted. Austin is supplied drinking water from the Edwards aquifer that is a karst geologic system. The aquifer is susceptible to reduced recharge impacted by increasing imperviousness, as well as contamination from stormwater events where recharge to the aquifer does occur. Stormwater is connected to water resource quality and supply, and is managed conjunctively with drinking water supply protection in mind. The Drainage Utility Department has approximately 300 staff members.

The Austin Drainage Utility Department serves an area of over 270 square miles with 600,000 accounts billed. Customers are billed a drainage fee monthly along with six other community services, which include water, sewer, solid waste, energy, and transportation. Drainage fees are set to cover both operational expenses, capital improvement projects (CIPs), monitoring and compliance for their MS4 permit, public education and outreach, efficacy of best management procedures (BMPs), and master plans and rate studies.

The City expends approximately \$20 million annually on CIPs. These fees are considered adequate to cover both operation and maintenance (O&M) activities and CIPs, although some general obligation (GO) bonds are issued for CIPs. An estimate of revenue collected annually was not available from the initial contact made with the City; however, as the revenues support the annual CIPs, revenue is at least \$20 million. The City Council views financial self-sustainability as an important goal for the Drainage Utility in addition to water and wastewater utilities, and has supported rate increases periodically as needed. While there is a mechanism for assessing fines, very little revenue is generated in this manner.

The drainage rates currently assessed are as follows:

- Residential Drainage Fee: \$3.67 per month
- Commercial Drainage Fee: \$39.59 per developed acre per month

Drainage fees for commercial customers are based on square feet of impervious cover. An effort to establish a database of existing properties and the amount of impervious cover was completed to enable assessment of these fees, informed in part by land use and zoning information. The data for impervious cover is kept up-to-date through a system of permits. The amount of impervious cover in square feet of a proposed new development must be submitted to the City as a part of the approval of new site plans that are required for the issuance of building permits. In this way, the data for impervious cover is collected for new development and the data base information is maintained.

The drainage fees were developed through a general three-step process: 1) estimate and forecast operational and CIP costs, and document these in a Master Plan, 2) determine the number of accounts served by the utility, and 3) establish rates based upon the quotient of the first two inputs (costs divided by number and types of accounts). This general method was used by other cities researched for this TM including Oro Valley and Salt Lake City.

Efficacy of BMPs are studied and funded from revenue generated by the Drainage Utility. CIPs implemented include water quality treatment projects, such as sand ponds, vegetated filter strips, and stream restoration of degraded urban creeks in which stream bed and banks are repaired, improvement of land management of adjacent riparian lands, and storm drainage projects. Green infrastructure projects are funded by the utility, including rain gardens and biofiltration projects. Channel conveyance projects are also funded by the utility and do not include concrete-lined channels, which have been essentially eliminated since approximately 1996 and are not used for larger streams. Criteria for all projects are performance-based and are specific to Austin's climate. Maintenance of all BMPs is in accordance with the City's Development Regulations. Non-residential customers are responsible for the maintenance of stormwater facilities on their property.

For more information about the Stormwater Treatment & Stream Restoration Section of the Watershed Protection and Development Review Department of Austin, please see the following web site: <http://www.ci.austin.tx.us/watershed/ordinances.htm>.

Oklahoma City, Oklahoma

Oklahoma City, Oklahoma has a population of over 500,000. In 1999, the City Council voted to create a Stormwater Utility. One city official offered that while there appeared to be few objections from customers upon the creation of the utility, the City Council members initially were reluctant to engage and complete the process to create the utility. An ordinance was adopted that authorizes creation of the utility and assessment of fees. This ordinance is regularly updated with assistance of city legal staff, and approved by the Council members. The Oklahoma City Stormwater Utility serves an area of approximately 610 square miles with 168,000 accounts billed a Drainage Utility fee. There are 29 staff members that include staff for year-round house-hold hazardous waste pickup.

The City estimates annual revenue generated from the Drainage Utility fees to be \$13 million. These Drainage Utility fees are billed monthly with the water utility bill and are based on water meter size. While the Stormwater Utility has not had difficulties with this approach in assessing fees, using meter size to assess fees makes it more difficult to offer credits back to citizens for their good practices that reduce runoff and improve water quality (for example, rain gardens).

Drainage Utility Fee currently charged by Oklahoma City is as follows:

- Residential Properties: \$4 per month (flat rate)
- Commercial Properties: Up to 16-inch meter at \$460 per month

Rates started in 1999 at \$2.73 per month per residence. In 2004, the Oklahoma City Council voted in a rate increase of 4 cents per year for four years. There have been no rate increases since 2007.

The Drainage Utility receives very little revenue from fines of stormwater violations. Typically, violators achieve compliance before anything goes to court. A re-inspection fee is assessed, however, which is \$35. Other revenue is generated through their permit system; a Land Disturbing Permit is used for construction permits. These permits cost \$55 per year and are issued for all disturbances. Oklahoma City's requirements are more stringent than those established by the Environmental Protection Agency that limits permit requirement to disturbances of one acre or more. Oklahoma City offers a "fill-in" stormwater pollution prevention plan (SWPPP) for areas of less than one acre disturbance. Construction permits cannot be issued without first having a SWPPP in place. Another revenue-generating mechanism comes from power washing (cosmetic cleaning) of streets and managing industrial discharges.

The Drainage Utility fee is shared with the Streets and Drainage department that handles the maintenance issues, such as repairing broken pipes, removing downed trees, and clearing blocked inlets. The Stormwater Utility is responsible for compliance stormwater quality aspects of the city's MS4 permit. Projects and programs funded through the Drainage Utility include the following:

- Trash and debris collection and management
- Maintenance of creeks
- Staff and their five areas of responsibility: administration; construction inspection; industrial inspection (verification with compliance for storage, practices, SWPPPs, etc.); water sampling; and public outreach
- Household hazardous waste collection and management

Oklahoma City benefits from regional cooperation between neighboring cities through the Central Oklahoma Stormwater Alliance (COSWA) that includes all Phase 1 and Phase 2 cities. The COSWA meets every other month to provide support to each other and to strive to have consistency in application of ordinances and practices in neighboring towns. COSWA members pool financial resources annually for radio advertising and television commercials that run six months per year. The television commercials are generally in spring and fall when people are cleaning out garages and using household hazardous chemicals, such as pesticides and fertilizers that impair water quality and can harm aquatic life and human health. Oklahoma City is strongly committed to communicating with its customers, particularly with construction permit holders, and regularly holds free workshops to educate and inform citizens of current and anticipated compliance requirements. As a part of that commitment, the city plays a series of public service announcements while callers are asked to wait on hold that are read by school children, citizens, the mayor, and council members. These announcements are titled "I'm an everyday environmentalist. Are you?"

For more information about the Oklahoma City Stormwater Utility and Stormwater Quality Division please see the following web sites: <http://www.okc.gov/pw/SWQ/storm.html> and <http://www.okc.gov/pw/SWQ/storm10.html>.

Oro Valley, Arizona

Oro Valley, Arizona is a Phase 2 city with a population of over 42,000. The city's stormwater utility was recently created by the City Council despite the recent economic downturn and the City followed a process of evaluation and establishment of the utility similar to other cities discussed in this TM. In November 2007, the Oro Valley City Council voted to establish its stormwater utility and the utility is authorized by an ordinance. The city has three full-time Stormwater Utility staff. Additional support is provided by the Streets and Drainage, and also from City Engineering for construction management and project review.

The Stormwater Utility Staff prepared an analysis and made a presentation for City Council that included the following elements:

- Services provided
- Cost of services
- Number of accounts
- Fees that would allow recuperation of these expenses

Based on this information and using methods similar to those described above for Austin, the staff prepared a rate structure to present to the City Council. The Oro Valley City

Council supported staff's recommendation to implement the fee structure and passage of the ordinance.

In Oro Valley, customers are charged as follows:

- Residential properties: \$2.90 per month (flat rate)
- Commercial and non-profit organizations: \$2.90 per month per 5,000 square feet of impervious area

A total of 18,000 accounts are billed with the stormwater utility. Of those, 16,000 are customers of the City's water utility. The remaining 2,000 accounts are served water by two other water providers or are on individual wells. For these accounts, separate bills are sent quarterly. A billing frequency less than quarterly was considered inadequate, as people move and sell property often enough that collecting these fees would become difficult. For water customers of the City, the stormwater fee is included on the monthly bill, listed as a service charge. There was very little response from the public when this was implemented. For customers billed individually and directly for the stormwater fee, however, there was an overwhelming negative response to the fee despite the City's outreach efforts in informing citizens about the fee, its purpose and when it would start.

The stormwater department used aerial photography and geographic information system (GIS) technology to determine the existing impervious areas within the incorporated area of the City. This information is kept up-to-date through building permits, which require the impervious area be included on permit applications. Occasionally, the stormwater department has to make a site visit to measure impervious area at a given location.

Large-scale projects are not funded from the revenue generated from the service charge; instead, the local Flood Control District handles and pays for these projects, although the funds are capitalized with the Stormwater Utility budget. Small-scale projects are paid from the revenue generated from the service fee.

The revenue generated from the fees is considered adequate for operational expenses that include equipment maintenance, Phase 2 requirements, public education, and water quality sampling.

Oro Valley has the authority to assess late fees and penalties, and if not paid to summon citizens to court. In some cases, city attorneys wrote letters and issued some complaints; however, there were no instances when matters went to court.

For more information about the Oro Valley Stormwater Utility, please see the following web site:

http://www.ovalleyaz.gov/Town_Government/Public_Works/Stormwater_UTILITY/Stormwater_UTILITY_Fee.htm

Phoenix, Arizona

Phoenix, Arizona has a population of over 1,500,000. Phoenix does not have a stormwater utility, but collects operating and capital expenses via an excise tax, also called an environmental tax. The tax is authorized through City Code. Phoenix is the only city researched as part of this TM that utilizes a tax rather than a fee for its stormwater program.

The Phoenix stormwater area is approximately 550 square miles with 330,000 residential accounts billed monthly. The residential accounts are billed on the water bill based on meter size, with the tax labeled as an "environmental fee." There are three staff members that handle stormwater maintenance issues.

The City estimates annual revenue generated from the Drainage Utility fees to be \$1.5 million, which is not adequate to cover operating and CIP costs estimated at \$200 million. The City believes that it has the lowest fee nationwide which ranges from is \$0.20 per meter up to \$1.00 per meter for the largest meter. CIPs are supported by GO bonds. Local paving and drainage projects are covered by general funds for \$60 million over a 5-year period; this amount of money is usually spent within the first year period and generally is insufficient. The stormwater department includes and pays for outfall inspections, illicit detections, enforcement, some plan reviews, and public outreach for approximately \$20,000 annually.

EPA audited Phoenix in January 2009 and suggested they use their enforcement actions to generate revenue, which is not the method the City likes to use. The City prefers citizens come into compliance.

Rates have not been increased on a regular basis in Phoenix. The stormwater department, which recently transitioned from the Streets Department to the Water Department, requested an increase to \$1.55 per month for residential users, up from \$0.20 per month. An election recently passed, so it may be possible that new Council members will be willing to make a rate increase, although many government candidates promise no tax increases during campaign.

For more information about the Phoenix stormwater ordinance, please see the following web site <http://www.phoenix.gov/STREETS/ordinan.html>.

Salt Lake City, Utah

Salt Lake City, Utah has a population of nearly 190,000. A Stormwater Utility for the city was created in 1990, following a careful planning and community involvement process that is described further below. The Salt Lake City Stormwater Utility serves an area of approximately 185 square miles and nearly 180,000 customers with approximately 47,600 connections. Customers are billed a "Stormwater Service Fee" monthly with their utility bill. There are 64 staff members within the City's Stormwater Utility.

Salt Lake City's rate structure is based on equivalent residential unit (ERU). Over the last ten years, the rate was \$3 per month per ERU, and is now being raised to \$4 per month per ERU. The ordinance defines ERU for the following categories:

- Single-family or duplex parcels less than 0.25 acre
- Single-family or duplex parcels greater than 0.25 acre
- All triplex and four-plex residential parcels
- Undeveloped parcels
- Other parcels
- Credit for on-parcel mitigation
- Low-income abatement
- Non-service abatement

A credit system is available for commercial users only for on-site mitigation that restricts flow or improves water quality. The utility can send a "shut off" notice to stop supplying drinking water to citizens as a penalty for nonpayment of the stormwater service fee or any portion of the utility bill not paid.

About \$4 million per year is generated from the fee of \$3 per month per ERU. Annual expenses are closer to \$5M. This revenue covers O&M costs and some CIP installations. Nearly \$13 million was spent over two construction seasons for storm drain projects. Prior to this, the utility saved up its CIP allocations. Salt Lake City has a new project upcoming estimated at \$8 million, and in addition to revenue generated from fees, \$3 million were issued in bonds for this project.

Staff at the utility consists of about 64 with 50 in engineering (surveyors, inspectors, and design support), 3 to 4 engineers in design and design technicians, and 8 to 10 on O&M crews not under the Maintenance Division for drainage. There is also a staff person who visits businesses to promote water quality and to verify that construction BMPs are compliant and working.

Creation of the Utility

Salt Lake City's first step in establishing its stormwater program was to develop a Master Plan of the drainage area within the city. The Master Plan provided a list of \$70-million of necessary capital improvement projects, including solutions to anticipated local drainage problems that could be expected to be encountered. Salt Lake City continues to use this project list as guidance for selection and implementation of its CIP. The Master Plan provided the base knowledge and understanding of the current status of the stormwater infrastructure, needs, and estimated associated costs. Using this information, staff was able to engage with members of local government and the public to establish the stormwater utility.

The stormwater utility was created through a careful planning process that involved formation of a 20-member Citizens' Advisory Committee (CAC). This committee included multiple levels of government, key stakeholders in the community, and professionals from related fields. The CAC studied the matter and made recommendations to the Public Utilities Advisory Committee, who in turn made recommendations to the Mayor and City Council who passed the ordinance developed by the CAC.

CAC members were provided issue papers prior to all meetings so that they were informed on the matter of stormwater management, water quality, and Salt Lake City's MS4 permit. Utility staff and a consultant organized and managed the meetings, including preparing agendas, and completing summary meeting notes. The CAC met every two weeks in very structured meetings with respect to issues outlined for the CAC's consideration.

At the same time the CAC was meeting, GIS mapping was authorized and used to determine the size of each parcel and the amount of impervious coverage on each parcel. This information was used to support the development of service fees that would sustain the utility's expenses. The process to create the utility was completed in six months.

Salt Lake City and County

The County also has flood control responsibility. The County charges a tax to residents living inside the city boundaries and within the county boundaries. Since these funds are comingled, Salt Lake City has monitored the use of these funds over time to ensure the value of the taxes paid to the County are coming back to benefit city residents. Salt Lake City's funding mechanism for its stormwater utility has been so successful that the County is looking to establish Special Services Districts to generate its own funds to support County stormwater utility functions in addition to the tax assessed.

For more information about the Salt Lake City Stormwater Utility please see the following web sites: http://www.slcgov.com/Utilities/ud_storm_water_home.htm and <http://www.ci.slc.ut.us/utilities/watersheds.htm>.

Seattle, Washington

The City of Seattle, Washington has a population of almost 600,000. In 1987, the City created a Stormwater Utility Division. The Seattle Stormwater Utility serves an area of approximately 60 square miles with approximately 134,000 residential and 76,000 non-residential accounts. The accounts are billed an environmental fee annually with the property tax assessment that is identified as a "fee."

The City generates over \$54 million annually from assessment of the stormwater fee. Seattle Public Utilities finances and accounts for the acquisition, operation, and maintenance of Seattle's drainage and wastewater system through the Drainage and Wastewater Fund. As an enterprise fund, it functions like a self-supporting business that must generate operating revenues, predominantly through user charges (i.e., rates), that are sufficient to cover all operating costs. The Drainage and Wastewater Fund combines the revenue and cost streams of the drainage line of business as well as the wastewater line of business, which are funded through separate rates collected from different ratepayer bases.

The rates for the Stormwater Utility fee are based on imperviousness of the subject property. There is a flat rate for residences; non-residential customers are billed based on degree of imperviousness and extent of impervious surface area. The City does offer a credit for actions that reduce the amount of impervious area and reduce runoff. There is a Residential Rainwise program for residential customers and a separate Rate Credit Program for non-residential customers. The credit was an important feature of the City's fee structure, as it is less challengeable in court to claims that this fee is a "tax." This credit program offers some fee relief for citizens, providing them a means to reduce their fee, which otherwise could not be done with a strict tax. Most importantly, however, the credit encourages activities that help the utility meet its overall water quality and stormwater quantity management goals, thereby reducing overall O&M and capital costs. Consequently, the savings are returned to citizens that help the utility in its mission.

Impervious areas and degree of imperviousness data, used as the basis for the environmental fee, were collected for Seattle in two separate events. First, a quick "windshield" survey generated data. Recently, the data were improved, using sophisticated information, such as aerial photography and GIS technology and coefficients used in hydrologic modeling for stormwater runoff based on soil and land use types. Table 2 provides a listing of the rates for 2009 and 2010 obtained from the City's web page at

TABLE 2
Annual Environmental Fee for Stormwater Utility in Seattle, Washington

	2009	2010
Small Residential Annual rate per parcel (1)		
Under 3000 sq. ft.	\$102.90	\$104.90
3000-4999 sq. ft.	\$149.56	\$152.46
5000-6999 sq. ft.	\$202.17	\$206.09
7000-9999 sq. ft.	\$256.38	\$261.35
All Other Properties Annual rate per 1,000 square feet		
Undeveloped (0-15% Impervious)		
Regular	\$16.85	\$17.18
Low Impact (2)	\$10.19	\$10.39
Light (16-35% Impervious)		
Regular	\$25.20	\$25.69
Low Impact (2)	\$18.98	\$19.35
Medium (36-65% Impervious)		
Regular	\$36.61	\$37.32
Low Impact (2)	\$29.70	\$30.28
Heavy (66-85% Impervious)		
Regular	\$47.34	\$48.26
Very Heavy (86-100% Impervious) (3)		
Regular	\$56.23	\$57.32

Drainage fees do not appear on your utility bill but are collected with your King County property taxes. The fee is shown on your tax bill as SWM (Surface Water Management) or Drainage. After February 15, you can view your 2010 drainage fee by entering your property tax ID in the King County Property Tax Information System.

(1) Single Family Residential & Duplex parcels less than 10,000 square feet which are charged a flat rate per parcel rather than a fee based on the percent impervious. Rates for other properties are per 1,000 square feet based on the percent of impervious surface.

(2) A customer in the Undeveloped, Light or Medium rate category with a significant amount of highly pervious (absorbent) surface may qualify for the Low Impact rate.

(3) "Very heavy" does not necessarily mean heavily developed. A parking lot would be classified as "very heavy" since it is 100% impervious.

www.seattle.gov/util/Services/Drainage_&_Sewer/Rates/DrainageRates/RateSchedule/index.htm

King County also has a stormwater utility, and the county also charges a fee through the county assessor's annual property taxes. The County fee is charged to county residents only, however. The City fee is charged to city residents only. The two funding sources are not mixed and therefore do not need to be tracked separately, as with the example from Salt Lake City.

Seattle collaborates with universities for studies, especially for BMPs within rights-of-way. Seattle also evaluates innovated drainage infrastructure features, such as natural infiltration and treatment, and is considering implementing a street sweeping program for water

quality purposes to reduce hydrocarbon and ethylene glycol loads, as well as nutrient loads from fertilizers and general urban activities.

For more information about the Seattle Stormwater Utility please see the following web sites [http://www.seattle.gov/util/Services/Drainage & Sewer/Rates/DrainageRates/index.htm](http://www.seattle.gov/util/Services/Drainage%20&%20Sewer/Rates/DrainageRates/index.htm) and [http://www.seattle.gov/util/Services/Drainage & Sewer/Rates/DrainageRates/StormwaterFacilityCredit/index.htm](http://www.seattle.gov/util/Services/Drainage%20&%20Sewer/Rates/DrainageRates/StormwaterFacilityCredit/index.htm).

Mid-Atlantic Cities and Counties

Cities and counties in the mid-Atlantic states of Maryland and Virginia have been proactive in establishing stormwater utility fee structures to support municipal stormwater needs. Figure 1 shows the current charge for a typical single family residential unit for 13 mid-Atlantic utilities currently in operation.

The need to ramp up stormwater activities in order to comply with NPDES stormwater permit requirements has often been a key trigger in establishing the utilities and fee structures for these communities. Some of these utilities (Portsmouth, Norfolk, Virginia Beach, and Prince William County) have been in existence since the mid 1990s, while some are relatively new. The Richmond, Virginia utility is sending out its first bills in 2009, and the City of Alexandria, Virginia is working toward implementation of a utility system.

Some of the key characteristics of these mid-Atlantic utilities include the following:

- In most cases, the fee structure is based on an ERU basis, in which the impervious area of a typical single family detached property defines the base unit, and commercial/industrial properties are charged based on the number of ERUs are reflected in their impervious areas. Using impervious area as a surrogate for the contribution of various properties to stormwater runoff and the need for related programs has been a key to securing support for many of these fee programs.
- Several of these jurisdictions differentiate the fees for attached and detached single family residential properties, based on the differences in impervious area between these property categories. For example, in Prince William County, Virginia, townhouses and condominiums pay a fee that is 0.6 ERU, because the impervious area of these properties was found to be 0.6 times the impervious area for detached single family units.
- In many cases, stakeholder education and engagement has been a key element in resolving policy issues (e.g., the level of service to provide, what sorts of credit programs should be included) and in gaining stakeholder and political support for the fee programs.
- The range of services funded through the utility fee varies. In some cases, the utility fee primarily funds maintenance of stormwater facilities; in other cases, the fees are also used to fund some capital projects and programmatic activities, such as public outreach and education.

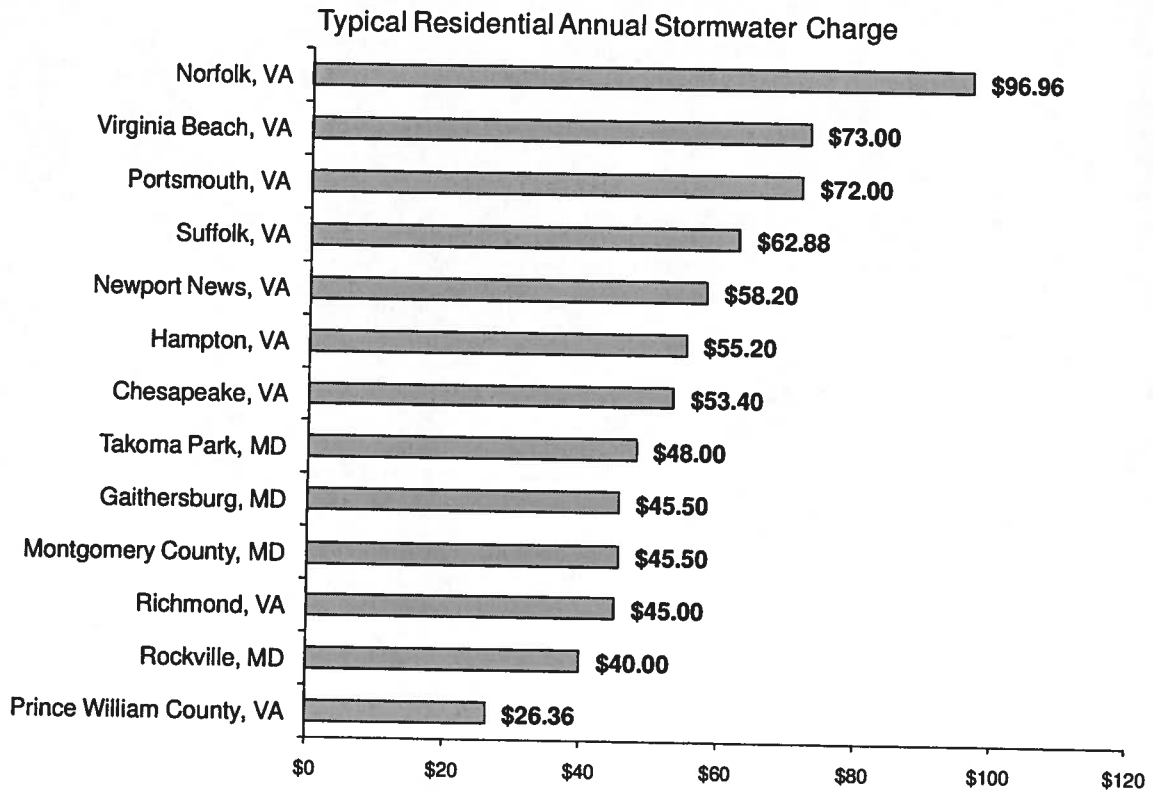


FIGURE 1
Typical Residential Annual Stormwater Charge

- As allowed by state enabling legislation for the stormwater fees, several of the utilities provide credits that allow property owners to receive credits on their bills if they satisfy certain criteria, such as providing on-site stormwater reduction facilities. Some programs allow certain institutional property categories, such as churches, to qualify for credits that reduce their bills if they participate in qualified programs (public education programs, adopt-a-stream or other clean-up programs, etc.).

Comparative Matrix

A summary of the cities researched for this TM is presented in Table 3 for a comparison between communities.

TABLE 3
Comparative Matrix

City	Population	No. of Accounts	Sq. Mi.	Personnel	Type	Residential Rate ¹	Basis of Fee	Non-Residential Rate ¹	Basis of Fee	Billing Frequency	Revenue by Fee	Revenue by Fines
Albuquerque	521,999	>65,500	181.3	19 (16 field, 3 office)	None	N/A	N/A	N/A	N/A	None	N/A	N/A
Arlene, Texas	115,930	N/A	N/A	N/A	Fee	\$2.95/month/>2,880 Sq. Ft.	per square foot	\$25/month/>50,000 Sq. Ft.	per square foot	Monthly with water bill	N/A	N/A
Austin, Texas	465,622	600,000	272	300	Fee	\$3.67/month	Flat Rate	\$39.59/month/developed acre	per developed acre	Monthly with water bill	N/A	Few to none.
Oklahoma City, Oklahoma	551,789		610	29 CSO&WW	Fee	\$4/mo/residence	Flat Rate	\$460/mo/meter size	Water Meter Size	Monthly with water bill	\$13M	Few to none.
Oro Valley, Arizona	43,233	18,000	35	3	Fee	\$2.90/month/residence	Flat Rate	\$2.90/month/5,000 Sq. Ft.	Sq. Ft. Impervious area	Monthly with water bill	N/A	Few to none.
Phoenix, Arizona	1,567,924	330,000 Residential	550	6	Excise Tax	\$0.20/month/residence	Flat Rate	\$10/month/6" meter or larger	Water Meter Size	Monthly with water bill	Est. \$1.5M	Few to none.
Salt Lake City, Utah	190,000	47,600	185	64	Fee	\$4/month/ERU	per ERU	\$4/month/ERU	per ERU	Monthly with water bill	\$4M to \$5M	Few to none.
Seattle, Washington	563,274	76,000	60	250 CSO&WW	Fee	\$261.35/year/>7,000 to 9,999 Sq. Ft.	Flat Rate & Sq. ft. Imperviousness	\$57.32/year/1,000 Sq. Ft.	Sq. Ft. impervious area & Degree of Imperviousness	Annually with Property Tax	Est. \$20 to \$30M	Few to none.

Notes:

1. Most expensive rates shown.

2. Number of accounts, revenue generated are estimations provided by these utilities.

N/A = Not Available

Summary

Several common themes emerge from the stormwater programs researched. First, all cities contacted placed heavy emphasis on generating support from members of local government at all levels, community members, professionals in related fields and citizens groups. A careful plan was used by many of these cities to educate members of government, citizens, and local groups of the issues related to stormwater management, the problems associated with impaired water quality impacted by everyday activities of citizens, and the consequence of non-compliance with the cities' MS4 permits. Many cities focused on the common community benefits realized by all from the implementation of stormwater utility, such as reduced incidence of flooding in local neighborhoods, increased opportunities for aquifer recharge and groundwater protection, improved river water quality for aquatic life, and recreational opportunities at local rivers and streams.

Many of the cities contacted had a similar process used to establish the stormwater utility as follows:

1. Form a Citizens Advisory Council with staff, managers, members of local government, stakeholders from the community, professionals from related fields, and members from the public at large to help draft the ordinance; provide the committee members with issue papers to educate them on the issues related to stormwater, the benefits to citizens from the formation of a stormwater utility, how the public can help, and the consequences for non-compliance with the city's MS4 permit and the problems from impaired water quality in drainages, tributaries and receiving bodies of water.
2. Complete a master plan that provides an assessment of the current condition of the stormwater utility infrastructure, the current level of impact on drainage from imperviousness, a list of projects needed based on current and projected stormwater impacts given community build-out plans, and the annual maintenance associated with the upkeep of these facilities.
3. Estimate costs related to the operation of the utility including staff and administration of the program, maintenance of the facilities, and the capital improvement costs for projects identified in the master plan.
4. Determine the number of accounts served by the stormwater utility and the types of categories to be considered, often simply divided into residential and non-residential customers.
5. Develop a rate structure informed and based upon the information gathered in the previous steps. Typically, the amount of impervious area is a basis for the stormwater fee (sometimes residential accounts are charged a flat rate). Consider creation of a credit system to encourage citizen involvement to assist the city achieve its stormwater quantity and quality goals. Require that all new building permits submit the amount of impervious area so that new accounts can be billed appropriately.
6. With help of the CAC, educate the city council, mayor, and public at large about the need for a stormwater utility, the benefit to the community, the plans for the formation of the utility, and the utility's goals.

7. Plan to make use of collaborative efforts with neighboring stormwater programs to continuously grow and improve upon the program, including offering educational workshops, possibly in a manner similar to that used by Oklahoma City.

The stormwater programs of the researched cities have changed over time and the programs are constantly developing and evolving. Partnership with the community yields positive results, as exemplified in Oklahoma City and Austin. All program managers discussed the importance of communicating the benefits to the community and citizens individually, including costs avoided from flood damage and fines for non-compliance.

Citizens rarely complained about the addition of a few dollars to their monthly bill, especially when a strong public education component accompanied creation of the stormwater utility. Complaints were received when the stormwater fee was assessed individually, not attached to another utility bill. By collecting fees from the entire customer base, most stormwater utilities were self-sufficient, needing to rely on general obligation bonds or general funds only in some cases to support large capital improvement projects. Non-residential customers typically are charged more than residential customers. For non-residential customers, more support was offered by the stormwater utility both in the form of offering a credit for reduced stormwater quantity and quality impact and educational materials to help those customers comply with the city stormwater ordinance.

Most communities assess a fee, rather than a tax, and the fee is billed monthly with the water or other utility bill. Phoenix is the only community contacted that assesses a tax, but refers to it as a fee. Seattle is the only community contacted that assesses its fee annually with property tax assessment. The importance of assessing a fee instead of a tax was emphasized by many stormwater program managers. The managers provided two reasons for the preference of a fee: 1) the potential for legal challenges is different for a tax than a fee, and 2) using a fee enables the utility to establish a credit system to reward efforts on the part of citizens to reduce the quantity of stormwater and improve stormwater quality.

Most communities have increased their rates (fees) over time; however, most were not regular. In some instances, as with Austin, a rate increase over a five-year period was approved by their city council. If rates can increase to adjust with the changes in cost of living or other indices, and be decoupled from the political process, this approach will allow rates to keep pace with other changes in the economic environment. The ability for the utility to be financially self-sustaining was an important goal of most cities researched.