COMMUNITY ENVIRONMENTAL HEALTH PROFILE

FAIRFAX COUNTY, VIRGINIA

Preface

The National Institute of Medicine in its groundbreaking 1988 report on *The Future of Public Health,* stated, "The removal of environmental health authority from public health agencies has led to fragmented responsibility, lack of coordination, and inadequate attention to the health dimensions of environmental health problems." Significant progress has been made in the past 20 years to strengthen the environmental health capacity of local governments, but much work remains to be done. Environmental health remains fragmented in most jurisdictions, with issues concerning "environment" being managed under one system and those concerning "health" being managed under another. The natural result of this fragmentation has been a loss of identity for the overall environmental health system where responsible agencies tend to take a very narrow, parochial view of environmental health. Unfortunately confining our attention only to those things for which we are responsible and ignoring the interrelationship of the various components of the system that is necessary to ensure optimum health and quality of life results in inefficient service and confusion among the general public.

The Centers for Disease Control and Prevention, in collaboration with the American Public Health Association; the Association of Environmental Health Academic Programs; the Association of Schools of Public Health; the Association of State and Territorial Health Officials; the National Association of City and County Health Officials; the National Association of Local Boards of Health; the National Environmental Health Association; the National Conference of Local Environmental Health Administrators; and the National Conference of State Legislators, developed the Environmental Public Health Performance Standards (EnvPHPS) as a way of bringing all of the diverse components of the environmental health system together to promote continuous improvement of the national environmental public health system and foster improvement at the local level through the following efforts:

- Build capacity to provide the ten Essential Environmental Services.
- Build community accountability for environmental public health services.
- Build consistency of services across environmental health system programs.

The Fairfax County Health Department embarked upon the Mobilizing for Action through Planning and Partnerships (MAPP) initiative in 2008. A stakeholder's meeting held in November of 2008 noted that the MAPP instrument failed to provide enough detail in evaluating the environmental health program, and requested that the County seek an alternative system that could provide a satisfactory evaluation of the environmental health system. The County elected to apply the EnvPHPS as the tool by which it would evaluate the local environmental public health system. A preliminary stakeholder's conference was held in October of 2009 to initiate the process by identifying a set of environmental public health indicators to use in writing a Community Environmental Health Profile, which is the first step in meeting the EnvPHPS. This document represents the culmination of a full year of work by a lot of people to conduct a comprehensive assessment of the environmental health status of Fairfax County. This document will subsequently be used to conduct a comprehensive Local Environmental Public Health System Assessment (LEnvPHSA), which will in turn be used to create an action plan to address noted gaps in service delivery.

Acknowledgements

It is no exaggeration to say that this document would not have been possible without the enthusiastic support of Dr. Blaine Parrish and the Management Approaches to Public Health (PubH 208) graduate class at George Washington University. Members of the PubH 208 class worked diligently for more than a year assisting with meetings, selecting indicators, conducting research, and writing draft reports that has culminated in this Profile. Budget constraints and staffing reductions made it impossible for internal Health Department staff to do the large volume of work necessary, so it is safe to say that this Profile would never have been done without the help of the PubH 208 class. The Fairfax County Health Department therefore recognizes the following students for their invaluable contributions to the completion of this important project:

Summer 2009 Class: Developed a preliminary list of potential LEnvPHSA stakeholder participants and reviewed tracking and surveillance system parameters. Class members were:

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COMMUNITY ENVIRONMENTAL HEALTH PROFILE (CEHP) FOR FAIRFAX COUNTY, VIRGINIA

GENERAL INFORMATION

Fairfax County was formed in 1742 from northern Prince William County. Today Fairfax County is comprised of the cities of Fairfax and Falls Church and the towns of Clifton, Herndon, and Vienna, in addition to 34 unincorporated communities. Together, these 37 communities are situated on 395 square miles of land, comprising 252,828 acres.[6] As of April 2009, the estimated population of the county was 1,037,605, with a population density of 2,455 people per square mile, making it by far the most populous jurisdiction in the Commonwealth of Virginia, with 13.1% of Virginia's population.[1] Fairfax is also the most populous jurisdiction in the Washington Metropolitan Area. Since 2000, population growth has increased by 7 percent and is expected to steadily increase over the next few decades. Fairfax County's adopted budget for fiscal year 2011 was $6.1 billion, which is larger than the budgets of four states (North Dakota, South Dakota, Vermont, and Wyoming).[1] Fairfax was the first county in the United States to reach a six-figure median household income, and has the second-highest median household income of any county in the United States with a population of 250,000 or more. Two international airports (Dulles International Airport and Ronald Reagan National Airport) share immediate proximity with Fairfax. Fairfax is also home to the headquarters of several national intelligence agencies as well as approximately half of the metropolitan area's Fortune 500 companies.

Figure 1. Fairfax County, Virginia

DEMOGRAPHIC INFORMATION

Ethnic Characteristics

Fairfax is one of the most ethnically diverse and thriving communities in Virginia[10]. The U.S. Census Bureau 2005-2007 American Community Survey reports that approximately 278,499 persons living in Fairfax are foreign born, which accounts for approximately 28% of the total population. Table 1 provides a summary of the ethnic composition of the county.

Table 1. Foreign-Born Population in Fairfax by Continent

Continent	All Persons	% of Foreign Born
Asia	140,161	50%
Latin America	83,868	30%
Africa	26,644	10%
Europe	24,296	9%
Other	3,530	1%
Total	278,499	100%

Source: U.S. Census Bureau 2005-2007; 2008 American Community Survey

Table 2 provides a further analysis of the ethnic composition of Fairfax for the period 1990-2010. The white demographic declined by approximately 30% over that period, but still represents two thirds of the total population of the county. All other ethnic groups showed significant increases, with the Asian/Pacific Islanders representing the most significant increase (107%) by a single distinct group.

Table 2. Race/Ethnic Composition of Fairfax Residents, 1990 – 2010

Race/Ethnic Origin	1990	2010	% Change
White	81.3%	62.7%	-29.67%
Black	7.7%	9.2%	19.48%
Asian/Pacific Islander	8.5%	17.6%	107.06%
American Indian/Alaska Native	0.2%	0.4%	100.00%
Other Race or Multi-Racial	2.3%	10.2%	343.48%
Hispanic (may be of any race)	6.3%	15.1%	139.68%

Source: U.S. Census Bureau, 1990 and 2000 Decennial Censuses and 2008 American Community Survey.

The 2008 American Community Survey conducted by the U.S. Census Bureau indicated that 35 percent of Fairfax's residents age five years and older spoke a language other than English at home. Fairfax County Public School information indicates that 44 percent of all elementary school students spoke a language other than English at home as of May 2009. These households containing elementary students who speak languages other than English at home form a very diverse group with more than 100 different languages being spoken. Table 3 provides a summary of the six most frequently spoken languages. All other languages combined represent the 29% that is not accounted for in the table.

Table 3. Languages Other Than English Spoken by Elementary School Students at Home

Language	# Students	% of All Students	% Non-English
Spanish	16,310	19	42
Korean	3,029	3	8
Vietnamese	2,557	3	7
Arabic	2,274	3	6
Urdu	1,729	2	4
Chinese/Mandarin	1,728	2	4

Source: 2008 American Community Survey

Not all households which speak a language other than English contain members who are immigrants. Data from the 2000 Census indicate that all of the household members were native-born U.S. citizens in 17 percent of households that spoke a language other than English at home.

Age Distribution

The median age of Fairfax residents is 39.7 years, with approximately 45% of the population being under the age of 35 (Table 4).

Table 4. Fairfax Age Distribution

Age Group	Females	Males	All Persons
Under 20 Years	13.0%	13.7%	26.7%
20 to 34 Years	8.1%	8.7%	16.8%
35 to 54 Years	16.8%	15.8%	32.6%
55 to 64 Years	7.2%	6.7%	14.0%
65 Years and Older	5.3%	4.6%	9.9%

Source: U.S. Census Bureau, 2008 American Community Survey.

Education

Fairfax residents tend to be more highly educated than the general U.S. population and are more likely to have internet access, as indicated in Table 5.

Table 5. Education Level and Internet Access

	Fairfax	Virginia	All U.S.
High School Graduates (Age 25 and Older)	83	75	69
College Graduates with a Bachelor's Degree or Higher (Age 25 and Older)	58	33	56
Households with Home Computers with Internet Access (2005)	88	68	62

Source: U.S. Census Bureau, 2008 American Community Survey.

FAIRFAX ECONOMIC INDICATORS

Employment and Household Income

The unemployment rate for Fairfax for December 2010 was 5.4% (Table 6). This is less than the national unemployment rate of 9.6% and the Virginia unemployment rate of 7.0% for the same period; however it represents an increase in unemployment since 2001.

Table 6. Employment and Unemployment Rate

Year	Total Employment	Unemployment Rate
December 2001	559,874	3.1%
December 2010	601,605	4.4%

Source: Virginia Employment Commission, monthly, not seasonally adjusted Labor Force, Employment and Unemployment data.

Median household income in Fairfax has risen significantly since 1997 (Table 7). In 2008, 4.8% of all persons residing in Fairfax were living below the poverty level, which is less than the national average of 5.8% or the Virginia average of 9.5%.

Table 7. Estimates of Median Household Income and Median Family Income

Year	Median Household Income	Median Family Income
1997	$72,000	$84,000
2008	$107,448	$126,900

Sources: Department of Systems Management for Human Services and U.S. Census Bureau, 1980, 1990 and 2000 Decennial Censuses 2001 (Note: Figures are rounded to the nearest $100.)

Housing

Approximately 50% of all Fairfax residents live in single family detached homes (Table 8). The average household size for 2008 was 2.69 persons.

Table 8. Number of Housing Units (2009)

Type Unit	# Units
Single Family Detached Units	191,640
Single Family Attached Units	98,789
Multifamily Units	104,127
Total Units	394,556

Sources: U.S. Census Bureau, 1970, 1980, 1990 and 2000 Decennial Censuses, 2001 to 2025 estimates and forecasts, Fairfax County Department of Systems Management for Human Services.

The median market value of all homes in Fairfax was $441,679 in 2009 (Table 9), which is more than the national average of $185,200. The average rental complex rate for 2009 was $1,375 per month.

Table 9. Median Market Value of Owned Homes (2009)

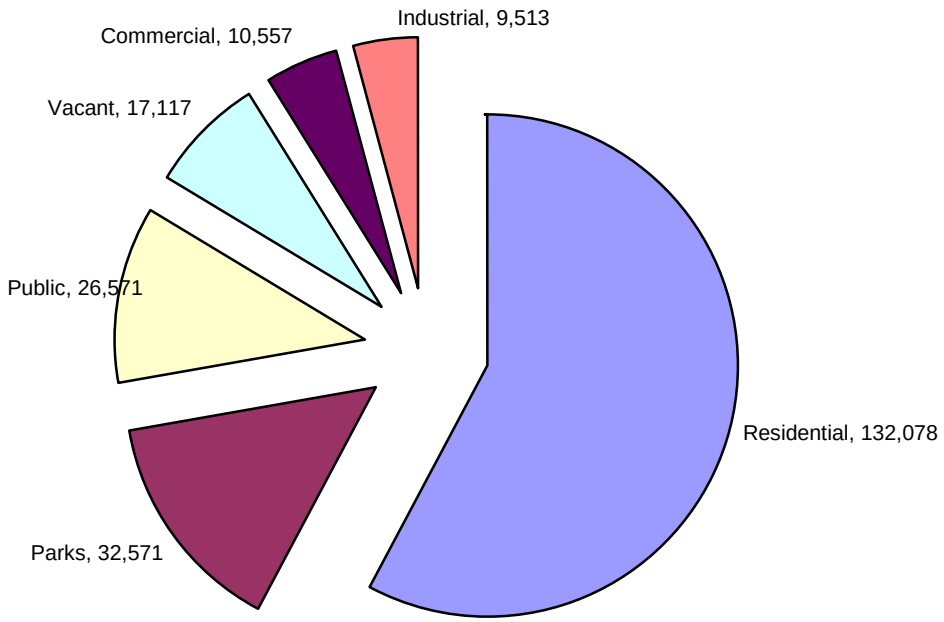
Type Housing Unit	Median Market Value	All U.S.
Single Family Detached Units	$550,167	
Single Family Attached Units	$341,626	
Multifamily Units	$239,338	
All Units	$441,679	$185,200

Source: Department of Systems Management for Human Services; U.S. Census Bureau

Land Use

Fairfax has 228,240 total acres of land, excluding areas in roads, water or small areas of land unable to be zoned or developed. Most of the land in the county (approximately 58%) is classified as Residential. (Figure 2)

Figure 2. Existing Land Uses in Fairfax County by Type Use and Total Acres



Source: Fairfax County Environmental Quality Advisory Council, 2009 Annual Report on the Environment

Much of the developable land in Fairfax has already been developed. In 2000, the Fairfax County Comprehensive Plan anticipated the supply of land planned for residential development would run out by the end of this century.[7] This "build-out" has caused the county to transition from a pattern of development on vacant land to one of redevelopment.[8] Despite limited land resources, the county's housing stock has increased through the addition of 80,585 new townhouses and multifamily units and the removal of 927 single-family homes since 1989.[7] Since 1990, the combined rate of development of apartments and townhouses doubled that of single-family houses.[7]

The build-out in Fairfax has also impacted natural spaces. Open space and natural habitat are continually decreasing in extent as a result of residential, commercial and road development. In 1980, vacant land accounted for 32.2 percent of the total land in Fairfax County; by 1990, this dropped to 19.5 percent and in 2004, to 11.3 percent.[8] In January 2009, only 7.3 percent of the county's land area was characterized by vacant and natural uses (Figure 2).[1] Loss of natural vegetative ground cover and the accompanying rise in impervious ground cover, such as cement

and asphalt, has led to increased stormwater run-off, which increases stream flow volume during storm events, degrades water quality, and adversely affects the ecological health of streams.[7] In June 2004, the Fairfax County Board of Supervisors adopted *Environmental Excellence for Fairfax County: a 20-Year Vision* (The Environmental Agenda) in an effort to promote natural spaces and environmentally healthy development.[1]

GOVERNANCE

Figure 3. Fairfax County Supervisory Districts

The Fairfax County government is one that consistently exhibits high quality performance. It is one of two jurisdictions nationwide to receive top scores in measures of quality local government in the latest Government Performance Project by Pew Charitable Trust.[1]

Virginia is a Dillon Rule State, which impacts the limits of authority that can be exercised by county government. The Dillon Rule as a concept is found in all states – meaning that apart from the power ceded to the federal government in the U.S Constitution, the state governments have all the remaining governmental authority. However, most states have adopted various types of "home rule" provisions that permit some or all of their local governments to undertake those governmental functions that are not specifically precluded by the state laws. Virginia has not provided such home rule authority to its local governments. This means that Fairfax has limited powers in areas such as raising revenue, and it cannot take certain actions without appropriate authority from the state, which limits revenue diversification options.[2] In interpreting the Dillon Rule, Virginia courts have concluded that the powers of local governments in Virginia are limited only to those powers that are specifically conferred on them by the Virginia General Assembly, those that come from a specific grant of authority, and those powers that are indispensable to the purposes of government.[1] An example of how the Dillon rule impacts the Fairfax environmental health program is the limitations placed on the local governments to impose restaurant fees and to regulate the installation of alternative onsite sewage disposal systems.

Fairfax County has an elected Board of Supervisors consisting of nine members elected by district (Figure 3), plus a chairman elected at-large. The Board establishes county government policy, passes resolutions and ordinances (within the limits of its authority established by the Virginia General Assembly), approves the budget, sets local tax rates, approves land use plans and makes appointments to various positions. The Board appoints a county executive, who manages the daily affairs of the county government and is responsible for the administration of all of the affairs of the county which the Board has authority to control.

Governmental and Special Authorities that Impact the Environmental Health Program

Board of Supervisors Environment Committee

The Environment Committee of the Board of Supervisors is a committee of the whole Board that convenes separately from normally scheduled Board meetings to consider environmental issues that affect the county.

Health Care Advisory Board (HCAB)

The HCAB is responsible for assisting the Board of Supervisors in the development of health policy for the County and for advising the Board on health and health related issues that may impact the community. It reviews and develops recommendations on county and regional health plans and reviews new or expanded health services or facilities in compliance with the Fairfax County Ordinance. The HCAB consists of eleven members--one appointed from each of the nine magisterial districts and two health care providers (usually physicians) appointed to serve at-large by the Chairman of the Board of Supervisors. Members serve four-year terms.

Environmental Quality Advisory Council (EQAC)

The EQAC is responsible for advising the Board of Supervisors on environmental matters through ongoing review of the quality of the County's physical environment and for advocating and promoting environmental preservation, protection, and enhancement. The EQAC consists of fourteen members - one member from each of the nine magisterial districts; one chairman at-large; one student; and three at-large representatives. Adult members serve 3 year terms and the student member serves a 1 year term.

Environmental Coordinating Committee (ECC)

The ECC is a collaborative interagency management committee that was established by the County Executive in 1999 to ensure an appropriate level of coordination and review of the county's environmental policies and issues. The ECC is also responsible for implementing the Board's Environmental Agenda. The Environmental Agenda was adopted in 2004 and provides long range statements of policy for growth and land use; air quality and transportation; water quality; solid waste; parks, trails and open space; and environmental stewardship. The Agenda was revised in 2007 to include policies regarding trees and climate change.

Multicultural Advisory Council (MAC)

The MAC was established in FY 2008 to provide guidance to the Health Director on health care issues that impact Fairfax's increasingly diverse communities. The MAC also serves as a sounding board to provide guidance to the environmental health program on the most effective ways to communicate environmental health information to our increasingly diverse communities.

HEALTH DEPARTMENT

The Fairfax County Health Department serves the community through a network of 15 offices and service sites located throughout the county and the cities of Fairfax and Falls Church[3]. The Health Department's main goal is to protect, promote and improve the health and the quality of life of Fairfax residents by addressing the following strategic goals:

- Prevent or minimize the impact of new and emerging communicable diseases and other public health threats.
- Assess community public health service needs and facilitate access to needed and/or mandated services.
- Employ and retain a skilled productive workforce that seeks to mirror the diversity of the community.
- Integrate and harness the use of proven technology to provide cost effective public health services

Underlying this strategic vision is the following core Health Department values[3]:

- Respect
- Integrity
- Customer Service
- Excellence
- Making a Difference

General Health Data:

The Robert Wood Johnson Foundation (RWJF) and the University of Wisconsin Population Health Institute (UWPHI) funded a county-by-county health status study in 2010 that ranked 132 localities throughout the state for a variety of health outcomes and health factors. The RWJF survey identified Fairfax County as the healthiest county in Virginia. Fairfax's rankings in each of the evaluative criteria are reflected in Table 10. Data provided in **bold print** indicates Fairfax County's rank in relation to the rest of the state ranked on a scale of 1 to 132, with 1 being the best in state, and 132 being the worst in the state.

Table 10. Fairfax County 2010 Robert Wood Johnson Foundation Study Ranking Report (N=132 Localities)

Health Outcomes			
Indicator	Measures (2001-2008 data)	Fairfax County	Virginia
Mortality	Premature Deaths per 100,000 population	3,693	6,872
Mortality Rank			**1**
Morbidity	Poor or fair health	8%	13%
	Poor physical health days	2.1	3.2
	Poor mental health days	2.1	3.2
	Low birthweight	7%	8%
Health Behaviors			
Indicator	Measures (2001-2008 data)	Fairfax County	Virginia
Tobacco Use	Adult smoking	13%	20%
Diet & Exercise	Adult obesity	22%	25%
Alcohol Use	Motor vehicle crash death rate per 100,000 population	7	13
	Binge drinking	16%	14%
High Risk Sexual Behavior	Chlamydia rate per 100,000 population	123	322
	Teen birth rate per 1,000 female population	18	37
Health Behaviors Rank			**2**
Clinical Care			
Indicator	Measures (2001-2008 data)	Fairfax County	Virginia
Access to Care	Uninsured adults	15%	15%
	Primary care provider per 100,000 population	159	124
Quality of Care	Preventable hospital stays per 100,000 population	49	68
	Diabetic screening	81%	82%
	Hospice use	40%	26%
Clinical Care Rank			**15**

Physical Environment			
Indicator	Measures (2001-2008 data)	Fairfax County	Virginia
Environmental Quality	Air pollution-particulate matter days	8	1
	Air pollution-ozone days	29	2
Built Environment	Access to health foods	47%	35%
	Liquor store density per 100,000 population	0.4	0.5
Physical Environment Rank (See "Comment" under Air Pollution indicator, page 26)			**132**
Overall Health Factors Rank			**7**

Source: County Health Rankings: Mobilizing Action Toward Community Health; Robert Wood Johnson Foundation and the Wisconsin Population Health Institute; the full report can be seen on their web site at www.countyhealthranking.org

The birth rate for Fairfax was 15.1 per 1,000 population, which was higher than the state rate of 13.7 per 1,000[14]. Of the total number of live births in Fairfax, 7% were low birth weight babies, compared to 8% on the state level.[14] In terms of prenatal care, 83.9% percent of the pregnant population in Fairfax County began prenatal care within the first 13 weeks compared to 84.6% percent of the pregnant population in the state. Infant mortality rates were significantly lower in Fairfax County compared to Virginia state rates, with a rate of 3.7 per 1,000 live births in Fairfax and 6.7 per 1,000 in the state.[14] Overall, Fairfax County has higher birth rates, lower rates of low birth weight babies and lower infant mortality rates compared to the state, which are all positive indicators of the community's health. However significant disparities exist between whites and blacks in the incidence of low birth weight and infant mortality (Tables 11 and 12), thus indicating that even in a jurisdiction such as Fairfax with high socioeconomic status, significant health disparities can exist.

Table 11. Infant Deaths by Age and Race, Fairfax County, 2009

	Count				Rate/1,000 resident live births			
	White	Black	Other	Total	White	Black	Other	Total
Early Infant Deaths (<1 day old)	28	9	6	43	2.7	5.8	1.8	2.8
Neonatal Deaths (<28 days old)	43	12	9	64	4.1	7.7	2.6	4.1
Infant deaths (28-364 days old)	56	20	11	87	5.3	12.8	3.3	5.6

Source: Virginia Department of Health Statistics

Table 12. Low Birth Weight Rate by Race, 2005-2008

Percentage of Live Births

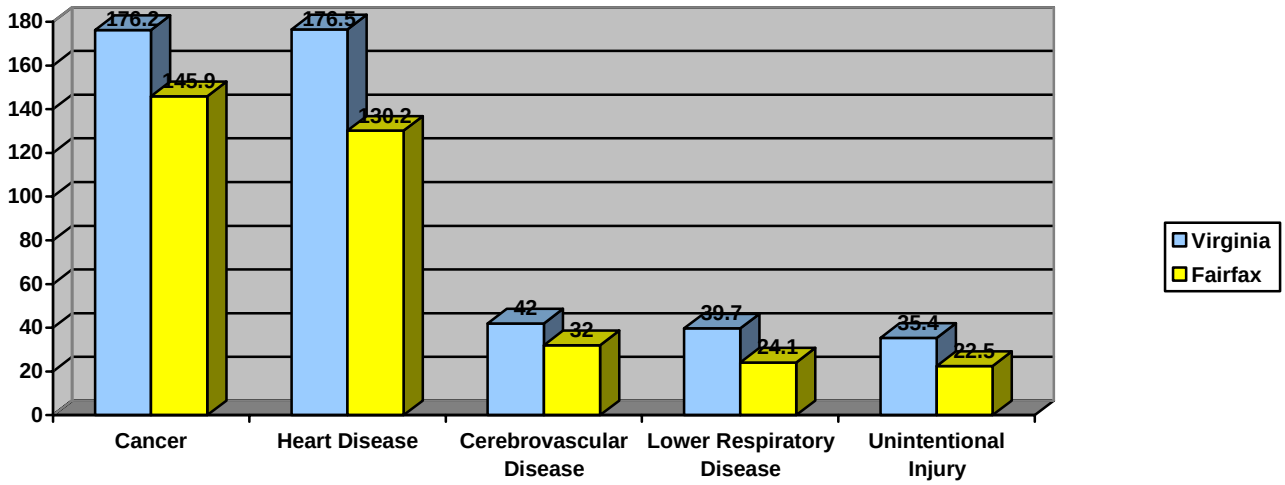
	2005		2006		2007		2008	
	% White	% Black	% White	% Black	% White	% Black	% White	% Black
US	7.16	13.59	7.21	13.59	7.3	13.9		
Virginia	7.0	12.8	7.0	12.9	7.1	13.8	7.1	13.0
Fairfax County	6.0	10.5	6.1	10.2	6.8	11.2	6.1	10.2
Fairfax City	5.6	28.6	7.0	15.8	7.7	12.5	7.9	8.3
Falls Church	12.0	0.0	6.7	0.0	7.1	50.0	5.1	0.0

Source: Virginia Department of Health Statistics (Note: Fluctuations in the observed low birth rate for blacks in the City of Falls Church are due to the relatively low numbers seen annually in that jurisdiction.)

According to demographic indicators for 2008, 10.8% percent of the Fairfax population did not have health insurance.[15] This translates to about 112,935 residents who are uninsured.[15]

The age-adjusted death rate in Fairfax County for 2008 was 587.5 per 100,000 people, compared to the state age-adjusted death rate of 758.0 per 100,000.[14] The five leading causes of death in Fairfax County are malignant neoplasms, cardiovascular heart disease, cerebrovascular disease (such as stroke), chronic lower respiratory diseases (such as asthma), and unintentional injuries (Figure 4).[14]

Figure 4: Age Adjusted Death Rates per 100,000, Fairfax County and State of Virginia. 2008: Five Leading Causes of Death



DIVISION OF ENVIRONMENTAL HEALTH SERVICES:

The Division of Environmental Health Services (DEH) provides high quality services that protect the public health through a variety of regulatory activities. These activities include permitting, regulating, and inspecting onsite sewage disposal systems, private water supplies, food service establishments, milk plants, swimming pool facilities, tourist establishments, summer camps, campgrounds, tattoo parlors, and religiously exempt child care centers. DEH staff also work to eliminate public health or safety menaces caused by rats, trash, and insect infestations, and seek to control vector borne diseases through mosquito and tick surveillance activities. The DEH also conducts an active public education program through local community events and its Environmental Health Ambassador program. These services are provided through a budget of approximately $5,000,000 and a staff of 55 Environmental Health Specialists, 10 Administrative Support Specialists, and one Business Analyst (Table 13). Six staff positions were lost between FY 2008 and FY 2010 as a result of a mandated Reduction in Force.

Table 13. Authorized Staffing Levels and Budget Expenditures, FY 2009-2011

Category	FY 2008 Actual	FY 2009 Actual	FY 2010 Actual	FY 2011 Adopted Budget Plan
Authorized Positions/Staff Years	72/72	68/68	66/ 66	66/ 66
Total Expenditures	$5,303,967	$4,492,064	$5,127,731	$5,108,530

Program staff provides the array of services mentioned above at a cost of less than $6.00 per capita per year (Table 14).

Table 14. Per Capita Cost for Environmental Health Services

Program Activity	Per Capita Cost *
Community Health and Safety	$1.12
Disease Carrying Insects	$1.20
Food Safety	$2.30
Onsite Sewage and Water	$1.09
Total Program Per Capita Cost	$ 5.71

* Per capita costs based on actual costs reported for FY 2010.

Impact of Mandated Budget Reductions

Budget reductions experienced in fiscal years 2009 and 2010 resulted in the loss of two programs: Air Monitoring and Environmental Hazards Investigation. The loss of these two programs resulted in the loss of six full time merit positions (4 in Air Monitoring and 2 in Environmental Hazards Investigation). Responsibility for conducting the air monitoring program was assumed by the Virginia Department of Environmental Quality (DEQ). Services previously provided by Environmental Hazards Investigation are now being done by either DEQ or by private contractors. In addition to the six positions that were permanently lost, the program has a mandate to hold an additional eight funded positions vacant indefinitely to further cover budget shortfalls.

Program Areas

The Ten Essential Environmental Health Services provide the basis for evaluating the effectiveness of an environmental health program. Briefly summarized, an effective environmental health program must ensure access of all residents to the following essential services:

Essential Service #1: Monitor environmental health status to identify and solve community environmental health problems.

This service requires that the program have the expertise and tools necessary to effectively evaluate community environmental health status, address identified gaps, and communicate that evaluation to members of the public.

Essential Service #2: Diagnose and investigate environmental health problems and health hazards in the community.

This service requires that the local program have access to the epidemiological and diagnostic tools and expertise necessary to effectively collect and analyze health risk data.

Essential Service #3: Inform, educate, and empower people about environmental health issues.

This service requires that the local program establish formal relationships within the community to enhance community engagement in the environmental health system.

Essential Service #4: Mobilize community partnerships to identify and solve environmental health problems.

This service requires that the local program have an efficient method for engaging all elements of the community in the decision making process.

Essential Service #5: *Develop policies and plans that support individual and community environmental health efforts*.

This service requires that the local program have a systematic process for conducting program planning and evaluation that ensures that all members of the community have equal access to needed environmental health services.

Essential Service #6: *Enforce laws and regulations that protect health and ensure safety*.

This service requires that the local program provide timely, consistent, and equitable enforcement of environmental health laws, regulations, and ordinances.

Essential Service #7: *Link people to needed environmental health services and assure the provision of environmental health services when otherwise unavailable*.

This service requires that the local program have an active outreach and referral mechanism in place to identify populations with limited access or barriers to services and link constituents to needed services.

Essential Service #8: *Assure a competent environmental health workforce*.

This service requires that the local program have a system in place to ensure the efficient recruitment, development, and evaluation of the environmental health workforce.

Essential Service #9: *Evaluate the effectiveness, accessibility, and quality of personal and population based environmental health services*.

This service requires that the local program include all stakeholders, including the public and other participating agencies, into a systematic program evaluation process.

Essential Service #10: *Research for new insights and innovative solutions to environmental health problems and issues*.

This service requires that the local program encourage environmental health staff to seek innovative solutions for identifying and solving environmental health problems, thereby promoting environmental public health and as a means for developing a more effective environmental health workforce.

Program Overview:

The following summaries describe how the Fairfax County DEH approaches each of these essential services in the provision of services to its constituents.

Air Quality:

As stated previously, the Air Monitoring program was terminated by the mandated budget reductions in the budgets for fiscal years 2009 and 2010 and responsibility shifted to the state. Although the field monitoring positions were lost, the Air Quality Program Manager Position was retained. The Manager continues to be active in regional air pollution control activities through participation in the Metropolitan Washington Area Air Quality Council's Technical Advisory Group.

Community Health and Safety:

The Community Health and Safety (CHS) program is responsible for enforcing Chapter 46 (*Health or Safety Menaces*) and Chapter 69.1 (*Water Recreation Facilities Ordinance)* of the Fairfax County Code of Ordinances and for protecting public health through the permitting, regulating, and inspecting of swimming pools, tourist establishments, summer camps, campgrounds, tattoo parlors, and religiously exempt child care centers.

Responsibility for enforcing the Fairfax County Property Maintenance Code was shifted from the Health Department to the Department of Planning and Zoning in fiscal year 2007, which resulted in a significant reduction in the number of complaints investigated by CHS staff (Table 15). Staff has shifted their focus to devote more activity to permitted establishments and to increase their responsiveness to complaints regarding bed bugs, rodents, and trash (Table 16).

Table 15. Total CHS Complaint Responses, 2007-2009

Year	Number of Complaints
2007	2,459
2008	1,339
2009	1,451

Source: Fairfax Inspection Database Online

Table 16. Percentage of CHS Complaints Responded to Within 3 Days, 2007-2009

Year	Percent Responded to Within 3 Days
2007	60
2008	65
2009	70

Source: Fairfax Inspection Database Online

CHS program activities are conducted by 10 staff when fully staffed. The Section currently has 8 staff.

1 Environmental Health Supervisor

The Supervisor is responsible for managing the daily function of the section and providing general program guidance to subordinate staff.

2 Environmental Health Seniors

These staff members have responsibility for providing high level technical support in enforcing Chapter 46, inspecting the county's 636 public swimming pools, and inspecting the other permitted establishments cited above.

7 Environmental Health Specialists when fully staffed. The Section currently has 5 Specialists.

These staff members have responsibility for conducting the field-based activities of the section, including conducting complaint investigations, educating homeowners, tenants, and property owners in the prevention of community environmental health hazards, and responding to request for information from the pubic.

Food Safety:

The Food Safety program is responsible for enforcing Chapter 43.1 of the Fairfax County Code (*Food and Food Handling)*. Staff conducts inspections in more than 3,000 restaurants throughout Fairfax as well as approximately 1,000 temporary events over the course of each year. Program staff members conduct approximately 8,000 inspections per year, which equates to approximately 470 inspections per staff member per year when fully staffed. At the current staffing level, staff is conducting approximately 570 inspections per staff member. The Food and Drug Administration's National Voluntary National Retail Food Regulatory Program Standards, Standard 8 recommends a ratio of one inspector for every 350 required inspections.

Program staff members also conduct an aggressive community outreach and education program that provides food safety tips for restaurant owners and operators as well as consumers.

The state requires that each public food establishment be inspected at least once every six months. The Food Safety program transitioned to a risk based inspection process in FY 2009, which assigns the inspection frequency based on the relative risk of the establishment to the public. Risk is assigned based on the complexity of the food being prepared and the inspection history of the individual restaurant. High risk establishments (which account for approximately 50% of all the restaurants in the county) are inspected three times per year; medium risk establishments (approximately 25% of the total) are inspected twice per year; and low risk establishments (approximately 25% of the total) are inspected once per year. Ninety-five percent of all restaurants were inspected in accordance with their assigned risk-based frequency in FY 2010.

Food Safety program activities are conducted by 23 staff when fully staffed. The Section currently has 20 staff.

2 Environmental Health Supervisors

The Supervisors are responsible for managing the daily function of the section and providing general program guidance to subordinate staff. Each Supervisor is responsible for the direct supervision of 2 Environmental Health Seniors and 8 or 9 Environmental Health Specialists.

2 Environmental Health Seniors

These staff members have responsibility for providing high level technical support to field staff and for ensuring that all field inspectors maintain their required standardization credentials

1 Environmental Health Senior

This staff member has responsibility for conducting food borne illness investigations and conducting routine inspections and monitoring activities at the Shenandoah Pride Dairy

1 Environmental Senior

This staff member has responsibility for community outreach and for conducting change of ownership inspections.

17 Environmental Health Specialists when fully staffed. The Section currently has 14 Specialists.

These staff members have responsibility for conducting risk-based food safety inspections of approximately 3,200 restaurants throughout Fairfax, providing food safety training to restaurant staff and the public, and for responding to requests for information from the public.

Onsite Sewage & Water:

The Onsite Sewage and Water (OSW) program is responsible for enforcing Chapter 68.1 of the Fairfax County Code (*Individual Sewage Disposal Facilities*) and Chapter 70.1 (*Private Water Well Ordinance*), which encompasses approximately 24,000 onsite sewage systems and 14,000 private drinking water wells throughout the County. Staff resources have transitioned from evaluating the installation of simple conventional sewage disposal systems in good soils to highly technical alternative sewage disposal systems installed on difficult sites and in marginal to poor soils. Staff members continue to be focused on the repair and replacement issues associated with older systems.

The scarcity of developable land has affected the number of onsite sewage disposal system (SDS) permit applications, which have declined by approximately 80% over the past 10 years (Table 17). The loss of developable land has also resulted in a significant increase in the utilization of high technology alternative onsite sewage disposal systems, which allow homes to be built on lots that were previously rejected due to substandard soils. For example, only 8% of all SDS permit approvals granted for the year 2000 were for alternative systems. However 52% of all SDS permits issued in 2010 were for alternative systems. Technological advances made in recent years in the onsite sewage treatment industry purport to produce treated effluent of sufficient quality to permit systems to be installed on lots that would not be suitable for

conventional sewage treatment technology. Many of these alternative systems have not been subjected to a sufficient level of field-testing to confirm their reliability under actual use conditions. Approving large numbers of experimental alternative systems could potentially result in adverse impact to surface and ground water in the county should these experimental systems fail in significant numbers under actual use conditions.

Table 17. Total Number of Sewage Disposal Systems Permits Issued, 2000-2009

Year	Number of Permits Issued
2000	504
2001	313
2002	203
2003	205
2004	129
2005	75
2006	112
2007	140
2008	138
2009	86

Source: Fairfax Inspection Database Online

OSW program activities are conducted by 10 staff when fully staffed. The Section currently has 8 staff.

1 Environmental Health Supervisor

The Supervisor is responsible for managing the daily function of the section and providing general program guidance to subordinate staff.

2 Environmental Health Seniors

These staff members have responsibility for providing high level technical support to subordinate field staff in enforcing Chapters 68.1 and 70.1.

7 Environmental Health Specialists when fully staffed. The Section currently has 5 Specialists.

These staff members have responsibility for conducting the field-based activities of the section, including conducting complaint investigations, educating homeowners, tenants, and property owners in the prevention of community environmental health hazards related to onsite sewage and water, and responding to request for information from the pubic.

Technical Review and Information Resources:

The Technical Review and Information Resources (TRIR) Section is responsible for providing plan review services to members of the commercial community and the general public as part of the permitting process. They also conduct soil site evaluations to determine site suitability for onsite sewage systems, provide technical support to DEH and Health Department web sites, and provide Geographic Information System (GIS) mapping services to the DEH and the Health Department. The TRIR provides these services with a staff of 7 people:

1 Environmental Health Supervisor

The Supervisor is responsible for managing the daily function of the section and providing general program guidance to subordinate staff.

2 Environmental Health Seniors

These staff members are responsible for doing plan reviews for swimming pools, restaurants, hotels, and other permitted facilities.

1 Environmental Health Senior

This staff member is responsible for doing plan reviews of onsite sewage disposal systems.

1 Environmental Health Senior (Soil Scientist)

This staff member is responsible for conducting soil evaluations to determine the suitability of the proposed site to support an onsite sewage disposal system.

1 Environmental Health Senior

This staff member is responsible for supporting the Division's web based activities.

1 Environmental Health Senior

This staff member is responsible for providing high level technical support for the Division's GIS mapping activities.

Administrative Support Section:

The DEH employs an administrative support pool in lieu of assigning administrative support staff directly to individual programs. This allows the flexibility to position staff as necessary to address shifting needs in the technical programs. The Administrative Support program is responsible for providing the full range of clerical support activities, as well as serving as the customer service front line for the DEH. They are also responsible for maintaining all of the DEH business processes and computer systems. The Administrative Support program provides these services with a staff of 11 people:

1 Business Analyst

This staff member is responsible for managing all of the Division's business processes, including managing the data processing and communication systems, maintaining the Division's inventory of electronic equipment, providing financial reports to program managers as necessary, and for supervising the Administrative Assistant V.

1 Administrative Assistant V Supervisor

This staff member is responsible for providing direct supervision of 9 subordinate administrative staff.

3 Administrative Assistant III

These staff members are responsible for providing general administrative support to the Division and for providing technical support and assistance to the 6 Administrative Assistant II's.

6 Administrative Assistant II

These staff members are responsible for providing general administrative support to the Division, including serving at the "first line" point of contact for members of the community who call the Health Department seeking assistance.

Disease Carrying Insects Program:

The Disease Carrying Insects Program (DCIP) is funded by a special tax levy under Fund 116, which funds the overall Integrated Pest Management Program (Table 18). Fund 116 is part of the Department of Public Works and Environmental Services (DPWES) budget, and as such is fiscally separate from the Health Department. The DCIP was established in fiscal year 2003 in response to an outbreak of West Nile Virus illness in the Washington, D.C. metropolitan area that resulted in 13 cases of illness and one death. Since the time of the program's inception, its emphasis has been broadened to include a robust tick surveillance program in response to heightened awareness and concern for Lyme disease.

DCIP activities include surveillance and testing for all insect borne diseases, particularly West Nile Virus and Lyme disease and conducting community outreach and education to advise residents what they can do to protect themselves against insect borne diseases. The DCIP also manages a contract with Clark Mosquito Company to conduct mosquito control activities, which includes the treatment of more than 100,000 catch basins annually for mosquito larvae and doing targeted spraying for adult mosquitoes when the possibility for the transmission of adult cases of West Nile Virus is high.

Table 18. Authorized Staffing Levels and Budget Expenditures for Disease Carrying Insects Program, FY 2009-2011

Category	FY 2009 Actual	FY 2010 Actual	FY 2011 Adopted Budget Plan
Authorized Positions/Staff Years	3/3	3/3	5/5
Total Expenditures	$1,336,498	$1,325,469	$2,220,535

DCIP program activities are conducted by 5 full time and 6 seasonal staff:

1 Environmental Health Supervisor

The Supervisor is responsible for managing the daily function of the section and providing general program guidance to subordinate staff.

1 Environmental Health Senior

This staff member is responsible for community outreach and education and for providing field support to the Environmental Health Specialists.

1 Environmental Health Senior

This staff member is responsible for providing high level technical support to the Environmental Health Specialists and Environmental Health Technicians.

2 Environmental Health Specialists when fully staffed. The Program currently has only one Specialist.

These staff members are responsible for conducting routine surveillance activities and for providing information to the public on preventing insect borne disease.

6 Seasonal Environmental Health Technicians

These staff members are responsible for conducting mosquito and tick surveillance from May through September of each year.

1 Administrative Support Specialist

This staff member is responsible for providing administrative and some limited field support to the Program.

Environmental Health Monitoring and Surveillance Systems

The Pew Environmental Health Commission issued a report in 2000 calling for a systematic, coordinated public health approach toward the surveillance of environmental hazards, exposures and disease (PEW Environmental Health Commission report *America's Environmental Health Gap: Why the Country Needs a Nationwide Health Tracking Network*; (http://healthyamericans.org/reports/files/healthgap.pdf). The report described information gaps and data in government programs that prevent epidemiologists and other scientists from fully understanding relationships between environmental exposures and disease. In response to the Pew Commission's recommendation, the Centers for Disease Control and Prevention (CDC) created the Environmental Public Health Tracking Network (EPHTN) to integrate data from environmental hazard monitoring, human exposure and the health effects surveillance into a network of standardized electronic data that will provide valid scientific information on environmental exposures and adverse health conditions, as well as the possible spatial and temporal relations between them (http://ephtracking.cdc.gov/showHome.action). The CDC made program implementation grants available to several States to implement the EPHTN, but Virginia is not currently a participant.

The Fairfax County DEH has access to the usual epidemiological databases at the state and local level on various environmentally related diseases and hazards, but these systems do not provide the type of integrated analysis that will enable the kind of coordinated, systematic approach suggested in the Pew report.

ENVIRONMENTAL HEALTH INDICATORS

The Health Department hosted a stakeholder conference in October 2009 that was comprised of representatives from government, academia, industry, and the community. The group was charged with developing a general statement on the environmental health status of Fairfax and establishing a set of model indicators that would be used to build this profile. The following points describe the general community perception of environmental health status as determined by the stakeholder group:

- The public is generally satisfied with environmental health services that are provided by the Health Department.
- The public generally thinks their environmental health status is good, but there is frustration about the unknown health effects of traffic and urbanization.
- The environmental health system is poorly understood by the general public and within the overall county structure. This lack of understanding is exacerbated by the fact that there is no "face" of environmental health with which the pubic generally identifies.

The next challenge presented to the stakeholder group was to select a set of environmental health indicators and measures that would effectively convey the actual community environmental health status to the public in the form of this Community Environmental Profile. The following

indicators that were used in developing this Profile were selected by the group from a set of model indicators identified by the Centers for Disease Control and Prevention (http://www.cdc.gov/nceh/indicators/default.htm).

Topic Area: Air, Ambient (outdoor):

Indicator: Criteria pollutants in air

Measure: Annual high levels of criteria pollutants

Status: The U.S. Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter of 10 micrometers (PM_{10}) and 2.5 micrometers ($PM_{2.5}$).[26] Fairfax County has shown significant progress in addressing criteria air pollutants over the last 20 years, and is currently in attainment for all of the criteria pollutants with the exception of ozone.

Fairfax County adopted the U.S. Cool Counties Stabilization Initiative (Cool Counties) on July 16, 2007 (http://www.fairfaxcounty.gov/living/environment/coolcounties/declaration.htm). The Cool Counties initiative aims to reduce green house gas (GHG) emissions by 80% by the year 2050 through an annual 2% reduction. Although the effort to control green house gas emissions isn't directly linked to criteria air pollutants, the strategies used to reduce GHG will also have a significant impact on efforts to reduce the level of ozone. The county plans to meet these goals by reducing motorized transportation and increasing the use of more environmentally friendly vehicles, increasing efficiency of land use patterns, utilizing renewable energy, and promoting energy efficiency for county government activities as well as by members of the general public.

Indicator: Unusual or unhealthy environmental conditions

Measure: Ambient ozone concentration that exceeds the safe level

Status: The NAAQS for a maximum 8-hour average for ozone was reduced from 0.08 ppm to 0.075 ppm on May 27, 2008. EPA has designated the Washington Metropolitan area (which includes Fairfax County) as a moderate non-attainment area for the 8-hour NAAQS for ozone (Table 19). Significant progress in reducing the 8-hour ozone concentration has been made since 2000. The number of ozone exceeding days has decreased from 24 to 8 days, and the overall levels of ozone are decreasing (Table 20). In spite of this progress, Northern Virginia continues to have the highest ozone levels in the state (See Table 10, and the PEW Environmental Health Commission report *America's Environmental Health Gap: Why the Country Needs a Nationwide Health Tracking Network*).

Table 19. Ozone 3-year average concentration for Fairfax County

(Maximum Allowable 8-Hour Ozone Concentration = 0.075 ppm)

Monitor Location	2006	2007	2008	3-Year Average
Lee Park (State owned monitor; still collecting data)	.087	.085	.085	.085
McLean (County owned monitor; taken off line July 1, 2010)	.088	.083	.080	.083
Chantilly (County owned monitor; taken off line July 1, 2010)	.081	.078	.078	.079
Annandale (County owned monitor; taken off line July 1, 2010)	.085	.084	.082	.083
Mt. Vernon (County owned monitor; taken off line July 1, 2010)	.088	.088	.085	.087

Source: Virginia Department of Environmental Quality

Table 20. Maximum 8-Hour Ozone Concentration Observed within Fairfax County, 2000-2010

Year	Maximum Concentration *
2000	0.125
2001	0.127
2002	0.158
2003	0.123
2004	Not Available
2005	0.098
2006	0.126
2007	0.103
2008	0.103
2009	0.080
2010	0.083

Source: Virginia Department of Environmental Quality

* Value presented represents the highest 8-hour value recorded from any monitor in the county for the year indicated.

Comment: The RWJF/UWPHI survey ranked Fairfax County 132nd out of 132 jurisdictions statewide for overall physical environment. That low ranking was due to the fact that Fairfax's air quality was rated as the poorest in the state due to being in non-compliance with the particulate and ozone standards. Subsequent to the RWJF/UWPHI report, Fairfax has come into compliance with the particulate standard, but continues to be in non-compliance with the ozone standard. The major contributors of ozone in Fairfax are:

- People driving increasingly more miles, in part because of sprawling development patterns.
- More vehicles on the road due to the population increases, interstate transit, increased affluence and families owning more vehicles, and limited transit options.
- People driving more highly polluting sport utility vehicles, including pickups and minivans, instead of lower-emitting vehicles.
- Industrial emissions produced elsewhere and transported into the area. Studies conducted by the Maryland Department Environmental Protection and the University of Maryland (http://www.mde.state.md.us/assets/document/AirQuality/BALT_OZONE_SIP/Appendix_G6.pdf) have estimated that approximately 40-60% of the ozone measured in Fairfax comes from outside the Washington D.C. metropolitan area.

Fairfax is working diligently with governmental partners in the Washington Metropolitan region and private groups such as Clean Air Partners, but the full resolution of the problem is clearly beyond the ability of local efforts to correct. Addressing these issues will require the concerted efforts of regional governments and national policy changes.

Indicator: Unusual pattern of asthma events

Measure: Incidence of asthma

Status: The rate of lifetime asthma in adult Virginians has steadily increased since 2000, from 10.5 percent to 14.1 percent, mirroring national trends, though Virginia rates exceed the national rate. Current asthma rates for adult Virginians have increased slightly from 7.1 percent in 2000 to 9.3 percent in 2008, a trend similar to the overall U.S. Childhood asthma rates have experienced a steady increase from 9.0 percent in 2004 to 9.6 percent in 2008, vacillating from a low in 2007 of 7.7 percent to a high of 10.3 percent in 2006. (National Center for Chronic Disease Prevention and Health Promotion; Behavioral Risk Factor Surveillance System; http://cdc.gov/brfss)

The prevalence of asthma in Fairfax County is lower than what is being seen statewide for Virginia (Table 21). An analysis of Virginia Health Information (VHI) data for the period from 1999 to 2005 showed that asthma hospitalizations rates (crude rates) decreased 15 percent from 155.3 per 100,000 to 131.5 per 100,000 (Figure 5). Asthma hospital discharges for Fairfax County were significantly lower than what was seen statewide (Table 22).

Table 21. Current Asthma Among Adults 18+ by Health District; Virginia, 2007-2008

	Percent
All Virginia	9.3
Fairfax County	7.0

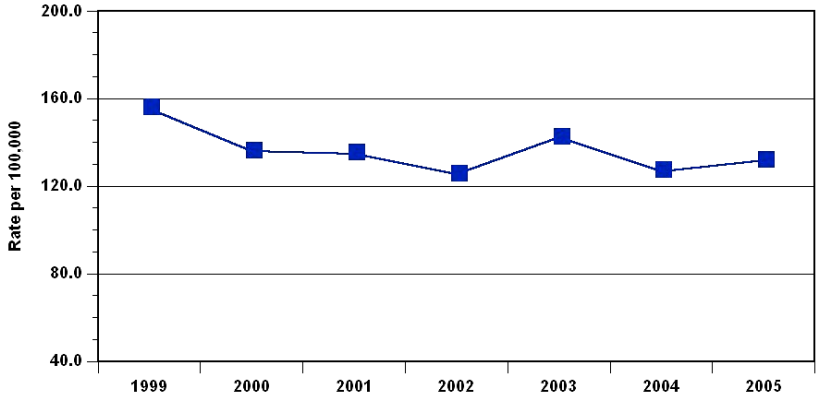
Source: Virginia Behavioral Risk Factor Surveillance System, 2005

Table 22. Asthma Hospital Discharge Rates by Health District, Virginia, 2005

	Hospitalizations	Rate per 100,000
All Virginia	9,955	131.5
Fairfax County	682	65.6

Source: Virginia Health Information, 2005. *Asthma hospitalization where the primary diagnosis was asthma (ICD-9-CM codes 493.0-493.9). ** Crude Rates.

Figure 5. Asthma Inpatient Hospitalizations, Virginia 1999-2005



Source: Virginia Health Information, 2005. * Asthma hospitalization where the primary diagnosis was asthma (ICD-CM-9 codes 493.0-493.9). ** Crude Rates.

Comment: We will need to research the data more deeply to determine if one segment of the community is disproportionately impacted by asthma and look for potential environmental triggers that could be the reason for any disproportional representation.

Indicator: **Motor Vehicle Emissions**

Measure: **Vehicle miles driven per capita**

Status: Total Vehicle Miles Traveled (VMT) has increased in Fairfax County by 7.2% from 2006-2008, compared to a 3.6% increase statewide. VMT for Fairfax County was 26,438,703 miles in 2009, which equates to approximately 25.4 miles per capita per year.

Fairfax County accounts for approximately 12% of the total VMT for the State of Virginia, but only contains 4% of the total roadway mileage.

Comment: The Cool Counties initiative seeks to address the issues of vehicle miles traveled per capita (http://www.fairfaxcounty.gov/living/environment/coolcounties/declaration.htm). Increasing the total roadway mileage in the county will reduce the amount of idling cars stuck in traffic, but getting more cars off the road and lowering the VMT will have the most significant impact on the region's ozone problem.

Indicator: Programs that address motor vehicle emissions

Measure: 1. Proportion of county employees who telework

Status: As of August 2010, the county achieved the regional goal of having at least 20% of the eligible workforce teleworking at least one day per week.

2. Percentage of county fleet that currently uses either alternative or advanced technology (hybrid) fuels.

Status: The Fairfax County fleet now includes 53 Toyota Priuses, 55 Ford Escape Hybrids, three Ford Fusion Hybrids and one Freightliner M2-106 dry cargo van. The county operates one plug-in hybrid electric vehicle (PHEV), a modified Toyota Prius, which carries an additional, larger battery pack that is recharged from grid power. Fuel economy is improved as part of the fuel requirement is shifted to the electrical grid, where energy cost is equivalent to about 75 cents per gallon of gas. The Division of Vehicle Services continues to seek grant funding for further exploration of hybrid and electric drive vehicles. As other prototype or early production vehicles become available, DVS will consider whether to conduct demonstrations with those vehicles.

Through fiscal year 2007, the county was able to fund the incremental cost of fleet hybrid drive vehicles through the Vehicle Replacement Fund. However budgets adopted subsequent to fiscal year 2007 have severely limited the County's ability to meet the incremental capital cost of production hybrid vehicles. The Ford Escape Hybrid is the only such vehicle on state contract. Its incremental cost is now $11,000. Ford Fusion Hybrids carry a similar cost increment. Incremental cost of the plug-in Hybrid-Electric School Bus is $103,000 and of the hydraulic "launch assist" refuse truck is about $50,000. The County will look to Energy Efficiency and Conservation Block Grant funding to cover increments for the first school bus and the first refuse collection truck.

Comment: The county's current fiscal situation will impede its efforts to upgrade its fleet to hybrid vehicles.

Indicator: **Availability of mass transit**

Measure: **Proportion of population who choose personal transportation alternatives.**

Status: Approximately 72% of Fairfax commuters ride alone, 11% carpool, and 9% take public transportation. Fairfax is one of the most congested areas in the United States. This indicates the majority of residents opt to commute by vehicle rather than through the use of public transportation.

Comment: The county is making progress in its attempt to address the mass transportation issue. For example, the county has partnered with the Washington Metropolitan Area Transit Authority to extend Metro lines into Fairfax County over the next decade.[39] Further progress could be realized by exploring options for potential partnerships with local businesses in the county to provide incentives for employees for using the Metro.

Topic Area: Air, Indoor

Indicator: **Tobacco smoke in homes with children**

Measure: **Proportion of children residing in households with adult smokers.**

Status: The Virginia Campaign for Tobacco Free Kids report for 2007 cited the following national statistics: (produced by the Virginia Foundation for Healthy Youth; http://www.virginiaasthma.org/documents/Asthma%20and%20secondhand%20Smoke_Virginia_Final.pdf):

- 280 children die each year from complications due to cigarette smoke.
- 300 children are injured each year from cigarette related burns and fires.
- More than one million children suffer from a smoking related illness.
- 152,000 Virginia children who are currently living will die from smoking related causes.

Data are not available for Fairfax County, but the Virginia Youth Tobacco Survey for 2007 reported that 38% of middle school students and 34% of high school students currently live in a home where somebody smokes. The proportion of students who live with a smoker stayed relatively stable from 2007-2009 across all races, with Hispanic students reporting the lowest rate (30%) of students living with a smoker. (Virginia Foundation for Healthy Youth; http://www.virginiaasthma.org/documents/Asthma%20and%20secondhand%20Smoke_Virginia_Final.pdf)

Comment: Secondhand tobacco smoke is a proven trigger for childhood asthma, which could account for the asthma rates presented previously. The lack of reliable data will need to be addressed in order to adequately address this issue.

Topic Area: Community Health and Safety

Indicator: **Compliance with standards for community health and safety.**

Measure: **Number of Notices of Violation (NOV) for noncompliance with the Fairfax County Health or Safety Menace Code.** (Chapter 46, *Health or Safety Menaces,* Fairfax County Code)

Status: A total of 208 Notices of Violation were issued during 2010. The most commonly cited violations for which Notices were issued were for improper waste disposal (68 separate citations), rodent infestation (32 separate citations), roach infestation (29 separate citations), and insect infestations (22 separate citations).

Comment: The relationship between issues for which NOV are issued and health consequences has not been identified. Technological resources such as GIS will be used to look for correlations between violations and health effects.

Topic Area: Food Safety

Indicator: **Unsafe or unhealthy environmental event or condition.**

Measure: **Proportion of licensed food establishments with at least 5 critical violations in one inspection.**

Status: Approximately 14% of the 3,223 restaurants in Fairfax County were noted to have 5 or more critical violations on their most recent inspection. Of those restaurants, 3% were ordered closed due to major violations.

Comment: Data need to be further analyzed to determine if ethnic restaurants are disproportionately represented in the enforcement process, and if so what factors contribute to the disproportionate representation.

Indicator: **Public education**

Measure: **Number of targeted training offerings provided to restaurant owners and operators with limited English.**

Status: Food Safety staff members conducted 64 targeted training offerings to restaurant owners and operators with limited English during the past year. These interactions are a combination of Food Safety Workshops, training inspections, and special events. The training inspections are performed by field staff and are conducted when certain risk factor violations are found to be “out of control” during the previous inspection.

Topic Area: Lead

Indicator: **Lead contamination in the environment.**

Measure: **Proportion of housing stock built before 1950.**

Status: A total of 10,500 dwelling units in Fairfax County were built prior to 1950, which represents approximately 3% of the total housing stock.

Comment: GIS technology will be utilized to determine if there is any relationship to the age of the housing stock to cases of elevated blood lead levels in children.

Indicator: **Blood lead level in children.**

Measure: **Proportion of high risk children with elevated blood lead levels.**

Status: Less than 1% of all children under the age of 72 months were found to have elevated blood lead levels (Table 23).

Table 23. Number of Children Tested for Elevated Blood Lead Levels less than 72 Months of Age

	Population <72 Months	Number Tested	Number Elevated Blood Lead	Percent Elevated	10-14 ug/dl	15-19 ug/dl	20-44 ug/dl	45-69 ug/dl	>70 ug/dl
Fairfax	81,675	12,036	31	0.3	23	3	5	0	0
Statewide	557,454	102,532	417	0.4	287	62	61	7	0

Source: Lead Safe Virginia Program, Childhood Lead Poisoning Prevention Program 2009 Surveillance Summary Report

Comment: The percentage of children with elevated blood lead levels in Fairfax is in line with what is observed statewide. The data need to be analyzed to compare elevated blood levels against other demographic characteristics in the county.

Topic Area: Pesticide Use

Indicator: **Pesticide use and patterns of use.**

Measure: **Patterns of use in agriculture, home and garden.**

Status: Though there are no data available regarding pesticide use by the average Fairfax County homeowner or gardener. Professional lawn care and landscaping companies must be licensed, registered and trained to use certain pesticides.[22] This information is tracked by the Virginia Department of Agriculture and Consumer Services.

The following groups need to be certified in order to apply pesticides:

- Private Applicators (Apply restricted use pesticides, produce an agricultural commodity, or apply pesticides on their own land or that of their employer)
- Commercial Applicators (For Hire) (Use any pesticides on others' property in exchange for compensation, and must work for a company with a Pesticide Business License)
- Commercial Applicators (Not for Hire) (Use any pesticides as part of job duties, on property owned or leased by them or their employers; use pesticides as a government employee; use pesticides on any area open to the general public at the following establishments: educational institutions, health care facilities, day-care facilities, convalescent facilities; use pesticides where open food is stored, processed or sold; or use pesticides on any recreational land over five acres.)
- Registered Technicians (Operate under the supervision of a commercial applicator when applying restricted-use pesticides, have not completed the requirements for commercial certification, and can apply general use pesticides without supervision.[22])

In addition to pesticide products requiring registration by the state Department of Agriculture and Consumer Services, Fairfax also requires county properties such as schools and government buildings to track and report pesticide/herbicide applications.[22]

Comment: Compiling an accurate estimate of the total amount of pesticide applied in the county by all applicators (governmental, commercial, and residential) would extremely difficult and expensive to undertake. A more reasonable approach might be to track the amounts of a specific class of pesticides that are applied or the amount of pesticide applied in a specific environment.

Indicator: **Public and professional education.**

Measure: **Public awareness about pesticides and herbicides, and safe application and use.**

Status: Promoting public awareness about the safe application and use of pesticides and herbicides is a shared responsibility among several county agencies and partnerships. The Northern Virginia Soil and Water Conservation District has created a "Water Quality Stewardship Guide" to provide information on the dangers pesticides pose to the watershed. The document lists tips on safe pesticide application and gives alternative choices for those considering pesticide use. [25]

The Fairfax County Department of Public Works and Environmental Services (DPWES) also participates as a member of Northern Virginia Clean Water Partners to conduct an aggressive "Only Rain Down the Drain" campaign. The goal of "Only Rain Down the Drain" is to educate residents of Northern Virginia about how storm runoff from streets and lawns ends up in the Potomac River, and ultimately the Chesapeake Bay.[23] In addition to this campaign, Clean Water

Partners formed a Green Thumb campaign to reduce home fertilizer runoff into the watershed. Clean Water Partners publishes local newsletters and provides information regarding pesticide application on its website. [24]

The Northern Virginia Soil & Water Conservation District also has a "Storm Drain Education Project." The group organizes local groups of volunteers (homeowner/civic associations, scout and youth groups, school groups, conservation/environmental groups, and individuals/families) to conduct community education (community newsletters/fliers/door-to-door education) about the dangers of dumping anything down stormdrains. The group also provides materials for the volunteers to label local storm drains with an "Only Rain Down the Stormdrain" message. (Source: http://www.fairfaxcounty.gov/nvswcd/stormdrained.htm) [25]

Comment: When an approach to developing a baseline pesticide utilization assessment is developed (see above comment), the next step would be to look for changes in utilization trends over time to assess the effectiveness of community awareness campaigns.

Topic Area: Sentinel Events

Indicator: **Unusual pattern of illness or condition with suspected or confirmed environmental exposure.**

Measure: **1. Cancer incidence and mortality rates, specifically lung cancer in non-smokers, mesothelioma, soft tissue sarcoma, and melanoma.**

Status: The Virginia Cancer Registry provides **lung cancer** information, but does not consistently record smoking or non-smoking status. Although blacks in Fairfax County are more likely to have lung cancer than whites in Fairfax County, blacks in Fairfax County are approximately 45 percent less likely to have lung cancer than blacks in the general Virginia population, and approximately 30 percent less likely to have lung cancer than whites in the general Virginia population (Table 24). Rates for lung cancer in Fairfax County for black, white, and all races are significantly lower than the statewide rates. (Table 24)

Table 24. Virginia Lung and Bronchus Cancer Mortality, 2003-2007 By Race*

Locality	All Races		White		Black	
	Total Deaths	Rate	Total Deaths	Rate	Total Deaths	Rate
Virginia	20,105	54.8	16,161	54.6	3,655	62.1
Fairfax County	1,513	36.3	1,283	37.4	95	42.5

* Rates are per 100,000 persons

Source: Virginia Cancer Registry

The Virginia Cancer Registry does not report the incidence of **mesothelioma** if there are fewer than 11 cases reported, so an incidence could not be calculated for Fairfax (Table 25).

Table 25. Mesothelioma Incidence 2006, Fairfax County

Locality	Total Deaths	Rate per 1,000,000 Population
Virginia	82	1.1
Fairfax County	<11	Undetermined

Source: Virginia Cancer Registry

Data provided by the Virginia Cancer Registry for **soft tissue sarcoma** exclude localized basal and squamous cell skin carcinomas and other in situ carcinomas except urinary bladder. Rates observed in Fairfax County are consistent with rates observed statewide (Table 26).

Table 26. Incidence of Soft Tissue Sarcoma, 2006

Locality	Total Deaths	Rate/100,000 Population
Virginia	516	6.4
Fairfax County	65	6.7

Source: Virginia Cancer Registry

Rates of **melanoma** seen in Fairfax County are similar to rates seen statewide (Table 27).

Table 27. Virginia Melanoma (Skin) Mortality, 2003-2007

Locality	Total Deaths	Rate/100,0000
Virginia	1,083	2.9
Fairfax County	130	2.5

Source: Virginia Cancer Registry

Measure: 2. Incidence rates for adverse reproductive health outcomes, specifically; low and very low birth weight and pre-term or very pre-term births.

Status: Incidence rates for adverse reproductive health outcomes observed in Fairfax County are displayed in the following tables. The percentage of live births with one or more congenital anomalies is generally consistent with the percentage observed statewide, however the percentage of white births with congenital anomalies is only half of what is seen statewide (Table 28).

Table 28. Resident Live Births with One or More Congenital Anomalies by Race, 2008

Locality	Live Births with One or More Congenital Anomalies							
	Number of Births with Anomalies				Percent of Births with Anomalies			
	Total	White	Black	Other	Total	White	Black	Other
Virginia	619	445	129	45	0.6	0.6	0.6	0.4
Fairfax County	55	35	6	14	0.4	0.3	0.4	0.4

Source: Virginia Department of Health

Fairfax County accounts for approximately 13% of the total population of Virginia, but less than 10% of the total resident low birth weight live births seen in the state (Table 29).

Table 29. Resident Low Birth Weight Live Births Under 2,500 Grams, 2004-2008

Locality	Year				
	2004	2005	2006	2007	2008
Virginia	8,674	8,594	8,883	9,344	8,996
Fairfax County	1,090	1,185	965	1,144	1,061

Source: Virginia Department of Health

The infant death for all races is significantly lower in Fairfax than for the state (Table 30).

Table 30. Infant Death Rates by Race, 2008

Locality	Rates of Infant Death per 1,000 Live Births			
	Total	White	Black	Other
Virginia	6.7	5.4	12.2	3.4
Fairfax County	3.7	3.0	9.3	3.4

Source: Virginia Department of Health

Measure: 3. Vector borne disease case rates (Lyme disease, West Nile Virus, Rabies)

Status: The total number of reported **Lyme disease** cases has increased by more than 600% across Virginia over the last 10 years (Table 31). The rate of disease seen in Fairfax County for 2009 was 24.8 cases per 100,000 population; this rate is significantly higher than the statewide rate of 11.7 cases per 100,000 population (Table 32). Further research and more complete data will be necessary in order to adequately answer this question in the future.

Table 31. Ten-Year Trend in Number of Reported Cases of Lyme Disease in Virginia, 2000-2009

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Virginia	149	156	259	202	216	274	357	959	933	908
Fairfax County	Unreported						236	231	191	260

Source: Virginia Department of Health

Table 32. Incidence of Lyme Disease for Fairfax County, 2009

Locality	Reported Cases	Rate per 100,000
Virginia	908	11.7
Fairfax County	260	24.8

Source: Virginia Department of Health

The number of reported **West Nile Virus** cases has decreased by 580% since it was first observed in the state in 2002 (Table 33). The decrease could be attributable to the mosquito surveillance and control program that was established across the state in 2003. Fairfax continues to see one to two cases per year.

Table 33. Total West Nile Virus Cases, 2002-2009

Locality	Year							
	2002	2003	2004	2005	2006	2007	2008	2009
Virginia	29	31	7	5	5	5	3	5
Fairfax County	13	3	1	0	3	2	1	1

Source: Virginia Department of Health

The number of rabies cases seen in animals in Fairfax County is shown in Table 34.

Table 34. Rabies Cases in Animals, 2009

Locality	Reported Cases	Percent of All Reported Cases
Virginia	564	100
Fairfax County	44	7.8

Source: Virginia Department of Health

Measure: **4. Number of food borne illnesses.**

Status: The number of reported cases of illness from selected foodborne illness pathogens is reported in Table 35.

Table 35. Number of Reported Cases and Rates per 100,000 for Selected Food Borne Illness Pathogens, 2009

Pathogen	Virginia		Fairfax County	
	Reported Cases	Rate per 100,000	Reported Cases	Rate per 100,000
Salmonella	1,095	14.1	111	10.6
Campylobacter	770	9.9	121	11.5
Shigella	198	2.5	26	2.5
E-coli	156	2.0	27	2.6
Hepatitis A	42	0.5	10	1.0

Source: Virginia Department of Health

Comment: Disease rates for most of the reported diseases are generally lower in Fairfax County than those observed statewide; however a data sets needs to be developed at the block level to determine if cultural disparities exist within Fairfax County for selected illnesses. Foodborne illness data needs to be analyzed further to explore the reason that Fairfax County has a higher incidence of campylobacter infection than the rest of the state. It is interesting that Fairfax, which generally has better access to reliable community water supplies than the rest of the state, has a higher incidence of campylobacter infection.

Topic Area: Sun and Ultraviolet Light

Indicator: **Ultraviolet light**

Measure: **Number of days in which the ultraviolet index exceeded safe thresholds.**

Status: According to the National Weather Service, the Washington, D.C. metropolitan area experienced 106 days during 2009 in which the UV Index was considered high or very high (Table 36).

Table 36. UV Index for the Metropolitan Washington, D.C. Area, 2009

UV Hazard Level	Number Days
Low (0-3)	162
Moderate (3-6)	85
High (6-8)	40
Very High (8-11)	66
Extreme (>11)	0

Source: National Weather Service Data

Topic Area: Toxics and Wastes

Indicator: **Hazardous waste sites.**

Measure: **Proportion of population in close proximity to leaking underground storage facilities, Brownfields properties, and sites on the National Priorities list.**

Status: There was a report of an oil product in a Fairfax County creek down gradient from the Fairfax City Tank Farm in September 1990. Approximately seven feet of oil was later discovered in a private water well located at the County line. One of the tank farm companies was later found to be responsible for the spill which required them to purchase 91 residential homes in the Mantua subdivision located next to the tank farm. A clean up project was initiated and site remediation was essentially completed in 2010. Groundwater monitoring is anticipated to continue for the foreseeable future. DEQ is currently in the process of investigating possible contamination resulting from leaking underground storage tanks in the Great Falls area. Staff from DEQ sampled 22 wells in the potentially impacted area. The results of the testing indicated an estimated value of the gasoline additive methyl-tert-butyl ether (MTBE) in five private wells, and low levels or an estimated value of the chlorinated solvent Tetrachloroethene (PCE) in two wells. Those homeowners were provided with water treatment systems to remove the compounds.

The only Brownfields site in Northern Virginia is the Hidden Lane Landfill, which is located in Loudoun County. Sampling conducted to date has shown elevated levels of volatile organic compounds (VOCs), including trichloroethene (TCE), 1,1,1- tricholoroethane and 1,2-dichloroethene, and other contaminants in the ground water near the landfill, however the site has not impacted any homes in Fairfax County. The Hidden Lane site has been proposed for inclusion on the National Priorities List.

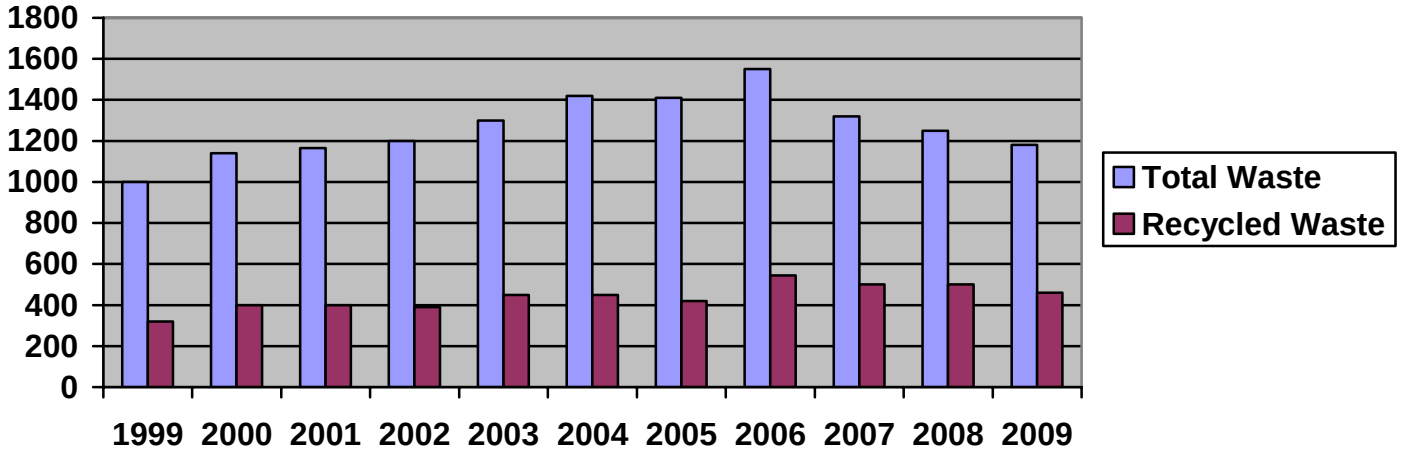
Indicator: **Reduction of waste and toxic substances.**

Measure: **Percentage of total solid waste stream that is recycled.**

Status: The State of Virginia has established a target for recycling 25% of the total waste volume. Fairfax County currently recycles more than 30% of its total solid waste stream (Figure 6).

Figure 6. Annual Recycling Rate as Percentage of Total Waste Stream; 2005-2009

(Units in Tons of Material in Thousands)



Source: DPWES Public Site; http://www.fairfaxcounty.gov/dpwes/recycling/tonnage.pdf

Indicator: **Use of surveillance and warning systems.**

Measure: **Number of jurisdictions that have surveillance systems for detecting methemoglobinemia and acute poisoning from lead, arsenic, cadmium, mercury, pesticides, and other chemicals.**

Status: The Virginia Department of Health (VDH) maintains two separate Public Health Toxicology Program databases. The first database contains information on children, age 15 years or younger, with an elevated blood lead level of greater than or equal to 10 micrograms of lead per deciliter of whole blood (µg/dL). The second database contains information on adults with a blood or urine test that indicates a possible exposure to a toxic substance, such as lead, cadmium, mercury or arsenic. Information is also provided on individuals diagnosed with asbestosis or pneumoconiosis. The data are passively collected from physicians, laboratories,

hospitals and other state agencies. Reports from both data bases for 2004 – 2006 are available at http://www.vdh.virginia.gov/epidemiology/DEE/PublicHealthToxicology/toxic.htm.

Topic Area: Water, Ambient

Indicator: **Monitored contaminants in ambient water.**

Measure: **Proportion of marine and freshwater recreational waters that fail to meet water quality regulations and guidelines.**

Status: Information regarding the ecological health of the county's streams is available on the Department of Public Works and Environmental Services (DPWES) web site at http://www.fairfaxcounty.gov/dpwes/stormwater/streams/assessment.htm . Information about the 2009 biological monitoring results can be found in the 2009 Fairfax County Stormwater Status Report. Based on biological data provided in the Stormwater Status Report, it is estimated that approximately 88 percent of Fairfax's streams are in fair to very poor condition (Table 37).

Table 37. Countywide Stream Quality Index for Sampling Years 2004-2009

Year	Percentage of Total Sites					Index Value
	Very Poor	Poor	Fair	Good	Excellent	
2004	40	30	17	13	0	2.03
2005	15	32.5	32.5	7.5	12.5	2.70
2006	36.4	34	15.9	11.4	2.3	2.09
2007	17.5	32.5	15	20	15	2.83
2008	35	25	17.5	15	7.5	2.35
2009	38	35	15	8	5	2.08

Source: Fairfax County Department of Public Works and Environmental Services, 2009 Stormwater Status Report http://www.fairfaxcounty.gov/dpwes/publications/stormwater/ms4/2009_stw_status_report.pdf

The number of sites placed in each of five rating categories ("excellent," "good," "fair," "poor," or "very poor") is based on benthic macroinvertebrate monitoring data. The stream quality index value is a calculated average that gives the average rating for all sites monitored, with an Index Value of 1 being very poor and an Index Value of 5 being excellent. The Index Value of 2.08 calculated for 2009 indicates that the quality of most streams in the county is poor.

Comment: The county has established a public education campaign to alert residents to the status of the county's streams that makes use of the county web site and notices placed at individual bathing beaches following significant rain events. The effectiveness of the public information campaign in reaching its targeted audience needs to be more closely evaluated.

Indicator: **Point source discharge into ambient water.**

Measure: **Volume of point source discharges by type of contaminant (permitted sanitary waste disposal, sewage overflows, unintentional discharges and spills)**

Status: The build-out in Fairfax has dramatically impacted natural spaces. Open space and natural habitat are continually decreasing in extent as a result of residential, commercial and road development. In 1980, vacant land accounted for 32.2% of the total land in Fairfax; by 1990, this had dropped to 19.5 percent and in 2004, to 11.3%.[34] In January 2009, only 7.3 percent of the county's land area was characterized by vacant and natural uses. Loss of natural vegetative ground cover and the accompanying rise in impervious ground cover, such as cement and asphalt, has lead to increased stormwater runoff, which increases stream flow volume during storm events, degrades water quality and adversely affects the ecological health of streams.[35]

The Upper Occoquan Sewage Authority and the Norman M. Cole Jr. Pollution Control Plant serve 340,000 homes and businesses and treat 161 million gallons of wastewater per day.[35] Fairfax County Wastewater Management has received many awards, including the EPA Partnership award in 2003 for its leadership role in the protection of the Chesapeake Bay and the National Association of Clean Water Agencies (NACWA) Gold and Platinum Peak Performance Award in 2005.[38]

The Virginia General Assembly enacted the Chesapeake Bay Preservation Act (*Code of Virginia Title 10.1, Conservation, Chapter 21; Chesapeake Bay Preservation Act*) in 1988, which includes Fairfax in the enforcement area. One provision of the Act establishes maintenance requirements for onsite sewage disposal systems that are intended to prevent point source pollution from onsite sewage disposal systems. The Fairfax County Health Department enforces applicable portions of the Act in Fairfax.

Topic Area: Water, Drinking

Indicator: **Monitored contaminants in drinking water.**

Measure: **Measurements of Safe Drinking Water Act (SDWA), Maximum Contaminant Level (MCL), Contaminant Candidate List (CCL), and contaminants monitored under state regulations and guidelines by type of water supply.**

Status: Groundwater sources for drinking are regulated by the Office of Water Programs (OWP) in the Virginia Department of Health. OWP receives monitoring information from 1,281 community waterworks throughout the state, serving approximately 7,000,000 people. The Annual Compliance Report for 2007 reported that no violations were reported for that year.

Indicator: **Source water protection programs.**

Measure: **Proportion of well heads covered by protection programs.**

Status: One hundred percent of potable water supply well heads are regulated under Chapter 70.1 (*Private Water Well Ordinance*) of the Fairfax County Code. Well

head protection is verified through the permitting process for new water supplies, repairs, and well abandonments, and the inspection of existing supplies through routine water samples and evaluations.

Indicator: **Source water contamination**

Measure: **1. Percent of Alternative Onsite Sewage Systems (AOSS) operating as designed based on annual inspection report.**

Status: On April 7, 2010, *Emergency Regulations for Alternative Onsite Sewage Systems* (12VAC5-613-10) became effective. These regulations establish performance, operation and monitoring requirements and horizontal setbacks for alternative onsite sewage systems (AOSS) necessary to protect public health and the environment. The emergency regulations will be in effect for a period of one year while permanent regulations are drafted and adopted by the Board of Health. As a result of these regulations, all AOSS are required to be inspected annually with reports sent to the local health department.

Measure: **2. Percent of septic tanks that have been pumped out within the past five years.**

Status: Chapter 68.1 (*Individual Sewage Disposal Facilities)* of the Fairfax County Code requires that all individual sewage treatment and disposal systems shall have pump-out of the septic tank accomplished a minimum of once every five years. This provision was adopted in the local code to comply with septic tank pump-out requirements set in the Chesapeake Bay Preservation Area Designation and Management Regulations.

Indicator: **Compliance with operation and maintenance standards.**

Measure: **Number of malfunctioning onsite sewage systems that are brought into compliance by repair or connection to the public sewage system.**

Status: All reported malfunctioning onsite sewage systems are investigated by the Health Department and Notice of Violation sent to the owner to alleviate the threat to public health and the environment. Properties that have access to the public sewage system are required to make connection. Properties that do not have public sewer access are evaluated to determine suitability of repairs. Properties with systems that cannot be repaired are placed on emergency pump and haul until technologies are available for repair or public sewer is made available. In fiscal year 2010 approximately 87% of out-of-compliance sewage disposal systems were corrected within 30 days. Correction of problematic onsite sewage disposal systems can be highly complicated and expensive for the property owner, resulting in unavoidable delays in achieving full compliance for the more technical systems, which accounts for the 13% of the systems that require more than 30 days to achieve compliance.

Comment: Health Department staff is required to monitor the status of AOSS maintenance agreements to ensure that maintenance is accomplished and that reports are submitted as required. Effective monitoring will require the development of a database to track the maintenance status of each system and the date maintenance was performed.

TARGETING THE FUTURE

The Health Department hosted a stakeholder conference in October 2009 to discuss community perspectives of environmental health and to select a set of indicators to use in preparing this Profile. The conference arrived at the following perspective of environmental health:

- The public is generally satisfied with environmental health services that are provided by the Health Department.
- The public generally thinks their environmental health status is good, but there is frustration about the unknown health effects of traffic and urbanization.
- The public has a poor understanding of what environmental health is, which causes what the environmental health program does to be taken for granted.
- There is no "face" of environmental health with which the public generally identifies.
- The environmental health *system* is poorly defined and not understood by the general public and within the county.

The data reported in this Profile indicate the possibility for significant challenges with which the environmental health system will have to deal over the next five years. Addressing these emerging issues will require broad-based community involvement and the coordinated involvement of the entire environmental health system. The following specific approaches could prove effective in addressing the issues identified:

1. Increasing cultural diversity in Fairfax will change the way we do business in all aspects of the system. We will need to explore more creative ways to effectively market our message in a variety of cultural contexts in order to effectively link constituents to services and address the health concerns of our increasingly diverse communities. We will also need to evaluate our overall enforcement program to ensure that no particular communities are inadvertently subjected to unequal enforcement actions due to a lack of understanding of the requirements of local codes and ordinances.

2. Fairfax residents tend to be younger (more than 40% of the population under the age of 35), better educated, and more computer-savvy than the general United States population. We will need to market our message more effectively to this younger population by making more effective use of the electronic media, and be more aggressive in targeting venues at which younger populations tend to congregate. We will also need to devote more attention to the situations of younger families, which tend to cook more meals at home and engage more in outdoor activities. We will still need to maintain a robust commercial food service program; however we will need to devote more effort toward messages that promote the safety of home cooked foods and recreational environments.

3. We will need to assume a more collaborative approach toward the business community and include them as partners in the environmental health system.

4. A comprehensive tracking and surveillance system that takes advantage of the most current technological resources must be developed to facilitate the tracking and management of environmental health parameters.

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