Chapter 9
Transportation and Environmental Services

Transportation Vision

The overarching goal for transportation in the District is as follows:

Develop and maintain a system that delivers safe, affordable and convenient ways to get people where they want to go - while protecting and enhancing the natural and cultural resources of the District.

Central to this vision is improving energy efficiency and access to goods and services through the provision of excellent alternatives to single occupancy driving in the city.

A well-balanced and multi-modal transportation system is integral to the city's efforts to sustain and enhance the quality of life and key to its future economic growth and role as the nation's capital. Achieving such a system requires integrating land use and transportation and implementing a range of improvements that enhance connectivity, livability and vitality.

Transportation System Overview

As the nation's capital and the center of one of the country's fastest growing metropolitan areas, the District faces increasingly complex mobility challenges as it plans for its future. While the city still retains a large share of the region's jobs, the region itself continues to decentralize, creating longer commutes, increased peak period congestion and poor air quality. Within the District, the major surface transportation arteries are highly congested during morning and evening commuting periods and the Metrorail system in Central Washington is expected to reach capacity in the relatively near future. Funding to maintain the existing transportation system, let alone expand the system to meet increased demand, is severely constrained.

However, these challenges also present opportunities. The District has one of the most extensive mass transit systems in the country, densities that support and promote transit use, a growing network of bicycle and pedestrian trails and a unique system of radial boulevards that distinguish it from all other American cities. Washington's gracious avenues, bridges and parkways are part of its history and a defining element of its urban form and character. With appropriate strategies in place, these transportation assets can enhance the quality of life in the city and increase the District's attractiveness, while still performing their essential function to move people and goods.

The city is also taking steps to augment and sustain its existing transportation network. It is expanding transit via bus rapid transit and light rail to areas not served by Metrorail. It is replacing the Anacostia River bridges, including the South Capitol and 11th Street bridges, to improve mobility and roadway operations and to support economic development and urban beautification goals. It is improving sidewalks and bicycle routes across the District. Table 9.1 summarizes the transportation assets of the District.

Table 9.1. Transportation Assets in the District

Transportation Asset	Description
Roadway System	4,286 lane miles
Bridges	215 (200 vehicle, 15 pedestrian)
Sidewalks	1400 miles
Bicycle Routes	
On-road bicycle lanes *Signed routes* *Off-road trails*	40 miles 64 miles 54 miles
Street Trees	1
Alleys	355 miles
Rail Mass Transit (Metrorail)	38 miles (total for region=106 miles) 40 stations (total for region = 86)
Bus Mass Transit (Metrobus)	Service on 298 miles of road (total for region=1,442 miles)
Airports*	Two international airports (Washington Dulles International and Baltimore-Washington International) and one domestic (Reagan National)
Railroads	27.2 miles of rail line (serving Amtrak passenger rail, MARC and Virginia Railway Express commuter rail, and CSX and Norfolk Southern freight rail). Union Station, within walking distance of the Capitol, provides connections to bus and rail transit along with shared cars, rental cars and sightseeing services.

*Dulles and BWI International Airports are located outside of the District but serve the metro DC region.

Program Activities

The District Department of Transportation (DDOT) is in the process of developing an Action Agenda that outlines its programmed investments, policy objectives and actions, and benchmarks for achievement over the coming years. The program is built upon a solid understanding of our infrastructure needs and capacities and the critical investments necessary to move forward into the next decade.

Capital Planning

The District's capital program (Transportation Improvement Plan) is based on five key principles:

1. Capital assets - fixing first the infrastructure we have means lower costs in the future
2. Safe passages - ensuring all users can safely move with comfort and efficiency
3. Going green - moving more users in the same space and improving environmental quality
4. Prosperous places - strengthening the economic competitiveness and success of our communities
5. Firm foundation - core programs ensure a strong base for the organization
6. Climate control - Cutting across all dimensions is a respect for the world and our impacts upon it

Capital Assets
DDOT has over $44 trillion worth of infrastructure in the city. The Agency's right of way real estate makes up nearly one-third of the city's land area. Like any homeowner, the city is best served when sufficient investments are made to preserve this tremendous, and expensive, asset.

- Improve the quality and quantity of DDOT's web-based information and general data collection
- Accelerate construction to reduce project costs and overall traffic impact
- Partner with neighborhood stakeholders to help protect and preserve assets
- Prolong the life of assets, choose durable materials in new construction, and reuse materials as possible when reconstructing

Safe Passages
The District Department of Transportation places a high priority on safety. Through improvements to our programs, partnerships and physical infrastructure, we are aiming to drastically reduce transportation-related injuries and fatalities.

- Establish designs and policies that accommodate and protect all modes and users
- Reduce injuries and fatalities through enforcement
- Utilize emerging, effective technology for system performance
- Educate all users to respect and protect one another

Going Green
DDOT's mission is to move people and goods as efficiently and cleanly as possible. Often this means finding ways to move more people, not vehicles, in a fixed right-of-way. DDOT has invested and will continue to invest in initiatives that reduce toxins in the air and improve overall air quality.

- Provide additional transit alternatives
- Expand facilities and technologies for non-auto travel
- Minimize impervious surfaces in the right of way and mimic natural systems to better manage storm water runoff
- Improve the health and expanse of the District's tree canopy
- Support urban infill to encourage smart growth

Prosperous Places
While DDOT's projects improve the safety, efficiency and condition of the transportation system, DDOT is proud that many of our projects also go above and beyond direct infrastructure improvements. In many instances throughout the city, the investment in roads, sidewalks and streetscape has become the catalyst for economic development throughout the corridor.

- Utilize infrastructure investments to strengthen local retail and employment districts
- Minimize construction impacts on local businesses
- Coordinate work with local utility companies

Firm Foundation
DDOT's core programs are the foundation on which DDOT is able to accomplish its mission. These are the programs that allow us to research and analyze innovations in the transportation field and improve customer service and outreach, among other things.

- Train the workforce of the 21st Century
- Provide exceptional customer service, responsiveness and transparency
- Reform business practices to reflect sustainability principles
- Enhance research program

Climate Control
DDOT recognizes that the transportation system represents one of the lynchpins for reducing greenhouse gas emissions and managing human impacts on the global climate.

- Reduce Vehicle Miles Traveled (VMT) by moving more people more efficiently
- Explore and utilize vehicle technologies that reduce or eliminate emissions
- Explore and utilize information technologies that help keep traffic moving and reduce congestion
- Tie together land use and transportation planning decisions

Title VI: Ensuring Equity in the Transportation Program

In implementing its transportation program, DDOT assures that no person shall on the grounds of race, color, national origin or gender, as provided in Title VI of the Civil Rights Act of 1964 and related statutes, be excluded from participation in, or be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which DDOT receives federal financial assistance. In order to comply with Title VI and meet the needs of an increasingly diverse population, DDOT gives special consideration to populations protected under Title VI in its transportation program. At all stages of planning and project development, DDOT emphasizes proactive and ongoing public involvement targeted toward traditionally underserved communities. Free language assistance is provided to ensure meaningful access to information and services for the District's limited-English proficient residents, compromising nearly seven percent of the population. In promoting equity considerations, DDOT is also committed to Environmental Justice and uses analyses and impact studies to identify and avoid disproportionately high or adverse human health and environmental effects of its program, policies and activities on minority and low-income populations.

Transforming Corridors through Great Complete Streets

Our avenues and boulevards are much more than simple transportation routes. They are a legacy of the 1791 L'Enfant Plan and are still one of the city's most distinctive features. They were designed to be beautiful corridors lined with distinctive buildings and affording dramatic vistas. While some of the city's radial corridors do serve this function, many now also handle hundreds of thousands of private vehicles each day as well as bicycles, trucks and buses.

Different corridors in the city serve different functions. Some, like New York Avenue, carry heavy truck and commuter traffic. Others have wide sidewalks that provide a safe and pleasant environment for pedestrians. Still others were once vital shopping streets or streetcar lines that today have lost their neighborhood-serving activities and are checkered by drive-through and auto-oriented uses. As the gateways to our communities, the District's corridors should once again become the centers of civic and economic life for surrounding neighborhoods and serve as vital transportation corridors. The challenge facing the District as it plans for and reinvests in its corridors is to balance the various transportation modes, tailor its transportation strategies to recognize the function of each major street and foster economic growth.

Improvement of the city's corridors—particularly public space along city streets—is an important part of the ongoing "Great Streets" initiative. Great Streets applies a multidisciplinary approach to corridor improvement, comprised of public realm investments, land use plans, public safety strategies and economic development assistance. Among other things, the initiative includes the construction of new sidewalks, lighting, signage and crosswalks. Such improvements are being used to leverage further investment in landscaping and public space by the private sector.

The Great Streets Initiative is a partnership of the District Department of Transportation (DDOT), the Deputy Mayor for Planning and Economic Development (DMPED), the Office of Planning (OP), and the Department of Parks and Recreation (DPR), among many others. The program concentrates on the following six designated corridors:

- Georgia Avenue, NW and 7th Street, NW from Eastern Avenue to Mt. Vernon Square
- H Street, NE and Benning Road, NE from North Capitol Street to Southern Avenue
- Nannie Helen Burroughs Avenue, NE from Kenilworth Avenue to Eastern Avenue
- Minnesota Avenue, NE/SE from Sheriff Road, NE to Good Hope Road, SE
- Pennsylvania Avenue, SE from the Capitol complex to Southern Avenue
- Martin Luther King Jr. Avenue, SE and South Capitol Street from Good Hope Road to Southern Avenue.

The progress of the Great Streets projects continues to move forward and the status of each corridor varies from final stages of planning on sections of Georgia Avenue to the award of a construction contract for Pennsylvania Avenue, SE to substantial construction on H Street/Benning Road, NE.

Transportation Choice: Balancing Mobility and Accessibility

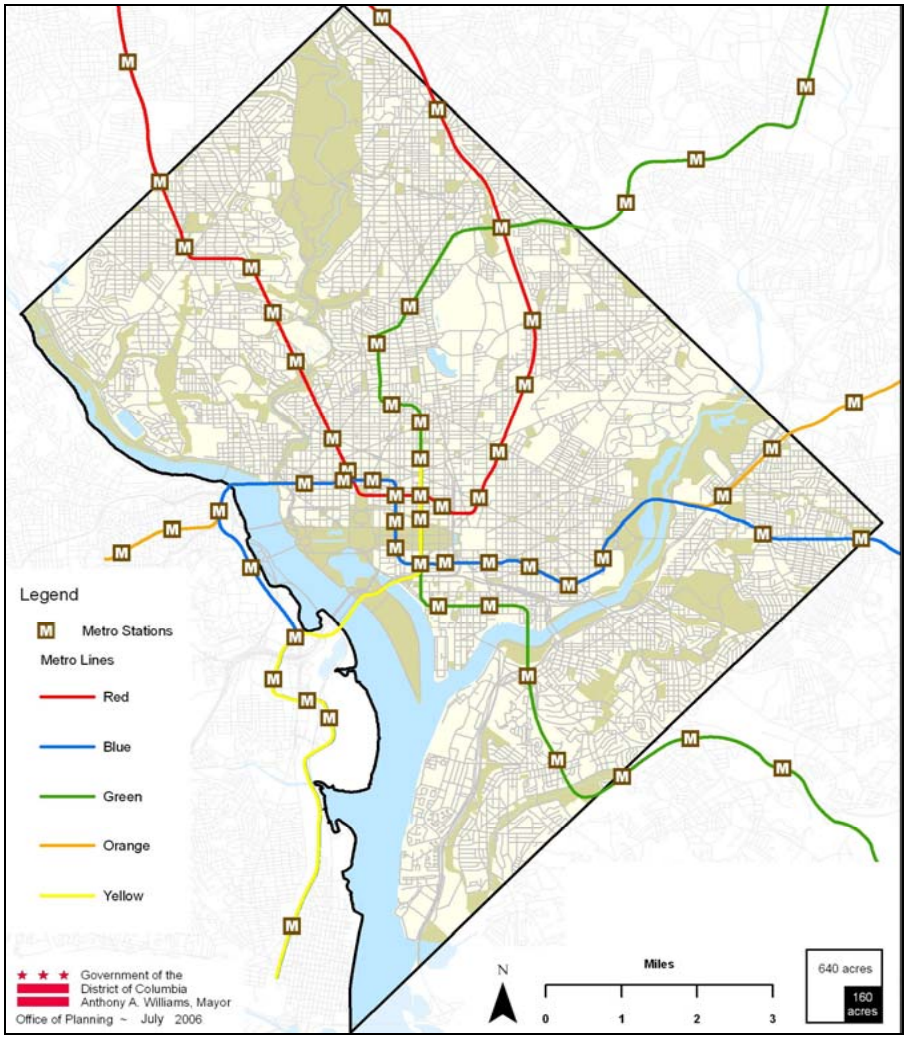
The District has one of the most balanced transportation systems in the country. It is ranked second only to New York City in terms of the percentage of residents who take public transportation, and second only to Boston in the percentage who walk to work. According to the 2000 U.S. Census, thirty-seven percent of the District's households have no automobile. Providing transportation choices that move away from the single-occupant car towards more efficient and environmentally friendly options such as walking, bicycling and public transit is a key goal of the Department of Transportation.

Transit Accessibility

The District and its region are served by the second largest rail transit system and the fifth largest bus network (measured by ridership) in the United States. The bus and rail systems are operated by the Washington Metropolitan Area Transit Authority (WMATA), which provides service throughout the Washington region.

WMATA was created in 1967 by an Interstate Compact to plan, develop, build, finance and operate a balanced regional transportation system in the National Capital area. Construction of the planned 103-mile Metrorail system began in 1969 and was largely funded by the federal government. Currently, all operating and most capital costs of the system are borne by the compact signatory jurisdictions of the District, Maryland and Virginia; and policy decisions are made by members representing these jurisdictions. The first phase of Metrorail began operation in 1976 and was completed in early 2001. In 2004, three new stations opened—two extended the Blue Line east of the Beltway and the first infill station (New York Avenue) opened on the Red Line. The system now totals 106 miles, 38.3 miles of which are located within the District itself. Close to half of the stations on the system -- 40 of 86 -- are located in the District. The Metrorail system is shown in Map 7.1. While much of the city is within ½ mile of a station, some areas such as Georgetown, the New York Avenue corridor, and Bolling Air Force Base, are not.

Map 9.1. Metrorail System



As the core of the region and the hub of the Metrorail system, much of WMATA's transit use centers on the District. In April 2009, the total average weekday boardings at all Metrorail stations was 781,429. Nearly 57 percent of these boardings occurred at District stations. In-bound metrorail trains are often filled to capacity in the suburbs in a.m. peak periods, leaving little space for District residents to board. Downtown station platforms are congested. The District and WMATA are studying the feasibility of underground pedestrian connections between Gallery Place/Metro Center and Farragut North/Farragut West stations to relieve overcrowding.

The WMATA Core Capacity Study investigated options to increase capacity of the system, but there are several obstacles to making long-term, large-scale improvements. For instance, the Orange and Blue Lines share a track through downtown Washington, greatly limiting the capacity of both lines. Likewise, the interlinking of the Green and Yellow Lines between L'Enfant Plaza and the Convention Center limits additional peak period service on either of those lines. Adding tracks in these areas would require extraordinary costs and service disruption. In 2006, the District funded a demonstration project to extend the Yellow Line to Fort Totten station during off-peak hours, doubling service to Green Line stations in the District north of Mount Vernon Square/Convention Center. The project's success led to the service cost being regionalized in 2008.

Because of the very high cost of building entirely new Metrorail subway lines within the District, the city is instead proposing better connections to and among the various spokes of the Metrorail system with investments in surface transit. These improvements include bus rapid transit, light rail transit and improvements to the Metrobus system. In addition, the city is working with WMATA to make more efficient use of existing infrastructure through measures such as increasing train lengths from six cars to eight cars. The increased train length adds about one-third more capacity to each train, helping to alleviate short-term congestion problems in the system. This technique does not require any changes to railroad or station infrastructure, only upgrades to the power system and the purchase of additional rail cars.

The District is served by a number of regional bus carriers in addition to Metrobus. In Maryland, these include MTA Commuter Bus, Dillon, Eyre and Keller Transportation. In Virginia, these include Lee Coaches, National Coach, Quick's, Loudoun County Commuter Bus and PRTC OmniRide. A number of private bus services also provide circulation within the District for schools, hospitals, universities and other areas or attractions. The District is also served by MARC and Virginia Railway Express commuter train service.

In the late 1990's the District of Columbia began exploring ways to increase surface transit options within the District. By 2003, the *District of Columbia Downtown Circulator Implementation Plan* was developed and began operating as a partnership between the District Department of Transportation (DDOT) and a non-profit organization known as District of Columbia Surface Transit, Inc. (DCST). Initially developed to help reduce downtown traffic congestion and high parking demand, and provide complementary transit service to Metrorail, Metrobus and other regional transit systems, the DC Circulator started with routes that crossed the city North/South and East/West. Growing demand for the service has lead to an expanded system that now includes five (5) routes. The first phase of the DC Circulator started service in July 2005 with 29 new buses on two routes linking Union Station with the Washington Convention Center and Georgetown via K Street, as well as connecting the Convention Center to the Southwest Waterfront through Downtown and the National Mall. A third route was added in March 2006 to expand circulator service around the National Mall. In April 2009, two more routes and 14 more buses were added to the system serving Capitol Hill, Capitol Riverfront, Union Station, Adams Morgan, Woodley Park, Columbia Heights and the 14th Street NW corridor.

WMATA also operates the Metrobus regional bus service. The buses run approximately 168,670 miles on an average weekday making about 431,000 passenger trips and 15,087 bus trips. Approximately 55 percent of these trips are within the District. Throughout the metropolitan area, Metrobus operates on 1,442 miles

of roadway. Within the District, Metrobus operates 59 major bus lines on 298 miles of roadway or 27 percent of the roadway system. Average weekday ridership on these lines ranges from as few as 200 persons to over 14,000 persons. Total ridership in the District is approximately 232,000.

The District continued to explore ways to increase surface transit options and in 2005 the *District of Columbia Alternatives Analysis* (DCAA) was completed. The purpose of this multi-corridor, multi-modal study of transportation alternatives was to define an efficient transit network that better connects District neighborhoods to destinations in the District. Recommendations from the study identified corridors in the District that would have investments of streetcar, bus rapid transit and local bus enhancements. By 2006, plans for streetcar investments had begun for the Anacostia neighborhood. At full build out, the streetcar network will extend throughout the District, with more than twenty (20) miles of in-street rail. High ridership bus corridors, such as Georgia Avenue (70's route series), Wisconsin Avenue, Massachusetts Avenue, Pennsylvania Avenue (30's route series) and 16th Street, NW (S route series) were targeted for immediate investments of rapid bus service, and between 2007 and 2009 the District launched the 79, 37, 39, and S9 bus routes with express, limited-stop service operated by WMATA. The *Neighborhood Circulation Study* was completed in 2009 and identified additional methods for expanding surface transit options for people that live in, work in and visit the District of Columbia.

WMATA faces complex and unique funding and budgetary challenges to maintain and operate the transit system. Research shows that over half of the total capital spending for other transit systems comes from dedicated funding sources of one kind or another. However, WMATA receives no dedicated funding from such sources. For operating costs, other transit systems obtain about one-third of their total funding from dedicated sources. For WMATA, it is less than two percent. Most of WMATA's operating budget comes from direct subsidy payments from cities and counties in the region, including the District. The amounts vary from year to year. WMATA needs a stable, reliable and dedicated revenue source to take the pressure off passenger fares and the local governments' annual subsidy. The District will continue to actively collaborate with regional jurisdictions to pursue a dedicated and more stable revenue stream, such as a sales tax. Representative Tom Davis of Virginia authored a bill that provided $1.5 billion in Federal payments over ten years to offset the large cost of capital maintenance of the system, in exchange for two Federal board members to be added to the WMATA Board of Directors. The bill became law in 2009 and the WMATA Compact was amended to allow this change to occur. The Federal government has yet to appropriate their payment.

Bicycle Access, Facilities and Safety

Bicycling has long been a part of the transportation mix in the District. In the late 19th and early 20th centuries, bicyclists, pedestrians, buggies and streetcars all shared District streets. The District's interest in bicycling as an alternative to motorized transportation grew in the 1970s in response to the energy crisis and the first District Bicycle Plan was adopted in 1976.

The use of bicycles for transportation and recreation is increasing within the District. Between 1990 and 2000, bicycle commuting grew by 55 percent, from a 0.75 percent share to a 1.16 percent share of all District-based work trips. Continued increases in bicycling as a percent of work trips is desired. Currently, the District has 40 miles of bike lanes, 54 miles of off-road bike paths and 64 miles of signed bicycle routes. The city is also working to improve bicycle connections through parks and green spaces. While existing conditions provide a firm foundation for bicycling, many parts of the city are not as bicycle-friendly as they should be,having no bicycle facilities at all. Further, many workplaces and other destinations have no facilities for storing or locking bicycles.

Safety is another big concern. On average there are 270 bicycle crashes in the city each year. Between 1992 and 2001, close to one-third of all fatalities from motor vehicle crashes in the District were pedestrians or bicyclists as compared to about 20 percent nationally and 27 percent for large urban areas.

In 2003, the District Department of Transportation estimated the Bicycle Level of Service (Bicycle LOS) along 400 miles of major collector and arterial streets in the District. The Department of Transportation evaluated roadway lane and shoulder width, speed limit, pavement condition and on-street parking data. The analysis found that about 70 percent of the study network received below-average Bicycle LOS grades. The recently completed Bicycle Master Plan includes many recommendations to improve bicycle facilities and infrastructure and should be consulted for more detail.

Pedestrian Access, Facilities and Safety

The District's population density, interconnected grid of streets, wide sidewalks and renowned park system have long contributed to a favorable environment for walking. In 2000, nearly 31,000 District residents (12 percent of the city's labor force) walked to work. The District has more than 1,600 miles of sidewalks. However, there are still streets without sidewalks and a backlog of sidewalks needing repair. Pedestrian safety remains a big challenge. There are roughly 550 collisions between cars and pedestrians in the city each year.

Improvements to pedestrian facilities can enhance the quality of the walking and public transit environments, and foster greater use of both modes. Improvements should focus on reductions in the number and severity of pedestrian-vehicle conflict points, clarified pedestrian routing, widened sidewalks and improved aesthetic features such as landscaping. Encouraging walking will bring many benefits to the District. It will provide convenient and affordable transportation options, reduce vehicular-travel and related pollution, and improve the health and fitness of District residents.

Roadway System and Auto Movement

The District's roadway system consists of 1,153 miles of roadway, 229 vehicular and pedestrian bridges and approximately 7,700 intersections. Approximately 17 percent of these intersections are signalized, with about one in three signalized intersections located within the downtown area. The roadways in the District are categorized by function, ranging from interstates and other freeways, which provide the highest degree of travel mobility, to local streets, which provide the highest level of access to land uses. Increases in funding for street maintenance since the mid-1990s have allowed the District to improve the condition of its roadway pavement. The District regularly monitors and rates the condition of its roadways and bridges.

Traffic congestion on the District's roadway network occurs primarily on the radial principal arterial roadways. The flow of traffic is greatly influenced by north-south movements along the I-95 corridor feeding into I-295 and I-395. These highways carry the heaviest daily traffic volumes in the District with an average of approximately 193,000 daily trips on I-395 and 80,000 on I-295. In addition, the limited number of crossings over the Potomac and Anacostia rivers generates higher volumes of traffic at these gateways than their counterparts in the northern portion of the District.

Universal Access / Addressing Special Needs

As the baby boom generation ages into its senior years, the demands upon multi-modal transportation options are ballooning. An estimated 85 percent of Americans living to full life expectancy will experience some sort of permanent disability sometime in their life. The number of Americans over the age of 80

will rise from 61 million in 1995 to 320 million in 2050.

In the 2000 census, 51 million Americans (18 percent) reported having a disability. Among these, 35 million (12 percent) reported having a severe disability. For the District, 15 percent of the population over five years old was counted as disabled, which represents over 67,000 people.

To promote a high quality of life for seniors and persons with disabilities, the city intends to engage a range of measures focused on affording independence and choice:

- Using technology to extend intersection crossing times to accommodate pedestrians with slower walking speeds
- Providing well lighted, safe pedestrian paths along DC sidewalks, including compliant curb ramps at over 61,000 locations, and accessible drop off and pick up areas
- Providing convenient and fully accessible bus stops for the 3,349 active bus stops in the District (note: 700 new shelters have been installed over the past year)
- Employing technology to improve accessibility to transit services by persons with disabilities and enhance and attract greater Metro bus ridership; including such options as advance notice systems and integrated GPS-based bus tracking systems
- Supporting and expanding home delivery services and home based opportunities
- Implementing Accessible Pedestrian Signal devices at all signalized intersections

To move forward with this vision DDOT has outlined a transition plan to comply with the Americans with Disabilities Act and to safeguard the right to access for persons with disabilities.

Making Multi-Modal Connections

Multi-modal connections refer to the links between different modes of travel, such as walking, cycling, transit (rail and bus), private cars, taxis, commuter rail and intercity passenger rail. Enhancing the places where these connections occur facilitates transfers between the different modes. Metrorail stations and their environs can be enhanced to allow for more effective bus and streetcar transfers, particularly as streetcars, RapidBus and Bus Rapid Transit services become more common. Improved pedestrian amenities, increased bicycle parking and more visible parking for car-share vehicles at Metrorail stations can enhance connections.

Intercity and commuter rail connections are also critical to creating an efficient multi-modal transportation system. Amtrak regularly runs trains into and out of Union Station, providing service along the northeastern rail corridor as well as to points west and south. The District's Union Station ranks third in Amtrak station passenger volume, after Philadelphia and New York City. The District is currently served by two commuter rail systems - Maryland Commuter Rail (MARC), which provides service from Maryland, and the Virginia Railway Express (VRE), which provides service from Virginia. These systems provide up to 40,000 trips in and out of Union Station on a typical weekday on 96 trains per day. Commuter ridership has increased substantially in recent years, and continued growth of both systems is expected.

The expansion of these intercity and commuter rail services, coupled with Metrorail and Metrobus service, will increase accessibility and enhance regional transportation options. A number of key facilities on the rail system need improvements to accommodate future ridership and enable intermodal transfers. Increased capacity at Union Station and L'Enfant Plaza is also needed to accommodate growing numbers of commuter rail passengers on MARC and VRE.

In addition, regional commuter bus services originating in Maryland and Virginia terminate at approximately 65 stops in the District. These services are growing. The District is reviewing stop locations to minimize traffic conflicts while providing additional options for commuters to make intermodal connections. Finally, taxis play an important role in the District's multi-modal transportation system. They provide an alternative and convenient means of travel throughout the District. In 2008, the District abandoned the old zone-based fare system and now requires all taxis to use meter-based fares as is common in most other cities.

Security and Emergency Preparedness

Transportation has always played an important role in Washington's security by providing a means of evacuation as well as routes for emergency and relief services. The city must continue to plan for and safeguard its transportation system, protecting its value as a major component of our urban infrastructure and economy. In light of the events of September 11, 2001, every major American city has embarked on emergency preparedness and traveler information systems designed to inform citizens how to respond in the event of an emergency. As the Nation's Capital, this is a critically important issue for the District.

Should the District face an emergency situation, the transportation system provides the means to evacuate residents, workers and visitors, as well as support the movement of emergency service response teams. Depending on the nature of an incident, persons may need to rely on car, train, bus, bike and/or walking. Maintaining and planning for a well-functioning system that can adapt to the needs of an incident is essential. Given the District's reliance on the regional transportation network in the event of an evacuation, close coordination with partners in Maryland and Virginia is also required.

The District's Department of Transportation is the lead District agency for all regional and federal emergency transportation coordination and activities. Another key agency is the District's Homeland Security and Emergency Management Agency (HSEMA), which partners with District agencies, businesses and communities to help plan for management of an emergency event. There is also increasing coordination between regional departments of transportation and other agencies, primarily through the Metropolitan Washington Council of Governments.

The region has identified 19 corridors radiating from downtown Washington as emergency event/evacuation routes. Each of the routes extends to the Capital Beltway (I-495) and beyond. Customized roadway signs allow for easy identification of direction; outbound signs direct motorists to I-495 in Maryland and Virginia, and inbound signs show images of monuments. Evacuation routes are also identified by special street name signs, which include the red and white District flag and evacuation bars placed above the signs.

If directions are given to evacuate the central business district, Pennsylvania Avenue, NW, between Rock Creek Park and the US Capitol serves as the dividing line for routes. None of the evacuation routes cross each other, and no vehicles would be permitted to cross Pennsylvania Avenue. Traffic signals would be timed to move traffic away from the incident area. In addition, police officers would be present at 70 critical intersections on the evacuation routes within the District to expedite the flow of traffic and prevent bottlenecks. There are also six bike trails identified that could be used by cyclists or pedestrians in the event of an evacuation.

HSEMA has produced several sets of plans relating to emergency preparedness. Its Emergency Response Plan includes a transportation section, which details District policies, actions and responsibilities related to traffic management, the coordination of transportation logistics and the status and/or restoration of the transportation infrastructure. In addition, DCEMA drafted 39 Community Emergency Preparedness Plans for neighborhood clusters throughout the District to help residents prepare for emergencies. However, these plans do not contain cluster-specific information regarding neighborhood evacuation routes, modes of travel and other transportation-related issues.

Although the District is more equipped now than it has been in the past, additional planning is needed in order to better prepare the region's transportation network and emergency management agencies. Not only should the District continue to plan for evacuations at the local level and provide necessary information to the public, it must also improve coordination with its regional partners and take advantage of new technologies, andfederal support, in preparing for emergencies.

As home to the largest concentration of federal agencies and facilities in the country, the District and the federal government must continue to coordinate extensively to ensure the District's security and mobility needs. Over the past decade, several of the District's streets have been closed by the federal government to protect the White House and the U.S. Capitol Building. These street closures have disrupted mobility for pedestrians and vehicles, requiring extensive re-routing of Metrobus and vehicular travel through downtown and Capitol Hill. This has led to delays for residents, workers, tourists and emergency service providers.

The Environment

The District Department of the Environment (DDOE) is a relatively new agency, formed in 2006 from the Department of Health's Environmental Health Administration, the DC Energy Office, policy functions of the Tree Management Administration and policy functions of the Office of Recycling. The mission of DDOE is to improve the quality of life in the District of Columbia by protecting and restoring the environment. DDOE is responsible for the natural and indoor environments in the District of Columbia. DDOE's work includes direct assistance to residents and businesses, policymaking, and monitoring and enforcement. DDOE works to conserve natural resources and provide energy policy and services. An $80 million dollar agency with 300 employees, DDOE performs city, county and state environmental functions for the nation's capital.

DDOE programs are designed to facilitate cleaner air and water, green our neighborhoods and building space, and assist with the management of hazardous and toxic waste disposal. Additionally, DDOE conducts community and educational outreach to increase public awareness of environmental and energy related issues. DDOE is responsible for providing energy assistance to District residents; reviewing development applications for compliance with environmental requirements; monitoring and enforcing air and water quality standards; regulating the use and disposal of toxic substances; preserving the District's natural habitat for fish and wildlife; and developing and implementing stormwater management regulations to minimize runoff pollution into District waterways.
The department's vision is for the District of Columbia to become a model of environmental protection and sustainable practices. DDOE will lead the way through partnerships with other District agencies, business groups, nonprofits and residents.

George S. Hawkins is the director of the District Department of the Environment. As director of DDOE, Hawkins has led the District's efforts in reducing childhood exposure to lead hazards. He negotiated, and now oversees, the implementation of the nation's most stringent federal permit to reduce pollutants from stormwater runoff. He manages the nation's most successful low-income energy assistance program, including energy conservation and home weatherization. He launched and chairs the Mayor's Green Team, which coordinates the District Government's internal sustainability program across more than 40 agencies.

George serves as the Chair of the Green Building Advisory Council, which oversees the implementation of the nation's most progressive green building law. He is a member of the Mayor's Green Collar Jobs Advisory Committee, and a board member of the DC Water and Sewer Authority (WASA).

DDOE Programs and Services

DDOE is responsible for:

- Providing energy assistance to District residents
- Reviewing development applications for compliance with environmental requirements
- Monitoring and enforcing air and water quality standards
- Regulating the use and disposal of toxic substances
- Preserving the District's natural habitat for fish and wildlife
- Developing and implementing stormwater management regulations to minimize runoff pollution into District waterways

Energy Assistance

DDOE assists residents with their energy and utility bills through financial assistance, discounts and late bill forgiveness programs. These programs are funded by the US Department of Health and Human Services, the District Government and the Reliable Energy Trust Fund. Services for Low-Income Residents include getting help paying utility bills, getting discounts on utility bills, assistance in getting new, energy-efficient appliances, and weatherization assistance for homes. DDOE assists all District residents with free home energy audits, and has launched programs aimed at providing incentives for solar installations, green roofs and the replacement of old, energy-inefficient appliances.

Green Energy DC

DDOE offers a single resource for all residents and businesses that need to know about renewable energy products and services via the Green Energy DC program. Energy use in the home is a major expense and has a major impact on the environment. Generating energy by traditional means also generates greenhouse gases. When these gases become trapped in the atmosphere, climate change is the result. By making homes and businesses more efficient, residents can avoid unnecessary energy use, save money and reduce their ecological footprint at the same time.

Renewable energy is green energy. It is also quickly becoming affordable energy. As the price of technology drops and the price for traditional fuels fluctuates, renewable energy use is growing across the United States and around the world. By switching to renewable energy sources such as solar, wind, geothermal and biomass, one can help reduce dependence on a shrinking supply of fossil fuels and help reduce the greenhouse gases that lead to climate change.

Air Quality

DDOE's Air Quality Division works to protect the health and welfare of the District of Columbia's citizens, millions of visitors, and natural environment by reducing the concentration of pollutants in the air in accordance with DC regulations and federal Clean Air Act and Clean Air Act Amendments requirements. Among the services provided by DDOE's Air Quality Division are the Five Day Weather Forecast, an Air Quality Forecast and Local Area Webcam, and Draft Ambient Air Monitoring Network Plans. DDOE also has programs that help monitor and eradicate indoor air quality problems like mold, radon and asbestos.
DDOE's Air Quality work centers on monitoring and assessing air quality, permitting and enforcement, and air quality planning. The District has five air quality monitoring stations that monitor air 24-hours a day. DDOE staff issues permits to facilities that emit air pollution in the District, and also enforces the conditions of those permits. DDOE staff, in conjunction with other area jurisdictions, also develops plans to improve air quality in the region. Emission control measures can be regulatory, voluntary or market-based. Controls are generally applied to technology, manufacturing processes, the use of products or work practices.
Motor vehicles are the largest source of emissions that originate in the District. Vehicle exhaust contaminates the air with pollutants such as carbon monoxide, nitrogen oxides, volatile organic compounds and soot. It erodes buildings and monuments and is a key contributor to the formation of ground-level ozone or "smog." Vehicle exhaust presents a hazard to human health and causes damage to personal and real property.

To reduce these emissions, the District has implemented a law to limit engine idling. The District's engine idling law is one of the strictest in the country. With few exceptions, motor vehicles powered by gasoline or diesel are not allowed to idle for more than three minutes while the vehicle is parked, stopped or standing.

Water in the District

Clean water is essential for human and animal life, for commerce and industry, and for recreation. Drinking water in the District of Columbia comes from the Potomac River, upstream of the District. Our main waterways are the Potomac and Anacostia Rivers and Rock Creek. The District is also part of the Chesapeake Bay Watershed.

DDOE has three divisions dedicated to water.

- The Watershed Protection Division regulates construction sites for stormwater management and sediment and erosion control, educates District residents, students and teachers on the benefits of environmental stewardship, assesses the health of watersheds and habitats, sponsors community restoration activities such as tree planting and drain marking, promotes the use of low-impact development and offers incentives to property owners to reduce stormwater runoff
- The Water Quality Division provides total chlorine and total coliform tests for drinking water, provides water quality certification for draft pollutant discharge permits and certifies dredge and fill permits issued by the U.S. Army Corps of Engineers
- The Stormwater Management Division manages the District's Municipal Separate Storm Sewer System (MS4) Permit, coordinates the District's stormwater fee, and works with other District Government agencies to reduce stormwater pollution

The District recently enacted an innovative measure for assessing the true costs of stormwater run-off. The federal government requires the District to control pollution from stormwater runoff. The stormwater fee provides a dedicated funding source to pay for these pollution control efforts. The fee helps pay for green roofs, rain gardens, tree planting, street sweeping and other activities that help keep waterways clean. Enacted on May 1, 2009, this fee is based on how much impervious surface area residents have on their property.

The District Council has also directed DDOE to establish a stormwater fee discount program to reduce stormwater fees for property owners who implement measures to manage and reduce stormwater runoff. This program is required to be established by May 2010. The Council also indicated that stormwater fee discounts shall be made retroactive to no earlier than the implementation date of the impervious area stormwater fee (May 1, 2009).

Fisheries and Wildlife

The District Department of the Environment's Fisheries and Wildlife Division has four major components: research and management, aquatic and wildlife education, licensing and regulation, and fishing. Collectively, these components serve to conserve the District's aquatic and wildlife resources for the benefit of residents and wildlife alike.

The District operates the Aquatic Resources Education Center, which provides free educational programs in which participants can learn about the District's aquatic environments. DDOE operates several education programs at the Center. Fisheries biologists can enlighten the public with an inside look at what is really lurking in the District's waters. School groups and the public can whet their appetites with a fishery or aquatic resources presentation and enjoy a guided or self-guided tour of the Center. Visiting students can be actively engaged in hands-on activities from fish identification to water quality testing. Students have the opportunity to witness fisheries research activities such as the rearing of American Shad larvae, or the care of endangered Atlantic Sturgeon in the aquaculture facility (or fish hatchery).

The Center's fish hatchery re-populates fish such as American Shad back to their historical spawning grounds in the District's rivers and creeks. The ultimate goal is to increase their survival rate. In spring of 2007, the hatchery successfully released 1 million American Shad larvae (young fish), 3,000 Blueback Herring larvae and 5,000 Hickory Shad larvae in the Anacostia River to live out their life cycle. When not raising fish and re-stocking the rivers, the Center's scientists conduct a variety of surveys such as freshwater seines, ichthyoplankton surveys (fish eggs and larvae) and aquatic vegetation surveys to gain information about the rivers to share with residents. Most of all, the Aquatic Resources Education Center staff are ready and eager to help any visitor learn about fish and other animals that live in the rivers and creeks that run through our city.

Lead and Healthy Housing

Lead is a heavy, low melting, bluish-gray metal that occurs naturally in the Earth's crust. However, it is rarely found naturally as a metal. It is usually found combined with two or more other elements to form lead compounds. Over the years, lead has been mixed with gasoline and with paint, used as solder for cans and for copper pipes, as piping for drinking water, blended with vinyl and with brass, employed as protective shielding against radiation and in the manufacture of batteries and computer components.

To deal with lead contaminants within the District, the DDOE is:

- Enforcing the District's lead laws to keep housing and child-care facilities safe
- Promoting lead screening of all children under age six in the District
- Working with the families of children whose blood tests show elevated levels of lead
- Helping property owners and contractors to comply with the District's lead laws
- Providing free replacement of windows and doors for residents who qualify

Business Services

Business owners, managers and employees need to understand and comply with the District's environmental regulations. The DDOE staff is available to answer questions, provide assistance and help the public improve its environmental performance.

DDOE Resources for Businesses

- Renewable Energy Incentive Program
- Taking Care of the Environment Makes Good Business Sense
- Mayor's Environmental Excellence Awards
- Air Quality Small Business Assistance Program
- Commercial Recycling Information

Environmental Education

Through our environmental education staff, DDOE educates teachers and students about the connections between their personal actions and the health of their natural surroundings, especially local waterways and the Chesapeake Bay. DDOE environmental education staff work in a close partnership with the District of Columbia Public Schools (DCPS) system. Programs are strategically designed to align with DCPS Standards of Learning and aim to help individuals make informed decisions and take responsible action to prevent pollution and conserve our soil and water resources. The District Department of the Environment works in public, public charter and private schools through the **Green DC Schools** program. Our staff conducts cleanups, tree plantings and assemblies for groups of students or the entire school.

Major Initiatives

Leading by Example

As a resource consumer and employer of more than 34,000 people, the Government of the District of Columbia has the opportunity to make a substantial difference in improving our environment, both locally and globally. Through the Mayor's Green Team and individual agency efforts, the District is taking action on reducing and reshaping its consumption and incorporating sustainable practices into its operations.
Facts:

- The District Government is currently undergoing energy audits of all its facilities to identify opportunities for greater efficiency
- Green roofs were recently installed at District facilities at Judiciary Square and the Reeves Center
- The District plants more than 4,000 street trees each planting season

Leading by Example Resources:

- Take Action at Work: An EPA guide on how to help the environment within an office setting

- Department of Public Works Fleet Management Administration: Learn about how the District is incorporating Alternative Fuel Vehicles into its municipal fleet
- Energy Efficiency in District Facilities: The Department of Real Estate Services (DRES – formerly the Office of Property Management) Facilities Management Division has information on measures that DRES is taking to conserve energy and lower District government utility costs
- District's Energy Conservation Guide: A guide by the DRES to sustainable measures that can be taken within District facilities.

Climate Change

The climate is an issue that permeates every environmental question. From the emissions generated by the built environment to the energy consumed in production and transportation to the uncertainty about future fuel reserves, solutions are needed to address a wide range of concerns. Chief among them is the challenge of climate change, which is largely caused by the emission of greenhouse gases created through energy consumption. Reversing the effects of climate change will require action on a number of fronts, such as energy conservation, exploration of renewable energy sources and both individual and governmental commitments to cutting carbon consumption.

Climate Change Resources

- Climate Registry: The District joined the Climate Registry in June 2007 in order to voluntarily report the District's carbon emissions. The Registry works to develop measurement standards, so that emissions can be accurately tracked by jurisdictions across the country.
- ICLEI: The District is participating in ICLEI's Cities for Climate Protection Campaign, which helps cities to adopt policies that will have a measurable impact on greenhouse gas emissions. This is accomplished by conducting a baseline measurement of emissions and then developing a climate action plan that sets a specific target for emission reduction.
- Mayor's Climate Protection Agreement: Signed by Mayor Adrian Fenty in January 2007, this agreement is an initiative by the U.S. Council of Mayors to meet the goals of the Kyoto Protocol at a local level.
- Working Together to Prevent Climate Change: This brochure gives an overview of actions for government, residents and businesses to take to minimize the threat of climate change.

Natural Environment

Despite its urban characteristics, the District of Columbia contains a vibrant and diverse natural environment, characterized by major rivers, parks, wetlands and habitats. The close proximity of these natural features to busy workplaces, commuter routes and residences creates unique challenges to ensure their protection, but also greater opportunities to enjoy their benefits. In reality, our urban environment causes us to value our rivers, streams, trees and green spaces even more, and prompts us to work to ensure their preservation and enhancement.

Natural Environment Resources

- Plan for a Fishable and Swimmable Anacostia River by 2032: takes as its starting point the twin goals of making the Anacostia River fishable and swimmable; goals which evolved from standards originally laid out in the Clean Water Act over thirty years ago.
- DC Schoolyard Greening: This project installs green elements in District schoolyards, as a means of furthering environmental education. Topics and projects covered by the group include trees, stormwater reduction, wildlife studies and green buildings.

- Anacostia Real-time River Monitoring: provides information regarding the current water conditions of the Anacostia River. Measurements include temperature, pH, depth, chlorophyll and turbidity.
- DC WASA Environmental Resources: Includes information on combined sewer system outflows, the municipal separate storm sewer system (MS4), conservation and the Biosolid Management Program.
- DDOE/Casey Trees Tree Planting Rebate: District residents can apply for a $50 rebate towards any large shade tree.
- Greenspace: There are many open, undeveloped areas in the District that have been set aside for parks, community gardens, street trees, habitat preservation and other uses.
- Trees and the Urban Environment: Urban forests are recognized as important storage sites for carbon dioxide, the primary greenhouse gas. Trees in urban forests provide additional air quality benefits and can be a sound method for controlling air pollution and stormwater runoff.
- Adopt a Tree, Get an 'Ooze Tube'!: The District's Urban Forestry Administration has a program by which District residents can care for newly planted trees on their block.
- Wildlife Action Plan: The District is home to over 500 species of birds, fish, mammals, reptiles and amphibians including two endemic species of amphipods.

Sustainable Development

Sustainable development involves making conscious choices to incorporate environmentally beneficial elements when deciding how to use a parcel of land. While buildings and construction methods are central to sustainable development, the term more broadly includes consideration of surrounding land features and use of innovative design techniques to lessen the impact of development. Thus, elements of sustainable development may include providing green space, managing stormwater on site, use of construction materials that contain little to no toxins, use of energy efficiency measures, accessibility, density and transit.

Green Buildings

Green building is an approach to building design, construction and operations that conserves resources while protecting human health. Green buildings use less energy, consume fewer natural resources such as water and forest products, and emit fewer pollutants into the environment. Because they are designed to make use of natural light and good ventilation, green buildings provide a healthier indoor environment for their occupants. Studies show that students in green buildings learn better and workers in green buildings are more productive.

Green building is an integral part of the District's sustainable development strategy. The Green Building Act of 2006 requires that all District public buildings meet the US Green Building Council's LEED certification standards for environmental performance. The District supports private sector innovation by expediting LEED Gold-level projects through the permitting process. By 2012, all new private development projects will be required to meet LEED certification.

Facts:

- The District was the first city in the nation to require new privately constructed buildings to meet LEED standards, thanks to the Green Building Act of 2006.
- There are 24 buildings in the District certified as LEED Silver or higher. An additional 150+ projects are LEED registered.

Sustainable Development Resources

- Guide to Green Buildings: The District's "The Guide to Green Buildings" contains principles, practices and resources that help make sustainable, green development part of our everyday practice – for both new construction and renovations.
- US Green Building Council: Oversees the Leadership in Energy and Environmental Design (LEED) Green Building Rating System and offers information on all types of green buildings, including commercial, schools and homes.
- Greening DC Building Code: In February 2008, with support from the Mayor's Green Building Advisory Council, the District developed and proposed a comprehensive overhaul of its building codes to incorporate energy efficiency and environmental standards. These are currently in review. The proposed updated codes incorporate International Code Council 2006 and ASHRAE 189.1 standards for improved energy efficiency, pushing District buildings to 30-percent improved performance over the 2004 codes.
- Green Building Act of 2006
- Green Building Fact Sheet: Prepared by the Department of Consumer and Regulatory Affairs to give an overview of requirements and resources related to the Green Building Act of 2006.
- Department of Housing and Community Development (DHCD) Green Building Pamphlet: Outlines green building resources and information about DHCD's role in the green building process.
- Department of Housing and Community Development Green Buildings Overview
- Greening the Washington Metropolitan Region's Built Environment: A report by the Metropolitan Washington Council of Governments which contains information about green building benefits and national studies in a regional context.

Rain Gardens & Other Innovations

While land use and buildings are critical components of sustainable development, there are a number of other measures that can be employed in order to reduce the impact of development on the surrounding environment. Many of these measures are categorized under the term "Low-Impact Design" (LID), which seeks to minimize stormwater runoff from a given site. LID projects include green roofs, rain gardens, rain barrels, downspout disconnections, permeable pavement, native plant landscaping and a host of other innovative ideas that combine to stop pollution from reaching our rivers and streams.

Facts:

- Stormwater is a commonly used term to describe nonpoint source pollution or polluted runoff. When a rainstorm or snowmelt occurs, water picks up pollutants from the ground cover. The runoff from the land, along with these pollutants, may then be discharged into rivers and streams either directly or via sewage overflow events.
- Green Roofs in the District. Learn how the Department of the Environment promotes green roofs as a way to reduce stormwater pollution and keep buildings cool.
- RiverSmart Homes Program: Tips and information from the District Department of the Environment on reducing stormwater runoff from your property.
- US EPA Low Impact Design website: Provides technical resources and analysis as well as strategies for reducing stormwater runoff.
- Information on BayScapes: Learn how to landscape your yard in a way that benefits the Chesapeake Bay.
- Permeable Pavement Overview: Explanation of another type of stormwater management technology, in which runoff can be filtered through special forms of pavement.

- Rain Garden Design Templates: Interested in installing your own rain garden? The Low Impact Design Development Center has information on how to get started.

Land Use

The District's Comprehensive Plan conveys that the quality of life for residents and visitors to the city is inextricably linked to the health of the city's environment. As such, the District considers sustainable development to be a critical feature in guiding future growth. By promoting low impact development, green building, riverfront restoration, transit options and walkable neighborhoods, among other strategies, Washington aspires to be a leader in environmentally sensitive land use policies.

Fact:

- With 7,800 acres of parkland, the District has the most park space among the U.S.'s most populous cities.

Land Use Resources:

- District of Columbia Comprehensive Plan: Developed by the DC Office of Planning, the Comprehensive Plan provides guidance for the future development of the city. The Comprehensive Plan was most recently revised in 2006.
- The Anacostia Waterfront Initiative: This summary by the Office of Planning gives an overview of the plans to create a new Anacostia waterfront. For more information, please visit the Office of Planning's Anacostia Waterfront Initiative.
- Capital Space Program: Capital Space is a collaboration between District and federal partners to improve and expand the District's park space.
- Center City Action Agenda: The Center City Action Agenda is an effort by the Office of Planning to develop a vision and plan for emerging neighborhoods around the District's traditional downtown. The Agenda's objectives have important implications for promoting sustainability in the District.
- Voluntary Clean-Up Program, District Department of the Environment: Provides information on restoring contaminated sites to productive uses.

Waste and Hazards

The presence of waste and hazardous materials in our environment has consequences that cut across a number of environmental issues. Waste disposal can shape land use by requiring space for landfills, rather than alternate uses. In addition, landfill disposal, as well as improper disposal of hazardous waste, can result in chemicals leaching into soil and groundwater. Additional pollution from waste may reach rivers and streams through stormwater runoff. Finally, landfill waste contributes to the production of methane, a greenhouse gas linked to global warming. Therefore, the simple steps of reducing consumption, reusing materials and recycling eligible waste not only decrease the waste stream, but have beneficial impacts on a host of related issues.

Hazardous materials may also be encountered in daily life via certain products and building materials. Lead, asbestos, radon, pesticides and mercury are just some examples of potentially hazardous materials that may be encountered through routine activities. Therefore, it is important to understand the potential health effects of these substances, and how to handle and dispose of them safely.

Facts:

- Of the waste collected through the Department of Public Works' residential collection program, 18.3 percent is recycled.
- It costs the District about $25 to haul and dispose of one ton of recyclable materials, compared to $60 per ton of non-recyclable trash.
- Household Hazardous Waste Disposal in the District: Information provided by the Department of Public Works
- Handling Compact Fluorescent Light Bulbs: A US EPA Guide:* As the popularity of energy efficient light bulbs grows, consumers should be aware of how to dispose of used and broken bulbs safely.
- Recycling in the District of Columbia: Contains guides to residential and commercial recycling requirements, as well as information about which materials are okay to recycle.
- Follow the Path to a Cleaner DC*: Recycling brochure in English and Spanish from the Department of Public Works.
- How to Manage Leftover Paint: Tips for properly disposing of leftover paint
- Not in Our DC: The Connect with Kids program partnered with the DC Department of Public Works to create ten powerful videos about young people and adults who are performing cleanups and bringing about change. Watch this program (in English or Spanish).
- Recycling Report 2005-07*: The District Government's report on recycling for Fiscal Years 2005-07.