Chapter 13
Infrastructure Element

Infrastructure Element

Overview 1300

The Infrastructure Element provides policies and actions on the District's water, sanitary sewer, stormwater, solid waste management, energy, and telecommunication systems. Investments in these systems are essential to our city's future, both to meet the demands of existing users and to accommodate future change and development. 1300.1

Like many older historic cities, the District suffers from aging infrastructure. Some portions of the water and sewer systems were built more than a century ago. The central challenge faced by the District is not one of capacity but one of meeting maintenance and replacement needs. In fact, the number of households in the city today is not substantially different than it was in 1950, though there are 230,000 fewer residents. Consequently, infrastructure is generally in place to support additional development, with some exceptions at specific locations where development did not previously exist. The conveyance systems and facilities, however, are suffering from structural deterioration and are in need of significant rehabilitation, modernization, and expansion as aging components approach the end of their useful lives. 1300.2

The planning, management, and oversight of the District's utilities is shared by several agencies, including the District of Columbia Water and Sewer Authority (WASA), the US Army Corps of Engineers, PEPCO, Washington Gas, and the District's Department of Public Works. In addition, the General Services Administration (GSA) contracts with Washington Gas and PEPCO to supply federal agencies with electricity and natural gas. This Element incorporates planning and policy guidance from the short-term and long-term plans of these service providers. 1300.3

The critical infrastructure issues facing the District of Columbia are addressed in this Element. These issues include:

- Improving water quality and public health by addressing the city's combined sewer and wastewater system
- Modernizing the aging water distribution system
- Ensuring the District has a world class telecommunications system with access for residents and businesses across the city. 1300.4

The overarching goal for infrastructure is:

Provide high-quality, efficiently managed and maintained, and properly funded infrastructure to serve existing development, as well as future change and growth.

Infrastructure Goal 1301

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Provide high-quality, efficiently managed and maintained, and properly funded infrastructure to serve existing development, as well as future change and growth. 1301.1

Policies and Actions

IN-1 Drinking Water 1302

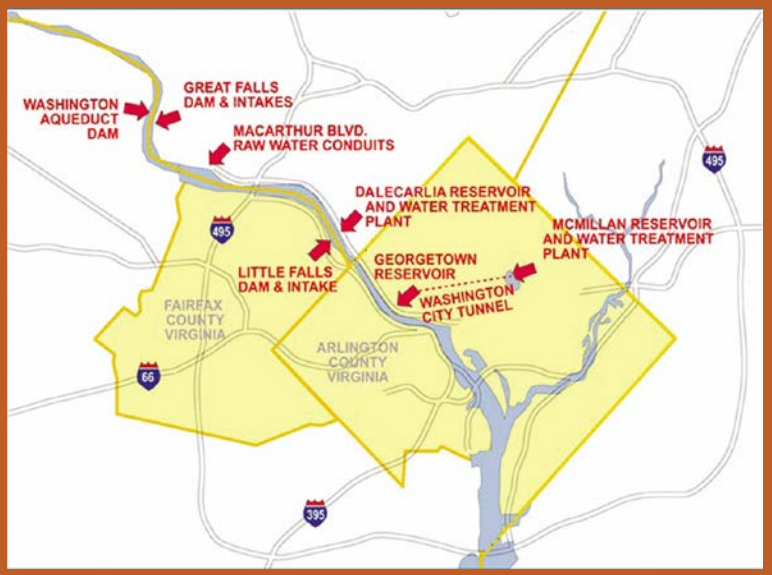
The water system serving the District of Columbia consists of two primary components: the water supply and treatment system, and the water distribution system. 1302.1

Water Supply and Treatment

The supply and treatment system includes raw water sources, pipelines carrying this water to treatment plants, and the water treatment plants themselves. The Washington Aqueduct Division of the US Army Corps of Engineers (USACE) operates and maintains these facilities and supplies treated water to several distributors. These distributors (which include WASA) deliver water to over one million users in the District and Northern Virginia. 1302.2

Figure 13.1:

Washington Aqueduct System 1302.5



Source: U.S. Army Corps of Engineers

The Washington Aqueduct was commissioned by Congress and built by the USACE in the 1850s to provide the nation's capital with a plentiful water source. It has been in continuous operation ever since. 1302.3

The Aqueduct System is composed of the Great Falls and Little Falls intakes on the Potomac River, the Dalecarlia and McMillan Reservoirs, the Georgetown Conduit and Reservoir, the Washington City Tunnel, and the East Shaft Pump Station. Figure 13.1 shows the Washington Aqueduct System. 1302.4

Water from the Aqueduct is currently allocated based on a Low Flow Allocation Agreement (LFAA) that was signed by the United States, Maryland, Virginia, the District

of Columbia, the Washington Suburban Sanitary Commission, and the Fairfax County Water Authority in 1978. The Agreement recognized the need to maintain a minimum flow in the Potomac River in order to sustain aquatic resources. It established a set of stages for river flow that would prompt action by the signatories to monitor and eventually restrict water withdrawal. It also established a formula for allocating Potomac River water during times of shortage. To date, the LFAA's low-flow stages have never been triggered. 1302.6

In 1982, the major water utilities and the Interstate Commission on the Potomac River Basin (ICPRB) signed the Water Supply Coordination Agreement (WSCA). It required the major water suppliers to coordinate their operations during drought emergencies. The Agreement also required that a 20-year study of supply and demand be prepared and updated every five years. It also included cost-sharing agreements for new facilities and subsequently included the Jennings Randolph and Little Seneca Reservoirs that serve as back-up water supply during droughts. 1302.7

The ICPRB Year 2005 assessment concluded that even under a high regional growth scenario, the water supply system developed 25 years ago is adequate to meet 2025 demand under a repeat of the worst meteorological and stream flow conditions in the historical record. The Assessment found that the system would also be able to meet estimated future water supply demand in 2045 given a repeat of the same drought conditions. 1302.8

The historic maximum production from the Washington Aqueduct was 284 million gallons per day (mgd), which occurred in 1974. Since 1974, water demand has decreased due to declining population and water conservation measures. Water demand is now relatively stable. In 2005, the average daily production from the Washington Aqueduct Division was approximately 185 mgd with a maximum day use of approximately 245 mgd. 1302.9

The Corps of Engineers treats water from the Aqueduct at the Dalecarlia and McMillan water treatment plants (WTPs). Both of these plants were designed for much larger populations and higher water use projections than have been realized. As a result, their treatment capacity exceeds present-day demands and peak requirements of the customers. The Dalecarlia facility has a design capacity of 164 million gallons per day (mgd) and maximum capacity of 264 mgd. The McMillan facility has a design capacity of 120 mgd and a maximum capacity of 180 mgd. WASA's projected average water demand based on population in 2020 is 156.5 mgd. Both Dalecarlia and McMillan serve the needs of the District (Dalecarlia also serves Arlington and Falls Church), so projected demand is well within the respective design capacities. 1302.10

Projections for future water demand for the regional WASA Service Area are shown in Table 13.1. These projections are maintained by WASA and assume levels of growth consistent with this Comprehensive Plan and the plans of adjacent cities and counties in the service area. 1302.11

The historic maximum production from the Washington Aqueduct was 284 million gallons per day (mgd), which occurred in 1974. Since 1974, water demand has decreased due to declining population and water conservation measures. Water demand is now relatively stable.

A positive trend is the water conservation of recent years. The ICPRB 2005 study noted that single-family household water use rates declined approximately 18 percent between 1990 and 2000 in the Washington area. The study also noted that supplier programs encouraging conservation were an important factor behind this trend.

Table 13.1:

Current and Projected Water Demands (mgd), WASA Service Area* 1302.12

Year 2000			Year 2020			Increase from 2000 to 2020		
Annual Average Day	Maximum Day	Peak Hour	Annual Average Day	Maximum Day	Peak Hour	Annual Average Day	Maximum Day	Peak Hour
136.8	189.6	345.7	156.5	217.8	396.3	19.7	28.2	50.6

Source: DC Water and Sewer Authority, 2005

** The WASA planning period is 2000-2020 rather than the Comp Plan period of 2005-2025. WASA projections are currently being updated.*

Water Storage, Distribution, and Pumping

Water storage and pumping responsibilities are shared by WASA and the Washington Aqueduct. WASA operates four treated water pumping stations (Anacostia, Bryant Street, Fort Reno, and 16th and Alaska), and eight reservoirs and elevated tanks. The Washington Aqueduct operates the Dalecarlia Pump Station and three reservoirs: Foxhall, Van Ness, and Fort Reno. 1302.13

The DC Water and Sewer Authority is the primary agency responsible for the District's treated water distribution system. This system consists of pipelines and hydrants that deliver water to customers and meet other municipal needs such as fire fighting. The system is divided into seven water distribution zones (also known as service areas) based on differences in ground elevation. These areas are shown on Figure 13.2. 1302.14

The distribution system includes almost 1,300 miles of pipes ranging in size from four to 78 inches in diameter. It also includes over 36,000 valves and approximately 9,000 hydrants. More than 50 percent of the water mains in the system are over 100 years old. These older cast iron water mains are vulnerable to breaks and also are subject to a problem called tuberculation, in which small mounds of corroded materials accumulate in the pipes. WASA continually assesses the reliability and integrity of the water and sewer system pipes. To the extent that maintenance, corrosion, and break reports reveal problems, specific upgrades are factored into the Capital Improvement Program 1302.15

IN-1.1 Ensuring an Adequate Future Water Supply 1303

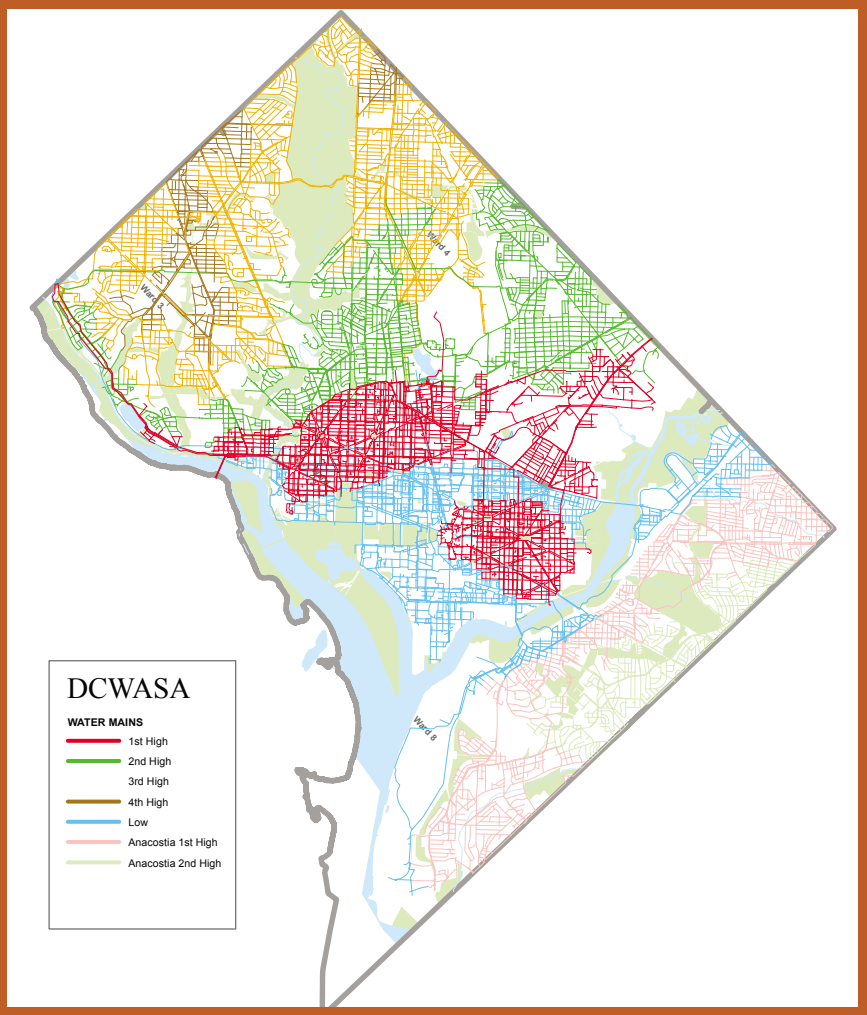
As noted above, the Interstate Commission on the Potomac River has concluded that water flow in the River and impoundments at upstream reservoirs will to be more than adequate to meet water needs through at least 2045. Due to conservation efforts and other measures, 20 year forecasts

are lower today than they were in 1990, 1995, or 2000. 1303.1

Despite the projections, there are always uncertainties associated with the future. For example, climate change may have an impact on resources that would change the study results, especially given the sensitivity of Potomac reservoirs to changes in historical streamflow. One positive trend is the water conservation efforts of recent years. The ICPRB 2005 study noted that single-family household water use rates declined approximately 18 percent between 1990 and 2000 in the Washington area. The study also noted that supplier programs encouraging conservation were an important factor behind this trend. 1303.2

Figure 13.2:

WASA Water Service Distribution Zones 1302.16



Source: DC Water and Sewer Authority, 2005

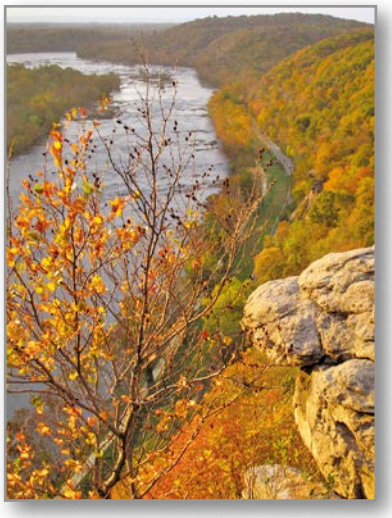
The following policy states the District's commitment to plan for the long-term adequacy of water supply. It is supplemented by policies in the Environmental Protection Element on water conservation. 1303.3

Policy IN-1.1.1: Adequate Water Supply

Ensure a safe, adequate water supply to serve current and future District of Columbia needs by working with other regional jurisdictions, the Army Corps of Engineers and WASA. 1303.4

IN-1.2 Modernizing Water Infrastructure 1304

In conjunction with WASA, the District must consider the impacts of new development and ensure that water infrastructure will be able to meet future demand. Planned improvements to the water system involve normal maintenance to replace aging water distribution mains and small diameter pipes, and upgrades to keep pace with population growth and new development. This may also include the addition of new water storage facilities, increasing the capacity of certain water mains, and upgrading pump stations. 1304.1



The Interstate Commission on the Potomac River has concluded that water flow in the River and impoundments at upstream reservoirs will to be more than adequate to meet water needs through at least 2045.

WASA's Capital Improvement Program has identified the need for several new storage facilities to support growth projections. These facilities will provide additional water pressure to certain areas of the District as well as emergency backup service. Two million gallons of elevated storage is needed in the southern half of the Anacostia First High service area. WASA has worked with the District and reached an agreement to site this water storage tank on the East Campus of St. Elizabeths Hospital. Currently, necessary approvals and permits are being pursued, including historic preservation approvals that will ensure no historic structures on the campus are negatively impacted. Another two million gallon elevated storage tank will be needed in the fourth high service area in the Upper Northwest. The Washington Aqueduct CIP also calls for storage improvements at the Georgetown Reservoir and for additional dewatering facilities at the Dalecarlia water treatment/reservoir site. 1304.2

Policy IN-1.2.1: Modernizing and Rehabilitating Water Infrastructure

Work proactively with WASA to repair and replace aging infrastructure, and to upgrade the water distribution system to meet current and future demand. The District will support water system improvement programs that rehabilitate or replace undersized, defective, or deteriorating mains. The District will also support concurrent programs that ensure that lines are flushed in order to eliminate the potential for stagnant water to accumulate at the ends of water mains. ANCs and community organizations should be consulted in the siting of any new facilities to ensure that the potential for adverse impacts are appropriately addressed. 1304.3

Policy IN-1.2.2: Ensuring Adequate Water Pressure

Work proactively with WASA to provide land for new storage tanks and other necessary operations so that adequate water supply and pressure can be provided to all areas of the District. The siting and design of water storage tanks and similar facilities should be consistent with the policies of the Urban Design and Environmental Protection Elements, and should minimize visual impacts and "skylining" effects on ridges or hills. 1304.4

Action IN-1.2.A: Water System Maps

Support WASA efforts to update water system maps to accurately show pipelines, valves, and hydrants, as well as the age, material, size, and lining of pipelines. 1304.5

Action IN-1.2.B: Small Diameter Water Main Rehabilitation Program

Continue the implementation of the Small Diameter Water Main Rehabilitation Program as identified in the WASA CIP. Work includes rehabilitating small diameter (12-inch diameter and smaller) water mains to improve water pressure, system reliability, and flows in the system, as well as to maintain water quality. 1304.6

Action IN-1.2.C: Water Treatment Plant (WTP) Improvements

Implement the planned improvements for the McMillan and Dalecarlia WTPs as identified in the Washington Aqueduct CIP. Planned improvements at McMillan include elevator and crane replacements and building renovations. Planned improvements at Dalecarlia include building, roadway and security improvements and clearwell cleaning and disinfection. 1304.7

Please consult the Environmental Protection Element for policies on drinking water quality and water conservation.

Like many older American cities, a significant portion of the District of Columbia is served by a combined sewer system. Such systems, which use the same pipes to convey stormwater and wastewater, were common in the 19th Century and are considered a relic of the past due to their damaging environmental effects.

IN-2 Wastewater and Stormwater Systems 1305

This section of the Element addresses wastewater and stormwater needs as well as WASA's efforts to improve its system to meet current and future needs. Although wastewater and stormwater disposal needs are very different, they are addressed together in this section because of the physical links that currently exist between the two systems. 1305.1

Like many older American cities, a significant portion of the District of Columbia is served by a combined sewer system. Such systems, which use the same pipes to convey stormwater and wastewater, were common in the 19th Century and are considered a relic of the past due to their damaging environmental effects. In wet weather, or about once every 10 days on average, the capacity of the District's conveyance system is exceeded. Excess raw sewage and rain water flows into the District's waterways via more than 60 permitted outfalls along rivers and streams. This discharge is called Combined Sewer Overflow (CSO). Plans to reduce CSO while meeting the city's future drainage and wastewater needs are discussed below. 1305.2

IN-2.1 Wastewater System 1306

The District of Columbia Water and Sewer Authority is responsible for wastewater collection and transmission in the District, including operation and maintenance of the sanitary sewer system. The conveyance infrastructure consists of 1,800 miles of sanitary sewers and combined sanitary and stormwater sewers, 22 flow metering stations, and nine wastewater pumping stations. WASA is also responsible for 125,000 sewer laterals from its mains to the property boundaries of residential, government, and commercial properties. In addition, WASA is responsible for the 50-mile-long Potomac Interceptor System, which provides conveyance of wastewater from areas in Virginia and Maryland to the Blue Plains Treatment Plant. 1306.1

The existing sanitary sewer system dates back to 1810, and includes a variety of materials such as brick and concrete, vitrified clay and concrete, reinforced concrete, ductile iron, plastic, steel, brick, cast iron, cast in place concrete, and even fiberglass. Current sewer construction materials typically consist of PVC, ductile iron, and concrete. Force mains are generally constructed of iron, steel, or concrete. 1306.2

WASA operates the Blue Plains Advanced Wastewater Treatment Plant, located on the Potomac River in Far Southwest. The Plant provides wastewater treatment services to over two million customers, including residents of the District of Columbia and over 1.6 million residents in portions of Montgomery and Prince George's Counties in Maryland and Fairfax and Loudoun Counties in Virginia. Treatment includes liquid process facilities for both sanitary sewer and peak storm flows, along with solids processing facilities. 1306.3

Blue Plains is rated for an average flow of 370 million gallons per day (MGD). It is required by its National Pollutant Discharge Elimination System (NPDES) permit to completely treat a peak flow rate of 740 MGD for up to four hours, and provide continuous treatment flows of up to 511 MGD thereafter. Additionally, up to 336 MGD storm water flow must receive partial treatment, resulting in a total plant capacity of 1,076 MGD. 1306.4

The 10-year WASA Capital Improvement Program (CIP) budget (FY 2004—2013) totals $2.1 billion and is funded by user fees and outside sources such as the USEPA and WASA's regional partners in Maryland and Virginia. Their CIP identifies a range of sewer replacement projects and system upgrades. WASA's CIP program also includes several steps to mitigate odors at the Blue Plains Water Treatment Facility. The $257 million Egg-Shaped, Anaerobic Digestion Facilities will replace the existing digesters, resulting in a less odorous, more consistent end product. The $79.4 million Dewatering Facilities Plan is designed to minimize odors that occur from biosolids being stored for extended periods. The $19.8 million Gravity Thickening Facility Upgrade includes funds for the addition of chemicals to the influent flow for odor control. 1306.5

The projected growth in population and jobs in the District of Columbia could add an estimated 20 MGD of total water demand, which would result in a commensurate increase in wastewater of 17 to 20 MGD. Approximately two-thirds of this growth is expected to occur within the combined sewer area. While the wastewater transmission system has adequate capacity for this volume, land use changes will require localized additions and pipeline increases. In the combined sewer area, increases should be factored into the planned upgrades under the Combined Sewer System Long Term Control Plan. 1306.6

Policy IN-2.1.1: Improving Wastewater Collection

Provide for the safe and efficient collection of wastewater generated by the households and businesses of the District. Ensure that new development does not exacerbate wastewater system deficiencies, and instead supports improved system efficiency and reliability. 1306.7

Policy IN-2.1.2: Investing In Our Wastewater Treatment Facilities

Provide sustained capital investment in the District's wastewater treatment system to reduce overflows of untreated sewage and improve the quality of effluent discharged to surface waters. Ensure that the Blue Plains treatment plant is maintained and upgraded as needed to meet capacity needs and to incorporate technological advances in wastewater treatment. 1306.8

Policy IN-2.1.3: Sludge Disposal

Promote the development of cost-effective and environmentally sound techniques to dispose of sewage sludge, including measures to extract energy from sludge where feasible. 1306.9

Action IN-2.1.A: Wastewater Treatment Capital Improvements

Continue to implement wastewater treatment improvements as identified in the WASA CIP. These projects include the replacement of undersized, aging, or deteriorated sewers; the installation of sewers to serve areas of new development or changed development patterns; and pumping station force main replacement and rehabilitation. Capital projects are required to rehabilitate, upgrade or provide new facilities at Blue Plains to ensure that it can reliably meet its NPDES permit requirements and produce a consistent, high- quality dewatered solids product for land application. 1306.10

Action IN-2.1.B: Unauthorized Storm Sewer Connections

Locate and map all stormwater and sanitary sewer lines outside of the combined sanitary and stormwater system area in order to identify sanitary lines that may be illegally discharging into the stormwater system. Take appropriate corrective measures, including penalties and termination of service, to abate such unauthorized connections. 1306.11

IN-2.2 Stormwater Management 1307

The District's storm drainage system consists of approximately 8,200 catch basins, 600 miles of storm sewers, and 15 stormwater pumping stations. WASA also maintains over 400 separate storm sewer discharges into local rivers and creeks. Since the early 1900s, separate stormwater and sanitary sewers have been constructed within the District and no new combined sewers have been built. 1307.1

Planned and programmed stormwater improvements include the replacement of undersized or deteriorated storm sewers with new and larger diameter pipes, and the installation of storm sewers to serve areas of new development or changed development patterns. Rehabilitation and replacement of pumping station force mains also is planned. Regional and inter-governmental cooperation will be needed to maximize the effectiveness of these upgrades (see "Regional Initiatives" text box). 1307.2

See the Environmental Protection Element for policies and actions related to Low Impact Development, green roofs and other ways to reduce stormwater run-off.

Policy IN-2.2.1: Improving Stormwater Management

Ensure that stormwater is efficiently conveyed, backups are minimized or eliminated, and the quality of receiving waters is sustained. Stormwater management should be an interagency process with clear lines of responsibility with regard to oversight, guidelines, and resources. 1307.3

Action IN-2.2.A: Stormwater Capital Improvements

Continue the implementation of stormwater capital improvements as identified in the WASA Capital Improvement program. 1307.4

Action IN-2.2.B: Stormwater Management Responsibilities

Develop an integrated process to manage stormwater that enhances interagency communication and formally assigns responsibility and funding to manage stormwater drainage. This process should include:

- an appropriate funding mechanism to consistently maintain Clean Water standards and reduce surface runoff;
- clear lines of responsibility with regard to which agency provides oversight, guidelines, and resources for the stormwater system and its management;
- consistent and reliable funding sources to maintain Clean Water standards and reduce surface water runoff; and
- assurance that stormwater improvements associated with new development are

Regional Initiatives 1307.6

The District has participated in several Chesapeake Bay Stormwater Initiatives in the past few years. The Chesapeake 2000 Agreement, undertaken in partnership with the EPA, the Chesapeake Bay Commission, and Maryland, DC, and Virginia, resulted in a directive called "Managing Stormwater on State, Federal and District-Owned Lands and Facilities." The directive called for better management of stormwater on public lands and facilities, which comprise more than 13 percent of the Chesapeake Bay watershed. The ultimate goal is to prevent stormwater problems resulting from increased development and to remediate stormwater problems on lands that have already been developed.

The 2001 Anacostia Watershed Restoration Agreement established new comprehensive goals for restoring water quality and living resources in the Anacostia basin. These goals include the creation of additional riparian forest buffers, decreasing impervious surface area through low impact development, and establishing active river advocacy groups in each major Anacostia subwatershed.

coordinated with the WASA Capital Improvement Plan. 1307.5

IN-2.3 Combined Sewer System (CSS) 1308

As noted earlier, a portion of the District's sewer system includes combined wastewater and stormwater pipes. This area encompasses about 12,600 acres—or one-third of the District's land area (see Figure 13.3). A majority of this area was developed before 1900. 1308.1

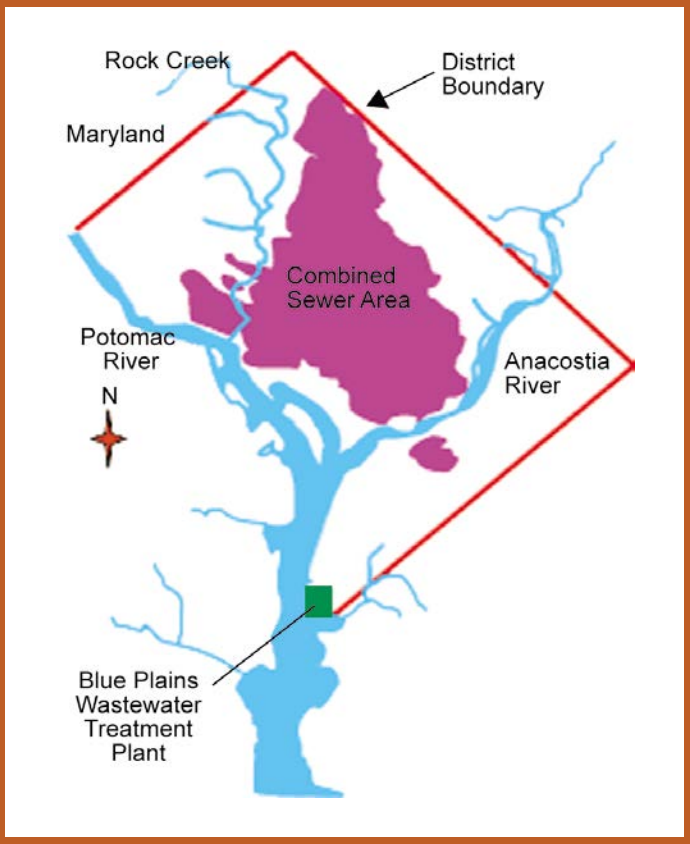
In 2002, WASA developed a Long-Term Control Plan (LTCP) to eliminate Combined Sewer Outfalls and thereby improve water quality (see text box on next page). A key component of the plan is the construction of four large tunnels which will allow runoff to be stored and then transported to the Blue Plains Wastewater Plant for treatment and gradual release. Two of the tunnels will be located near the Anacostia River, one will be near the Potomac River, and one will be near Rock Creek. The LTCP also includes separation of combined sewers in several sections of the District, consolidation and elimination of 13 of the 60 outfalls, and implementation of Low Impact Development (LID) practices at WASA facilities and across the District. The project will take 20 years to complete and has a projected construction cost of over $1.2 billion. 1308.2

When fully implemented, combined sewer overflows will be reduced by a projected 96 percent (98 percent on the Anacostia River), resulting in improved water quality and less debris in local waterways. Overflow events would be reduced to two per year in the Anacostia River, four per year on the Potomac and Rock Creek, and one per year at Piney Branch. 1308.3

The LTCP provides for an effective balancing of cost, benefits and environmental protection that will greatly reduce CSO discharges. However, even with the full implementation of the LTCP, CSO discharges will still occasionally occur. Additional provisions to improve water quality will also be needed. 1308.4

Figure 13.3:

Combined Sewer System Area 1308.5



Source: DC Water and Sewer Authority, 2005

The Long Term Control Plan 1308.9

The Combined Sewer System Long Term Control Plan (CSS LTCP) (July 2002) provides the District's approach to reducing sewer overflows. Upon completion of the CSS LTCP improvements, existing overflows should be reduced by approximately 96 percent. The CSS LTCP that was originally scheduled to be implemented over the next 40 years is now being implemented over 20 years. WASA utilized financial planning models developed by the EPA to assess the long-term impacts of these improvements on customer rates.

Key components of the LTCP include:

- Construction of storage tunnels, allowing storage and gradual release of CSO flows
- Separation of the combined sewers in several sections
- Consolidation and elimination of 13 outfalls
- Pumping station improvements
- Low Impact Development.

The complete LTCP including the detailed list of control program elements can be found at http://www.dcwasa.com/education/css/longtermcontrolplan.cfm

See the Environmental Protection Element for additional information on sewer overflow conditions as well as the need to update the District's water quality standards.

Policy IN-2.3.1: Reducing CSO Outfalls

Reduce the Combined Sewer Overflow (CSO) outfall to the region's rivers by implementing WASA's Long Term Control Plan (LTCP). 1308.6

Action IN-2.3.A: Rehabilitate Pumps

Rehabilitate and maintain pump stations to support the LTCP and off-load stormwater in targeted combined sewer areas. 1308.7

Action IN-2.3.B: Federal Funding

Pursue federal funding to cover an equitable share of the LTCP. Also, pursue funding from Maryland and Virginia and consider a graduated rate structure for DC residents as a water conservation initiative. 1308.8

IN-3 Solid Waste 1309

The District generates roughly 650,000 tons of Municipal Solid Waste (MSW) per year, which is collected and processed by both public and private facilities. Municipal Solid Waste consists of everyday items such as product packaging, food waste, furniture and other household items, clothing, and larger bulk items such as household appliances. The District Department of Public Works (DPW) Solid Waste Management Administration is responsible for waste collection services from all government entities and approximately 110,000 single-family homes and residential buildings with up to three living units. Private haulers handle trash from commercial and multi-family residential establishments, including condominium and apartment buildings with more than three units. Approximately 70 percent of the annual solid waste in the District is from commercial sources and multi-family residences, while 30 percent is generated from other residential uses and the government sector. 1309.1

In addition to waste collection, the DPW collects 5,000 tons of bulk trash and provides recycling service, household hazardous waste collection, leaf and yard waste collection, and dead animal removal. The DPW is also responsible for street and alley cleaning and solid waste education and enforcement.

The DPW Office of Recycling is responsible for education, technical assistance, outreach, and enforcement. District recyclables are sorted at the Eagle Recovery Facility on North Capitol Street for sales and remanufacturing. The text box on the next page describes DC recycling regulations. 1309.2

See the Environmental Protection Element for information and policies on recycling and reducing the solid waste stream.

Many new landfills collect potentially harmful landfill gas emissions and convert the gas into energy. The EPA's Landfill Methane Outreach Program (LMOP) promotes the use of landfill gas as a renewable, green energy source. Landfill gas is primarily carbon dioxide and methane, both by-products of the decomposition of solid waste. While there are currently no landfill gas-to-energy (LFGE) projects or candidate landfills in the District, both Maryland and Virginia encourage and support such projects at landfills within those states. 1309.3

IN-3.1 Solid Waste Transfer Facilities 1310

An efficient solid waste transfer station system is essential for the District. There are currently five solid waste transfer facilities, three of which are privately owned and two of which are District operated. Map 13.1 on the next page shows the location of these stations. Approximately 60 percent of the District's municipal solid waste is processed at the Fort Totten Station, and the remaining 40 percent is processed at the Benning road facility. All municipal solid waste is removed by truck from the area since there are no active incinerators or landfills in the District. Trash is loaded onto long-haul trailers for removal to landfills as far away as North Carolina. 1310.1

The Benning Road facility was recently renovated; the Department of Public Works estimates that it has a functional capacity of 2,000 tons per day. The Fort Totten facility is scheduled to undergo major repairs to improve building safety and operations, including environmental pollution

DC Recycling Regulations 1309.4

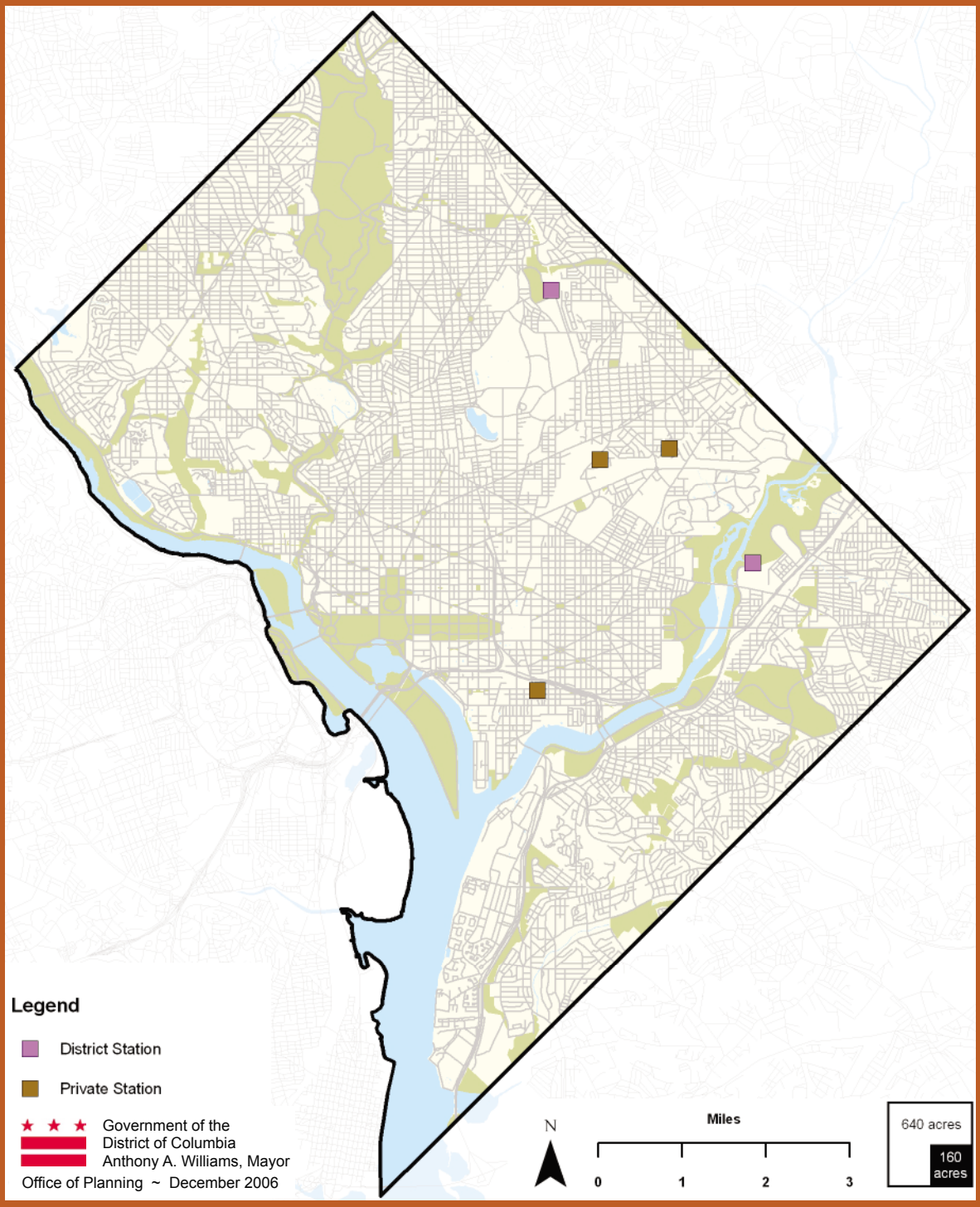
The District's residential and commercial recycling programs are managed by DPW. Residential recycling is voluntary and includes a pickup on the same day as trash pick-up. Commercial recycling is required by law. Any premise not authorized to receive municipal trash and recycling collection services, or containing a unit used for non-residential purposes, is considered a business or commercial establishment.

Under DC law, all businesses located in the District must submit a bi-annual recycling plan to the Department of Public Works Office of Recycling and implement an ongoing recycling program. This program must include:

- Separation of recyclables from other solid waste;
- Adequate number of containers for separated recyclables; and
- Hiring a licensed, registered recycling hauler to regularly pick up recyclables (or, in certain circumstances, establishing a system where an entity may haul away its recyclables on its own).

Map 13.1:

Trash Transfer Stations in the District of Columbia 1310.2



control measures. Major improvements will include brickwork and masonry repair, replacement of foundations and roofs, repair of utility systems, and replacement of machinery. Once these improvements are completed, the District will be able to process more than 4,000 tons daily including trash that was formerly handled by privately operated trash transfer stations. The text box to the right provides more information about trash transfer facilities. 1310.3

The District does not currently have a construction and demolition debris (C&D) transfer station, but it does permit disposal of a limited amount of C&D at the Fort Totten processing station. Large-scale commercial building debris disposal is handled privately. The majority of C&D is currently processed by several transfer stations in the surrounding areas of southern Maryland and northern Virginia. 1310.4

Policy IN-3.1.1: Solid Waste Collection

Ensure safe, reliable, adequate solid waste collection from residences, business establishments, institutions and other facilities. 1310.5

Policy IN-3.1.3: Reducing Community Impacts

Reduce the adverse effects of solid waste facilities, including noise, odors, and truck traffic, on District neighborhoods. 1310.6

Action IN-3.1.A: Upgrade Fort Totten Facility

Upgrade the Fort Totten transfer facility to provide a fully enclosed, modern solid waste transfer station to meet the District's solid waste needs. Consider expansion of this facility to provide adequate space to meet other solid waste needs, including vehicle storage, "white goods" such as washing machines, refrigerators and other large household appliances, and other special waste disposal. 1310.7

Action IN-3.1.B: Trash Transfer Regulations

Enact regulatory changes that enable the private sector to provide more efficient trash transfer stations, be in compliance with enforceable regulations, and potentially provide a much needed state-of-the-art

What Is a Solid Waste Transfer Facility? 1310.9

A solid waste transfer facility is a light industrial facility where trash collection trucks discharge their loads for compacting. Once compacted, trash is reloaded onto larger vehicles (e.g., trucks, trains and barges) for shipment to a final disposal site. Transfer facilities are typically fully enclosed. Workers screen incoming wastes on the receiving floor or in an earthen pit, recovering materials from the waste stream that can be recycled and separating out any inappropriate wastes (e.g., tires, large appliances, automobile batteries). Transfer facility operators usually unload, compact, and transport waste off the site in a matter of hours.

The District undertook a Needs Assessment and Site Selection Study for trash transfer stations in 2000-2001 to assess the adequacy of existing facilities and determine how future needs might be met. Among the recommendations of the study were:

- Changes to siting and permitting requirements, including setback and buffering standards;
- Upgrading of the Fort Totten and Benning Road transfer stations;
- Development of drop-off facilities for residents at Fort Totten and Benning Road; and
- Further analysis of costs, needs, public education programs, and employee training initiatives.

construction and demolition waste processing site under private operation and ownership. Work with ANCs and community organizations in drafting these regulations to ensure that neighborhood concerns are addressed. 1310.8

IN-4 Telecommunications 1311

Telecommunication is the transmission of information by wire, radio, optical cable, electromagnetic, or other means. The provision of high-quality digital infrastructure—wireless networks, fiber optics, and broadband telecommunications—is important to residents and businesses, and is vital to economic development. Such infrastructure is critical in the 21st century, particularly given the security and information needs of the national capital. 1311.1

The District's Office of the Chief Technology Officer (OCTO) is responsible for improving, enhancing, and expanding wireless technology, communications systems, and electronic commerce in the District. OCTO develops and enforces policies and standards for information technology in District government and identifies where and how technology can systematically support the business processes of the District's 68 agencies. 1311.2

OCTO has initiated DC-NET, a fiber optic telecommunications network supplying District consumers with complete voice, data, video and wireless communications services. The system consists of interconnected strands of optical plastic from various providers that, when completed, will connect the majority of government and quasi-governmental services in the District. These include radio towers; police, fire and emergency management facilities; administrative buildings; public schools and libraries; recreation and community centers; District-owned hospitals and clinics; and semi-governmental entities such as WASA, WMATA and UDC. 1311.3

In order to elevate the stature of the District, the "City of Access" initiative provides free Internet access and free or low-cost computer sites for DC residents. The initiative also aims to expand Internet access and technology training in DC neighborhoods by combining public and private institutional resources. 1311.4

IN-4.1 Planning and Coordination of Telecommunications Infrastructure 1312

Localities such as the District of Columbia can plan for and regulate telecommunications infrastructure within the limitations of Section 253 of the 1996 Telecommunications Act. The Act prohibits local governments from imposing statutes, regulations, or other barriers that would have the effect of prohibiting a telecommunications provider from entering the market. It defines the authority of local government to plan and regulate

such attributes as facility location, height, setbacks, and safety standards. The Federal Communications Commission (FCC) has the overall responsibility for regulating the interstate and international telecommunications industry and has the ability to preempt local actions that do not conform to the provisions or the intent of the Act. 1312.1

In the District, the federal sector, local government, commercial industry, and general public rely heavily on radiofrequency services, facilities, and devices. In recent years, this demand has necessitated the location of new antennae on both federal and private land. The District Zoning Commission has established development standards for antenna towers and the National Capital Planning Commission has written guidelines for antennas on federal property in the National Capital Region. Both sets of guidelines govern the appropriate location of radiofrequency facilities for functional and aesthetic reasons, protecting the operational needs of federal installations and preserving parklands and important viewsheds. The planning regulations that govern the location of new antennas and towers for human health or safety are found in the Federal Elements of the Comprehensive Plan. These policies suggest joint use and co-location of antennae, interior attenuation devices, and prudent avoidance to high exposures of electromagnetic fields. 1312.2

Policy IN-4.1.1: Development of Communications Infrastructure

Plan and oversee development and maintenance of communications infrastructure including cable networks, fiber optic networks, and wireless communications facilities to help support economic development, security, and education goals. 1312.3

Policy IN-4.1.2: Digital Infrastructure Accessibility

Promote digital infrastructure that provides affordable broadband data communications anywhere, anytime to the residents of the District. Investigate the cost-effectiveness of providing municipally-owned wireless broadband connectivity to guarantee more affordable high speed-internet access for residents, businesses, schools, and community organizations. 1312.4

Action IN-4.1.A: Guidelines for Siting/Design of Facilities

Establish locational and design criteria for above-ground telecommunication facilities including towers, switching centers, and system maintenance facilities. In addition, establish provisions to put cables and wires underground wherever feasible. Consult with ANCs and community groups in the development of siting criteria. 1312.5

Pepco's oil-powered plant at Benning Road

See the Environmental Protection Element for additional policies and actions on the siting of telecommunication towers and transmission facilities.

IN-5 Energy Infrastructure 1313

Although population has declined over the last 50 years, energy consumption in the District has remained relatively constant. Declines in residential use have been offset by growth in commercial use. Today, the commercial sector accounts for 62 percent (106 trillion Btu of energy used annually) of the District's energy consumption, whereas the residential sector accounts for 20 percent (33.5 trillion Btu). The transportation sector is the third largest energy consumer with 15.5 percent (26.5 trillion Btu). The commercial sector energy usage in the District accounts for 80 percent of the dollars spent on energy in the city. 1313.1

IN-5.1 Electric Infrastructure 1314

Electricity is delivered to District consumers by electric generation, transmission, and distribution facilities. Power plants generate high voltage electricity, which is released along transmission lines into the power grid to substations located throughout the District. From the substations, distribution lines deliver the electricity to transformers on the ground or mounted on utility poles. The transformers reduce the voltage so it can be safely used by District consumers. Currently, the Potomac Electric Power Company (PEPCO) supplies 95 percent of the city's residential customers and 79 percent of the city's commercial customers; the remainder is provided by other suppliers. 1314.1

In the District, PEPCO operates two oil-fired power plants located at Benning Road (550 MW) and Buzzard Point (256 MW). Oil has been the sole energy source used at these plants since coal was phased out in the mid-1970s. However, the dependence on generating stations in the city is not as prevalent as it used to be. Today, a majority of electricity supplied to District residents is generated by coal-fueled power plants in Maryland. In addition, with the emergence of cogeneration projects and purchased power over the last 20 years, the District has access to and takes advantage of 450 megawatts from utilities as far away as Ohio. 1314.2

PEPCO plans to run the Benning Road and Buzzard Point power plants indefinitely. A significant PEPCO presence on other properties in the city will also be required for substations, fleet maintenance, and storage and service yards. The utility currently uses a 10-year planning horizon to estimate substation capacity. Its latest ten-year forecast determined that two new substations will be needed to meet load growth needs through 2015. A new Northeast substation, to be located near the intersection of

New York Avenue and Florida Avenue NE will provide additional capacity for the NoMA, Hechinger Mall/Bladensburg Road, Rhode Island Avenue Metro, and H Street NE areas. A proposed Southeast substation near the Southeast Federal Center will provide additional substation capacity for the South Capitol Corridor, Buzzard Point, Waterside Mall, and the Southwest Waterfront areas. 1314.3

PEPCO is also increasing capacity at three existing substations by adding transformers and/or supplies. Existing substations will be expanded to serve growth along 7th Street, the U Street Corridor, Howard University Town Center, and Historic Anacostia. Beyond the ten-year horizon, PEPCO will site and construct substations to relieve future overloads at stations that are approaching capacity and to respond to future growth needs. At this time, PEPCO cannot determine the locations of new substations beyond the ten-year horizon with any degree of certainty. 1314.4

Individual development projects and redevelopment on large sites will require new "feeder" lines to serve additional customers. Construction of these lines will impact existing development and infrastructure in a variety of ways. Underground distribution systems, which are typically required in new development, will require construction of new conduits, cables, and subsurface or pad-mounted transformers. Dense commercial or multi-family residential developments will often require the extension of new mainline underground feeder groups, potentially resulting in digging up of the streets and sidewalks. Public utility easements may also be needed to provide buried distribution systems inside multi-building developments. 1314.5

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Policy IN-5.1.1: Adequate Electricity

Ensure adequate electric supply to serve current and future District of Columbia needs. This will require collaboration with PEPCO and other service providers. 1314.6

Policy IN-5.1.2: Undergrounding Electric Distribution Lines

Plan for the undergrounding of electric distribution lines throughout the District to provide increased reliability of service and enhanced aesthetics and safety, and seek equitable means to cover the high costs associated with undergrounding. Use the opportunity for undergrounding to bury other above-ground communication lines, such as telephone lines, wherever feasible. 1314.7

See the Environmental Protection Element for information about the District's Energy Emergency Plan and Comprehensive Energy Plan.

IN-5.2 Gas Infrastructure 1315

Consumption of natural gas has remained stable for the past 25 years, (+/- 30 trillion BTU), even as petroleum and coal consumption have decreased dramatically. District consumers receive natural gas through transmission and distribution pipelines leading to compressor stations in and around the region. Regional Washington Gas compressor stations are located in the District, in Loudoun County and in Chillum, Maryland with additional Transco Natural Gas Compressor Stations in Manassas and Columbia. It is important to be ever vigilant about the need for natural gas safety given the potential hazards associated with gas leaks. 1315.1

Policy IN-5.2.1: Natural Gas Safety

Promote consumer education on the benefits of regular monitoring of all above ground and buried natural gas piping on the customer's side of the meter to prevent corrosion, leaking, and other safety hazards. 1315.2

IN-6 Infrastructure and New Development 1316

This section addresses the need to plan for, coordinate, fund, and implement capital improvements to address existing deficiencies as well to address the impacts and cost of new development. 1316.1

IN-6.1 Coordinating and Funding Infrastructure Improvements 1317

One of the basic purposes of the Comprehensive Plan is to improve the linkage between development and capital improvement decisions. However, as this Element highlights, many of the infrastructure improvements required to serve development are funded by entities other than the District of Columbia. Interagency coordination is necessary to ensure that capacity remains adequate. Coordination with the private sector is also important. The general trend in cities and counties across the country has been for the development community to bear a greater share of the cost of infrastructure expansion, rather than leaving this burden to local taxpayers and ratepayers (see text box). This is already common practice in the District and will continue to be so in the future, given the District's already high tax rates and fiscal imbalance. 1317.1

Paying for Infrastructure 1317.3

In general, local governments and/or independent agencies or authorities (e.g., WASA, PEPCO) are responsible for the maintenance and upkeep of infrastructure. There are a number of ways that local governments fund infrastructure improvements. The most common are long-term financing via bonds and "pay-as-you go" revenues collected via taxes or utility rates. In many cases, municipalities have foregone investment in infrastructure due to revenue constraints. The result is deferred maintenance and a long backlog of unfunded repairs—an unfortunate reality in cities across the country.

Many local governments require infrastructure costs for new development to be borne by the developer through impact fees, special assessments, or other fees or taxes. Such fees are usually proportionate to the actual costs of building new water lines, sewer lines, and other utilities to serve the development site. While impact fees are effective to address the impacts of new development, they may not be used to address deferred maintenance. Those costs must be financed through other means—generally through higher rates that cover the cost of bonds and capital projects.

Policy IN-6.1.1: Coordination of Infrastructure Improvements

Ensure that infrastructure upgrades are carefully scheduled and coordinated with development and redevelopment plans in order to minimize traffic rerouting, pavement cuts for laying cable or placement of other infrastructure within the street right-of-way, street closings, disruptive subsurface excavation, and utility shut-offs. 1317.2

Policy IN-6.1.2: Creative Financing

Promote creative financing tools to fund infrastructure maintenance and replacement. These could include innovative taxing programs, user fees, and new development charges. 1317.4

Policy IN-6.1.3: Developer Contributions

Require that private developers fund the necessary relocation or upgrading of existing utilities to address limitations with existing infrastructure on or adjacent to proposed development sites. For necessary upgrades to water and wastewater infrastructure, developers should contribute to the cost of extending utilities to the project site or upgrading existing utilities to the specifications necessary for their proposed project. 1317.5

Action IN-6.1.A: Developer Reimbursement Agreement

Formulate consistent, equitable, and manageable developer Reimbursement Agreements for the incremental costs of water, sewer, and other utility upgrades. The Agreements should provide a means for the initial developer to be reimbursed by the District through payments by other developers who benefit from the initial developer's infrastructure improvements. 1317.6

Action IN-6.1.B: Coordination Of Infrastructure Upgrades

Establish a central repository for data and schedules for planned infrastructure upgrades to minimize the need for repeated street and sidewalk excavation. 1317.7