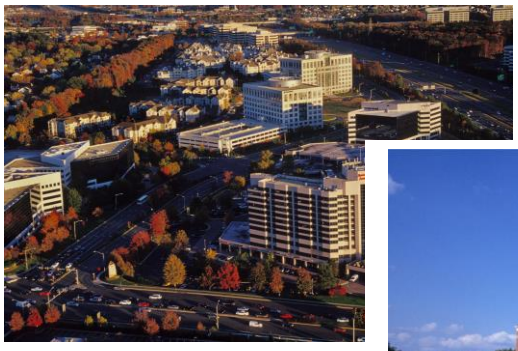
TOWN OF HERNDON
2030 Comprehensive Plan



Adopted August 12, 2008

Amended through January 13, 2015

Prepared by the Department of Community Development

TOWN OF HERNDON, VIRGINIA
2030 Comprehensive Plan

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TOWN OF HERNDON, VIRGINIA
2030 COMPREHENSIVE PLAN
ACKNOWLEDGEMENTS

TOWN COUNCIL

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Connie Haines Hutchinson, Vice Mayor
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William B. Tirrell, Sr.
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The project staff wishes to thank the Herndon community and to acknowledge the many valuable contributions during the public process to draft the comprehensive plan. In addition, special thanks are due to Kenneth Holbert for his contribution with GIS maps, former Director of Community Development, Henry G. Bibber, former Planner II Michelle M. O'Hare, and to the other staff members from various Town of Herndon departments who contributed to the 2030 Comprehensive Plan.

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I. Introduction

Brief History and Regional Context

The Town of Herndon has evolved from a small rural town of the 19th century into a mature community with major office and commercial development complementing a wide variety of residential neighborhoods and recreational areas. Most vacant land within the town has been developed and several sites have been redeveloped in recent years. Residential and commercial growth within the town and in areas surrounding the town has been dramatic and vibrant. Since the 1980s in particular, the town has grown rapidly just as the entire Dulles Corridor has developed and matured.

Employment within the Town of Herndon at the start of 2007 was estimated at over 25,260 jobs, exceeding the size of the estimated resident population of 23,217 persons. Existing commercial and retail development within the Town of Herndon approached 9.5 million square feet of gross floor area. Additional commercial or retail development is under construction or approved for construction through zoning and site planning review processes. These statistics were developed by the town's Community Development staff.

Many parts of the town have developed according to the Herndon 2010 Comprehensive Plan, originally adopted in June 1990. Dating back to the early 1960s, the town has had the benefit of an active planning citizenry with regard to comprehensive plans and specific area plans. Today the Town of Herndon, like other areas in the Dulles Corridor, has realized much of its planned development potential.

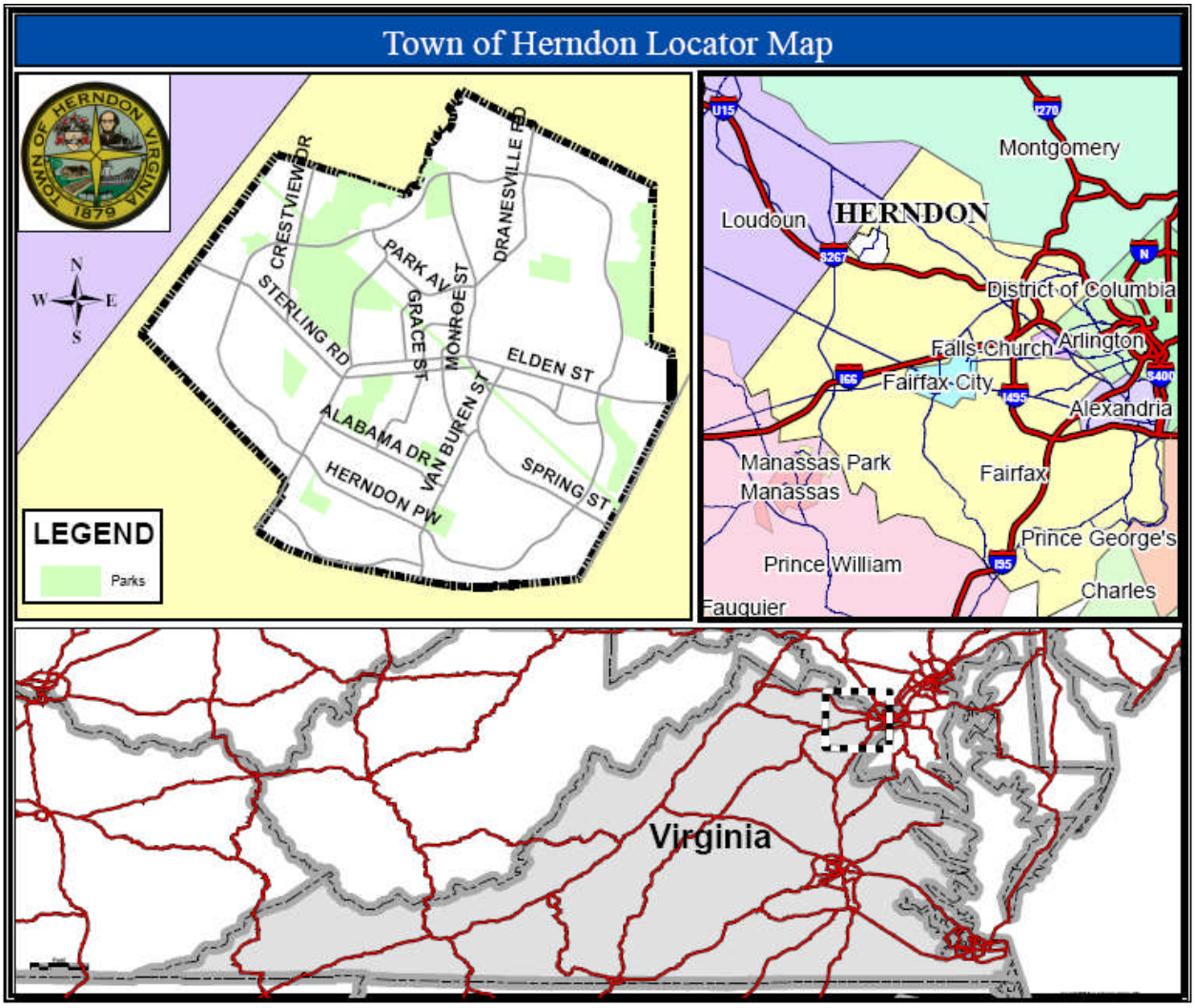
Yet a new era of growth in the Dulles Corridor is already under way. Over the next 25 years, population in the Dulles Corridor is expected to increase by 45 percent while employment growth is expected to increase by 63 percent, according to the July 2004 Final Environmental Impact Statement of the Dulles Corridor Rapid Transit Project. This job growth rate would result in the addition of 185,000 jobs in the Corridor over the next 25 years. The Dulles Rail E.I.S. indicates that "Total Weekday Corridor-related Work Trips" are projected to increase from 460,000 trips in year 2000 to 680,000 trips in year 2025. "Total Weekday Corridor-related Trips" (total travel trips for any purpose) are projected to increase from 2,150,000 trips in 2000 to 3,210,000 trips in the year 2025.

While Worldgate and some of the other commercial properties within the town have nearly reached build-out, nearby areas outside of the town may have the potential for 15-20 million square feet of additional gross floor area. The Dulles Corner area (south of the Dulles Toll Road, between Route 28 and Centreville Road) has the potential to develop nine million additional square feet of mixed-use space in accord with the Fairfax County comprehensive plan, according to the Dulles Rail E.IS. The Center for Innovative Technology area between the town's western boundary and Route 28 in Loudoun County is nearly as large in land area as Dulles Corner. This area has the potential for several million square feet of commercial and mixed-use development as well.

Thus comprehensive planning for the Town of Herndon must address the potential impacts of dramatic growth and change that will take place in these nearby areas in Fairfax County and Loudoun County. In the year 2008, the Town of Herndon finds itself in the middle of a very dynamic environment with growing pressure for development of vacant or underused sites located either within the town or in these sizeable areas just outside of the town boundaries. This magnitude of growth implies that an enhanced transportation system will be developed to provide mobility. The 2030 Comprehensive Plan seeks to protect and

enhance the quality of life for Town of Herndon residents as well as residents adjacent to the town limits and the large number of "daytime residents" who work at jobs located within the town.

Town of Herndon Locator Map



Dulles Rail on the Horizon

While project timelines remain in flux, the project sponsors are hopeful that the Metrorail extension of a "Silver Line" from West Falls Church through Tysons Corner, Reston, Herndon and on to Dulles Airport will begin construction by March 2009, with utility relocations already underway at this writing. Thus, this plan addresses the coming of Metrorail, with both the Herndon and Route 28 rail stations located in the Dulles Toll Road right-of-way near to the town's southern boundary. The Herndon Station features a pedestrian "touchdown" facility within the town

limits along the northern edge of the Dulles Toll Road right-of-way.

The Metropolitan Washington Airports Authority (MWAA) has reached a formal agreement with the Commonwealth of Virginia. MWAA will design, build and finance the Metrorail extension, with emphasis on extending the system through the Herndon area and on to Dulles Airport and Loudoun County in one continuous phase. A significant portion of the commercial property within the Town of Herndon will likely be affected. The Town Council would have to approve any special tax district within the town limits before it could be enacted by Fairfax County. The county has already enacted a special tax district affecting the Tyson's Corner area along with the eastern portion of Reston.

Purpose of the Comprehensive Plan

As required under Section 15.2 – 2223 of the Code of Virginia, the local Planning Commission shall prepare and recommend a comprehensive plan and the local governing body shall adopt a plan for its jurisdiction. The purpose of a comprehensive plan is to guide the present and future physical development of a jurisdiction to promote the health, safety and welfare of its residents.

Under state law, the comprehensive plan shall be general in nature. The plan, accompanied by maps, charts and text, can include elements such as existing and future land use, transportation features, historic areas, community service facilities, public buildings, and utilities. The plan is also to address the location of transportation improvements and their costs.

This document, the Herndon 2030 Comprehensive Plan, fulfills this requirement for the town. For the Town Council, Planning Commission, Heritage Preservation Review Board, Architectural Review Board, Board of Zoning Appeals, the town staff and town citizens, the Herndon 2030 Comprehensive Plan provides land use policy guidance on development and redevelopment within the town. This document replaces the Herndon 2010 Comprehensive Plan of 1990, as amended. The annual Capital Improvement Program (CIP) of the town is also part of the town's full comprehensive plan. The CIP is adopted on an annual basis and these volumes are published separately from this document. In addition, comprehensive plan policies are implemented through the other instruments such as the zoning ordinance and the subdivision ordinance of the town code.

This plan contains goals and objectives that are designed to guide land use and development decisions in the Town of Herndon. To fully implement this plan, zoning ordinance changes and small area plans will be required. To ensure that the plan policies are periodically reviewed and continue to meet the needs of the town, Section 15.2-2230 of the Code of Virginia requires the local Planning Commission to determine every five years if the plan needs to be amended. Plan amendments can occur at any time and may be initiated by the Town Council as well as anyone seeking to change plan policy. While the Town Council amends the plan through an initiating resolution directing the Planning Commission to review and consider the proposed amendment, others may do so by filing a Comprehensive Plan Amendment application with the Department of Community Development.

This comprehensive plan will be implemented in a number of ways. Land use designations will guide a variety of public and private actions, including the review of development proposals by the Planning Commission and Town Council.

Town Council Vision Statement

During 2007 the Town Council undertook a strategic planning process and developed the document entitled "2027: A Vision for the Town of Herndon." This effort yielded the following vision:

> *"In the year 2027, Herndon continues to be a 21st century town where history and heritage are respected and where people and their involvement matter. Herndon's inclusiveness and sense of community foster empowerment in each citizen. Its unique character and charm attract a wide variety of people, including many families who are raising their children here. Herndon is the anchor of an expanded community where positive benefits extend beyond the town's boundaries."*

This vision is further articulated by a series statements addressing the themes: **Citizens Who Matter, Exceptional Service, Our Rare Sense of Heritage and Place, Maintaining a Residential Haven, A Planned Approach to Community Development, Regional Growth We Took Charge!, Modern Multi-Modal Transportation, and Our Renowned Amenities.** Specific short term goals and objectives have been identified to implement these ideas.

The Town of Herndon 2030 Comprehensive Plan supports the Town Council's vision statement, and these guiding principles can be found throughout this document. Implementation of this plan will assist in achieving the Town Council's vision for the year 2027.

Comprehensive Plan Process

On March 14, 2006, the Town Council of the Town of Herndon adopted a resolution to replace the 2010 Comprehensive Plan adopted in June of 1990 with a new plan having a 2030 horizon date. This resolution was based upon the Planning Commission's determination that it was advisable to amend the plan. This determination was made during the five-year review of the plan conducted in 2005 as required under Section 15.2-2232 of the Code of Virginia.

The first step in revising the plan was for town staff to publish a Background Report detailing conditions in Herndon and raising potential issues for the future. This document was published during February 2006 and was made available on the town's web site (www.herndon-va.gov/Planning/Zoning/Comprehensive Planning).

The second major step in revising the plan was to obtain public comment on the future of Herndon. Five public meetings were held in the spring and summer of 2007 to obtain input on plan elements such as land use, transportation, environmental policies, public facilities and the future transit station areas. Summaries of the public discussions were posted on the town's website throughout the process. Comments were also received via telephone and email to the special Comprehensive Plan mailbox (CompPlan@herndon-va.gov). A wide range of input was received and the points of view and concepts discussed have shaped the development of this plan document.

After the initial public input phase, a first draft of the plan was developed and finalized by Community Development staff on September 12, 2007. The Planning Commission held

several work sessions over a period of months to review the draft plan and make revisions. All work sessions were open to the public and were reported in the press. In the same time frame, staff discussed the draft plan with the Joint Communication Committee of the Town Council and Planning Commission, the Architectural Review Board and the Heritage Preservation Review Board.

A revised plan was developed for the Planning Commission and issued January 9, 2008. After additional discussion and revision, the Planning Commission released the 2030 Comprehensive Plan "Draft for Public Hearings" and held a public hearing on February 4, 2008. The Planning Commission held additional public hearings on the comprehensive plan. The Planning Commission made its final recommendation on the plan to the Town Council on April 7, 2008. The Town Council held public hearings on the draft plan on May 27, 2008, June 10, 2008, July 8, 2008 and August 12, 2008.

The Town Council developed a number of revisions to the draft plan during work session discussions. The most significant change was the addition of new features in the Land Use Plan chapter. While the basic land use framework did not change, a new Business Corridor category was created and a number of properties that had previously been Adaptive Areas became Business Corridor. A new Adaptive Areas-Residential category was also created and several properties that had been designated Adaptive Area or Neighborhood Conservation were given this new Land Use Plan designation. The Town Council requested staff to present and discuss the most significant changes with the Planning Commission. After a staff briefing and a discussion at the Planning Commission work session of July 21, 2008, the Chairman provided a memorandum to the Mayor and Town Council dated August 1, 2008. This memorandum expressed the commission's support for the Town Council's revisions to the plan. The Town Council adopted this plan on August 12, 2008.

II. Profile of the Town of Herndon

Located in western Fairfax County and just minutes from Washington Dulles International Airport, Herndon is the third largest incorporated town in Virginia. With approximately 23,000 residents, most of the town is dedicated to residential uses and is comprised of a wide variety of residential neighborhoods. As with every community in Northern Virginia, the town has seen a significant amount of development over the past 20 years. While Herndon has become a hub for information technology as one of Fairfax County's most dynamic office, retail and hotel centers, it has had the ability to maintain its unique sense of community and small-town charm. Herndon has a historic, central, downtown core that contains government offices, a public library, a town green and a variety of shops and restaurants. The downtown is the venue for fairs and festivals throughout the year. Other town assets include sixteen parks, the Herndon Community Center, the W&OD Bike Trail and the Herndon Centennial Golf Course. The town is also home to a robust business community and contains approximately 9.5 million square feet of commercial gross floor area.

Demographics

The estimated Town of Herndon population for January 2008 is 23,367 persons. The town's population has steadily increased over the years and has more than doubled since 1980. Along with the population growth, the number of housing units in town has increased over time. According to the 2000 Census, the average household size in Herndon is 3.11 persons, which is greater than the 2.96 persons per household size reported in the 1990 Census. While housing and population growth has slowed in recent years due to the scarcity of land available for residential development, it is anticipated that most growth in housing and population figures will be generated from redevelopment in the downtown or near the future metro station. Town staff has projected these figures up to the year 2030.

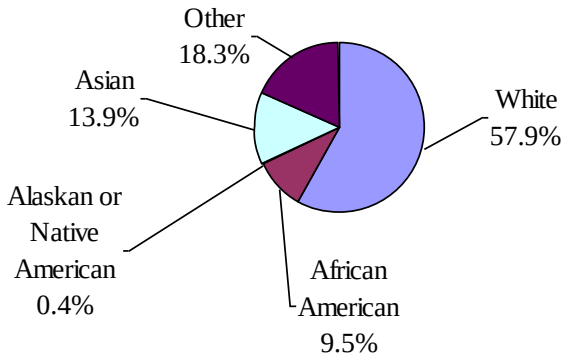
POPULATION AND HOUSING PROJECTIONS

Year	Population	Housing Units
1980	11,449	4,388
1990	16,139	5,786
2000	21,655	7,190
2008*	23,367*	7,762*
2010	23,948	7,955
2020	25,754	8,555
2030	26,270	8,726

*January 1, 2008 estimate prepared by town staff

Background studies (traffic, water, sewer, financial) for the Herndon Metro Station Area Study used a projection of 3.2 million net square feet of additional commercial floor area and approximately 2,400 dwellings in the Herndon Transit-Oriented Core (HTOC) by 2035. Gross floor area (including existing f1oor area to be redeveloped, net new commercial floor area, and residential floor area) in the HTOC could reach 6.9 million square feet. Those projections are considered preliminary and are expected to change to ref1ect the reality of the regional traffic and population changes as zoning regulations and other implementation actions begin to shape the future of the Metro Station Area.

2000 Census Data - Racial Composition



Herndon, as well as the northern Virginia region, has become a more racially and ethnically diverse community. While the white population made up 85 percent of Herndon residents in 1980, this figure has dropped to 58 percent in 2000. The graph below shows the racial make-up of the town residents, based on 2000 Census data.

The Hispanic population in Herndon has significantly increased since 1980. Based on United States Decennial Census data, only 2.78 percent of Herndon residents were of Hispanic origin in 1980. This figure climbed to 8.8 percent in 1990 and to 26.0 percent in 2000.

Commercial Space Inventory

Herndon has a healthy mix of commercial land uses that brings to the town economic vibrancy and substantial tax revenue. Commercial development is focused along the major transportation corridors: Elden Street, Herndon Parkway, Spring Street and Worldgate Drive. Existing commercial and retail development within the Town of Herndon approaches 9.5 million square feet of gross floor area.

Approximately 1,000,000 square feet of additional commercial and retail floor area is anticipated based on zoning approvals granted to date.[1] The chart below is an inventory of commercial space.

Type of Development	Gross Floor Area (GFA) in Square Feet	Percentage
OFFICE	6,422,157	68.0%
RETAIL	1,284,247	13.6%
SERVICE	726,761	7.7%
HOTEL	476,926	5.0%
WAREHOUSE/INDUSTRIAL	468,363	5.0%
OTHER USES	67,293	0.7%
TOTAL GFA	**9,445,747**	**100%**

[1] Data on commercial inventory comes from the Town of Herndon Department of Community Development

Employment

Employment within the Town of Herndon at the start of 2008 was estimated at over 25,260 jobs, exceeding the size of the estimated resident population of 23,367 persons. Businesses located within the Town of Herndon range from major corporate entities to locally-owned establishments. Major employers include Fannie Mae, General Dynamics, Sprint Nextel, Northwest Federal Credit Union, Parsons Brinckerhoff, SAVVIS, Inc., Verizon and the U.S. Federal Government.

It is expected that the number of employees working in the Town of Herndon will continue to increase. The Washington Metropolitan Council of Governments has estimated that 27,543 employees will be working in Herndon by the year 2030. With the potential redevelopment associated with Dulles Rail, employment numbers within the town limits may be greater than what is projected. The small area plan for the Metrorail Station Urban Development Area will include projected employment figures based on the maximum commercial floor area ratio for this designated area.

Economic Development

The Town of Herndon has benefited from its prime location in the Dulles Corridor and from the efforts of the Fairfax County Economic Development Authority. The authority works in several locations around the world to promote the county and the Dulles Corridor. From time to time, the Economic Development Authority works with specific clients interested in Herndon. Community Development staff assists by providing information on features of the town and its regulations.

In recent years, the Herndon Visitor's Center has supported extensive promotional efforts focused on various town events and amenities. These efforts also emphasize the hospitality and restaurant sectors within the town. The Visitor's Center is a non-profit corporation that receives support from the town.

The Dulles Regional Chamber of Commerce takes in the town as part of its area of activity through the Herndon Chamber of Commerce. The chamber has been a great supporter of town events and town businesses and presents events such as Friday Night Live concerts and business networking mixers.

In its *2027: Vision for the Town of Herndon* document, the Town Council adopted a goal to establish an Economic Development Task Force by November 2008. This citizen task force will be charged with developing goals, objectives and recommended resources for economic development. Further, the Planning Commission has recognized the need to establish a citizen task force to make recommendations to the Planning Commission after examination of transition areas, the interface of zoning districts, inter-town transportation and transit issues and other relevant concerns for the downtown.

The town should also complete a market study and economic development analysis of the downtown to determine the viability of various land uses and other relevant information in support of the community discussion on the future of the downtown. The Metro station access at Herndon brings unparalleled economic opportunities. An economic study conducted for the Herndon Transit Oriented Core found fiscal balance was possible, with annually recurring net revenues in excess of expenditures.

As an incorporated town, Herndon is an integral part of Fairfax County. Town citizens receive

public education, health and social services, fire and ambulance services, judicial services, correctional facilities and additional recreation services from Fairfax County. Therefore, Herndon residents, including its corporate citizens, pay Fairfax County real estate taxes as well as the town's real estate tax. In FY2008, the residential sector comprised 50.1 percent of the assessed real property valuation, while the commercial sector contributed the remaining 49.9 percent. The town has been able to maintain this relative equity among the total amount of commercial versus residential real estate revenues for over ten years. In addition, the town has a diversified revenue base with the majority of General Fund revenue coming from a variety of sources other than property tax. These sources include user fees, consumer utility taxes, transient occupancy taxes and reimbursements from federal and state government

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III. Land Use Plan

Land Use History

Although officially incorporated as a town in 1879, development of Herndon began around 1857 resulting from the construction of a rail stop and depot along the Alexandria, Loudoun and Hampshire Railway, now known as the Washington and Old Dominion. Herndon received its name when residents requested that a post office be established at the depot. Residents decided to name the post office after Captain William Herndon, who heroically died trying to rescue all passengers on his ship, the Central America, after it sustained damage in a hurricane off the coast of North Carolina. The post office with the Herndon namesake officially opened on July 13, 1858.

Development of the area was impeded by the Civil War, as many of the area railroads were destroyed in the conflict. Rail service to Herndon was not reestablished until 1868. The rail line provided the economic engine for Herndon into the early 1900s. Dairy farming thrived, as the railroad provided a convenient way to ship milk into the capital city. The railroad also brought city dwellers into Herndon, as many sought the refreshing cool air of the country, which was a relief from the hot, swampy conditions of summers in Washington, DC. Several summer homes were built in Herndon during that time frame.

As population in the area increased after World War II, not only was Herndon's dairy industry thriving, but Herndon was also becoming a small bedroom community to Washington, DC. The train depot provided convenient transportation access into the city. Use of the railroad for both farmers and commuters began to decline as local roadways improved and truck and auto transportation became cheaper and more reliable. Passenger service stopped in 1951.

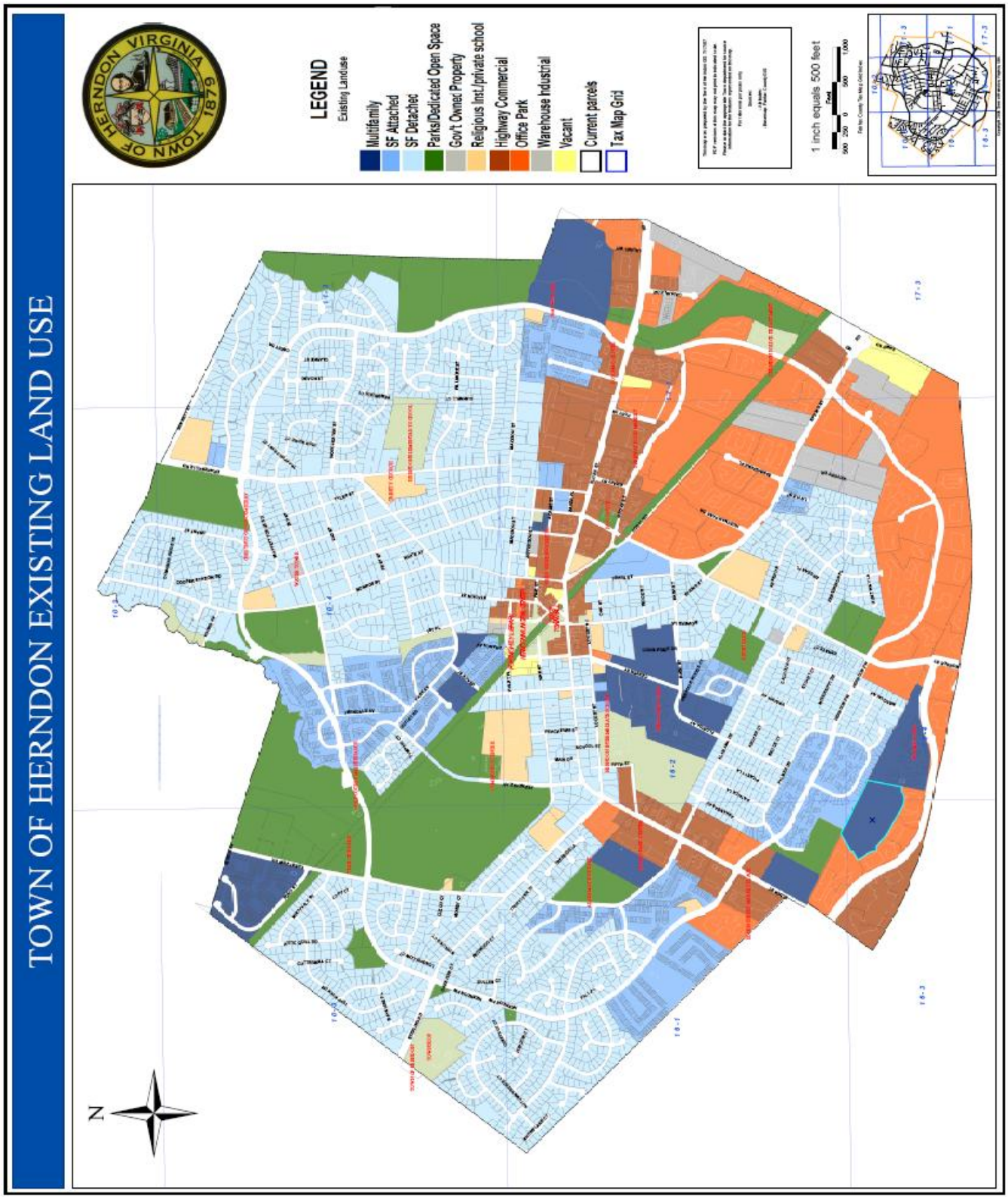
The railroad was last used for construction of Dulles Airport. The last major job for the single-line freight railroad, then operated by the Washington and Old Dominion Company, was to haul sand in from the beaches of the Atlantic Ocean for concrete used to build the runways at Dulles Airport. The last train left Herndon in August 1968.

With the proximity of Dulles Airport, Herndon began to experience growth related to this transportation mode. Businesses such as light industry, research laboratories and administrative headquarters began locating in Herndon. The need for housing accompanied this development.

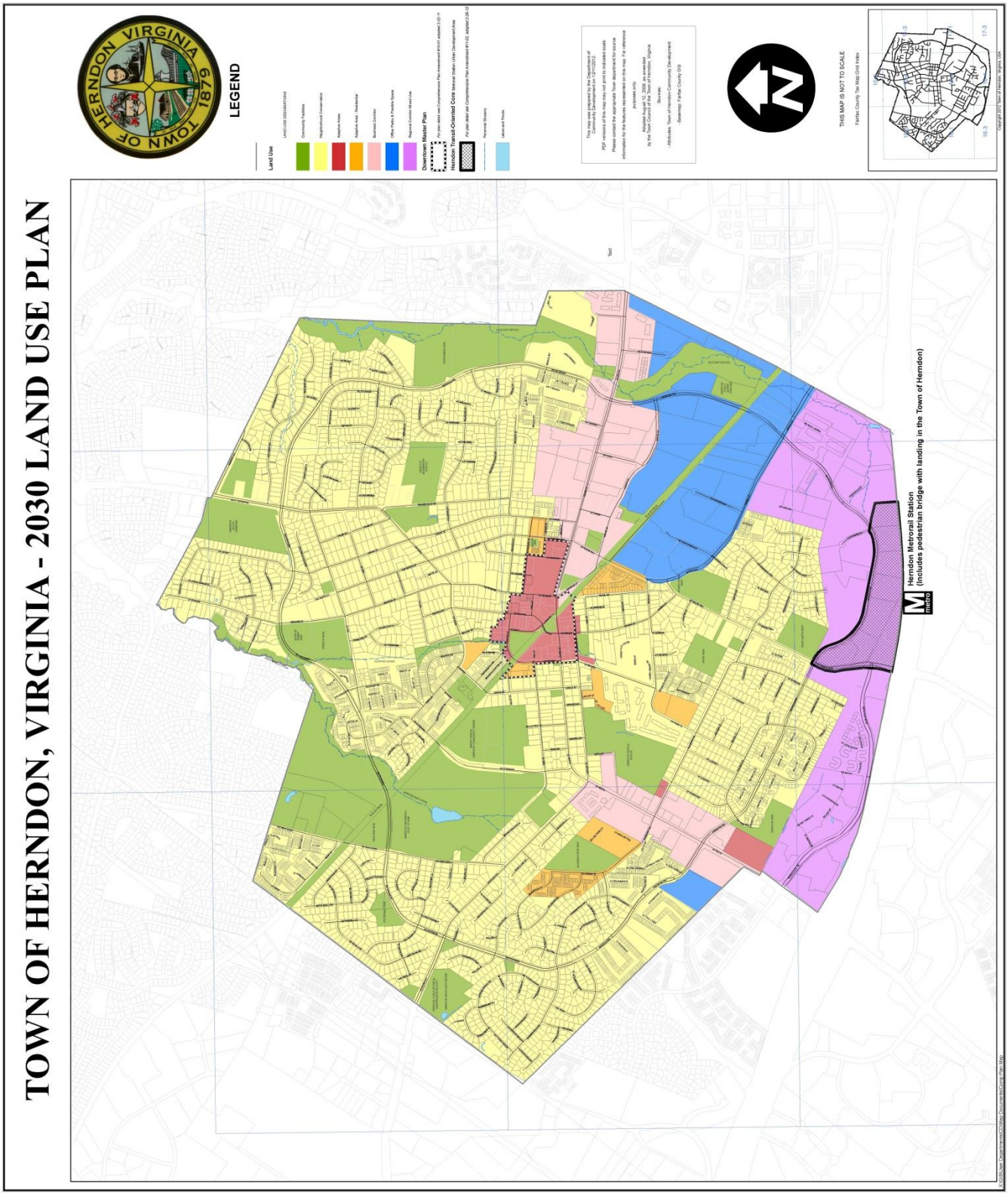
Development within the town was steady from the late 1970s to the mid 1990s. Map A identifies the existing land uses on all parcels located in the town as of July 2007. Of the 4.25 square miles of land that comprise the town, 23 percent of the land is used for commercial purposes, such as office and retail. More than half (56 percent) of the town's land area is dedicated to residential uses. Eighteen percent of land within the town is used for community facilities, which includes public and private schools, religious institutions, town-owned property, and parks. Only 56 acres or 2 percent of property in the town is vacant, not counting parks or other public open spaces as vacant. For comparison, 302 acres or 11 percent of the land in the town was vacant in 1992.

Downtown Herndon circa 1983

Map A: Town of Herndon Existing Land Use Map *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*



Map B: Town of Herndon 2030 Land Use Plan *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*



Illustrative Plan
Herndon Transit-Oriented Core
HERNDON METRO PROMENADE DETAIL
Bus Stop and Metro Passenger Drop-off/Pick-up Area
North Pavilion Entrance
Herndon Metro Promenade
HERNDON PARKWAY
DULLES TOLL RD & AIRPORT ACCESS HWY
LEGEND
Buildings
Parking Structures
not to scale
NORTH

Block D
The resolution included the following language related to this block: "The Council recognizes that the Block D parking structure must include a permanent public easement for the use of a minimum of 182 spaces to fulfill existing town public shared parking agreements. The Block D garage could be configured as per the Option A plan at 570 spaces or a smaller garage providing fewer spaces (420 spaces+-) could be configured exclusively on town land within Block D and without serving future development on privately owned land on Block D. The land on blocks D and E that is owned by the town would be fully served by such a reduced facility. Alternately, an exchange of land for parking could be negotiated so that the 570-space garage as shown on Option A could be developed with a permanent parking easement to serve redevelopment on lots 26 and 27A, as included in the Planning Commission's initial plan recommendation of May 2010."

Block E: Arts/Associated Uses
Town Council approved a public art center combined with commercial space for arts related uses. The resolution notes that the arts/associated uses designation would be reevaluated if a facility is not designed and funded by the end of 2015

Block F: Multi-Family
Town Council resolution added options for single-family homes or townhouses

Pines Block
Small lots single family homes along Jefferson Street as part of the transition to the existing neighborhood are shown here per the Town Council Resolution

1. Reinforce Elden Street as the retail core by adding new mixed-use buildings and restoring certain historic buildings to accomodate viable commercial uses
2. Convert Center Street in to a residential address lined by townhouses and multi-family buildings
3. Increase connections along the trail and extend Pine Street as a direct link to the trail. Create a new public space at Pine and Lynn Street that could include a small pavilion and outdoor seating.
4. Redevelop The Pines Shopping Center as a mixed-use center with retail along Elden, and new housing transitioning back to the neighborhood
5. Encourage a hotel use somewhere in the Downtown

(*) **See also the plan options page for two blocks where the Town Council resolution provides alternate land uses.**

URBAN DESIGN ASSOCIATES

APRIL 2011

100 0 100 200 500 FEET

N

Downtown Master Plan

Adopted By Town Council February 22, 2011 | Resolution 10-G-68
Comprehensive Plan Amendment #10-01 | Town of Herndon, VA

Block F

Alternative 1: Townhouse option

Develop additional housing in a townhouse form as a transition from the mixed-use block east of Center Street over to the single-family neighborhood to the west. Townhouses shall complement the historic character of downtown and occur in no more than 6 units in a row. On site parking and public open space shall be provided.

Alternative 2: Small Lot Single Family Detached Option

This plan option proposes to extend Haley Place back to Vine Street and develop a series of single-family lots within Block F. The primary frontage of these units shall occur along Vine Street and Center Street, with parking located in the rear of the lots and accessed via the new road extension. These lots shall reflect the smaller house typologies of Herndon and serve as a transition from downtown to the more residential neighborhoods to the west.

BLOCK D: Alternate configuration per Town Council Resolution item

(Item B. 6 of Town Council Resolution 10-G-68 of February 22, 2011):

This plan option reflects the redevelopment of Block D on town-owned land only. Vine Street shall be extended and a new garage may be developed to provide additional parking capacity for downtown. The garage will be accessed from Vine Street and will include improved streetscaping along Center Street as a buffer to the neighborhood. The Vine Street façade should be articulated in such a way as to enhance the pedestrian walkability along this new connection. A new pedestrian connection through the block is proposed between the garage and a new mixed-use building to be developed on the existing town parking lot. This will enhance the connectivity from Elden Street, across the Vine Street extension, and over to the Herndon Municipal complex.

URBAN DESIGN ASSOCIATES

APRIL 2011

100 0 100 200 300 FEET

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Downtown Master Plan: Plan Options for Blocks D & F
Adopted By Town Council February 22, 2011 | Resolution 10-G-68
Comprehensive Plan Amendment #10-01 | Town of Herndon, VA

The Land Use Plan Element of the 2030 Comprehensive Plan

The adopted 2030 Land Use Plan (Map B) provides guidance on the location of desired and appropriate land uses by classifying all land area within the town into specific categories. The adopted Land Use Plan has seven basic land use categories: Neighborhood Conservation, Community Facilities, Office Parks and Flexible Space, Regional Corridor Mixed-Use, Business Corridor, Adaptive Areas, and Adaptive Areas-Residential. Metrorail Station Urban Development Areas have policies that apply in addition to the base category of Regional Corridor Mixed-Use. The development or redevelopment of any parcel should be consistent with the land use polices of its designated land use category and with the Redevelopment Criteria as follows. The land use policies for each of the seven basic land use categories are set forth below.

In general, this plan seeks to preserve and enhance all areas of the town; especially those areas designated Neighborhood Conservation or Community Facilities. The plan does not support consolidation and redevelopment to a higher density in these areas. However, this plan is flexible and it may support high quality redevelopment within the other land use designations if the redevelopment criteria and other relevant planning considerations can be addressed.

With less than 2 percent of developable land area within the town vacant, future development in the town will, for the most part, be redevelopment. The town anticipates significant redevelopment within the town mainly in the downtown core and the areas surrounding the future Metrorail stations. The Business Corridor designation denotes a stable area with a mix of retail, services, hotels, medical, and other business uses. Modernization and redevelopment of individual sites can be anticipated over the long term, consistent with existing zoning.

The Town of Herndon supports the application of Universal Design in all land uses. Universal Design is the simple design of both products and the built environment to be usable by people of all ages and abilities, and which promotes the ability for people to age in place. The town also welcomes the possibility of attracting community institutions such as hospitals or college campuses within its limits.

Neighborhood Conservation

The Neighborhood Conservation designation applies to land identified in yellow on the adopted 2030 Comprehensive Plan Land Use Plan map. Neighborhood Conservation areas consist mainly of residential land developed with single-family detached, townhouse or multifamily structures. These areas are generally considered to be stable residential havens. The existing land uses, which are predominately residential neighborhoods, are desirable and worthy of conservation.

Goals for Neighborhood Conservation

1. Maintain and enhance the existing neighborhood character.

2. Protect existing neighborhoods from redevelopment to other uses or to significantly higher densities.

3. Create policies and programs that promote stability and encourage property owners to maintain the appearance of their residences. See also the "Residential Areas and Housing" chapter of this document.

Land Use Policies for Neighborhood Conservation

1. Development or redevelopment in Neighborhood Conservation should not exceed the maximum density prescribed in the underlying zoning district.

2. Development should be compatible with the existing, adjacent residential neighborhoods to maintain the same or similar character.

3. The consolidation of parcels and redevelopment is not encouraged; neither is the re-subdivision of lots into sizes smaller than the neighborhood average.

4. Residential infill should be compatible in density, size, height, placement and scale to adjacent dwellings. The exterior design of buildings should respect the neighborhood's existing continuity of architectural elements. Develop and consider ordinance amendments that would limit the size of new construction and additions to existing homes while still complying with the Virginia Code.

5. Neighborhood Conservation supports accessory uses associated with residential neighborhoods such as home based businesses and permitted accessory dwelling units.

6. Maintaining neighborhood appearance through property maintenance and beautification is supported and encouraged.

7. Buffering should be used to screen residential neighborhoods from dissimilar adjacent uses such as non-residential uses and higher density residential development. For proposed non-residential uses adjacent to residential areas, screening should include both constructed and vegetative screening. For proposed higher density residential adjacent to existing neighborhoods, vegetative buffering should be provided.

Community Facilities

Land classified as Community Facilities on the Land Use Plan map is property that is used or planned for future use as a municipal government building, a water tower, a public school, houses of worship, parks and recreation sites and facilities, open space, and other land owned by the Town of Herndon, the County of Fairfax or other public entity.

Goal for Community Facilities

Provide high quality facilities to serve town residents and other customers such as those who work in the Town.

Land Use Policies for Community Facilities

1. Public facilities should be located so as to best serve the users of these facilities.

2. Public facilities should be sited and developed with consideration for pedestrian, bicycle and traffic access, compatibility with surrounding uses, levels of noise and activity and other community and site planning factors.

3. Public facilities should be maintained in good, accessible condition, to the benefit of all users as well as to surrounding property owners.

4. Public facilities will be developed, operated and maintained in an environmentally sensitive and sustainable manner.

5. Encourage private landowners to preserve open space and protect ecological and cultural resources through the use of conservation easements, land use valuation, and other land use options, incentives and programs.

6. Protect, monitor and manage park water resources and stream valleys.

7. Protect parklands from encroachments and minimize adverse human impacts to natural areas.

8. Minimize adverse impacts of development on water resources and stream valleys.

9. Ensure the mitigation of adverse impacts to park and recreation facilities and service levels caused by growth and land development through the provision of proffers, conditions, contributions, commitments, and land dedication.

10. Non-residential development should offset significant impacts of work force growth on the parks and recreation system.

11. Ensure that comprehensive plan land use amendment proposals (including rezonings) for higher densities include the provision of parkland and trails or sidewalks to offset the impacts of increased density.

12. On development adjacent to park property, encourage designs that minimize the potential for encroachments and adverse environmental impacts on parkland and that augment the natural resource values of the parkland.

Office Parks and Flexible Space

Land classified as Office Park and Flexible Space on the adopted Land Use Plan map includes properties in which the predominate uses are business offices, flexible space, warehousing, light industrial workshops and maintenance facilities. The predominate use is office space in a campus environment with high quality development standards including extensive landscaping treatments.

Goal for Office Parks and Flexible Space

Provide for the more modest commercial activity not designated in the Regional Corridor Mixed-Use designation. For example, businesses that may not require the premium cost and greater visibility of the Dulles Corridor.

Land Use Policies for Office Parks and Flexible Space

1. Create an attractive environment that encourages companies and businesses to locate and remain within the town limits.

2. Generate positive economic benefits for the town economy in terms of employment, retail sales and tax revenues.

3. Encourage "light" industrial uses, office uses, uses that include research and development of high technology products, and related uses. Such uses should:

    a. Have minimal off-site impact;

    b. Not generate emissions or effluent that degrade the environmental quality of the town;

    c. Be visually and acoustically harmonious with surrounding development and not generate vibrations that can be experienced off-site;

    d. Have operations that are conducted within an enclosed building with all loading and storage of goods, equipment, and vehicles totally screened from adjacent properties and from any public right-of-way.

Business Corridor

This land use designation applies within large portions of the Elden Street corridor. It denotes a dynamic mix of retail, services, hotels, medical and professional offices and other non-residential uses. Consistent with existing zoning, modernization and redevelopment are anticipated over the long term.

Goal for Business Corridor

Provide space for the businesses that serve the local community and to a more limited extent the regional market area.

Land Use Policies for Business Corridor

1. Provide goods and services to the community while maintaining high quality site design.

2. Business Corridor uses that border Neighborhood Conservation areas must provide for appropriate transitions which will normally include extensive landscaping and physical buffering with quality walls or other structures.

3. Generate positive economic benefits for the town economy in terms of employment, retail sales tax and other tax revenues.

4. Create a master plan for redevelopment of the Herndon Centre (K-Mart Shopping Center).

Regional Corridor Mixed-Use

This is the most intense land use category within the town, providing for major mixed-use development along the Dulles Toll Road corridor. This category includes relatively dense residential and commercial land use ranging from hotels to office buildings. The Regional Corridor Mixed-Use designation is shown in purple on the Land Use Plan map.

Land Use Policies for Regional Corridor Mixed-Use

1. Provide for a regional scale mixed-use development environment.

2. Create an attractive environment that encourages companies and businesses to locate and remain within the town limits.

3. Generate positive economic benefits for the town in terms of employment, retail sales and tax revenues.

4. Provide appropriate site design and excellent pedestrian facilities to support mobility among the mix of uses within the Regional Corridor Mixed-Use and connectivity to other areas of the town.

Metrorail Station Urban Development Areas

Within the Regional Corridor Mixed Use area there is land further designated on the Land Use Plan map as the Metrorail Station Urban Development Area. The Metrorail Station Secondary Impact Area covers portions of adjacent land designated as Office Parks and Flexible Space. The Urban Development Area and the Secondary Impact Area are part of the land included in the Dulles Corridor Metrorail Phase Two Transportation Improvement District, as adopted by the Town of Herndon and Fairfax County on November 10, 2009.

The Metrorail Station Urban Development Area conforms to new Virginia Code § 15.2-2223.1 requirements concerning areas for growth with new urbanist development. These requirements are shown in the text box. The Urban Development Area (UDA) identifies where higher density, transit oriented development is

appropriate. A mix of uses is encouraged. Properties that border the Dulles Toll Road and/or Herndon Parkway are foreseen to have a higher redevelopment potential. The properties that border the residential neighborhood to the north and are near the residential areas to the west have redevelopment potential but building heights must taper down dramatically in relation to the scale of the adjacent and nearby neighborhoods.

Code of Virginia – New Comprehensive Plan Requirements in Regard to Urban Development Areas; Effective July 1, 2007:

§ 15.2-2223.1. Comprehensive plan to include urban development areas; new urbanism.

A. Every county, city, or town that has adopted zoning pursuant to Article 7 (§ 15.2-2280 et seq.) of Chapter 22 of Title 15.2 and that (i) has a population of at least 20,000 and population growth of at least 5% or (ii) has population growth of 15% or more, shall, and any county, city or town may, amend its comprehensive plan to incorporate one or more urban development areas. For purposes of this section, population growth shall be the difference in population from the next-to-latest to the latest decennial census year, based on population reported by the United States Bureau of the Census. For purposes of this section, an urban development area is an area designated by a locality that is appropriate for higher density development due to proximity to transportation facilities, the availability of a public or community water and sewer system, or proximity to a city, town, or other developed area. The comprehensive plan shall provide for commercial and residential densities within urban development areas that are appropriate for reasonably compact development at a density of at least four residential units per gross acre and a minimum floor area ratio of 0.4 per gross acre for commercial development. The comprehensive plan shall designate one or more urban development areas sufficient to meet projected residential and commercial growth in the locality for an ensuing period of at least 10 but not more than 20 years, which may include phasing of development within the urban development areas. Future growth shall be based on official estimates and projections of the Weldon Cooper Center for Public Service of the University of Virginia or other official government sources. The boundaries and size of each urban development area shall be reexamined and, if necessary, revised every five years in conjunction with the update of the comprehensive plan and in accordance with the most recent available population growth estimates and projections. Such districts may be areas designated for redevelopment or infill development.

B. The comprehensive plan shall further incorporate principles of new urbanism and traditional neighborhood development, which may include but need not be limited to (i) pedestrian-friendly road design, (ii) interconnection of new local streets with existing local streets and roads, (iii) connectivity of road and pedestrian networks, (iv) preservation of natural areas, (v) satisfaction of requirements for stormwater management, (vi) mixed-use neighborhoods, including mixed housing types, (vii) reduction of front and side yard building setbacks, and (viii) reduction of subdivision street widths and turning radii at subdivision street intersections.

C. The comprehensive plan shall describe any financial and other incentives for development in the urban development areas.

D. No county, city, or town that has amended its comprehensive plan in accordance with this section shall limit or prohibit development pursuant to existing zoning or shall refuse to consider any application for rezoning based solely on the fact that the property is located outside the urban development area.

Land Use Principles and Policies for Metrorail Station Areas

1. Recognize the potential to concentrate the highest density or land use close to the rail station.

2. Ensure there is a mix of land uses that support a variety of activities at various times to promote and support transit ridership and provide shared parking opportunities.

3. Provide appropriate traffic calming measures and other facilities as needed to address the impacts of Metrorail in areas throughout the town.

4. Within the transit station area, accommodate and provide for multi-modal transportation methods, including pedestrian, bicycle, trolley bus and bus travel. Also provide for taxi stands, shuttle stops, limousine and tour bus parking.

5. Ensure public open spaces are provided through the development of an open space plan that includes major green space components signifying planted areas with pervious surfaces. Green space components should include green roof designs. The town shall develop a conceptual open space plan with green space components. Developers shall provide detailed plans with specific development proposals.

6. Establish urban design standards that create a unified streetscape and harmonious building design to support and invite pedestrian activity.

7. Design a mixed-use pedestrian corridor that terminates at the north access point of the Herndon Rail Station. Ensure that public art and public amenities are included in this corridor.

8. Promote the development of appropriate pedestrian and vehicular access on the north side of the Herndon Rail Station.

9. Determine an acceptable parking formula that accommodates on-site parking while encouraging the use of rail. Minimize the visual impact of parking structures and surface parking lots.

10. Establish a firm boundary and mandate buffering guidelines with extensive vegetation and either structural walls or large berms or both in order to protect single-family homes adjacent to the transit station area from redevelopment.

11. Establish a parking permit policy that prohibits commuters from parking in neighborhoods that are in close proximity to the rail station.

Herndon Metro Station Area

The Herndon Metro Station Area Study, including the Herndon Transit-Oriented Core Plan, was developed by the town Planning Commission with extensive input from citizens and landowners and support from technical consultants. The vision resulting from this planning process is contained within the following statement:

> *The Herndon Transit-Oriented Core is a distinctive potential employment center and residential neighborhood characterized by concentrated development that is vibrant, mixed use, transit oriented*[1] *and pedestrian friendly. Emerging development is interwoven with and strengthens the town's cultural fabric and sense of identity.*

Many elements are required to achieve this vision, including a proper intensity and mix of land uses, improvements to pedestrian access, and the provision of open space. The Herndon Metrorail Station Area Study, including the Herndon Transit-Oriented Core (HTOC) Plan, and its various appendices, prepared by VHB, Inc, dated December 14, 2011, is incorporated by reference as a part of the 2030 Comprehensive Plan and should be consulted as the initial guidance about development of the Metro Station Area.

A priority element for the town is providing safe and convenient passenger drop off and pick up accommodations on the north side of the Metro station anticipated to be located in the median of the Dulles Toll Road immediately south of Town.

At the onset of Metro service, a transit center providing bus, taxi and private vehicle drop-off along the Herndon Parkway will be in place. Access to the Herndon Metro Station pavilion will be provided by a sidewalk with lighting.

During future redevelopment, the Town will work with applicants on a cooperative design process using a list of design criteria and objectives. The intent of this process is to ensure that developers can incorporate an enhanced transit center and a passenger drop-off/pick-up facility into their redevelopment site plans. Criteria for the facility include, but are not limited to:

1. Drop-off area of a size, style and design that serves as an alternative to long term parking at the Herndon-Monroe Park and Ride facility.

2. The presence of a pedestrian-oriented public open space upon exiting the North Entrance Pavilion instead of just the immediate presence of a plain sidewalk leading to roadway pavement and vehicular activity.

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[1] From US Department of Transportation, Federal Transit Administration, appearing on webpage on June 27, 2011: "Transit-Oriented Development (TOD) - compact, mixed-use development within walking distance of public transportation - is a key element of livable and sustainable communities. TOD creates communities where people of all ages and incomes have access to transportation and housing choices by increasing location efficiency and allowing people to walk, bike and take transit for their daily trips. TOD is attractive to its residents because it fosters a convenient and affordable lifestyle where housing, jobs, restaurants, and entertainment are all in convenient proximity. In addition, TOD increases transit ridership and reduces automobile congestion, providing value for both the public and private sectors."

3. A minimum size of the proposed open space should be determined. The open space should be adjacent to the North Entrance Pavilion landing.

4. The open space should be highly visible from both Herndon Parkway and the North Entrance Pavilion, and should not be enclosed on all sides.

5. Essential components of the passenger drop-off/pick-up facility, regardless of configuration or location, may include:

    a. Drop off lane (for the activity of driving up, dropping off, driving away; no standing): while a length of 180 feet per vehicle is a standard recommended by the consultant, a lane longer than 180 feet is preferred.

    b. Standing spaces (for drivers in vehicles to await passengers disembarking from the Metro): ten to fourteen spaces. These spaces should be accommodated with redevelopment near the Metro station. The spaces do not need to be contiguous. For example, half of the spaces could be north of Herndon Parkway and half could be south of Herndon Parkway. As another example, the spaces could be shared among several properties close to the Metro station. The principal point is that drivers picking up or dropping off passengers should not have to drive directly up to the Metro entrance pavilion, and do not need to be in standing spaces immediately adjacent to the station to wait.

    c. A minimum of two bus bays.

    d. An off-site cell phone waiting area.

Guiding Principles

1 There should be no decrease in employment, value of development, or commercial floor area existing in 2011.

2. Concentrated development in the HTOC should support and reinforce the quality of life, sense of community, engagement of citizens, economic prosperity of other commercial areas, and other features that comprise the character and fabric of the town.

3. Redevelopment to create a transit oriented development must be facilitated over the long term and is likely to involve phases of development and capital improvements.

4. The HTOC should complement reinvestment in the Downtown and in other parts of town.

5. Future redevelopment in the HTOC should be viewed as a means to support the existing comprehensive plan goal to enable Herndon to be a leader in environmental stewardship for the region.

Goals

The Herndon Transit-Oriented Core should

1. Ref1ect Herndon's unique identity and be distinct from other Metro stations.

2. Enable land uses that will help optimize for the Town the investment in transit.

3. Balance protection of surrounding neighborhoods with the need for mobility connections from the HTOC to the rest of Herndon and the region.

4. Enhance and encourage use of non-auto modes of travel within the town.

5. Enable the town's internal system of sidewalks, streets, and trails to connect to mass transit.

6. Provide housing choices within the Metro Station Area for those attracted to compact, mixed-use, walkable neighborhoods with nearby transit availability.

7. Recognize the need for interjurisdictional collaboration as the HTOC is predicted to serve a community larger than the Town of Herndon.

8. Promote redevelopment and design that will enhance the aesthetic qualities of the town.

Objectives

1. Enable only the amount of development that can be served by street improvements that are:

    a. within the type of street features currently used by town (i.e., excluding grade-separated interchanges, displaced left turn lanes, triple left turn lanes, or flyovers).

    b. of a cost reasonable for funding in the foreseeable future when development is anticipated to occur. This objective is not intended to restrict the Mayor and Town Council in requesting any type of street improvement through the regional transportation planning process.

2. Minimize traffic impacts of TOD development on nearby neighborhoods. Elicit restricted parking requests from neighborhoods in an effort to preclude commuter parking in those neighborhoods.

3. Provide access improvements to the Herndon Transit-Oriented Core with priority given to (i) pedestrians, (ii) bicyclists, (iii) transit users (buses), (iv) private vehicles (single occupancy vehicles and carpools).

4. Improve bus, bicycle and pedestrian connectivity for those using the Metro Station; include links to Herndon neighborhoods as well as to areas outside the town limits.

5. Participate in any multi-jurisdictional Transportation Demand Management (TDM) program to monitor the achievement of regional and individual TDM measures.

6. Link the Metro Station Area to other parts of Herndon by:

    a. encouraging Fairfax County to provide enhanced local bus service.

    b. enhancing the pedestrian and bicycle environment.

    c. providing direct trail linkages to the Metro station.

7. Distinguish the Metro Station Area with unique architecture, streetscape and landscape of the highest caliber and conforming to the design criteria; i.e.,

    a. Avoid uniformity of building mass, style and appearance.

    b. Establish an urban street edge with wide multi-purpose sidewalks for core streetscapes.

    c. Require multi-story parking structures otherwise visible at street level to enhance the pedestrian street experience, by such methods as being wrapped with buildings.

    d. Present a pedestrian friendly and inviting image with no unadorned parking garage structures or vehicle areas clearly visible from streets or pathways.

8. Create active streetscapes and storefronts, including incorporation of storefronts and building entrances on the ground floor of podium parking decks and other parking facilities.

9. Incorporate street level landscaping, green roofs, and improved storm water management systems to assist the town's goals of achieving increased tree canopy and meeting Chesapeake Bay storm water management requirements.

10. Forge collaborative relationships between representatives of the town and affected properties, including adjacent neighborhoods, to help achieve the vision for the Metro Station Area Plan.

11. Establish a system in which prospective developers within the Metro Station Area provide an evaluation of community benefits to reveal how proposed development will aid other commercial areas in town (such as by a multiplier effect), improve the quality of life in the town, and create more revenue than expenses to the local jurisdictions.

12. Develop a classification of public amenities required for redevelopment to achieve densities approaching the maximum FAR permitted within the HTOC.

Principles for Intensity, Land Uses, and Building Form

The HTOC will occur through zoning that guides urban form and allows market demand to influence the mix of uses. Form-based zoning is a tool for this purpose as well as conventional zoning. Properties in the HTOC are currently zoned O&LI, Office and Light Industrial, at a maximum density of 0.7 floor area ratio (FAR) which will remain in effect. At such time as a property owner seeks to redevelop and intensify uses on the property, a rezoning application must be made for a new district based on the guidance of the Herndon Metro Station Area Study. The language governing the new district shall include Project Evaluation Criteria. To achieve the maximum densities stated below, the rezoning proposal must meet the Project Evaluation Criteria for the HTOC. The level of density matched to the level at which a project meets criteria will be described in the new zoning district language. The project evaluation criteria will be essentially based on the Herndon Metro Station Area Study: Vision, Guiding Principles, Goals, Objectives (Chapter 1), as well as Principles and Guidelines (Chapter 6).

Maximum Density Measured Per Development in the Herndon Transit-Oriented Core (HTOC)
Combined Residential and Non-Residential Floor Area

Floor Area Ratio Not to Exceed	Proximity to Metro Station (refer to HTOC map)
3.8	Parcels that lie farthest from the Metro Station and are within the HTOC
4.3	Parcels in the HTOC that abut and are impacted by the following significant public improvements: the Herndon Metro Promenade, Worldgate Drive Extension and the Metrorail North Side Pavilion.

While this plan accepts the influence of market demand on the mix of uses, the area should have a balance of uses to ensure its vibrancy. Neither 100 percent residential nor 100 percent non-residential uses would be appropriate in the area as it transforms from a 2011 pattern with 100 percent non- residential uses. Background studies for the Plan used a certain land use mix, shown below, that can be used as a guide. This mix is not intended to be required of individual projects.

Gross Building Floor Area as Share of Total Floor Area in the Herndon Transit-Oriented Core (excluding parking garages) Assumption for Background Study Purposes	
	By 2035
retail	3%
office	50%
residential	41%
hotel	6%

Principles for the Provision of Open Space in the HTOC

While the HTOC will create a new and exciting entrance and economic engine for the town as a whole, it will also serve as a unique neighborhood for its residential and business inhabitants. The HTOC will be served by attractive and functional public and private exterior and interior spaces to ensure a balanced environment, provide adequate open space for the health and recreational needs of its residents, workforce and visitors, protect existing recreational resources in the town from over-use, and create attractive and inviting surroundings. These spaces will afford connectivity, relaxation, exercise, minor entertainment venues, civic pursuits and social engagement.

The signature open space within the HTOC will be the Herndon Metro Promenade. Crucial to the success of the HTOC, the Herndon Metro Promenade must make arrival in Herndon a unique experience among Metro stations.

The HTOC will be enhanced and served by a variety of additional open spaces. The design of an individual open space shall be governed by its intended purpose. Shared qualities shall include superior materials incorporating beauty and durability, an appropriate balance of landscape and hardscape, state of the art landscape practices, a dependence on native trees augmented by native and non-native shrubs, annuals and perennials, and unique features providing aesthetic appeal and a memorable sense of place, including but not limited to water features, statuary, mosaics, plaques, lighting, streetscape furnishings and accessory structures where appropriate. General green space for both respite and active play will be provided in conjunction with residential uses throughout the Core.

Specific principles for public and private spaces necessary to achieve the desired environment are listed in the HTOC and address:

- Herndon Metro Promenade
- Commercial and Residential Open Space
- Interior Recreation Space
- Interior Community Facilities
- Primary Streetscape (Herndon Parkway)
- Secondary Streetscape
- Multimodal Trails

Planning efforts in cooperation with Fairfax and Loudoun Counties will continue to address land use planning for the Route 28 Metrorail Station located just south of the town within Fairfax County and just east of the Loudoun County line. At this writing the full extension of the Metro Silver Line through the Reston and Herndon areas to Dulles Airport and Loudoun County is expected to be completed by the year 2017. However, project timelines and funding schemes have shifted many times in recent years.

Adaptive Areas

Land designated as Adaptive Areas on the adopted Land Use Plan map includes areas where the town is flexible and may be able to accommodate a variety of land uses depending on the specific circumstances. These areas are colored pink on the Land Use Plan. These properties are often dynamic in nature and/or subject to change over the long term. These properties may be well suited for rezoning and redevelopment in accord with the following Redevelopment Criteria. These areas may be suitable for a change of use and especially for a mix of uses on various sites or even within particular buildings. Any new development or redevelopment will impact existing development and the 2030 Comprehensive Plan does not propose any specific zoning map changes.

Adaptive Areas – Residential

Land designated as Adaptive Areas – Residential includes areas where the town encourages redevelopment over the long term to some form of residential use. Compatibility with existing residential neighborhoods will be a key factor in evaluating development proposals. Redevelopment to large scale commercial or any other use that is not residential is generally not supported. The town generally encourages rezoning and redevelopment for residential use, in accord with the Redevelopment Criteria.

Redevelopment Criteria

Any property designated Office Parks and Flexible Space, Regional Corridor Mixed-Use, Adaptive Area – Residential or Adaptive Area that is contemplated for redevelopment through an application for site plan or rezoning needs to be evaluated based on the following redevelopment criteria. The following criteria are to be considered when evaluating the compatibility of a particular proposal, along with other considerations to advance sound planning and the public welfare with regard to specific locations and properties:

1. Where the property proposed for development adjoins areas that are Neighborhood Conservation, potential impacts upon the residential area should be a primary factor. The effectiveness of mitigation of those impacts through physical separation as well as constructed and vegetated buffer treatments shall be a major consideration in evaluating proposals.

2. Compatibility with existing land use and zoning shall be a primary factor, particularly where there are stable long-term uses in place.

3. Industrial uses shall be considered only when they can demonstrate excellence in meeting performance standards of the zoning ordinance, excellence in site design and buffering and avoidance of negative impacts on the environment.

4. The extent to which a proposal features beneficial consolidation of parcels with an effective master plan of development.

5. The extent to which a proposal removes a property from a non-conforming status with respect to the zoning ordinance or if conforming due to a variance, the extent to which the proposal removes the current use and provides for a use allowed in the applicable zoning district.

6. Public Services Impact: Development applications should be evaluated for their impact on public services. For example, commercial and residential uses should have easy access to mass transit routes and public recreation areas. Impacts on schools, parks and recreation, public safety, water and sewer infrastructure, transportation and traffic impact must be mitigated or alleviated in development applications.

7. Use of environmentally sound practices including green roofs, natural (especially wooded) open space corridors/areas as transition zones, visual amenities and buffers. Use of natural site amenities (e.g., quality trees, streams, etc.) through sensitive building placement, street and parking lot design/construction.

8. Efforts to minimize the amount of impervious surface and provision of stormwater management facilities which can be retained as open space amenities. Use of bioretention and best management practices for stormwater retention wherever possible.

9. Mitigation of noise impacts of the development and/or adjacent streets.

10. Provision of wired fiber optic, wireless capabilities or other technologies to eliminate the need for satellite dishes in commercial and residential areas.

11. Placement of native trees and woody vegetation for energy conservation and other positive impacts. Planting of canopy shade trees in planting islands, serving to provide shade, reduce heat, absorb stormwater and visually break up large parking areas.

12. Use of architectural masses scaled to relate positively to the site and to adjacent uses through consideration of building size, design, siting, setbacks and landscaping.

13. Mitigation of height impacts of proposed structures on existing neighboring structures through consideration of factors such as architectural design, provision of generous buffer areas, and avoidance of blocking sunlight to adjacent structures; neighborhood reception to the proposal should be considered.

14. Use of structured parking whenever possible; integrate parking decks into overall building architecture.

15. Provision of secure bicycle parking areas.

16. Incorporation of pedestrian plazas at major building entrances, featuring special paving, seating, plantings and water features such as fountains.

17. Provision of outdoor architectural elements such as trellises, kiosks, public art and bus shelters.

18. Integration of on-site service (e.g., loading areas, trash collection containers, or utility substations) and amenity features into overall functional and design scheme; provision of a high quality image to all off-site public views.

19. Placement of utility lines underground, screening and landscaping utility substations and service areas from public view.

20. Assistance with the provision of a continuous pedestrian/open space system linking the project to existing and planned community amenities and activity nodes.

21. Consolidation of parcels wherever possible. This results in opportunities for better site design, more efficient use of site, better drainage controls, fewer curb cuts, and better landscape design.

Green Streets

Green Streets are defined as an open space strip of 25 feet in width to be provided adjacent to the public right-of-way. Green streets provide a natural buffer between the road and the building, providing a green corridor on each side of the designated thoroughfares. Berms, understory vegetation, ground covers and the preservation of existing natural areas are supported under this land use designation. The Green Streets policy is implemented through the Town of Herndon Zoning Ordinance. The green streets policies generally apply to the following streets or rights-of-way:

1. Elden Street, excluding the downtown area;

2. Herndon Parkway, except along the Herndon Transit Oriented Core;

3. Washington and Old Dominion Railroad Regional Trail;

4. Spring Street, from the eastern town boundary to Van Buren Street;

5. Van Buren Street, from Spring Street to Elden Street;

6. Dranesville Road, from the northern town boundary to Park Avenue;

7. Sterling Road.

Green Streets Land Use Policies

1. Buffers strips, tree plantings and other features should be provided per the zoning ordinance.

2. Structures, automobile parking areas or other impervious area should be located outside the Green Streets buffer area.

3. Sidewalks, driveways for ingress and egress, and signs are permissible in the Green Streets buffer area.

4. Placement of storm water management ponds in the Green Streets buffer area is discouraged.

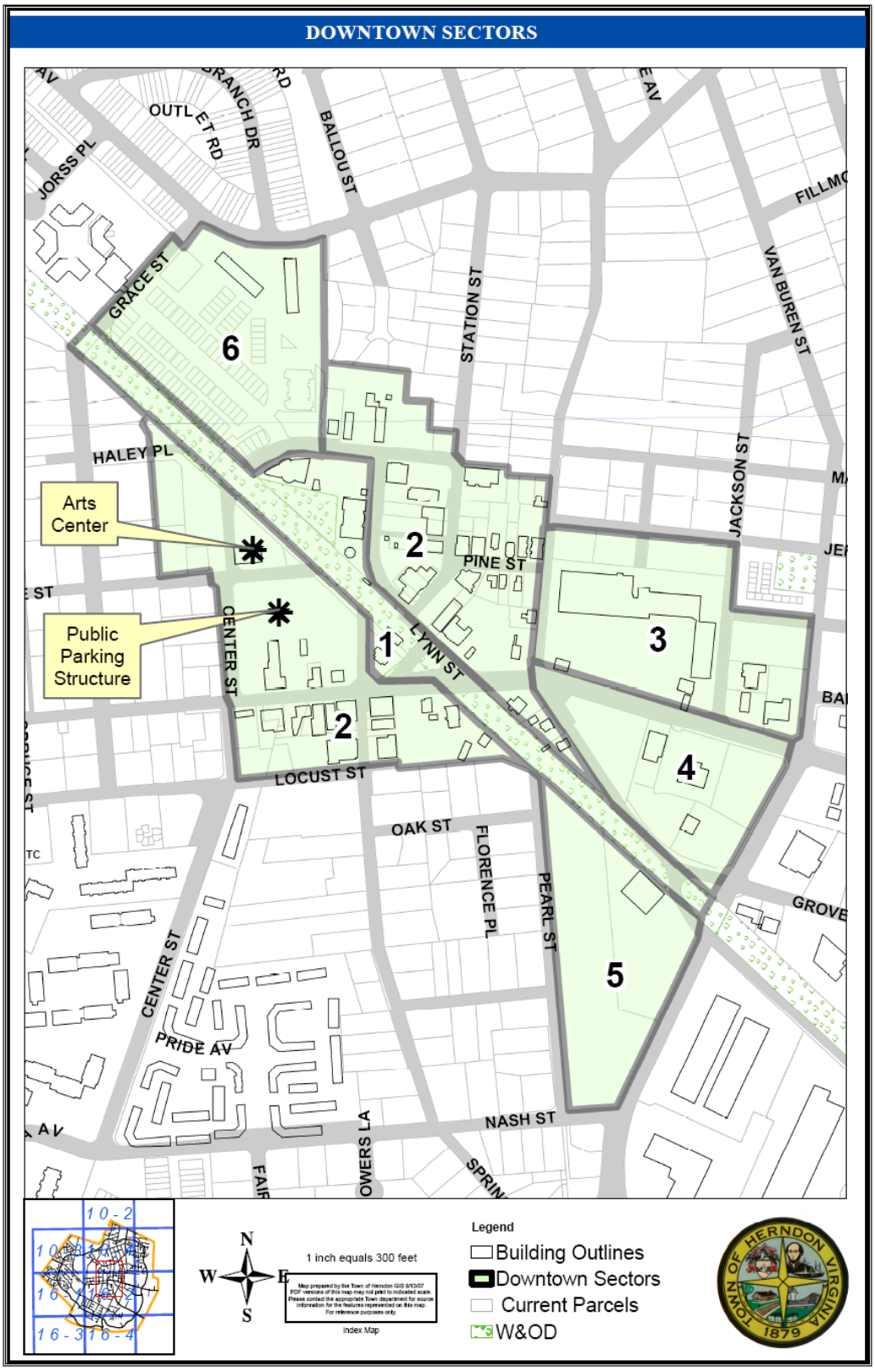
Where there is conflict or inconsistency between the provisions of Green Streets and Downtown Streetscape, the Downtown Streetscape approach prevails.

The HTOC has a distinct streetscape standard that should be incorporated as additional urban standard in The Guidelines for the Planning and Design of Town Street Projects.

The Herndon Downtown – Vision and Specific Land Use Policies

The Herndon Downtown is designated and further divided into six sectors as shown on Map C. The geographic area identified as the Herndon Downtown is the traditional core commercial area of the town, which is an Adaptive Area. Public, commercial and residential uses are supported in the downtown. Land use policies in the downtown are guided by both the underlying land use designation (Community Facilities, Adaptive Area, or Adaptive Area – Residential) and the vision, goals, objectives and policies set forth below. In addition, the Downtown Master Plan (adopted February 22, 2011) provides a specific land use plan for Sectors 1, 2 and 3 and a small portion of Sector 6 along Center Street. This Downtown Master Plan is incorporated into the 2030 Comprehensive Plan by this reference. The intent of the Herndon Downtown policy is to ensure the integration of redevelopment with the unique heritage assets of Herndon's traditional commercial center and surrounding residential areas. The downtown master planning process of 2008-2011 is documented and reports on the Market Analysis, Heritage Resources Analysis and other materials including a spreadsheet of approximate development quantities for each block ("Herndon Downtown Development Analysis") are available from the Department of Community Development.

Map C: Town of Herndon Downtown Sectors Map *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*



Vision Statement

Downtown Herndon will be a thriving, vibrant location reflecting a variety of commercial environments that have existed in Herndon, along with new downtown development; where a unique, properly-scaled town commercial center includes a mix of complementary retail, civic, arts, entertainment, office, and residential uses, including restaurants, personal services, lodging and other businesses; where an attractive pedestrian environment links public spaces and facilities; where traffic flow is managed and calmed; where a variety of public and private parking facilities are available, yet visually obscured; where business is complemented by year-round festivals, concerts and special events.

Goals for the Herndon Downtown

1. Maintain and enhance Herndon's Downtown image as an attractive entertainment destination.

2. Provide a complementary mixed-use emphasis in the downtown, encouraging a sense of community as well as day and evening activity and street life.

3. Create a special sense of place and cohesion by blending new development of appropriate scale, design and use with existing uses.

4. Encourage complementary redevelopment, retail expansion and new residential development in all Downtown Sectors.

5. Create a safe, pedestrian-friendly environment while providing for reasonable traffic circulation, adequate parking and appropriate lighting.

6. Create a singularly attractive downtown where property owners, as well as the town government, enhance public and private spaces with enhancement projects and attention to property maintenance, landscaping plants and other features.

7. Consistent with the goals and objectives of the Heritage Preservation chapter of this plan, distinguish the town from its surroundings through appropriate preservation and adaptive re-use.

Selected Goals with Objectives

GOAL 1: Maintain and enhance Herndon's Downtown image as an attractive entertainment destination:

OBJECTIVE 1: Continue to provide a full program of concerts, festivals and special events;

OBJECTIVE 2: Promote entertainment venues in the downtown and seek additional activities through an arts center and other public or private venues.

GOAL 3: Create a special sense of place and cohesion by blending new development of appropriate scale and character with existing uses:

OBJECTIVE 1: Manage growth so that new development is compatible with heritage structures and with the unique atmosphere of the surrounding residential areas;

OBJECTIVE 2: Minimize any adverse impacts that development or redevelopment would have on single-family residential neighborhoods surrounding the downtown;

OBJECTIVE 3: Guide urban design through the Downtown Heritage Preservation Zoning District, the Heritage Handbook and the associated review process, and the Fortnightly Neighborhood Urban Design Guidelines;

OBJECTIVE 4: Codify the Heritage Handbook guidelines as appropriate so that the guidelines become ordinance after Town Council consideration and action.

GOAL 4: Encourage complementary redevelopment, retail expansion and new residential development in all Downtown Sectors:

OBJECTIVE 1: Allow possible higher density commercial and residential redevelopment in the downtown core, using Planned Development-Downtown (PD-D) zoning which includes mixed-use within a 50 foot height limit;

OBJECTIVE 2: Support the core commercial areas of the downtown with housing extending to areas such as the Townes at Herndon Centre, Fortnightly Square and the Herndon Lumber site;

OBJECTIVE 3: Expand the commercial core through redevelopment of the Pines Shopping Center and nearby properties as a potential rezoning to Planned Development-Downtown (PD-D) with building heights and development intensity stepping down toward the eastern end of this land block and also toward the northern edge along Jefferson Street;

OBJECTIVE 4: Create illustrative redevelopment concepts and schematics in cooperation with local businesses and the organizations that represent them.

GOAL 5: Create a pedestrian-friendly environment while providing for reasonable traffic circulation and adequate parking:

OBJECTIVE 1: Encourage walking by linking residential and commercial areas utilizing sidewalks, trails and design amenities including sufficient lighting;

OBJECTIVE 2: Provide sufficient parking, including Public Shared Parking; pursue opportunities to create a balance of convenient parking that is distributed on various blocks, with an emphasis toward locations that are behind or apart from the primary commercial storefronts;

OBJECTIVE 3: Accommodate shuttle bus and transit bus stops in any new development or redevelopment;

OBJECTIVE 4: Provide significant street and intersection improvements consistent with the Transportation Plan chapter of this plan. Update the 2003 Downtown Traffic Study to include a CORSIM model and simulation of year 2025 buildout conditions during AM, Midday and PM peak hours;

OBJECTIVE 5: Enhance the relationship between activities and land uses on the south side of Elden Street and those on the north side of Elden Street;

OBJECTIVE 6: Ensure fluid and safe pedestrian access on and across Elden Street to create a dynamic synergy throughout the entire downtown;

OBJECTIVE 7: All new green spaces and open spaces that are developed should be open to the public.

GOAL 6: Create a singularly attractive downtown where property owners, as well as the town government, enhance public and private spaces in a variety of ways. Use pride and mutual effort as well as regulatory tools to achieve the highest standards of property maintenance and beautification:

OBJECTIVE 1: Seek additional green space that is accessible to the public. Provide for art in public spaces, especially through the review of development proposals. Seek vegetated public pocket parks;

OBJECTIVE 2: Develop feasible means to place utilities underground; establish a pro rata share account or other mechanism where the town can accumulate contributions toward a coordinated downtown effort, even as undergrounding may not be practical for individual lot development;

OBJECTIVE 3: Secure funding to complete the Downtown Streetscape project currently under design and to extend similar public improvements to additional streets in the downtown.

Land Use Policies by Sector

Certain policies and planning approaches apply to specific Downtown Sectors as shown on Map C. With regard to Sectors 1, 2, 3, and a small portion of Sector 6, the Downtown Master Plan adopted February 22, 2011, shall govern with regard to specific density and other features; the density and features described below for Sectors 1, 2 and 3 are to be viewed only as a general guide. The general approach that is appropriate for this area is traditional town planning or new urbanism. This concept embraces the traditional street grid without setbacks other than enhanced streetscapes. The town seeks a cohesive street wall that respects the heritage character and avoids deep setbacks and parking in the front of buildings. On-street parking is encouraged and other parking is to be completely enclosed within structures or placed in the rear of buildings. Preservation of existing structures is encouraged, especially where there is a continuous fabric with a number of heritage buildings along a given street. Certain structures of a generic concrete block construction may not be appropriate for preservation despite their age. Rather, the town seeks redevelopment in a form and with a high level of quality that reflects turn of the century heritage for Virginia towns and cities. The Herndon Heritage Preservation Handbook (forthcoming in 2008 and as amended thereafter) and the zoning ordinance should be consulted for all development in the downtown.

Sector 1

This area of the downtown is focused on major public facilities and civic activities. Sector 1 includes the Herndon Municipal Center complex which includes the Herndon Council Chambers, the Herndon Fortnightly Library, the Town Green concert area and the Municipal Center building itself. The "old" Town Hall and green on Elden Street, the W&OD Trail and the Herndon Harbor House complex are part of this sector as well.

The plan encourages these long-term major public uses. This plan encourages enhancement of the properties over time, through maintenance and minor improvements such as streetscape upgrade and replacement. Open spaces are to be kept largely intact. The parking lot at the corner of Center Street and Lynn Street should be retained as a potential area for future expansion of the Municipal Building or other public use. Parking could be maintained at the ground level with a structure above. The entrance on Center Street serving both the Fortnightly Library and the Municipal Center should remain if this portion of the property is developed.

Sector 2

This core area of the downtown is appropriate for redevelopment in accord with the character, density and generalized building locations specified in the Downtown Master Plan adopted February 22, 2011, Consolidation of parcels is supported and this would include vacation of relatively small portions of public right-of-way to support coherent development. Reduced height and building mass, as shown in the Downtown Master Plan adopted February 22, 2011, and enhanced buffering are appropriate in areas where Sector 2 borders properties with single-family detached zoning. The former Dominion Virginia Power parcels and the Town land bounded by Vine Street, Center Street and the W&OD Trail right of way are appropriate for residential use only. These parcel areas are designated Adaptive Area – Residential.

Sector 3

Areas bounded by Elden Street, Monroe Street, Jefferson Street and Van Buren Street are included in Sector 3. This area should be redeveloped in accord with the character and generalized density and building locations specified in the Downtown Master Plan adopted February 22, 2011. This area is appropriate for redevelopment with buildings forming a wall along the street and parking placed out of sight from the street, generally in a parking structure. This area is appropriate for PD-TD Planned Development –Traditional Downtown zoning once that new district is created and adopted.

Sector 4

This area includes a mixed-use development (tax map 16-2-002, parcels 200A, 200B, 200C and 200D; bounded by Elden, Van Buren and Monroe Streets) that features several retail and office uses with enhanced streetscape. Buildings are set back from the street. This area makes a transition from the core downtown form of development to the more suburban development that exists along the rest of the Elden Street corridor eastward to Reston.

Sector 5

This sector consists entirely of the former "Herndon Lumber" site on tax map 16-2-002, parcel 134A and 135A. This site is currently expected to be developed per the approved Timber Ridge site plan that consists of mixed residential use, predominately townhouse development.

Sector 6

This sector features the Fortnightly Square development that is currently nearing completion of construction. This sector also includes the adjacent Park Avenue Square apartment's property that is encouraged to be redeveloped in a manner consistent with Fortnightly Square. This redevelopment would provide an important public trail facility that will bring the Folly Lick/Spring Branch Trail directly into the downtown. A trail facility on this property represents one of a small handful of remaining missing segments to complete this important trail. The Folly Lick Trail offers the opportunity to form a loop from the W&OD Trail, northward along the Sugarland Run Trail and then circling back southward along Fairfax County trails to re-enter the town and proceed southward to the W&OD Trail in the downtown.

Development in this sector is guided by the Fortnightly Neighborhood Urban Design Guidelines, hereby incorporated by reference. Design objectives for development in this sector are:

1. To foster a sense of place, arrival and community;
2. To orient buildings to the street;
3. To create an attractive pedestrian environment;
4. To encourage compatible development that relates positively to surrounding neighborhoods and the downtown core;
5. To integrate Herndon Harbor House and the Herndon Senior Center with the downtown core of Herndon.

Development/redevelopment in this sector should create an urban environment. To maintain an urban setting and to prevent parking facilities from being a dominant feature, a reduced number of off-street parking space(s) per unit may be appropriate. Parking should be provided on-street and in private garages wherever possible. Conversion of garage space to living space or any use other than parking of personal vehicles of the residents shall not be permitted. On-street parking within the boundaries of the sector may be viewed as a partial means of meeting the parking requirement. Where surface lots are provided, they should be located in the interior of the block, to allow the street frontage to be used for attractive buildings and to prevent direct views of expanses of parking lots. Some commercial parking should be provided off-site through the town's Public Shared Parking program.

To create an urban sense of place, streets should be characterized by consistent edges defined by buildings, landscaping, and streetscape features. Diverse, yet complementary, uses should be located along Center Street (opposite the Fortnightly Library) as well as the southern portion of Fortnightly Boulevard and Branch

Drive. Ground level business uses, such as neighborhood services, retail, or small offices, and upper story residential would be appropriate. A small hotel or inn would also be an appropriate use fronting on Center Street. In keeping with the urban street design, the residential uses should also create street walls. Residential uses should be located along Fortnightly Boulevard, Branch Drive and the W&OD Trail. Buildings should be clad in brick. Streets and buildings should be designed to be pedestrian friendly and adherence to the town's Downtown Streetscape standards is important for this purpose.

Sector 6 helps to provide a critical mass of residential development to help sustain and fortify the market for downtown businesses. A higher residential density is, therefore, appropriate as long as it is part of a master plan that adheres to the design guidelines.
Within Sector 6, 44 existing residences would be affected by redevelopment. These residences are part of the Park Avenue Apartment rental complex. Because of zoning use and structural nonconformities, and because these units are nearing the end of their initial life cycle (35 years), the Park Avenue apartments are deemed to constitute "substandard dwellings." Note that the base land use designation for this property is Adaptive Area –Residential.
Temporary or permanent relocation of residents shall comply with (a) Fairfax County Relocation Guidelines, adopted by the Fairfax County Board of Supervisors in June 1993, and (b) the Park Avenue Apartments Relocation Plan, dated March 19, 1999, or as may be amended. Both documents were prepared by the Relocation Services Branch of the Housing Management Division of the Fairfax County Department of Housing and Community Development and both documents are incorporated by reference. The goal of the town in adopting these guidelines and of this element of the comprehensive plan is to mitigate the possible disruption of these residents and to facilitate their relocation within new dwelling units with the town, Fairfax County or elsewhere. These guidelines provide a method for the temporary relocation, if necessary, of such persons living in Sector 6 and also a method of providing (unless already available) decent, safe, and sanitary dwellings in the town or Fairfax County substantially equal in number to the number of substandard dwellings to be cleared from Sector 6, at rents within the financial reach of the income groups displaced from such substandard dwellings.

Downtown Public Shared Parking

During the early 1990s, the Town developed a unique program to provide public parking for downtown businesses. The program currently provides 218 unassigned parking spaces in four municipal parking lots. Through an ordinance established in 1996, commercial properties can opt to participate in a capital cost share with the Town to provide parking for a business use that would otherwise be required to provide on-site parking. At this writing 203 of the 218 spaces developed by the town are subscribed through contractual agreements with various downtown businesses.

The town's current plan is to consolidate three of the surface parking lots into a parking structure as part of a public-private mixed-use development in the downtown. The town is also seeking some additional capacity within this parking structure to allow for future small business participation in the Public Shared Parking program.

Downtown Streetscape

The adopted Downtown Streetscape Map (Map D) identifies streets that are subject to the Downtown Streetscape policies. These streets are located in downtown Herndon where the pedestrian environment requires a special emphasis to visually establish the connectivity of the downtown through the creation of streetscape standards. There are two types of Downtown Streetscape: Residential and Commercial. The following Downtown Streetscape Map details the desired location for Residential and Commercial Streetscape. The Town Council may change the Downtown Streetscape designation during the development plan review and approval process, if the current designation is inconsistent with the proposed use. For detailed streetscape standards, see Guidelines for the Planning and Design of the Town Streetscape Projects document (Draft July 2008, adoption anticipated November 2008) as well as the Herndon Heritage Preservation Handbook (as amended).

The purpose of the Downtown Streetscape policies is to maintain and to enhance Herndon's traditional character of a walkable and inviting small town. The Downtown streetscape policies and standards help create public rights-of-way that have a comfortable pedestrian scale and continuity of the built environment, while using visual elements that link the past with the present. Streetscape elements are to include sidewalk pavement, street lighting, street trees and plant materials, and streetscape furnishings, such as benches and trash receptacles.

Downtown Streetscape Land Use Policies:

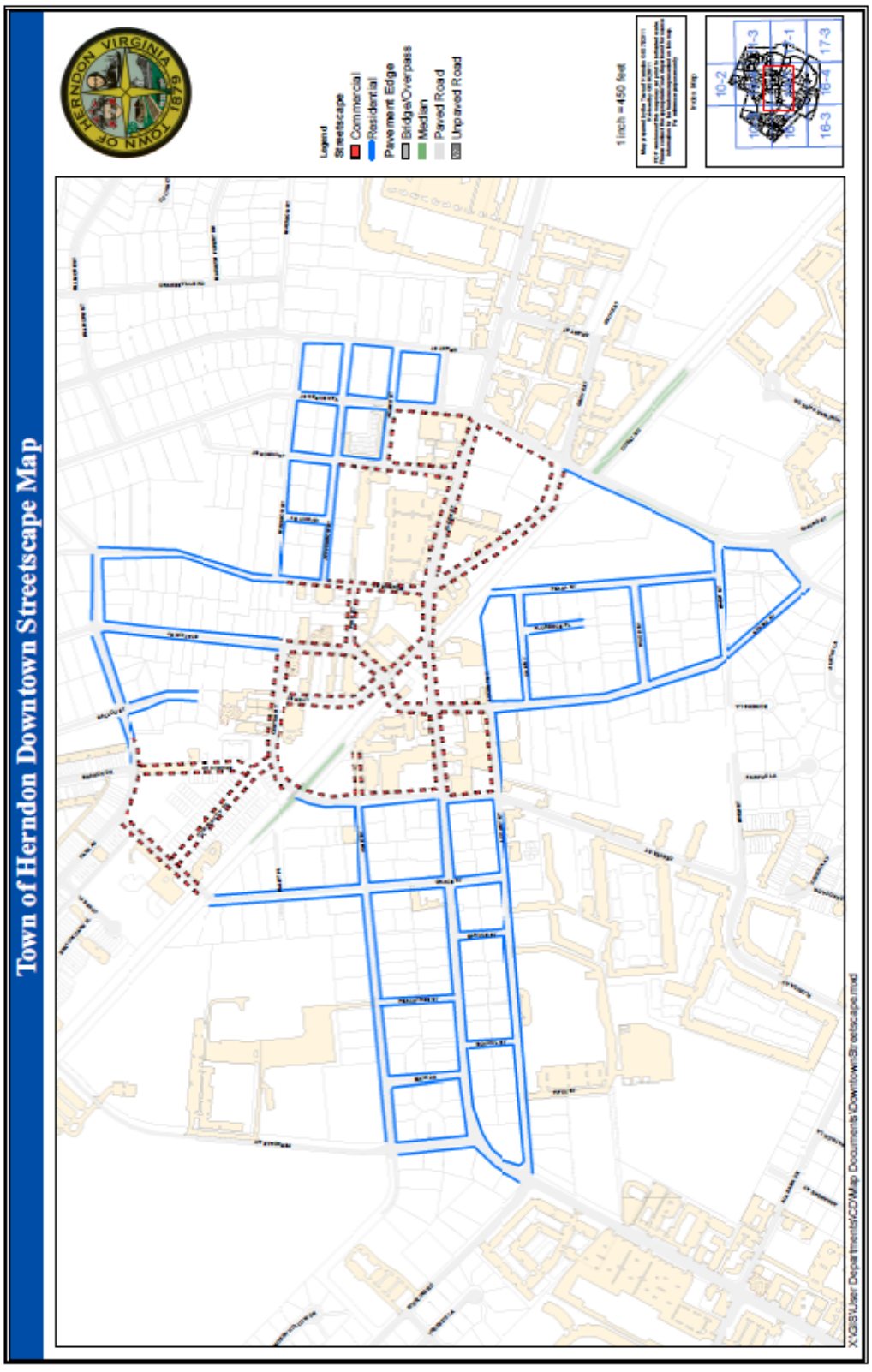
1. Strive to implement and construct Downtown Streetscape as shown on the map.

2. Assure a design character in public spaces that respects Herndon's unique attributes and is consistent with heritage preservation concepts.

3. Successfully blend Herndon's traditional and existing streetscape with proposed new construction and infill development.

4. Implement the Downtown Streetscape by requiring developers to construct these elements as part of the right-of-way improvements for any site.

Map D: Town of Herndon Downtown Streetscape Map *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*



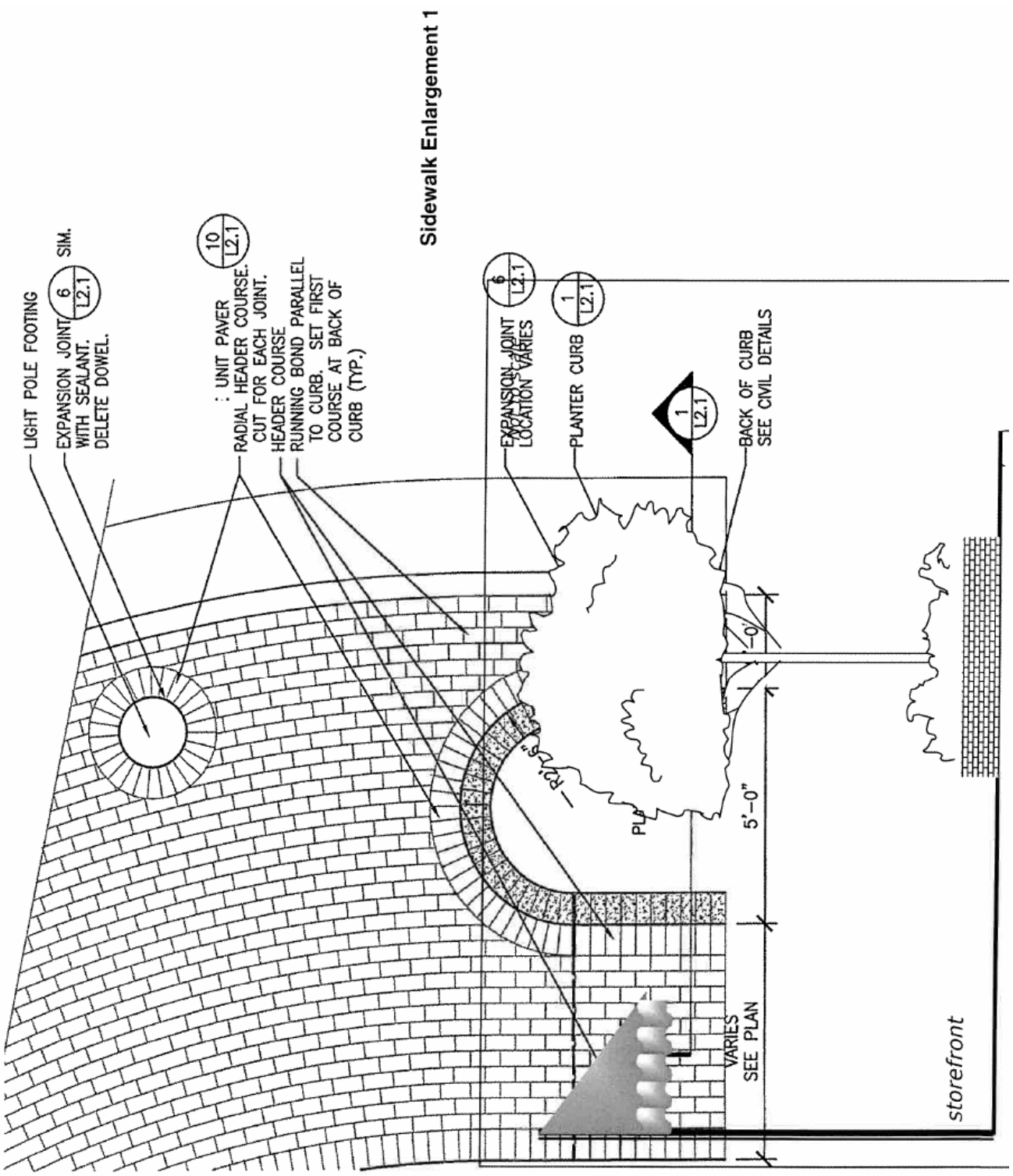
Commercial Streetscape Standards

The main focus of the Downtown Streetscape policy is the Commercial Streetscape Standard. This standard features a minimum 12-foot width brick or brick paver streetscape with raised planting beds, street trees and special heritage streetlights. The details of this streetscape standard are illustrated on the diagrams on the following pages.

Residential Streetscape Standards

The Residential Streetscape Standard is a concrete sidewalk meeting the Americans with Disabilities Act standards and featuring a special dimple pattern that was used historically in Herndon. All streetlights in the residential streetscape area are to be the special heritage streetlights, such as the HADCO Acorn or equivalent. Where practical, with subdivision development occurring after the date of adoption of this plan, the Downtown Residential Streetscape should include a five-foot strip planted with grass between the sidewalk and the drainage way or pavement. Where necessary, an easement may be used for sidewalk construction on land abutting the right-of-way. Where a five-foot width is impractical, the grass strip should be a minimum of two-feet in width. Section 78-513 of the Herndon Zoning Ordinance requires the provision of curb, gutter and sidewalk, with provisions of a waiver when curb and gutter are not already present in the neighborhood and when the street is not on the town's plan for installation of curb and gutters. For such areas [subject to a waiver] standard concrete curb and gutter installation may not be appropriate or desirable, as the existing ditch drainage may be preferred. However, if effective stormwater management requires curb and gutter, it should be carefully planned and sensitively implemented.

CONCEPT DESIGN: SIDEWALK, CROSSWALK, ACCESSIBILITY RAMPS


Sidewalk Enlargement 1
LIGHT POLE FOOTING
EXPANSION JOINT WITH SEALANT. DELETE DOWEL.
6 L2.1
SIM.
: UNIT PAVER RADIAL HEADER COURSE. CUT FOR EACH JOINT. HEADER COURSE RUNNING BOND PARALLEL TO CURB. SET FIRST COURSE AT BACK OF CURB (TYP.)
10 L2.1
EXPANSION JOINT LOCATION VARIES
6 L2.1
PLANTER CURB
1 L2.1
1 L2.1
BACK OF CURB SEE CIVIL DETAILS
5'-0"
VARIES SEE PLAN
storefront

Streetscape Trash Receptacle

MANUFACTURER:
VICTOR STANLEY, INC.; DUNKIRK, MD; (301) 855-8300

MODEL AND OPTIONS:
FC-12 CONCOURSE LITTER RECEPTACLE
36 GALLON CAPACITY
S-1 STEEL DOME LID
BLACK POWDER COAT ALL STEEL
SURFACE MOUNT

NOTES:
1. PROVIDE PRODUCTS AS INDICATED OR EQUAL APPROVED BY OWNER'S REPRESENTATIVE.
2. ANCHOR TO CONCRETE BASE UNDER PAVERS PER MFR'S WRITTEN SPECIFICATIONS.

IV. The Natural Environment

Due to the development pressures from population and economic growth in the region, much of northern Virginia's natural environment has been replaced with residential, commercial and office developments. The natural areas in town include four natural parks - Runnymede, Stanton, Monroe Street and Spring Street – and the publicly and privately owned floodplain areas. With limited green space and the air and water pollution generated by the built environment, protecting our natural resources becomes more critical. State and federal mandates have required the town to implement environmentally sensible policies relating to recycling, stormwater management and stream buffers. While the town's existing policies meet the mandates, the town should encourage and support pollution control measures and environmental policies that surpass the minimum requirements, thereby improving the environment and natural resources throughout the town. The town should emphasize environmental stewardship and be a leader in environmental policy.

Existing Environmental Policies

While the town can be classified as a suburban environment, there are many natural resources in the town that should be preserved to the extent possible. The natural features in the town of Herndon have experienced several different stages of alteration. Original forested areas were converted to farmland. As development pressures mounted from the growth of the Washington, D.C. area, the farmland gave way to the development of homes, businesses, roadways and public facilities.

Land Features

The land's geology and soils can dictate what type of development is appropriate for a particular site. The Town of Herndon is within the Piedmont physiographic province of Virginia in an area known as the Piedmont Lowlands. In the north part of Herndon, where the Barker Hill and Dominion Ridge subdivisions are located, there are remnants of older metamorphic rocks (schists). Hardened sandstones and igneous diabase rocks are underneath Herndon as a product of past volcanic activity. These rocks are the dominant factor in the existing topography of Herndon and are very resistant to weathering and erosion. The current drainage patterns and topographic contours of the town have resulted from these underlying rocks and their erosion over time.

Soils found in the town come from the geology of the underlying rock. Sandstone and diabase are the primary materials for most of the town's soils. Associations of soils found within the town include Calverton-Brecknock-Croton, Penn-Bucks-Calverton, Kelly-Brecknock-Catlett, Brecknock-Catlett-Croton and Glenelg-Eliok-Manor. Most of the soils within the town are suitable for development, if proper soil conservation measures are implemented. However, large areas of the town may be constrained due to a high water table and rocky terrain, which can preclude the construction of basements. In addition, Herndon does have another type of problematic soil, known as the orange soils group, and it can be found throughout the town. The orange soils have shrink-swell characteristics that can cause

footings to break and house walls to crack. Proper building techniques, in accordance with local codes, can eliminate these concerns. These techniques include anchoring footings to the parent rock and removing and replacing problem soils along the foundation.

Current soil information is based on the soil identification map of Fairfax County, Virginia, dated 1972. Fairfax County is in the process of updating a soil survey for the entire county, including Herndon. The Northern Virginia Soil and Water Conservation District has completed a field survey. The new soil survey will be published during 2008. A GIS data layer will be available to the Town and a web application will make the data available at websoilsurvey.nrcs.usda.gov.

Water

The town relies on surface water withdrawals from the Potomac River (primary source) and the Occoquan Reservoir (emergency use). The town purchases its water from the Fairfax County Water Authority. Water from the authority is treated at two water treatment plants within the county. One is the Corbalis plant, just north of the town, and the other is the Lorton plant on the Occoquan Reservoir. It is anticipated that these sources of water are more than adequate to serve the town in the future.

Watershed and waterways in the town are important natural resources. A watershed is an area of land that drains all of its water to one river or water body. As shown on the map, the two watersheds in the Town of Herndon are Sugarland Run and Horsepen Creek. Currently, Fairfax County is working on developing management plans for all 30 watersheds, which will be completed over the next several years. Watershed management planning takes a holistic approach to maintaining the ecological integrity of stream corridors. The town staff will be part of the county process when it develops plans for the watersheds that include the town: Sugarland Run and Horsepen Creek. The plans, developed using community input, will analyze current stream conditions and anticipate future conditions to develop goals and objectives to maintain or enhance the ecological integrity of the watershed.

The associated waterways in the town's watersheds are Sugarland Run, Folly Lick

Branch and Spring Branch. Spring Branch is a tributary of the Folly Lick Branch, which in turn is a tributary of Sugarland Run. At one time, both Sugarland Run and Folly Lick Branch were fed by a number of small tributaries cutting through the landscape. With development, however, many of these small tributaries have been bulldozed or covered and turned into storm sewers. All of these man-made structures – piped streams, swales, storm drains and storm sewers – that are built to handle stormwater are integral to water quality protection efforts within the town, because they eventually connect to the town's natural stream channels.

To protect the town's waterways, the town has several regulations that manage stormwater. Among them are the Chesapeake Bay Preservation regulations, stormwater quantity regulations, erosion and sediment control practices and the National Pollution Elimination Discharge System (NPDES), Phase II.

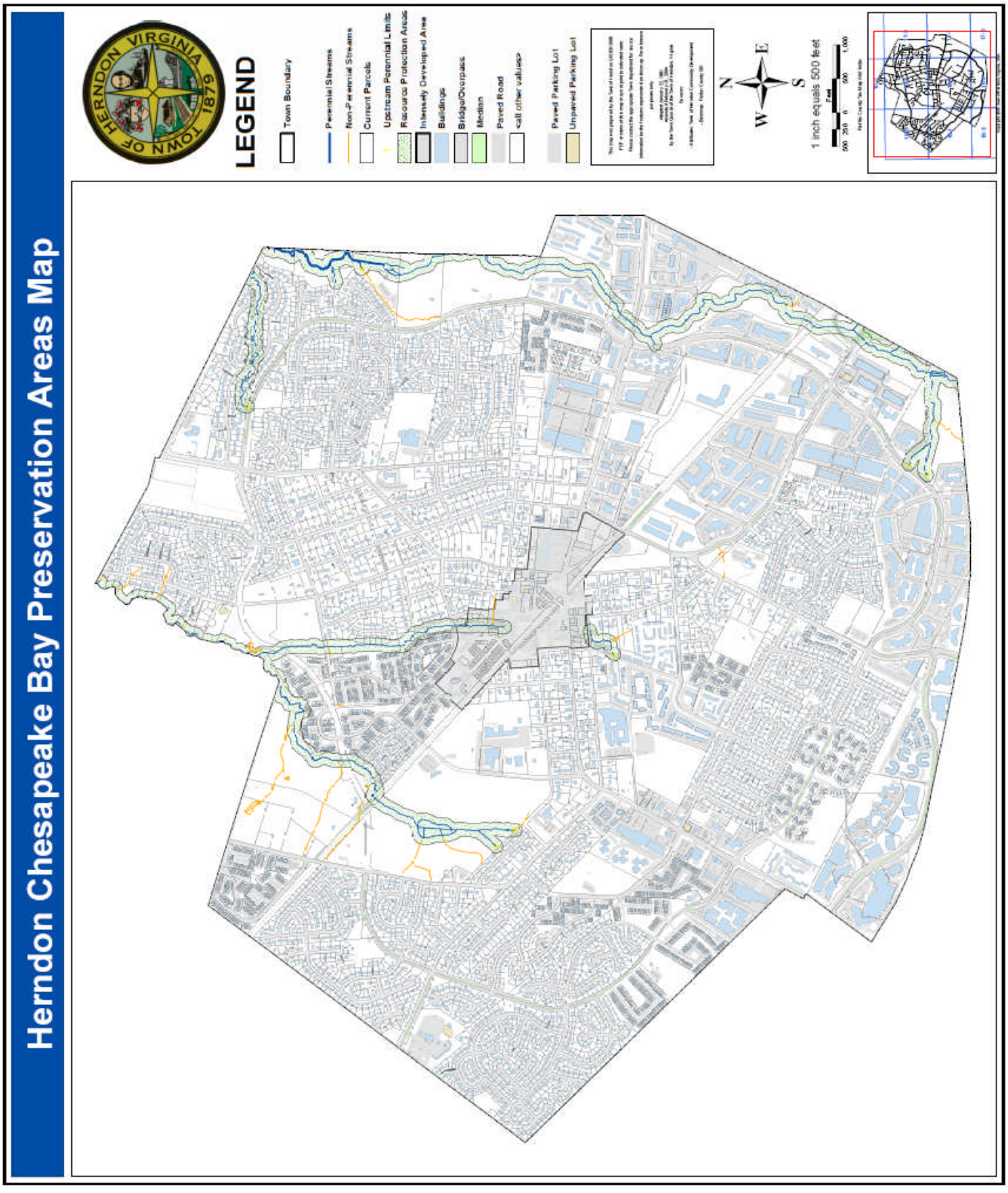
Chesapeake Bay Preservation Policies

As a tidewater locality, Herndon must comply with the state's regulations regarding the Chesapeake Bay Preservation requirements. These regulations require that new developments meet stormwater quality regulations for phosphorus removal and provide an undeveloped, 100-foot vegetative buffer along perennial streams. The regulations also require each jurisdiction to have an adopted Chesapeake Bay Preservation Areas map. See Map E for the adopted Chesapeake Bay Preservation Areas Map for the Town of Herndon. Areas identified as Resource Protection Areas (RPAs) on the map show where the 100-foot vegetative buffer should be implemented.

As mandated by the state, the town adopted an ordinance in 1990 to implement and enforce Chesapeake Bay Preservation requirements. The Chesapeake Bay Local Assistance Board (CBLAD) found the town's ordinance consistent on June 25, 1993. The state amended and refined these management regulations in 2001, which required affected localities to amend their regulations to be consistent with the new policies. CBLAD found the town's amended regulations to be consistent with state policy on December 31, 2004. The town's Chesapeake Bay Preservation ordinance is administered and enforced under the town's zoning ordinance.

The state also required each tidewater locality to include a Chesapeake Bay Preservation chapter in its comprehensive plan. The Town Council adopted this plan on May 26, 1998, and CBLAD found the town's plan consistent with these requirements on June 21, 1999. See Appendix A for the adopted plan.

Map E: Town of Herndon Chesapeake Bay Preservation Areas Map *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*



Stormwater Quantity and Quality

The town has regulated stormwater quantity for new developments since 1997, under the Town of Herndon Public Facilities Manual. New developments must detain and release stormwater runoff at specific rates to compensate for impervious surfaces created by the development to control the amount and velocity of water runoff from a site. Such techniques include the construction of stormwater dry ponds, infiltration trenches, bioretention facilities, raingardens, and underground facilities that are designed to capture stormwater runoff from a site, detain it and release the captured water over a period of time. These techniques help prevent erosion on adjacent developments and the receiving waterways, to which these facilities are ultimately connected.

With stormwater management requirements becoming increasingly complex, the town adopted a Comprehensive Stormwater Master Plan on June 13, 2000, to identify an implementation strategy for the town regarding existing and future state and federal stormwater mandates as well as other optional stormwater policies the town should consider to protect and improve its waterways. Several strategies were identified to address mandates such as NPDES Phase II and the Chesapeake Bay Preservation ordinance. See Appendix B for the adopted Stormwater Master Plan.

For NPDES Phase II, which stems from the Clean Water Act, the town is required to more closely account for and minimize non-point source pollution within its borders. A variety of public education campaigns, such as television and radio campaigns and distribution of various publications at public events, have been utilized. Education about stormwater and hazardous waste disposal, along with better tracking and monitoring of the maintenance and operation of these existing stormwater management facilities, are the basic tenants of these regulations. As required, the town submitted its first NPDES Phase II plan and obtained its five year permit in 2003. A new five year plan and permit will be required in 2008.

The town has adopted an Erosion and Sediment (E&S) Control ordinance pursuant to the Virginia Erosion and Sediment Control Law and is in conformance with criteria established by the Virginia Division of Soil and Water Conservation. The purpose of the town's Erosion and Sediment Control ordinance is to prevent the degradation of local soil and water resources as a result of land disturbing activities. The regulations require the developer to provide adequate control of erosion and sedimentation. The town's E&S ordinance also requires the landowner to take necessary measures to preserve and protect trees and other vegetation during all phases of any land disturbing activity. Under the E&S ordinance, landowners proposing land disturbing activity of 2,500 square feet or greater must first submit an Erosion and Sediment Control Plan to the town Department of Public Works. The town's erosion and sediment control requirements are detailed in Chapter 26, Article III of the town code.

Floodplains

In 1979, the Federal Emergency Management Agency (FEMA) conducted a study of flooding potential and hazards in Herndon as part of its national flood insurance program. The study was meant to be used as a tool to assist the town in effective floodplain management. The major results of this study were a Flood Insurance Rate Map for the Town (effective August 1, 1979) and the subsequent adoption of a Floodplain Overlay District to protect the 100-year floodplain as part of the town's zoning ordinance. No development is allowed in the

Floodplain Overlay District unless the effect of such development is fully offset by accompanying improvements that have been approved by all appropriate state and local authorities. Certain uses such as agricultural, recreational and public utilities and facilities are permitted if the underlying zoning district permits the use and given that the use does not require structures, fill, or storage of materials and equipment.

Final floodplain maps from FEMA for the town and Fairfax County are expected by 2009. For the town to use the updated maps, the zoning ordinance must be amended through a public hearing process to incorporate the new maps.

Federal Clean Water Act Section 303(d) Total Maximum Daily Load (TMDL) Regulations

Pursuant to federal law, Section 303(d) of the Clean Water Act [33 U.S.C. § 1251 et seq. (1972)], or the Total Maximum Daily Load (TMDL), requires that states identify pollutant-impaired stream segments and report them to the U.S. Environmental Protection Agency every two years (known as the "303(d) list"). A TMDL is a plan that allocates by source the maximum load of a specific pollutant that can enter a water body without exceeding in-stream water quality standards. While the TMDL process is a state responsibility, local governments are significantly affected when it comes time to implement load reductions by source.

Maintaining the quality of our waterways is a challenge. Even with all these regulations, in 2006, Sugarland Run was listed on the 303d TMDL list for failing certain stream health standards. Samples were taken and reported by the Fairfax County Water Authority. Sugarland Run exceeded the amount of Escherichia coli, more commonly known as E. coli. E. coli, is always found in feces and is, therefore, a direct indicator of fecal contamination. As the headwaters for this waterway, the town must investigate and remedy its contribution to this contamination, if any. According to the Department of Environmental Quality, a TMDL plan for Sugarland Run must be developed by 2014.

Wetlands

The fill or disruption of wetlands is regulated by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency through Section 404 of the federal Clean Water Act [33 U.S.C. § 1251 et seq. (1972)]. In Virginia, these mandates are enforced by the Department of Environmental Quality as Virginia Water Protection (VWP) permits (non-tidal wetlands). Anyone developing property is responsible for identifying wetlands on a site and obtaining the appropriate wetland permits. The town is required to ensure that the appropriate permits are obtained.

The general locations of major wetlands in the town are identified in the Chesapeake Bay Preservation chapter of the town's comprehensive plan. However, there has been no attempt made to identify wetland areas outside of the Folly Lick Branch and Sugarland Run mainstem areas. Delineation of these inland wetlands is required under Section 404 of the Clean Water Act during the development process using the U.S. Army Corps of Engineers' Wetlands Delineation Manual (1987 version). The town will pursue a field mapping of potential non-tidal wetland areas for planning purposes.

Air Quality

Air quality improvements are coordinated on a regional level through the Metropolitan Washington Council of Governments. The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set national air quality standards to reduce pollutants that can harm our health and environment. These national standards limit the concentrations of six pollutants that are often found in the air we breathe: carbon monoxide, lead, nitrogen dioxide, ground-level ozone, particulate matter, and sulfur dioxide. Air quality in the Washington region has markedly improved since 1990. However, pollutant levels of ozone and particles are still above the national health standards. As a result, our region does not meet the ozone and particulate matter standards, and is classified as a non-attainment area for these two pollutants.

To determine whether the region's air attains the federal standards for ozone and fine particles, air quality monitors located throughout the Washington region measure pollutant concentrations hundreds of times a day. The nearest testing facility to the Town of Herndon is located in Ashburn. Regional air quality has improved dramatically since the Washington region began monitoring air quality 40–50 years ago. Levels of all six regulated pollutants have dropped significantly. Through 2005, the region continued to make good progress toward reducing levels of ozone and particulate matter. The current air pollution episodes are shorter in duration and affect a smaller area than in previous years, and maximum pollutant levels are lower. Within the next few years the region expects to see large drops in these pollutants, as a result of new federal and state controls on power plant and vehicle emissions. Nevertheless, additional effort will be required to ensure that the Washington region will attain both the eight-hour ozone and particulate matter standards.

The Town of Herndon helps promote better air quality by obtaining transportation related grants under the Congestion Mitigation for Air Quality (CMAQ) improvement program. This federal program jointly administered by the Federal Highway Administration and the Federal Transit Administration funds state's department of transportation agencies to invest in projects that reduce criteria air pollutants regulated from transportation-related sources. Herndon has applied for and received several grants to fund initiatives to help improve air quality. Such projects include CMAQ grants for alternative fuel vehicles, trail construction and improved trail crossings, as well as traffic signal synchronization to reduce the vehicle delays and vehicle idling at signalized intersections.

The town recognizes the benefit of urban forestry practices that can be used to reduce the emission of greenhouse gases such as carbon dioxide. In support of the Fairfax County Tree Action Plan, the town will demonstrate its commitment to trees by using parks, schools, and other public lands as examples.

Solid Waste / Recycling

The Town of Herndon has a 20-year integrated solid waste management plan that was approved by the Virginia Department of Environmental Quality on April 25, 2005. Herndon not only meets, but it also exceeds the 25 percent mandated minimum recycling rate for municipal solid waste collected in the Town of Herndon. Municipal solid waste includes solid waste generated by residential and a portion of commercial-establishments.

Herndon Recycles!

Recyclables should be empty and clean; no food or soiled materials.
Yard Waste should be placed in paper bags.

Recycling YES

IN THE BIN


Plastic bottles & jugs ONLY: Check for the neck!


Metal food containers


Pill bottles


Glass bottles and jars


Soda bottles & cans

IN BIN, BAG OR CONTAINER


Junk mail, magazines, mixed paper and catalogs


Flattened cardboard


Newspapers


Phone books


Cereal and cracker boxes

YES AT THE CURB


Grass


Leaves


Brush

Recycling NO


Yogurt, dairy tubs


Plastic bags


Styrofoam packaging


Plastic food boxes or trays


Aluminum foil & trays


Foam take-out containers


Pizza boxes


Hard back books


Paper plates & napkins


Lids, caps, tops


Ceramics


Lightbulbs


Prescription vials


Pots & pans


Alkaline batteries

NO AT THE CURB


Propane Tanks


Rocks


Bricks


Logs over 6 inches

For more information about recycling in the Town of Herndon, visit us online at ***www.herndon-va.gov***, or call 703-435-6860.

The Town of Herndon provides weekly curb side collection and disposal of trash, yard waste and recyclables for single-family and townhouse residential developments. The town will also collect a set maximum volume for those condominium and commercial places desiring collection by the town. The town will not collect industrial waste. Through an agreement with Fairfax County, the town takes collected trash and recyclables to the I-66 Transfer Station, located at 4618 West Ox Road, and Fairfax County ultimately disposes of it at the I-95 Energy/Resource Recovery Facility – Landfill Complex in Lorton, Virginia. A majority of the yard waste collected by the Town of Herndon is taken to a composting facility in Loudoun County; otherwise it is used as a soil enhancer for town parks. Apartments, industrial parks, and those condominium complexes and commercial businesses not receiving collection by the town or exceeding the maximum set volume, such as restaurants, hotels, and offices are responsible for their waste collection and contract this responsibility to private disposal services.

To prevent unsafe conditions for refuse crews and reduce litter in neighborhoods, the town of Herndon adopted the "Can-It" program in August 2002. These regulations required that all trash, except recyclables, be placed in sturdy trashcans having a maximum capacity of 50 gallons and a maximum load capacity of 50 pounds. In addition, all cans must have lids. The Town provides curbside pick up of bagged grass clippings, bundled brush and leaves for recycling. When disposing of yard waste, brush, branches and tree limbs must be cut in lengths of four feet or less and tied in bundles not weighing more than 50 pounds. Grass clippings, shrub clippings, weeds, and leaves must be placed in 30-gallon kraft paper recyclable bags. Failure to follow these guidelines results in trash service not being provided and potential fines. During the fall, residents can pile up loose leaves at curbside for pick-up by a vacuum truck. This service is available only once per year per household.

For the remainder of its curbside recycling program, the Town of Herndon supplies blue bins to each single-family and townhouse unit. The following materials can be placed in the bins for recycling: aluminum cans, glass bottles and jars, tin-plated cans and HPDE (milk and water jugs, juice containers, detergent bottles) and PET (two-liter soft drink bottles) plastics. Newspapers, mixed paper, junk mail, magazines, paperboard boxes, phone books and flattened cardboard are also collected for recycling in bins, bags or containers. Consult the town's website for the latest information on recycling.

In addition to weekly curbside recycling, the town operates a drop off center at the Public Works Town Shop complex. Large disposal bins are provided for the following materials for recycling: mixed paper, corrugated cardboard, telephone books, newspapers, glass bottles and jars, aluminum cans, tin plated cans and HPDE and PET plastics. All recyclables collected from town-owned municipal buildings are sent to a dumpster at Herndon High School, which is maintained by a voluntary student organization called Students Against Global Abuse (SAGA). This group recycles the material and the proceeds are used to fund scholarship programs.

Other Waste Collection Programs

Twice a year, the town offers "Special Collection Days", which allow residents of single-family and townhouse dwellings to set out bulky household items, such as furniture, appliances, plumbing fixtures and auto parts, including tires (weighing under 50 pounds), and tree trunks and stumps (not exceeding four feet in length) for curbside pick-up without an additional charge.

In cooperation with Fairfax County, the town has also sponsored a household hazardous waste drop off program. Fairfax County residents can drop off items such as fluorescent light bulbs, acids, automobile fluids, mercury products, oil-

based paint, paint thinner, pesticides, poisons, pool chemicals & rechargeable batteries. The collection site is usually at the Town Shop.

Goals for the Environment

1. Create policies and programs that respect the natural environment and that enable Herndon to be a leader in environmental stewardship for the region:

    a. Encourage LEEDs[2] (or equivalent) development for public buildings with an eye towards the long term cost benefits.

2. Protect the streams in town through stream bank restoration and water quality improvements:

    a. Continue to enforce the Chesapeake Bay Preservation regulations;

    b. Encourage the adoption of a stream bank restoration program that is annually funded through the stream bank stabilization project in the Capital Improvement Program;

    c. Encourage the establishment of a 100-foot native plant vegetative buffers along stream segments that currently do not have them;

    d. Work with Fairfax County to develop the watershed management plans for Sugarland Run and Horse Pen Creek;

    e. Encourage the implementation of measures, such as public education and the placement of pet waste bag dispensers on the Sugarland Run trail, to de-list Sugarland Run from the 303(d) Total Maximum Daily Load (TMDL) for fecal coliform as required by 2014;

    f. Encourage the establishment of a program that annually ensures public and private stormwater management ponds and systems are properly functioning and maintained;

    g. Stormwater management facilities that are installed underground, in contained spaces and/or that use man-made filtration systems must have a certified, written maintenance program approved by the town's engineer at the time of occupancy of the project and the facility owner must annually submit maintenance records to the town engineer for certification;

    h. Promote bi-annual stream clean ups in the spring and fall for the Sugarland Run, Spring Branch and Folly Lick;

    i. Implement unfulfilled actions in the stormwater master plan adopted by the town, including:

[2] LEED stands for Leadership in Energy and Environmental Design, a certification process sponsored by the U.S. Green Building Council.

1. Updating the pro-rata share program and policies for the town;
2. Adopting a stormwater management ordinance;
3. Consider fee in lieu of on-site Best Management Practices (BMPs), under certain scenarios;
4. Survey all wetlands in town;
5. Consider adopting alternative stormwater controls such as Low Impact Development (LID)[3] design elements.

3. Improve the air quality in town:

   a. Encourage the plan to purchase alternative fuel or hybrid vehicles as part of the vehicle replacement program for the town fleet;

   b. Identify and prioritize the construction of missing sidewalk and trail linkages to promote pedestrian and bike travel;

   c. Evaluate the establishment of tree canopy goals in comparison to the existing landscaping standards in the zoning ordinance. Establish landscaping policies or tree canopy goals that meet or exceed Fairfax County's tree canopy goal of 45 percent by 2037;

   d. To the extent practical, program the automated traffic signal control system to minimize the amount of time cars idle at traffic lights;

   e. Support regional initiatives that improve air quality;

   f. Encourage the use of mass transit and rideshare programs;

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[3] "Low Impact Development (LID) is an innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing / treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through small, cost-effective landscape features located at the lot level. These landscape features, known as Integrated Management Practices (IMPs), are the building blocks of LID. Almost all components of the urban environment have the potential to serve as an IMP. This includes not only open space, but also rooftops, streetscapes, parking lots, sidewalks, and medians. LID is a versatile approach that can be applied equally well to new development, urban retrofits, and redevelopment / revitalization projects." Copied with permission from the Urban Design Tools web site (http://www.lid-stormwater.net/background.htm#What_is_LID)

g. Implement measures such as emissions trap retrofit kits for heavy duty diesel vehicles;

h. Consider additional policies to improve air quality such as incentives for alternative fuel vehicles.

4. Enact polices that support additional recycling efforts and reduce the solid waste stream generated by businesses and residents:

   a. Establish a permanent household hazardous waste drop-off site or increase the number of annual household hazardous waste collection days;

   b. Encourage businesses and multi-family dwellings to comply with the town's recycling policies, including the recycling of mixed paper and cardboard;

   c. Encourage the use of recycled building material products and the reduction of construction site waste;

   d. Encourage the implementation of a public education campaign to encourage backyard composting;

   e. Increase recycling efforts to include additional materials as practical;

   f. Encourage recycling efforts by providing multi-sort or separate recycling containers in public spaces;

   g. Increase the frequency of the household hazardous waste drop off program.

5. Promote and encourage more environmentally sensitive land use development policies:

   a. Encourage working with Fairfax County to update the soils maps for the town;

   b. To the extent practical, require the use of native species as part of the landscaping plan;

   c. Develop a zoning ordinance amendment to allow for density bonuses when existing native tree stands are preserved on site;

   d. Encourage creating a town-owned tree repository that will serve as a holding site for native trees and shrubs that have been removed from a site before it is cleared for development;

   e. Create policies that allow qualified organizations as determined by the Director of Community Development to remove wildlife from a site prior to its development. The Wildlife Rescue League, the Human Society and the Raptor Conservancy are examples of qualified organizations operating in Northern Virginia;

f. Encourage the use of LEED standards (or equivalent) for rezoning and site development;

g. Amend the zoning ordinance to permit and encourage additional Low Impact Development (LID) concepts such as narrower streets, and the reduction of impervious surfaces;

h. Encourage the adoption of updated floodplain maps;

i. Encourage the completion of a Geographic Information System (GIS) data layer of town-owned trees and vegetated open space;

j. Review and evaluate the Fairfax County Tree Action Plan for specific components and related policies that the town may wish to adopt;

k. Minimize light emissions to those necessary and consistent with general safety; recognize the nuisance aspect of unfocused light emissions;

l. Development proposals should implement Best Management Practices (BMPs) to reduce runoff pollution and other impacts and to recharge groundwater, preserve undisturbed open space and to enhance ecological diversity through the creation of wetlands or other habitats, consistent with state guidelines and town regulations;

m. For new development and redevelopment, apply better site design and Low Impact Development (LID) techniques such as those described below; pursue commitments to reduce stormwater runoff volumes and peak flows, to increase groundwater recharge and to increase preservation of undisturbed areas:

    i. Minimize the amount of impervious surface created;

    ii. Site buildings to minimize impervious cover associated with driveways and parking areas and to maximize tree preservation;

    iii. Where feasible, convey drainage from impervious areas to pervious areas;

    iv. Encourage development designed to maximize protection of ecologically valuable land;

    v. Encourage the preservation of wooded areas and steep slopes adjacent to Resource Protection Areas and other stream valley areas;

    vi. Encourage fulfillment of tree cover requirements through tree preservation instead of replanting, where the existing tree cover permits. Encourage tree preservation beyond the minimum zoning ordinance requirements;

    vii. Encourage the donation of conservation easements in areas outside of private residential lots as a mechanism to protect wooded areas and steep slopes;

viii. Minimize subdivision street dimensions and curb and gutter sections and overall impervious cover within cul-de-sacs, consistent with other requirements of the zoning ordinance and the Public Facilities Manual;

ix. Encourage the use of innovative BMPs and infiltration techniques of stormwater management where site conditions allow;

x. Apply nonstructural BMPs where site conditions allow, consistent with other town requirements;

xi. Encourage shared parking between adjacent land uses where permitted;

xii. Encourage the use of pervious parking surfaces in low-use parking areas;

xiii. Maximize the use of infiltration landscaping within streetscapes, consistent with other town requirements.

V. Heritage Preservation

Existing Conditions and Brief History

Herndon has a heritage that has been shaped by events in history, by development in the region, and by the community. The town's history has been shaped to a large degree by its proximity to transportation routes. Since the town's founding in the mid-19th century, the Washington & Old Dominion Railroad has influenced the development of Herndon. After the Civil War, the railroad influenced area settlement patterns with its direct link to Washington, D.C. From 1880 to 1940, the railroad contributed to the growth of dairy farming in the region by transporting milk to regional markets. The town developed into a bedroom community in the World War II era, as residents used the rail's passenger service to commute to government jobs in the nation's capital.

From 1959 to 1961, the Washington & Old Dominion Railroad experienced its busiest years ever hauling construction materials to build neighboring Dulles Airport, which opened in 1962. Finally, suffering from financial losses and the popularity of automobile and truck transport, the railroad discontinued service in 1968.[4] Soon after, the rail right-of-way was converted to become the W&OD Trail, a multi-use regional trail. Officially, the Washington & Old Dominion Railroad Regional Park of Northern Virginia Regional Park Authority.

A handful of concerned citizens formed the Herndon Historical Society in 1970, expressly for the purpose of preserving the town's train depot. As the railroad was instrumental in the development of a small village into the Town of Herndon of the mid-20th century, the vernacular ca. 1857 depot represented an integral element of the town's heritage. The depot was renovated in 1974 and 1990. In 1979 it received state and national recognition, with its placement on the Virginia Register and on the National Register of Historic Landmarks.

In the late 1970s, downtown Herndon experienced the loss of the Old Congregational Church on the corner of Monroe and Pine Streets, Sasher's Drug Store on Station Street and the Dudding Hardware Building on the corner of Lynn and Station Streets to fire. The loss of these contributing structures, combined with the depot's Virginia and National Register designations, elevated the community's awareness of and interest in its heritage resources, sparking what may be termed the "Herndon Preservation Movement".

[4]William T. Frazier, Historic Context of Herndon, Virginia, (Herndon, VA, 1988).

The town government's involvement in preservation began in 1977 with the completion of a preliminary historic preservation district survey.[5] This document verified the existence of significant historic resources and the feasibility of establishing local historic districts. In 1987, the town conducted a reconnaissance level architectural survey of historic properties within the town limits.[6] That survey found that 83 percent of the properties surveyed were contributing to the historic character of the community and that all were constructed between 1855 and 1940, with the majority of buildings built from 1890 to 1920.

Transportation again played a role in Herndon's development with the opening of the Dulles Toll Road in 1984. With this important link to national airports and important business centers to the east, the town regained prominence and visibility, itself becoming an important business center. Explosive growth in and around Herndon severely threatened the town's earliest heritage resources. Because it had not been perceived as an "historic town", like several of its Northern Virginia neighbors, the town began to lose many of its historic structures to new development. The town recognized this heightened threat to the town's heritage resources.

The next step in developing Herndon's preservation program was the adoption of the Heritage Preservation ordinance in 1987[7] "to provide for the establishment of historic landmarks and preservation districts as a means of preserving the historical, cultural and architectural heritage of the community and protecting the designated historic resources in the Town of Herndon". The ordinance instituted mandatory architectural review of proposed alterations and additions to existing buildings in designated heritage districts and established procedures for the review of signs and new construction applications. Certificates of Appropriateness were required for the alteration, restoration, reconstruction, relocation or demolition of an existing structure and for new construction including signs. In addition, the ordinance set forth provisions for the demolition, relocation and alterations of property, if a Certificate of Appropriateness was not granted for such requests.

Thus enabled by the legislation of the Heritage Preservation ordinance, four areas in the town were designated local heritage preservation districts in 1989 (Map F). In general, the largest district consisted of the commercial portion of downtown Herndon and several of the surrounding older residential neighborhoods. A second smaller residential district to the north of downtown was referred to as the Van Vleck's Addition. The two remaining districts consisted of one residential building each, Loudoun Hall and the Herndon-Reston Medical Center, respectively.

Herndon's heritage preservation program was further strengthened in 1989 with the establishment of the Heritage Preservation Review Board (HPRB). Comprised of the five members of the town's Architectural Review Board and two additional members, the HPRB was charged with demonstrating an interest, competence and knowledge of historic preservation in reviewing all Certificates of Appropriateness within heritage districts.

The HPRB grants Certificates of Appropriateness for applications based on the design guidelines of the Herndon Heritage Preservation Handbook.[8]

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[5]Michael Leventhal et al., An Exterior Architectural Site Survey for the Town of Herndon, (Blacksburg, VA: Virginia Polytechnic Institute and State University, 1977).

[6]William T. Frazier, Town of Herndon, Virginia, 1987 Historical Architectural Survey, (Herndon, VA, 1987).

[7]Town of Herndon, Virginia, Article 49. Heritage Preservation Ordinance, Zoning Ordinance, (1987).

[8]Frazier Associates, Herndon Heritage Preservation Handbook, (Herndon, VA, 1989). An updated handbook is forthcoming in 2008.

First adopted in 1989, the document provides design and technical assistance to property owners and the HPRB in considering appropriate rehabilitation projects or new construction within heritage preservation districts.

In 1989 the town prepared a nomination report for the state and national registers.[9] This report successfully established the Herndon Historic District on the Virginia Landmarks Register and the National Register of Historic Places. Such recognition is a distinction reserved for "a geographically definable area urban or rural possessing a significant concentration linkage or continuity of sites buildings structures or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history."[10]

These esteemed designations elevated awareness of Herndon's heritage resources to the state and national levels and allow property owners to apply for federal tax credits and state grants in historic preservation. The Herndon Historic District encompassed the majority of the downtown area consisting of approximately 190 contributing buildings. Under the federal designation, no regulations or restrictions are imposed on properties. However, to retain the district designation, contributing properties must retain their "integrity." In other words, a property must retain enough of its historic physical features to convey its significance as part of the district. Alterations can damage a property's historic appearance and its integrity.

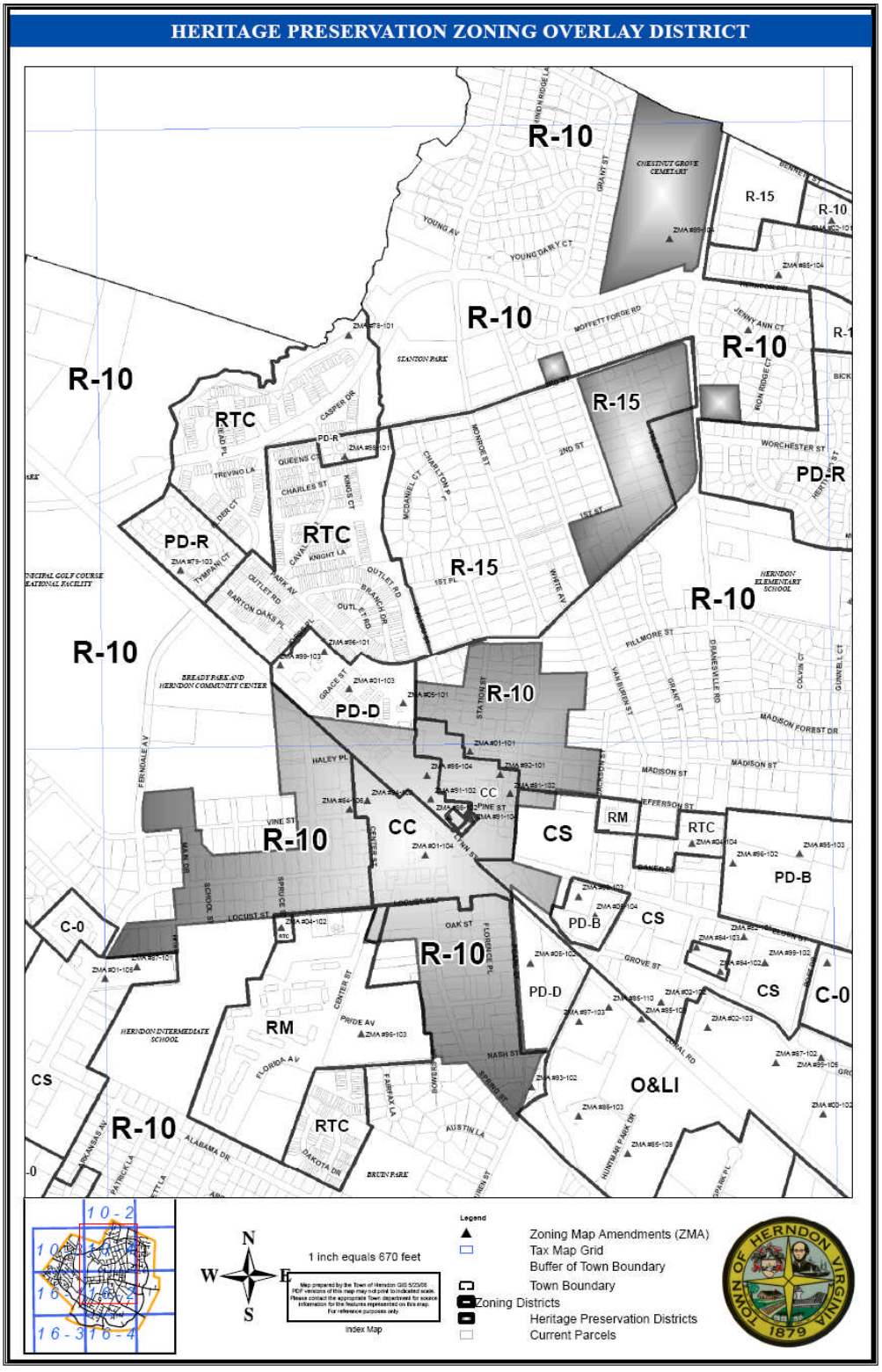
Based on its local importance, the Chestnut Grove Cemetery was recognized as the town's fifth Heritage Preservation Overlay Zoning District in May, 2000. Established in 1874, the Chestnut Grove Cemetery is older than the town itself and is a part of the social and institutional heritage of Herndon. Prior to town ownership of the property beginning in 2000, the Home Interest Garden Club of Herndon made significant improvements to the cemetery including a stone entryway and a memorial garden. As a northern gateway into the town, the rolling cemetery landscape with its numerous mature trees is a landmark identifying the Herndon corporate limits.

There is local, state and international historical significance among those buried in Chestnut Grove Cemetery. Members of the earliest Herndon families are buried in the Cemetery: the Breadys, the Detwilers and the Presgraves. Several former Town Council members are buried in the cemetery, including the first Mayor of Herndon, Isaiah Bready. Two unknown confederate soldiers are buried at the cemetery. These soldiers were initially buried in Cub Run Virginia but were re-interred at Chestnut Grove in 1969. Finally, the last freely elected prime minister of Hungary, Ferenc Nagy III, is buried at the cemetery.

[9]William T. Frazier and Nancy Born Frazier, National Register of Historic Places Registration Form for the Herndon Historic District, (Herndon, VA, 1989).

[10] Title 36: Section 60.3 Parks Forests and Public Property, Chapter One, Part 60. National Register of Historic Places.

Map F: Town of Herndon Heritage Preservation Zoning Overlay District Map *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*



Goals and Objectives for Heritage Preservation

1. Preserve and enhance heritage features, structures, areas and other elements deemed worthy representations of the town's heritage:

    a. Encourage the maintenance, rehabilitation and appropriate adaptive re use of private heritage resources as both visual and heritage assets;

    b. Enhance historic features of architecture and community layout;

    c. Avoid alterations to community architecture and layout that might compromise the historic significance of the heritage district:

        i. Reinforce the pattern typical in older neighborhoods with streets laid out in grids and buildings facing the street.

    d. Promote a town-wide preservation ethic through education and public involvement in heritage preservation:

        i. Increase knowledge about heritage resources, the value and benefits of preservation, and the effective preservation tools and techniques among the town's citizens, officials, administration and staff;

        ii. Strengthen alliances between the town's elected officials, administration, staff and the public to achieve mutual heritage preservation goals;

        iii. Enhance relationships with county, regional, state and national preservation organizations to educate the Heritage Preservation Review Board and town staff;

        iv. Encourage the creation of high quality, engaging, outdoor interpretive exhibits about the built environment of the downtown between 1880 and the present.

2. Strengthen the positive image that is projected through Herndon's heritage districts and that distinguish the town from its surroundings:

    a. Guide appropriate rehabilitation and infill development:

        i. All properties:

            (1) Provide guidelines for the alteration and construction of noncontributing structures in heritage preservation overlay districts, such that physical changes respect and reinforce existing traditional character;

            (2) Promote an appropriate mix of architecture and urban design elements sympathetic to the existing traditional character, though not necessarily limited to historic styles.

ii. Residential Areas:

(1) Emphasize natural features (i.e., mature trees, gently rolling terrain, etc.) that accentuate the residential areas of the preservation districts;

(2) Ensure that new and expanded homes respect the character of traditional Herndon residences, using appropriate materials and construction techniques;

(3) Respect the street patterns and lot orientation of the traditional neighborhoods.

iii. Downtown Commercial area:

(1) Strengthen downtown's traditional and historic image in the construction of new buildings;

(2) Maintain and strengthen the street wall on downtown streets;

(3) Ensure that development on the edge of the commercial district relates positively to adjoining residential areas and does not overwhelm them;

(4) In accord with other elements in the 2030 Comprehensive Plan, encourage compatible redevelopment of vacant areas, parking areas, and other remnants of downtown Herndon's industrial past by creating new downtown mixed-use development with traditional street walls and architecture.

3. Support the preservation and enhancement of heritage districts through public efforts related to streets, sidewalks, trails, open space, public spaces, linkages, signs, edges and policies that help shape the built environment:

a. Ensure strategically placed and effective architectural design to help reestablish a strong visual delineation of Herndon's traditional business center to distinguish it from neighboring strip development;

b. Provide appropriate signage announcing the entry to downtown and strengthening the sense of arrival;

c. Support the historical character of downtown through the use of open space:

i. Retain at least 25% open space in the downtown on private property and public property combined;

ii. Establish a program with procedures and suitable locations for participation by downtown developers who choose the zoning option of providing off-site open space. Section 78.303.2 (10) of the zoning ordinance provides for the provision of open space in the Planned Development Downtown zoning district where open space may be provided in excess of the minimum 15% open space requirement for non-residential uses. The ordinance states: "The Town Council may allow, at the request of the property owner, off-site open space enhancement in excess of the village street improvements…Preservation of historic features that are off-site and within the Herndon downtown may also be considered."

iii. Encourage the incorporation of the historic blacksmith shop foundation into the open space plan, whether on privately- or publicly-owned land;

iv. Continue ongoing efforts to reduce the perception of the Washington and Old Dominion Regional Trail as a barrier and to integrate it with adjoining development.

d. Promote the pedestrian appeal of downtown:

i. Plan for and build a heritage trail route in Herndon that links the Chestnut Grove, Van Vlecks, and downtown heritage districts and provides high-quality interpretive markers for trail users. These interpretive markers should include historic points of interest to include past significant occurrences, buildings, programs, as well as locations of previously located buildings that figured in Herndon's history;

ii. Continue cultivating a streetscape that provides continuity and convenience while highlighting an aesthetic combination of materials, signage, lighting, seating, and other features to help tie different elements of downtown together;

iii. Promote street level activities and urban design that engage pedestrians. Street level activities could include window displays, views into retail or restaurant operations and other active conditions that avoid simple facades without activity.

e. Promote immaculate maintenance and cleanliness of public spaces, private buildings and signs in the downtown;

f. Evaluate the need for potential Capital Improvement Projects to improve infrastructure as well as the appeal of public rights-of-way in the heritage preservation districts.

VI. Public Services and Facilities

Public Schools

The Town of Herndon relies on Fairfax County to provide public school services for town residents. The cost per pupil for the FY2008 school year is $13,407.00. School age residents are assigned to a public school based on the child's age and the location of his or her residence. Elementary school age residents are assigned to six different elementary schools in the area, while only one middle school and one high school serve the town's school age population. There are only two public schools physically located within the town limits: Herndon Elementary and Herndon Middle School.

There are also a number of private schools located within the town. Below is a list of public schools that serve the school age residents of the town, and they are collectively called the Herndon High School Pyramid. Enrollment in the Herndon pyramid is expected to decrease from the current 6,709 students to 6,523 students in 2012-2013, mainly at the middle and high school levels. The table also includes data regarding student capacity, enrollment numbers, ESOL (English to Speakers of Other Languages) and the Free/Reduced Lunch Program.

Herndon High School Pyramid Capacity/Enrollment/Demographics

School	2007 Capacity	2002 Actual Enrollment	2007 Actual Enrollment	2008 Projected Enrollment	2012 Projected Enrollment	% ESOL	% F/R Lunch
Herndon High	2225	2328	2190	2160	1926	14.9%	18.7%
Herndon Middle	1100	1246	1020	1052	894	19.9%	25.6%
Aldrin	650	713	550	542	581	8.3%	8.0%
Armstrong	606	469	460	480	495	9.1%	7.5%
Clearview	576	491	525	530	607	20.0%	21.6%
Dranesville	739	858	658	638	669	14.0%	17.8%
Herndon	878	716	715	719	721	24.1%	25.2%
Hutchison	866	616	591	588	630	37.8%	41.8%

Capacity is defined differently for elementary schools as opposed to middle and high school, as there are differences in the instructional program needs of elementary and secondary level students. In elementary schools, a specific room is dedicated full-time to each class section. Capacity needs are thus expressed as "room requirements," which include general education, program support, special education, and School-Aged Childcare (SACC) rooms. In middle and high schools, however, individual students rotate among course room assignments on a scheduled basis. Capacity in these schools, therefore, is expressed in "student spaces." All capacity calculations include temporary classroom space or modular buildings.

Projected 2012 Capacity for Herndon Pyramid Schools

School	Projected School Capacity (Surplus or Deficit) for 2012
Aldrin Elementary	0 Classrooms
Armstrong Elementary	+3 Classrooms
Clearview Elementary	-3 Classrooms
Dranesville Elementary	+1 Classrooms
Herndon Elementary	+4 Classrooms
Hutchison Elementary	+9 Classrooms
Herndon Middle School	+206 Student Spaces
Herndon High School	+299 Student Spaces

Trailers, or temporary classrooms, are used by Fairfax County Public Schools to supplement capacity at schools to accommodate short-term fluctuations in enrollment while still maintaining student-per-classroom and per-instructor ratios. As of September 29, 2006, approximately 700 portable classrooms were in use in the Fairfax County Public School system to address the increases in student membership and program requirements. Fairfax County Public Schools has implemented multiple strategies to reduce the number of students that would otherwise receive instruction in temporary facilities. Strategies implemented include support and resource areas converted to instructional spaces, dedicated computer labs replaced with wireless mobile "laptop" labs, SACC classrooms shared during the regular school day, and modular classroom additions.

The town and its residents repeatedly expressed displeasure with temporary classrooms when they began to function as permanent components of the school. Under pressure from the town, the school system has implemented some interim strategies to reduce the use of temporary classrooms. The town and Fairfax County recognize that brick and mortar solutions are the answer to the school capacity issues and the town must continue to work with the county to move these projects forward. Recent capital improvements include a 10-room/250-student modular addition at Herndon Elementary and a 12-classroom addition at Hutchison Elementary. Based on the FY2009 – FY2013 Capital Improvement Program for Fairfax County Public Schools, future capacity deficits for Herndon High and Hutchinson Elementary are being recommended for potential boundary adjustments. Herndon Elementary is currently on the school system's priority listing for 20-25 year cycle renovations. No new construction is scheduled for the Herndon pyramid for the next five fiscal years.

Public Safety Center

The town purchased this 4.93 acre site in 2004 to provide new offices for the Herndon Police Department. The town renovated approximately one-half of this one-story, brick office building to provide the Herndon Police Department with a larger and more secure public safety center. The other half of the building, containing 27,479 square feet, is commercial office space. The

town leases this space to approximately four tenants. This space could be utilized for public uses if needed at a future date.

The Herndon Police Department provides law enforcement for the town. The department uses the community policing philosophy to help control crime by talking to residents about concerns and problems in the neighborhood. The police provide a variety of law enforcement services including: patrol, traffic enforcement, criminal investigation, narcotics enforcement, evidence collection, training, bike patrol and crime prevention. The current facility has been planned to meet the facility needs of the department until the year 2020. One component of the facility that was not constructed during the renovation was the sally port, a drive-through containment facility that allows the safe transport of prisoners into the police department. Construction of the sally port is anticipated in FY2009, as the adopted FY2009 – FY2014 Capital Improvement Program provides full funding of the project in FY2009.

The Herndon Police Department currently has 75 employees, which includes sworn officers, communication dispatchers and civilian personnel. The current staffing meets the needs of the Herndon population; however, if the population of the town increases significantly, additional police personnel may be necessary.

Fire and Rescue

Fire and Rescue services are provided by Fairfax County and it operates the Herndon Fire and Rescue Station at 680 Spring Street. Based on an assessment by Fairfax County, a new station is needed for Herndon. Call volume for the Herndon Fire Station has increased 46% in the past 15 years. Moreover, additional staffing space and women's facilities are needed to accommodate current and future needs. Finding an appropriate site for the fire station will be a challenge as very few parcels in town meet the specifications desired by fire and rescue. A seven minute total response time, using five of those minutes for travel, is the service delivery response goal for all Fire and Rescue stations in the county. New site requirements include a minimum of five acres that is accessible to a major roadway, four drive-through apparatus bays with front and rear drive aprons, 30 parking spaces and stormwater management. The county has worked extensively with the town to determine the appropriate location for the new station, considering alternate designs that recognize the limited size of potential sites within the town. Subject to detailed feasibility and design work by the county and an agreement between the parties on the financial structure, the town may lease or sell a portion of the site at 397 Herndon Parkway for a new county fire station co-located with the existing police station. A public hearing would be held for the Town Council to consider such an action. This entire property is designated Community Facilities on the 2030 Land Use Plan map. A fire station at this location shall hereby be interpreted as a feature shown on the 2030 Land Use Plan and the map label for the property shall read "Herndon Public Safety Complex".

Government Administration

Old Town Hall

Located at 730 Elden Street, this two-story brick structure was built in 1938 and was known as the Municipal Building. It now referred to as the "Old Town Hall." It originally housed the post office on the first floor, offices for the Mayor and Town Treasurer on the second floor and a jail in the basement. In 2008, the Town Hall houses the offices of the Town Attorney, the Mayor, the Virginia General Assembly Delegate, the Fairfax County Supervisor for the Dranesville District, the Herndon Council for the Arts, the Herndon Chamber of Commerce and Herndon Community Television.

Washington and Old Dominion Railroad Herndon Depot

Built in 1857, the depot is located at 717 Lynn Street. The Herndon Historical Society was formed to save the depot from being demolished in the early 1970s. Through the efforts of the historical society, the depot is a registered national historic landmark. The depot now serves as the Herndon Dulles Visitor's Center and houses a small museum maintained by the Herndon Historical Society. The town leases the depot for the current uses and funds the operation and maintenance of the structure.

Herndon Municipal Center Complex

Completed in 1995, the Municipal Center was constructed to bring town government back to the heart of Herndon. The Municipal Center, located at 777 Lynn Street, houses the administrative offices of town government, such as Finance, Human Resources, Information Technology, Public Works, Community Development, the Town Clerk, the Public Information Officer and the Town Manager. Integrated into the rear exterior of the Municipal Center is an outdoor stage that overlooks the Town Green, where a variety of concerts and community events are held. The complex also includes the Council Chambers, a 138 person capacity public meeting room with a 7 seat dais. Town Council meetings, as well as, Planning Commission, Heritage Preservation Review Board, Architectural Review Board and the Board of Zoning Appeals meetings are held in the Council Chambers. On Wednesday mornings, the Council Chambers are used for Fairfax County District Court. Most town public meetings are held in the Chambers.

Town Shop

Located at 1479 Sterling Road, this 20,000 square foot facility was constructed in 1990 to house staff, equipment and supplies for the Public Works Maintenance Facility. Town functions such as trash removal and recycling, street maintenance, the water and sewer division, traffic engineering, building maintenance, grounds and sports field maintenance, and vehicle fleet repair and maintenance operate from this building.

Staff increases at the Town Shop have caused stock and work areas to be converted into needed office space. The original building plans anticipated a 4,600 square foot future expansion of the facility. A design contract for the facility

expansion is currently being pursued, and it will include a space survey of the existing facility. The main purpose of the addition is to replace the unsightly and inefficient sea-land storage containers with more efficient, practical storage. Work space may be incorporated into the addition, if it is a recommendation from the space survey.

Municipal Annex

This 9,000 square foot structure, located at 1481 Sterling Road, was constructed in the early 1950s as a Fairfax County Public School Building. In 1986, the elementary school was renovated and became the Town of Herndon Police Headquarters. The police department vacated this facility when the department relocated to 397 Herndon Parkway in August, 2005. The building now serves as the offices for the Zoning Inspections team and other town departmental staff. This building may be used to alleviate future office expansion needs in the Town Shop, or other town positions or functions as they arise.

Neighborhood Resource Center

Located at 1086 Elden Street in a Dulles Park Shopping Center storefront, the Neighborhood Resource Center is a 7,700 square foot center providing health, social, and educational services to area residents. The center is a collaborative effort between the Town of Herndon and Fairfax County, and it has been in operation since July, 1999.

Offerings are subject to change, however the center currently offers a combination of programs and services such as:

Town of Herndon: Neighborhood College, Home Improvement, Crime Prevention (Neighborhood Watch)

Fairfax County: FECEP/Head Start, Adult Outreach Learning Center, GRANTS Alternative High School, Computer Learning Center, English for Speakers of Other Languages (ESOL) Special Supplemental Nutrition Program for Women, Infants and Children (WIC), Mental Health Counseling

In addition, a variety of services are offered by local volunteer groups, religious and leadership organizations.

The center also has a community association library and conference rooms for community organizations and groups.

Herndon Fortnightly Public Library

The Herndon Fortnightly Public Library is part of the Fairfax County Library System. The current library located at 768 Center Street was opened in May 1995. Having 17,400 square feet of space, the library has a collection size of 55,000, which includes items such as books, magazines, compact disks and videos. The library also has 10 study carrels and provides two public meeting rooms having a capacity limit of 20 and 70 persons.

The current facility meets the demand of library services for town residents. The Reston Regional Library, having a dynamic collection of more than 215,000 volumes, is located two miles from the Herndon Fortnightly library and

supports library services for Herndon residents due to its close proximity.

The previous library was a 1,600 square foot brick building located at 660 Spring Street. It opened in 1927. The library's name sake was the Fortnightly Club, a volunteer organization that funded and operated the library until 1972, when an agreement was made with Fairfax County to incorporate the library into the county system. The Fortnightly Club dates back to 1889 when 11 Herndon women established a club that met once every two weeks for the purpose of "the mutual improvement of its members in literature, art, science and the vital interests of the day."

Chestnut Grove Cemetery

Established as a private cemetery in 874, the town obtained ownership and operation of Chestnut Grove Cemetery in 1997. Due to the historical significance of individuals buried at Chestnut Grove, the town deemed it to be of local historic significance and included it in its Heritage Preservation District in 2000. To ensure the viability of the cemetery, the Town Council adopted the Chestnut Grove Cemetery Master Plan on July 13, 1999. To date, various aspects of the master plan have been implemented, such as the elimination of a few drive aisles and the construction of an administration building and a new maintenance facility.

Herndon Harbor House / Senior Center

The Herndon Harbor House and Senior Center is the fulfillment of a joint effort between the town and Fairfax County to provide housing, activities and programs to low and moderate income seniors. Herndon Harbor House, completed in 2001, is comprised of four buildings containing a total of 120 rental apartment units and an adult day care facility. The senior center is the fifth and final component of the Harbor House complex and was opened in 2005. The 23,000 square foot centers offers a variety of senior programs, and is a drop off and pick-up point for the FASTRAN transportation service offered to disadvantage seniors in Fairfax County.

Water and Sewer

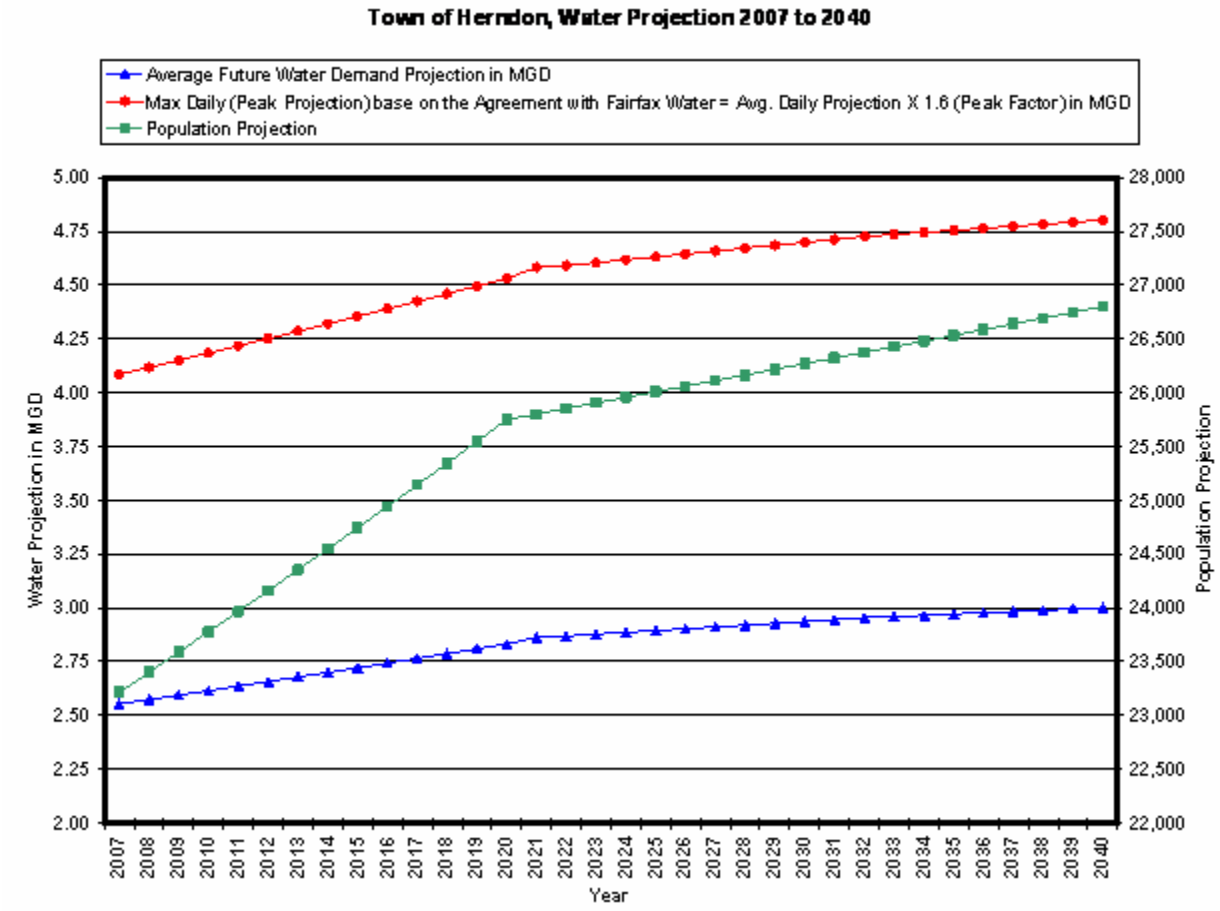
Drinking Water – Source, Quality and Supply

The town does not operate an independent water supply. Rather, the town obtains its drinking water from Fairfax County through a service agreement. The sources of the drinking water are from the Potomac River and the Occoquan Reservoir, which is fed by the Occoquan River. Before it is distributed for consumption, it is sent to water treatment facilities operated by Fairfax County. Water from the Potomac River is treated at the James J. Corbalis Jr. Treatment Plant and water from the Occoquan Reservoir is sent to the Occoquan Treatment Plant. Due to its proximity to the town, most of the town drinking water is supplied from the Corbalis plant.

As required by federal and state drinking water regulations, Herndon personnel take samples of its drinking water at various locations in the town's water system to monitor the quality. The data is provided to the town and reported to the Virginia Department of Health. The town also publishes annually a drinking water quality report that is distributed to every household in

town. The report publishes the results of the town's drinking water samples as they compare to the maximum contaminant levels allowed by law. The town drinking water meets all federal and state requirements for safe drinking water.

Based on usage and population projections up to the year 2040, there will be sufficient supply to meet the water needs of the town. As shown in the chart below, the projected water demand is significantly less than what the town is able to purchase under its agreement with Fairfax County. As required by the Commonwealth of Virginia under Regulation 9 VAC 25-780-10, the town is participating in the development of a regional water supply plan. The purpose of this plan is to ensure there is adequate and safe drinking water for northern Virginia. The town has implemented a variety of programs to meet the water conservation requirements. Examples of these efforts include a peak and nonpeak water rate schedule, a leak detection program, a cast iron water main replacement program, and an annual preventive maintenance program.



Sewer System

The town has a sewer service agreement with Fairfax County that provides a cooperative effort of sewage disposal through both town and county conveyance systems. While sewage from the town is ultimately treated at the Blue Plains Treatment Plant in Washington, DC, Fairfax County meters the flow the town generates and bills Herndon for its usage. The sewerage rate of flow is monitored at various meter stations throughout town. As provided in the sewer service agreement, the sewerage rate of flow from the town shall not exceed an

average of three million gallons per day on an annual average basis.

The town has implemented several preventive maintenance programs to keep the sewer system functioning properly. These efforts include sewer line relining, manhole rehabilitation, daily sewer flushing, and inspections of sewage pumping stations. It is anticipated that future sewer capacity needs in Herndon can be accommodated through amendments to the sewerage service agreement with Fairfax County. In addition, the Blue Plains Treatment Plant has a variety of capital investment projects that will improve the efficiency and capacity of the facility.

Goals for Public Services

1. Ensure that adequate public facilities exist to support the needs of town residents and businesses:

    a. Conduct a facilities needs analysis to ensure town offices have the capacity to meet future personnel space requirements;

    b. Construct the Herndon Police Department sally port in accord with the annual Capital Improvement Program;

    c. Provide high quality, responsive police protection in accordance with the department's strategic plan;

    d. Reevaluate and reexamine police resources and services when the town's population exceeds 26,000 persons;

    e. Work with Fairfax County to appropriately locate a new Fire and Rescue Station in Herndon while meeting the esthetic and technological needs of the town;

    f. Implement the Chestnut Grove Cemetery Master Plan;

    g. Evaluate the feasibility of providing free wireless internet service for the Town Green/HMC/Fortnightly Library area to enhance this location and to help attract retail and other business uses.

2. Ensure that the installation of new or retrofitted utilities have adequate capacity to meet the demands of the businesses and residents of Herndon while reducing the land disturbance and visual impact that such improvements and installations may cause:

    a. Continue to place new and existing power lines underground;

    b. Establish a pro rata share policy and account to fund the placement of existing utilities underground;

c. Establish and enforce policies that minimize damage to property when new utilities are constructed or placed in an existing easement;

d. Ensure there is sufficient drinking water and sewer capacity to meet the needs of the town residential and commercial residents;

e. Ensure modern technologies are incorporated into the utility infrastructure in Herndon;

f. Ensure that the Capital Improvement Program projects are consistent with the goals and objectives of the Herndon 2030 Comprehensive Plan;

g. Develop and implement an inspection and maintenance program of all sewer lines that ensures no leaking to or from the groundwater.

3. Assist Fairfax County with meeting the facility needs of the Herndon school age population:

a. Proactively work with Fairfax County to coordinate and assess the capital improvements and resource needs for the public schools contained in the Herndon pyramid;

b. Establish and implement a renovation schedule for the schools in the Herndon pyramid;

c. Eliminate temporary classrooms at all schools in the Herndon pyramid by building permanent facilities;

d. Work with Fairfax County to establish policies that enable school proffers received from residential rezoning in the Town of Herndon be applied only to schools in the Herndon pyramid;

e. Work cooperatively with Fairfax County to ensure that any county or town residential rezoning in the Herndon area that generates additional units above the by-right zoning adequately contributes to offsetting the costs for educating additional students. Seek comment from Fairfax County on Town of Herndon rezonings and provide comment to Fairfax County on county rezonings in the greater Herndon area.

VII. Parks and Recreation

The Parks and Recreation Department provides a comprehensive park and recreation program to meet the diverse interests of local residents. Besides overseeing nine neighborhood parks, the department oversees the operation of the indoor tennis center and the Herndon Community Center which includes an aquatics facility. The Parks and Recreation Department offers a variety of family oriented regional and local programs for all ages, ranging from sporting events to concert series to holiday activities to festivals.

Recreational facilities in Herndon serve more than the population residing within the town limits. In turn, town residents use other public facilities than those provided within the town. It is not possible to isolate Herndon in studying recreational facilities; the town must be examined in the context of its surrounding area.

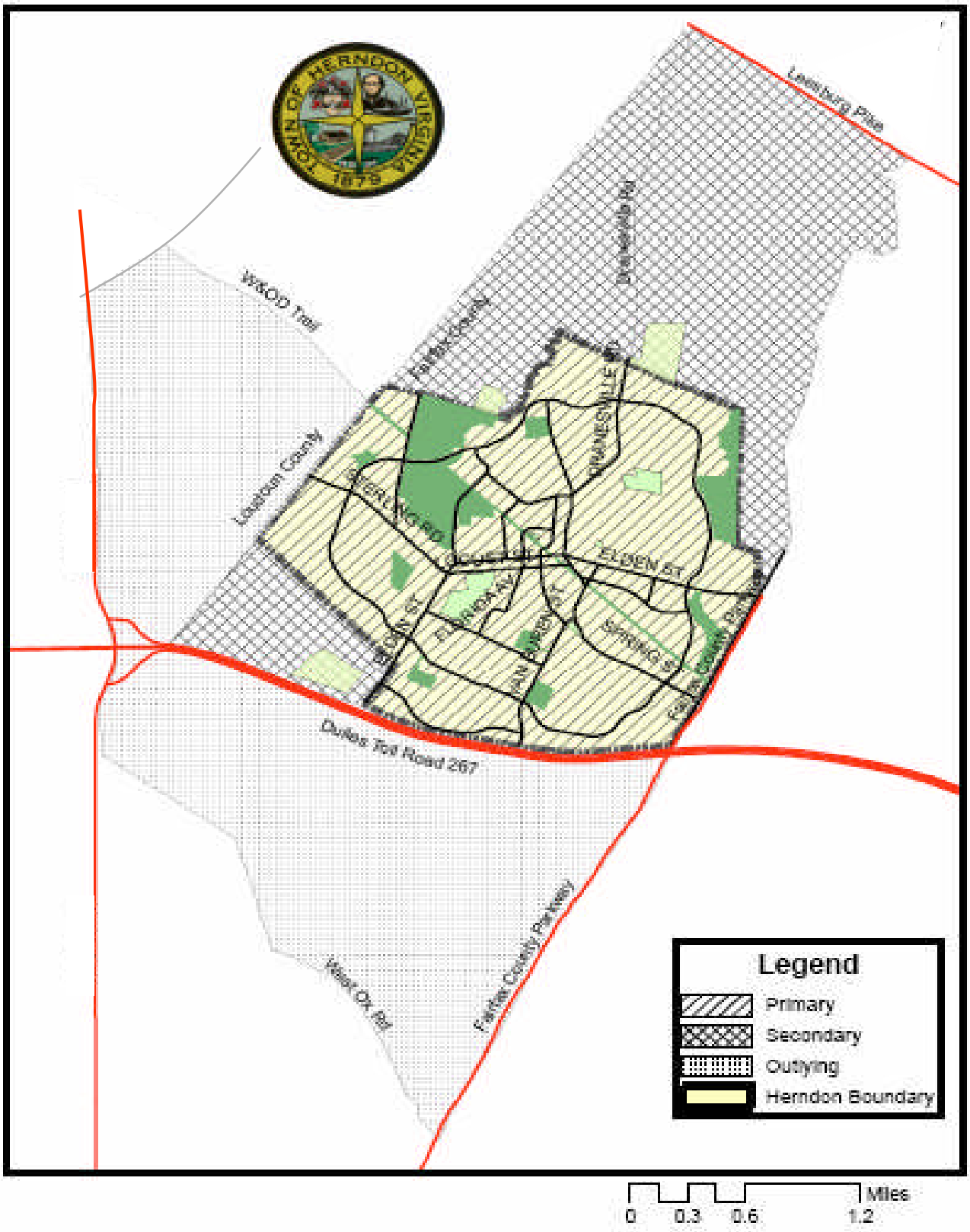
Two different service areas, primary and secondary, were studied to assess the adequacy of facilities serving Herndon. The primary service area is comprised of the land within the town limits. The secondary service area extends just north and just south of the town. In addition, an outlying service area is acknowledged. The entire service area, primary, secondary and outlying, (see map) encompasses 10 sub census tracts. This area is approximately bordered by Leesburg Pike on the north, Sully Road/Route 28 on the west, West Ox Road on the south, and Fairfax County Parkway on the east. Some parts of Loudoun County and Reston are included in the service area.

Table 1: Town of Herndon, Virginia Parks and Recreation Service Areas

	Jurisdiction	Sub Census Tracts
Primary Service Area	Town of Herndon	4808, 4809
Secondary Service Area	Fairfax County (Parcher Avenue area and Dranesville Road Area)	4805.01,4805.02, 4810.01
Outlying Service Area	Fairfax County south of DTR, north of West Ox, west of FC Pwy	4811.01,4811.02, 4811.03, 4825.01
Outlying Service Area	Loudoun County, east of Sully, north of DTR, south of W&OD Trail	6117.2

There are seven public sector recreational service providers in the service area: the Town of Herndon Parks and Recreation Department (HPRD), the Fairfax County Department of Recreation and Community Services (FCDRCS), the Fairfax County Park Authority (FCPA), Fairfax County Public Schools, the Loudoun County Department of Parks, Recreation and Community Services, the Reston Association, and the Northern Virginia Regional Park Authority (NVRPA). In addition, volunteers with the Herndon Optimist Club and numerous other service organizations assist with coordination of recreational activities.

Herndon Parks and Community Recreational Service Areas



The town's Parks and Recreation Department's primary involvement is with organized and active recreational pastimes. Besides offering over 200 youth instructional programs, a variety of classes, and scheduling facilities, it also orchestrates special events such as the Fourth of July celebration, the Labor Day Jazz and Wine Festival and the Herndon Festival. The town owns 16 of the 18 parks within its boundaries. The parks include Bready Park (with the Herndon Community Center), Bruin, Chandon, Cuttermill, Folly Lick/Spring Branch Trail, Fortnightly Square, Haley Smith, Harding, Monroe Street, Spring Street, Sugarland Run Trail, Runnymede, Town Green, Town Hall Square and Trailside. In addition, the town has established an 18-hole golf course on 142 acres. It provides trash removal on athletic fields on school sites within the town. These recreational assets are used to help meet the needs of the Fairfax County and Loudoun County residents who look to the Town of Herndon as the provider of their recreation facilities.

The Fairfax County Department of Recreation and Community Services provides recreational classes in county schools. It also organizes after school middle and high school programs, tours, art shows, as well as visual and performing arts classes.

The Reston Community Center is affiliated with the Fairfax County Department of Recreation and Community Services, however its board is independently governed. The center emphasizes the cultural arts, instructional classes and aquatics, with their theatre and indoor pool.

The Fairfax County Park Authority (FCPA) coordinates county sponsored activities and facilities. It owns two parks (Alabama Park and Stanton Park) in Herndon and maintains four (Alabama Park, Bruin Park, Chandon Park, and Stanton Park) within the town borders. The FCPA is instrumental in obtaining recreational amenities to accompany new development in the county. It is also responsible for acquisition and development of new parkland in the county and is authorized to use municipal bonds for this purpose. Within the secondary service area and the outlying service area are Frying Pan Park, Stratton Woods Park, Folly Lick Stream Valley, and the Sugarland Run Stream Valley. Beyond the service area, in nearby Reston, the FCPA also provides a regional park at Lake Fairfax.

Fairfax County Public Schools (FCPS) provide about 20 acres of land with numerous recreational opportunities within the town boundaries. Just beyond the town boundaries, FCPS provides more land at Herndon High School, Hutchison Elementary School, Clearview Elementary School and Dranesville Elementary School. Detailed information about school facilities is provided below in the table, Recreational and Athletic Facilities in Herndon Schools (Primary and Secondary Service Area) 2006.

The Loudoun County Department of Parks, Recreation and Community Services provides recreational, educational and cultural services through park programs, community centers, day care service, before and after school programs, sports leagues for youth and adults, programs for people with special needs, and the Area Agency on Aging. While there are no recreational facilities of any kind within Herndon's outlying service area bounded by the W&OD trail, Sully Road/Route 28, the Dulles Toll Road, and the Town of Herndon, there are nearby Loudoun County facilities such as the Sterling Annex Community Center, the Sterling Community Center, the Arcola Community Center, and Claude Moore Park. In 2007, Claude Moore Community Center opened in Claude Moore Park with features such as a gym, indoor competitive pool and water play facility, teen room, fitness facility and classrooms.

The Reston Association provides 65 facilities including tot lots, recreation areas, the Walker Nature Center, pools, garden plots, and playfields. The Reston Association specializes in special events and programs, but not in organized team activities. Many Reston Association facilities are restricted to use by Reston residents. However, the Armstrong Elementary School in Reston has an attendance area that includes part

of Herndon, and Herndon Middle School in Herndon has an attendance area that includes part of Reston. This is one of the ways that Herndon and Reston interact.

The NVRPA is a coalition of jurisdictions and provides over 10,000 acres of parkland in 19 parks in Northern Virginia. Its parks contain 40 different types of recreational facilities including golf, ball fields, batting cages, boating, pools, picnic areas, open play fields, natural areas, and trails. It has no direct involvement in organized team athletics and typically charges fees for the use of its facilities. The only NVRPA facility in the service area is the Washington and Old Dominion Regional Trail, an improved hike/bike/equestrian route which extends from Alexandria to Purcellville. Nearby, outside the service area, is Algonkian Regional Park, which provides a golf course, ball fields, a water park, trails, and boat access to the Potomac River.

Altogether, the three service areas of Herndon Parks and Recreation enjoy over 700 acres of park land (including school recreational areas). See the table, 2006 Inventory of Public Recreational Resources in the Herndon Parks and Recreation Service Area.

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Table 2: 2006 INVENTORY OF PUBLIC RECREATIONAL RESOURCES IN THE HERNDON PARKS AND RECREATION SERVICE AREA

	Local Parks	Resource Based Parks	Regional Parks	Portion of Schools with Recreational Facilities
Primary Service Area (372.2 ac.)	Alabama Drive (10 ac.) Bruin (8 ac.) Chandon (8 ac.) Cuttermill (6 ac.) Fortnightly Square (0.4 ac.) Haley Smith (0.5 ac.) Harding (0.5 ac.) Herndon Community Center with Bready Park (12 ac.) Monroe Street (5 ac.) Spring Street (1.5 ac.) Stanton Park (10 ac.) Town Green (0.9 ac.) Town Hall Square (0.1 ac.) Trailside (6 ac.)	Runnymede (58 ac.) Sugarland Run Stream Valley Trail (32 ac.) Folly Lick / Spring Branch Stream (12 ac.)	W & OD Trail (29.2 ac.) Herndon Municipal Golf Course (142 ac.)	Herndon Elementary (7 ac.) Herndon Middle (13.6 ac.)
subtotal	**78.4 acres**	**102 acres**	**171.2 acres**	**20.6 acres**
Secondary Service Area (225 ac.)		Sugarland Run Stream Valley Trail (158 ac.) Folly Lick Branch Stream Valley Trail (23 ac.)		Clearview Elementary (6 ac.) Dranesville Elementary (8 ac.) Hutchinson Elementary (17 ac.) Herndon High (13 ac.)
subtotal	**0 acres**	**181 acres**	**0 acres**	**44 acres**
Outlying Service Area (143 ac.)	Stratton Woods (25.5 ac.)	Frying Pan Park (104 ac.)	W & OD Trail (13.5 ac.)	
TOTAL OF ALL (740.2 ACRES)	**104.9 ACRES**	**387 ACRES**	**184.7 ACRES**	**64.6 ACRES**

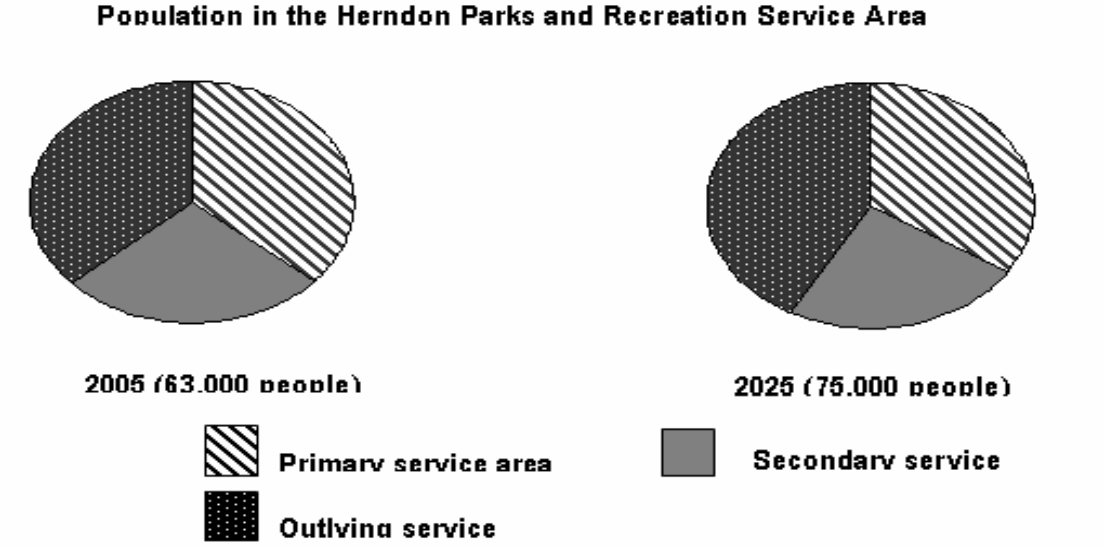
Population

Town parks and recreation programs are available to all, and especially serve those within close proximity to the town. The service area is estimated to encompass approximately 63,000 people, with about one third of that population residing within the town itself. The largest growth in population is anticipated to occur in the "outlying" service area which lies west of town in a portion of Loudoun County, and south of town, including McNair Farms.

Table 3: Population of Service Area for Herndon Parks and Recreation (2006)

Service Area	Census and Sub census Tract	2005	2010	2015	2020	2025
Primary (Town)	4808/4809	22,848	23,948	24,351	24,754	25,512
Secondary (Fairfax County)	4805.01	5,948	6,040	6,210	6,264	6,282
Secondary (Fairfax County)	4805.02	6,196	6,265	6,366	6,400	6,414
Secondary (Fairfax County)	4810.01	4,718	4,797	5,138	5,239	5,269
Outlying (Fairfax County)	4811.01	3,848	7,698	7,709	7,720	7,728
Outlying (Fairfax County)	4811.02	8,263	8,780	9,508	9,722	9,783
Outlying (Fairfax County)	4811.03	4,170	4,195	4,294	4,325	4,337
Outlying (Fairfax County)	4825.01	4,133	5,855	6,037	6,095	6,113
Outlying (Loudoun County)	6117.2	2,711	2,847	2,989	3,138	3,295
Primary Service Area total		22,848	23,948	24,351	24,754	25,512
Secondary Service Area		16,862	17,102	17,714	17,903	17,965
Outlying Service Area		23,125	29,375	30,537	31,000	31,256
Service Area Total		62,835	70,425	72,602	73,657	74,733

Sources: Town of Herndon Department of Community Development, U.S. Bureau of the Census, U.S. Census of Population and Housing: 2000; American Community Survey, and Fairfax County Department of Systems Management for Human Services, 2004 through 2025.
Note: Sub census tracts are Fairfax County designations and are not recognized by the U.S. Census Bureau. Sub census tracts divide federally defined census tracts into smaller areas for analysis purposes.



Evaluation of Service Delivery

Standards in General

This plan uses the standards of the Fairfax County Park Authority (FCPA). It should be noted that standards of the state, the NVRC and Fairfax County are in an almost continual process of review and revision.

Table 4: FAIRFAX COUNTY COMPREHENSIVE PLAN, 2003 Edition POLICY PLAN
Parks and Recreation, Amended through 6-20-2005

Park Facility	**Population-based Countywide Service Level Standard**
Rectangle Fields (soccer, football, lacrosse, field hockey and cricket fields)	1 field/2,700
Adult Softball Diamonds with Skinned Infields	1 field/22,000
Youth Softball Diamonds with Skinned Infields	1 field/8,800
Youth Baseball Diamonds with Grassed Infields	1 field/7,200
Adult Baseball Diamonds with Grassed Infields	1 field/24,000
Trails	Consistent with Adopted Countywide Trails Plan and Goal to Link Trails to Park Facilities
Playgrounds	1 playground/2,800
Multi-use Courts	1 court/2,100
Reservable Picnic Areas	1 site/12,000
Neighborhood Dog Parks (Typically less than 3 acres)	1 site/86,000
Regional Dog Parks (Typically more than 8 acres with special event features)	1 site/400,000
Neighborhood Serving Skate Parks- (Modular/Portable Types)	1 site/106,000
Countywide Skate Parks- (Larger Permanent/Fixed Type)	1 site/210,000
Golf (measured by number of golf holes)	1 hole/3,200
Nature Centers (measured in building square feet)	0.04 sf/person
RECenters including Indoor Aquatics, Fitness and other Community Uses (measured in building square feet)	1.1 sf/person
Indoor Gyms (measured in building square feet)	2.8 sf/person
Outdoor Family Aquatics Facilities	1 site/570,000
Horticulture/Garden Parks	1 site/350,000
Equestrian Facilities	1 site/595,000
Waterfront Parks	1 site/90,000

The Fairfax County Park Authority Board learned in a benchmark survey that Fairfax County provides about 22 acres of public open space per 1,000 population, compared to an average of 19 acres per 1,000 population in nearby peer jurisdictions. The public open space in Fairfax County includes lands owned by the federal government, the state government, the county government, town governments, and the City of Fairfax. The Fairfax County Park Authority also learned in a citizen survey that there is overwhelming support for additional open space in the county.

At this writing, recreational public land within the town, including parks owned by the NVRPA, the FCPA and the Town of Herndon (including the golf course) comprise 352 acres which amounts to about 15 acres per 1,000 population.

The Fairfax County comprehensive plan does establish a standard that may be applied in Herndon: *"for Local Parkland, provide a minimum of 5 acres per 1,000 population."* Analysis shows that Herndon has four acres of "local parkland" per thousand population (see Table 2: "2006 Inventory of Public Recreational Resources in the Herndon Parks and Recreation Service Area" and Table 5: "Town of Herndon, Virginia: Land Area for Recreation, August 2006" for a listing of parks that may be considered "local parkland".)

Definitions - Residents of Herndon use the terms "passive" and "active" to characterize types of park development in the town. The plan for parks and recreation seeks to define these terms to clarify their distinctions and similarities. The definitions distinguish the activities of people from specific site features:

1. Passive Recreational Pastimes: Characterized by non-consumptive, low impact and less structured activities such as strolling, picnicking, bird watching, informal game activities, nature study, reading, drawing, etc.;

2. Active Recreational Pastimes: Characterized by individualized pursuits or team activities; can be either structured/organized or unstructured activity. Usually requires special site features to facilitate the activity;

3. Passive Recreational Site Features: Should include parking, trash containers, and benches at a minimum. Can include forests, meadows, wetlands, and other natural areas. Can include historical/archaeological sites and artifacts. Can include picnic tables, trails, open play areas, playgrounds, horseshoe pits, interpretive stations. Can be characterized by natural areas or a landscaped urban setting;

4. Active Recreational Site Features: Typically requires land disturbance with site grading and clearing. Can include hard surface areas for tennis, basketball, shuffleboard or dodgeball. Can include specially maintained turf for golf, softball/baseball, football or soccer. Can also include swimming pools.

All passive recreational pastimes need not be confined to sites of predominantly passive recreational features, just as all active recreational pastimes need not be confined to sites of predominantly active recreational features. For example, jogging, backpacking, biking, volleyball or football can occur on trails or meadows in passive areas even though these pastimes are not necessarily passive. Similarly, picnicking and strolling can accompany active recreational pursuits like softball or soccer games.

Given the constraints for establishing new parks in Herndon, a balance of the range of activities and site features should be designed into any new parks or modifications of existing parks.

Table 5: Town of Hendon, Virginia: Land Area for Recreation August 2006						
entities involved\1	name of park	acreage	Site is predominantly:		land owned by Town	local parkland\3
			Active	Passive		
TOH	Herndon Comm. Ctr.	2.0	•		•	•
TOH	Bready Park	10.0	•		•	•
FCPA	Alabama Drive Park	10.0	•			•
FCPA/TOH	Bruin Park	8.0	•		•	•
FCPA/TOH	Chandon Park	8.0	•		•	•
TOH	Cuttermill Park	6.0	•		•	•
TOH	FL/Spring Branch Trail	12.0		•	•	
TOH	Fortnightly Square	0.4		•	•	•
TOH	Haley Smith Park	10.0	•		•	•
TOH	Harding Park	0.5		•	•	•
TOH	Monroe Street Park	5.0		•	•	•
TOH	Runnymede Park	58.0		•	•	
TOH	Spring Street Park	1.5		•	•	•
FCPA	Stanton Park	10.0		•		•
TOH	Town Green	0.9		•	•	•
TOH	Town Hall Square	0.1		•	•	•
TOH	Trailside Park	6.0		•	•	•
TOH	Sugarland Run Trail\4	32.0		•	•	
	Schools:					
FCPS	Herndon Elem. School	7.0\2	•			
FCPS	Herndon Interm. School	13.6\2	•			
	Regional:					
TOH	Golf Course	142.0			•	
NVRPA	W&OD Trail	29.0		•		
Total Acreage		372.0	76.6	155.4	302.4	78.4

1/ TOH = Town of Herndon
FCPA = Fairfax County Park Authority
FCPS = Fairfax County Public Schools
NVRPA = Northern Virginia Regional Park Authority

2/ estimated area of school site with recreational facilities

3/ as described in the Fairfax County Comprehensive Plan: ". . . Local parks primarily provide facilities for active or passive recreation, or both; areas for scheduled and unscheduled recreation activities and social gathering places. . ."

4/ stream valley area not otherwise counted as part of a park

Evaluation of Present Facilities

Community Input

To evaluate interest and needs of the community, the Department of Parks and Recreation undertook several initiatives to evaluate citizen interest. In March 2006 a community forum was held to obtain citizen input. The results of the forum indicated interest by citizens to protect sensitive lands and to consider creating small pocket parks where small land areas are available but unsuitable for development. Pocket parks would serve as neighborhood beautification and as buffers between commercial and residential areas.

The Parks and Recreation Department conducted a citizens and user survey in March 2006 to assess the effectiveness of programs and facilities. A question on the survey requested respondents to indicate their "most wanted" and "least wanted" facilities for the community.

The largest response from residents for "most wanted" facilities was for multi-use trails (34 percent) followed by an outdoor pool (21 percent), an amphitheater (20 percent), and dog parks (16 percent). The most noted response for "least wanted" facilities was dog parks (32 percent). The survey revealed how town parks rated for perceptions of safety and appearance on a scale of one to four, with four being the highest. Haley Smith Park rated the highest, while Alabama Drive Park rated the lowest, although all parks rated above two for appearance. The town has also received citizen input through public hearings and written correspondence to develop a skateboard area and for a two field youth baseball facility.

Land for Recreation in the Town

Most recreational facilities in the study area are provided by the Town of Herndon, the FCPA or the Fairfax County School Board. The town provides 80 percent of the parkland within its boundaries. This plan uses land area standards for active and passive areas of 8.5 acres per 1,000 people for each type. A projected population in the town of 25,512 people in 2025 should be served by the following areas: 213 acres of active land, 213 acres of passive land, and a total of 426 acres. In 2006, the town contained 372 acres of public recreational land, or 87 percent of this area requirement.

Considering a long term pattern of increasing population accompanied by the development of almost all land in the town, the town must seek other approaches to serving recreational needs of persons within the service area. Privately provided recreation land helps to some extent (see Table 8: "Private Facilities Providing Recreation Services in the Town of Herndon."). Park improvements and management can help maximize the use of the parks through techniques such as prolonging the hours of use, installing lighting, using synthetic turf, and increasing the scheduling of activities. To address the need for open space that brings visual relief and mitigates storm water runoff, alternate techniques such as green roofs, stormwater management ponds that are attractively landscaped to be visual amenities, and permeable parking surfaces may be considered.

Herndon Parks and Community Recreational Facilities

Table 6: RECREATION FACILITIES IN PARKS IN THE TOWN OF HENRDON, VIRGINIA, 2006																		
	TOH		**FCPA**	**FCPA /TOH**	**FCPA /TOH**	**TOH**	**TOH**	**TOH**	**TOH**	**TOH**	**TOH**	**TOH**	**TOH**	**FCPA**	**TOH**	**TOH**	**TOH**	**TOH**
	Herndon Community Ctr.	Bready Park	Alabama Drive Park	Bruin Park	Chandon Park	Cuttermill Park	FL/ Spring Branch	Fortnightly Square	Haley Smith Park	Harding Park	Monroe Street Park	Runnymede Park	Spring Street Park	Stanton Park	Town Green	Town Hall Square	Trailside Park	Sugarland Run Trail
Acreage	**2**	**10**	**10**	**8**	**8**	**6**	**12**	**0.4**	**10**	**0.5**	**5**	**58**	**1.5**	**10**	**0.9**	**0.1**	**6**	**32**
Indoor Pool	1																	
Baseball Field-60'		1	1	1		1			1									
Baseball Field-90'			1		1													
Softball Field-Youth									1									
Softball Field-Adult		1																
Basketball - Indoor	1-½																	
Basketball – Outdoor		2	2	1		½			1									
Fitness Room	1																	
Football Field																		
Playground		2	1	1	1	2			1	1		1		1			1	
Picnic Shelter		1		1								2 (2007)		1			1	
Soccer Field		1	1						1									
Tennis Court		6		2	2													
Volleyball – Indoor	2																	
Volleyball – Outdoor						1			1								1	
Trails							1	1				17						1

TOH – Town of Herndon FCPA – Fairfax County Park Authority

Table 7: RECREATION & ATHLETIC FACILITIES IN HERNDON SCHOOLS (Primary and Secondary Service Areas) 2006						
	Clearview Elementary	Dranesville Elementary	Herndon Elementary	Herndon Middle	Herndon High	Hutchinson Elementary
Soccer/Lacrosse	2		1	1	1	6
Football				1	1	
Baseball - 60' Diamond		2		2		2
Baseball - 90' Diamond				1	1	
Softball - 60' Youth			2			
Softball - 65' Adult						
Basketball Indoor	1	1	1	2	2	1
Basketball Outdoor	1	3 ½ courts	1		2	2
Track				1	1	
Tennis					6	
Playground	1	1	1			1

Table 8: PRIVATE FACILITIES PROVIDING RECREATION SERVICES IN THE TOWN OF HERNDON		
OUTDOOR SWIM POOLS	TENNIS COURTS	PLAY AREAS
Cavalier Park	Courts of Chandon (2)	Bluemont Town Homes
Courts of Chandon	Crestview Townhouse Association (1)	Dulles Green Apartments
Four Seasons Recreation Association	Four Seasons Recreation Association (2)	Dumbarton Square Town Homes
Herndon Recreation, Inc.	Hunters Creek Recreation Association (2)	Four Seasons Recreation
Hunters Creek Recreation Association	Old Dranesville Hunt Club (1)	Stuart Woods Apartments
Jefferson Mews Condominiums		Tralee Town Homes
Lifestyle Condominiums	BASEBALL FIELD	OUTDOOR BASKETBALL COURTS
Stuart Woods Apartments	Four Seasons Recreation Association	Courts of Chandon
Sunfield Swim Pool		Four Seasons Recreation Association
Towns at Herndon Centre		Herndon Courts Apartments
Worldgate Condominiums		Hunters Creek Recreation Association

Table 8: PRIVATE FACILITIES PROVIDING RECREATION SERVICES IN THE TOWN OF HERNDON		
OUTDOOR SWIMMING POOLS	TENNIS COURTS	OUTDOOR BASKETBALL COURT
Kingston Chase Homeowners	Kingston Chase Homeowners	Reflection Homes Association Pool
Hiddenbrook Swim Club	Hiddenbrook Swim Club	PLAYGROUNDS
Kingstream Community Pool	Kingstream Community Pool	Kingston Chase Homeowners
Reflection Pool		
Towns of Copper Spring		

Facilities Provided by the Fairfax County Park Authority in the Herndon Parks and Recreation Service Area

In addition to the facilities shown in the Table 6: Recreation Facilities in Parks in the Town of Herndon, Virginia, 2006, the FCPA also provides facilities at:

1. Stratton Woods Park, located in the extreme southeast corner of the Herndon Parks and Recreation Outlying Service Area. Stratton Park includes one 60' ball field, one 90' ball field, two basketball courts, a rectangular field, two tennis courts, three volleyball courts, and a trail;

2. Folly Lick Stream Valley Trail, along Folly Lick Branch on the north side of town in the Herndon Parks and Recreation Secondary Service Area. Trail property owned by the FCPA comprises 23 acres;

3. Sugarland Run Stream Valley Trail along Sugarland Run north of the town in the Herndon Parks and Recreation Secondary Service Area, and beyond. Trail property in the secondary service area and owned by the FCPA comprises 158 acres. This land also includes two outdoor basketball courts, two playgrounds, and one soccer field.

The 2004 Needs Assessment by the FCPA reveals that the FCPA is not committed to providing 100 percent of facilities to meet the adopted Countywide Service level. Recognizing that there are other service providers in Fairfax County, including private providers as well as the National Park Service, the FCPA is committed to providing only a share of the facilities, as shown in Table 9: Evaluation of Fairfax County Parks Authority Parks and Recreation Facilities. Deficiencies in FCPA facilities in the Herndon secondary service area appear in the categories of Neighborhood/Community Parks and ball fields. However, the needs assessment does establish the Herndon vicinity as a 2015 service area for purposes of providing adult baseball fields.

Table 9: EVALUATION OF RECREATIONAL FACILITIES IN THE HERNDON SECONDARY PRIMARY AND SECONDARY SERVICE AREA USING FCPA STANDARDS AUGUST 2006					
Park Facility	**Population-based Fairfax County Service Level Standard (Countywide)**	**FCPA Policy for FCPA Contribution Level Countywide (from 2003 Needs Assessment)**	**Service Level that Should be Provided in Herndon Parks and Recreation Primary and Secondary Service Area, based on a 2005 population of 39,710**	**FCPA facilities provided in the Herndon Parks and Recreation Primary and Secondary Service Area**	**Total facilities provided by FCPA, FCPS, Town of Herndon in the Herndon Parks and Recreation Primary and Secondary Service Area**
Rectangle Fields (soccer, football, lacrosse, field hockey and cricket fields)	1 field / 2,700	95	15	8	23*
Adult Softball Diamonds with Skinned Infields	1 field / 22,000	4	2	2	4
Youth Softball Diamonds with Skinned Infields	1 field / 8,800	0	6	0	11
Youth Baseball Diamonds with Grassed Infields	1 field / 7,200	0	6	1	3
Adult Baseball Diamonds with Grassed Infields	1 field / 24,000	9	2	0	1
Playgrounds	1 playground / 28,000	2 (Countywide Type)	14	6	17
Multi-use Courts	1 court / 2,100	12	19	0	0
Reservable Picnic Areas	1 site / 12,000	55	4	0	6
Neighborhood Dog Parks	1 site / 86,000	6	1	1	1
Regional Dog Parks (Typically more than 8 acres with special event features)	1 site / 400,000	1	0	0	0
Neighborhood Serving Skate Parks (Modular/Portable Types)	1 site / 106,000	9	1	0	0

Table 9: EVALUATION OF RECREATIONAL FACILITIES IN THE HERNDON SECONDARY PRIMARY AND SECONDARY SERVICE AREA USING FCPA STANDARDS AUGUST 2006					
Park Facility	**Population-based Fairfax County Service Level Standard (Countywide)**	**FCPA Policy for FCPA Contribution Level Countywide (from 2003 Needs Assessment)**	**Service Level that Should be Provided in Herndon Parks and Recreation Primary and Secondary Service Area, based on a 2005 population of 39,710**	**FCPA facilities provided in the Herndon Parks and Recreation Primary and Secondary Service Area**	**Total facilities provided by FCPA, FCPS, Town of Herndon in the Herndon Parks and Recreation Primary and Secondary Service Area**
Countywide Skate Parks-(Larger Permanent/Fixed Type)	1 site / 210,000	2	0	0	0
Golf (measured by number of golf holes)	1 hole / 3,200	0	13	0	18
Nature Centers (measured in building square feet)	0.04 sf / person	13,070 sf	1,589 sf	0	-
RECenters including Indoor Aquatics, Fitness and other Community Uses (measured in building square feet)	1.1 sf / person	152,118 sf	43,681 sf	0	63,569
Indoor Gyms (measured in building square feet)	2.8 sf / person	101,741 sf	111,188 sf	0	
Outdoor Family Aquatics Facilities	1 site / 570,000	Expand existing Water Mine	0	0	0
Horticulture/Garden Parks	1 site / 350,000	Maintain existing park and develop horticultural themed community parks	0	0	0
Equestrian Facilities	1 site / 595,000	1	0	0	0
Waterfront Parks	1 site / 90,000	2	0	0	0
Note: The fields at Herndon High School are not used for community athletic events.					

The Plan for Parks and Recreation

In January 2007, the Town Council approved a strategic plan for the Parks and Recreation Department which outlined four strategic themes: Identify community needs and engender partnerships; Maintain and improve facilities; Focus on employee recruitment and training and sustain agency accreditation; and Protect and enhance town parks.

In addition, the department has incorporated the town's vision and goals, in particular the initiative "Our Renowned Amenities" into its fiscal objectives in creating a sense of place and livable community. To complete the planning process, in 2006 the department developed a recreation program plan which articulates strategies and objectives to achieve these same goals through programs and services offered in the upcoming 3-5 years.

Planned and Proposed Facilities in Herndon

1. Community Center, Phase Five - This Plan suggests that the town may never be able to meet standards for the amount of space needed to serve the resident population. Maximizing the use of existing facilities will become increasingly necessary as the population of the town and area served by the town continue to grow. The Community Center offers a recreational opportunity that is alternative to outdoor recreational activities. Since this plan documents a permanent shortage of land area to meet recreational needs, increasing the use of the Community Center is justifiable and necessary. Originally constructed in 1979, the Community Center completed Phase IV expansion in November 2006, which included a 20,000 square foot addition and 62 space expansion to the parking lot. Phase V improvements will include a 10,000 square foot addition, more space for community fitness, classes, and community meeting space.

2. Runnymede Park - Park improvements in this 58 acre park include the 2007 construction of two picnic shelters, an improved entrance, addition of parking spaces and an Americans with Disabilities Act (ADA) accessible trail to Sugarland Run. Finalize and complete additional park improvements and development, including the Nature Center, as outlined in the resource management plan and the detailed Park Master Plan adopted by the Town Council on December 10, 1991 and amended on November 8, 2005. Develop a written, actionable maintenance plan for Runnymede Park to include such things as best management practices for invasive plants, diseases and animals, pond maintenance and dredging, meadow succession management, trail maintenance and signage, stream testing, litter control, interpretive programs, and environmental education and stewardship.

3. Trails and Stream Valley Parks - The town's transportation plan and capital improvement program (CIP) recognize the importance of trails as both an alternate mode of transportation and for leisure and fitness activities. The CIP includes projects to construct new sidewalks, complete construction of a trail in the Folly Lick Branch and Spring Branch stream valleys, improve intersections of the W&OD Regional Trail with streets, improve lighting, maintenance and surface treatment of trails, and provide lighting along the W&OD Regional Trail in the Herndon downtown area. Maintaining the viability of stream valley parks requires an ongoing effort to stabilize the stream banks that are prone to erosion during peak flows during and after heavy rainfall. That effort is also included in the town's CIP.

4. Downtown Recreation and Cultural Events Support Facilities - The town enjoys the use of Town Hall Square, the Town Green, and even town streets for special events in the downtown. The town will continue to promote Herndon and the downtown by attracting people to the area with community events including the Herndon Festival, Labor Day Jazz and Wine Festival, Summer Concert Series and Farmers' Market Fun Days. These events warrant the provision of permanent public restrooms at a suitable location in the downtown. Opportunities will continue to be sought to accommodate the public restrooms. Over time, redevelopment in the core of the downtown will overtake the existing municipal parking lots that have been used from time to time for festivals and community events. The Parks and Recreation Department will need to make use of other town facilities to stage certain portions of major events such as the annual Herndon Festival and the carnival rides that are a part of this event.

5. Arts Center - The town has planned for the development of an arts center in the downtown for many years. The arts center concept was included in the 2010 Comprehensive Plan adopted in 1990. During 2003, the town purchased the Hands Inc. property at 750 Center Street (Tax Map 16-2-002, parcels 10B, 17 and 18) for the development of an arts center in conjunction with other downtown redevelopment. In 2006, the Town Council passed a resolution requesting detailed proposals for downtown development and defining the size and major features of an arts center. In this resolution and in subsequent documents reviewed by the Town Council the arts center was defined as a flexible multi-use theater including performance space with seating for approximately 250 persons, lobby, public rest rooms, community television studio, set storage, backstage areas and related features with a total floor area for the facility in the range of 12,000 square feet. The arts center is envisioned as a space that may be contained within a larger structure housing other uses.

6. Temporary Arts Center. In August of 2007, the town entered into a lease agreement for the use of a portion of the building at 750 Center Street for a temporary arts center. The arts center opened in August 2008. The lease describes cultural arts uses such as an art gallery, meetings with artists, art classes and artistic events. The lease is to be terminated upon notice in the event that the town redevelops the land as part of a larger public-private project.

7. Town-owned Property on Monroe Street North of Stanton Park: Since 1990, the town-owned property north of Stanton Park has been designated as a community facility and specifically as a public park. The town should undertake a master planning process to establish suitable facilities at this site.

Alternative Provision Strategy for Parks and Recreation

In the absence of land and public resources to meet the recreational needs of Herndon residents, this plan affirms policy to work with various other sources, both within and outside the town, to supplement the supply of facilities. Sources may include churches with land usable for open play areas, or homeowner associations with recreational amenities. The enclosed pool at the Aquatics Center helps meets the demand for aquatic activities in Herndon. Another source might include commercial developments where recreational amenities are provided (e.g., hotel pools) or land usable for open play areas.

Goals for Parks and Recreation

1. To provide a variety of quality recreation experiences, respect and recognize the diversity of the community, and enhance the lives of the citizens and visitors, while maintaining affordability and access for the citizenry.

2. To provide recreation and aquatics facilities that offer fun, friendly, and accessible opportunities for the citizens and visitors to exercise, learn, relax, socialize, celebrate and enjoy their leisure time.

3. To improve, enhance and expand top-quality facilities, open spaces and programs to enrich the recreational opportunities for town residents and visitors.

4. To serve the community with fiscal efficiency and effectiveness to maintain its responsibility to the community and to demonstrate excellent management.

5. To provide access to recreation to those who may be hindered by cultural, economic, physical or social barriers.

6. To plan, coordinate, implement and evaluate a diverse array of recreation programs and activities to meet the social, physical, intellectual and/or cultural interests of the town's citizens.

7. To develop an attractive, environmentally sensitive open space system such as trails, stream valleys, parks of all kinds, Green Streets and Village Streets, to help maintain attractive, pleasing places to live, work and play.

8. To protect, monitor and manage park water resources and stream valleys.

9. To recognize the role of parks for enhancing healthy, livable communities.

10. To promote the health and wellness of our patrons and citizens and combat detrimental health concerns such as obesity and juvenile diabetes.

11. To promote Herndon and the downtown by attracting citizens to the area through community events including the Herndon Festival, Labor Day Jazz and Wine Festival, Summer Concert Series and Farmers' Market Fun Days.

12. To join with other public agencies to provide a balance of quality recreational facilities:

    a. Provide parks with natural areas for nature study, jogging, hiking, picnicking;

    b. Provide areas with amenities like ball fields, tennis and basketball courts;

    c. Ensure an equitable distribution of recreational facilities to include neighborhood parks, community parks, natural areas, vest-pocket parks, tot lots and a linear trail system;

    d. Protect existing recreational facilities within the town, especially those on public school grounds.

13. To manage a capital program for recreational resources in Herndon, including:

    a. Complete Herndon Community Center Phase Five;

    b. Initiate plans of general sports field and improvements to town parks;

    c. Encourage the implementation of funding to complete the Bready Park synthetic turf field;

    d. Construct the remaining improvements approved by the Town Council at Runnymede Park, including the Nature Center;

    e. Implement planning and development of the Folly Lick/Spring Branch Trail;

    f. Encourage the construction of a community skateboard facility;

    g. Monitor stream bank stabilization issues for Sugarland Run Stream;

    h. Trails:

        i. Provide pedestrian links between neighborhoods, parks, commercial areas, and transit services via sidewalks and trails;

        ii. Provide improved lighting, maintenance, and surface treatment of trails between parks for hiking, biking and jogging;

        iii. Work with Fairfax County to study alternatives and construct W&OD Trail crossing enhancements at Crestview Drive, Ferndale Road, and Grace Street;

        iv. Design and install lighting along the W&OD Trail in the Herndon downtown area.

14. To protect parklands from encroachments and minimize adverse human impacts to natural areas. Minimize the effects of stormwater outfalls on parkland.

15. To manage vegetative resources, including invasive species, through appropriate inventories, monitoring, education, planning, management and restoration to protect and improve the ecosystem function including increasing native species biodiversity.

16. To continue efforts for the acquisition of permanent public open spaces.

17. To protect, monitor, plan, manage and restore wildlife, and wildlife habitat, on parkland to protect the ecosystem function, including increasing biodiversity of native species.

18. To encourage natural resource stewardship through educational programs and other means that highlight the significance of natural resources.

19. To mitigate adverse impacts from park activities on surrounding neighborhoods through careful park planning, site design, management and operations.

20. To protect parklands from adverse impacts of off-site development and uses. Specifically, identify impacts from development proposals that may negatively affect parklands and private properties under protective easements and require mitigation and/or restoration measures, as appropriate.

21. To ensure that efficient park facility maintenance and management practices can be achieved to provide for long-term sustainability and preservation of the public investment.

22. To apply appropriate design standards to all facilities proposed for inclusion in the park system and develop signature architectural elements and logos.

Parks and Recreation Strategy

1. Provide opportunities for citizens to join in celebration of Herndon through entertainment, social, sports, and cultural events.

2. Provide safe, clean, and attractive facilities in a customer-friendly environment.

3. Improve consistency of the approval rating of the appearance of public parks, as shown in citizen surveys.

4. Acknowledge that the user population for Herndon recreational facilities lies in an area larger than the town itself and may be described as being within a "primary service area", a "secondary service area" and an "outlying service area." The population for this service area is approximately three times the size of the town population based on present usage patterns and a vicinity defined by West Ox Road to the south, Harry Flood Byrd Highway to the north, Sully Road and the W&OD Railroad Regional Park to the west, and the Fairfax County Parkway to the east.

5. Recognize the responsibility of Fairfax County to provide services in the Herndon area:

    a. In western Fairfax County, ensure that Fairfax County fulfills its commitment to the provision of active and passive recreational areas;

    b. For the Town of Herndon, develop coordinated initiatives with Fairfax County to help ensure that Fairfax County fulfills its standards for the provision of facilities;

    c. Encourage support by Fairfax County for the Herndon-based organizations recognized by Fairfax County as providing sports programs.

6. Provide priority access for town residents to registered programs provided exclusively by the Town of Herndon.

7. Continue coordination efforts between community groups and the town Parks and Recreation Department to fulfill documented recreation needs.

8. Assess, on an annual basis, the interests of current users and non-users regarding recreation programs using methods that include surveys, evaluations, and focus groups.

9. Engage in a master planning process for the town-owned property designated in 1990 as a public park on Monroe Street (abutting the north side of Stanton Park).

10. Ensure that current and future planning of park and recreation facilities and programs provided by the town reflect the diverse needs of town residents:

a. Ensure equitable use by residents of the community for all facilities including Herndon Community Center, Bready Park Tennis Structure, sports fields, playgrounds and parks, and picnic shelters;

b. Identify marketing methods and resources that reach non-traditional users of Parks and Recreation programs and activities;

c. Train staff to relate effectively to various cultures and diverse ethnic groups;

d. Respond to requests for inclusion of special needs and at-risk populations.

11. Continue to ensure the most efficient use of recreational resources within the town.

12. Achieve and maintain agency accreditation by meeting or exceeding standards set by the National Recreation and Park Association.

13. Continue Herndon's participation in regional recreational planning.

14. Engage the community in the protection, sustenance and revitalization of environmental resources:

    a. Establish efforts to protect and manage wildlife habitats;

    b. Incorporate opportunities for organized nature study activities.

15. Develop and maintain a safe, integrated, and coordinated network of shared use trails in accordance with appropriate standards to accommodate multiple users in conjunction with providing access to recreational, employment, educational, and commercial activity centers.

16. Encourage funding for park acquisition and development through voluntary developer contributions to offset the impact of new residential development.

17. Ensure that new residential development provides adequate on-site private recreation facilities for the residents of the development.

18. Encourage the mitigation of adverse impacts to park and recreation facilities and service levels caused by growth and land development through the provision of proffers, conditions, contributions, commitments, and land dedication.

19. Non-residential development should offset significant impacts of work force growth on the parks and recreation system.

20. Ensure that Comprehensive Plan land use amendment proposals for higher densities include provision of parkland and trails or sidewalks to offset the impacts of increased density.

21. On development adjacent to park property, encourage designs that minimize the potential for encroachments and adverse environmental impacts on parkland and that augment the natural resource values of the parkland.

VIII. Residential Areas and Housing

Housing Stock – Mix of Housing Types

Herndon has a balanced mix of housing types. As shown in the chart below, the town's housing stock consists of similar proportions of single-family detached, townhouse and multifamily units. The second chart displays similar data going back to 1994. The total number of housing units grew over 29 percent between 1994 and 2007. The largest factor affecting the housing mix over time was the construction during the 1990s of over 800 units of multifamily condominiums and rental apartments as part of the Worldgate development.

January 1, 2008 Housing Unit Estimate

Dwelling Units	Number	Percentage of Total Dwelling Units
Single Family Detached	2,938	38%
Single Family Attached (Townhouses)	2,284	29%
Multifamily (Apartments and Condominiums)	2,540	33%
TOTAL	**7,762**	**100%**

January 1, 1994 Housing Unit Estimate

Dwelling Units	Number	Percentage of Total Dwelling Units
Single Family Detached	2,671	45%
Single Family Attached (Townhouses)	1,675	28%
Multifamily (Apartments and Condominiums)	1,614	27%
TOTAL	**5,960**	**100%**

Housing Stock – Age

The age of the housing is also an important factor when evaluating housing stock. Based on figures from the 2000 Census, a significant amount (37 percent) of the housing stock was built during the 1970s. This figure dropped over the next two decades, as approximately 25 percent of the existing housing stock was constructed during the 1980s and 1990s. Since the year 2000, 525 housing units, or about 7 percent of the total housing stock, has been built[11]. Sixty-seven percent, or 352, of these units have been townhouses, which were approved as residential rezoning applications.

[11] Based on counts of the Town of Herndon building finals for new construction and the review of approved site plans and subdivision plans for residential development.

Housing Ownership

According to the 2000 Census, 65.9 percent of the housing units in the town were owner occupied. During 2007 the town was affected by the nationwide crisis in the mortgage industry. Questionable and sometimes predatory lending practices led to many foreclosures and the town did not escape regional and nationwide trends in this regard.

Housing Affordability

According to a study on housing affordability in Fairfax County done by the Center for Regional Analysis, School of Public Policy at George Mason University, housing affordability is and will continue to be a concern for Fairfax County[12]. This study evaluated rental units and ownership housing affordability for 2005, 2010 and 2025. In 2005, households making the median income could afford 97 percent of rental units in the county. In 2010 and 2025, rental housing will continue to be affordable to most households earning the median income. It is important to note that Fairfax County has one of the highest median income levels in the country. That level is also affected by a high percentage of two or more wage earners within a household. The study projects that in 2010, households earning the median will be able to afford 95 percent of rental housing. In 2025, this figure drops slightly to 94 percent. These figures assume that rent amounts to 30 percent of household income.

Affordability of home ownership is another matter; the study found that in 2005 only 28 percent of ownership units were affordable to households making the median income. These figures decline slightly in 2010 to 22 percent. By 2025, the study projects that only 4.9 percent of ownership units will be affordable to households earning the median income. Affordability for home ownership in the study is based on Fannie Mae's calculator for "How much housing you can afford". It assumes a 30–year mortgage at 6.5 percent interest, $20,000 in cash available, $700 monthly debt and 5 percent down payment. The chart shows the housing price, number of units projected to be sold and percentage of for sale housing for households earning the median income.

The Department of Housing and Urban Development estimates the FY2007 median family income for the Washington, DC metropolitan area is $94,500 for a family of four. Based on generally accepted guidelines of paying no more than 30 percent of gross income for rent and purchasing a home that is 2.5 times the annual household income, a family earning the median income could afford rent up to $2,362.50 a month or an ownership unit costing $236,250.

Fairfax County provides a variety of affordable housing initiatives such as county and federally funded rental programs, federally funded housing rental vouchers, and affordable dwelling unit programs for rental and ownership units. The county also supports a variety of first time home buyer programs and has several programs for affordable senior housing including county operated residences and privately owned complexes. County affordable housing initiatives in the Town of Herndon include the Herndon Harbor House (senior housing) and affordable rental dwelling units in Archstone

[12] McLain, John, AICP; Fowler, Lisa A., PhD; "Need for Affordable/Workforce Housing in Fairfax County", Center for Regional Analysis, School of Public Policy, George Mason University, November, 2006.

(formerly Westerly) at Worldgate. The Low and Moderate Income Housing Guide prepared by Fairfax County in 2004 identifies two privately owned apartment complexes in Herndon that rent some or all units at a moderate cost and may accept federal housing vouchers.

Year	Median Household Income	Maximum Price of Affordable For Sale Housing	Number of Units To Be Sold	Percent of Total For Sale Housing Units
2005	$94,610	$384,444	6,213	28.2%
2010*	$104,071	$427,301	5,351	22.3%
2025*	$135,292	$580,526	1,366	4.9%

* Figures in these rows are projected. Assumes income increase by 2% annually and home price increase of 3.4% annually between 2005 through 2010 and 6% annually between 2010 and 2025.

Maintenance and Appearance of Housing Stock

The Town of Herndon has a variety of programs that support the appearance of its neighborhoods. The Building Inspections Division is responsible for enforcing code requirements for property maintenance and vacant housing. In 2003, this effort was supplemented by hiring an additional staff member solely devoted to enforcing property maintenance regulations in specific neighborhoods.

In 2000, the town hired a Housing Rehabilitation Specialist through a Fairfax County grant program. This position has actively assisted various homeowner associations in updating their exterior architectural standards and the position has also educated homeowners about the Fairfax County Home Improvement Loan Program, which provides low interest loans to income eligible homeowners for repairs and upgrades to their dwelling unit. Since 2001, this initiative has provided rehabilitation efforts in eight townhouse communities and to individual homeowners throughout the town's residential neighborhoods. This position also provides technical and design assistance to Herndon homeowners in the rehabilitation and maintenance of their homes.

Another town sponsored program is the Cultivating Community Initiative which promotes neighborhood beautification and builds community spirit. Relying heavily on community volunteers, the Cultivating Community Initiative coordinates and implements the following programs: Good Neighbor Award, Yard of the Month, Herndon in Bloom, Neighborhood Celebration Month and the Garden Tour.

During 2007 the town enacted a targeted Rental Inspection Permit program to provide for the periodic inspection of rental housing units to ensure that the units meet minimum building code and safety standards. The program is contained in the town code at Chapter 10, Article VI Neighborhood Preservation. The program is geared to prevent deterioration and to provide for safe, decent and sanitary living conditions for tenants. After adopting the program the Town Council created Rental Inspection Districts for the Branch Drive Townhouses, the Park Avenue Townhouses, and the Waterford Park Townhouses. From time to time the Town Council may consider additional residential areas for rental inspection districts. Data analyzed by the Community Development staff during 2006 on townhouse and single-family neighborhoods indicated that there were several developments where known rental units

exceeded 12 percent of total units. It is assumed that there are a significant number of additional rental units that were not revealed by a comparison of Fairfax County property data and town water account records.

Goals and Objectives for Housing

1. Ensure there is a diverse mix of housing to meet the needs of the town residents:

    a. Encourage policies that maintain and encourage a balanced and diverse housing stock in terms of dwelling type, lot size, cost and tenure;

    b. Encourage development of housing that addresses the needs and lifestyles of the senior population;

    c. Support the Fairfax County Redevelopment and Housing Authority and the Fairfax County Department of Housing and Community Development in their effort to manage the Herndon Harbor House and Senior Center facilities and to provide housing and other services within the town.

2. Ensure that neighborhood appearance and function is maintained and enhanced:

    a. Provide support and education to neighborhood groups and HOA's to ensure that neighborhoods are well-maintained;

    b. Encourage new residential developments to be constructed with durable and low-maintenance exterior materials, consistent with Heritage Preservation guidelines for properties in Heritage districts;

    c. Continue to support the efforts of the housing rehabilitation program provided through the Neighborhood Resource Center and Fairfax County programs such as the Home Improvement Loan Program;

    d. Continue to support the town zoning enforcement team to reduce and eliminate overcrowded housing conditions;

    e. Continue to support and enhance the Cultivating Communities Initiative that strengthen and enhance neighborhoods through such programs as Good Neighbor Award, Yard of the Month, Neighborhood Celebration Month and the Garden Tour;

    f. Support the enforcement of property and building maintenance code requirements to ensure that homes and neighborhoods do not fall into disrepair or decline. Continue to use the enhanced capabilities and staffing levels in the Zoning Enforcement Division of the

Department of Community Development and the Building Official's office of the Public Works Department;

g. Continue implementation of the rental inspection program first enacted in by Town Council in 2007 and consider the establishment of additional rental inspection districts each year, depending on conditions;

h. Develop neighborhood indicators for tracking neighborhood conditions over time to determine where neighborhood improvement initiatives should be targeted;

i. Focus public improvement projects, such as infrastructure and streetscape initiatives, in older neighborhoods where such facilities are deteriorating or lacking.

3. Ensure the availability of housing for all income ranges:

a. Encourage the preservation of affordable housing units in town by either retaining the current units or replacing units lost through redevelopment with new units. See the following listing of existing housing projects considered affordable as of 2008;

Multifamily Data For Town of Herndon – as of January 2008

Rental Apartment Projects	Address	Rent**		Number of Units
		Minimum	Maximum	
Archstone Worldgate*	13000 Wilkes Way	$1,300	$1,930	320
Berkdale Apartments	661 Dulles Park Court	$1,085	$1,510	184
Dulles Glen Apartments	1265 Elden Street	$1,132	$1,610	180
Herndon Harbor House	873 Grace Street	$758	$853	120
International Apartments	831 Locust Street	$1,135	$1,265	90
Park Avenue Apartments	901 Park Avenue	$1,000	$1,000	44
Park Ridge Gardens	560 Florida Avenue	$935	$1,525	144

*The Archstone at Worldgate Apartments were developed under the Fairfax County Zoning Ordinance during the mid-1990s. This project fulfilled a requirement to provide 5% of the units within a project as affordable to County guidelines. These units within this project continue to be rented to tenants who qualify based on income.
** Rent information was collected in December of 2007 via telephone conversations with owner sales representatives.

b. Seek the inclusion of affordable and/or workforce housing units as for sale and/or rental units mixed in to standard market driven housing projects;

c. Consider adopting a workforce housing unit requirement or similar guidelines for residential rezonings and new development.

IX. Transportation

Introduction

Transportation issues in Herndon are shaped by a location near the western end of the Dulles Technology Corridor, a concentration of high technology companies expanding westward from the Capital Beltway. The town's transportation environment is characterized by direct links to major metropolitan area highway, air, and rail transportation facilities. A network of major highways and arterial streets interconnects Herndon and surrounding communities in Fairfax and Loudoun counties.

This plan element includes strategies addressing Greater Herndon area transportation links as well as strategies recommended within the town itself. The document also sets forth a Proposed Major Street Network and recommends numerous specific facility improvement projects. The town's annual capital improvement program (CIP) document sets forth a number of specific transportation projects.

An additional component of transportation planning is the town's sidewalk and trail system. A Master Trails Plan was first adopted by the Town Council in March of 1993. This plan was intended to address the recreational and transportation needs for trails in Herndon. In addition, it established a trail hierarchy with basic design standards. Most of the trail network has been constructed. However, important segments remain to be completed. Regional trails are included in specific capital improvement program projects. The Folly Lick/Spring Branch Regional Trail will be the focus of efforts over the next several years. The remainder of local trails and sidewalk improvements are included in the Trails and Sidewalks CIP project as well.

Street Classifications

Town streets are designated within categories that are consistent with the functional classifications used by the Virginia Department of Transportation and the Federal Highway Administration. These categories are based on three urban street systems: the Urban Principal Arterial System, the Urban Minor Arterial System and the Urban Collector System. For the purposes of additional planning specificity within the town, Minor Arterials and Collectors have each been subdivided into two types. The following Functional Classifications Chart displays the functions and features of each classification and its federal/state equivalent.

Principal Arterial roadways such as the Dulles Access Toll Road and the Fairfax County Parkway border the town. Urban Minor Arterials such as South Elden, East Elden and East Spring Streets carry high volumes and a significant amount of through traffic. Town Minor Arterials such as Worldgate Drive and Spring Street west of Herndon Parkway are also very important to the circulation pattern within the town. Collector streets provide access within residential, commercial, and industrial areas, channel traffic from local residential streets into the arterial system, and provide circulation within the Downtown.

2015 TRANSPORTATION PLAN – FUNCTIONAL CLASSIFICATIONS

Town Functional Classification	Typical Functions and Appropriate Policies	Typical Road Section Features	Maximum Volume (VPD)	Typical R.O.W. Width	FHWA/VDOT Equivalent
Principal Arterial Roadways (none lie within the Town boundaries) Example: Fairfax County Parkway	Highest volume, longest trips; connects major metropolitan centers. Appropriate for truck traffic.	**Limited access, grade-separated interchanges 4+ travel lanes, wide medians and shoulders.**	40,000 +	200' + (60m +)	Urban Principal Arterial System (Interstates, Other Freeways and Expressways, Other Urban Principal Arterials)
Urban Minor Arterial Streets (significant through movement) Example: South Elden Street	Higher volume, through movements connecting major suburban centers; major bus routes; interconnects with Principal Arterial system. Appropriate for truck traffic.	**4 to 6 travel lanes, large medians, dedicated turning lanes, pedestrian / bicycle facilities on both sides of the street.**	40,000	100' + (30m +)	Urban Minor Arterial Street System (Urban Minor Arterials are not subdivided)
Town Minor Arterial Streets (predominantly intro-Town movement) Example: Worldgate Drive	Moderate length trips, somewhat lower mobility, land use access, local bus routes; interconnects with Principal Arterial system. Regional through movement in generally discouraged. Appropriate for truck traffic.	**4 travel lanes, medians, dedicated turn lanes, pedestrian / bicycle facilities on both sides of the street.**	30,000	80' + (24m +)	
Major Collector Streets Example: Old Elden Street (between Sterling Rd and Monroe St)	Direct service to local areas, circulation within residential, commercial or industrial areas; channels residential streets on to arterials. Facilitate traffic flow; limited driveway access.	**Generally 2 travel lanes*, dedicated turn lanes, parking lanes in some cases; pedestrian facilities on both sides of the street where feasible.**	20,000	60' + (18m +)	Urban Collector Street System (Collectors are not subdivided)
Minor Collector Streets Example: Alabama Drive	Land access service, channels residential streets on to Major Collectors and Arterials. Support moderate mobility, parking can usually be accommodated.	**2 travel lanes, parking lanes in some cases, pedestrian facilities on at least one side of the street.**	10,000	50-60' (15-18m)	
Local Streets Example: Magnolia Lane	Direct access to abutting land use, lowest mobility, usually no bus routes. Discourage through movement; support appropriate traffic calming devices.	**2 travel lanes, parking lanes except in older areas; pedestrian facilities on at least one side of the street.**	5,000	40-60' (12-15m)	Urban Local Street System

*Any four lane streets should be divided with a median.

KEY: VPD = Vehicles Per Day (24 hour period)
R.O.W. = Full street right of way
FHWA = Federal Highway Administration
VDOT = Virginia Department of Transportation

Existing Conditions

Table 1 displays 24-hour traffic counts for 2006, giving an indication of existing conditions on the town's major streets. In general, it is likely that traffic on these streets will continue to increase in the future. The extent of this increase in traffic will depend mostly upon:

1. Increased resident and work force population associated mainly with new residential and commercial developments in and around the town;

2. What is done to improve (or reduce) the capacity of these streets; and

3. What is done to provide (or reduce) capacity on other streets that traffic could use, in and around the town; and

4. What is done to influence the use of various modes of transportation.

TABLE 1: Traffic at the Town Limits (*Two-way volumes in vehicles per day, VPD*)

Count Station Name	Station Number #	2000 Base Year	2001	2004	2005	2006	Net Change 2000-2006	Percent Change 2000-2006
Dranesville Road	1	26,151	23,210	18,329	17,588	18,637	-7,514	-28.7%
Elden St. (East)	2	31,201	32,976	34,590	30,630	31,285	84	0.3%
Spring St. (East)	3	47,213	46,049	38,978	35,617	35,714	-11,499	-24.4%
Van Buren St. (South)	4	19,042	18,571	19,608	23,095	23,236	4,194	22.0%
Elden St. (South)	5	41,450	41,581	41,098	36,475	N/A*	N/A*	N/A*
Sterling Road	6	30,874	30,937	31,366	34,586	34,423	3,549	11.5%
Crestview Drive	7	14,495	14,654	14,347	14,212	18,703	4,208	29.0%
Totals		210,426	207,978	198,316	192,203	161,998	-6,978	9.7%

* Data not available due to major construction on South Elden Street.

Source: Town of Herndon, Department of Public Works Traffic Counts

For comparison, examples of traffic counts on other major area roadways are listed below, in annual average vehicles per day for 2004.

Route 267 (Dulles Toll Road), From Route 7 to Route 674 (Hunter Mill Road)	90,000
Route 267, from Route 602 (Reston Parkway) to Centreville Road	78,000
Route 7, from Route 228 (Dranesville Road) to Route 28	48,000
Route 602 (Reston Parkway) from Sunrise Valley Dr. to Sunset Hills Rd.	32,000

Source: Fairfax County Economic Development Authority, Area Business Reports, February 2007.

Goals for Transportation

1. To provide a transportation system that safely accommodates local traffic.

2. To encourage use of major regional roads and highways outside of the town for regional traffic.

3. To design needed transportation system improvements consistent with the town's character, to include maintaining a peaceful and harmonious environment.

4. To use the transportation system to help guide growth and development within the town.

5. To divert through traffic away from local streets and from the downtown.

6. To facilitate alternative modes of transportation within the town.

7. Provide safe streets that are friendly to pedestrians and bicyclists

Objectives for Transportation

1. Contain the great majority of through traffic movement within the Minor Arterial Street System.

2. Design and construct road improvements that preserve the small-town character and scale of Herndon, to include traffic management, landscaping and noise abatement amenities conducive to minimize disruption and maintain quiet neighborhoods.

3. Provide efficient and safe flows of traffic on major streets through careful design and use of modern traffic signal technology.

4. Identify and program sufficient resources to complete major elements or upgrades to the planned road network.

5. Continue to support the Herndon Metrorail Station of the Dulles Corridor rail system and develop plans for surrounding access to the station.

6. Continue to integrate pedestrian and bicycle facilities with the street and transit network through the Trail and Sidewalk Program and other project components of the town's capital improvement program involving transportation improvements.

7. Apply appropriate traffic calming techniques and improvements to enhance vehicular and pedestrian safety and to preserve neighborhood character. Develop a policy regarding speed bumps and seek creative solutions to calm traffic.

8. Minimize conflicting traffic movements by means of improved road design on arterial streets.

Transportation Strategies

The following strategies reflect specific courses of action in support of the goals and objectives outlined above. Transportation policies for the town are not simply based on projections of future demand and a program of improvements to meet that demand. Rather, plans and policies reflect an approach which balances mobility and efficiency with other expressed community goals such as retaining a small town atmosphere and quality of life. Greater Herndon Strategies focus on promotion of county, regional and state level efforts to improve the arterial network outside the Town. Townwide Strategies focus on the transportation system within the town limits.

Greater Herndon Strategies

1. Support the funding, final design and construction for the Dulles Rail extension to Dulles Airport and Loudoun County.

2. Promote enhanced access facilities at the north side of the Herndon Metrorail Station, including the provision of a kiss and ride facilities.

3. Support the completion by Fairfax County and VDOT of the extension of Wiehle Avenue to Lincoln Avenue.

4. Promote the interconnection of arterial street systems in Loudoun and Fairfax Counties to improve the availability of truck routes without heavy dependence on Herndon Parkway.

5. Promote the connection over the Dulles Access Toll Road of Sunrise Valley Drive to Rock Hill Road. This connection is included in the Fairfax County Comprehensive Plan and physical space for this connection touchdown has been provided within new development at the south side of the Dulles Toll Road.

6. Monitor/coordinate transportation planning activities west of the town in Loudoun County (Route 606, Rock Hill Road, Shaw Road, Davis Drive. Potential connections to Innovation Drive).

7. Promote pedestrian and bicyclist safety through better diversion of through traffic and possible bike lanes.

Townwide Strategies

1. Investigate transportation system management techniques to alleviate future traffic congestion and delay, including the following:

    a. Continue implementation and manage the automated traffic signal technology project to provide efficient flows of traffic on major streets;

    b. Develop incentives to encourage transportation demand management by employers (car pools, flex hours, membership in the Dulles Area Transportation Association, etc.);

c. Support independent transportation associations, such as the Dulles Area Transportation Association, which attempt to reduce commuter traffic;
d. Participate in planning for feeder bus service to regional commuting facilities including the Herndon and Route 28 Metrorail stations;

e. Support telecommuting to reduce trip generation, including telecommuting centers located within the town;

f. Consider the development of an internal trolley system to serve Elden Street and other locations within the town.

2. Accept high levels of congestion during peak traffic periods where additional street capacity could be provided only on widened streets that would adversely affect the town's character.

3. Implement appropriate traffic calming measures through the work of the town's Traffic Engineering Improvement Committee; a variety of appropriate measures should be considered to mitigate traffic impacts and retain small-town scale and urban character

4. Provide protected left turn and right turn lanes at major intersections as warranted.

5. Avoid the use of unprotected center lanes painted with left turn arrows for opposing directions of traffic (two-way left turn lanes).

6. In accord with the town's adopted Master Trails Plan, provide an attractive and useful pedestrian and bicycle trail network within the town which connects to the regional trail network:

   a. Continue use of a capital improvement program to improve the pedestrian environment along major streets and complete the missing sections of trails as designated in the Master Trails Plan;

   b. Follow sidewalk and trail construction standards appropriate to pedestrian patterns and types of streets, as indicated by the Downtown Streetscape Overlay Policy, the Master Trails Plan, the Fairfax County Public Facilities Manual, and the Virginia Department of Transportation;

   c. Provide crosswalk striping, pedestrian signals, and corner curb cuts where sidewalks function as trails;

   d. Continue to pursue grant funding to supplement town resources for trails and sidewalks;

   e. Provide suitable accommodations for bicycles in accord with state and local standards.

7. Evaluate all street, trail or sidewalk improvement projects for conformance with comprehensive plan policies for Green Streets, Downtown Streetscape, Master Trails Plan, Neighborhood Conservation, and other relevant policies.

8. Encourage use of the Herndon Parkway by through traffic and discourage new curb cuts and median breaks; provide signal synchronization and intersection improvements.

Major Street Network

The proposed Major Street Network depicted on MAP G is designed to achieve the town's goals. Through traffic should be encouraged to utilize Herndon Parkway and the arterial streets on the Town's periphery. Elden Street inside of the loop formed by the Herndon Parkway should be used by local traffic. Through traffic should be discouraged from using this section of Elden Street. A network of smaller streets will handle traffic in the downtown. This is consistent with the unique and historic character of downtown Herndon, which is designed to slow traffic down and spread it on to local streets, where destination land uses are located. This contrasts with the high-speed, limited access arterial concept which has detracted from many other older downtowns.

The projects listed below are needed to achieve the proposed Major Street Network over a planning horizon stretching to the year 2030. Projects which are included within the capital improvement program are denoted by "(CIP)" at the end of the description. In some cases, this is indicative only of funds programmed for traffic study/concept plan efforts, or of out-year funding listed as "to be determined."

1. Dulles Corridor Rail Station: Pedestrian, bus and bicycle access to the proposed rail transit station to be located within the Dulles Airport Access Road median. Metrorail plans for the Herndon Station are to include a pedestrian bridge with escalators and elevators landing within the Town of Herndon at its southern boundary along the Dulles Toll Road. The plans provide for a sidewalk extending northward from the landing area to Herndon Parkway. The town will seek enhanced Metrorail station access by constructing additional pedestrian links in the station vicinity where feasible. The town will also consider development of limited areas for vehicles to safely drop passengers for the Metrorail station. All of the north side access facilities shall be considered part of the Herndon Metro Station, a feature shown on the 2030 Land Use Plan map. (CIP) See the Herndon Transit-Oriented Core Plan, Chapter 6 of the Herndon Metro Station Area Study, for specific multimodal features to be implemented.

2. Solicit Fairfax County for an improved internal transit system to facilitate trips to Metrorail through the Fairfax Connector bus transit service and/or for profit service or public/private partnership operating within the Town of Herndon.

3. East Elden Street: (Urban Minor Arterial) Fairfax County Parkway interchange to Herndon Parkway; may include widening and turn lane extensions, based on the results of preliminary planning and engineering study. May include reconstruction of the box culvert over Sugarland Run, along with pedestrian/bicycle facility to bring the Sugarland Run Trail over or under Elden Street. This is a Virginia Department of Transportation Six Year Plan project and the project is also included in Metropolitan Washington Council of Government's (MWCOG) Constrained Long Range Plan. (CIP)

4. East Elden Street: (Town Minor Arterial) turning lanes and street section improvements from Monroe Street to Herndon Parkway. This is a Virginia Department of Transportation Six Year Plan project and the project is also included in MWCOG's Constrained Long Range Plan. (CIP)

5. East Spring Street: (Urban Minor Arterial) widen to six lanes from Herndon Parkway to the East Town Line. See the Herndon Metro-Oriented Core Plan, Chapter 6 of the Herndon Metro Station Area Study for specific features to be implemented.

6. South Elden Street: (Town Minor Arterial) Herndon Parkway to Sterling Road, improve to divided four lane section. Project study area to encompass Elden Street/Sterling Road and Elden Street/Ferndale Avenue intersections. (CIP)

7. Park/Monroe/Station Intersection reconfiguration: (Major Collector meeting two Minor Collectors) (CIP)

8. Station Street Improvements: (Minor Collector) Drainage and streetscape improvements from Pine Street to Park Avenue. (CIP)

9. Worldgate Drive Connector: (Town Minor Arterial) construct a four lane section from Van Buren Street to Herndon Parkway as shown on the Herndon Transit-Oriented Core Plan, Chapter 6 of the Herndon Metro Station Area Study.

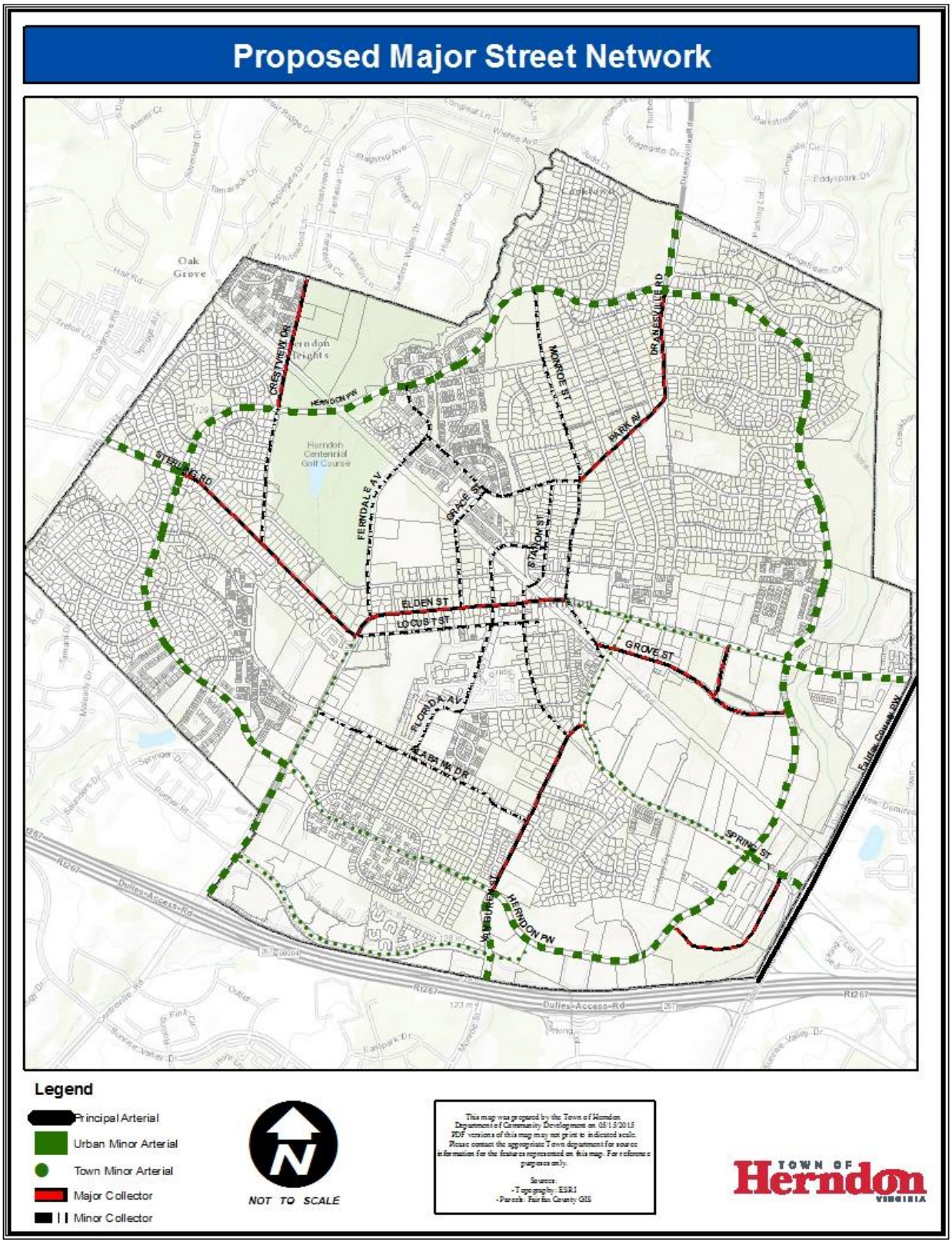
Longer term projects or projects anticipated to be financed and/or built mainly by private developers or other funding sources:

1. Van Buren Street: (Town Minor Arterial) four lanes, divided (approximately 700 feet), from Spring Street to the W&OD Regional Park.

2. Crestview Drive: (Major Collector) four lanes (approximately 2,100 feet), from the Town boundary to the Herndon Parkway (contingent upon consistent Fairfax County action regarding Crestview Drive.)

3. Fairbrook Drive: (Major Collector, approximately 1500 feet) anticipated two travel lanes from end of the existing section of Fairbrook Drive to Spring Street, with additional turning lanes at the approach to the intersection with Spring Street

Map G: Town of Herndon Proposed Major Street Network *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*



Master Trails Plan

The intent of the Master Trails Plan is to merge the traditional pedestrian system (sidewalks) with the off-road bicycle and pedestrian trail system. The plan also calls for the establishment of trail categories and prioritization based on anticipated trail use. It is the town's primary focus to completing missing sections of Regional and Intermodal trails and ensure safety of existing trails, with a secondary long term emphasis on enhancing any existing portions of trail which may not meet the standards set forth in the Fairfax County Public Facilities Manual section on Sidewalks and Trails. (Map H)

Trail Categories

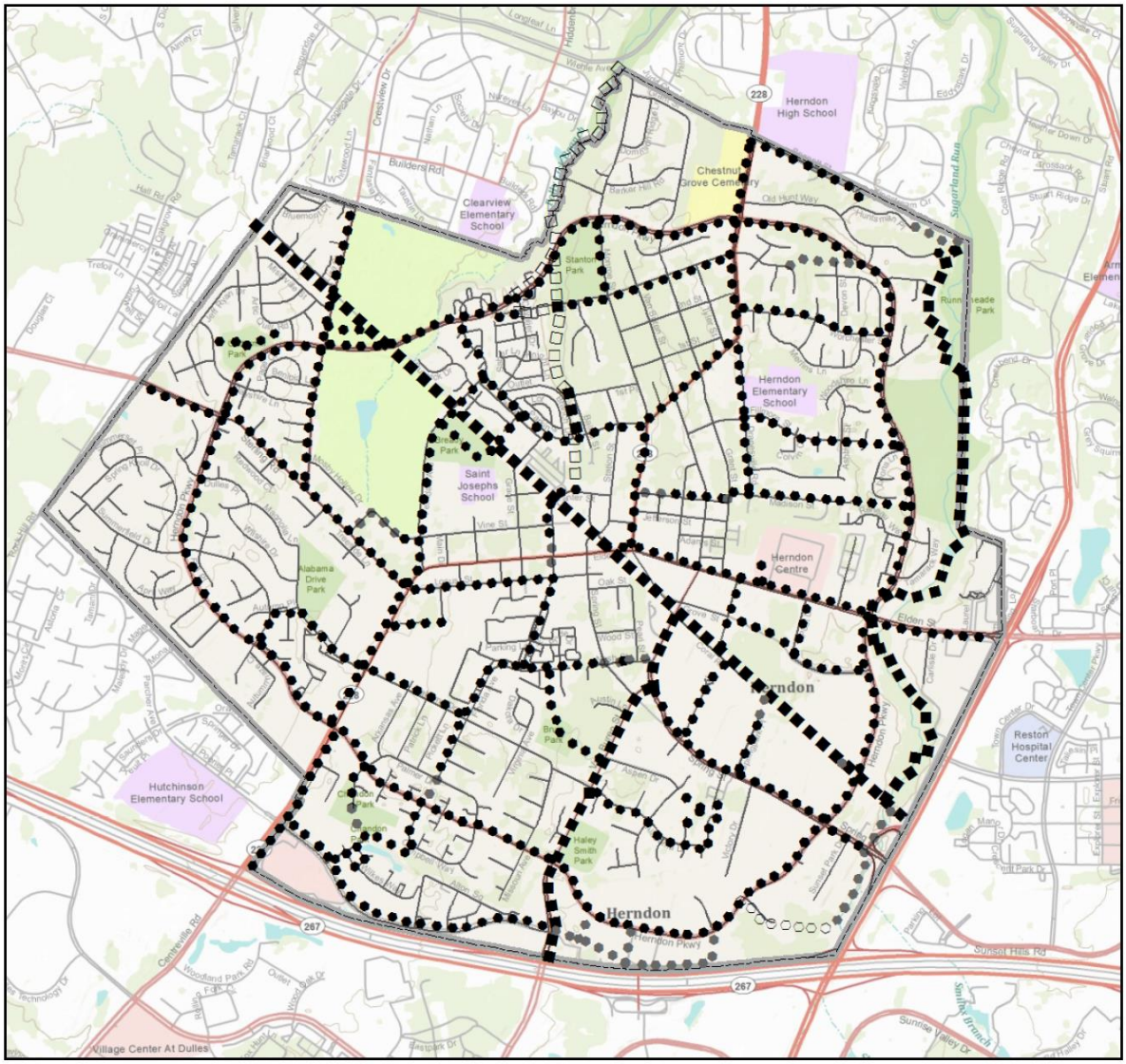
Regional trails connect Herndon to a larger network of trails and paths in surrounding jurisdictions. They increase access to the town from adjacent communities, and provide greater opportunities for leisure and commuter trail users. Regional trails are to be constructed with an asphalt surface with a width of 8' or over.

Intermodal trails connect Herndon's varied activity areas to one another. They can be constructed with either asphalt or concrete and should be a width of no less than 6'.

Local trails provide a complete network within neighborhoods and activity areas and connect to Regional or Intermodal trails. They are generally configured as concrete sidewalks at a width of 4' to 6'.

Map H: Town of Herndon Master Trails Plan *(Full scale map available at **www.herndon-va.gov** or through the Department of Community Development)*

Town of Herndon Master Trails Map



Map Legend

- ●●●● Intra-Nodal - Existing
- ●●●● Intra-Nodal - Proposed
- ○○○○ Intra-Nodal Proposed - Rezoning Obligation
- ■■■ Regional - Existing
- □□□ Regional - Proposed

NOT TO SCALE

This Map was prepared by the Town of Herndon Department of Community Development on 12/11/2012. PDF versions of this map may not print toindicated scale. For reference purposes only.

Sources:
- Topography: ESRI
-Trails: Town of Herndon

X. Urban Development Areas and Potential Boundary Adjustments

Areas to the south and west of the town boundary have potential for truly regional scale mixed-use development. These areas feature vacant land, a large rock quarry and other industrial land uses that have great potential for regional scale mixed-use development. These areas are of particular interest because of the potential for major impact on the Town of Herndon. These areas are now served by a limited road network and the town is concerned with the provision of adequate transportation facilities, recreational facilities and other public services. The areas of concern are generally described as:

1. Fairfax County land bounded by the Dulles Toll Road, the Loudoun County line, the Town of Herndon line and Centreville Road.

2. Loudoun County land bounded by Route 28, Sterling Boulevard, The W&OD Trail and the Town of Herndon line extending southward along the Fairfax County/Loudoun County line to the Dulles Toll Road.

The March 2007 Background Report for the 2030 Comprehensive Plan contains descriptive text and maps on these areas of interest. The town will explore options in regard to these important areas.

XI. Economic Development

RESERVED

CHESAPEAKE BAY PRESERVATION CHAPTER

Town of Herndon, Virginia

Adopted May 26, 1998

CPA # 97-2

CHESAPEAKE BAY PRESERVATION CHAPTER

TO THE TOWN OF HERNDON COMPREHENSIVE PLAN

Prepared by the Town of Herndon, Virginia

With assistance from the
Northern Virginia Planning District Commission

Under a grant from the
Chesapeake Bay Local Assistance Department

May 26, 1998

CPA #97-2

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CHESAPEAKE BAY PRESERVATION CHAPTER
TO THE TOWN OF HERNDON COMPREHENSIVE PLAN

General Policy Statement

The Town of Herndon is committed to the protection, preservation, and restoration of its natural environment and in particular, its water resources. Similarly, the Town is committed to the protection, preservation, and restoration of one of Virginia's most valuable economic and ecological resources, the Chesapeake Bay. Fairfax County, including the Town of Herndon, lies within the watershed of the Chesapeake Bay. The linkages between water quality, natural habitat, and quality of life are widely acknowledged. So too are the linkages between water quality, air quality, and land use. The major goal of this Chapter is to account for this interdependency between people and their environment and to guide the Town as it seeks not only to minimize the impacts of new development on water quality, but to improve water quality and the general environment through the redevelopment process, an examination of existing sources of pollution, and the identification of opportunities to prevent pollution before it impacts the environment.

It is the intention of the Town, using this Chapter as a tool, to:

- restore impaired streams that are capable of supporting a diverse aquatic habitat;
- protect streams which currently support aquatic life from the degradory effects of improperly planned or constructed development and other sources of pollution; and,
- expand efforts to provide residents with a wide-range of opportunities to interact with and learn about their natural environment.

Through these efforts, the Town hopes to make a meaningful contribution to the restoration of the Chesapeake Bay and to the improvement of the overall quality of life for the residents of the Town of Herndon.

Authority and Scope

Section 15.446.1 of the Code of Virginia (1950), as amended, requires that each municipality in Virginia develop its own comprehensive plan. The mandate states "The comprehensive plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted, and harmonious development of the

territory which will, in accordance with present and probable future needs and resources best promote the health, safety, morals, order, convenience, prosperity, and general welfare of the inhabitants."

In addition, the Virginia General Assembly, in response to growing citizen concern for the health of State waters and in particular the Chesapeake Bay and its tributaries, enacted the Chesapeake Bay Preservation Act of 1988 (Sections 10.1-2100, *et seq*., of the Code of Virginia (1950)). Section 10.1-2109.B of the Act states that "Counties, cities, and towns in Tidewater Virginia shall incorporate protection of the quality of State waters into each locality's comprehensive plan consistent with the provisions of this chapter."

The Chesapeake Bay Preservation Act of 1988 was a direct response to the 1983 Chesapeake Bay Agreement signed by the governors of Virginia, Maryland, and Pennsylvania, the Mayor of the District of Columbia, and the U.S. EPA. The Chesapeake Executive Council signed amendments to the original agreement in 1987 and 1992 specifying the intent to implement tributary-specific pollution reduction strategies for each of the Bay's major tributaries. In 1996, the first of the strategies was completed for the Shenandoah and Potomac river basins.

The Town of Herndon, recognizing the importance of the goals of the Act, not only for the Chesapeake Bay, but also for the integrity of its own water and natural resources, has therefore produced the following *Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan*.

ORGANIZATION

This Chapter takes the approach that in order to arrive at achievable water quality goals and strategies and in order to identify future work programs to improve water quality, it is necessary to have a detailed understanding of the Town's natural environment and its implications for future sustainable growth.

To help foster this approach, this Chapter is divided into the following sections:

I. The Existing Natural Environment
II. Constraints to Development
III. Existing and Potential Sources of Environmental Pollution
IV. Existing Programs and Regulations to Protect the Environment
V. Analysis of Program Needs and Strategic Water Quality Protection Plan
VI. Strategies and Action Statements
VII. Implementation Plan and Time-Line

The Existing Natural Environment
I

The Town of Herndon is strategically located in northwestern Fairfax County, about 20 miles northwest of Washington D.C., and occupies a land area of 4.2 square miles. Because the Town is hydrologically and economically connected to the Chesapeake Bay, the Town must be particularly diligent in its water quality protection efforts. Although the Town lies within the political boundaries of Fairfax County, it enjoys its own planning and zoning authority. Figure I.1 illustrates the location of the Town in relationship to Tidewater Virginia, i.e., coastal plain land that drains to the Chesapeake Bay.

The Town has a strong commitment to the preservation and enhancement of its natural environment. In 1989, the Town added a full-time staff position dedicated to urban forestry. In 1990, the Town adopted the Herndon 2010 Comprehensive Plan, incorporating the general principles of the State's Chesapeake Bay Preservation Act. The Comprehensive Plan contains policy about urban forestry, as well as policy to establish "Green Streets" (corridors with special landscaped buffers) and "Clean Streams" (water quality

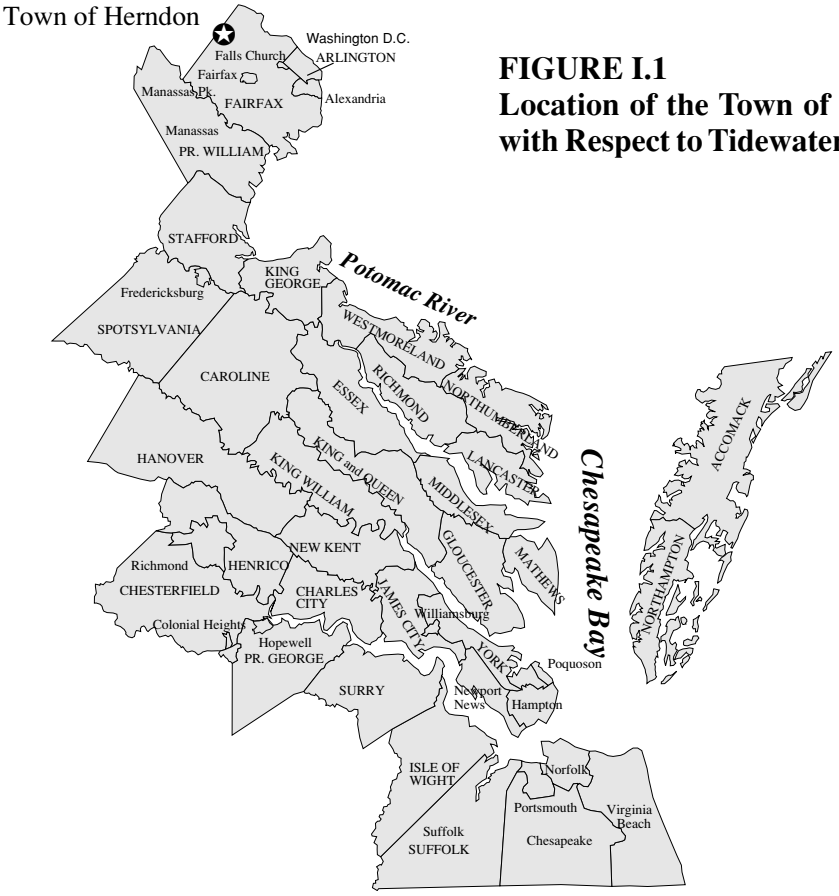


FIGURE I.1
Location of the Town of Herndon with Respect to Tidewater Virginia

I

goals). It also contains development guidelines intended to emphasize protection and integration of the natural environment on development and redevelopment sites (guidelines for "Infill and Redevelopment" and "Adaptive Areas"). During the same period, the Town adopted zoning provisions for protection of the Chesapeake Bay, and established the entire Town as a Resource Management Area with extensive Resource Protection Areas as described under State enabling legislation. Also in 1990, the Town established an aggressive recycling program supported by a staff coordinator. In 1991, the Town adopted a revised master plan for a 58 acre stream valley park named Runnymede. The park master plan envisions a natural park setting with the vast majority of the parkland set aside as a conservation area. The Town also has reviewed and strengthened its stormwater management regulations by adopting the relevant portions of the Fairfax County Public Facilities Manual.

Natural and built features that comprise the Town have experienced successive stages of alteration. Many original forested areas were converted to farmland. Farmland and forest fragments were then converted to development of homes, businesses, roadways, and public facilities. Approximately 70% of remaining forest cover was cleared from the late 1970s through the 1980s.

The Town and its environs have experienced phenomenal growth over the past several decades largely as a result of its location between Washington, D.C. and Dulles International Airport. According to U.S. Census data, the Town grew from 11,449 residents in 1980 to 16,139 in 1990 – resulting in an additional 1,396 housing units in that time period. The Town's 1997 population is estimated at 19,560. Along with growth in population, there has been similar growth in the industrial and commercial sectors as businesses have located in the area. It may be anticipated that future development will result in higher densities as developer pressure mounts on undeveloped or underdeveloped parcels that remain along the Dulles corridor.

Along with development, the Town maintains an abundance of natural resources which benefit both residents and businesses. Several habitat areas have been set aside as natural or semi-natural parks (such as Stanton, Runnymede, and Spring Street parks) while others, including stream valleys, are protected through Town regulations, including the Chesapeake Bay Preservation Ordinance and Floodplain Overlay District.

These areas must be recognized and protected to assure that Town residents continue to enjoy the benefits that these natural areas provide.

Despite the Town's recent accomplishments in protecting its natural resources, many protections were instituted after development. Development within the Town has had a significant impact on the natural environment. And, due to earlier design and construction practices, including clearing and earthwork operations, a portion of developed areas continue to create environmental impacts due to poor runoff water quality.

In order to plan for future development and redevelopment that complements the natural resources of the Town, it is necessary to identify and understand the existing natural environment, how it has changed over the past few decades, and where it will be in the future if present trends continue. The following section provides a summary of natural resources and environmental features that are unique to Herndon as well as those which are shared with its neighbors – Fairfax County and Loudoun County.

Environmental features affecting or affected by water quality that are covered in this section include the following:

- Climate and Precipitation
- Natural Habitats
- Topography
- Geology and Soil Characteristics
- Watersheds and Water Resources
- Groundwater Resources
- Wetlands

I.1 Climate and Precipitation

The climate of the Town, based on climatological data collected at nearby Dulles International Airport, is generally temperate, but relatively humid, with an average annual rainfall of approximately 40 inches per year. Precipitation is fairly well distributed throughout the year although frontal storms which may produce torrential downpours and high winds are concentrated in the warmer late-spring and summer months. Summers are warm and winters are relatively mild. The average annual temperature is 53.8° F (four degrees cooler than the average annual temperature at National Airport to the east), with a daily average high of 65.1º F and a daily average low of 42.5º F. The hottest month of the year is July (daily average high of 87.0º) while the coolest month of the year is January (daily average high of 40.1º). Snowfalls of 4 inches or more occur only twice each winter on average and accumulations of greater than 20 inches are extremely rare.

I.2 Natural Habitats

Long before Herndon experienced its most recent surge of development, much of the indigenous vegetation of the area was cleared for agricultural purposes, commercial and industrial uses within the Town, roads, and scattered homes. However, parcels of open and undeveloped land, utility line rights-of-ways, and stream valleys, in combination with suitable forms of development, have resulted in a limited, yet remarkably resilient wildlife habitat known to ecologists as "typical suburban." While the Town has maintained a good urban tree cover and enough parks and open space to provide habitat to many terrestrial animals and birds, the bulk of the Town's wildlife habitat is located along the green corridors associated with Sugarland Run, Folly Lick Branch, and their associated stream valley parks.

According to a 1997 study by the Metropolitan Washington Council of Governments (MWCOG) entitled *Rapid Stream Assessment Technique Survey of the Sugarland Run Watershed*, most of the Sugarland Run mainstem within the Town is protected by a treed buffer of over 100 feet and has a mean canopy cover (providing shade) of over 60%. This places the corridor in the "good" range for riparian habitat condition. The notable exception is that portion of Sugarland Run from the Dulles Toll Road to Elden Street. This portion of Sugarland Run has a low mean tree canopy cover (29%, or "fair") primarily due to a complete lack of canopy cover from the Dulles Toll Road to just before the W&OD Trail.

FIGURE I.2
Folly Lick Branch Habitat Corridor

A 1974 survey of the Sugarland Run/Horsepen Creek watersheds found that remaining species of flora were consistent with the local geology. Piedmont upland hardwood forests, consisting largely of oak, hickory, beech, tulip poplar, and maple, still covered 21% of the watershed at the time of the survey.

A recent floral survey of Runnymede Park by volunteers of the Maryland and Virginia Native Plant societies and the Runnymede Rangers identified

over 250 native plant species, as well as 11 exotic species. This is an ongoing survey. Runnymede Park has been nominated as a Virginia Native Plant Society (VNPS) Registry site by the Potowmack Chapter of the VNPS, due to the diversity of species and habitat types in the park area.

The park contains a diabase glade plant community that is a State endangered habitat type. The four acre meadow is an outstanding natural asset, and includes plant assemblages typical of Eastern wet meadow and prairie communities.

Records maintained by the Virginia Department of Conservation and Recreation, Division of Natural Heritage (DNH), reveal the presence of many species which still call the Sugarland Run watershed home. Among these are twenty-two different species of fish, several types of frogs, salamanders, and toads, three species of turtle, and over a dozen species and subspecies of snake (including the poisonous copperhead). Over 100 species of birds have been confirmed as breeding or courting within the Sugarland Run watershed. A publication entitled "Birds of Runnymede Park" provides information on over 116 species of birds observed by local birders in that park in 1995. "Edge" species of mammals such as deer, squirrel, beaver, muskrat, and fox also inhabit the area.

MWCOG's 1997 effort also included an assessment of Sugarland Run's macroinvertebrate (without backbone) population as a means of assessing the stream's overall ecological health. The mainstem of Sugarland Run was examined for the abundance and diversity of macroinvertebrates with particular attention given to the presence of relatively pollution-intolerant species such as flathead mayflies, stoneflies, and cased caddisflies. All portions of the Sugarland Run mainstem within the Town were found to be in the "good" range for overall community condition. However, the relatively low number of pollution-intolerant species found compared to an undisturbed watershed confirms that human activity in the Sugarland Run watershed has taken a toll even within the Town's relatively undisturbed stream valleys.

The DNH also maintains records on the general location and occurrence of endangered species of wildlife or vegetation in the Northern Virginia region. According to the DNH, there are no records of federal or State endangered species in or immediately bordering the Town. However, the presence of threatened and endangered species has been confirmed within other parts of the Sugarland Run watershed. Therefore, while DNH records do not currently contain information to document the presence of endangered or threatened species within the Town, it is possible that they reside undetected within the Town's quiet stream valley parks. Some threatened and endangered species in the Sugarland Run watershed and its environs include the Bald Eagle (federally endangered), Earleaf Foxglove (federal candidate), Wood Turtle (State threatened), Brown Creeper (State candidate), Common Moorhen (State candidate), and Yellow-Crowned Night-Heron (State candidate). Brown Creepers and Yellow-Crowned Night Herons have been observed occasionally, but regularly, in Runnymede Park, through 1996, when experienced volunteer observers were no longer available. Both species were observed during 1997, but breeding and courting has not been confirmed. The diabase plant community is an endangered State habitat type.

I.3 Topography

Most of the Town is characterized by low, gently rolling hills with elevations ranging from about 260 feet above sea-level where Folly Lick Branch and Sugarland Run exit the Town limits, to slightly more than 420 feet above sea-level in the Benicia Estates and Broad Oaks neighborhoods in western Herndon (see Figure I.3). Steeper slopes are found along many stream banks and on hillsides in some areas. Folly Lick Branch and Sugarland Run form two well defined valleys which traverse the Town roughly from the southwest to the northeast. A series of hills and ridges, which run through the center of Town (roughly mirroring Dranesville Road) separates the valleys until they converge where Folly Lick Branch empties to Sugarland Run just north of the Town. Smaller tributaries branch out from Folly Lick Branch and Sugarland

FIGURE I.3
Topographic Map of the Town of Herndon

Contour Interval = 10 feet.

SOURCE:
U.S. Geological Survey, Herndon Quadrangle Map: 1982.

Run, cutting smaller valleys and ridges into the landscape.

I.4 Geology & Soils Characteristics

Among all the natural features of the Town, none have as inherently significant an impact on development potential, natural habitat, and eventually water quality as geology and soils. Land is the foundation of most human activities, and the characteristics of the underlying geology and soils often dictate what type of activity is appropriate or feasible for a particular site. Improper development on sensitive soils can easily result in soil erosion which contributes to downstream siltation problems and creates long-term difficulties for structures built upon these soils.

GEOLOGICAL FEATURES – The Town of Herndon is within the Piedmont physiographic province of Virginia in an area known as the Piedmont Lowlands. The Piedmont was formed

by fragments of continental and oceanic crust that were pushed together by a series of tectonic plate collisions and separations.

The geology of the Piedmont is very complex. The rocks were folded, faulted, and altered. The depression where Herndon is located was a fresh water lake during the Triassic period. Most of the surface rocks were deposited in this lake and consist of conglomerate, sandstone (some quartzite), shale, and siltstone. In the north part of Herndon (Barker Hill and Dominion Ridge subdivisions), there are remnants of older metamorphic rocks (schist). A period of volcanic activity followed the sedimentation. The surficial rocks were intruded by an intricate network of diabase sills (volcanic intrusions parallel to bedding planes of sedimentary layers) and dikes (volcanic intrusions that cut across bedding planes). These intrusions baked and hardened the sedimentary rocks where the hot igneous rocks came in contact with the sediments.

The hardened sandstones (quartzites) and igneous diabase rocks are very resistant to weathering and have been the dominant factors in controlling the topography of Herndon. Differences in erosion rates of the underlying rock types have shaped the modern drainage patterns and topographic contours of the landscape.

SOIL FEATURES – Soils serve as the lifeblood of the ecology as well as the most basic of building material for roadways, embankments, and building foundations. Management of soils is important to ensure that development does not result in excessive soil erosion and sedimentation. Areas consisting of shrink-swell clays (such as the Orange soils group), highly permeable and erodible soils, hydric soils, low depth to groundwater, wetness, and a number of other sensitive soil characteristics also require special consideration in an urban environment. In addition to development considerations, soil characteristics also affect the types of indigenous vegetation that thrive in the Town.

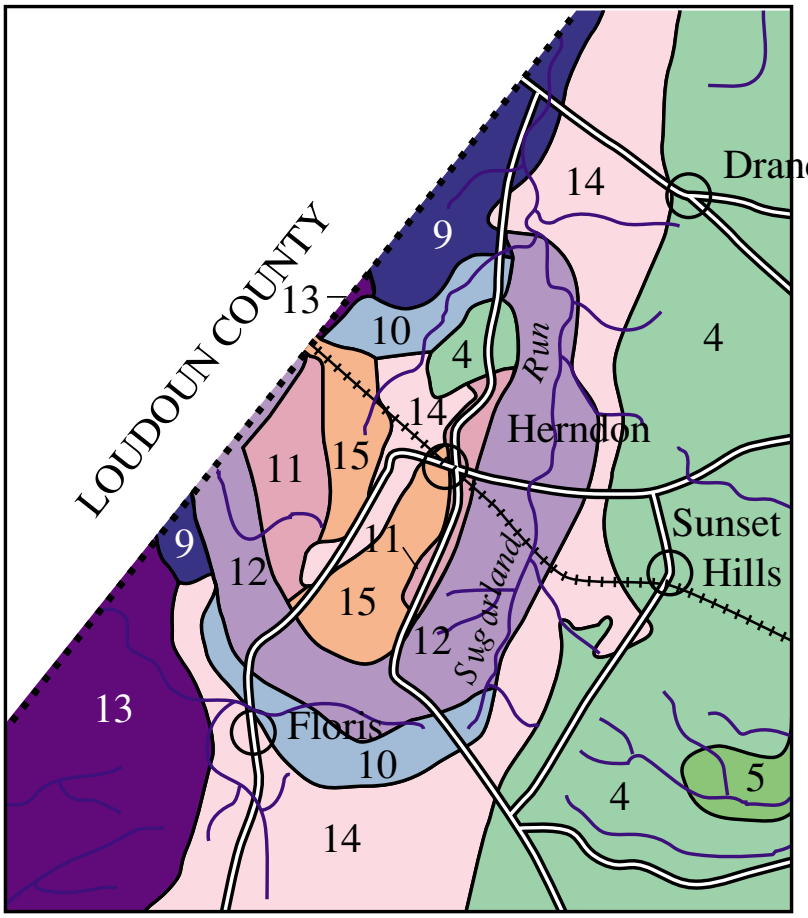
Two detailed soils maps, the *Soil Survey of Fairfax County, Virginia* (1963) and the *Soils Identification Map of Fairfax County* (1972), provide information on the types of soils found within the Town and their general characteristics. Most soils within the Town have been permanently altered or disturbed by development. Therefore, while general observations are possible, site specific soil exploration and tests are necessary for development and foundation engineering purposes.

Soils within the Town are typical of those formed from the Piedmont Lowland and the primary parent materials for most of the Town's soils are sandstone and diabase. Associations of soils found within the Town include Calverton-Brecknock-Croton, Penn-Bucks-Calverton, Kelly-Brecknock-Catlett, Brecknock-Catlett-Croton, and Glenelg-Eliok-Manor. Each of these broader soils associations are divided into more specific soils types.

The preponderance of soils within the Town are suitable to most types of development if proper soil conservation measures are implemented. However, large areas may be constrained due to high water table and rocky terrain. These features may preclude the construction of basement areas. In addition, some soils have a soft, plastic clay subsoil which requires special considerations for building footings. A local example is the Orange soils group, which is found abundantly throughout the Town. These soils, when saturated with water, become soft, plastic, and sticky and have a very low value of support. When the clay dries, it shrinks, which can cause footings to break and house walls to crack. While problems can be avoided in many instances by anchoring building footings to the underlying weathered parent rock, and excavating the shrink-swell soil within three feet of the foundation and replacing it with granular, well-drained soil, it is important that these areas are recognized for their limitations.

By steering inappropriate development away from sensitive areas, the Town can avoid future costs to taxpayers associated with property damage as well as the costs of correcting damage to the ecology and to water quality. A generalized map of soils associations found in the Herndon vicinity is presented in Figure I.4. Constraints to

FIGURE I.4
General Soils Map of the Town of Herndon



SOIL ASSOCIATIONS

Soils on Crystalline Rock in the Piedmont Upland

(4) Glenelg-Elioak-Manor
(5) Manor-Glenelg-Elioak

Soils on Sandstone, Shale, and Conglomerate of the Piedmont Lowland

(9) Penn-Calverton-Croton
(10) Brecknock-Catlett-Croton
(11) Kelly-Brecknock-Croton
(12) Irdell-Mecklenburg-Rocky Land
(13) Calverton-Readington-Croton
(14) Penn-Bucks-Calverton (Sandy)
(15) Calverton-Brecknock-Croton (Loams)

Map digitized directly from "General Soil Map of Fairfax County, Virginia." Information is for display and general reference purposes only.

SOURCE:
U.S. Department of Agriculture, Soil Conservation Service. *Soil Survey of Fairfax County*. May, 1963.

development posed by geology and soils characteristics are further discussed under II CONSTRAINTS TO DEVELOPMENT.

I.5 Watersheds & Water Resources

The watershed is the most important way of viewing the land from a water quality standpoint. Political jurisdictions do not often follow watershed boundaries and actions that negatively affect water quality in one jurisdiction will ultimately result in reduced water quality for downstream neighbors. This highlights the need for local, regional, and State coordination in the water quality planning process.

The Town is divided into two major watersheds (defined by the Virginia Division of Soil and Water Conservation) – Sugarland Run (watershed #A10) and Broad Run (watershed #A09) – both of which drain to the Potomac River and eventually the Chesapeake Bay. The Broad Run watershed covers approximately 0.6 square miles of the southwestern portion of the Town. Horsepen Creek is the tributary of Broad Run which drains this area of the Town.

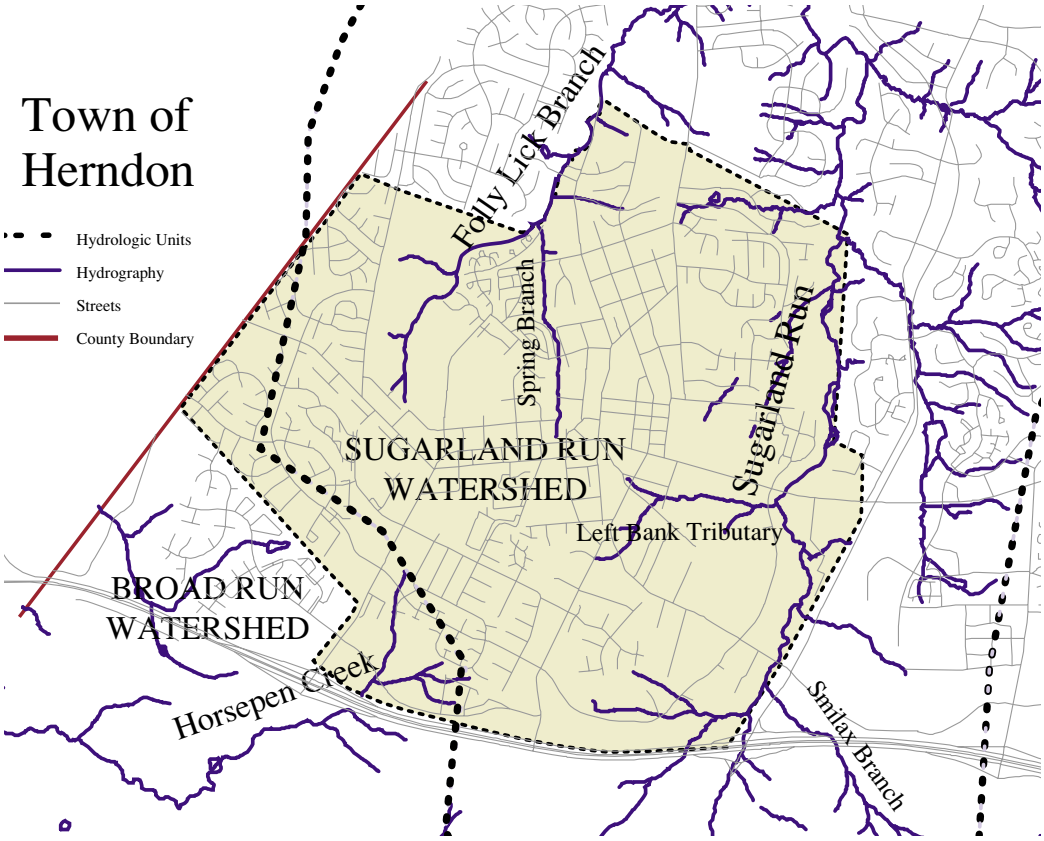
The Sugarland Run watershed drains the remaining 3.6 square miles of the Town. Sugarland Run begins in the Reston area of Fairfax County and flows approximately 9 miles, through the eastern edge of the Town, to the Potomac River in Loudoun County. The stream channel of the Town's

portion of Sugarland Run is fairly steep and very well defined, with main channel gradients averaging from 35 to 50 feet per mile. Low water stream channels have nearly vertical banks varying from 1 to 5 feet in height. Stream bed materials generally range from sand and gravel, to cobblestones and boulders, and extensive diabase outcrops in some areas. Slower reaches of the stream are particularly prone to silt deposits from upstream erosion, which smother bottom dwelling aquatic species.

Folly Lick Branch, a major tributary of Sugarland Run which has similar stream morphology, has its headwaters near Mosby Heights and drains the western portion of the Town. Folly Lick Branch empties into Sugarland Run to the northeast of the Town. Figure I.5 shows the delineation of streams and major hydrologic units within the Town.

Land use within the Sugarland Run watershed is primarily residential, with attending commercial and business sectors. Heavy and light industrial uses are also present in the watershed, which extends well beyond the Town boundary. At one time, both Sugarland Run and Folly Lick Branch were fed by a number of small tributaries cutting through the landscape. With development, however, many of these small tributaries have been bulldozed or covered and turned into storm sewers. All of these man-made structures – piped

FIGURE I.5
Streams and Hydrologic Units of Herndon and Vicinity



SOURCE:
Hydrologic Unit Maps for Fairfax County, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation. 1995

streams, swales, storm drains, and storm sewers – that are built to handle stormwater are integral to water quality protection efforts within the Town because they eventually connect to the Town's natural stream channels. Piped streams are fed by storm drains, which collect water from highly impervious, and often polluted, surfaces such as streets, parking lots, and driveways. In addition, many people carelessly use storm catch basins as a convenient way to dispose of unwanted used oil, paints, litter, antifreeze, etc. As a result, all the Town's waterways – natural and man-made – must be the subject of the Town's water quality protection efforts.

Both the Sugarland Run and Broad Run watersheds are identified as high priority by the Virginia Department of Conservation and Recreation under the *1996 Nonpoint Source Pollution Potential Priorities* guidelines.

STREAMBANK EROSION – As with many urban jurisdictions in Tidewater Virginia, streambank erosion in the Town has been identified as a major concern. High density development, both within and outside of Town, has significantly increased impervious surface areas in the watershed. These developments are connected to the nearest floodplain by storm sewers.

At the same time, the natural vegetative cover has been removed. Vegetated areas reduce the flow of surface water, encourage infiltration, and improve water quality by filtering out pollutants. The result is that peak flow during storms has increased and low flow between storms has been reduced because of the lack of adequate groundwater recharge. With the increase in peak runoff from smaller storms (two to ten year storms) the streams are out of equilibrium because the channels do not have capacity to carry the stormwater. The high velocity and turbulence of the water in the stream channel and the increased surface runoff cause several types of erosion. Types of erosion include bank undercutting and meandering, formation of gullies in tributaries, bottom scouring in the stream channels, and development of ancillary channels.

Diabase geological formations prevent significant downcutting of the major stream channels (Sugarland Run and Folly Lick Branch). The gradient of the primary stream can not change rapidly because they have downcut to the diabase intrusions that are very resistant to weathering. However, small tributaries to the major streams that flow through sedimentary rock have downcut rapidly until their gradients have adjusted to the gradients of the major streams or they have downcut to the depth of diabase rock.

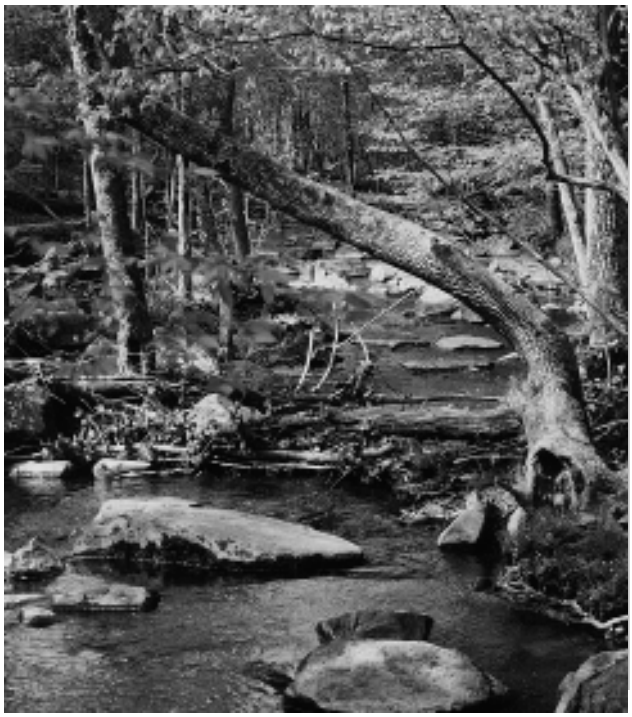
The headwaters and portions of Sugarland Run south of Herndon have been mostly confined to stormwater structures to support development in Reston. During the early 1990's the Fairfax County Parkway was constructed between the Dulles Access Road and the W&OD Trail. Part of the stream channel was confined to box culverts, all the vegetation was removed, and a three-acre beaver pond and wetland area were destroyed for construction of the Parkway. At Planning Commission public hearings in late 1990 and early 1991, promises were made by the Virginia Department of Transportation to construct detention facilities to control the additional peak runoff caused by road construction, and to replace part of the retention and water quality functions of the beaver pond and wetland.

The Department of Transportation did not construct detention facilities in the manner anticipated by the Town. Streambank erosion is also a problem in this area because most of the tree cover was removed and there is nothing to stabilize the banks. The Town is working with Colonial Pipeline Company to correct some of these problems as part of the settlement for the 1993 oil spill in Sugarland Run.

The portion of Sugarland Run between the W&OD Trail and Elden Street flows through Town-owned land. The floodplain is quite wide and forested. The stream meanders extensively through sedimentary materials, but the banks are relatively stable due to the broad floodplain which provides for water storage during peak flows. Beaver fre-

quent this location. This is also the section of stream where the 1993 oil spill entered Sugarland Run. A significant amount of the native trees, shrubs, and forbs (herbs other than grasses) were killed. These losses were documented by the Town for the Natural Resource Damage Assessment, but no replacement plantings were offered in settlement. Therefore, invasive exotic plants have colonized, replacing the more effective and useful native species and degrading the area for wildlife habitat and human recreation.

FIGURE I.6
View of Sugarland Run



Streambank stability varies along Sugarland Run between Elden Street and the north end of Stuart Woods apartments. Some erosion problems have been observed at the bridge within the Stuart Woods development and bank erosion is pronounced at the north end of the apartment complex.

Bank erosion continues north into Runnymede Park with undercut banks ranging from three to five feet in height. The stream is in the early stages of developing turns, or meanders. Sand and gravel bars are occurring on the inside of bends, and undercutting is appearing on the outside of bends. Undercutting is retarded by the clay content of the banks and tree roots, but observable widening has occurred during the past decade. Some local bottom scouring is present where temporary obstructions produce additional turbulence. Runoff from the Herndon Parkway is causing additional problems that affect Sugarland Run as well as areas between the Herndon Parkway and Sugarland Run. A pronounced gully has formed where the parkway drains into the southern end of Runnymede Park. Surface water then flows through hardwood forest by a combination of sheet flow and small newly-formed channels and reaches Sugarland Run through a series of small but expanding gullies.

The stream is controlled by a diabase intrusion through the central portion of Runnymede Park, from a point aligned with Creekbend Drive (Reston) to a little north of the Hunters Creek Clubhouse. No significant downcutting can occur in this portion of the stream or the immediate upstream portion because of the resistance of the diabase intrusion. There are, however, several places where new ancillary channels are being formed by floodwater above the primary stream channel.

Over time, the ancillary channels may deepen and provide additional conveyances for water during normal flow. An example of this process at a more advanced stage is near the Hunters Creek Clubhouse, where several channels carry water during normal flow stages of the stream. East of the Clubhouse, the floodplain was severely constricted by fill material during subdivision development. This has resulted in significantly increased water velocity during peak flows. The fill feature is prominent on the map in Figure II.1(B).

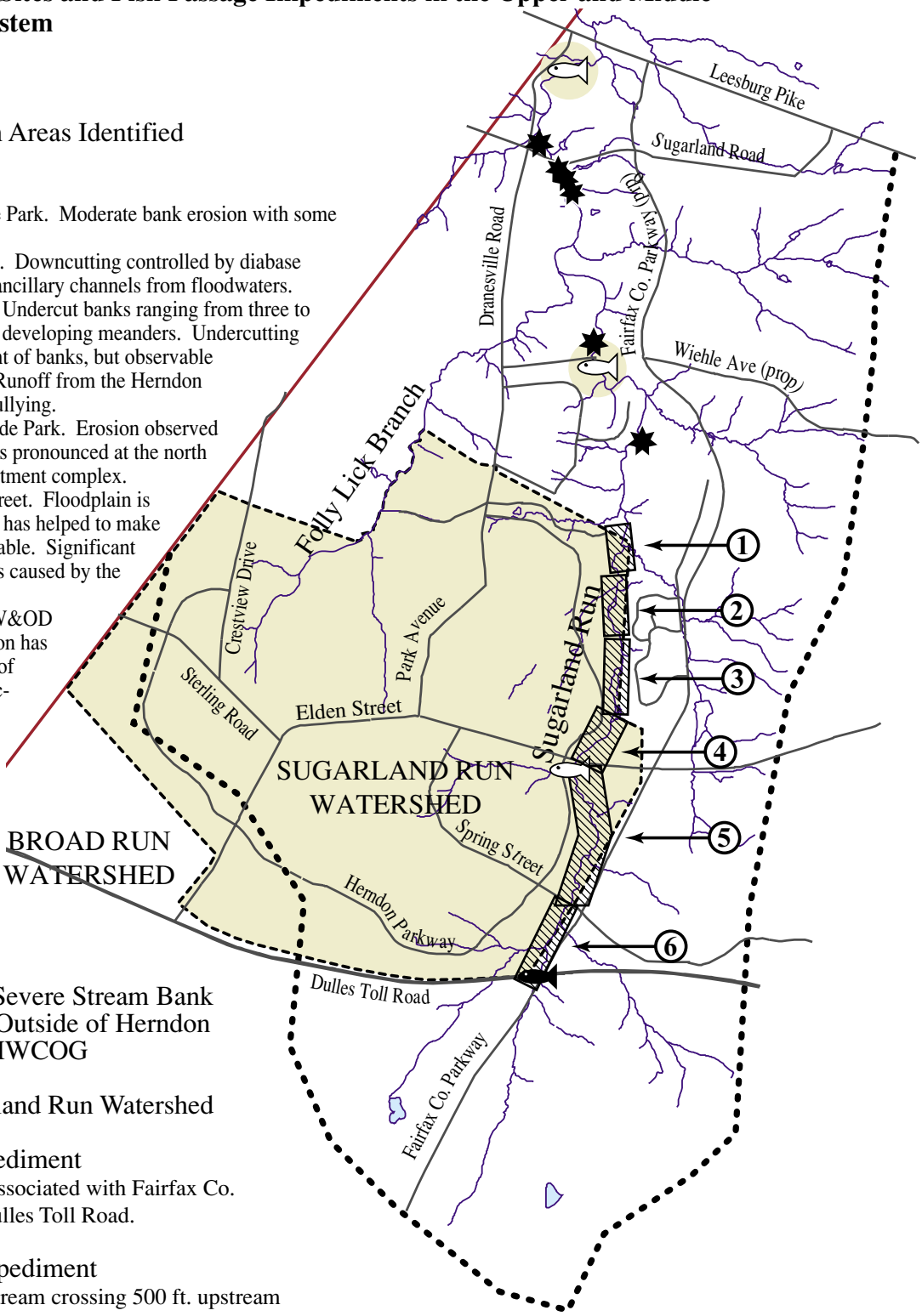
In the north end of Runnymede Park, Sugarland Run again flows through sediments. The floodplain is quite wide on both the Herndon and Reston sides of the stream. Moderate bank erosion is occurring in this area with some meandering. Wetlands consisting of a wet meadow, marsh, and

FIGURE I.7
Streambank Erosion Sites and Fish Passage Impediments in the Upper and Middle Sugarland Run Mainstem

KEY

Stream Erosion Areas Identified in Text

(1) North end of Runnymede Park. Moderate bank erosion with some meandering.
(2) Central Runnymede Park. Downcutting controlled by diabase intrusion. Formation of ancillary channels from floodwaters.
(3) South Runnymede Park. Undercut banks ranging from three to five feet. Early stages of developing meanders. Undercutting is retarded by clay content of banks, but observable widening has occurred. Runoff from the Herndon Parkway has produced gullying.
(4) Elden Street to Runnymede Park. Erosion observed at bridge. Bank erosion is pronounced at the north end of Stuart Woods apartment complex.
(5) W&OD Trail to Elden Street. Floodplain is wide and forested, which has helped to make this segment relatively stable. Significant damage to vegetation was caused by the 1993 oil spill.
(6) Dulles Toll Road to the W&OD Trail. Stream bank erosion has occurred due to removal of tree cover and the destruction of wetlands during construction of the Fairfax County Parkway.



Moderate and Severe Stream Bank Erosion Areas Outside of Herndon Identified by MWCOG

Limit of Sugarland Run Watershed

Total Fish Impediment
- Box culvert associated with Fairfax Co. Pkwy. and Dulles Toll Road.

Partial Fish Impediment
- Abandoned stream crossing 500 ft. upstream of Elden Street.
- Beaverdam located appx. 1,000 feet upstream of proposed Wiehle Ave.
- Log jam appx. 450 ft. upstream of Hughes Branch/Sugarland Run confluence.

Streambank erosion areas outside of Herndon and fish impediments identified by Metropolitan Washington Council of Governments, *Rapid Stream Assessment Technique (RSAT) of the Sugarland Run Watershed – Phase I: Sugarland Run Mainstem.* Washington, D.C.: 1997.

emerging swamp are adjacent to the stream on the west side and floodplain hardwood forest is on the east side.

Throughout Sugarland Run within the Runnymede Park sections, increasing undercutting and bank erosion are evidenced also by increasing loss of trees over the past ten years. The greater numbers of trees blocking the channel reduces the stream velocity during peak flows, but the debris also traps sediments and creates additional turbulence.

RIPARIAN BUFFER AREAS – A natural, undisturbed, mature vegetated forest buffer is among the most effective means of protecting water quality and aquatic habitats from the impacts of land use development. As noted previously, most of the Sugarland Run mainstem within the Town limits is protected by a buffer of greater than 100 feet. The notable exception is that portion of Sugarland Run from the Dulles Toll Road to the W&OD Trail where there is a complete lack of tree canopy cover. As a general rule, lack of canopy cover can result in elevated stream temperatures during the summer months that may render the stream uninhabitable by many aquatic species.

While restoration of denuded buffer areas should be a major goal of the Town's Chesapeake Bay protection efforts, much of the Town's polluted stormwater is piped directly from streets and other impervious surfaces via culverts and stormdrains. Because these stormdrains effectively bypass the benefits provided by vegetated buffers, additional water quality protection measures must be implemented to address these sources of pollution.

FISH PASSAGE IMPEDIMENTS – According to MWCOG's 1997 study of the Sugarland Run mainstem, there are a total of six identified fish passage barriers. Four of these barriers are located in the upper and middle mainstem (see Figure I.7). Only one barrier, located upstream of Elden Street, is within the Town limits. All but one of the fish impediments are classified as partial blockages. A culvert associated with the Fairfax County Parkway and Dulles Toll Road is the only blockage considered to be complete.

Addressing fish barriers is important in order to maintain and promote biological diversity and provide migratory fish with access to historic habitat and spawning grounds. Overcoming obstructions to fish passage is a long-range goal of the State's Department of Game and Inland Fisheries as outlined in "2003: A Vision for the Future" (1993).

WATER QUALITY – Protecting the quality of surface water is a major challenge for many urban jurisdictions including Herndon. The removal of tree canopy cover (which serves to cool and protect a stream) during development as well as an increase in impervious surface area draining to local streams have a generally negative effect on stream water quality. Water quality may be decreased by runoff laden with pesticides and fertilizers from adjacent lawns or by runoff from parking lots which may contain nutrients, heavy metals, pathogens (bacteria), and hydrocarbons (oil and grease). Other factors which must be taken into consideration include illegal dumping into storm drains, trash and litter, leaking above-ground and underground storage tanks, and potentially, leaking sanitary sewer lines.

Long term water quality in Sugarland Run and Folly Lick Branch is monitored by the Fairfax County Health Department. In addition, grab-sample water quality monitoring was performed by the MWCOG during late 1996 and early 1997 and specifically for fecal coliform bacteria by the Town's Department of Public Works in August and September of 1997. Water quality standards, which are used to measure the effectiveness of the Town's water quality efforts, are set under the federal Clean Water Act (CWA), which is administered in Virginia by the Department of Environmental Quality – Water Division (DEQ-WD).

The Town's two major streams, Sugarland Run and Folly Lick Branch (as well as the Town's three other named streams including Spring Branch, Left Bank Tributary, and Horsepen Creek), are classified as Class III (non-tidal streams in the Coastal and Piedmont zones) under the CWA. All State waters are expected to be maintained to support recreational use and the propagation and

TABLE I.1
Virginia Water Quality Standards for Class III Waters and Summary of 1996 Water Quality Data for Folly Lick Branch and Sugarland Run

TEST PARAMETER	FOLLY LICK BRANCH	SUGARLAND RUN	VIRGINIA WATER QUALITY STANDARD
Temperature (average)	76°F*	76°F*	Max 89.6°F
pH (average)	7.1	7.2	6.0-9.0
Fecal Coliform (geometric mean)	969fc/100ml	899fc/100ml	Max 200fc/100ml
Dissolved Oxygen (average)	8.5 mg/l	8.9 mg/l	Min Daily Avg 5.0 mg/l
Total Phosphorus (average)	0.1 mg/l	0.1 mg/l	See Notes.
Nitrate Nitrogen (average)	2.2 mg/l	1.5 mg/l	See Notes.

SOURCE:
Fairfax County Health Department, *Fairfax County 1996 Stream Water Quality Report*, 1997.
Virginia Water Control Board. Virginia Water Quality Assessment for 1996: April, 1996.

NOTES:
Temperature: Temperature data only available as County-wide annual average high.
Fecal Coliform Standards: According to the Commonwealth of Virginia State Water Control Board Regulations, "The fecal coliform bacteria shall not exceed a geometric mean of 200 fecal coliform (fc) bacteria per 100 ml of water for two or more samples over a 30 day period, or a fecal coliform bacteria level of 1,000 per 100 ml at any one time." A waterbody is considered to not support Clean Water Act (CWA) goals if more than 25% of samples exceed 1,000 fc/100 ml. A waterbody is considered to partially support CWA goals if between 10 and 25% of samples exceed 1,000 fc/ 100ml. See Figure I.8 for additional data on Sugarland Run.
Dissolved Oxygen: According to VR680-21-01.5, the minimum instantaneous DO level for a Class III stream (Sugarland Run and Folly Lick Branch) is 4.0 mg/l. The daily average minimum DO level is 5.0 mg/l.
Total Phosphorus and Nitrate Nitrogen: Virginia has not set a standard for these parameters for free flowing streams. However, unpolluted water seldom exceeds 10 mg/l for nitrate nitrogen. Variations of the phosphorus content in water may help determine possible trends and sources of pollution.

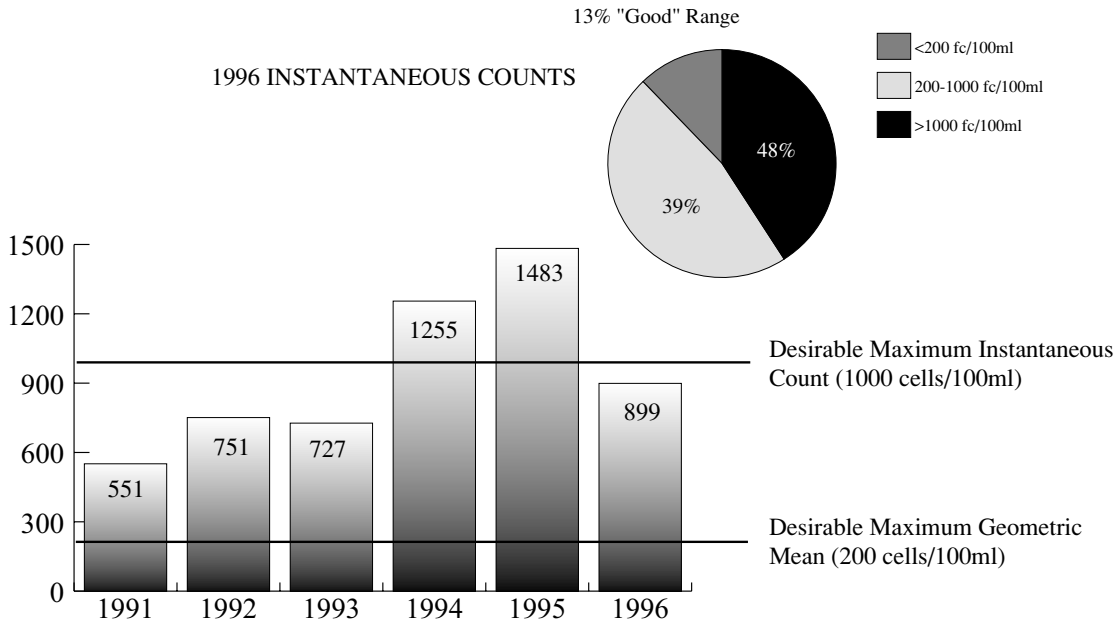
growth of all aquatic life reasonably expected to inhabit them. These are known as the CWA swimmable and fishable goals. The parameters used to determine these are minimum and daily average dissolved oxygen content (DO), $_{p}$H (alkalinity/ acidity), maximum temperature, and fecal coliform bacteria level.

Fecal coliform levels are the most important from a human health standpoint. These indicator organisms, while not necessarily harmful in themselves, are found in the intestinal tracts of warmblooded animals, including humans, and therefore can be indicative of fecal contamination and the possible presence of pathogenic organisms.

Dissolved oxygen is a primary surrogate parameter indicating the general health of an aquatic ecosystem. The presence of DO in water is essential for aquatic life and the type of aquatic community is dependent to a large extent on the concentration of DO present.

Temperature and $_{p}$H are other indicators of the health of the aquatic ecosystem. Strongly related to $_{p}$H are biological productivity, stream diversity, and the toxicity of certain chemicals, as well as important chemical and biological activity. Temperature affects feeding, reproduction, and the metabolism of aquatic animals. A week of high temperatures each year may make a stream unsuit-

FIGURE I.8
Levels of Fecal Coliforms in Sugarland Run Water Samples – 1991 through 1996



SOURCE:
1996 Stream Water Quality Report, Fairfax County Health Department, Division of Environmental Health, 1997.

able for sensitive aquatic organisms, even though temperatures are within tolerable limits throughout the rest of the year. Table I.1 presents the minimum water quality standards for Class III waters.

The Fairfax County Health Department maintains two testing sites just outside the Town limits at Folly Lick Branch near Hiddenbrook Drive (Site #02-02) and Sugarland Run at Leesburg Pike (Site #02-03). Therefore, the water quality information described below is a result of runoff from the Town, the extensive residential areas north of the Town, and the Dulles Toll Road and Fairfax County Parkway. Fairfax County's stream water quality program began in 1969 and now includes a network of 72 sampling sites throughout the County. The presence of this network is invaluable from a comparative standpoint. In 1996, 23 samples were taken of water in Folly Lick Branch and Sugarland Run. Sample parameters include those for Virginia Water Quality Standards as well as other important water quality standards including total phosphorus, nitrate nitrogen, and heavy metals.

As presented in Table I.1, pH, DO, and temperature for Sugarland Run and Folly Lick Branch generally fall within the Virginia Water Quality Standards. pH in the Sugarland Run watershed has generally been stable (1991 to 1996). Levels of nitrate nitrogen and total phosphorus, while above what is considered to be normal for unpolluted waters, have been relatively stable, indicating that long term management of these pollut-

ants may be effective. Unpolluted waters generally have a nitrate nitrogen level below 1.0 mg/l and levels above 10.0 mg/l are considered unsafe for drinking water. Phosphorus levels higher than 0.03 mg/l contribute to increased plant growth and levels higher than 0.1 mg/l may stimulate eutrophication.

Eutrophication, i.e., the excessive growth of attached and planktonic plants, is the result of too many nutrients entering the Chesapeake Bay. Excess nutrients result in massive algae blooms, which block sunlight and deplete oxygen content during decay. Because aquatic life requires dissolved oxygen and sunlight to survive, reducing the amount of phosphorus, and particularly nitrogen, entering the Chesapeake Bay has been the main focus of Bay restoration efforts.

Average fecal coliform counts, however, are well above the limits of what is considered to be in the "good" range of less than 200 cells/100ml. Fairfax County's monitoring program shows that for the monitoring year 1996, only 13% of Sugarland Run samples tested in the "good" range for fecal coliforms and another 39% of samples tested between 200 cells/100ml and 1,000 cells/100ml. 48% of samples were found to be above the 1,000 cells/100ml swimmable and fishable standards. A trends analysis shows that fecal coliform contamination in the watershed is rising, although 1996 saw a decrease from an all time high of 1,483 cells/100ml in 1995. While increases in Folly Lick Branch are less dramatic (from 533 cells/100ml in 1991 to 969 cells/100ml in 1996), the general trend remains alarming.

In August and September of 1997, the Town Department of Public Works sampled water quality for fecal coliform bacteria from several areas of Sugarland Run, Folly Lick Branch, and Spring Branch. These tests demonstrate the inherent seasonal and locational variability of fecal coliform bacteria contamination. While six samples taken from Sugarland Run and Folly Lick Branch (from the golf course south) had fecal coliform counts significantly less than 200 cells/100ml (well within the good range), one sample from Spring Branch (north of Third Street) and two samples from Folly Lick Branch (north of the Herndon Parkway to the Town line) fell within the fair to poor ranges.

In addition to indicating potential human health problems, increasing fecal coliform levels are also a concern because fecal matter contributes significantly to downstream nutrient pollution problems.

The two primary sources of fecal contamination in urban areas are leaky antiquated sewer lines and fecal matter from household pets (as a result of curbing dogs and ignoring local "pooper scooper laws). Fecal matter may also become a problem where domestic or wild fowl take up residence in large groups (such as is often the case on a golf course or in a BMP facility). Fowl can kill vegetative cover and compact the soil, leaving the local water course defenseless against animal waste laden runoff. Other sources of fecal coliforms include malfunctioning and abandoned septic systems and possibly the illegal dumping of septic waste. Spot sampling performed by the Town within Herndon's limits has been unable to confirm the extent of fecal coliform contamination developed by monitoring points taken by Fairfax County. Periodically, additional sampling will take place in order to confirm the results being received at County monitoring points.

Town sewer mains are recognized as a potential source for fecal contamination. However, other than infrequent commercial spills, Town inspection of the sewer lines has failed to reveal any overt leakage into the stream system. The Town has an extensive infiltration and inflow (I&I) program which consists of regular surveillance and repairs of the sanitary conveyance systems through the use of Insituform and other main improvement methods. Over the last 12 years, the Town has rehabilitated 22,400 feet (4.2 miles) of sewer main with Insituform. An additional 3,500 feet of main is scheduled for relining during fiscal year 1999.

It is the opinion of the Town that the most likely source of fecal coliform contamination comes from animal waste. It is either dumped or enters

the stream from surface runoff via the storm drainage system. Another potential source would be from extensive septic fields located outside of the Town's eastern boundary.

Testing for heavy metals in 1996 indicated no contamination of stream water by cadmium, mercury, or silver. Small quantities of arsenic, barium, lead, chromium, and selenium were detected; however detection levels were far below what is considered to be safe under Preliminary Maximum Concentration Levels (PMCLs) set by the U.S. EPA.

In late 1996 and early 1997, the MWCOG, as part of its Sugarland Run mainstem assessment, tested for pH, DO, turbidity, total dissolved solids, substrate fouling, nitrate, and fluoride. Results indicated that overall water quality is only in the "fair" range for most of the Sugarland Run mainstem within the Town, with the area from the Dulles Toll Road to Elden Street experiencing overall "poor" water quality (see Figure I.10). Spot fluoride tests having concentrations over 0.3 mg/l found between Creekbend Drive and Old Hunt Way may suggest the presence of sewage or treated water in the stream. This should be verified using background checks of groundwater, potable water, and sewage in the area.

In March 1998, the Town's Department of Public Works completed an extensive television inspection survey of the Folly Lick Branch and Sugarland Run sanitary trunk lines. This survey covered over 14,000 feet of sanitary main within the Town's boundaries. The results of the survey revealed no evidence of sewer main exfiltration. However, small amounts of groundwater infiltration are occurring in several areas. The Department of Public Works took immediate action and restoration work still continues on all infiltration sources.

POTABLE WATER SUPPLY AND PROTECTION – Herndon relies on the Potomac River for its municipal water supply. There is one known privately owned well within the Town, which is used for irrigation. The Town also has three wells, which are used only for irrigation at the golf course. All other existing development is connected to the municipal water system. All new development is required to be connected to the municipal water system.

The Town purchases its water from the Fairfax County Water Authority (FCWA). The FCWA maintains two water treatment plants (WTPs), one on the Potomac River in Loudoun County (Corbalis WTP) and one on the Occoquan Reservoir (Lorton WTP). It is anticipated that water from these sources will be more than adequate to meet the Town's needs in the future.

The Town's water supply is among the best protected in the Commonwealth. The Town's primary water supply is received from the Corbalis water treatment plant. This water treatment facility has been upgraded for quantity and quality during the past few years. Water treatment now includes ozonation to reduce the amount of chlorine required and carbon filters. During emergencies, such as the 1993 oil spill that caused the Corbalis plant to close for several days, the Town receives its water from the Occoquan Reservoir. By cooperative agreement under the Occoquan Basin Nonpoint Pollution Management Program (established in 1978), the entire Occoquan Reservoir watershed has been subject to Best Management Practices to control nonpoint source pollution since the early 1980s. In addition, large areas of the Occoquan Reservoir watershed have been downzoned to protect the watershed from large areas of impervious surfaces. Water quality monitoring for a wide array of parameters is conducted on a routine basis by the Occoquan Watershed Monitoring Lab to ensure that the reservoir remains safe as a drinking water supply.

I.6 Groundwater Resources

The groundwater aquifer of the Town consists of the sandstones and shales, and to a lesser extent the diabase intrusions, of the Piedmont Lowland. The Town no longer relies on groundwater for its source of potable municipal water. The Town abandoned its municipal well system and now relies on surface water withdrawals from the Poto-

mac River (primary source) and the Occoquan Reservoir (for emergency use). Groundwater protection is still important in that many of the streams of the region normally should be fed by groundwater, especially during periods of extended dryness. Groundwater is extremely dynamic, and groundwater contamination can spread rapidly. Once contamination has occurred, mitigation is very expensive and time consuming.

While groundwater is dynamic, natural groundwater characteristics are fairly stable over time because they are dictated by the chemical and structural characteristics of the local aquifer. An analysis of municipal wells dug for the Town of Herndon between 1931 and 1958 reveals that wells yielded 25 to 100 gallons per minute (gpm), which is considered to be in the "good" range. These wells (200 feet to 420 feet deep), however, were much deeper than average household wells, which on average, produced only 10 gpm or less during the same time frame. More recent studies confirm that the groundwater yield of shales and sandstones found in the Town can be expected to be within the fair to poor range (average of 11 gpm). In diabase intruded areas of the Town, yields are generally expected to be even lower.

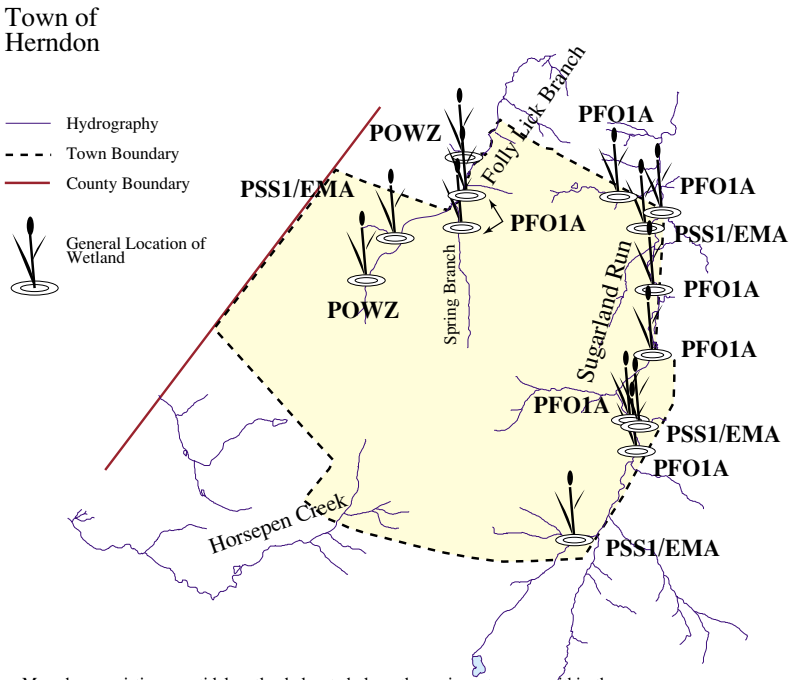
Groundwater within the Town is generally hard (hardness ≥120 mg/l) to very hard (≥180 mg/l), slightly alkaline, high in dissolved solids, and may at times exceed the limits of U.S. EPA standards (Secondary Maximum Contaminant Levels, or SMCLs) for some constituents. High concentrations of sulfate (>250 mg/l) are common problems with deeper wells and directly correspond with high concentrations of dissolved solids. Iron, which may be objectionable at levels above 0.3 mg/l, is found in most of the groundwater drawn from the Piedmont Lowlands. Excessive iron causes stains in laundry, cooking utensils, and porcelain fixtures and also may impart an objectionable taste and color to food and beverages. Excessive levels of manganese may also occur in groundwater withdrawals. It should be noted that groundwater characteristics within the Town vary depending on the location and depth of the well.

Overall, groundwater from sources in the Herndon area are suitable for domestic, public, industrial, and irrigation purposes with proper treatment.

I.7 Wetlands

The value of wetlands in urban areas has only recently become recognized. In the not too distant past, wetlands were viewed as nuisances and filling of wetlands was considered an improvement. To the contrary, wetlands serve as important habitat for a wide range of plants and animals and are vital as a means of buffering and

FIGURE I.9
Approximate Location of Herndon's Wetlands



Map shows existing non-tidal wetlands located along the main waterways within the Town. Waterways were walked over a period of two days in February, 1998. Measurements for exact boundaries were not conducted. U.S. Fish and Wildlife Service National Wetlands Inventory Maps and Wetland Identification were utilized for the map and identification. Non-tidal wetlands in other areas of the Town were not identified and are normally identified during the site plan review process.

protecting local streams from the adverse impacts of development. Wetlands also serve as areas for nutrient uptake by vegetation and for pollutants and other materials to be filtered and settled out. As a result, the preservation of remaining urban wetlands is considered essential to water quality protection efforts.

Most of the Town's remaining nontidal wetlands are concentrated along its main tributaries, including Folly Lick Branch, Spring Branch, and particularly Sugarland Run. These waterways were walked by Town staff over a period of two days in February, 1998 to identify nontidal wetland types found within Herndon. Wetlands were identified with the help of National Wetlands Inventory Maps (U.S. Fish and Wildlife Service, 1986). The results of the survey are found in Figure I.9. Measurements for exact boundaries of wetlands were not conducted, and wetlands in other areas of the Town not associated with main waterways were not identified.

All of the Town's wetlands are defined as nontidal palustrine. Nontidal wetlands are areas that are inundated or saturated by surface or groundwater at a duration and frequency sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions and not influenced by ocean-driven tides. Palustrine (identified as "P" in Figure I.9) is defined as any nontidal wetland dominated by trees, shrubs, persistent emergents, and emergent mosses or lichens.

Specific wetland classes identified within the Town include the following.

- Emergent Wetland (EM) – This class contains rooted herbaceous plants that are covered or saturated by water at the base, and are present for most of the growing season. The modifier "A" indicates that these areas are temporarily flooded. An example is a cattail marsh located in the north end of Runnymede Park.

- Scrub-Shrub Wetland (SS) – This class contains woody vegetation less than six meters (20 feet) in height. The particular sub-class (1) found in the Town contains broad-leaved deciduous plants. An example is located at the south end of Sugarland Run just north of the Dulles Toll Road.

- Forested Wetland (FO) – This class contains woody vegetation greater than six meters in height. The specific sub-class (1) found in the Town contains broad-leaved deciduous plants. An example is the forested area located in the south end of Runnymede Park.

- Open Water (OW) – This class contains small, permanently flooded open water areas that are too small to be considered lakes.

While Figure I.9 provides the general location of significant wetlands associated with the Town's main waterways, wetlands must be identified for individual development sites according to all applicable federal, State, and Town wetlands regulations, including the Town's Chesapeake Bay Preservation Ordinance. Wetlands are protected under section 404 of the federal Clean Water Act, which is administered by the U.S. Army Corps of Engineers. The U.S. Army Corps of Engineer's *Wetlands Delineation Manual* may be used for delineation purposes.

I.8 Summary and Analysis of the Existing Natural Environment

The Town of Herndon maintains a diverse and rich natural environment worthy of preservation and enhancement. The climate of the Town is generally considered to be temperate.

While natural habitats are limited to scattered open space, suitable forms of suburban development, and the Town's parks and stream valleys, the wildlife that survives in the Town is remarkably diverse, resilient, and even vibrant. A 1997 analysis of macroinvertebrates in the Sugarland Run mainstem indicates that the overall ecological health of the stream is in the "good" range. How-

ever, when compared to an unaltered watershed, it becomes apparent that suburbanization/urbanization has taken a toll on Sugarland Run.

There are federal or State threatened or endangered species that have been identified within Sugarland Run watershed, although not specifically within the Town's boundary. It is possible that endangered and/or threatened wildlife reside within the Town's quiet, and relatively undisturbed, stream valley parks. To this end, the continued preservation of the Town's stream valley parks in a natural state is essential to water quality and habitat protection in the Town.

The topography of the Town is characterized by gently rolling hills that have been cut by the Town's numerous streams and creeks.

Geologically, the Town is located within the Piedmont physiographic province of Virginia and more specifically within an area known as the Piedmont Lowlands. Rocks of the Piedmont Lowlands are siltstones, shales, and sandstones. As a result of past tectonic activity in the area, some areas of the Town have been intruded by dark, igneous rock called diabase.

Soils within the Town are typical of those formed from the rocks of the Piedmont Lowlands and are distinguished from surrounding areas by a purplish-red tint not present in other Piedmont soils. Areas of the Town intruded by diabase are easily recognized by the presence of relatively rocky terrain. Most soils in the Town are suitable to most types of development if proper soil conservation measures are implemented. Some areas, however, are constrained due to high water table, rocky terrain, and the presence of shrink-swell soils.

The Town is divided by two major watersheds, Sugarland Run and Broad Run. The Sugarland Run watershed is drained by Sugarland Run, Folly Lick Branch, and Spring Branch. The Broad Run watershed portion of the Town (which represents only 15% of the Town's land area) is drained by Horsepen Creek. Land uses which impact on these streams are primarily residential in nature; however, there exists large concentrations of industrial and commercial uses within both watersheds.

Streambank erosion levels in the Sugarland Run mainstem are generally in the low to moderate range. However, a few areas are experiencing more severe erosion problems. Because streambank erosion prevention is significantly more cost effective than correcting existing erosion problems, and given the relatively good condition of Sugarland Run, the Town must continue to find additional ways to protect local streams from excessive stormwater volumes including the provision of additional stormwater detention and the minimization of impervious surfaces.

Riparian buffer areas along Sugarland Run are generally greater than the 100 feet necessary to provide adequate buffering and to stabilize stream temperatures. A notable exception is that portion of Sugarland Run between the Dulles Toll Road and the W&OD Trail. A concerted effort to revegetate this stretch of Sugarland Run will help to improve water quality.

While riparian buffers are an effective means of protecting streams from adjacent land uses, they do not protect streams from the impacts of stormwater piped directly to the channel via the stormdrain/culvert system. Water quality in the Town's streams can be improved only if this source of pollution is adequately addressed.

Water quality for Sugarland Run and Folly Lick Branch is monitored by the Fairfax County Health Department. Testing is performed for fecal coliforms, dissolved oxygen (DO), pH, temperature, phosphorus, nitrate, and several heavy metals. Water quality in Sugarland Run and Folly Lick Branch, with the exception of fecal coliforms and nutrients, is considered to be within the acceptable range. Nutrient levels (including phosphorus and nitrate), while testing higher than that of an unpolluted stream, have been relatively stable over time – indicating that current management efforts have been successful. Grab Sample testing for pH, DO, turbidity, total dissolved solids, substrate fouling, nitrate, and fluoride in the

FIGURE I.10
Summary Results of MWCOG's Sugarland Run Mainstem Rapid Stream Assessment Technique (RSAT) Survey

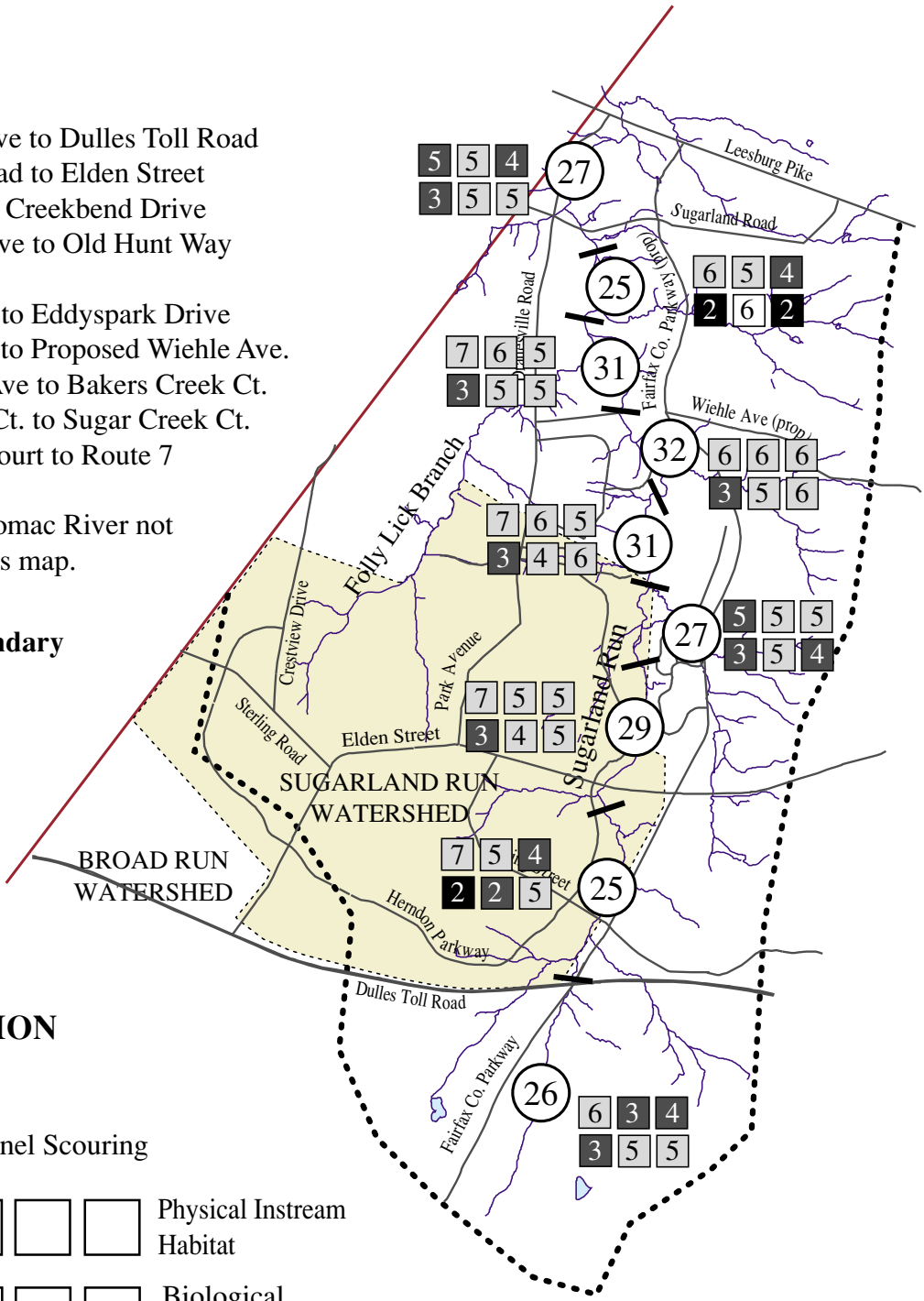
SEGMENTS

Upper Mainstem
1. Rosedown Drive to Dulles Toll Road
2. Dulles Toll Road to Elden Street
3. Elden Street to Creekbend Drive
4. Creekbend Drive to Old Hunt Way

Middle Mainstem
5. Old Hunt Way to Eddyspark Drive
6. Eddyspark Dr. to Proposed Wiehle Ave.
7. Prop. Wiehle Ave to Bakers Creek Ct.
8. Bakers Creek Ct. to Sugar Creek Ct.
9. Sugar Creek Court to Route 7

Lower Mainstem
* Route 7 to Potomac River not included on this map.

Segment Boundary



RSAT EVALUATION PARAMETERS*

Channel Scouring

Channel Stability ☐☐☐ Physical Instream Habitat

Water Quality ☐☐☐ Biological Indicators

Riparian Habitat

***See legend on next sheet.**

FIGURE I.10 (continued)
Summary Results of MWCOG's Sugarland Run Mainstem Rapid Stream Assessment Technique (RSAT) Survey

SYMBOL LEGEND

General Verbal Ranking Categories for RSAT Evaluation Parameters and Their Associated Point Ranges

	Excellent	Good	Fair	Poor
Channel Stability	9-11	6-8	3-5	0-2
Channel Scouring	7-8	5-6	3-4	0-2
Physical Instream Habitat	7-8	5-6	3-4	0-2
Water Quality	7-8	5-6	3-4	0-2
Riparian Habitat Condition	6-7	4-5	2-3	0-1
Biological Indicators	7-8	5-6	3-4	0-2

RSAT Score Per Stream Segment (Total of RSAT Evaluation Parameters

	Point Range	Verbal Stream Quality Ranking
24	42-50	Excellent
	30-41	Good
	16-29	Fair
	>16	Poor

SOURCE:
Metropolitan Washington Council of Governments for the Virginia Environmental Endowment. *Rapid Stream Assessment Technique (RSAT) of the Sugarland Run Watershed – Phase 1: Sugarland Run Mainstem*. Washington, D.C.: May, 1997.

Sugarland Run by MWCOG in late 1996 and early 1997 found water quality to be in the "fair" range for all areas except from the Dulles Toll Road to Elden Street. Water quality in this segment of Sugarland Run was found to be in the "poor" range.

Trend analysis of fecal coliform levels indicates the presence of a severe water quality problem. Between the period of 1991 to 1996, the level of fecal coliforms in Sugarland Run nearly doubled, with over 48% of samples falling in the unacceptable range for human health purposes. Fecal coliform levels in Folly Lick Branch are also considered unacceptable. Identification and management of the sources of fecal coliforms in the Town must be a part of the Town's water quality management efforts. High spot fluoride concentrations in the stream segment between Creekbend Drive and Old Hunt way suggests that a possible source of fecal contamination may be from a leaking sanitary sewer line. An additional source may be fecal matter from pets or local water fowl.

The Town purchases its potable water supply from the Fairfax County Water Authority. The FCWA maintains two water intakes, one on the Potomac River in Loudoun County and one on the Occoquan Reservoir. It is anticipated that water from these sources will be more than adequate to meet the Town's future needs.

Groundwater, while no longer used as a source of potable water, is still considered an important Town resource. Several wells are still maintained within the Town's boundaries. Well yields in the Piedmont Lowlands are considered to be fair and may require treatment due to high levels of iron, sulfate, and manganese.

The Town contains many small nontidal wetlands, most of which are associated with floodplain areas of Sugarland Run and Folly Lick Branch. Wetlands within the Town are generally protected under the Town's Chesapeake Bay Preservation Ordinance and Floodplain Overlay District as well as federal wetland regulations.

Figure I.10 provides a summary of the conditions of many of the Town's natural resources based on a Rapid Stream Assessment Technique (RSAT) survey of the Sugarland Run mainstem conducted by the Metropolitan Washington Council of Governments in 1996 and 1997.

CONSTRAINTS TO DEVELOPMENT
II

A basic tenet of this Supplement is that development and the protection of the natural environment are not mutually exclusive. Healthy economic growth is beneficial and desirable. In addition, Herndon's natural environment makes the Town a pleasant and healthy place to live and work. As steward of the environment, the Town has a responsibility to guide development in a manner that protects sensitive resources, that if improperly developed, could result in environmental degradation.

In order to best manage the Town's natural resources, it is necessary to identify the type, location, and extent of sensitive areas within the Town. From such an inventory, the Town may steer development to areas where natural conditions can best support development and protect resources where development may be inappropriate. The following section provides an overview of the primary growth determinants and environmental constraints within the Town of Herndon. Constraints to development include:

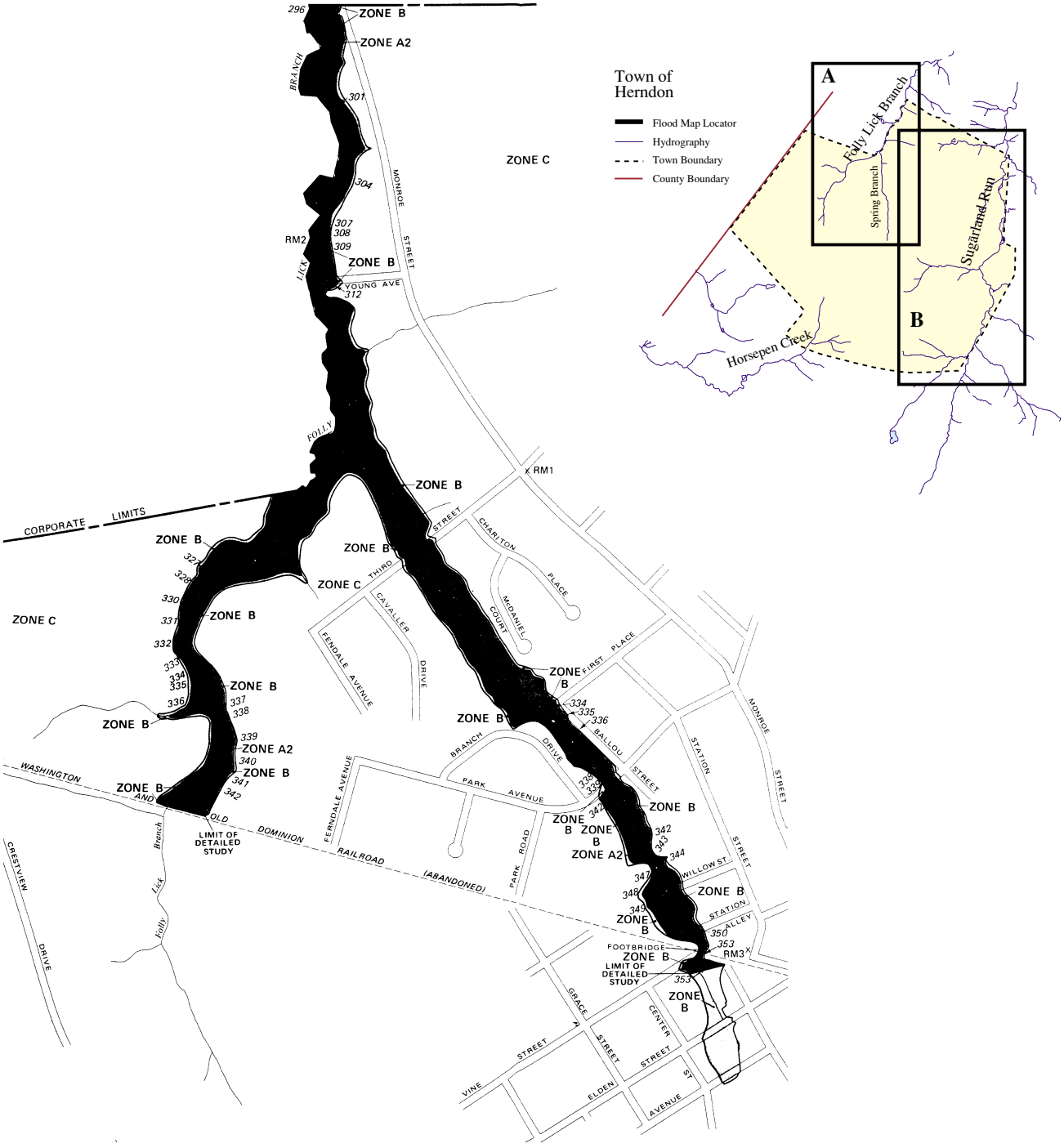
- Floodplains
- Geology and Soils
- Topography
- Wetlands
- Mature Forest Areas and Stream Valley Corridors
- Groundwater

II.1 Floodplains

Floodplains are among the most sensitive of the Town's aquatic resources due to their location adjacent to the Town's streams. In addition to providing for natural stormwater management, floodplains serve as a buffer from nonpoint sources of pollution from adjacent land uses and provide important habitat for a range of plant and animal species. While development in the floodplain must be avoided in order to allow it to perform its beneficial water quality functions, floodplain soils are often unsuitable for development anyhow due to high water table, shrink-swell soils, and highly permeable and hydric soil conditions. Encroachment on floodplains, particularly artificial fill, reduces a stream's flood-carrying capacity, increases flood heights, and can expand flood hazard areas beyond the encroachment.

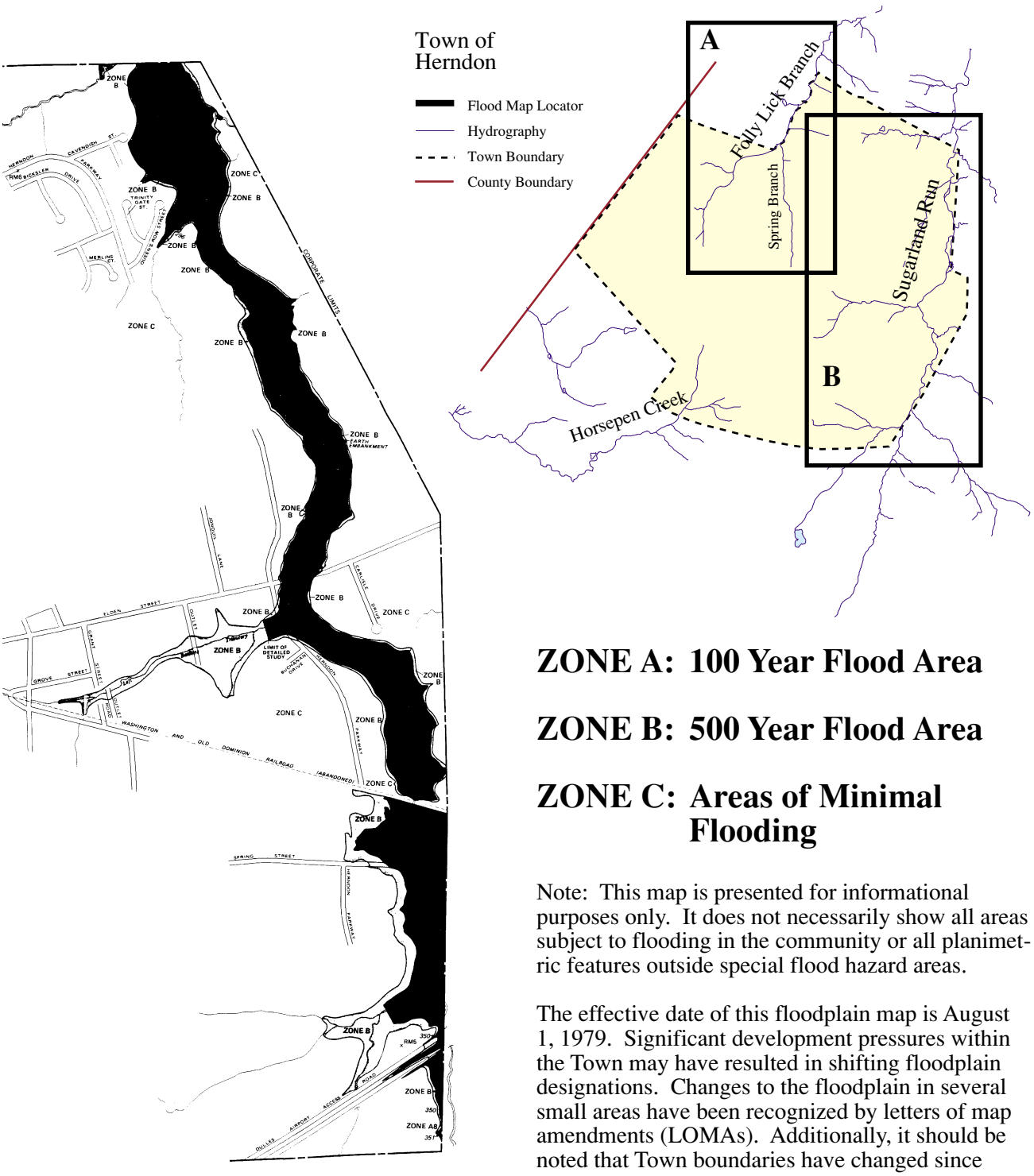
In 1979, the Federal Emergency Management Agency (FEMA) conducted a study of flooding potential and hazards in Herndon as part of its national flood insurance program. The plan was also meant to be used as a tool to assist the Town in effective floodplain management. The one-hundred year floodplain, which is the most common measure of where development is inappropriate, encompasses the entire length of Sugarland Run. In addition,

FIGURE II.1
(A) Folly Lick Branch and Spring Branch FEMA Floodplain Map



SOURCE:
Federal Emergency Management Agency, U.S. Department of Housing and Urban Development. Flood Insurance Rate Map, Town of Herndon, Virginia. August 1, 1979

FIGURE II.1
(B) Sugarland Run FEMA Floodplain Map



ZONE A: 100 Year Flood Area

ZONE B: 500 Year Flood Area

ZONE C: Areas of Minimal Flooding

Note: This map is presented for informational purposes only. It does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

The effective date of this floodplain map is August 1, 1979. Significant development pressures within the Town may have resulted in shifting floodplain designations. Changes to the floodplain in several small areas have been recognized by letters of map amendments (LOMAs). Additionally, it should be noted that Town boundaries have changed since 1979.

SOURCE:
Federal Emergency Management Agency, U.S. Department of Housing and Urban Development. Flood Insurance Rate Map, Town of Herndon, Virginia. August 1, 1979

significant reaches of Folly Lick Branch, Spring Branch, and Left Bank Tributary, along with several other smaller tributaries, are identified as having one-hundred year floodplain. Figure II.1 delineates the one-hundred year floodplain in the Town as mapped by FEMA.

Although FEMA floodplain maps are the primary legal basis for restricting encroachment into the floodplain, the actual limits of the 100-year floodplain have changed over time due to development in and around the Town, loss of wetlands, and fill. This fact must be considered during the development and redevelopment process. The Department of Public Works should initiate an update of the FEMA floodplain maps within the next five years.

II.2 Geology and Soils

It is difficult of overemphasize the importance of geology and soils characteristics when planning development and redevelopment within the Town. While taking local soil characteristics into consideration during new development will serve to protect water quality, addressing soil constraints during redevelopment can serve to improve water quality by addressing existing problems.

As previously noted, the preponderance of soils within the Town are suitable to most types of development if proper soil conservation measures are implemented. For instance, large areas of the Town are characterized by high water table, rocky terrain, and soft plastic subsoils. Some of these constraints preclude the use of basement areas (such as high water table and some shrink swell clays associated with the Orange soils group); however, most only require that extra precautions are taken during development such as proper soils management or extending building footings to rock below the subsoil.

Areas where any development is inappropriate is limited to floodplain soils (Mixed Alluvial Land and Rowland Silt Loam). Areas with slopes greater than 14% may experience rapid to very rapid runoff and should only be developed with highly restrictive property management techniques. There are no areas of the Town with slopes greater than 25%, which should be kept under permanent vegetative cover. Figure II.2 presents soils constraints and considerations for the Town.

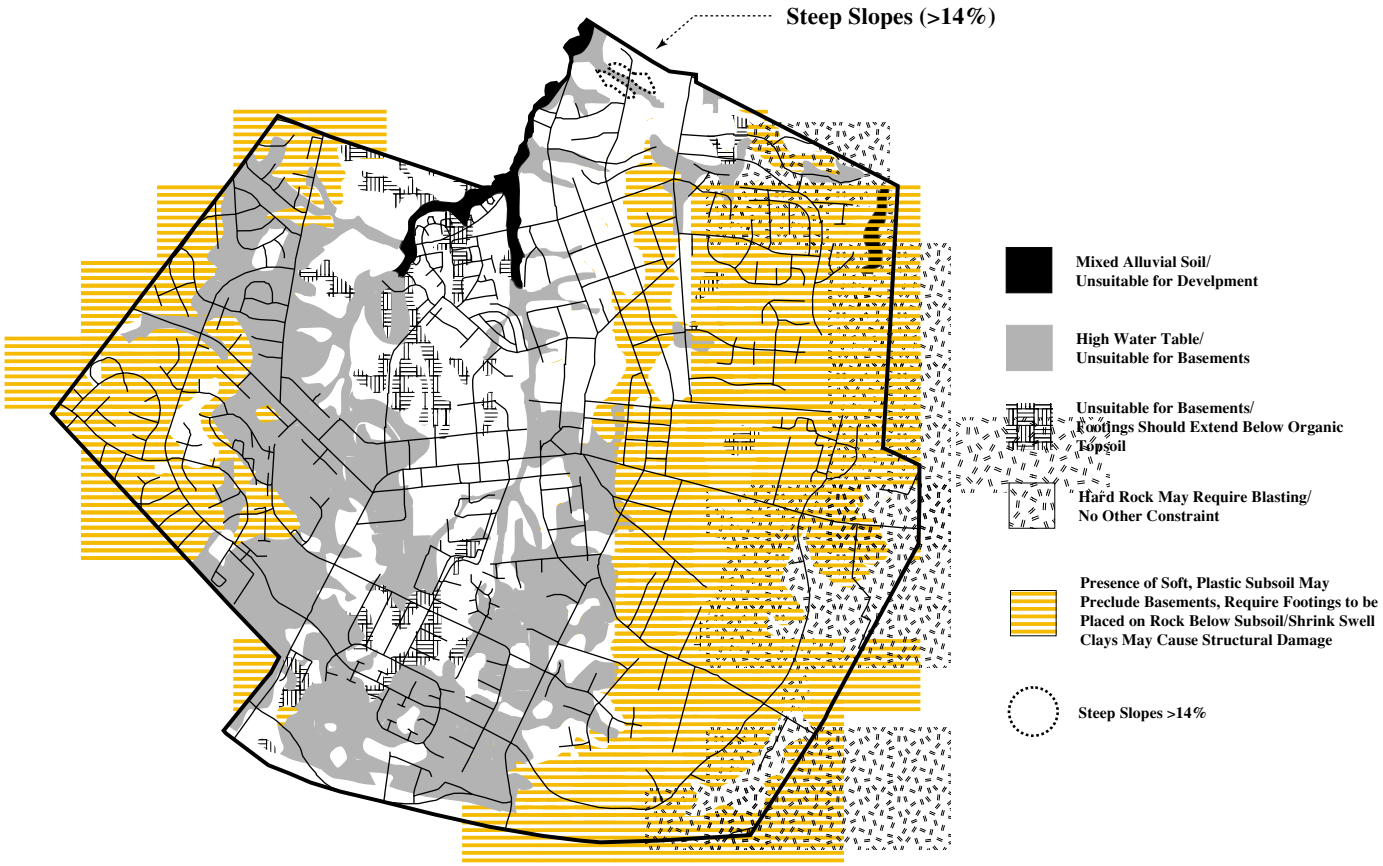
Areas characterized by highly permeable soils also require special consideration in an urban environment. Highly permeable soils transmit water quickly (six inches of movement per hour) through the soil profile. A concern with highly permeable soils is that polluted stormwater will infiltrate into the soil too fast and reach the groundwater before chemical and physical processes can clean the water. In addition, in areas with septic systems or underground storage tanks, the presence of highly permeable soils increases the likelihood for groundwater contamination. Highly permeable soils in the Town are mapped in Figure II.3.

Figure II.2 and Figure II.3 provide a general indication of the extent of sensitive soils within the Town. However, a detailed soils map, such as the *Soil Survey of Fairfax County, Virginia* (1963) or the *Soils Identification Map of Fairfax County* (1972), should be consulted for specific soils information. Many development proposals will require an onsite soil survey to be performed.

II.3 Topography

In general, slopes are characterized as steep when they exceed a 14% grade. According to the *Soils Identification Map of Fairfax County* (1972), slopes greater than 14% are concentrated near two small tributaries to Folly Lick Branch near the Oak Grove area. This area comprises less than 3% of the Town and is already developed, with steep slopes under permanent vegetation. There are no slopes identified as exceeding 25%, which is the level at which land should be kept under permanent cover of grass or forest to prevent serious erosion from occurring. Approximately 63% of the Town's land area is characterized with slopes of less than 7% where erosion potential is slight. Another 19% of the Town is characterized by slopes within the 7 to 14% range where erosion potential during development is moderate, but easily controllable with proper land management techniques.

FIGURE II.2
Soil Constraints and Considerations



SOURCE:
Fairfax County, Virginia. *Soils Identification Map of Fairfax County, Virginia*: 1972.
Refer to original document for site specific information.

While the Town contains minimal areas of excessively steep slopes, poorly designed and constructed developments on even rolling slopes can result in increased runoff and excessive levels of erosion. While the Town is largely built out, any redevelopment within the Town must take topographic constraints into consideration.

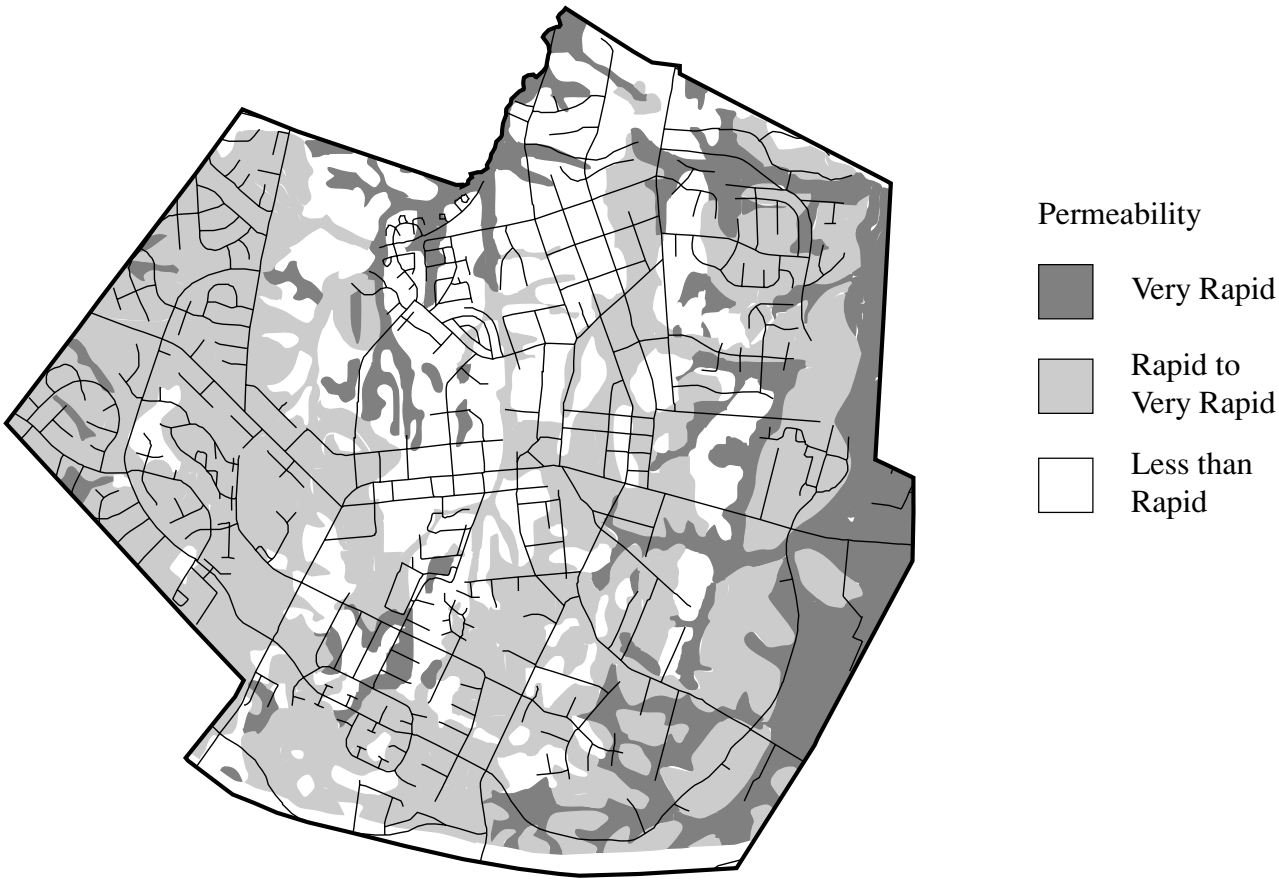
II.4 Wetlands

Wetlands, which are concentrated along the Town's main waterways, are a protected resource under Herndon's Chesapeake Bay Preservation Ordinance and Section 404 of the federal Clean Water Act. Although the Town has identified the general location of many of Herndon's wetlands (see Figure I.9), developers must identify wetlands for individual development sites and protect them according to all applicable federal, State, and Town wetlands regulations. The U.S. Army Corps of Engineer's *Wetlands Delineation Manual* may be used for delineation purposes.

II.5 Mature Forest Areas and Stream Valley Corridors

The leaves, branches, and organic leaf litter of an area of mature tree canopy cover serve to protect water quality by providing a physical barrier which softens the impact of falling rain and slows the

FIGURE II.3
Soil Permeability Map



SOURCE:
Fairfax County, Virginia. *Soils Identification Map of Fairfax County, Virginia*: 1972.
Refer to original document for site specific information.

rate of surface runoff from impervious surfaces during storm events. Tree roots hold soil particles in place and protect the ground from erosion. Preserving mature tree stands helps to protect the infiltrative capacity of the soil and the ability of the landscape to naturally filter and assimilate pollution. Tree canopy which shades a stream helps to reduce and stabilize water temperatures, which is beneficial to aquatic life and helps the water to retain essential dissolved oxygen.

Stream valleys and mature forest areas also serve as significant wildlife habitat corridors, the fragmentation of which can result in degraded habitat conditions.

Mature tree canopy within the Town is concentrated along the Sugarland Run and Folly Lick Branch stream valleys. However, there are significant areas of the Town which support individual or small groves of mature trees that afford significant environmental and water quality benefits. There is currently no comprehensive assessment or map of mature tree canopy cover within the Town of Herndon.

While much of the Town's mature tree cover is located within protected park areas, significant areas of mature tree cover should be preserved and protected where possible. Protection of existing mature tree cover along the Town's tributary streams is mandated under the Herndon's Chesapeake Bay Preservation Ordinance.

II.6 Groundwater

Although the Town now relies on a treated water supply from the Potomac River and the Occoquan Reservoir, protection of the Town's groundwater must be a consideration during development and redevelopment. When development occurs, it affects the natural balance of the groundwater flow. Increased imperviousness as a result of development reduces the potential for groundwater recharge and should be taken into consideration when designing a site plan. Generally, high topographic areas are groundwater recharge areas and impervious surface areas in defined groundwater recharge areas should be minimized. By providing recharge areas for stormwater, groundwater equilibrium can be maintained.

The protection of groundwater was recognized by the Commonwealth of Virginia when the General Assembly enacted the Groundwater Act of 1973. This legislation was enacted ". . . in order to conserve, protect, and beneficially utilize the groundwater in this State and to ensure the preservation of the public welfare, safety, and health. . ." Once contaminated, the usefulness of an aquifer as a resource may be limited or destroyed depending on the toxicity of the contamination and the effort, time and money involved in clean-up. In most cases it is impractical and sometimes impossible to restore a contaminated aquifer to its original level of purity. The time involved in restoring the damage from groundwater contamination depends on the type and severity of the contamination as well as the rate and direction of groundwater movement.

Common sources of groundwater contamination include but are not limited to leaking underground storage tanks, septic systems situated on improper soils, and improperly capped wells. In addition, improperly maintained water quality BMPs may present a groundwater threat if not properly situated or maintained.

In Herndon, the most common source of groundwater contamination on record with the Department of Environmental Quality, Water Division, is from petroleum leaks and spills, although an examination of the effects of open or improperly sealed wells has not been attempted. Contamination by leaking underground storage tanks is better documented than other types of pollution because of strict regulations governing their placement and maintenance. More stringent underground tank standards enacted in recent years should reduce the level of contamination from these sources.

Careful site planning will decrease the potential for groundwater pollution during development or the installation of underground storage tanks. Areas which are prone to potential groundwater pollution should be identified before development occurs and improper development should be steered away from such areas. For example, the potential for groundwater contamination near streams is heightened due to high water table and soils characteristics. In addition, regular maintenance and inspection of potential sources of groundwater pollution is a critical component of groundwater protection. In general, the potential for groundwater pollution in the Piedmont Lowlands is greater than that of the rest of the Piedmont physiographic province.

II.7 Summary and Analysis of Constraints to Development

The primary constraints to development within the Town are floodplains, geology and soils, topography, wetlands, mature forest areas and stream valley corridors (including areas of significant wildlife habitat), and groundwater recharge areas.

Very few areas of the Town are untouched by these constraints to development, which is the primary reason why the Town has adopted a Town-wide

Resource Management Area as part of its Chesapeake Bay Preservation Ordinance. However, most constraints to development only necessitate that the development occur in an environmentally sound manner that takes into account the potential for development to degrade local and regional water quality.

Some of the Town's most sensitive environmental features, in order to protect water quality and preserve the integrity of the Town's wildlife habitats, must remain in a natural, undeveloped state. These areas include the wildlife habitat areas surrounding the Sugarland Run and Folly Lick Branch stream valleys. These areas contain a preponderance of the Town's floodplain areas, wildlife habitat, sensitive soils, wetlands, and sensitive topography.

Sensitive environmental features of the Town that must be properly managed during and after development include several sensitive soil associations, areas with moderately steep slopes (7 to 14% grade), mature forest areas outside stream valleys, groundwater recharge areas, and areas where inappropriate uses could negatively impact groundwater resources. In particular, the Town contains a number of soils, including the Orange soils group, that if improperly developed could result not only in nonpoint source pollution but also a public safety hazard.

Existing and Potential Sources of Pollution
III

Pollution problems faced by the Town until recently were considerably different than those being faced today. Long before the Town became concerned with urban nonpoint source pollution, a myriad of human activities placed stress on the Sugarland Run and Broad Run watersheds. According to a 1974 report on the history of the Sugarland watershed, "Alterations to the environment have been caused by the copper mine at Frying Pan Branch, water powered mills at the mouth of Jefferson Branch and on Sugarland Run, a sawmill in Herndon and charcoal manufacturies in the Nichols Run watershed. Sewage input was probably minimal until the 1940s, although dairy farms near Herndon probably stressed the streams at an earlier date. Chemical pollution from the croplands has probably become significant in the last 30 years."

Today, the Town and its surrounding watersheds face a host of new challenges including pollution from chemicals used to care for urban lawns, automobiles, leaking underground storage tanks, dumping, and litter. The dramatic increase in impervious surfaces resulting from urbanization serves to exacerbate urban runoff and water quality problems. Some level of environmental pollution resulting from human activity may be inevitable. However, it is within the power of the community to maintain pollution below levels that can be readily assimilated into the environment with minimal harm. Unmanaged pollution can result in surface and groundwater contamination, poor air quality, aesthetic degradation of the landscape, and the destruction of important ecological habitats, all of which detract from the Town's basic character.

The most cost-effective approach to the problem of pollution is to prevent it at its source. A number of tools are available to the Town to aid in pollution prevention including public education and awareness programs, water conservation programs, lawn care programs, and recycling efforts, to name only a few. The cost to the Town once environmental damage is done includes not only short term clean-up costs, but long-term costs including decreased property values and loss of tax base. A number of public (Virginia Cooperative Extension, Northern Virginia Soil and Water Conservation District, etc.) and private (Friends of the Sugarland Run, etc.) organizations are available to assist the Town in implementing pollution prevention programs.

The Town also recognizes that the only way to protect local and regional water quality is through the use of an integrated watershed management plan. An integrated watershed management plan involves the strategic use of structural and nonstructural BMPs to address all sources and types of

pollutants in order to optimize water quality and resource protection.

The following section describes the Town's existing sources of pollution as well as potential sources of pollution which the Town may face as it grows and develops. This inventory, along with the various tools afforded by the State and the federal government, should be used by the Town to minimize and eliminate the impacts of pollution on the environment of Herndon. Existing and potential sources of pollution include:

- Point Source Pollution
- Nonpoint Source Pollution
- Erosion of the Land
- Underground Storage Tanks/Transmission Mains
- Above Ground Storage Tanks
- Septic Systems and Abandoned Wells
- Air Pollution

III.1 Point Source Pollution

Point source pollution is pollution which can be attributed to a specific outfall and is therefore often the most easily recognizable and regulatable form of pollution. Industries and municipalities, under the federal Clean Water Act (U.S.C. §1251 *et seq*., 1987 as amended) National Pollution Discharge Elimination System (NPDES), are required to report pollution discharges to water courses above a certain threshold, and to the maximum extent practicable, mitigate the effects of the pollution on the environment. The Virginia Department of Environmental Quality, Water Division, maintains records on these sources of pollution and is charged with ensuring that environmental regulations are enforced.

According to State records there are two industrial NPDES discharge points located within the Sugarland Run watershed. Discharges from these sources are strictly controlled and currently meet all environmental standards. There are no municipal discharges (usually in the form of wastewater treatment plant outfalls and major storm water outfalls) in Herndon that currently fall under NPDES regulations. However, future extensions of NPDES regulations may make it necessary for the Town to address the issue of its stormwater discharges into local watercourses.

III.2 Nonpoint Source Pollution

Nonpoint source pollution cannot be easily attributed to a single source but is the result of runoff from many diffuse sources. Most commonly, nonpoint source pollution is a result of pollutants accumulating on impervious surfaces which are subsequently flushed into local waterways during rainfall events.

Urbanization dramatically increases the imperviousness of the land area, thereby increasing the amount and time-of-concentration of stormwater runoff delivered to nearby streams. The effects are three-fold.

- The flash flooding of streams is increased in that stormwater reaches the local stream course faster and at the same time. This can increase the flood potential for surrounding areas since the stream course can be overwhelmed by stormwater.

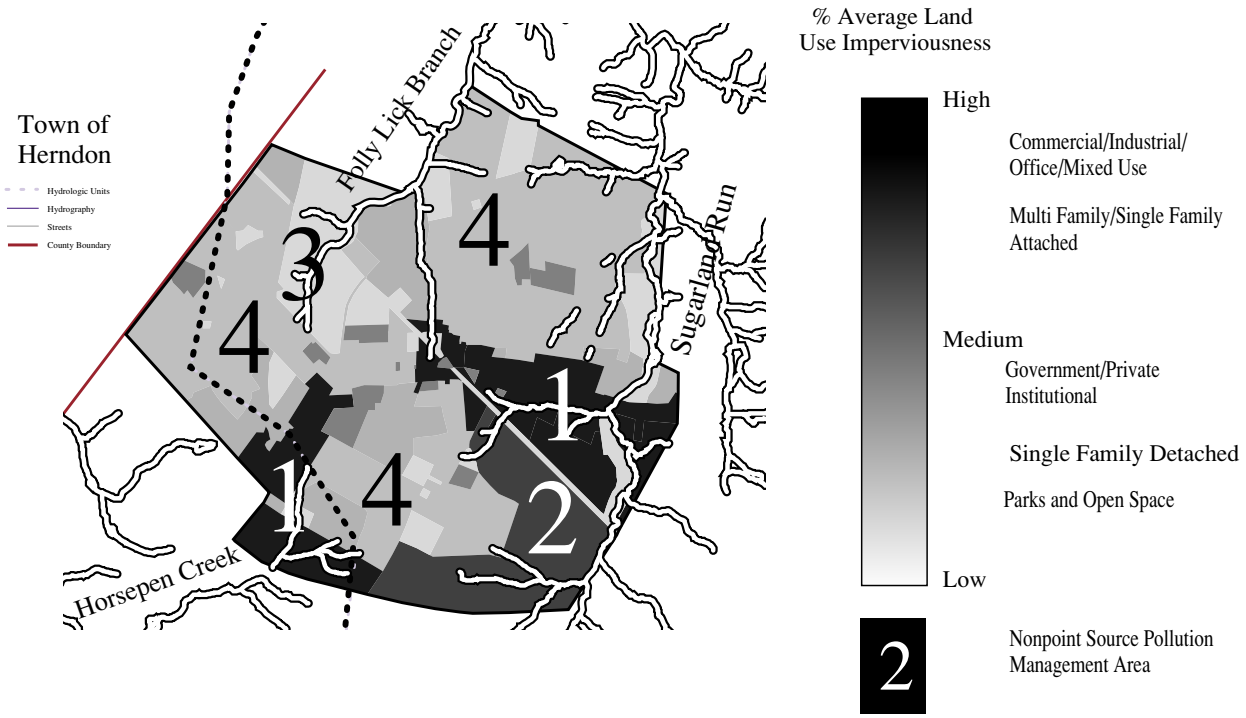
- As stormwater runs off impervious surfaces, swales and streams gain velocity, thereby increasing the probability of erosion in unprotected areas.

- Natural and man-made pollutants, which once were absorbed by vegetation or neutralized by infiltration through the soil horizon, are flushed directly into local stream courses.

On a per acre basis, urban land use in general, including residential development, produces higher annual nonpoint source pollutant loadings of nutrients, heavy metals, and oxygen-depleting substances than do rural agricultural uses. Oil contamination, sediments, pesticides, metals, and other toxic substances found in urban runoff can kill fish and destroy bottom life.

Among the most destructive, yet inconspicuous, pollutants are excess nutrients. Excess nutrients

FIGURE III.1
Town Imperviousness Map and Nonpoint Source Pollution Management Areas



can result in a phenomenon known as eutrophication, which is characterized by low dissolved oxygen levels and high algal growth. The primary detrimental effect on water resources, and particularly on large bodies of water such as the Potomac River and the Chesapeake Bay, is algal blooms, which block sunlight from aquatic life and deplete the dissolved oxygen content during decay. Eutrophication also destroys the recreational use of water resource and results in strong odor and undesirable taste.

Because nonpoint source pollution is highly correlated with impervious surface area, it is a useful exercise to identify areas of the Town that are highly impervious. Figure III.1 provides a snapshot of impervious surface areas within the Town in relation to its water resources.

Overall, as an urban area, the Town now has an impervious surface area of approximately 41%, which is considerably higher than the Tidewater average of only 16%. Therefore, a significant element of the Town's pollution prevention and control efforts must be directed towards urban nonpoint source pollution. Because the Town lies within the Chesapeake Bay drainage area, the control of nonpoint source pollution takes on an even greater urgency.

The Virginia Division of Soil and Water Conservation has designated the control of nonpoint source pollution as a high priority for the Sugarland Run and Broad Run watersheds.

NONPOINT SOURCE POLLUTION MANAGEMENT AREAS – Nonpoint source pollution from urban areas is particularly

problematic because it is generated from a wide range of sources and includes a wide range of pollutants. In general, nonpoint source pollution from urban areas can be reduced by minimizing the amount of impervious surface area as a result of urban development, utilizing open space and preserving indigenous vegetation, restoring denuded vegetative stream buffers, preventing pollution through public education, and by employing the use of structural best management practices (BMPs), which operate by trapping stormwater runoff and detaining it until unwanted nutrients, sediment, and other harmful pollutants are allowed to settle out or be filtered through the underlying soil.

However, different land uses and activities are associated with different pollution problems. Similarly, different pollution problems can be addressed most appropriately with different management techniques.

In order to facilitate nonpoint source management efforts in the Town and to provide the Town with a tool to target different nonpoint source pollution problems, the Town has been divided into four NPS pollution management areas. Nonpoint source pollution management areas identified for the Town include:

- **Area 1, High Density Commercial and Mixed Use Corridors.**

  These are areas of the Town that are commercial or mixed use in character. Impervious surface area can constitute up to 80 to 90% of the landscape, although imperviousness will often be much less. Nonpoint source pollution in these areas is best controlled through the use of stormwater management ponds and other structural BMPs, measures that reduce impervious surface coverage, and measures that reduce the introduction of litter and other pollutants such as automobile fluids and particulates onto impervious surfaces.

- **Area 2, Industrial Areas.**

  Industrial areas are characterized by highly impervious surface areas and may be subject to the use or storage of heavy equipment or chemicals. Management of nonpoint source pollution in these areas includes the use of structural BMPs, measures that reduce impervious surface coverage, and measures to ensure that industrial effluent or waste is minimized and disposed of properly.

- **Area 3, Public and Private Institutional and Recreational Uses.**

  These areas include public uses such as schools, libraries, and playing fields, and private uses such as golf courses, that may have extensive grounds that require maintenance.

  In addition to structural BMPs and minimizing impervious surfaces, management techniques that will reduce the impacts of these uses on the environment include integrated pest management and water-wise landscape management.

  The Town and Herndon Centennial Golf Course management have recognized the potential for significant environmental impact from this particular recreational use. A number of actions have been taken to minimize adverse impacts. These include:

  (1) use of organic-based slow release nitrogen sources to protect the groundwater and surface runoff by controlling the amount of soluble nitrogen present at any one time;
  (2) deep aerification of fairways and tees to four inches so that pesticides and nutrients will be absorbed before they have a chance to run off, and to ensure healthier grass and plant growth that is less subject to pests and diseases;
  (3) new spray equipment that allows staff to apply limited pesticides only to targeted areas;

(4) establishment of no-cut areas to act as filters for surface water and provide habitat for wildlife;
(5) pesticide application by two licensed applicators and one registered technician to ensure that proper practices are followed;
(6) installation of trash racks on the two main stormdrains that feed the golf course pond (nine to ten bags of trash are removed from these racks after every storm);
(7) integrated pest management combining cultural, biological, and chemical controls is used for protection of wetlands and the Chesapeake Bay; and,
(8) since 1993, golf course maintenance practices have been updated based on evaluations by an agronomist from the USGA Turf Advisory Service.

In addition, a once-severe waterfowl problem has been controlled largely by the use of noisemakers.

- **Area 4, Low and Medium Density Residential Areas.**

  This category includes the remaining residential areas of the Town. In addition to structural BMPs and minimizing impervious surface areas, public education may play an important role in the control of residentially-generated nonpoint source pollution. Yards and automobiles are major sources of nonpoint source pollution. Nonpoint source pollution enters the environment through dumping down stormdrains, runoff from the yard, or erosion of bare spots. Public education efforts will be particularly effective in these areas.

A number of resources are available that provide guidance on the prevention of nonpoint source pollution through sensitive site design and through public education. The Town should promote nonpoint source pollution reduction through its own public education programs and by encouraging the use of sensitive site design during the plan review and subdivision process.

III.3 Erosion of the Land

Soil erosion is one of the most pressing pollution problems faced by the Town. Suspended sediments choke and muddy local waterways making them uninhabitable by desirable species of aquatic life and severely disrupting the natural foodchain found in healthy streams. In addition, nutrients and other pollutants attach themselves to sediment particles and contribute to eutrophic conditions in the Potomac River and the Chesapeake Bay.

Soil erosion is most often a result of streambank erosion, improperly managed land uses, and land development. The Town has identified several areas along Sugarland Run which are experiencing erosion problems (see Figure I.7 and Section I.5). The Town's Erosion and Sediment Control Ordinance addresses soil erosion problems during the site development process.

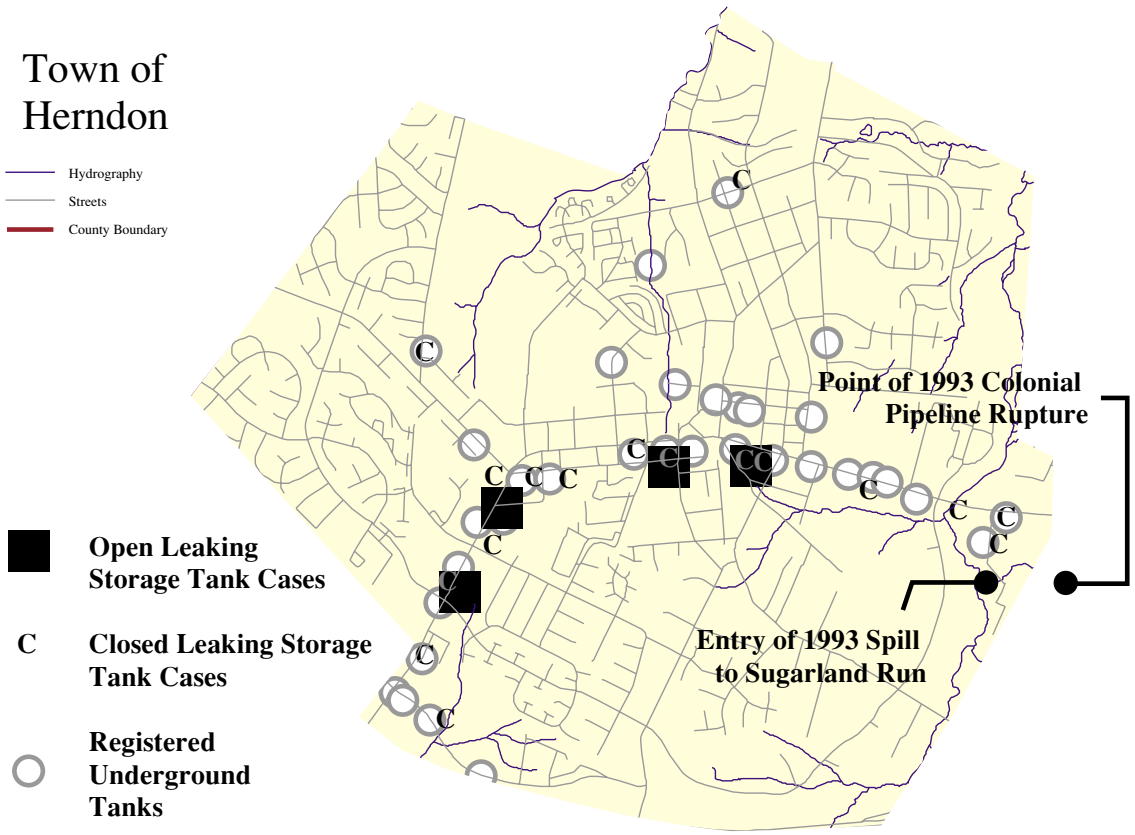
III.4 Underground Storage Tanks/ Transmission Mains

Underground storage tanks (USTs) are regulated by the federal Resource Conservation and Recovery Act of 1976. The Virginia Department of Environmental Quality, Water Division, is responsible for permitting and tracking USTs. The Virginia Water Quality Assessment for 1992 states that underground storage tanks are the primary source of groundwater contamination in Virginia. In addition, many streams are fed by groundwater and therefore leakage also may adversely impact surface water quality. In addition to gasoline, underground tanks are used for storing benzene, kerosene, diesel fuel, and fuel oil.

Underground storage tanks, while regulated through the Commonwealth, often pose a greater threat than other sources of pollution because a problem may not be detected for years after a leak has occurred.

As of July, 1996, there were 4 open cases (and 24 mitigated and closed cases) regarding leaking underground storage tanks in the Town of Herndon. Other open cases exist immediately outside the

FIGURE III.2
Location of Registered Underground Storage Tanks/Open and Closed Leaking Underground Storage Tanks and 1993 Colonial Pipeline Rupture



Town in neighboring Fairfax and Loudoun counties. Because groundwater movement follows topography and geology rather than jurisdictional boundaries, the issue of leaking underground storage tanks is a regional one requiring regional communication and coordination.

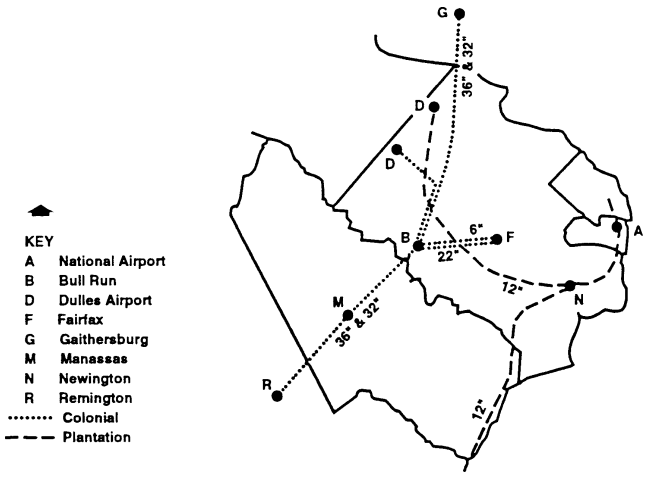
Forty-eight underground storage tanks are currently registered within the Town. Most are concentrated in the Elden Street commercial corridor, although storage tanks dot the entire landscape of the Town. While underground storage tank standards are much better than they were, there is still the potential for leakage. The Town should take due diligence in working with the DEQ-WD to prevent leakage and to ensure that any leakage into the environment is remedied. Figure III.2 provides information on the location of underground storage tanks in the Town and the location of underground storage tank spills currently under remediation.

In addition, vacant commercial and industrial properties sometimes contain leaking underground storage tanks that contaminate groundwater. These contaminants sometimes surface near residential areas in the storm sewer system or in natural streams, causing public health and safety issues and producing undesirable odors. The Town has been engaged actively, directly or indirectly, in mitigating the effects of some of these residual tanks, but the presence of others is possible.

COLONIAL PIPELINE – The presence of a major east coast transmission pipeline along the edge of the Town poses a continual threat of catastrophic spills.

On the morning of March 28, 1993, a break occurred in a 36-inch pipeline operated by Colonial Pipeline Company at the edge of a parking lot at Reston Hospital. The pipeline was shut down within 15 minutes. Approximately 407,000 gallons of number 2 fuel oil spilled through stormwater drainage structures into Sugarland Run in the Town of Herndon and progressed northward through Runnymede Park and on through Fairfax and Loudoun counties. Approximately 80% of the spilled product was recovered before it entered the Potomac River. The portion of the product that did enter the Potomac River threatened water supplies from Fairfax County's Corbalis Water Treatment Plant and caused several shut-downs to prevent petroleum-contaminated products from entering the water intake.

FIGURE III.3
Generalized Location of Petroleum Pipelines Transecting Northern Virginia



SOURCE:
Northern Virginia Planning District Commission, 1990.

A number of factors helped to mitigate the environmental damage caused by this oil spill. These factors are both natural and probabilistic. They are:

(1) The product that spilled was number 2 fuel oil and not a more toxic substance such as gasoline (gasoline was being pumped through the same pipe an hour earlier).
(2) Meteorological and hydrological conditions were optimal for reducing the environmental impact. The weather was cool, reducing vaporization; saturated soils reduced absorption; the stream was at full bank stage, which prevented stream bottom contamination; and the groundwater table was high, which resulted in groundwater flow toward the stream instead of toward the groundwater reservoir.
(3) Emergency response was rapid and efficient, maximizing recovery and minimizing escape of products into the environment.

On April 3, 1993, after repairing the break, Colonial Pipeline Company requested approval from the Office of Pipeline Safety to resume normal operations at full pressure in the pipeline. This proposal met with objections from all elected officials in Northern Virginia. On April 4, 1993, a compromise condition was agreed to where Colonial Pipeline Company could resume operations at half pressure until the pipeline had been inspected by a "smart pig" between the Chantilly Pumping Station and the Dorsey Junction Station in Maryland. All anomalies were inspected by excavation and visual inspection of the pipe.

Inspection with the smart pig resulted in 124 anomalies (indications of some defect in the pipe, or of magnetic material near the pipe).

As of October 29, 1993, 88 anomalies in Virginia and 33 anomalies in Maryland had been inspected with a schedule for completion of the inspections in mid-November. In early November, Colonial Pipeline Company requested approval to resume operations at full pressure to satisfy energy needs in the northeast coastal areas. The Fairfax County Executive formally objected to this request on be-

half of Fairfax County and other local jurisdictions that were impacted by the spill.

The initial emergency response to this oil spill was excellent. The longer term program for recovery and mitigation suffered from unnecessary delays. Five areas suffered significant environmental damage. These areas were:

(1) the immediate spill site where contaminated soils were removed;
(2) a wooded area in the future Fairfax Parkway right-of-way along the Fairfax County - Herndon boundary;
(3) the floodplain near Carlisle Drive in Herndon;
(4) an area in Runnymede Park in Herndon where a beaver dam diverted petroleum products over the floodplain with significant infiltration; and,
(5) one of the primary recovery areas in Algonkian Park in Loudoun County.

All parties agreed that bioremediation was the proper method for treating all contaminated areas except the highly contaminated areas where the soil had to be removed. (Bioremediation is a method where natural or introduced bacteria are used to decompose the petroleum products into harmless compounds such as water and carbon dioxide). Difficulties and delays occurred due to disagreements about the method of bioremediation. Colonial Pipeline Company proposed adding mulch to the soil and tilling the soil to encourage the bacterial activity. This is an appropriate technology for use in open areas where flooding is not a problem. In the Sugarland Run floodplain, tilling would destroy root systems of trees, destroy other native vegetation, and cause additional siltation problems during heavy rains. The Treatment Technologies Working Group established by the EPA insisted on approaches that would be less damaging to local environmental conditions. A compromise was reached and a consent order issued in July, 1993, four months after the oil spill, that specified:

(1) removal of highly contaminated soil at the spill and at Carlisle Drive;
(2) tilling of limited areas where all vegetation had been killed at Carlisle Drive;
(3) treatment with fertilizers to enhance bacterial growth at the Fairfax Parkway right-of-way, Carlisle Drive, and Runnymede Park; and,
(4) allowing the Algonkian Park site to recover with no additional disturbance.

The treatment program started on July 25, 1993. Time lost in initiating the bioremediation programs delayed degradation of petroleum products and recovery of the ecological systems of the stream. Bioremediation works best during warm weather and is very slow during winter months. The process could have been significantly advanced if the treatment had started in April or May to take advantage of the warm spring and summer months.

A public hearing was held on the Colonial Pipeline rupture by the Subcommittee on Investigations and Oversight of the Committee on Public Works and Transportation, House of Representatives, on May 18, 1993. A significant amount of testimony emphasized the need for improved maintenance and inspection of pipelines to reduce the probability of future ruptures.

The 1993 oil spill has had major and continuing effects on the stream and affected floodplain area in Runnymede Park, in addition to the effects south of the park. Although levels of residual oil were too low to measure in the water or the streambed a few months after the spill, the oil had killed all in-stream wildlife that were active at the time of the spill. It has taken much longer to rebuild the food chain in the stream. Although no spilled oil entered the marsh and wetland areas adjacent to the stream in the north end of the park, loss of beaver and muskrat populations resulted in significant changes in plant communities and habitat conditions.

III.5 Above Ground Storage Tanks

Above ground storage tanks are regulated by the federal government through the Clean Water Act. 40 CFR Part 112 requires owners of single tanks with a capacity greater than 660 gallons or multiple tanks with an aggregate capacity greater than 1,320 gallons to register and formulate a "Spill Prevention Control and Countermeasure Plan." The Commonwealth of Virginia, which regulates above ground storage tanks through the DEQ, Water Division, has just recently adopted requirements for tank owners to present an "Oil Discharge Contingency Plan" (ODCP) before a storage tank may be registered. The purpose of an ODCP is to have a plan of action in the event of a catastrophic release of oil from the largest tank. The plan must also identify what the impact of such a discharge will be on the environmental receptors and what will be done to mitigate those impacts in the event of a spill.

However, individual tanks with a capacity of less than 660 gallons or multiple tanks with an aggregate capacity of less than 1,320 gallons are not regulated by the State or the federal government. Most home fuel oil tanks are typically only 200 to 660 gallons and are not regulated. According to 1990 federal census data, slightly under 3 percent of Town households rely on fuel oil or kerosene for their primary source of heat – this is less than the Fairfax County average of 8 percent. Nevertheless, while not a large threat, the aggregate of tanks may pose a serious threat if small problems are not taken seriously. It is therefore the responsibility of the individual owner to ensure that leaks and spills do not occur. According to the DEQ, approximately 90 percent of releases from individual tanks are a result of overfill or the tipping over of the tank. Overfill can occur if the driver/filler is not paying attention or if the capacity of the tank is not known. To reduce the risk of an accidental spill, the homeowner or fuel oil company should inspect a tank before filling to ensure that it is sturdy and does not exhibit signs of corrosion. An owner should also have the capacity of the tank clearly marked on the tank and specifically indicate the filling cap location.

III.6 Improperly Maintained Septic Systems & Abandoned Wells

Improperly maintained septic systems contribute to water quality problems by threatening ground water quality, and in some instances, by contributing directly to surface water quality problems through overland flow of septage. Improperly abandoned wells contribute to water quality problems by providing a direct conduit for pollution to travel from the surface to groundwater.

While the Town requires that any new development connect to public sewer and water, septic systems still serve several households within the Town. According to Fairfax County Health Department records, there are between one and ten septic systems found in each of the Fairfax County Tax Map areas encompassing the Town (Tax Maps 10-3, 10-4, 11-3, 16-1, 16-2, 16-3, 17-1, 16-4, and 17-3).

When designed, sited, and maintained properly, septic systems do not pose a threat to water quality. However, several factors make it necessary for the Town to pay close attention to its existing septic systems.

- The average year of septic system installation for five of the nine Herndon Tax Map areas is before 1960. The average year of installation for two Tax Maps is 1960 to 1969, while the average year of installation for one is 1970 to 1974. Installation data is unavailable for one Tax Map.

  Septic system age is significant because flow diversion values were not required before 1974. In the upper-northwest portion of Fairfax County (including Sugarland Run, Difficult Run, and Broad Run), there were no septic tank failures reported between 1974 and 1983. The septic failure rate for this area for tanks installed after 1984 is only 0.17%. By contrast, the failure rate is 1.78% for 1969 to 1973, 1.54% for 1964 to 1968, 1.24% for 1959 to 1963, 2.40% for 1954 to 1958, and 4.05% for 1949 to 1953. Because all of Herndon's

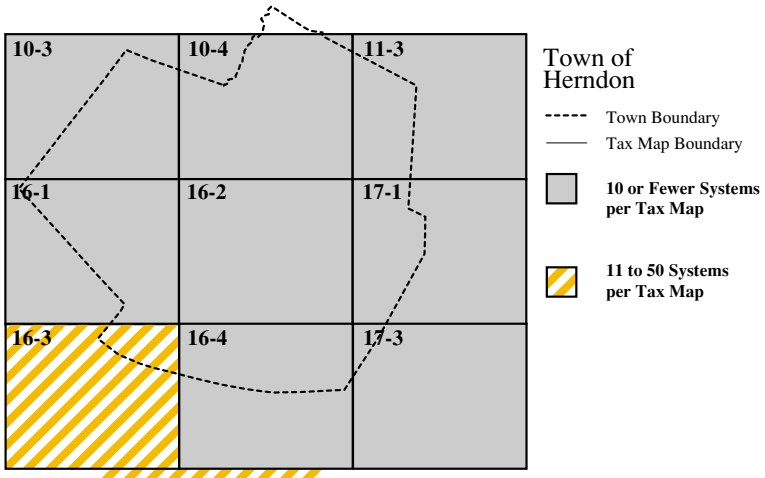
systems were installed before 1974, there is a relatively high risk of failure within the Town.

- Average soil perc rates (minutes per inch) for Herndon Tax Map areas are high (that is, it takes water longer to travel through one inch is soil). The area around Herndon contains some of the highest perc rates in northwestern Fairfax County with one Tax Map having a perc rate of over 41 minutes per inch and two having perc rates of 31 to 40 minutes per inch. High perc rates generally correspond with higher failure rates.

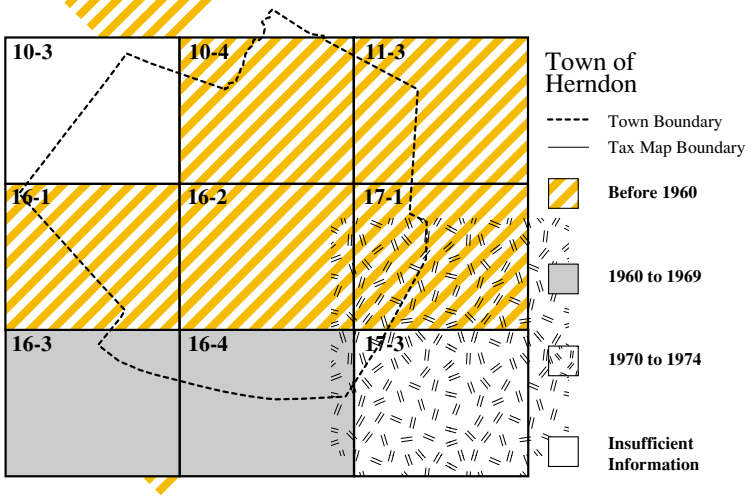
- In general, failure rates for septic systems installed in the Fairfax Piedmont Lowlands (of which the Town is situated) are higher (4.38%) than for septic systems installed in the Fairfax Piedmont (2.22%).

To date, there have been relatively few failures reported within Herndon Tax Map areas, although some instances of complete failures have been reported. While three Tax Maps are reported to have failure rates of over 10%, these Tax Maps contain fewer than 9 septic systems each. One Tax Map is reported to have a failure rate of 2.1 to

FIGURE III.4
Factors Affecting Septic System Failure Rates

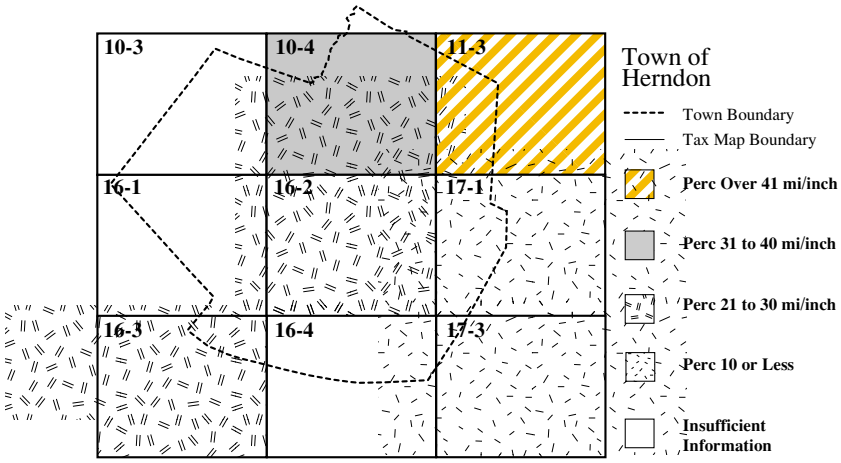


Septic System Density by Tax Map

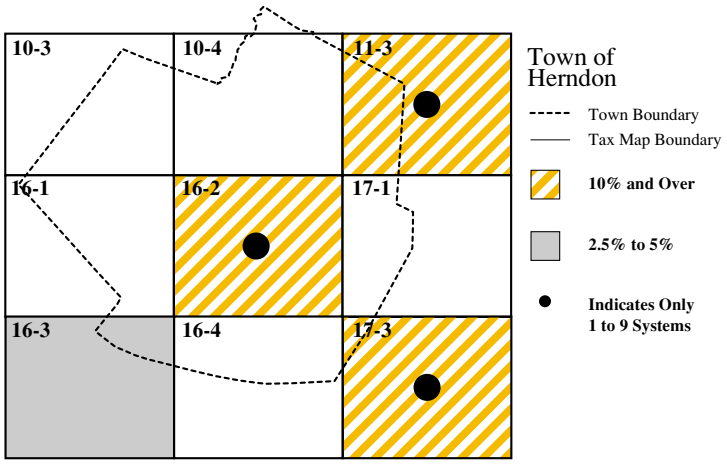


Average Age of System Installation by Tax Map

FIGURE III.4
Factors Affecting Septic System Failure Rates (continued)



Average Soil Percolation Rates by Tax Map



Septic System Failure Rates by Tax Map

5%. However, as area septic systems continue to age, the Town must pursue measures to protect local water resources from potential failures.

There are many reasons for septic failure, most of which are preventable through public education. One of the most common reasons cited for failure to the Fairfax County Health Department is failure by an owner to regularly (every three to five years) pump out the tank. Other factors contributing to septic failure include age, an unlevel distribution box, poor soils, hydraulic overload (too many users for the tank design), crushed/broken conveyance system, tree root damage to drainfield lines, and high water table.

III.7 Air Quality

Air quality is important from a water quality standpoint since, according to the Chesapeake Bay Program, approximately 27% of nitrogen reaching the Chesapeake Bay originates from atmospheric deposition of air pollution. The passage of the federal Clean Air Act Amendments of 1990 is requiring significant changes in air quality planning and implementation at local, State, and regional

levels. The legislation, which encompasses a broad range of planning and regulatory requirements, mandates specific emissions control measures and sets a target date of 1999 for the attainment of ozone and carbon monoxide health standards in the Washington metropolitan region. Northern Virginia is currently considered a "serious non-attainment" area for ozone, compared to Baltimore, which is considered a "severe non-attainment" area.

In the Washington area, the generation of ozone and carbon monoxide is largely attributable to mobile sources and in particular to the use of automobiles. Many of the most effective approaches to improving air quality from mobile source emissions will be implemented at State and regional, rather than local levels, through increased investment in public transportation and high occupancy vehicle lanes. Technological advances such as reformulated fuels, vapor-catching fuel dispensing systems, and tighter tailpipe standards are other measures whose widespread application is expected to contribute to improved air quality.

Regional air quality policies are developed through the Metropolitan Washington Air Quality Committee (MWAQC). Because Herndon does not hold separate membership on MWAQC, the Town must work through Fairfax County to ensure adequate representation. Herndon seeks to contribute to the larger effort by adopting policies which increase awareness of the environmental problems associated with increased ozone and carbon monoxide levels. Establishment of transportation policies which encourage ride-sharing, use of public transportation, and alternate forms of travel such as walking and bicycling will contribute to the effectiveness of the Clean Air Act.

III.8 Summary and Analysis of Existing and Potential Sources of Pollution

Nonpoint source pollution, underground storage tanks, petroleum pipelines, above ground storage tanks, improperly maintained septic systems, and atmospheric deposition are among the primary existing and potential sources of pollution within the Town.

Preventing and reducing pollution from underground storage tanks, petroleum pipelines, septic systems, and atmospheric deposition will require continued coordination with various State, local, and federal agencies including the Virginia Department of Environmental Quality, the Fairfax County Health Department, and the MWAQC.

Nonpoint source pollution poses the greatest threat to the Town's water resources and is also the area of pollution prevention for which the Town has primary responsibility. Because nonpoint source pollution comes from many diffuse sources, it is important for the Town to begin to identify what nonpoint source pollutants are the greatest problem and where they are coming from. The Town can then better target resources where they will have the greatest impact on reducing nonpoint source pollution.

The best resource for accomplishing this task is to reexamine the water quality data collected by the Fairfax County Health Department and MWCOG for Sugarland Run and Folly Lick Branch. These data indicate that fecal coliform pollution, which may come from animal waste as well as human waste, is of predominant concern. Possible sources include water fowl activity at the Herndon Centennial Golf Course, exfiltration from sewer lines, and pet owners who ignore local animal waste control regulations.

Elevated (but stable) nitrate nitrogen levels indicate the need to better manage this source of pollution. The three-prong approach of implementing structural BMPs to clean polluted stormwater runoff, encouraging site design that minimizes impervious surfaces, and public education is the most effective means of controlling the entry of this pollutant into local waterways. Nitrate nitrogen is most often generated from erosion of the land, overapplication or misapplication of fertilizers, fecal matter from sanitary sewers or animals, vegetative matter, and automobile exhaust.

Existing Programs and Regulations to Protect the Environment
IV

The Town of Herndon has adopted a number of important ordinances and programs to address the constraints to development, potential and existing sources of pollution, and the protection of sensitive natural features identified in the previous sections.

The Town has worked diligently with State agencies to bring its environmental and water quality protection programs into compliance with State laws and regulations and has worked to implement its own programs to address locally identified environmental and water quality needs. The Town was one of the first Tidewater jurisdictions to adopt a Chesapeake Bay Preservation Ordinance.

The following section presents an overview of existing Town ordinances and programs related to environmental protection. The purpose of this section is to provide a foundation on which to assess the effectiveness of the Town's environmental protection ordinances and programs in light of the needs identified in previous sections. The next section analyzes the potential need for the Town to increase or modify its protection efforts.

IV.1 Herndon 2010 Comprehensive Plan and Chesapeake Bay Preservation Chapter

The Town's 2010 Comprehensive Plan, together with this Chesapeake Bay Preservation Chapter, outlines the Town's long-range environmental goals and action strategies. The Comprehensive Plan is a visionary document and represents the Town's vision for what ought to be.

The Herndon 2010 Comprehensive Plan contains policy about urban forestry, as well as policy to establish "Green Streets" (corridors with special landscaped buffers) and "Clean Streams" (water quality goals). It also contains development guidelines intended to emphasize protection and integration of the natural environment with development and redevelopment sites (guidelines for "Infill and Redevelopment" and "Adaptive Areas"). The Chesapeake Bay Preservation Chapter contains additional information and recommendations for protecting stream habitats and water quality by preventing pollution and developing and redeveloping in a way that complements and protects natural resources.

The 2010 Comprehensive Plan and Chesapeake Bay Preservation Chapter should be used in conjunction with the Town's ordinances and programs to

guide the Town as it continues to grow, seeks to overcome existing problems, and faces new challenges.

IV.2 Chesapeake Bay Preservation Act

The Chesapeake Bay Preservation Act (Chapter 25, Title 10.1 of the Code of Virginia) was enacted in recognition that Virginia could no longer afford to ignore nonpoint source pollution from urban and agricultural sources. The Chesapeake Bay, one of Virginia's most important natural and economic resources, has been on the verge of becoming an ecological disaster area. However, the Chesapeake Bay is only the most visible manifestation of a larger problem. Local streams and watersheds also suffer directly from the effects of pollution. Many could no longer support aquatic life when the Chesapeake Bay Preservation Act was enacted, and, though there have been some improvements, local tributaries still require improvements in water quality in order to meet acceptable water quality standards.

The Chesapeake Bay Preservation Act establishes a program to protect environmentally sensitive features which, when disturbed or developed incorrectly, lead to reductions in water quality. The Act provides a framework for local government to identify these sensitive areas and to enact regulations to better plan land use activities on and around them. Under the regulations, the Town of Herndon is required to:

- protect existing high quality State waters and restore all other State waters to a condition or quality that will permit all reasonable public uses, and will support the propagation and growth of all aquatic life which might reasonably be expected to inhabit them;
- safeguard the clean waters of the Commonwealth from pollution;
- prevent any increase in pollution;
- reduce existing pollution; and
- conserve water resources in order to provide for the health, safety, and welfare of the present and future citizens of the Commonwealth.

In accordance with the guidelines established by the Chesapeake Bay Preservation Area Designation and Management Regulations, Chesapeake Bay Preservation Areas (CBPAs) were mapped for the Town of Herndon and the Town adopted a Chesapeake Bay Preservation Area Overlay District as part of the Town's Zoning Ordinance on January 22, 1991. The mapping of these areas, which include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs), was based on a survey of existing natural resources documentation as well as field surveys.

RESOURCE PROTECTION AREAS – RPAs are lands at or near the shoreline containing components which are especially sensitive because of (1) the intrinsic value of the ecological and biological processes they perform which benefit water quality, or (2) the potential for impacts that may cause significant degradation to the quality of State waters.

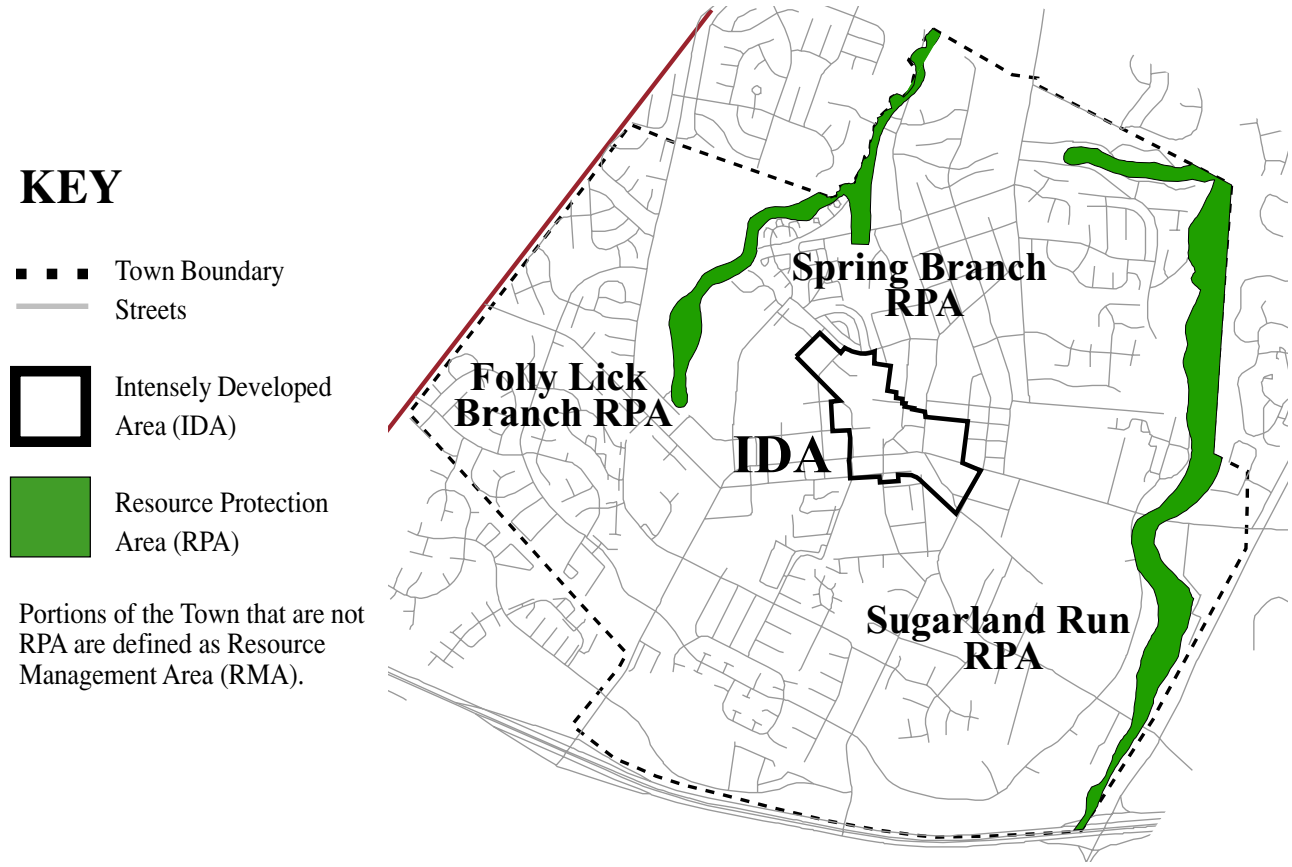
The RPA designation within the Town includes a 100-foot vegetated buffer area located adjacent to and landward of all tributary streams and nontidal wetlands connected by surface flow and contiguous to tributary streams. These lands are excluded from development in most instances.

RESOURCE MANAGEMENT AREAS – RMAs include land types that, if improperly developed, have the potential for causing significant water quality degradation or for diminishing the functional value of the RPA.

The RMA consists of all land located in the Town which is not included in the RPA. The RMA within the Town incorporates, but is not limited to concentrations of the following land categories: floodplains; wetlands; highly erodible soils; steep slopes greater than 15%; and nontidal wetlands not connected by surface flow to tributary streams.

A property may be excluded from the RMA if it can be shown that RMA performance criteria are met in an area contiguous to and within 100 feet of the boundaries of the RPA and that the property is not characterized by floodplains, wetlands,

FIGURE IV.1
Generalized Chesapeake Bay Preservation Area Map for the Town of Herndon



This map is for general informational purposes only. The designation criteria for RPAs and RMAs shall control the location and boundary of those areas. Any conflict between the boundary line as shown on this map and the actual location of the criteria shall be resolved by the location of the designation criteria as shown on the approved site plan or subdivision plat; or house location survey.

highly erodible soils, or steep slopes greater than 15%.

INTENSELY DEVELOPED AREAS – IDAs include areas in which pre-Chesapeake Bay Preservation Act development is concentrated and little of the natural environment remains. The concentrated nature of development in IDAs may not allow for the implementation of specific performance criteria identified in the Town's Ordinance. As a result, all development in the IDA is considered to be redevelopment and may be exempt from the buffer requirements of the RPA. Specific areas of the Town identified as IDA are show in Figure IV.1.

If the CBPA boundaries include a portion of a lot, parcel or development project, then only that portion must comply with the Town's Ordinance. However, the division of property does not constitute an exemption from this requirement.

The criteria are intended to establish rules that local governments can use in granting, denying

or modifying requests to rezone, subdivide, or to use and develop land in the CBPA. Implementation of the criteria is achieved through the use of performance standards, Best Management Practices, and various planning and zoning concepts.

Figure IV.1 presents a generalized view of the Town's Chesapeake Bay Preservation Area Map. It should be noted that it is the designation criteria identified in the Chesapeake Bay Preservation Ordinance which is binding, and when conflicts between the Chesapeake Bay Preservation Area Map and the designation criteria arise, the designation criteria shall prevail.

IV.3 Erosion and Sediment Control Ordinance

The purpose of the Town's Erosion and Sediment Control Ordinance is to prevent the degradation of local soil and water resources as a result of land-disturbing activities by ensuring that the owner of the property on which land disturbing activities are being carried out provides adequate controls of erosion and sedimentation. The Town's E&S Ordinance also requires the land owner to take necessary measures to preserve and protect trees and other vegetation during all phases of any land-disturbing activity. The Erosion and Sediment Control Ordinance implements the Virginia Erosion and Sediment Control Law (§§ 21-89.1 *et seq*., Code of Virginia (1950)) as well as the Chesapeake Bay Preservation Act.

Under the E&S Ordinance, land owners proposing a nonexempt regulated land disturbing activity of greater than 10,000 square feet (or 2,500 square feet in a Chesapeake Bay Preservation Area) must first submit an erosion and sediment control plan to the Town Department of Public Works. The Town's erosion and sediment control requirements are detailed in Chapter 6 of the Town Code.

The following is an abbreviated list of the basic principles of the Town's E&S Ordinance. The developer must refer to the Town Code for a complete description of requirements.

- The development plan must be fitted to the topography and soils so as to create the least erosion potential.
- Wherever feasible, allowing for development permitted in the zoning district in which the land is situated, natural vegetation shall be retained and protected.
- Provisions shall be made to effectively accommodate the increased runoff caused by changed soil and surface conditions during and after development.
- Sediment basins and similar structural measures shall be installed below high sediment-producing areas to remove sediment from runoff waters from land undergoing development.
- Timing of development will be conducted so that the smallest practicable area of land is exposed at any one time, all erosion and siltation structures are in place prior to the first step in grading, and special measures are provided to protect any disturbed areas not paved, sodded, or built upon.
- Conservation practices for erosion and sediment control are equal to or exceed the specifications of those contained in the most recent edition of the Virginia Erosion and Sediment Control Handbook.

In addition, the Town has adopted relevant portions of the Fairfax County Public Facilities Manual relating to stormwater management facilities to prevent erosion as a result of increased impervious surfaces.

IV.4 Floodplain Ordinance

The purpose of the Town's Floodplain Ordinance is to prevent the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, and unnecessary expenditure of public funds for flood protection and release as a result of improper development within the floodplain. Because most land uses are inappropriate for the floodplain, the Town's ordinance also results in the protection of the floodplain as a wildlife habitat corridor.

In 1979, the Federal Emergency Management Agency investigated the existence and severity of flood hazards in the Town of Herndon to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The study was also meant to be used by local and regional planners in their efforts to promote sound floodplain management. To these ends, the Town established a Flood Plain District to protect the 100-year flood plain as part of the Town's Zoning Ordinance (Article 48).

No development is allowed in the Flood Plain District unless the effect of such development on flood heights is fully offset by accompanying improvements which have been approved by all appropriate State and local authorities. The following uses, however, are allowed if the underlying zoning permits and given that they do not require structures, fill, or storage of materials and equipment.

- Agricultural uses such as general farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, forestry, and sod farming and wild crop harvesting.
- Public and private recreational uses and activities such as parks, day camps, picnic grounds, golf course, boat launching and swimming areas, hiking and horseback riding trails, wildlife and nature preserves, game farms, fish hatcheries, trap and skeet ranges and hunting and fishing areas.
- Utilities and public facilities and improvements such as railroads, streets, bridges, transmission lines, pipelines, water and sewage treatment plants, and other related uses.

Figure II.1 (under CONSTRAINTS TO DEVELOPMENT) presents areas of the Town which have been designated as being floodprone (the one-hundred year floodplain) for which the Town's ordinance applies.

IV.5 Urban Forestry and Landscaping Ordinance

The purpose of the Town's Urban Forestry and Landscaping Ordinance (Article 28 of the Town Code) is to promote and protect the public health, safety, and general welfare by providing for the regulation of the planting, maintenance, preservation, and removal of trees, shrubs, and other vegetation within the Town. Among its provisions, the Ordinance requires that no healthy tree may be destroyed or removed from any parcel of land for which a subdivision plat, subdivision plan, or lot development plan has been submitted to the Department of Community Development. No healthy tree thereafter may be destroyed or removed unless it has been specifically permitted. A Landscape Mitigation Plan (LMP) must be submitted for those trees required to be preserved under the terms of the Ordinance if it is determined that trees protected under the site development plan have been destroyed or removed, or if in the opinion of the Town's Urban Forester a tree has been damaged by construction to the extent that it will lead to deterioration or death.

No subdivision plan, site plan, or lot development plan may be approved by the Zoning Administrator which provides for the destruction or removal of any existing healthy tree unless such destruction is necessary in order for development on the parcel to be accomplished in accordance with the other approved aspects of the subdivision or lot development plan, or would further the purposes of this Ordinance by allowing for a more appropriate landscape design. The Ordinance also regulates and requires vegetated buffer areas of certain sizes for various classes of land use.

IV.6 Town Pollution Prevention Programs

Pollution prevention is the most economical and environmentally friendly means of protecting local and regional water resources from pollution. By preventing pollution in the first place, damage to the environment can be avoided and expensive pollution clean-up programs and facilities will be unnecessary.

Pollution prevention covers a broad range of programs and regulations aimed at modifying the human behavior or activity that causes pollution

in the first place. Significantly, pollution prevention programs can be tailored to address specific pollution problems or specific pollution generating activities.

The Town is currently working to promote the Northern Virginia Soil and Water Conservation District's "Backyard to the Bay" watershed education program. By not reinventing a separate pollution prevention program, the Town can save money and take advantage of the NVSWCD's considerable expertise. It also allows the Town to pick and choose programs that fit the Town's pollution prevention needs. Highlights of the NVSWCD's program are included in Table IV.1.

WATERSHED AWARENESS EDUCATIONAL PROGRAMS – Runnymede Park, master-planned as a primarily natural park, is an asset with great potential for extending watershed conservation information and for citizen education in pollution prevention, stream mechanics, and aquatic life. This outdoor learning center and living laboratory offers extensive conservation areas, Sugarland Run along the eastern edge, small wetland areas and other habitat types, space for demonstration areas, and a future nature center as a focal point for educational programs and activities.

Watershed, stream, and wetland educational programs conducted by Runnymede Ranger volunteers should be promoted more widely and additional volunteers should be located and trained in park ecology and examples of processes. The Parks & Recreation naturalist and the Community Development urban forester should work closely with available volunteers to implement further educational opportunities.

COMBINING STEWARDSHIP EDUCATION AND COMMUNITY SERVICE – Well-established stream cleanups, sponsored jointly by TreeAction and the Town since 1987, have always included a public education component that could be expanded. Recent plant restoration and habitat improvement work and planned projects in

TABLE IV.1
Menu of Pollution Prevention Options – Northern Virginia Soil and Water Conservation District's "Backyard to the Bay" Program

- "Don't Dump" community education and stormdrain stenciling program.
- Nonpoint source pollution prevention programs including lawn care demonstrations and workshops and techniques for dealing with home drainage and erosion problems.
- Resource materials, interactive displays, and exhibits at special events.
- Citizens Water Quality Handbook outlining solutions to common watershed problems and suggestions for "make a difference" activities."
- Teacher training in Project WET (Water Education for Teachers).
- Youth watershed projects.
- Erosion and sediment control seminars for developers and the general public.
- Pond management and riparian restoration seminars and workshops.
- Support for citizen based watershed stewardship groups.
- Volunteer water quality monitoring projects to raise awareness, collect resource information, and encourage action.

wetlands area, by the same volunteer groups, should be continued.

The Town should work closely with the Friends of Runnymede Park and others, to extend watershed awareness information to residents in adjacent and nearby subdivisions surrounding the park. For example, stormwater from Herndon (K-Mart) Center is piped into the marsh area of Runnymede Park, and this adds an opportunity for volunteers to work with commercial center owners to reduce pollutants – especially trash carried through the storm drains. These activities are excellent opportunities to combine educational activities and community service projects for youth.

Schoolyard habitat projects, such as the Herndon Middle School and Tree-Action partnership with a strong water-and-wetlands and water conservation component, could be supported by the Town, as a means of reaching a broad audience in a dedicated setting. In addition, the Town will implement a stormdrain labeling program to warn the public about dumping materials into stormdrains. This project will be funded under the Virginia Litter Prevention and Recycling grant the Town received in 1997. The Town hopes to implement the project in the fall of 1998.

In addition to citizen and business education, the Town staff continues to work specifically with the Herndon Centennial Golf Club to mitigate water quality problems associated with that particular type of land use. Water quality management techniques identified in Section III.2, Area 3 should continue to be implemented and improved upon.

Another important form of pollution prevention is the promotion of land development that minimizes impervious areas so that the landscape can absorb and retain rainfall. There are a number of resources available that outline techniques that can be used to promote environmentally-friendly site design. The Town should strive to have a degree of flexibility in its Zoning and Subdivision Ordinances to allow creative design that minimizes the use of impervious surfaces.

Analysis of Program Needs and Strategic Water Quality Protection Plan
V

The purpose of this section is to examine the Town's environmental and water quality protection ordinances and programs in light of the Town's desire to protect its sensitive natural resources, avoid improper land uses on areas with constraints to development, and reduce or eliminate existing and potential sources of pollution. The purpose of such an examination is to identify the strengths of the Town's environmental and water quality protection programs and to develop a strategic water quality protection plan to address issues and concerns that are not adequately accounted for by existing Town programs. The results of this analysis are then used as the basis of the strategies and action statements in Section VI.

V.1 Sensitive Natural Resources

Sensitive natural resources within the Town include natural habitats, topography, geology and soils, surface water, groundwater, and wetlands. All of these sensitive resources require continued protection and often serve as constraints to development. In addition, protection of many of these sensitive natural resources (such as surface and groundwater quality and streambank erosion) can be achieved through the prevention and control of existing and potential sources of pollution.

This section focuses on actions that the Town may take to improve and enhance natural resources within the Town that are not otherwise addressed under constraints to development (Section V.2) or control of existing and potential sources of pollution (Section V.3).

Proactive environmental and water quality protection education should be undertaken to increase understanding of physical constraints and natural resources by staff members and by elected or appointed decision-makers. Seminars or workshops might be conducted, in cooperation with NVSWCD or other knowledgable entities or individuals. Benefits include less susceptibility to inappropriate choices when definition of standards are stretched or protective measures are compromised unnecessarily by development proposals.

RIPARIAN BUFFER AREAS – Riparian buffer areas in Chesapeake Bay Preservation Areas are protected under the Town's Chesapeake Bay Preservation Ordinance (CBPO). During development and redevelopment, a 100 foot vegetated buffer area must be protected, and in most cases reestablished if not present, landward of all other RPA features and all tributary streams.

In general, MWCOG's 1997 assessment of the Sugarland Run mainstem found that most of the stream is protected on both sides by a canopied buffer of greater than 100 feet. The notable exception is the stream reach from the Dulles Toll Road to the W&OD Trail where there is a complete lack of tree canopy cover. (Also see the following WETLANDS section reference.) While reforestation efforts are already underway, the long-term benefits of a mature canopy will not be fully realized if the plantings are not maintained. The Town should work with VDOT, local environmental and conservation groups, and the Virginia Department of Forestry to ensure that the tools for proper maintenance are available and utilized. Also refer to WETLANDS information. Wetlands lost during construction of the Fairfax County Parkway, should, in part, be replaced by the intended detention area in order to immediately benefit water quality downstream. This would reduce sedimentation and filter pollutants, though it would not reduce water temperature. Detention capability does not serve as well as the original retention functions of the beaver pond and natural wetland destroyed by construction, but it would help.

Reforestation of riparian buffer areas is an integral part of the health of a stream valley and serves not only to protect water quality but also provides excellent wildlife habitat. It is also a significant part of Virginia's overall Chesapeake Bay protection efforts. In order to help the Town to strategically protect existing riparian buffer areas and restore denuded riparian buffer areas, the Town should undertake an assessment of all Town streams similar to that performed by MWCOG for the Sugarland Run mainstem. The Town should utilize local environmental and conservation organizations to help perform the assessment and should approach the Northern Virginia Soil and Water Conservation District and the Virginia Department of Forestry to establish a buffer restoration plan.

FISH PASSAGE IMPEDIMENTS – There is only one partial fish barrier located within the Town on the Sugarland Run mainstem. The Town should investigate ways to reduce the impact of this impediment which is located immediately upstream of Elden Street. While the box culvert at the intersect of Sugarland Run and the Fairfax County Parkway to the north of the Town represents a complete blockage, no cost-effective remedial actions have been identified at this time.

More importantly, fish impediments are located to the north of the Town in Fairfax and Loudoun counties. These impediments, while not located in the Town, nonetheless impact the Town's natural habitats. The Town should encourage its neighbors to investigate ways to provide increased fish mobility in the Sugarland Run.

POTABLE WATER SUPPLY AND PROTECTION – It is anticipated that the Town's water supply will be adequate to serve the needs of the Town into the foreseeable future. Water conservation measures will ensure that surface water withdrawals and the generation of wastewater are minimized. The Town does not currently have a water conservation education program in place. A simple public education brochure, mailed with local water bills, can be an effective means of educating the public on water conservation techniques. The City of Fairfax has a water conservation brochure that the Town can adapt for its own purposes at minimal cost.

V.2 Constraints to Development

The primary physical constraints to development in the Town include floodplains, geology and soils, topography, wetlands, mature forest areas and stream valley corridors (including areas of significant wildlife habitat), and groundwater recharge areas.

FLOODPLAINS – Floodplain areas are protected under the Town's Floodplain Overlay District and are defined as an RMA feature under the Town's Chesapeake Bay Preservation Ordinance (CBPO). As a practical matter, most significant floodplain areas are located within the Town's designated RPA and are therefore excluded from development in most instances. In addition, the Town has set

aside significant areas of the floodplain, particularly around the Sugarland Run mainstem, as part of its municipal park and stream valley system.

Within the past few years, the Town has allowed filling of floodplain for development in one instance and development of an area adjacent to a floodplain that provided extended storage of flood waters. These incidences should not be considered as precedents for further encroachment into floodplain areas.

GEOLOGY AND SOILS – The preponderance of soils within the Town are suitable for most types of development if proper soil conservation measures are implemented, although some soil groups preclude the use of basements or require extending building footings to rock below the subsoil. The Town's Erosion and Sediment Control Ordinance (E&SC Ordinance) adequately addresses soil and water conservation as a result of general site development while the Town's CBPO addresses highly erodible soils (such as those located on slopes greater than 15%) and highly permeable soils.

The Virginia Uniform Statewide Building Code (VUSBC) provides guidance on the engineering requirements and constraints for other sensitive soil associations found within the Town. In addition, the Town's Zoning Ordinance allows cluster development in order to avoid building on particularly sensitive soil areas. The Town should promote this provision as a means of avoiding development on sensitive soil features. A site specific soils test to identify limitations is required for all development within the Town.

The only soils within the Town for which any development is inappropriate are floodplain (mixed alluvial) soils. Floodplain soils within the Town are limited to areas protected by the Floodplain Overlay District and areas defined as RPA under the CBPO where development potential is extremely limited.

TOPOGRAPHY – In general, there are few topographic constraints within the Town that cannot be adequately addressed through the Town's E&SC Ordinance. Less than 3% of the total land area is identified as having slopes in excess of 15%. Most of these areas have already been developed and are under vegetative cover. Slopes of 15% or greater are defined as RMA under the Town's CBPO.

WETLANDS – Most of the Town's wetlands are associated with Herndon's main waterways. Although many wetlands have disappeared as a result of construction and development activities, significant wetland areas still remain. Wetland areas associated with the Town's main waterways have been identified through stream walks conducted by Town staff in February of 1998 (see Figure I.9) with the help of federal National Wetland Inventory Maps. While these wetlands are defined as an RMA feature under the Town's CBPO, their location within floodplain areas, and often within the 100 foot RPA Buffer Area, in many instances protects these wetland resources from encroachment.

Currently mapped and any unidentified wetlands that may be delineated during the site planning process are also protected under Section 404 of the federal Clean Water Act (U.S.C. §1251 *et seq*., 1987 as amended). Section 404 requires anyone proposing to impact three or more acres of wetland to obtain a U.S. Army Corps of Engineers permit. A notification form and report are required for any activity affecting less than three acres. The Town's CBPO requires that all wetland permits are obtained before development may begin.

GROUNDWATER – The Virginia Groundwater Protection Act is the primary tool for protecting groundwater recharge areas within the Town. Because the Town is located completely within the Piedmont Lowlands aquifer, there are no discernible recharge areas that require special attention or delineation. Rather, the approach that the Town must take is to promote development that reduces impervious surface areas so that groundwater recharge may occur naturally. The

Town's CBPO, as well as the Town's Urban Forestry and Landscaping Ordinance, require that natural vegetated areas be preserved to the maximum extent practicable. In addition, the CBPO requires that impervious surface areas be minimized as a result of land development. The Town should encourage and promote site design techniques and other measures, where appropriate, that will reduce impervious surface areas and increase opportunities for groundwater recharge.

V.3 Existing and Potential Sources of Pollution

Identified existing and potential sources of pollution include point source pollution, nonpoint source pollution, erosion of the land, underground storage tanks, petroleum transmission mains, above ground storage tanks, failing septic systems, and air pollution.

POINT SOURCE POLLUTION – Point sources of pollution are strictly regulated through the Department of Environmental Quality. Two industrial sites within the Town have permits that meet environmental standards to discharge to Sugarland Run. There are no municipal discharges (usually in the form of wastewater or major stormwater outfalls) that are currently regulated under the federal Clean Water Act's National Pollution Discharge Elimination System (NPDES) permit program. However, the Town recognizes that municipal stormwater discharges may eventually be regulated under NPDES. Implementing the recommendations covered in this section will help the Town to comply with these regulations in the future.

NONPOINT SOURCE POLLUTION – The Town's primary nonpoint source pollution control measures include its CBPO and its E&SC Ordinance. All new development and redevelopment must implement nonpoint source pollution control measures under the Town's CBPO general performance criteria. However, the CBPO allows a developer to opt-out of the performance criteria provisions if the developer can demonstrate that the property contains none of the RMA features identified in the CBPO. Because most new development is hydrologically connected to the local stream system via stormdrain, under the opt-out provision all pollutants that collect on streets and other impervious surfaces will be flushed directly to the local stream without the benefit of treatment. To rectify this situation, the Town should extend its BMP requirements to all areas of the Town regardless of whether or not they contain RMA features. However, if there are no RMA features, the property may be exempt from performing the other requirements of the CBPO.

Since much of the Town is nearing build-out, most development in the future will take place as redevelopment. Redevelopment presents an excellent opportunity to improve local water quality by making development more water quality friendly. Under the Town's CBPO, nonpoint source pollution loads must be reduced by 10% from existing site conditions during redevelopment. Redevelopment also presents an opportunity to replace antiquated sewer lines, connect to the sanitary sewer system (as opposed to a septic field), connect to gas or electricity (instead of having an individual fuel oil tank), restore vegetated areas (including Buffer Areas required under the CBPO), and correct erosion problems.

However, because many of the features identified as RMA under the Town's CBPO have been obliterated as a result of past development within the Town, many redevelopment sites may be able to exempt themselves from the CBPO's redevelopment performance criteria. For this reason as well, the Town should extend its BMP requirements to all areas of the Town. BMPs such as sand filtration systems, which require no surface space and can be shared among many different operators, can be implemented in the more densely developed historic sections of the Town in order to minimize effects on the existing character of the Town.

The Town should also identify opportunities for retrofitting already developed areas through the strategic use of regional or shared BMPs. This approach should be coordinated with neighboring Fairfax County.

BMPs must be properly maintained in order to provide long-term protection to local water quality. The Town requires the owner of any privately maintained BMP facility to enter into a maintenance agreement with the Town. The Town must continue to monitor and enforce these BMP maintenance agreements.

Despite the effectiveness of structural BMPs, pollution prevention is the most cost effective means of controlling nonpoint source pollution. While the Town has begun to work with the Northern Virginia Soil and Water Conservation District to implement a Town pollution prevention program, few actual measures have been developed and implemented. The Town should work with the NVSWCD to establish a full range of nonpoint source pollution education programs that fit the needs of its citizens and businesses and that address the various identified sources of nonpoint source pollution. Options may include lawn management, street cleaning, hazardous waste disposal, stormdrain stenciling, and public education measures.

The Town should develop a means of assessing common sources of pollution. Citizen interviews as well as stream walks are excellent ways of identifying problem areas. For instance, discussions with Herndon Centennial Golf Course staff resulted in the construction of trash screens to aid in the removal of large amounts of trash and other contaminants that previously found their way to the irrigation pond. The primary source of these contaminants is the stormdrain system. A combination of public and business education and stormdrain stenciling may help to ameliorate this problem.

Of additional concern are highly elevated fecal coliform levels in Sugarland Run and Folly Lick Branch. As noted previously, elevated fluoride levels in grab sample water quality monitoring indicates that leaking sanitary sewer lines may be responsible for at least part of the problem. Identification and remediation of problem lines is the only means of correcting for this water quality and health factor in the long run. In addition, more stringent enforcement of local animal waste control laws can help to reduce overall fecal coliform levels. The Town should enforce Fairfax County's animal waste control ordinance. A public education campaign that links animal waste control with a public safety hazard may be an effective means of fecal coliform control and should be incorporated into the Town's overall nonpoint source pollution prevention program. Runnymede Park and Stanton Park are ideal settings for such a public education program. In addition, the Town may consider partnering with local pet stores or scout troops to distribute or provide low-cost/free scoopers to pet owners.

Another form of pollution prevention is to minimize the amount of impervious surface area associated with land development. By allowing rainwater to infiltrate naturally into the soil, less pollution is flushed to the local stream and stormwater runoff volume is decreased. The Town should encourage the use of creative site design techniques that minimize impervious surface areas such as shared parking arrangements and tree preservation. A comprehensive review of the Town's Zoning and Subdivision ordinances to identify opportunities for allowing such measures should be undertaken.

In addition to structural BMPs and pollution prevention, riparian buffers also serve to protect streams from overland runoff and nonpoint source pollution. As previously noted, much of the Sugarland Run mainstem and Folly Lick Branch are buffered by at least a 100 foot canopied riparian buffer system. However, one particular area of concern is the Sugarland Run mainstem from the Dulles Toll Road to the W&OD Trail where there is almost a complete absence of tree canopy cover. Restoration of this and other denuded riparian areas will help to protect local water quality and enhance the Sugarland Run stream valley's function as a natural wildlife habitat corridor.

The Town should seek to build upon the Metropolitan Washington Council of Government's 1997 assessment of the Sugarland Run mainstem by performing similar assessments on Folly Lick

Branch, Spring Branch, and other tributaries throughout the Town. This will allow the Town to better identify areas of denuded stream buffer and target these areas for reforestation either by public means or through the redevelopment process. Such a study will also allow the Town to better identify potential and existing sources of pollution in the Town.

Finally, public and private institutional and recreational land uses are of particular concern to the Town because they often involve the maintenance of large areas of turf and landscaping. Specifically, the Town's municipal golf course, a significant potential source of pesticides, fertilizers, and fecal coliform bacteria in Folly Lick Branch, is an example of how best management practices can be applied. The Town has worked with the course management to implement integrated pest management (IPM), fertilizer application controls, and grass filter strips in accordance with Golf Course Superintendents Association guidelines developed in association with the Audubon Society. The Town should use its public areas as a means to showcase proper environmental management techniques.

The Town should work with the Fairfax County Health Department and the Department of Environmental Quality to monitor long term trends in water quality in order to gauge the impacts of nonpoint source pollution control programs. In addition, the Town should expand upon this program in order to pinpoint specific problem areas or pollution "hot spots" and to get a more comprehensive picture of stream health. The Town should explore the use of local volunteer and environmental groups such as the Friends of Sugarland Run to perform such monitoring or the establishment of a program run by the Fairfax Health Department similar to that of the City of Fairfax.

EROSION OF THE LAND – The control of site specific soil erosion as a result of land development is adequately addressed under the Town's E&SC Ordinance. However, while there are adequate controls in place to prevent site specific erosion problems, the Town does not have an adequate mechanism to address the cumulative effects of increased runoff on downstream areas. One of the most significant sources of erosion in the Potomac River and the Chesapeake Bay is instream erosion and streambank erosion as a result of excessive volumes and velocities of runoff. While BMPs established as part of the Town's CBPO performance criteria help to alleviate this problem to a degree by providing stormwater detention, these BMPs are not specifically designed for water volume control purposes.

To address the problem of downstream scouring and erosion, the Town should proceed with its long-term goal of adopting a Stormwater Management Ordinance as is allowed under the Virginia Stormwater Management Regulations (4VAC 3-20-10 *et seq*.). In most instances, stormwater management facilities can be incorporated into water quality BMPs. Combining these practices is cost-efficient and helps to alleviate both water quality and water volume problems.

Some areas of the Sugarland Run mainstem have been identified as experiencing bank erosion. The Town should work with the Northern Virginia Soil and Water Conservation District to determine the specific causes of the erosion (if any), and seek to stabilize these areas without the use of streambank hardening. The NVSWCD and MWCOG can provide resource materials on environmentally sound streambank stabilization techniques using bioengineering. In addition, an adequately performed Resource Management Plan for Runnymede Park should address erosion problems, and coordinate planning with habitat objectives, interpretive objects, and other factors.

UNDERGROUND STORAGE TANKS – The Town has a high incidence of leaking or previously leaking underground storage tanks. While the Virginia Department of Environmental Quality is directly responsible for monitoring these tanks, the Town should continue to work closely with the DEQ to ensure compliance with all applicable laws and regulations.

ABOVE GROUND STORAGE TANKS – While the Town has less than the County-wide average for houses that rely on above ground storage tanks for fuel oil or kerosene, the potential for spillage makes these tanks a significant threat. The specific location of these tanks is not currently documented. The Town should identify homes which rely on fuel oil and kerosene (this can be accomplished by working with companies that supply fuel oil) and develop a brief information guide on above ground storage tank safety for distribution.

PIPELINES – Colonial Pipeline traverses the eastern edge of the Town, and is a potential source of extremely devastating environmental and public health and safety effects. The Town should continue to work with DEQ to ensure enforcement of inspections that assure the safety and integrity of this pipeline.

IMPROPERLY MAINTAINED SEPTIC SYSTEMS – There are only a few households in the Town that still rely on septic fields for waste disposal. However, the age of these systems and the characteristics of the local geology makes it likely that many of these will fail without proper long-term maintenance. While all new development is required to hook into public sewer, prevention is key to ensuring that existing septic systems remain in good working order. The Fairfax County Health Department sends notices to all septic tank owners informing them of their responsibility to pump a tank every five years under the Chesapeake Bay Preservation Act and how to maintain the system. The Town should work with the Health Department to bolster these efforts.

AIR QUALITY – Air quality is a regional issue that is being addressed through the Metropolitan Washington Air Quality Committee. The Town should work with MWAQC through Fairfax County to assure that the Washington area can shed its nonattainment status for ozone and carbon monoxide.

STRATEGIES AND ACTION STATEMENTS VI

The intent of the following strategies and action statements is to promote the protection of the Town's streams, and consequently the Potomac River and Chesapeake Bay, from the avoidable impacts of land use activities and restore degraded streams that are capable of supporting indigenous stream-dwelling or stream-using wildlife. These strategic action statements are the result of an exhaustive inventory and analysis of the Town's natural resources, constraints to development, existing and potential sources of pollution, and existing State, local, and federal regulations and programs aimed at protecting water quality and other natural resources.

A specific implementation plan, along with implementation responsibilities and time-lines, is presented in Section VII.

GOAL 1 **Protect the Town's streams, and consequently the Potomac River and Chesapeake Bay, from the avoidable impacts of land development and human activities.**

Integrated Watershed Management Plan

STRATEGY Optimize water quality and resource protection through the strategic use of structural and nonstructural BMPs to address all sources and types of pollutants.

STRATEGY Share information with Fairfax County and local, State, and regional organizations involved in water quality protection to avoid redundancy and to identify enforcement or programmatic gaps.

Stormwater Management

STRATEGY Ensure that there is no net increase in nonpoint source pollution destined for the Chesapeake Bay as a result of new development and reduce the impacts of existing land uses as a result of redevelopment.

ACTION Vigorously enforce the provisions of the Town's Chesapeake Bay Preservation Ordinance and Erosion and Sediment Control provisions, to ensure that they are effective stormwater management tools.

ACTION Strengthen the requirements to qualify for the Town's CBPO "opt-out" provision or eliminate the "opt-out" provision altogether to require the use of stormwater quality BMPs for all development.

ACTION Plan and implement cooperative/regional stormwater management controls, where appropriate, to improve overall water quality management and decrease the overall maintenance burden.

ACTION Encourage the use of BMPs which require no surface space (such as sand filtration systems) in densely developed sections of the Town to address water quality issues without detracting from the urban character of the area.

ACTION Continue to require and enforce a strong maintenance program for public and private BMPs to ensure the long-term effectiveness of these facilities.

ACTION Encourage site design that minimizes impervious surface areas, including the use of porous pavement, and maximizes the preservation of indigenous vegetation.

ACTION Perform a review of the Town's Zoning and Subdivision ordinances to identify opportunities for reducing impervious surface requirements during the site plan development and review process.

ACTION Ensure that all development avoids unnecessary impacts on sensitive environmental features and that development takes appropriate measures to avoid improper development on sensitive soils.

ACTION Amend the Town's Zoning Ordinance to include site design guidelines that encourage clustering in order to preserve sensitive soil areas as permanent open space.

ACTION Ensure that development and redevelopment practices for municipally-owned land are undertaken using environmentally sensitive tech-

niques. Publicize these practices in order to serve as a model for other development projects.

ACTION Work to reduce the contribution of atmospheric deposition to water quality problems by working with Fairfax County and the Metropolitan Washington Air Quality Committee.

ACTION Continue to use the redevelopment performance criteria of the Town's CBPO as an opportunity to reduce nonpoint source pollution from previously developed land.

STRATEGY Protect local streams from the adverse impacts of increased stormwater volume and velocity as a result of increased land imperviousness.

ACTION Adopt and implement a Stormwater Management Ordinance that will comprehensively regulate stormwater volume in addition to stormwater quality.

ACTION Continue to enforce the Town's Floodplain Overlay District to protect floodplain areas from encroachment and residents and businesses from potential harm.

ACTION Update FEMA floodplain maps to reflect the new development, loss of wetlands, and fill occurring in and around the Town.

ACTION Encourage the use of landscaping practices that minimize impervious areas and maximize vegetation to allow rain water to infiltrate into the soil rather than become overland stormwater runoff.

Buffer Areas and Wildlife Habitat Corridors

STRATEGY Protect existing vegetated stream buffer areas and identify opportunities to restore impaired stream buffers and wildlife habitat corridors.

ACTION Enforce and strengthen CBPO provisions to protect the 100 foot RPA Buffer Area along tributary streams.

ACTION Continue to protect the Town's stream valleys, which serve as critical habitat area, from further encroachment. Identify any additional parcels that have the potential for use as permanent Town open space along the Town's stream valleys.

ACTION Continue to enforce the Town's Urban Forestry and Landscaping Ordinance.

Point Sources of Pollution

STRATEGY Protect the Town's water resources from the avoidable impacts of existing and potential point sources of pollution including petroleum transmission mains, septic systems, sanitary sewer lines, and hazardous household materials.

ACTION Ensure that owners of pipeline transmission lines, such as Colonial Oil Pipeline, comply with all applicable laws for inspection of lines and safe operating practices.

ACTION Establish a Town Household Hazardous Materials drop-off and collection program for homeowners, to operate at specific times, such as during Fall and Spring clean-ups. Drop-off would require proof of Town residence. Town would arrange for transfer to Fairfax County facility, perhaps with special volunteer assistance.

ACTION Continue to work with the Fairfax County Health Department to ensure that the five year septic system pump out provisions of the Chesapeake Bay Preservation Act are adequately enforced. Identify Town lots with septic systems and provide information to residents on the pump out program.

ACTION Identify leaking sanitary sewer or stormsewer lines that contribute to degraded local water quality and elevated levels of fecal coliform bacteria. Develop a plan for replacing or repairing sanitary sewers that are identified as experiencing significant exfiltration.

Education Strategy

STRATEGY Educate and involve residents in environmental and water quality protection activities.

ACTION Work with and support citizen and business groups to implement environmentally beneficial projects identified above including watershed awareness, wildlife habitat gardening, rain gardens, invasive plant removal, native plant restoration projects, water quality monitoring, riparian restoration, stormdrain stenciling, and watershed assessments.

ACTION Work closely with the Northern Virginia Soil and Water Conservation District to implement a strategic nonpoint source pollution program (based on the NVSWCD's Backyard to the Bay program) for the Town that will prevent pollution at its sources.

ACTION Expand learning-and-doing stewardship activities, increasing educational component of ongoing stream clean up and wetlands habitat restoration projects that combine basic resource information with community service opportunities.

ACTION Utilize Runnymede Park natural areas, volunteers, and future nature center to expand existing watershed awareness educational programs that further public sensitivity and understanding of hydrologic systems and human interactions.

ACTION Implement a public education campaign aimed at enforcing and strengthening the Town's animal waste control laws.

ACTION Develop a database of households with above ground storage tanks and implement an education program (such as a informational mailing) aimed at preventing accidental discharges.

ACTION Continue to educate citizens and businesses on proper disposal of hazardous materials, such as paint, pesticides, and petroleum products through Town publications.

ACTION Implement a water conservation education program using water billing statements as a distribution vehicle. Use the City of Fairfax's program as a model.

ACTION Conduct seminars or workshops, in cooperation with NVSWCD and other knowledgeable entities or individuals, for staff members and elected or appointed decision-makers. This will increase understanding of physical constraints, natural and constructed water management processes and systems, and impacts of decisions on water quality.

GOAL 2 Restore degraded streams so that they are capable of supporting aquatic life.

Data and Planning Needs

STRATEGY Gather the data necessary for the Town to strategically restore its sensitive natural resources and to target public education projects.

ACTION Support the expansion of the Metropolitan Washington Council of Government's stream assessment of the Sugarland Run mainstem to include Folly Lick Branch, Spring Branch, and other tributaries. Use local volunteer organizations and other community groups in order to expand awareness of local water quality issues.

ACTION Implement a systematic, Town-wide program to update environmental and water quality baseline data (including floodplain designations and wetland identification) to ensure that incorrect or outdated information is not carried forward into future planning and assessment efforts.

ACTION Expand the Town's water quality monitoring efforts through the use of local volunteer and environmental groups or by contracting with the Fairfax County Health Department.

ACTION Map mature forest areas and groves within the Town in order to better utilize the Town's Urban Forestry and Landscaping Ordinance and to provide the Town with a better picture of

how reforestation and protection can better link existing resources.

ACTION Update the Parks and Recreation Plan and include it as part of a Town Open Space Plan that identifies passive and active recreation areas, affiliated recreational facilities, and urban public spaces. Include wildlife habitat value enhancement guidelines and natural area management guidelines. Include environmentally-sensitive management guidelines for all types of open space in the Town.

ACTION Develop and implement a Town-wide watershed restoration and protection plan in order to improve local water quality and wildlife habitat. Use water quality monitoring data in order to pinpoint potential sources of pollution and a stream reach assessment, including an inventory of denuded stream reaches, as the basis of the plan. To the extent practicable, incorporate these restoration and planning principles into the Town's Stormwater Management plan currently under development.

Habitat Enhancement

STRATEGY Reduce identified barriers to the restoration of degraded streams that are otherwise capable of supporting diverse aquatic habitats.

ACTION Help coordinate or provide proper maintenance to the newly reforested section of Sugarland Run from the Dulles Toll Road to the W&OD Trail to ensure that long term benefits of a riparian forest buffer are realized.

ACTION Investigate and implement ways to reduce the impact of fish impediments in the Sugarland Run mainstem and encourage Fairfax and Loudoun counties to find ways to provide increased fish mobility in the downstream portions of Sugarland Run.

ACTION Devise and incorporate detention capabilities in the denuded section of Sugarland Run between Dulles Toll Road and the W&OD Trail, in addition to recently planted trees, and even

in place of some seedlings, to achieve more immediate water-quality improvement, as well as other benefits, downstream.

GOAL 3 Protect the Town's groundwater resources.

STRATEGY Utilize existing Town ordinances and State programs to maximize groundwater recharge potential and to reduce the threat that underground storage facilities pose to groundwater resources.

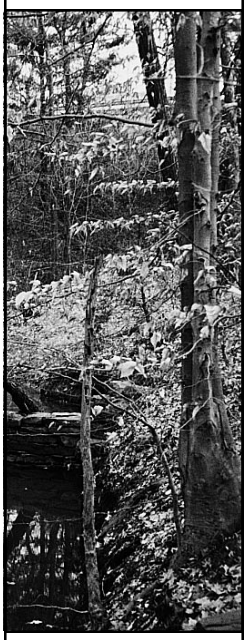
ACTION Continue to work with the Virginia Department of Environmental Quality to ensure that owners of underground storage facilities comply with all applicable laws.

ACTION Maximize groundwater recharge potential through the Town's Chesapeake Bay Preservation Ordinance by minimizing impervious surface area and promoting the use of porous pavement.

Implementation Plan and Time Line
VII

This section outlines the responsibilities and time lines for implementing the actions identified in Section VI. For each action item, information is provided on Primary Responsibility, Fiscal Impact, Capital Improvement Program (CIP) Impact, and Time Frame. Many of the action items can be implemented with negligible fiscal impact because they refer to the continuation or expansion of existing Town programs. In most cases where a fiscal impact is noted, it is in the form of staff time allocated to perform the coordination and research that is required to develop, improve, or expand environmental programs or regulations.

Each action item is scheduled to be achieved on an ongoing basis or within a time frame that is short – defined as within one year of adoption – or long – defined as over one year. Ongoing actions are those activities which should occur on a regular and continuing basis.



STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
GOAL 1 **Protect the Town's streams, and consequently the Potomac River and Chesapeake Bay, from the avoidable impacts of land development and human activities.**					
Integrated Watershed Management Plan Optimize water quality and resource protection through the strategic use of structural and nonstructural BMPs to address all sources and types of pollutants. Share information with Fairfax County and local, State, and regional organizations involved in water quality protection to avoid redundancy and to identify enforcement or programmatic gaps.					
Stormwater Management Ensure that there is no net increase in nonpoint source pollution destined for the Chesapeake Bay as a result of new development and reduce the impacts of existing land uses as a result of redevelopment.	Vigorously enforce the provisions of the Town's Chesapeake Bay Preservation Ordinance and Erosion and Sediment Control provisions, to ensure that they are effective stormwater management tools.	Community Development	–	–	Ongoing
	Strengthen the requirements to qualify for the Town's CBPO "opt-out" provision or eliminate the "opt-out" provision altogether to require the use of stormwater quality BMPs for all development.	Attorney	–	–	Long

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
	Plan and implement cooperative/regional stormwater management controls, where appropriate, to improve overall water quality management and decrease the overall maintenance burden.	Public Works	Yes	Yes	Short
	Encourage the use of BMPs which require no surface space (such as sand filtration systems) in densely developed sections of the Town to address water quality issues without detracting from the urban character of the area.	Public Works	–	–	Long
	Continue to require and enforce a strong maintenance program for public and private BMPs to ensure the long-term effectiveness of these facilities.	Public Works	–	–	Ongoing
	Encourage site design that minimizes impervious surface areas, including the use of porous pavement, and maximizes the preservation of indigenous vegetation.	Community Development	–	–	Ongoing
	Perform a review of the Town's Zoning and Subdivision ordinances to identify opportunities for reducing impervious surface requirements during the site plan development and review process.	Community Development	Yes	–	Long
	Ensure that all development avoids unnecessary impacts on sensitive environmental features and that development takes appropriate measures to avoid improper development on sensitive soils.	Community Development	–	–	Ongoing

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
	Amend the Town's Zoning Ordinance to include site design guidelines that encourage clustering in order to preserve sensitive soil areas as permanent open space.	Community Development	Yes	–	Long
	Ensure that development and redevelopment practices for municipally-owned land are undertaken using environmentally sensitive techniques. Publicize these practices in order to serve as a model for other development projects.	Community Development	Yes	Yes	Ongoing
	Work to reduce the contribution of atmospheric deposition to water quality problems by working with Fairfax County and the Metropolitan Washington Air Quality Committee.	Community Development	Yes	–	Ongoing
	Continue to use the redevelopment performance criteria of the Town's CBPO as an opportunity to reduce nonpoint source pollution from previously developed land.	Community Development	–	–	Ongoing
Protect local streams from the adverse impacts of increased stormwater volume and velocity as a result of increased land imperviousness.	Adopt and implement a Stormwater Management Ordinance that will comprehensively regulate stormwater volume in addition to stormwater quality.	Public Works	Yes	–	Long
	Continue to enforce the Town's Floodplain Overlay District to protect floodplain areas from encroachment and residents and businesses from potential harm.	Community Development	–	–	Ongoing
	Update FEMA floodplain maps to reflect the new development, loss of wetlands, and fill occurring in and around the Town.	Public Works	Yes	–	Short

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
	Encourage the use of landscaping practices that minimize impervious areas and maximize vegetation to allow rain water to infiltrate into the soil rather than become overland stormwater runoff.	Community Development	–	–	Ongoing
Buffer Areas and Wildlife Habitat Corridors					
Protect existing vegetated stream buffer areas and identify opportunities to restore impaired stream buffers and wildlife habitat corridors.	Enforce and strengthen CBPO provisions to protect the 100 foot RPA Buffer Area along tributary streams.	Community Development	–	–	Short
	Continue to protect the Town's stream valleys, which serve as critical habitat area, from further encroachment. Identify any additional parcels that have the potential for use as permanent Town open space along the Town's stream valleys.	Community Development	Yes	Possible	Long
	Continue to enforce the Town's Urban Forestry and Landscaping Ordinance.	Community Development	–	–	Ongoing
Point Sources of Pollution					
Protect the Town's water resources from the avoidable impacts of existing and potential point sources of pollution including petroleum transmission mains, septic systems, sanitary sewer lines, and hazardous household materials.	Ensure that owners of pipeline transmission lines, such as Colonial Oil Pipeline, comply with all applicable laws for inspection of lines and safe operating practices.	Public Works	Yes	–	Ongoing

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
	Establish a Town Household Hazardous Materials drop-off and collection program for homeowners, to operate at specific times, such as during Fall and Spring clean-ups. Drop-off would require proof of Town residence. Town would arrange for transfer to Fairfax County facility, perhaps with special volunteer assistance.	Public Works	Yes	–	Short/Ongoing
	Continue to work with the Fairfax County Health Department to ensure that the five year septic system pump out provisions of the Chesapeake Bay Preservation Act are adequately enforced. Identify Town lots with septic systems and provide information to residents on the pump out program.	Public Works	Yes	–	Ongoing
	Identify leaking sanitary sewer or stormsewer lines that contribute to degraded local water quality and elevated levels of fecal coliform bacteria. Develop a plan for replacing or repairing sanitary sewers that are identified as experiencing significant exfiltration.	Public Works	Yes	Yes	Short/Ongoing
Education Strategy					
Educate and involve residents in environmental and water quality protection activities.	Work with and support citizen and business groups to implement environmentally beneficial projects identified above including watershed awareness, wildlife habitat gardening, rain gardens, invasive plant removal, native plant restoration projects, water quality monitoring, riparian restoration, stormdrain stenciling, and watershed assessments.	Community Development	Yes	–	Ongoing

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
	Work closely with the Northern Virginia Soil and Water Conservation District to implement a strategic nonpoint source pollution program (based on the NVSWCD's Backyard to the Bay program) for the Town that will prevent pollution at its sources.	Community Development	Yes	–	Ongoing
	Expand learning-and-doing stewardship activities, increasing educational component of ongoing stream clean up and wetlands habitat restoration projects that combine basic resource information with community service opportunities.	Community Development	Yes	–	Long
	Utilize Runnymede Park natural areas, volunteers, and future nature center to expand existing watershed awareness educational programs that further public sensitivity and understanding of hydrologic systems and human interactions.	Parks and Recreation	Yes	–	Ongoing
	Implement a public education campaign aimed at enforcing and strengthening the Town's animal waste control laws.	Police	Yes	–	Short/Ongoing
	Develop a database of households with above ground storage tanks and implement an education program (such as a informational mailing) aimed at preventing accidental discharges.	Public Works	Yes	–	Long
	Continue to educate citizens and businesses on proper disposal of hazardous materials, such as paint, pesticides, and petroleum products through Town publications.	Public Works	Yes	–	Long

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
	Implement a water conservation education program using water billing statements as a distribution vehicle. Use the City of Fairfax's program as a model.	Public Works	Yes	–	Periodic
	Conduct seminars or workshops, in cooperation with NVSWCD and other knowledgeable entities or individuals, for staff members and elected or appointed decision-makers. This will increase understanding of physical constraints, natural and constructed water management processes and systems, and impacts of decisions on water quality.	Community Development	Yes	–	Ongoing
GOAL 2 **Restore degraded streams so that they are capable of supporting aquatic life.**					
Data and Planning Needs					
Gather the data necessary for the Town to strategically restore its sensitive natural resources and to target public education projects.	Support the expansion of the Metropolitan Washington Council of Government's stream assessment of the Sugarland Run mainstem to include Folly Lick Branch, Spring Branch, and other tributaries. Use local volunteer organizations and other community groups in order to expand awareness of local water quality issues.	Community Development	Yes	–	Long
	Implement a systematic, Town-wide program to update environmental and water quality base-line data (including floodplain designations and wetland identification) to ensure that incorrect or outdated information is not carried forward into future planning and assessment efforts.	Community Development	Yes	–	Ongoing

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
	Expand the Town's water quality monitoring efforts through the use of local volunteer and environmental groups or by contracting with the Fairfax County Health Department.	Public Works	Yes	–	Long
	Map mature forest areas and groves within the Town in order to better utilize the Town's Urban Forestry and Landscaping Ordinance and to provide the Town with a better picture of how reforestation and protection can better link existing resources.	Community Development	Yes	Possible	Long
	Update the Parks and Recreation Plan and include it as part of a Town Open Space Plan that identifies passive and active recreation areas, affiliated recreational facilities, and urban public spaces. Include wildlife habitat value enhancement guidelines and natural area management guidelines. Include environmentally-sensitive management guidelines for all types of open space in the Town.	Community Development	Yes	Possible	Long
	Develop and implement a Town-wide watershed restoration and protection plan in order to improve local water quality and wildlife habitat. Use water quality monitoring data in order to pinpoint potential sources of pollution and a stream reach assessment, including an inventory of denuded stream reaches, as the basis of the plan. To the extent practicable, incorporate these restoration and planning principles into the Town's Stormwater Management plan currently under development.	Community Development	Yes	–	Long

STRATEGY	ACTION	PRIMARY RESPONSIBILITY	FISCAL IMPACT	CIP IMPACT	TIMEFRAME COMPLETION
Habitat Enhancement					
Reduce identified barriers to the restoration of degraded streams that are otherwise capable of supporting diverse aquatic habitats.	Help coordinate or provide proper maintenance to the newly reforested section of Sugarland Run from the Dulles Toll Road to the W&OD Trail to ensure that long term benefits of a riparian forest buffer are realized.	Community Development	Yes	–	Long
	Investigate and Implement ways to reduce the impact of fish impediments in the Sugarland Run mainstem and encourage Fairfax and Loudoun counties to find ways to provide increased fish mobility in the downstream portions of Sugarland Run.	Community Development	Yes	Possible	Long
	Devise and incorporate detention capabilities in the denuded section of Sugarland Run between Dulles Toll Road and the W&OD Trail, in addition to recently planted trees, and even in place of some seedlings, to achieve more immediate water-quality improvement, as well as other benefits, downstream.	Public Works	Yes	Yes	Long
GOAL 3 **Protect the Town's groundwater resources.**					
Utilize existing Town ordinances and State programs to maximize groundwater recharge potential and to reduce the threat that underground storage facilities pose to groundwater resources.	Continue to work with the Virginia Department of Environmental Quality to ensure that owners of underground storage facilities comply with all applicable laws.	Public works	Yes	–	Ongoing
	Maximize groundwater recharge potential through the Town's Chesapeake Bay Preservation Ordinance by minimizing impervious surface area and promoting the use of porous pavement.	Community Development	–	–	Ongoing

COMPREHENSIVE STORMWATER MASTER PLAN

Town of Herndon, Virginia

Adopted June 13, 2000

CPA #00-1

TOWN OF HERNDON
COMPREHENSIVE STORMWATER MASTER PLAN

Prepared by the Town of Herndon, Virginia
777 Lynn Street
P.O. Box 427
Herndon, Virginia 20172-0427
(703) 435-6805

Under contract to the
Northern Virginia Regional Commission
Contract 98-2 Task Order #1

June 13, 2000

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Appendices

INTRODUCTION

The Town of Herndon is confronted with increasingly more complex stormwater management requirements and needs in order to comply with State and federal regulations and to protect the Town's streams and other natural resources from the impacts of urban development and land use activities. The purpose of this Comprehensive Stormwater Master Plan is to help make sense of the multitude of State and federal stormwater management mandates and regulations encumbered upon the Town and to provide the Town with a decision-making tool to implement a comprehensive stormwater management program. The plan identifies existing and possible future federal and State regulations and mandates relating to stormwater quality and quantity management that require, or will require, positive action by the Town of Herndon. In addition, the plan investigates programs that, while optional, the Town may wish to adopt in order to further locally identified environmental goals. Finally, the plan investigates the various funding opportunities for the Town as it proceeds with plan implementation. The Comprehensive Stormwater Master Plan is organized into eleven parts:

Introduction
Summary of Stormwater Action Priorities
Glossary and Acronyms

I. Herndon's Stormwater Management Ordinances and Programs
II. Existing and Potential Stormwater Management Mandates
III. Optional Stormwater Management Programs
IV. Stormwater Management Funding Opportunities
V. Recommendations for Action

Appendix A. Summary of Federal and State Stormwater Management Regulations
Appendix B. Costs and Contacts
Appendix C. Comprehensive Plan Implementation Table

EXECUTIVE SUMMARY AND ACTION PRIORITIES

The primary goal of this Plan is to identify actions necessary to bring the Town into compliance with existing and future State and federal stormwater management mandates and to identify additional measures necessary to protect water quality and habitat in the Town's streams. This was accomplished by conducting an assessment of existing Town programs and ordinances, existing and future stormwater mandates, and voluntary opportunities for stormwater management.

While there are many factors driving changes to the Town's existing stormwater management programs, most are related to four core areas including:

- Changes to Town programs necessitated by upcoming federal Clean Water Act NPDES Phase II permit requirements;
- Changes to Town ordinances and programs resulting from existing and future Chesapeake Bay Preservation Act requirements;
- Updates to the Town's Pro Rata Share Program; and,
- Voluntary adoption of a Stormwater Management Ordinance.

In addition to these core areas, other actions identified for consideration by the Town to enhance its stormwater planning and management capabilities include:

- Identifying additional wetlands resources in the Town for planning purposes;
- Submitting changes to floodplains to the Federal Emergency Management Agency and requesting re-mapping of Town floodplains; and,
- Investigating additional funding sources for stormwater management, including Fairfax County's consideration of a Stormwater Utility Fee.

The following table is a summary and prioritization of recommendations (actions resulting from a mandate) and suggestions (optional actions) presented in this document. Priorities are based on need for complying with State and federal mandates, timing with other program elements, benefit to Herndon's environment, and cost-benefit to the Town. Priority nomenclature includes:

Now: There is an immediate need or desire for action.
Near Term (FY01): Action is needed or desirable within Fiscal Year 2001.

Near Term (FY02): Action is needed or desirable within Fiscal Year 2002.
Mid Term: Immediate action not required, action needed or desirable within 3 to 5 year time period.
Long Term: Immediate action not required, action can be carried out over long term (greater than 5 years).

Each action item includes a page reference where the reader can obtain background information and analysis of the issue.

ACTION	PRIORITY	WHY A PRIORITY/ EXPLANATION	MANDATE OR OPTION
STORMWATER MANAGEMENT ORDINANCE			
Adopt Stormwater Management Ordinance (p. III.1, V.6)	**NOW**	Funding available to the NVRC through grant from Virginia Coastal Program which expires 9/30/00. Comprehensive Plan recommendation.	Option. Serves to streamline many Town ordinances under one umbrella.
PRO RATA SHARE PROGRAM			
Update Pro Rata Share program – project identification. (p. I.7, IV.1, V.7)	**NEAR TERM (01) (1-6 months)**	Projects for the Town's Pro Rata Share program have not been updated for several years. Northern Virginia Regional Commission performed baseline mapping work in FY 2000. Comprehensive Plan recommendation.	Option. Needs to be updated to maintain as a credible funding source.
Update Pro Rata Share program – projection of engineering costs. (p. I.7, IV.1, V.7)	**NEAR TERM (01) (6-12 months)**	Same as above. Need to develop costs associated with implementation projects in order to adjust Pro Rata Share fee.	Option. Needs to be updated to maintain as a credible funding source.
Update Pro Rata Share program – cost structure update, make ordinance more flexible to handle increased assessments of need. (p. I.7, IV.1, V.7)	**NEAR TERM (02)**	Same as above. Cost structure needs to be updated based on identified engineering costs and analysis of watershed imperviousness at build-out.	Option. Needs to be updated to maintain as a credible funding source.

CHESAPEAKE BAY PRESERVATION ORDINANCE			
Incorporate a policy requiring private BMP owners provide annual inspection to the Town. (II.4, V.5)	**NEAR TERM (01)**	Future compliance issue. Failure to implement may result in future maintenance cost burdens to the Town.	Strategy optional. Action mandatory.
Eliminate RMA opt-out provisions of the CBPO. (III.3, V.4)	**NEAR TERM (01)**	Comprehensive Plan recommendation. Relatively simple amendment – requires outreach to development community. Coordinate with other amendments to the CBPO and upcoming changes to the Chesapeake Bay Act Regulations (expected within a year). Funding may be available from CBLAD.	Option.
Allow for fee-in-lieu of on-site BMPs under certain scenarios. (IV.3, V.4)	**NEAR TERM (01)**	Same as above.	Option.
Incorporate civil penalties into Chesapeake Bay Preservation Ordinance. (III.3, V.4)	**NEAR TERM (01)**	Same as above.	Option.
Implement a system for tracking variances and waivers of Chesapeake Bay Ordinance. (II.4, V.4)	**MID TERM**	Future compliance issue. Dependent on ability of CBLAD to move on the issue.	Strategy optional. Action mandatory.
Submit Subdivision and Zoning Ordinances to CBLAD for review. (II.4, V.4)	**MID TERM**	Future compliance issue. Dependent on ability of CBLAD to move on the issue.	Mandate.

FEDERAL CLEAN WATER ACT REQUIREMENTS (NPDES PHASE II)			
Incorporate sanitary sewer lines and minor storm sewer lines/outfalls into Town GIS. (II.5, V.2)	**NEAR TERM (01)**	Need as base for NPDES compliance. Major storm sewer lines and outfalls already digitized per contract with NVPDC. Permit application due 2003. Compliance by 2008.	Mandate.

Implement a Town-sponsored used oil, filters, and antifreeze recycling program. (II.5, V.2)	**NEAR TERM (01)**	Recommended for compliance with NPDES in recognition of decreasing private sector participation. The Town should watch for potential legislation at the 2001 General Assembly, which may make funding available for local governments to a recycling infrastructure.	Strategy optional.
Implement dry weather storm sewer outfall monitoring program. (II.5, V.2)	**NEAR TERM (02)**	Required for compliance with NPDES. Implementation to occur no later than 2008, but early implementation will help Town identify pollution hot-spots.	Mandate.
Implement a public education program on dog waste disposal regulations. (II.5, V.2)	**NEAR TERM (02)**	Recommended for compliance with NPDES. Implementation to occur no later than 2008, but early implementation desirable.	Strategy optional. Action mandatory.
Implement a storm drain stenciling/ labeling program and a related public education program. (II.5, V.2)	**NEAR TERM (02)**	Recommended for compliance with NPDES. Implementation to occur no later than 2008, but early implementation desirable.	Strategy optional.
Implement a point of purchase placard program for oil and antifreeze recycling. (II.5, V.2)	**NEAR TERM (02)**	Recommended for compliance with NPDES. Town should watch for potential legislation at the 2001 General Assembly, which may result in State-wide program.	Strategy optional.
Implement annual or semi-annual household hazardous materials drop-off collection day in coordination with Fairfax County. (II.5, V.5)	**NEAR TERM (02)**	Recommended for compliance with NPDES. Implementation to occur no later than 2008, but early implementation desirable. Comprehensive Plan recommendation. May be cost-prohibitive if service provided full-time or independent from County.	Strategy optional.

OTHER PROJECTS/PROGRAMS			
Strongly encourage alternative BMPs acceptable to meet Chesapeake Bay Preservation Ordinance pollutant removal calculations.	**NOW**	To promote the use of other on-site stormwater management facilities within the Town other than traditional dry ponds.	Option.

Field survey of wetlands. (II.1, V.1)	**NEAR TERM (01)**	Comprehensive Plan recommendation. Relatively simple implementation.	Option.
Submit Letters of Map Revision (LOMRs) to Federal Emergency Management Agency for re-mapping consideration. (II.2, V.6)	**MID TERM**	Major changes in drainage patterns since 1979. While site-specific changes in floodways have been mapped, there is no recent information on how changes have affected floodways in other parts of the Town.	Option.
Expand base of BMPs acceptable to meet CBPO pollutant removal calculation requirements.	**MID TERM**	Allowable BMPs are largely governed by Fairfax County Public Facilities Manual. While innovative BMPs are permitted, several hurdles often result in the use of traditional dry pond BMPs. The Town will consider (1) developing its own design criteria for innovative BMPs, such as bioretention, or (2) working with the NVRC to incorporate alternative BMPs into the regional Northern Virginia BMP Handbook.	Option.
Investigate the future implementation of a Stormwater Utility Fee. (IV.1, V.8)	**LONG TERM**	Fairfax County is considering implementation of a Stormwater Utility Fee to provide a continuous funding source for stormwater infrastructure and maintenance. Herndon may also wish to consider the use of a SUF. One option under consideration by Fairfax County is to add a SUF to individual property tax bills. The Town needs to participate in the Fairfax process to ensure that if funds are collected from Town residents, which they are allocated for Town use.	Option.

GLOSSARY AND ACRONYMS

The following is a list of terms and acronyms used in this Plan. The list is meant to serve as a reference for readers and in no way should be construed as a legal document for the purpose of regulation or permitting.

- **303(d) List:** Refers to Section 303(d) of the federal Clean Water Act which requires each state to submit a list of water quality "impaired" streams, stream segments, or other water bodies to the U.S. Environmental Protection Agency on a bi-yearly basis. States are required to develop a TMDL (Total Maximum Daily Load) for each 303(d) stream or stream segment.
- **404 Wetland Delineation Criteria:** Refers to Section 404 of the federal Clean Water Act which authorizes the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency to protect wetlands. The actual delineation methodology is provided in the Corps "Wetlands Delineation Manual" (1987 version).
- **BMP/Best Management Practice:** A general term used to describe the most effective and practicable means of preventing or reducing pollution generated by nonpoint sources. The term is commonly used to refer to a structural stormwater management facility (such as wet and dry ponds, infiltration trenches, and sand filters) that is used to meet various water quality management requirements, but can also refer to nonstructural practices such as street sweeping and vegetative buffers.
- **Chesapeake Bay Agreement:** Agreement signed by Virginia, Maryland, Pennsylvania, the District of Columbia, the U.S. Environmental Protection Agency, and the Chesapeake Bay Commission (originally in 1983) establishing the Chesapeake Bay Program. Subsequent directives and amendments have been used to set new Chesapeake Bay Program policies and initiatives. The Virginia Chesapeake Bay Preservation Act was one outgrowth of Virginia's voluntary commitments under the Agreement.
- **CBLAB/Chesapeake Bay Local Assistance Board:** A Board created under the Virginia Chesapeake Bay Preservation Act to develop regulations, review local government ordinances and programs, and provide guidance to local governments on implementation of the Act.
- **CBLAD/Chesapeake Bay Local Assistance Department:** The Virginia agency formed to support CBLAB and to provide assistance to local governments on Chesapeake Bay Preservation Act implementation.

- **CBPA/Chesapeake Bay Preservation Area:** Area protected under a Chesapeake Bay Preservation Ordinance. A CBPA must include Resource Protection Areas and Resource Management Areas. A CBPA may also include, and in Herndon does include, Intensely Developed Areas.
- **CBPO/Chesapeake Bay Preservation Ordinance:** The ordinance adopted by a locality to meet the requirements of the Chesapeake Bay Preservation Act.
- **Chesapeake Bay Preservation Area Designation and Management Regulations:** The regulations stemming from the Chesapeake Bay Preservation Act which are promulgated by the Chesapeake Bay Local Assistance Board. The regulations are implemented in three phases: (1) mapping and ordinance adoption; (2) comprehensive planning; and (3) enforcement and voluntary audits.
- **Chesapeake Bay Program:** The program established under the U.S. Environmental Protection Agency to administer the interstate Chesapeake Bay Agreement. The program's main office is located in Annapolis, Maryland.
- **CRS/Community Rating System:** A program that provides flood insurance premium reductions for communities that exceed FEMA's minimum flood management criteria.
- **CWA/Clean Water Act:** The term commonly used to refer to the 1972 amendments to the Federal Water Pollution Control Act and subsequent amendments and reauthorizations to this Act. The Clean Water Act deals with a wide breadth of water issues including control of water pollution and protection of wetlands.
- **DCR/Department of Conservation and Recreation:** The lead Virginia agency on stormwater management and nonpoint source pollution issues.
- **DEQ/Department of Environmental Quality:** The lead Virginia regulatory agency for implementation of federal Clean Water Act provisions and the lead agency on point source pollution issues and wetland regulations.
- **E&S Ordinance/Erosion and Sediment Control Ordinance:** Local ordinance to implement the Virginia Erosion and Sediment Control Regulations and to define the methods used to regulate land-disturbing activities in order to minimize erosion.
- **Daylighting:** The process of returning a stream enclosed in a drainage pipe or culvert to a more natural, open condition.
- **Dry Weather Outfall Monitoring:** Refers to testing of water flowing from stormwater conveyance system outfalls during dry weather. The purpose is to detect illegal discharges to the stormwater system apart from pollutants that are flushed from impervious surfaces during a storm event. Dry weather monitoring is a required element of an NPDES Phase II permit.
- **FEMA/Federal Emergency Management Agency:** The federal agency responsible for oversight of local flood control ordinances and for mapping floodplains for insurance purposes.
- **FIRM/Flood Insurance Rate Map:** The official map developed by FEMA that designates local floodplains, associated flood risks, and the insurance rates associated with various risk zones. Boundaries of floodplains can be changed through a detailed on-site survey. Documented changed are submitted to FEMA in a Letter of Map Revision (LOMR).

- **Floodplain:** Lands that are periodically inundated by flood water. The "100-year floodplain" is the area that would be inundated by a storm expected to occur at an average of once in 100 years, although a 100-year storm may occur in any given year.
- **FPOD/Flood Plain Overlay District:** The district established under the Town's Zoning Ordinance that regulates building and development in the floodplain.
- **GIS/Geographic Information System:** Refers to a computer-based mapping system. A GIS contains layers of information that can be overlain with each other to perform analysis. Specific features may also have "attributes" or data associated with them to aid in analysis or mapping.
- **GPS/Global Positioning System:** Equipment that uses earth orbiting satellites to determine an exact longitudinal and latitudinal position. This information is often used in conjunction with a GIS for mapping purposes.
- **HHM/Household Hazardous Materials:** Household materials such a flammable liquids, pesticides, cleaning agents, etc. that are not appropriate for disposal through regular household garbage.
- **IDA/Intensely Developed Area:** A designation of a Chesapeake Bay Preservation Ordinance which recognizes that many of the ordinance's performance criteria are not applicable in heavily urbanized environments.
- **I&I/Inflow and Infiltration:** Refers to the problem of groundwater or surface water seeping or otherwise being misrouted to the sanitary sewer system. The excess water during rain events can overwhelm the sanitary sewer system and result in the discharge of only partially treated sewage.
- **Impervious Surface/Cover:** Surface composed of any material that significantly impedes or prevents natural infiltration of water into the soil. Impervious surfaces may include (but are not limited to) roofs, buildings, streets, parking areas, concrete, asphalt, and compacted gravel.
- **LOMR/Letter of Map Revision:** Official request to FEMA from a locality to modify a segment of a FEMA floodplain map or Flood Insurance Rate Map. LOMRs require significant detail and analysis to complete.
- **MS4/Municipal Separate Storm Sewer System:** Refers to a locality's storm sewer system including culverts, underground storm water pipes, and storm water outfalls to local streams. Under the Clean Water Act, localities must obtain an NPDES permit for their MS4.
- **NWP/Nation-Wide Permit:** A permit system established by the U.S. Army Corps of Engineers that provides a streamlined framework for allowing certain activities in wetlands and other waters of the United States.
- **NPS/Nonpoint Source Pollution:** Pollution that emanates from diffuse sources, such as runoff from agriculture and urban land development and uses.
- **Non-Tidal Wetlands:** Wetlands not affected by tides.
- **Northern Virginia BMP Handbook:** Handbook developed by the Northern Virginia Regional Commission and the Engineers and Surveyors Institute that outlines regionally

accepted standards for the implementation of BMPs to meet the Chesapeake Bay Preservation Act.

- **NPDES/National Pollutant Discharge Elimination System:** A permitting system established under the Clean Water Act that requires localities to reduce pollution from a storm sewer system to the maximum extent practicable. The permit requires a combination of monitoring, pollution prevention, and regulation. Federal implementation of NPDES includes Phase I (localities over 100,000) and Phase II (urban localities under 100,000).
- **NVRC/Northern Virginia Regional Commission:** Regional coordinating body representing 13 Northern Virginia localities, including Herndon. Virginia is divided into 21 regions, generally known as "Planning Districts." NVRC was called the Northern Virginia Planning District Commission until June, 2000.
- **NVSWCD/Northern Virginia Soil and Water Conservation District:** A political subdivision that works closely with the Chesapeake Bay Local Assistance Department and the Department of Conservation and Recreation to reduce nonpoint source pollution and conserve soil and water resources. The NVSWCD includes Fairfax County and its towns.
- **Point Source Pollution:** Pollution discharged from a clearly identifiable discrete source such as a factory or a sewage treatment plant.
- **Pro Rata Share:** Refers to a program that requires land developers to pay for their proportionate cost of managing stormwater in a particular watershed.
- **PFM/Public Facilities Manual:** A manual that provides specifications for the construction of public facilities and facilities that will be turned over for public maintenance. The Fairfax County Public Facilities Manual provides specifications for stormwater management facilities and BMPs.
- **Redevelopment:** Development within an existing impervious or disturbed area that is or has been previously developed.
- **RMA/Resource Management Area:** Refers to an element of a Chesapeake Bay Preservation Area. RMAs consist of lands on which improper use or development could cause significant water quality degradation. In Herndon, RMAs include all parts of the Town not specifically classified as Resource Protection Areas.
- **RPA/Resource Protection Area:** Refers to an element of a Chesapeake Bay Preservation Area. RPAs consist of lands that have an intrinsic water quality value due to the ecological and biological processes they perform, or that are sensitive to impacts which may result in significant degradation to the quality of state waters. In the Town of Herndon, this includes tributary streams, contiguous wetlands, and a one hundred-foot buffer around each of these features.
- **Source Control Fund:** A fund that can be created under a Chesapeake Bay Preservation Ordinance which developers may pay into in lieu of building on-site BMPs. The monies are to be used for water quality improvements and public education.
- **Storm Drain Stenciling/Labeling:** The process of stenciling or labeling a message on the face or top of a storm drain inlet. The message typically asks the public not to dump waste down an inlet because it drains to a local stream and the Chesapeake Bay. Stenciling

involves painting (usually with spray paint) a message; labeling is an alternative that involves gluing a prefabricated message onto the inlet.

- **Stormwater Detention:** Refers to any man-made structure that holds rainwater and then slowly releases it. Detention is used to reduce the velocity of water entering a natural stream system and to spread the volume out over a longer period of time. The purpose is to prevent erosion of stream banks and bottoms.
- **Stormwater Utility:** A user fee administered like a tax or service charge on all land owners that contribute runoff impacts. The monies collected from such a fee provide ongoing revenue to pay for stormwater management.
- **SWMO/Stormwater Management Ordinance:** An ordinance that may be adopted at local option under the Virginia Stormwater Management Regulations for the purpose of controlling stormwater volumes and velocities from developed land. The SWMO may also be used as an umbrella ordinance for Chesapeake Bay Preservation Act implementation and flood control requirements.
- **Tidal Wetlands:** Vegetated and non-vegetated wetlands influenced by tides. These are defined for legal purposes in 62.1-13.2 of the Code of Virginia.
- **TMDL/Total Maximum Daily Load:** A provision of the federal Clean Water Act that requires a TMDL to be developed for all "impaired" streams or water bodies. The acronym is taken from a maximum amount of a specific pollutant that can enter a system without violating surface water quality standards.
- **Tributary Stream:** Conceptually, any stream flowing into a water body to which it is a tributary. For example, Sugarland Run is a tributary to the Potomac, which is a tributary to the Chesapeake Bay. Under the Chesapeake Bay Preservation Area Designation and Management Regulations, a tributary stream is defined as any perennial stream appearing on the most recent USGS quadrangle map.
- **USACE/United States Army Corps of Engineers:** The federal agency that is responsible for administering federal wetlands regulations.
- **USEPA/United States Environmental Protection Agency:** The federal agency that is responsible for administering NPDES and TMDL requirements. In Virginia, oversight authority is provided to the Department of Environmental Quality.
- **USGS/United States Geological Survey:** The federal agency responsible for mapping and other land surveys. In Herndon, the USGS is responsible for producing the USGS quadrangle maps from which tributary streams under the Chesapeake Bay Preservation Ordinance are defined.
- **USGS Quadrangle Map:** Maps developed by the U.S. Geological Survey that show topography, streams and other water bodies, roads, and other features which cover 7 minutes of a degree of latitude and longitude. Also called "quad maps," the USGS produces them across the entire United States.
- **VPDES/Virginia Pollution Discharge Elimination System:** Virginia's equivalent of the National Pollution Discharge Elimination System that is run under the auspices of the U.S. EPA. Originally established in the 1970s to set limits on point sources of pollution, the program was expanded to cover pollution from MS4 systems in the 1990s.

- **VWPP/Virginia Water Protection Permit:** Refers to the permit required for any activity affecting State waters in Virginia such as streams and wetlands. The program is run by the Department of Environmental Quality. Some permits are run under the auspices of the U.S. Environmental Protection Agency.
- **WQIA/Water Quality Impact Assessment:** The study required under the Chesapeake Bay Preservation Ordinance any time that land-disturbing activity is proposed in a Resource Protection Area.
- **WQIF/Water Quality Improvement Fund:** A State fund established under the Virginia Water Quality Improvement Act of 1997 to support voluntary pollutant reduction efforts as outlined in Virginia's Tributary Strategies.
- **Wetlands:** Refers to areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.
- **Zoning Ordinance:** The part of a locality's Code dealing with permitted land uses and building and development.

PART I
TOWN STORMWATER MANAGEMENT ORDINANCES AND PROGRAMS

Part I of this Plan provides an overview of existing Town stormwater management ordinances and programs. The primary purpose of this overview is to provide a framework for comparing existing programs and ordinances with federal and State mandates as well as voluntary stormwater management options.

I.1 CHESAPEAKE BAY PRESERVATION CHAPTER TO THE TOWN OF HERNDON COMPREHENSIVE PLAN

The purpose of the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan is to establish a long-range vision for how to protect and restore the Town's creeks and streams as well as the natural habitats of the Chesapeake Bay and the Potomac River. The Chapter contains an inventory and analysis of the Town's water environment and establishes goals, policies, and action plans.

Section 15.446.1 of the Code of Virginia requires that each municipality in Virginia develop a comprehensive plan. The Virginia General Assembly, responding to growing citizen concern for the health of State waters and in particular the Chesapeake Bay and its tributaries, enacted the Chesapeake Bay Preservation Act in 1988. Section 10.1-2109.B of the Act states that "Counties, cities, and towns in Tidewater Virginia shall incorporate protection of the quality of State waters into each locality's comprehensive plan consistent with the provisions of this chapter."

In order to comply with the Chesapeake Bay Preservation Act, the Town, with assistance from the Northern Virginia Planning District Commission (now the Northern Virginia Regional Commission), adopted the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan on May 26, 1998. Actions relating to stormwater quality and quantity management in the Town (excluding those related to the enforcement of existing regulations or the continuation of existing programs) include the following.

(1) Strengthen the requirements to qualify for the Town's CBPO [Chesapeake Bay Preservation Ordinance] opt-out provisions or eliminate the opt-out provision altogether to require the use of stormwater quality BMPs for all development.
(2) Plan and implement cooperative/regional stormwater management controls, where appropriate, to improve overall water quality management and decrease the overall maintenance burden.
(3) Perform a review of the Town's Zoning and Subdivision ordinances to identify opportunities for reducing impervious surface space requirements during the site plan development and review process.
(4) Amend the Town's Zoning Ordinance to include site design guidelines that encourage clustering in order to preserve sensitive soil areas as permanent open space.

(5) Adopt and implement a Stormwater Management Ordinance that will comprehensively regulate stormwater volume in addition to stormwater quality.
(6) Update FEMA floodplain maps to reflect new development, loss of wetlands, and fill occurring in and around the Town.
(7) Establish a Town Household Hazardous Materials Drop-Off and Collection Program for homeowners, to operate at specific times, such as during Fall and Spring clean ups. The Town would arrange for transfer of materials to Fairfax County facility, perhaps with special volunteer assistance.
(8) Work closely with the Northern Virginia Soil and Water Conservation District to implement a strategic nonpoint source pollution program for the Town that will prevent pollution at its sources.
(9) Implement a public education campaign aimed at enforcing and strengthening the Town's animal waste control laws.
(10) Develop a database of households with above ground storage tanks and implement an education program aimed at preventing accidental discharges.
(11) Implement a water conservation education program using water billing statements as a distribution vehicle. Use the City of Fairfax's program as a model.
(12) Implement a systematic, Town-wide program to update environmental and water quality baseline data to ensure that incorrect or outdated information is not carried forward into future planning and assessment efforts.
(13) Expand the Town's water quality monitoring efforts through the use of local volunteers and environmental grounds or by contracting with the Fairfax County Health Department.
(14) Map mature forest areas and groves within the Town in order to better utilize the Town's Urban Forestry and Landscaping Ordinance and to provide the Town with a better picture of how reforestation and protection can better link existing resources.
(15) Develop and implement a Town-wide watershed restoration and protection plan in order to improve water quality and wildlife habitat. Use water quality monitoring data in order to pinpoint potential sources of pollution and a stream reach assessment, including an inventory of denuded stream reaches, as the basis of the plan. To the extent practicable, incorporate these restoration and planning principles into the Town's Stormwater Management Plan currently under development.
(16) Help coordinate or provide proper maintenance to the newly reforested section of Sugarland Run from Dulles Toll Road to the W&OD Trail.
(17) Devise and incorporate detention capabilities into denuded sections of Sugarland Run between Dulles Toll Road and the W&OD Trail.

All recommendations in this Plan are cross-checked in Appendix C to examine the extent to which they satisfy the goals of the Chesapeake Bay Preservation Chapter.

I.2 FLOODPLAIN OVERLAY DISTRICT

In 1979, the Federal Emergency Management Agency (FEMA) conducted a study of flooding potential and hazards in Herndon as part of its national flood insurance program. The study was meant to be used as a tool to assist the Town in effective floodplain management. The major results of this study was a Flood Insurance Rate Map for the Town (effective August 1, 1979)

and the subsequent adoption of a Floodplain Overlay District to protect the 100-year floodplain as part of the Town's Zoning Ordinance (Article VIII).

No development is allowed in the Floodplain Overlay District unless the effect of such development is fully offset by accompanying improvements that have been approved by all appropriate State and local authorities. The following uses, however, are allowed if the underlying zoning permits and given that they do not require structures, fill, or storage of materials and equipment.

- Agricultural uses such a general farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, forestry, and sod faring and wild crop harvesting.
- Public and private recreational uses and activities such as parks, day camps, picnic grounds, golf courses, boat launching and swimming areas, hiking and horseback riding trails, wildlife and nature preserves, game farms, fish hatcheries, trap and skeet ranges and hunting and fishing areas.
- Utilities and public facilities and improvements such as railroads, streets, bridges, transmission lines, pipelines, water and sewage treatment plants, and other related uses.

While the official FEMA map has not been redrawn since 1979, numerous changes to the floodplain designation have been granted by the Town Council and FEMA based on detailed, development-specific hydrologic studies. In these cases, Letters of Map Revision (LOMRs) are submitted to FEMA for technical review and incorporation by reference.

I.3 EROSION AND SEDIMENT CONTROL ORDINANCE

The purpose of the Town's Erosion and Sediment Control Ordinance is to prevent the degradation of local soil and water resources as a result of land disturbing activities by ensuring that the owner of the property on which land disturbing activities are being carried out provides adequate control of erosion and sedimentation. The Town's E&S Ordinance also requires the land owner to take necessary measures to preserve and protect trees and other vegetation during all phases of any land disturbing activity. The Town's E&S Ordinance implements the Erosion and Sediment Control Law (§10.1-560, *et seq*, Code of Virginia) and the Erosion and Sediment Control Regulations (VR 625-02-00) as well as the Chesapeake Bay Preservation Act.

Under the E&S Ordinance, land owners proposing a nonexempt regulated land disturbing activity of greater than 10,000 square feet (or 2,500 square feet in a Chesapeake Bay Preservation Area) must first submit an Erosion and Sediment Control Plan to the Town Department of Public Works. The Town's erosion and sediment control requirements are detailed in Chapter 26, Article III of the Town Code.

I.4 CHESAPEAKE BAY PRESERVATION ORDINANCE

The Chesapeake Bay Preservation Act establishes a program to protect environmentally sensitive features, which, when disturbed or developed incorrectly, lead to reductions in water quality. The Act provides a framework for local governments to identify these sensitive areas and to

enact regulations to better plan land use activities on and around them. Under the Act, the Town of Herndon is required to:

- protect existing high quality State waters and restore all other State waters to a condition or quality that will permit all reasonable public uses, and will support the propagation and growth of all aquatic life which might reasonably be expected to inhabit them;
- safeguard the clean waters of the Commonwealth from pollution;
- reduce existing sources of pollution; and,
- conserve water resources in order to provide for the health, safety, and welfare of the present and future citizens of the Commonwealth.

In accordance with the guidelines established by the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20 *et seq*), Chesapeake Bay Preservation Areas (CBPAs) were mapped and the Town adopted a Chesapeake Bay Preservation Overlay District as part of the Zoning Ordinance on January 22, 1991. The mapping of these areas, which include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) was based on a survey of existing natural resources documentation as well as field surveys.

Resource Protection Areas (RPAs) are lands at or near the "shoreline" (a regulatory definition which in Herndon means tributary streams) containing components which are especially sensitive because of (1) the intrinsic value of the ecological and biological processes they perform which benefit water quality, or (2) the potential for impacts that may cause significant degradation to the quality of State waters. The RPA designation within the Town includes a 100-foot vegetated buffer area located adjacent to and landward of all tributary streams and nontidal wetlands connected by surface flow and contiguous to tributary streams. These lands are excluded from development in most instances.

Resource Management Areas (RMAs) include land types that, if improperly developed, have the potential for causing significant water quality degradation or for diminishing the functional value of the RPA. The RMA within the Town incorporates, but is not limited to concentrations of the following land categories: floodplains; highly erodible soils; steep slopes greater than 15%; and nontidal wetlands not connected by surface flow to tributary streams.

The entire Town outside RPA and IDA areas (discussed below) has been designated as an RMA. However, a property may be excluded from the RMA if it can be demonstrated that RMA performance criteria are met in an area contiguous to and within 100 feet of the boundaries of the RPA and that the property is not characterized by floodplains, wetlands, highly erodible soils, or steep slopes greater than 15%. This option is frequently exercised in practice.

Intensely Developed Areas (IDAs) include areas in which pre-Chesapeake Bay Preservation Act development is concentrated and little of the natural environment remains. The concentrated nature of development in IDAs may not allow for the implementation of specific performance criteria in the Town's Ordinance. As a result, all development in the IDA is considered to be redevelopment and may be exempt from the buffer requirements of the RPA.

If the CBPA boundaries include a portion of a lot, parcel or development project, then only that portion must comply with the Town's Ordinance. However, division of property does not constitute an exemption from the Ordinance.

The CBPA "General Performance Criteria" that apply to all land within RPAs and RMAs are outlined in Appendix A.2. The two most important of these criteria from a stormwater management perspective include the following.

- For new development, the post-development nonpoint source pollution runoff load shall not exceed the predevelopment load based upon average land conditions (41% imperviousness for the Town).
- Redevelopment of any site not currently served by water quality best management practices shall achieve at least a 10% reduction of nonpoint source pollution in runoff compared to the existing runoff load from the site.

Implementation of the Chesapeake Bay Preservation Ordinance at the staff level is a cooperative responsibility of the Department of Community Development and the Department of Public Works. The only provision of the Ordinance, which is not the direct responsibility of the Town, is the 5-year septic pump-out provision. Enforcement of this provision is the responsibility of the Fairfax County Health Department.

I.5 FAIRFAX COUNTY PUBLIC FACILITIES MANUAL

In lieu of adopting a separate Stormwater Management Ordinance, the Town has adopted relevant portions of the Fairfax County Public Facilities Manual relating to stormwater management facilities. The purpose of these criteria is to require new development to provide stormwater detention to prevent flooding and streambank erosion caused by increased runoff from new impervious surface area. Fairfax County's program requires the following, as compared to the Virginia Stormwater Management Regulations.

Criteria	**Fairfax County**	**State Regulations**
Frequency	2-Year/10-Year	2-Year (vel.) 10-Year >Accepted
Duration	2-Hr <20 Ac 24-Hr >20 Ac	24-Hr
Distribution	FFX unit Hyd. For 2-Hr duration SCS Type II for 24-Hr duration	SCS Type II

I.6 STORMDRAIN AND SANITARY SEWER MAINTENANCE PROGRAM

To prevent the Town's sanitary sewer system from becoming a source of pollution (primarily fecal coliform bacteria and nutrients), the Town has implemented an extensive infiltration and inflow (I&I) program which consists of regular surveillance and repair of the sanitary conveyance systems through the use of Insituform technology and other main improvement methods. Over the last 12 years, the Town has rehabilitated 22,400 feet (4.2 miles) of sewer main with Insituform. In fiscal year 1999, 3,500 feet of main were scheduled for relining.

The Town does not have a similar program for inspecting its stormwater conveyance system. The Town performs a physical inspection of drain inlets twice a year to ensure that no clogging is taking place. However, there is no inspection of actual stormwater lines, nor is there a means of inspecting for illicit discharges to the system. Some means of inspecting for potential illicit discharges will be required under forthcoming NPDES Phase II requirements (see Section II.2.1).

I.7 POLLUTION PREVENTION PROGRAMS

Pollution prevention covers a broad range of programs aimed at modifying the human behavior or activity that causes pollution in the first place. Pollution prevention programs must be framed in a way that addresses specific pollution problems and provides viable alternatives to the pollution-generating activity. The Town, primarily through the Department of Community Development's community forester, is currently beginning to develop a pollution prevention program with the help of the Northern Virginia Soil and Water Conservation District.

Watershed awareness educational programs are conducted by volunteer organizations such as the Runnymede Rangers, Tree Action, the Friends of Runnymede Park, and the Friends of Sugarland Run in cooperation with the Parks and Recreation naturalist and the Community Development community forester. Well established stream clean-ups, sponsored jointly by Tree Action and the Town since 1987, have always included a public education component.

The Town intends to eventually implement a storm drain stenciling or labeling program to warn the public about dumping materials into stormdrains (a major source of oil and antifreeze contamination). The Town is investigating the potential for using a labeling technique that is different from the traditional "stenciling" approach. Instead, a plaque that can be affixed to the stormdrain structure could be used. The Town has not yet determined a final approach and is attempting to identify an outside funding source.

Finally, the Town staff continues to work successfully with the Herndon Centennial Golf Club to mitigate water quality problems associated with that particular land use. A number of actions have been taken to minimize adverse impacts to water quality including:

(1) use of organic-based slow release nitrogen sources;
(2) deep aerification of fairways and tees to four inches so that pesticides and nutrients will be absorbed before they have a chance to runoff;
(3) new spray equipment that allows staff to apply limited pesticides only to targeted areas;
(4) establishment of no-cut areas to act as filters for surface water and to provide habitat;
(5) pesticide application by two licensed applicators and one registered technician;
(6) installation of trash racks on the two main stormdrains that outfall through the golf course;
(7) integrated pest management combining cultural, biological, and chemical controls; and,
(8) course maintenance practices have been based on evaluations by an agronomist from the USGA Turf Advisory Service.

I.8 PRO RATA SHARE OFF-SITE DRAINAGE FACILITY PROGRAM

The purpose of a pro rata share program is to require land developers to pay their share of the cost of providing off-site drainage improvements made necessary, or required at least in part, by the development of land. The ultimate objective of the pro rata share program is to provide a *supplemental* funding source to implement adequate drainage facilities and to minimize damage to the drainage network and downstream receiving waters. Section 15.2-2243 of the Code of Virginia allows a locality to "provide in its subdivision ordinance for payment by a subdivider or developer of land of the pro rata share cost of providing reasonable and necessary sewerage, water, and drainage facilities, located outside of the land owned or controlled by the subdivider or developer…"

The maximum amount of revenue that can be collected through this program is limited to the increased cost of drainage facilities that are required to accommodate increased runoff from new development.

Because of a significant change in the Code of Virginia in 1990, pro rata funds may be allocated towards drainage projects located within an entire watershed. Formerly, improvements must have been located downstream of the development project. This change has allowed funds to be pooled for the implementation of priority projects throughout a watershed. However, before collecting pro rata funds in a particular watershed, the Code of Virginia requires that the locality adopt a general drainage improvement program.

The Town of Herndon's current rate structure and drainage improvement program was established in 1973 based on a study by Johnson and Williams, Consulting Engineers. At that time, the Town Council set the pro rata share rate at $2,000 per impervious acre for the Sugarland Run watershed and $3,500 per impervious acre for the Folly Lick Branch watershed.

The Town's rate structure was based on the proportionate share of the total cost of all required drainage improvements within each subwatershed that are related to new development or planned to offset the impact of stormwater from new development. Items that may be included are land acquisition, design, utility relocation, construction, and administrative costs associated with these projects. The proportionate share of the total cost of improvements was calculated by

determining the increase in imperviousness as a result of the development and comparing it to the difference between existing watershed imperviousness conditions and future build out conditions. Under Herndon's program, the cost of on-site stormwater management improvements is always considered the responsibility of the developer.

There is a stated need to update the Town's Pro Rata Share Program to reflect current stormwater management needs and anticipated growth projections.

I.8.1 Fairfax County's Pro Rata Share Program

The following is an overview of Fairfax County's pro rata share program as a potential framework for revision of the Town's program. It should be noted that while Fairfax County contains 30 watersheds, the Town would be dealing with as few as three watersheds – Sugarland Run, Folly Lick Branch, and Horsepen Run.

CRITERIA FOR INCLUDING PROJECTS IN PROGRAM: In order for a project to be included in a pro rata share program, it must meet certain qualifications. Under Virginia Code, it must be necessitated or required, at least in part, by the construction or improvement of the subdivision or development. Generally, on a watershed basis, all drainage improvements with undeveloped land upstream meet this qualification. Most regional BMPs, inadequate roadway crossings, and streambank erosion control projects are included in Fairfax County's program.

PROJECT COSTS: The cost estimate of each project in the program is updated using current design, land acquisition, construction, and administrative costs. Projects are then divided by watershed and their costs totaled to determine the total watershed costs for improvement projects contained in the program. Costs are updated semi-annually to reflect adjustments in accordance with the construction cost index as published in the Engineering News Record. A more comprehensive cost review is conducted on an as needed periodic basis.

LAND DEVELOPMENT: The current and projected ultimate land use levels are used to determine the increase in impervious area. Recent aerial photographs are used to input the current land use, or development level. The ultimate land use development level is prepared using the Comprehensive Plan and current zoning maps. By finding the current land use scenario and deducting it from the ultimate developed land scenario, a projected increase in impervious area is calculated.

RATE DETERMINATION: The total cost of the proposed projects within each watershed is multiplied by the ratio of the increase in impervious area of the watershed to the total impervious area at ultimate buildout. This provides the dollar amount of the total cost of all projects within each watershed that can be assessed to new development under the uniform pro rata share program.

This dollar amount that can be charged as pro rata share is then divided by the increase in impervious area for the specific watershed. This yields the cost per increase in impervious acre.

SELECTION CRITERIA FOR PROJECT IMPLEMENTATION: The procedure for implementation of specific projects is based on a priority system. For any project to be implemented with pro rata share funds it must be included in the pro rata share program. The following priority system is used for project implementation in Fairfax County.

1. To achieve State and federally mandated water quality requirements.
2. To alleviate structures from flooding.
3. To alleviate severe bank and channel erosion.
4. To alleviate minor bank and channel erosion.
5. To alleviate yard flooding.
6. To alleviate street flooding.

In addition, in limited situations the priority of projects may be administratively adjusted based on opportunities to participate with developers who wish to contribute over and above the minimum pro rata share requirements. Priority adjustments will be considered on a case by case basis.

I.8.2 Example of How to Determine Pro Rata Share

A hypothetical example of a pro rata share program assessment for Herndon might be as follows.

The Town anticipates that future streambank erosion mitigation, drainage improvement, and regional BMP implementation projects will cost $950,000. The Town determines that its current rate of imperviousness in the Sugarland Run watershed is 41%, or 1,102 acres, and its anticipated build-out rate of imperviousness is 50% (hypothetically based), or 1,344 acres. This means that there is an anticipated increase in imperviousness of 242 acres as a result of new development.

The rate is determined by taking the total cost of the proposed projects ($950,000) multiplying it by the ratio of the increase in impervious area to the total impervious area at ultimate build-out (242/1,344, or 0.18006). The result, $171,057, is the amount that can be assessed to new development under the program. To arrive at the cost that can be charged to a developer per increase in impervious acreage, the total dollar amount that can be charged under pro rata share ($171,057) is divided by the total increase in impervious area (242). The result is $706.85 per impervious acre.

Therefore, should a developer propose a project that increased imperviousness by 2.5 acres, the Town would collect $1,767.13.

I.8.3 1991 Town Stormwater Runoff Analysis

In 1991, the Town conducted an analysis of present and future stormwater runoff/land use conditions within the Town limits. The results were derived from the October, 1991 Zoning Map.

		EXISTING CONDITIONS		POST 2010 BUILDOUT	
Watershed	**Acreage**	**"C" Factor**	**% Impervious**	**"C" Factor**	**% Impervious**
Horsepen Run	451.4	0.55	41	0.63	52
Folly Lick Branch	1,045.3	0.51	39	0.53	42
Sugarland Run	1,254.1	0.54	42	0.66	57
Town-Wide	2,750.8	0.53	41	0.61	50

While primarily used as the basis for Chesapeake Bay Preservation Ordinance calculations (and not for the Town's Pro-Rata Share Program) the analysis is useful for informational and historical purposes.

MATRIX OF TOWN STORMWATER MANAGEMENT ORDINANCES AND PROGRAMS

Ordinance/ Program	Mandated/ Optional	Date Adopted	Major Stormwater Management Components	Administration
Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan	Mandated (Chesapeake Bay Preservation Act).	May 26, 1998	Establishes goals, policies, and action plans on stormwater quality and quantity issues.	Shared responsibility of Department of Community Development (DCD) and Department of Public Works (DPW).
Floodplain Overlay District (Article VIII)	Mandated for Town residents to receive flood insurance (National Flood Insurance Act/Virginia Flood Damage Reduction Act).	August 1, 1979	Prohibits development in floodplain unless the effect of such development is fully offset by accompanying improvements.	Shared responsibility DCD and DPW.
Erosion and Sediment Control Ordinance (Chapter 26)	Mandated (Virginia Erosion and Sediment Control Law).	September 28, 1993	Requires an Erosion and Sediment Control Plan for all land disturbing activities of 10,000 square feet or more (2,500 SF in areas subject to the Town's CBPO).	DPW.
Chesapeake Bay Preservation Ordinance (Article X)	Mandated (Chesapeake Bay Preservation Act).	January 22, 1991	Establishes stormwater quality performance criteria and other requirements for Chesapeake Bay Preservation Areas. No-net-increase in nonpoint source pollution from average jurisdiction-wide conditions for new development and 10% reduction in nonpoint source pollution from existing site conditions for redevelopment.	Shared responsibility DCD and DPW.

MATRIX OF TOWN STORMWATER MANAGEMENT ORDINANCES AND PROGRAMS

Ordinance/ Program	Mandated/ Optional	Date Adopted	Major Stormwater Management Components	Administration
Fairfax County Public Facilities Manual	Optional		Establishes stormwater volume control criteria Town-wide in lieu of the adoption of a separate Stormwater Management Ordinance. New development must control two-year/10-year frequency, two-hour (<20 acres)/24-hour (>20 acres) duration.	DPW.
Stormdrain and Sanitary Sewer Maintenance Program	Optional (future mandate under Clean Water Act).		Program to ensure the structural integrity of the Town's stormdrain and sanitary sewer system.	DPW.
Pollution Prevention Programs	Optional (future mandate under Clean Water Act).		Various public education and outreach programs; stormdrain labeling program; Centennial Golf Club pollution prevention program.	Shared responsibility DCD and Parks and Recreation.
Pro Rata Share Off-Site Drainage Facility Program	Optional	June 12, 1973	Program to provide a supplemental funding source to implement adequate drainage facilities and to minimize damage to downstream receiving waters. Maximum revenue is limited to the increased cost of facilities required to accommodate increased runoff.	DPW.

PART II
EXISTING AND POTENTIAL STORMWATER MANAGEMENT MANDATES

Part II provides an overview of existing stormwater management mandates as well as a description of potential mandates that the Town is likely to face in the foreseeable future. Each section contains a discussion of the mandate (organized by federal and State originating legislation), its impact (or potential impact) on the Town, and issues related to the implementation of the existing or future mandate. The reader is referred to Appendix A for a full summary of relevant federal and State stormwater management regulations.

II.1 EXISTING MANDATE*S*

II.1.1 Federal Clean Water Act Section 404 (Wetlands) Virginia Water Protection Permit

OVERVIEW: The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency, under Section 404 of the federal Clean Water Act, regulate the fill or disruption of the Town's wetlands. In Virginia, the mandates of the CWA Section 404 are enforced by the Department of Environmental Quality as Virginia Water Protection (VWP) permits (non-tidal wetlands). The U.S. Army Corps of Engineers has established a system of Nation-Wide Permits (NWPs) which allow for expedited review of small wetland/stream channel fill projects. Current NWP guidelines became effective February 11, 1997, although the Norfolk District of the Corps is in the process of finalizing replacement "Regional Permits."

IMPACT ON THE TOWN: The mandates of Section 404 primarily impact the development community. The Virginia Chesapeake Bay Preservation Area Designation and Management Regulations (through the Town's Chesapeake Bay Preservation Ordinance) require that a developer provide evidence to the Town that all proper wetland permits have been obtained before development may begin. It is the responsibility of the Town to ensure that this is indeed the case. Permits must also be obtained for all municipal projects, including Town road and utility projects (smaller road and utility projects are covered under NWPs 12 and 14).

ISSUES: The general locations of major wetlands in the Town are identified in the Chesapeake Bay Preservation Chapter of the Town's Comprehensive Plan. However, there has been no attempt made to identify wetland areas outside of the Folly Lick Branch and Sugarland Run mainstem areas. Delineation of these inland wetlands is required under Section 404 of the Clean Water Act during the development process using the U.S. Army Corps of Engineers' Wetlands Delineation Manual (1987 version). The Town should to pursue proactive screening-level field mapping of potential non-tidal wetland areas for planning purposes.

STATUS ON COMPLIANCE: The Town is fully compliant with wetland-related mandates.

II.1.2 National Flood Insurance Act and Flood Disaster Protection Act Virginia Flood Damage Reduction Act

OVERVIEW: The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 set up a process that requires local governments to adopt floodplain management criteria developed by the Federal Emergency Management Agency in order for residents in flood prone areas to qualify for federal flood insurance. The minimum criteria are found in 44 CFR 60.3. The National Flood Insurance Act is mimicked in the Code of Virginia as the Virginia Flood Damage Reduction Act (§10.1-600). Once a community has adopted a program, it is up to that community to enforce its provisions. However, FEMA conducts random "Community Assistance" visits that are designed to check or monitor the local flood management program. Although the State has no authority over the National Flood Insurance Program, the Department of Conservation and Recreation's Floodplain Management Program does provide technical assistance to communities on floodplain management issues.

IMPACT ON THE TOWN: Effective August 1, 1979, the Town's floodplain management program, formalized as the Town's Floodplain Overlay District, was accepted into the National Flood Insurance Program.

ISSUES: Although the FEMA floodplain maps are the primary legal basis for restricting encroachment into the floodplain, the actual limits of the 100-year-floodplain have changed over time due to development in and around the Town, loss of wetlands, and fill. The partial construction of the Fairfax County Parkway and the completion of the Herndon Parkway are significant contributors to changes in the limits of the 100-year floodplain. The Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan calls for the Department of Public Works to initiate an update of the FEMA floodplain maps within the next five years. According to FEMA representatives, there is very limited funding available to localities for updating floodplain maps. The Town would need to request a map update by sending FEMA's Region III office a letter describing exactly what needs to be done, justifications for the map, and include any information on areas that have already been re-mapped. The request is placed on a priority list depending on the need for the project. The priority list is always changing and there is usually a backlog of 70 applicants. There are only 5 to 10 studies conducted in any one year, therefore it takes from 1 to 5 years before anything is usually initiated.

According to the FEMA Technical Services Division, FEMA is currently undergoing a five year nation-wide screening exercise to better assess the mapping and technical needs of localities. As a result, the timing for the Town to submit a request for remapping is particularly opportune.

In addition, the Town could apply for a grant under the Flood Prevention Protection Fund (§10.1-603.16, Code of Virginia). The FPPF was established by Virginia, and is

administered by the Division of Soil and Water Conservation, to provide localities a 50% match for flood prevention or protection projects, including floodplain studies and mapping. Under this program, the Town would contract-out the floodplain study, which would be submitted to FEMA for incorporation into its program. The drawback is that matching funds are required.

The Town has the option of participating in the Community Rating System (CRS), which provides a premium reduction for communities exceeding minimum flood management criteria. However, conversations with the State and FEMA have brought the Town to the conclusion that the program benefits are not worth the extra effort.

STATUS ON COMPLIANCE: The Town is fully compliant with floodplain-related mandates.

II.1.3 Federal Chesapeake Bay Program
Chesapeake Bay Preservation Act/Chesapeake Bay Preservation Area Designation and Management Regulations

OVERVIEW: The 1983 Chesapeake Bay Agreement, fostered through the U.S. Environmental Protection Agency, established a cooperative effort among Virginia, Maryland, Pennsylvania, and the District of Columbia to improve water quality in the Chesapeake Bay. The most widely known result of this agreement in Virginia is the Chesapeake Bay Preservation Act of 1988 which is implemented in Herndon as the Chesapeake Bay Preservation Ordinance.

The Chesapeake Bay Local Assistance Department (CBLAD) has approached Chesapeake Bay Preservation Act implementation in three phases. Phase I is program development and ordinance adoption. Phase II is the incorporation of water quality into local comprehensive plans. Phase III involves (1) reconciliation of all local ordinances involving water quality and (2) establishing a system of State oversight over local program implementation. The Town is in compliance with Phase I and Phase II of Chesapeake Bay Act implementation.

IMPACT ON THE TOWN: The Town adopted a Chesapeake Bay Preservation Ordinance on January 22, 1991, which was found consistent with the Chesapeake Bay Act Regulations by the Chesapeake Bay Local Assistance Board. The Town adopted amendments to its Comprehensive Plan in the form of a Chesapeake Bay Preservation Chapter on May 26, 1998. CBLAD is embarking on a program to enforce or implement Phase III.

ISSUES: With regard to the Town's Chesapeake Bay Preservation Ordinance, the Chesapeake Bay Preservation Chapter to the Herndon Comprehensive Plan calls for the Town to tighten or eliminate the RMA opt-out provisions of its Ordinance. Further, the Chesapeake Bay Preservation Area Designation and Management Regulations are currently undergoing review and it is likely that changes will be made in 2000 or 2001.

Discussions with CBLAD staff has indicated that any changes affecting Herndon should be minor and may require very slight administrative amendments.

The only weak area of the Town's Phase I program is its private BMP maintenance inspection program. Although a maintenance agreement is part of the establishment of any private BMP, the Town has no means of follow-up to ensure that maintenance is adequately being performed. A cost-efficient approach used in Prince William County (§720.15 of the Prince William County Public Facilities Manual) is to require the owner of a private facility to provide annual inspections by a certified professional engineer and to provide a report to the Town which addresses the maintenance needs of the facility in accordance with the inspection.

Of potential concern to the Town is that CBLAD staff has recently taken on the issue of what defines a Resource Protection Area (RPA) under the Regulations. Under the Town's Ordinance, RPAs have been mapped for Folly Lick Branch, Sugarland Run, and portions of Spring Branch. The criterion used for these designations (as with most other Tidewater localities) is that the streams show up as "tributary streams" on USGS 7 1/2 minute quadrangle maps. However, CBLAD, in a letter to Arlington County, has held that limiting RPAs to these USGS "blue lines" when better information is available locally and/or through the site development process, is a violation of the intent of the Chesapeake Bay Preservation Act. In Arlington, an analysis has shown that the expanded RPA would double the number of parcels affected by the Act. This issue could have major implications for the Town, which contains a number of smaller free flowing streams not presently designated as RPA. There are many legal and practical questions associated with this issue – especially as it relates to retroactively designating RPAs. The Town should wait for additional legal guidance from CBLAD and the Commonwealth's Attorney General.

With regard to Phase III enforcement, the Town filing system makes no provision to distinguish whether opt-outs and/or waivers are approved or disapproved. This may make it difficult to make future reports to CBLAD. NVRC has approached CBLAD to determine whether there is a better way to track opt-outs granted by the Town.

STATUS ON COMPLIANCE: The Town is fully compliant with Phase I and Phase II Chesapeake Bay-related mandates – although there are several amendments to the Town's Ordinance that would strengthen implementation. In addition, the Town may need to readdress RPA designations depending upon the outcome of issues also discussed above. The BMP maintenance aspect of the Town's program is the only existing compliance issue of significant note. It is likely that the Town would easily comply with the reconciliation requirements of Phase III. However, it is also likely that the Town will have to change its opt-out and waiver tracking system in order to comply with a future CBLAD enforcement protocol.

II.1.4 Virginia Erosion and Sediment Control Law

OVERVIEW: The Erosion and Sediment Control Law of 1988 deals primarily with the control of erosion and sediment during the development process. The Law is codified as Section 21-89.1 *et seq* of the Code of Virginia. The regulations are applicable to land development projects disturbing 10,000 square feet or more, except in locally designated Chesapeake Bay Preservation Areas, where the Regulations are applicable at 2,500 square feet of disturbance. The Town has a jurisdiction-wide RMA; therefore, the 2,500 square feet threshold is applicable in all areas of Herndon.

IMPACT ON THE TOWN: The Town has adopted an Erosion and Sediment Control Ordinance that fully meets the requirements of State mandates.

ISSUES: None.

STATUS ON COMPLIANCE: The Town is fully compliant with erosion and sediment control-related mandates.

II.2 FUTURE MANDATES

II.2.1 Federal Clean Water Act Section 402 National Pollution Discharge Elimination System (NPDES) Phase II Municipal Separate Storm Sewer System (MS4) Permit
Virginia DEQ Pollution Discharge Elimination System Phase II MS4 Permit

OVERVIEW: As explained in further detail in Appendix A, Congress amended the CWA in 1987 to require phased NPDES requirements for municipal stormwater discharges. Phase I of NPDES (which is already being implemented) requires a two-part application process for discharges from systems serving large (500,000 or more people) or medium (100,000 to 500,000 people) municipalities.

Regulations for smaller urban municipalities (Phase II) with populations under 100,000 were published in the Federal Register on December 8, 1999. Herndon is noted specifically as being subject to NPDES Phase II under 40 CFR Parts 122 and 123. The Phase II permit process is greatly streamlined over the Phase I permit process. For instance, Phase II localities are encouraged to file a Notice of Intent (NOI) to comply with the requirements of a General Permit, rather than going through the process of applying for an individual permit. Once the permit is issued, a Phase II locality will have five years to comply with the permit's requirements. The current deadline to submit either an NOI to comply with General Permit requirements or an alternative permit application is March 10, 2003. Localities will be expected to achieve full implementation of the Phase II permit requirements by 2008.

Despite streamlining, all Phase II permit holders will have additional burdens placed on them to more closely account for, and minimize nonpoint source pollution within their borders. At a minimum, Phase II localities opting to comply with a General Permit will

be required to meet six minimum control measures. These minimum control measures are outlined in the following table. Required and recommended actions for each control are so noted.

NPDES MINIMUM CONTROL MEASURES	REQUIRED AND RECOMMENDED* ACTIONS
(1) Public Education and Outreach on Stormwater Impacts	• Brochures or fact sheets.* • Speaking engagements.* • Public service announcements.* • Educational programs in local school.* • Storm drain stenciling/labeling.* • Community clean-up events.*
(2) Public Involvement/Participation	• Comply with state and local public notice requirements. • Citizen stormwater committee.* • Citizen volunteer opportunities.*
(3) Illicit Discharge Detection and Elimination	• Develop a map of the stormsewer system, indicating outfall locations and receiving waters. • Prohibit by law illicit discharges into the MS4. • Develop and implement a plan to detect and address illicit discharges (i.e., dry weather flow monitoring). • Inform public employees, businesses, and the general public of hazards associated with illicit discharges.
(4) Construction Site Stormwater Runoff Control	• Adopt an ordinance that requires implementation of erosion and sediment controls on construction sites greater than one acre. • The ordinance must also specify proper measures for controlling waste at a site, such as concrete, truck washout, chemicals, litter, and sanitary waste. • Have procedures for site plan review, inspection and enforcement, and public complaints.
(5) Post-Construction Stormwater Management in New Development and Redevelopment	• Adopt an ordinance to address runoff from new development and redevelopment. • Implement strategies with a combination of structural and/or nonstructural BMPs. • Ensure adequate long-term operation and maintenance of BMPs.
(6) Pollution Prevention/Good Housekeeping for Municipal Operations	• Develop and Operations and Maintenance Program to prevent or reduce pollutant runoff from municipal operations. • Provide municipal employee training to prevent and reduce stormwater pollution.

A guidance menu of BMP measures to meet NPDES minimum requirements is anticipated to be issued by the U.S. EPA on October 27, 2000. Town staff attended a stormwater workshop on NPDES requirements on February 15, 2000.

IMPACT ON THE TOWN: The impact of NPDES to the Town could be fairly significant. In particular, the Town will need to invest more heavily in public education and outreach programs (a goal of the Chesapeake Bay Chapter to the Town of Herndon Comprehensive Plan). The Town's efforts to monitor its sanitary sewer system will need to be mimicked with its storm sewer system and additional mapping will be necessary. Currently, the Town performs a physical inspection of stormdrain inlets (not actual piping) twice a year and does not have a means of checking for illicit discharges.

Construction site stormwater runoff control requirements are largely covered by the Town's Erosion and Sediment Control Ordinance. While the Town's Chesapeake Bay Preservation Ordinance will go a long way towards meeting the post-construction stormwater management requirements, issues concerning BMP maintenance need to be addressed.

II.2.2 Federal Clean Water Act Section 303(d) Total Maximum Daily Load (TMDL) Regulations

OVERVIEW: Section 303(d) of the Clean Water Act requires that states identify pollutant-impaired stream segments and report them to the U.S. Environmental Protection Agency every two years (known as the "303(d) list"). In the late 1990s, environmental organizations around the nation successfully sued the U.S. EPA to implement a largely ignored component of Section 303 which requires states develop a TMDL, or Total Maximum Daily Load, for each stream segment on the 303(d) list. There are presently 240 impaired stream segments in Virginia, and the Commonwealth has signed a Memorandum of Understanding with the U.S. EPA to develop TMDLs for all of them by the year 2010.

A TMDL is a plan that allocates by source the maximum load of a specific pollutant that can enter a water body without exceeding in-stream water quality standards. For instance, if a stream segment is impaired for fecal coliform, all sources of fecal coliform would need to be identified. Each source would then be assigned a numerical limit to meet in-stream water quality requirements. While the TMDL process is a State responsibility, local governments will be significantly affected when it comes time to implement load reductions by source.

Although Sugarland Run is not on the most recent (1998) 303(d) list, most of the 14 Northern Virginia watersheds that are on the list are there due to violations of fecal coliform standards. As outlined in the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan, fecal coliform levels in Folly Lick Branch and Sugarland Run are routinely elevated.

IMPACT ON THE TOWN: Herndon has a vested interest to avoid the placement of Sugarland Run on Virginia's 303(d) list for fecal coliform. Any ongoing or new programs (for instance those that will be required to meet NPDES requirements) should take into consideration the need to reduce fecal coliform pollution.

II.2.3 Chesapeake Bay Preservation Act/Chesapeake Bay Preservation Area Designation and Management Regulations

OVERVIEW: As noted previously, CBLAD will eventually embark on a program to enforce or implement Phase III of the Bay Act Regulations. The Town should work with CBLAD now to make the administrative transition for reporting as smooth as possible. NVPDC has been in contact with CBLAD and will develop a draft reporting protocol for the Town.

In addition, the Chesapeake Bay Preservation Area Designation and Management Regulations are currently undergoing review and it is likely that some changes to the Town's Ordinance will be required.

PART III
OPTIONAL STORMWATER MANAGEMENT PROGRAMS

III.1 STORMWATER MANAGEMENT REGULATIONS

OVERVIEW: In 1989 the General Assembly adopted the Stormwater Management Act (§10.1-603.2, et seq., Code of Virginia), enabling the establishment of comprehensive stormwater management programs. The Department of Conservation and Recreation promulgated the Virginia Stormwater Management Regulations in 1990, which were substantially revised in 1998. The State stormwater management program addresses the permanent changes in stormwater runoff than occur as a result of land development. The Regulations specify minimum technical and administrative requirements for local programs and State agency projects and are applicable to development projects that disturb one acre of land or more.

Localities are provided the option of adopting local stormwater management programs. Localities choosing to adopt a stormwater management program must comply with the minimum criteria established in the Regulations. These Regulations require that local stormwater management ordinances include specific elements (see Appendix A.2), including maintenance of post-development peak runoff rates at or below pre-development runoff rates for regulated development activities, and minimum technical criteria to control NPS pollution and localized flooding. Localities may reduce the one-acre threshold and may adopt criteria more stringent than the minimum requirements contained in the Regulations. Localities implement the program through the adoption of a local ordinance.

ISSUES: The Town is currently achieving stormwater volume management through the adoption of pertinent sections of the Fairfax County Public Facilities Manual. The Chesapeake Bay Preservation Chapter of the Town's Comprehensive Plan calls for the adoption of a Stormwater Management Ordinance. Funding for the Town to adopt a Stormwater Management Ordinance has been made available from the Virginia Coastal Resources Management Program through a grant obtained by the Northern Virginia Regional Commission.

III.2 TRIBUTARY STRATEGIES/CHESAPEAKE BAY 2000

OVERVIEW: By 1987, it had become apparent that in order to protect the health of the Chesapeake Bay, it would be necessary to further reduce the flow of nutrients and other harmful pollutants entering the Bay (previous efforts such as the Chesapeake Bay Preservation Act focus on a no-net-increase approach). As a result, the Chesapeake Bay Agreement was amended in that year to include a goal of reducing the flow of controllable nutrients (phosphorus and nitrogen) to the Bay by 40% by the year 2000. The State has taken the approach that participation in the program should be flexible in order to maximize benefits while minimizing costs.

In 1997, and after much negotiation, the General Assembly accepted the *Shenandoah and Potomac River Basins Tributary Nutrient Reduction Strategy*. In general, the Northern Virginia strategy calls for achieving nutrient reduction through:

- increased use and coverage of nonpoint source BMPs (through retrofit of existing land uses) for both agricultural and urban lands; and,
- retrofit of all wastewater treatment plants in the region, with a design capacity of 0.5 million gallons per day or greater, with year around biological nutrient removal (BNR) or equivalent technology.

Nearly 90% of the cost of achieving Northern Virginia's nutrient reduction goals comes from proposed retrofit of regional wastewater treatment facilities. The primary funding mechanism for Tributary Strategies is the Virginia Water Quality Improvement Fund created by the Virginia Water Quality Improvement Act of 1997. This fund will pay for up to 50% of the cost of nutrient reduction projects on a competitive basis.

On June 28, 2000, signatories of the Chesapeake Bay Agreement adopted "Chesapeake 2000 – A Watershed Partnership." The driving force behind this new Agreement is the fact that the Chesapeake Bay has been listed by the U.S. EPA as an impaired water under Clean Water Act Section 303(d) (see discussion under II.2.2). In order to avoid the implementation of a regulatory process for the Bay that would largely usurp the existing voluntary process, the Chesapeake Bay Executive Council committed to reducing nutrient, sediment, and chemical pollution to the Bay in an amount sufficient for the Chesapeake Bay to be de-listed. This effort will likely dwarf existing Tributary Strategy efforts to date and will need to occur within a very short time frame (2010). Strategies will include continued upgrades to wastewater treatment facilities, implementation of urban and agricultural BMPs, increased pollution prevention efforts, etc. Among the most difficult new strategies may be to consider large development above a certain threshold to be a "point source" rather than a "nonpoint source" of pollution. This would require an added level of scrutiny over impacts to water quality.

Other elements of the Agreement that could affect Herndon include provisions for states to work with local governments to:

- incorporate wetlands protection into local land use plans by 2010;
- restore 20,000 acres of wetlands in Virginia by 2010;
- incorporate stream corridor and forest corridor management into local land use plans by 2010;
- reduce sprawl through an investigation and modification of local tax policies;
- redevelop 1,500 brownfield sites by 2010; and,
- reduce the rate of conversion of forest and agriculture to urban land use by 30% by the year 2010.

ISSUES: While Herndon is not mandated to achieve any specific nutrient reductions since it does not own or operate a wastewater treatment facility, it may participate voluntarily through the Water Quality Improvement Fund grant program. Since the Town has identified the use of regional BMPs to improve water quality as an ongoing goal, the Town should take the

opportunity to apply for WQIF cost-share funds when applicable (i.e., the project results in a water quality benefit).

Currently, Virginia is embarking on a series of public processes to determine what needs to be accomplished, how much it will cost, and who will bear responsibility for meeting water quality goals by 2010.

III.3 CHESAPEAKE BAY PRESERVATION ORDINANCE

There are two voluntary stormwater management options that the Town should consider regarding its Chesapeake Bay Preservation Ordinance.

ELIMINATION OF OPT-OUT PROVISION: The Chesapeake Bay Preservation Chapter of the Town of Herndon Comprehensive Plan states "Strengthen the requirements to qualify for the Town's CBPO opt-out provision or eliminate the opt-out provision altogether to require the use of stormwater quality BMPs for all development." Section 78-1125 of the Town Code currently allows a property, or portions of a property, to be excluded from an RMA if the following can be demonstrated to the satisfaction of the Zoning Administrator.

(1) The RMA performance criteria are met in areas contiguous to and within 100 feet of the boundaries of the RPA; and
(2) The property is not characterized by any of the following: (a) floodplains; (b) wetlands; (c) highly erodible soils; or (d) steep slopes greater than 15%.

The issue is two fold: (1) because Herndon has long been built out, most properties can make a good case for opting-out of the RMA criteria; and, (2) because all urban development is hydrologically connected to the Town's surface waters via stormdrains, regardless of a site's "natural features," it no longer makes sense from a water quality standpoint to provide the opt-out. The Town needs to determine how Section 78-1125 needs to be modified or whether it should be deleted altogether.

INCORPORATION OF CIVIL PENALTIES: In 1998, the General Assembly amended the Act itself to specifically allow localities to incorporate provisions for civil penalties into local ordinances for violations in Chesapeake Bay Preservation Areas. This new power, which allows for a penalty of $1,000 per day per penalty up to $10,000, is contained in §10.1-2109.E of the Code of Virginia. This will allow the Town to speed enforcement of its Chesapeake Bay Preservation Ordinance provisions, especially with regard to projects on individual lots that have no long term interest in maintaining good relations with Town staff. The Town may wish to wait for the final revised Regulations to be promulgated, at which time the Town can make revisions to its own Ordinance accordingly.

MATRIX OF STORMWATER MANAGEMENT MANDATES AND OPTIONS

Program	Mandate/ Future Mandate/ Optional	Impact on Herndon	Issues	Status of Compliance
Clean Water Act Section (404) Wetlands/Virginia Water Protection (VWP) Permit	Wetland protection mandated.	Chesapeake Bay Preservation Ordinance requires developers to show evidence of all wetland permits.	Inadequate local mapping resources. Strictly a planning issue and not a compliance issue.	Fully compliant.
National Flood Insurance Act/Flood Disaster Protection Act	Mandated for Town residents to receive flood insurance.	Floodplain Overlay District of Zoning Ordinance.	Outdated FEMA floodplain maps (1979 version). Strictly a planning issue and ease of permitting issue. Not a compliance issue. Cited in Comprehensive Plan as needing to be updated.	Fully compliant.
Chesapeake Bay Preservation Act Phase 1 (Ordinance)	Mandated.	Chesapeake Bay Preservation Ordinance.	Potential amendments as a result of changes to State Regulations. Enforcing private BMP maintenance requirements is a compliance issue.	Program is fully compliant. Implementation of BMP maintenance agreements is likely to be a future compliance issue.
Chesapeake Bay Preservation Act Phase II (Comprehensive Plan)	Mandated.	Chesapeake Bay Preservation Chapter to the Herndon Comprehensive Plan.	None.	Fully compliant. Chesapeake Bay Local Assistance Board approved the Chapter on June 21, 1999.

MATRIX OF STORMWATER MANAGEMENT MANDATES AND OPTIONS

Program	Mandate/ Future Mandate/ Optional	Impact on Herndon	Issues	Status of Compliance
Chesapeake Bay Preservation Act Phase III (Ordinance Reconciliation and Enforcement)	Future mandated.	Further review and revisions to the Town's Erosion and Sediment Control Ordinance and Subdivision Ordinance. Establishment of region-wide reporting protocol.	Town needs to be able to track and justify waivers, exceptions, and exemptions for future reporting requirements.	Changes to the Town's program are likely for future consistency.
Virginia Erosion and Sediment Control Law	Mandated.	Erosion and Sediment Control Ordinance.	None.	Fully compliant.
Clean Water Act NPDES/VPDES Phase II Municipal Separate Storm Sewer System (MS4) Permit	Future mandated.	Will require the Town to meet the provisions of a "general permit" to control nonpoint source pollution. May include extended public outreach and education, enhanced monitoring and mapping of storm sewers, and implementation of more stringent post-development stormwater controls.	The Town will need to expand public education and outreach programs aimed at protecting water quality and develop a means of detecting and eliminating illicit discharges into Town stormdrains. Notice of Intent to comply with a general permit is due by 2003, with full compliance required by 2008.	Changes to the Town's program are likely for future consistency.

MATRIX OF STORMWATER MANAGEMENT MANDATES AND OPTIONS

Program	Mandate/ Future Mandate/ Optional	Impact on Herndon	Issues	Status of Compliance
Stormwater Management Regulations	Optional.	The Town may adopt a Stormwater Management Ordinance.	Ordinance would replace existing reference to Fairfax County Public Facilities Manual to control post-development stormwater volume and quantity. Issues include whether or not to include water quality criteria in the Town's SMO. Adoption of a SMO is a policy objective of the Comprehensive Plan.	Not applicable.
Tributary Strategies	Optional.	Voluntary reductions in nonpoint source pollution are encouraged. Any stormwater retrofit that reduces pollution from existing land uses is eligible for grant funding.	Funding may be available to help off-set the costs of implementing Town stormwater quality management projects.	Not applicable.
Chesapeake Bay Preservation Act – Civil Penalties	Optional.	Allows the Town to incorporate civil penalties into its Chesapeake Bay Preservation Ordinance.	Recently authorized by the General Assembly, the incorporation of civil penalties would add teeth to the Town's Ordinance.	Not applicable.

MATRIX OF STORMWATER MANAGEMENT MANDATES AND OPTIONS

Program	Mandate/ Future Mandate/ Optional	Impact on Herndon	Issues	Status of Compliance
Chesapeake Bay Preservation Ordinance – Elimination of Opt-Out Provisions	Optional.	Eliminates the ability of developers to "opt-out" of the requirements of the Town's Chesapeake Bay Preservation Ordinance.	The rationale for this step is outlined in the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan. The result would be a higher level of environmental protection at an incrementally higher cost for developers who would have otherwise been exempted from BMP requirements.	Not applicable.
Pro Rata Share Program	Optional.	Means of securing supplemental funding for stormwater management projects within the Town.	The Town's program needs to be updated in order to reflect current stormwater management needs and anticipated growth projections.	Required in order to continue to implement this optional funding program.
Stormwater Utility Fee Program	Optional.	Represents a powerful means of raising money for stormwater management.	Impacts residences and businesses in the form of a "charge" or "fee". Will be seen by many as a tax. This effort is in place in Prince William County but recently failed in Fairfax County.	Not applicable.

PART IV
STORMWATER MANAGEMENT FUNDING OPPORTUNITIES

State and federal stormwater management mandates are rarely accompanied by direct financial assistance for implementation. However, there are several means by which the Town can raise the necessary revenue to implement State and federal mandates as well as locally identified stormwater management projects and programs. Part IV describes the major means of generating revenue to implement stormwater management projects. These include:

- **Pro Rata Share**
- **Stormwater Utility**
- **Source Control Fund**
- **Grant Programs**

IV.1 PRO RATA SHARE

The Town has adopted a Pro Rata Share Program that is described in Part I.8. There is a stated need for updating this program to reflect current stormwater management needs, costs, and development conditions.

IV.2 STORMWATER UTILITY

The purpose of a stormwater utility (or stormwater tax/service charge) is to provide an ongoing source of revenue to offset the costs of stormwater management. Under §15.2-2114 of the Code of Virginia, income derived from these charges may be used to pay or recover costs for the following:

- The acquisition of real and personal property, and interest therein, necessary to construct, operate, and maintain stormwater control facilities;
- The cost of administration of such programs;
- Engineering and design, debt retirement, construction costs for new facilities, and enlargement or improvement of existing facilities;
- Facility maintenance;
- Monitoring of stormwater control devices;
- Pollution control and abatement, consistent with State and federal regulations for water pollution control and abatement; and,
- Planning, design, land acquisition, construction, operation, and maintenance activities.

Charges may be assessed to property owners or occupants, including condominium unit owners or tenants (when the tenant is the party to whom the water and sewer service is billed), and should be based upon their contributions to stormwater runoff. Waivers are mandated for the following categories.

- Federal, State, or local government agencies when the agency owns and provides for maintenance of storm drainage and stormwater control facilities or is a unit of the locality administering the program.
- Roads and public street rights-of-way that are owned or maintained by the State or local agencies.
- Any person who owns and provides for complete private maintenance of storm drainage and stormwater facilities, provided such person has obtained proper permitting.

Income from service charges may not exceed the actual costs incurred by a locality operating under the provisions of this title.

If a property does not contain stormwater control facilities, the contribution to runoff would be determined by impervious area alone. Under this method, those properties that generate increased runoff pay for the increased runoff. However, this method needs adjustments to account for the mitigating effects of facilities constructed to control stormwater runoff.

Fairfax County established a Stormwater Utility Advisory Group and hired Camp, Dresser, and McKee (CDM) to investigate the feasibility of establishing a stormwater utility for the County. While the core idea behind stormwater utility is fairly simple, (a flat fee based on imperviousness), the SUAG investigated three ancillary issues including:

(1) to what extent the owners or operators of privately maintained stormwater BMPs would be given a stormwater utility credit;
(2) whether the stormwater utility fee would be structured on a County-wide or a watershed basis; and,
(3) whether privately owned travelways would be deleted from the measurements of residential impervious areas.

On issue (1), the SUAG found that a maximum of 60% fee reduction would be allowed for any one site. This is based on a 30% maximum reduction for water quality facilities and a 30% maximum reduction for stormwater detention facilities that are designed and constructed in accordance with the County's Public Facilities Manual.

On issue (2), the SUAG found that it would be more equitable to base the stormwater utility fee structure on a watershed basis, although the administration of such a program would be more complicated. This is not so much of an issue in the Town, where there are only three watersheds – one of which only represents a fraction of the entire Town.

On issue (3), the SUAG found that it was only fair to delete privately owned travelways from the formulation of residential impervious areas since publicly owned travelways are exempted from the formulation under the law.

In 1997, Fairfax County tabled the idea of implementing a stormwater utility. Jurisdictions in Virginia that have implemented stormwater utility fee programs include Virginia Beach,

Chesapeake, Newport News, Norfolk, Hampton, and Prince William County. These programs are briefly outlined in the following table.

Jurisdiction	Residential Flat Rate $/mo./ERU	Maximum Stormwater Management Credit*	Fee Adjustments (% Reduction)
Virginia Beach	$2.74	50%	1-20% peak flow/ 10-30% WQ control
Chesapeake	$1.75	40%	20% peak flow/ 20% WQ control
Newport News	$2.30	25%	5-15% peak flow/ 5-15% WQ control/ 5-10% other
Norfolk	$4.50	60%	≤ 60% WQ control
Hampton	$2.50	25%	Under study.
Prince William Co.	$1.50	50%	10% peak flow/ 10% WQ control/ 10-30% participation in stormwater management program

** Most jurisdictions limit stormwater management credits to non-residential land uses.

ISSUES: If Fairfax County adopts a Stormwater Utility that is added to the personal property tax, the Town should be concerned whether the funds collected would remain in the County or be allocated to the Town. This is particularly relevant since the Town maintains its own stormwater infrastructure.

IV.3 SOURCE CONTROL FUND

This is not a very common way to raise revenue for stormwater management programs and the only example in Virginia is Arlington County. The Source Control Fund (SCF) is part of Arlington's Chesapeake Bay Preservation Ordinance (CBPO). Under the CBPO, developers are provided an option to contribute to the SCF in lieu of establishing an on-site BMP. Payments are in an amount of $0.25 per new impervious square foot above a 38% site imperviousness threshold (jurisdiction average). The $0.25 figure was determined in 1992 to represent the incremental cost of implementing quality management measures above and beyond that already required quantity management measures. The primary purpose of the SCF concept is to avoid the implementation of many small maintenance intensive BMPs that can drain private and public resources (and will probably not be maintained in the long run) and instead focus efforts in a more comprehensive fashion. For instance, eligible projects include the implementation of regional BMPs, public outreach and education, pollution prevention measures, street sweeping efforts, etc. Arlington's CBPO was approved by the Chesapeake Bay Local Assistance Board in 1993 after a year of conditional approval. Since 1992, the SCF has resulted in the collection of approximately $150,000.

Arlington County is currently undergoing a comprehensive review of its CBPO, including the Source Control Fund. Two primary concerns have been raised with regard to the SCF. First, there is concern that the per square foot SCF contribution is too low and that a process needs to be established to update the contribution. Second, because it is the developer's choice of whether to implement on-site BMPs or contribute to the SCF, many believe that the County has missed some opportunities where water quality protection could have been better served by an onsite BMP. The County is considering raising the contribution amount and providing staff with the authority to choose whether an on-site BMP would be more appropriate than a SCF contribution based on site-specific criteria.

IV.4 GRANT PROGRAMS

There are a number of federal and State grant programs that can help defray the costs of planning and implementing stormwater management programs. Although not an exhaustive listing, the following represent the most common sources of grant funding for stormwater management.

- CHESAPEAKE BAY LOCAL ASSISTANCE FUND
  Administrating Agency: Chesapeake Bay Local Assistance Department (State source)
  Match: None required, but definitely encouraged.
  Funds Available: $592,000 in FY99.
  Cycle: RFP in December, grant year from July 1 to June 30.
  Priorities: Local program development projects designed to achieve compliance with the Chesapeake Bay Preservation Act and local implementation projects. Comprehensive plan development, ordinance development and implementation, GIS (maximum $5,000).
  Contact Number: 1-800-CHE-SBAY

- VIRGINIA COASTAL RESOURCES MANAGEMENT FUND
  Administrating Agency: Department of Environmental Quality (NOAA source)
  Match: 50%.
  Funds Available: $660,000 in FY99.
  Cycle: RFP in March, grant year from October 1 to September 30.
  Priorities: Watershed management and planing, including incorporation of Stormwater Management Regulations, nutrient reduction, erosion and sediment control, air quality, toxics assessment; habitat protection including fish habitat, dune protection, wetlands, riparian buffers, and land acquisition; and managing the impacts of development (including GIS and initiatives to reduce sprawl).
  Contact Number: 1-804-698-4320

- VIRGINIA WATER QUALITY IMPROVEMENT FUND
  Administrating Agency: DEQ/Department of Conservation & Recreation (State source)
  Match: 50%.
  Funds Available: Variable ($2.5 million for NPS in FY98).
  Cycle: RFP and grant year still variable.
  Priorities: Any projects that are clearly demonstrated as likely to achieve reductions in NPS pollution. Projects include but are not limited to the acquisition of

conservation easements, conservation planning and design assistance for agricultural operations, implementation of urban retrofit, and reimbursement to local governments for tax credits and other tax relief that provides incentive to water quality improvement.

Contact Number: 1-804-371-8984

- WATERSHED RESTORATION GRANTS (CWA SECTION 319)

  Administrating Agency: Department of Conservation & Recreation (EPA source)
  Match: 40% from grantee.
  Funds Available: Between $400,000 and $1,000,000 in FY99.
  Cycle: RFP for pre-proposals in June.
  Priorities: Eligible activities include programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects. Preference is given to "on-the-ground" activities that address a cause of the identified water quality problem. Planning activities and other developmental activities not directly related to implementation are not eligible.
  Contact Number: 1-804-786-1712

- WATER QUALITY MANAGEMENT PLANNING (CWA SECTION 604(b))

  Administrating Agency: DEQ (EPA source)
  Match: 25% from grantee.
  Funds Available: Variable.
  Cycle: RFPs in December. Grant year October 1 through September 30.
  Priorities: Funds are available to conduct water quality monitoring, develop, revise, and review water quality standards, develop lists of impaired waters, and develop continuing planning processes. Projects should focus on watershed protection issues.
  Contact Number: 1-804-698-4299

- FLOOD PREVENTION PROTECTION FUND

  Administrating Agency: Department of Conservation and Recreation (State source)
  Match: 50% match.
  Funds Available: Variable.
  Cycle: Grant year July 1 through June 30.
  Priorities: Projects can include floodplain studies and mapping, structural protection and buyouts, relocation, and floodproofing and/or elevation of structures repeatedly damaged by flooding.
  Contact Number: 1-804-786-1712

- SMALL WATERSHED GRANTS PROGRAM

  Administrating Agency: National Fish and Wildlife Foundation (via Chesapeake Bay Program)
  Match: 50% from grantee.
  Funds Available: $350,000 in FY99.
  Cycle: RFP in January. Grant year July 1 through June 30.

Priorities: Funds are available to implement Tributary Strategies and other community watershed initiatives.
Contact Number: 1-410-377-6270

- VIRGINIA ENVIRONMENTAL ENDOWMENT
Administrating Agency: Virginia Environmental Endowment
Match: 50% from grantee.
Funds Available: Variable.
Cycle: Application deadlines are April 15, August 15, and December 15.
Priorities: Funds are used to support community action, reinforced by research and education in the areas of sustainable communities and water quality protection and management.
Contact Number: 1-804-644-5000

- CHESAPEAKE BAY RESTORATION FUND
Administrating Agency: Chesapeake Bay Restoration Fund Advisory Committee
Match: Variable % from grantee.
Funds Available: Variable.
Cycle: RFPs in December. Grant year October 1 through September 30.
Priorities: Funds available for public education and outreach programs as well as conservation and restoration projects.
Contact Number: 1-804-786-3591

MATRIX OF STORMWATER MANAGEMENT GRANT FUNDING OPPORTUNITIES

Grant Name and Sponsoring Organization	Purpose of Fund	Match Required	Funding Cycle	Contact Number
Chesapeake Bay Local Assistance Fund Chesapeake Bay Local Assistance Department	Local program development projects designed to achieve compliance with the Chesapeake Bay Preservation Act and local implementation projects. Comprehensive plan development, ordinance development, and GIS implementation.	None required, but strongly encouraged.	RFP in December, grant year July 1 to June 30.	1-800-CHE-SBAY
Virginia Coastal Resources Management Fund Virginia Coastal Program, Department of Environmental Quality	Watershed management and planning (include. nutrient reduction, erosion and sediment control, air quality, toxics assessments), habitat protection (include. fish habitat, wetlands, riparian buffers, and land acquisition), and managing the impacts of development.	50%	RFP in March, grant year from October 1 to September 30.	1-804-698-4320
Virginia Water Quality Improvement Fund Department of Conservation and Recreation	Any projects that are clearly demonstrated as likely to achieve reductions in nonpoint source pollution. Projects include the acquisition of conservation easements, implementation of urban retrofits, and reimbursement for tax credits and other tax relief that provides incentives to water quality improvement.	50%	RFP and grant cycle still variable.	1-804-371-8984
Watershed Restoration Grants – Section 319 Department of Conservation and Recreation (EPA Source)	Activities include programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects. Preference is given to on-the-ground activities that address a cause of an identified water quality problem. Planning activities not directly related to implementation are not eligible.	40% from grantee.	RFP for pre-proposals in late June.	1-804-786-1712

MATRIX OF STORMWATER MANAGEMENT GRANT FUNDING OPPORTUNITIES

Grant Name and Sponsoring Organization	Purpose of Fund	Match Required	Funding Cycle	Contact Number
Water Quality Management Planning Grants – Section 604b Department of Environmental Quality (EPA Source)	Funds available to conduct water quality monitoring, develop, revise, and review water quality standards, develop lists of impaired waters, and develop continuing planning processes. Projects should focus on watershed protection issues.	25% from grantee.	RFPs in December. Grant year from October 1 through September 30.	1-804-698-4299
Flood Prevention Protection Fund Department of Conservation and Recreation	Projects can include floodplain studies and mapping, structural protection and buyouts, relocation, and floodproofing and/or elevation of structures repeatedly damaged by flooding.	50%	July 1 through June 30.	1-804-786-1712
Small Watershed Grants Program Center for Chesapeake Communities	Funds are available to implement Tributary Strategies and other community watershed initiatives.	50%	RFP in January. Grant year July 1 though June 30.	1-410-377-6270
Virginia Environmental Endowment Grants Virginia Environmental Endowment	Funds are used to support community action, reinforced by research and education in areas of sustainable communities and water quality protection and management.	50%	Application deadlines are April 15, August 15, and December 15.	1-804-644-5000
Chesapeake Bay Restoration Fund Chesapeake Bay Restoration Fund Advisory Committee (Virginia)	Public education and outreach programs.	Variable % from grantee.	Variable.	1-804-786-3591

PART V
ANALYSIS AND RECOMMENDATIONS FOR ACTION

The following are recommendations for action based on an analysis of issues raised in Parts I through IV. In addition to recommendations for action, which primarily address those required for consistency with State and federal mandates, this section outlines suggestions for strengthening the Town's stormwater management program.

V.1 CLEAN WATER ACT

V.1.1 Section (404) Wetlands/Virginia Water Protection Permit

ANALYSIS: A general location map and a description of major wetlands associated with the Sugarland Run and Folly Lick Branch mainstems is provided in the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan. This inventory was performed via field survey in 1998 by the Town Community Forester in order to update information contained in the U.S. Fish and Wildlife Service's National Wetlands Inventory map. The Town's Chesapeake Bay Preservation Ordinance requires the delineation of specific wetland areas by a developer during the site development process.

RECOMMENDATION: None.

SUGGESTION: Perform a field survey of additional wetland areas located within the Town but not associated with the Sugarland Run and Folly Lick Branch mainstems.

V.1.2 NPDES/VPDES Phase II MS4 Permit

ANALYSIS: The future requirement for the Town to obtain a NPDES Phase II MS4 permit will result in the need for additional actions on the part of the Town to protect water quality. While the Town will not need to apply for a permit until 2003, with implementation required within 5 years after that date, there are several actions that the Town can take now to make future implementation easier.

In particular, the Town will need to invest more heavily in public education and outreach programs. The Town's most notable pollutant of concern, based on water quality monitoring performed by the Fairfax County Health Department, is fecal coliform bacteria. The primary likely causes of this pollutant are pet waste, human waste from sanitary sewer lines, and/or an overpopulation of wild life. However, other pollutants of concern include leakage from automobiles (brake fluid, oil, etc.), used oil dumping, nutrients from fertilizers, pesticides, and sediments from land disturbing activities. The Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan outlines a number of specific actions for implementing public education and outreach programs.

Secondly, the Town's efforts to monitor its storm sewer system will need to be strengthened and additional mapping will be necessary for flow modeling and analysis. Currently, the Town performs a physical inspection of the stormdrain inlets (not actual piping) twice a year but does not have a means of checking for illicit discharges into the system. The most common means of checking for these illicit discharges is to establish a dry weather monitoring regimen. Other Northern Virginia localities have established time schedules for screening outfalls and sampling discharges for a range of common urban pollutants.

RECOMMENDATION: Incorporate sanitary sewer lines and minor storm sewer outfalls into the Town's GIS. The Northern Virginia Regional Commission, under contract to the Town, has produced a GIS layer depicting major storm sewer lines and outfalls. The Town will eventually be required to map all outfalls for monitoring purposes and should consider applying for a grant from the Chesapeake Bay Local Assistance Department or Department of Environmental Quality to help offset the costs of the GIS layers and the purchase of necessary equipment (such as a global positioning system, or GPS).

RECOMMENDATION: Develop a dry weather outfall monitoring program to detect illicit discharges to the storm sewer network.

SUGGESTION: Implement a Town-wide storm drain stenciling or labeling program and develop public education materials to be distributed prior to actual labeling. Obtain pre-labeling education materials for adaptation by the Town from the Northern Virginia Regional Commission and the Northern Virginia Soil and Water Conservation District. Apply for funding from the Virginia Environmental Endowment, the Chesapeake Bay Restoration Fund, and/or the Chesapeake Local Assistance Fund.

SUGGESTION: Develop a public education brochure on the Town's dog waste disposal regulations and provide a number on the brochure for people to contact should they see a violation taking place. ArlingtonDogs, Fairfax County, the City of Alexandria, and Seattle, Washington, have all developed public education materials that could be adapted by the Town.

SUGGESTION: Implement an annual or semi-annual Town Household Hazardous Materials Drop-Off and Collection Day for homeowners in accordance with the action statements contained in the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan. Distribute information from Fairfax County Household Hazardous Waste Program informing Town residents where they can take hazardous materials on a year-around basis (West Ox Road/I-66 Transfer Station).

SUGGESTION: Implement a permanent, Town sponsored used oil, filters, and antifreeze recycling program. Potential legislation in 2001 by the General Assembly may make funding available for this action. If State funding is not available, the cost for basic collection infrastructure is likely to be in the $3,000 to $5,000 range. Collection costs range from $0.15 to $0.30 per gallon of used oil and antifreeze and $0.25 to $0.33 per used oil filter.

SUGGESTION: Develop a placard, to be placed at all points of sale for oil and antifreeze, alerting the consumer of the need to recycle and providing the names and locations of the Town's used oil and antifreeze recycling centers. This is required (but rarely enforced) under the Code of Virginia §10.1-1422.5. The Department of Environmental Quality has sample placards available upon request. This step is necessary to address the day-to-day hazardous material recycling needs (primarily used oil and antifreeze) of Town residents. Free advertising for businesses that participate in recycling efforts may also help to increase business participation. As with funding for collection centers, the Town should watch to see of the 2001 General Assembly results in a State-wide approach to used oil and antifreeze management.

V.2 CHESAPEAKE BAY PRESERVATION ACT

V.2.1 Phase I (Chesapeake Bay Preservation Ordinance)

ANALYSIS: A number of factors will require changes to the Town's Chesapeake Bay Preservation Ordinance. First, the Chesapeake Bay Local Assistance Board is currently in the process of making revisions to the Chesapeake Bay Preservation Area Designation and Management Regulations. Some of these changes are administrative in nature; however, others make clarifications or changes to the intention of the Regulations. It is unclear at this point what the actual affects will be on the Town, though it is likely that the Chesapeake Bay Local Assistance Department will provide guidance on how the newly revised Regulations will affect localities. Depending on the nature of these changes, the Town will likely be required to make revisions to its Ordinance.

Second, the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan calls for tightening or eliminating the provision of the Ordinance which allows for opting out of the RMA. The rationale for changing this provision of the Ordinance is that all development in the Town is connected to surface waters via stormdrains – and therefore, controlling nonpoint source pollution in these areas is not simply a matter of protecting or managing on-site natural resources. As a result, it makes sense from an environmental and an administrative standpoint to eliminate the opt-out provision.

Third, the 1998 General Assembly added language to the Chesapeake Bay Preservation Act allowing for the imposition of civil penalties for violations of local Chesapeake Bay Preservation Ordinances. Incorporating this language into Herndon's Ordinance will provide for increased enforcement leverage on the part of the Town.

Finally, in some instances, where an on-site BMP would normally be required, a developer may apply for a waiver under Section 78-1131-(d) of the Town's Chesapeake Bay Preservation Ordinance. Under the Town's Ordinance, when such a waiver is granted, there is no requirement for a monetary contribution in lieu of on-site BMPs to assist with implementation of the Town's overall stormwater management program. While this is also the case in Fairfax County – Prince William County provides for a

waiver of BMP requirements only with an accompanying contribution equivalent to what would have been made if on-site BMPs had been required. Arlington County provides an option for payment into a Source Control Fund, thereby making applications for a waiver extremely rare. Similarly, the City of Williamsburg has a provision that allows a developer to purchase the development rights of an undeveloped property as a means of meeting the requirements of their Ordinance. There are also instances when the Town may feel that an on-site BMP is not the most appropriate option from an environmental or a public health point of view.

However, the Town's Ordinance contains no provision for waiving only BMP requirements or for collecting a monetary contribution in substitute when on-site BMP requirements are waived. The Chesapeake Bay Local Assistance Department does not have objections to this course of action so long as "equivalency," in the form of a regional water quality management plan, is demonstrated. Language should be added to the Town's Ordinance that allows for the payment of a fee-in-lieu of on-site BMP requirements for use in water quality-equivalent activities. The Chesapeake Bay Local Assistance Department has indicated that it will want to review the arrangement, to ensure that there is no dramatic increase in waivers at the expense of requiring appropriate on-site controls. However, in practice, CBLAD has no objections to this arrangement and believes that it is supportable under current enabling legislation.

SUGGESTION: The timing of the following changes to the Chesapeake Bay Preservation Ordinance should be coordinated in a fashion which allows for a single set of Ordinance amendments. Practically, this means that amendments should be made after the Chesapeake Bay Local Assistance Board has promulgated the new Chesapeake Bay Preservation Area Designation and Management Regulations – expected to occur in late 2000.

SUGGESTION: Incorporate civil penalties into the Town's Chesapeake Bay Preservation Ordinance as is allowed now under §10.1-2109.E of the Code of Virginia.

SUGGESTION: Eliminate the provision of the Town's Chesapeake Bay Preservation Ordinance (§78-1125-2b) which allows for opting out of RMAs.

SUGGESTION: Add language to Section 78-1128-(2) of the Town's Ordinance which allows for the payment of a fee-in-lieu of on-site implementation of a stormwater BMP that may be accrued for the implementation of strategic regional or multi-site facilities, or the purchase of development rights, if on-site BMPs are not desirable. For instance: "The requirements of Section 78-1128-(2)-a, b, and c may be waived or modified for a property if the Director of the Department of Public Works determines that the provision of on-site BMPs is not practical or desirable due to constraints imposed by the dimension of the property, if the public interest is diminished by the requirement of on-site BMPs, or if a more cost-effective approach to improving water quality than the implementation of an on-site BMP has been identified." "A monetary contribution, in the amount of $X per square foot of impervious surface above the average watershed conditions for development and above 90% of the existing impervious cover for redevelopment, shall be

substituted when on-site BMPs are waived." Arlington County has computed a monetary contribution of $0.25 per square foot of impervious surface. Arlington County is in the process of revising these figures. Herndon would need to follow Arlington County's methodology for computing a per square foot cost equivalent for on-site BMPs.

SUGGESTION: Eventually, as the Town adopts a Stormwater Management Ordinance, Section 78-1128-(2)-a and c of the Town's Chesapeake Bay Preservation Ordinance should be deleted for reference to the SMO. (See discussion under V.5.)

V.2.2 Phase II (Comprehensive Plan)

ANALYSIS: The Town adopted the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan on May 26, 1998 under a grant from the Chesapeake Bay Local Assistance Department and with the assistance of the Northern Virginia Planning District Commission, (now the Northern Virginia Regional Commission). The Chesapeake Bay Local Assistance Board certified the Chapter on June 21, 1999, and the Town is in compliance with Section 10.1-2109.B of the Chesapeake Bay Preservation Act.

RECOMMENDATION: Implement Section VI "Strategies and Action Statements" of the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan in accordance with Section VII "Implementation Plan and Time Line."

V.2.3 Phase III (Ordinance Reconciliation and Enforcement)

ANALYSIS: The Chesapeake Bay Local Assistance Department, with the establishment of an Enforcement Review Officer, is in the beginning stages of Phase III Bay Act implementation. So long as the Town continues to implement its Chesapeake Bay Preservation Ordinance and begins to implement its newly adopted Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan, there are no outstanding *issues* which the Town should be concerned with.

However, there are two administrative issues and one enforcement issue that need to be addressed by the Town. The first administrative issue is that the Town will need to implement a system for easily tracking variances and waivers to the Chesapeake Bay Preservation Ordinance. CBLAD has indicated that they will eventually move towards a yearly reporting requirement in order to ensure some level of uniformity with Ordinance enforcement across jurisdictional lines. The second administrative issue is that while the Town has been working with the Department of Conservation and Recreation to ensure that its other environmental and land use ordinances are mutually supportive, the Town will eventually need to demonstrate to CBLAD that Chesapeake Bay protection has been integrated with its Zoning and Subdivision ordinances. As a first step, the Town should submit these ordinances to CBLAD for a preliminary review.

The one enforcement issue revolves around the maintenance of privately owned and operated BMPs built within the Town. While the Town maintains its public BMPs

(including those within single family subdivisions), there has been little tracking of maintenance of other private BMPs. Frequent inspection of these facilities could be expensive and should be unnecessary since owners and operators are required to maintain these BMPs. The Chesapeake Bay Preservation Chapter to the Comprehensive Plan includes the action statement "Continue to require and enforce a strong maintenance program for public and private BMPs to ensure the long-term effectiveness of these facilities."

RECOMMENDATION: Implement a system of tracking variances and waivers (and requests for variances and waivers) to the Chesapeake Bay Preservation Ordinance.

RECOMMENDATION: Submit Subdivision Ordinance and Zoning Ordinance to Chesapeake Bay Local Assistance Department for preliminary review.

RECOMMENDATION: BMP maintenance aspects of the Town's program should be addressed by incorporating a policy that requires the owner of a private facility to provide annual inspections by a certified professional engineer and to provide a report to the Town which addresses the maintenance needs of the facility in accordance with the inspection. The Town's BMP maintenance agreement template will need to be changed to require annual inspections.

V.3 VIRGINIA EROSION AND SEDIMENT CONTROL LAW

ANALYSIS: The Town has adopted an Erosion and Sediment Control Ordinance pursuant to the Virginia Erosion and Sediment Control Law and is in conformance with criteria established by the Virginia Division of Soil and Water Conservation.

RECOMMENDATION: None.

V.4 FLOODPLAIN ORDINANCE

ANALYSIS: The Town's Floodplain District of the Town's Zoning Ordinance is consistent with the requirements of the Federal Emergency Management Agency. The primary concern with the Town's program is that the official map (1979) is out-of-date. Numerous changes to the floodplain designation have been granted by FEMA and the Town Council based on more detailed, development-specific hydrologic studies. In these cases, Letters of Map Revision (LOMRs) are submitted to FEMA for technical review and incorporation by reference. While the criteria of what designates a floodplain in the Town's Zoning Ordinance ensures that Town floodplains are protected, the Town floodplain map is no longer a useful planning and screening tool for developers and citizens.

SUGGESTION: The Town should submit its floodplain map, along with pertinent LOMRs and reasons why the Town's floodplains have changed (i.e., Herndon Parkway, Fairfax County Parkway, and development) to FEMA's Region III office. FEMA is currently undergoing a comprehensive five year assessment of floodplain mapping needs,

and Herndon must submit its request in order to be considered. An option, which would come partially at the Town's expense, would be to apply for a 50% cost-share grant to the Department of Conservation and Recreation's Flood Prevention Protection Fund. It is recommended that the Town submit its map to FEMA for review to see if an update can be achieved gratis. If this does not turn out to be the case, and the Town decides to pursue grant funding, it should wait for completion of the Fairfax County Parkway in order to accommodate any changes to the Sugarland Run floodplain.

V.5 STORMWATER MANAGEMENT ACT

ANALYSIS: The Town, by resolution, currently requires developers to comply with the stormwater volume management performance standards outlined in the Fairfax County Public Facilities Manual. The Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan calls for the Town to "Adopt and implement a Stormwater Management Ordinance that will comprehensively regulate stormwater volume in addition to stormwater quality." The benefit of adopting a stand-alone Stormwater Management Ordinance is that it places all the Town's stormwater management ordinances (Erosion and Sediment Control, stormwater volume management, and Chesapeake Bay Preservation Ordinance) under one umbrella; therefore making administration and interpretation of the Town's ordinances easier. The Department of Conservation and Recreation is available for technical assistance to the Town and grant funding has been made available in the past for program implementation through the Virginia Coastal Program. Adoption of a SMO is voluntary although encouraged.

There are a number of different options that the Town may consider during the drafting of a SMO. These options are better discussed during the drafting stages, rather than outlined in this report.

SUGGESTION: Adopt a Stormwater Management Ordinance with technical assistance from the Department of Conservation and Recreation and grant funding obtained by NVPDC trough the Virginia Coastal Program.

V.6 TRIBUTARY STRATEGIES/CHESAPEAKE BAY 2000

ANALYSIS: Although the Shenandoah and Potomac River Basins Tributary Nutrient Reduction Strategy provides goals and guidelines for achieving the region's nutrient pollution reduction goals, the Town of Herndon is not held to any specific reduction. Rather, it is the desire of the State for all localities to identify opportunities to achieve nutrient reductions through the retrofit of already developed areas with BMPs. In instances where measurable nutrient reductions can be calculated, localities are eligible for 50% match funds from the Virginia Water Quality Improvement Fund.

SUGGESTION: During the recommended update of the Town's Pro Rata Share Program (discussed in V.7), identify all projects that would qualify for Water Quality Improvement Funds and apply for grant funding on an annual basis for these projects as they are implemented.

V.7 PRO RATA SHARE PROGRAM

ANALYSIS: The Town's Pro Rata Share Program should in many ways serve as a funding mechanism that brings together all recommendations and suggestions requiring capital construction. For instance, projects should be considered with the nutrient reduction goals of Tributary Strategies and future NPDES requirements in mind in addition to meeting and exceeding Chesapeake Bay Preservation Act and Stormwater Management Act requirements.

However, the Town's Pro Rata Share Program, adopted in 1973, is in need of being updated and there is no overall plan of projects that are eligible for funding. Contract #98-2 (Task Order #1 and #2) initiated with the Northern Virginia Planning District Commission, (now the Northern Virginia Regional Commission), in March, 1998, is intended to lay the foundation for revising and updating the Town's Pro Rata Share Program by collecting and digitizing information on the Town's stormwater infrastructure including (1) streams/major drainage, (2) watersheds and subwatersheds, (3) major stormwater outfalls, and (4) location of existing and proposed stormwater management BMP facilities, with attributes.

The Town has also expressed a desire to make greater utility of stormwater management facilities other than standard dry ponds as part of its Pro Rata Share Program and other stormwater management initiatives. Dry ponds are often favored because of standardized engineering and pollutant removal calculations. Because of the Town's reliance on the Fairfax County Public Facilities Manual for BMP design criteria, developers do not have much incentive to utilize newer BMPs such as biofiltration.

RECOMMENDATION: Continue to move forward with updating the Town's Pro Rata Share Program. The sequence required for the update includes:

- identification and location of potential stormwater management projects;
- identification and quantification of engineering and land costs associated with projects selected for funding; and,
- modification of Pro Rata Share funding structure and establishment of process for updating program costs.

SUGGESTION: The Town should work with Fairfax County and the Northern Virginia Regional Commission to incorporate additional BMPs into the regional Northern Virginia BMP Handbook. If that it not possible, the Town could consider developing or adopting its own design standards for innovative BMPs.

V.8 STORMWATER UTILITY FEE PROGRAM

ANALYSIS: Six Virginia local governments have successfully adopted stormwater utilities, including Prince William County. However, the proposed adoption of a stormwater utility in Fairfax County was recently tabled for the near future. Although the Town has the authority to implement its own stormwater utility, it is recommended that the Town wait until that time when Fairfax County adopts a utility, in which case the Town should model its own program after.

RECOMMENDATION: No action at this time.

SUGGESTION: Work with Fairfax County to ensure that if a Stormwater Utility Fee is proposed to be part of the property tax bill, that funds collected from Town residents are returned for use on Town-sponsored projects and programs.

V.9 OVERALL PLANNING FOR STORMWATER MANAGEMENT

ANALYSIS: Several mechanisms are recommended for funding projects and programs to meet Herndon's stormwater management needs (including capital projects such as regional BMPs and outreach projects aimed at reducing pollution). Specifically, the Pro Rata Share Program and a proposed "fee-in-lieu of BMPs" fund require Herndon to identify projects and to arrive at costs for implementing such projects. It would make sense for Herndon to develop a consolidated project planning document that contained all potential projects and for Herndon to develop a short list of criteria for funding projects on in the planning document. This would include a distinction between projects that could be funded through the Pro Rata Share program and those projects that could be funded through fee-in-lieu of payments, grants, etc.

MATRIX OF RECOMMENDATIONS FOR ACTION

Recommendation/ Suggestion	Purpose	Required for Compliance	Responsibility	Estimated Cost	Funding Source
Perform a field survey of additional wetland areas located within the Town but not associated with the Sugarland Run and Folly Lick Branch mainstems.	Town planning purposes.	No.	Department of Community Development.	One day of staff time.	Town.
Incorporate sanitary and stormsewer lines into the Town's GIS.	Allows for flow modeling and mapping of stormdrains in preparation for future VPDES Phase II MS4 nonpoint source pollution control requirements.	Yes. Future VPDES Phase II MS4 requirements.	Department of Public Works.	$5,000 to $10,000 based on similar work performed by the Northern Virginia Regional Commission for the Town of Vienna.	Apply for grant from the Chesapeake By Local Assistance Department ($5,000 max. for GIS projects). Some match (variable %) required by the Town.
Implement a Town-wide stormdrain stenciling or labeling program and develop public education materials for pre-labeling distribution.	To reduce the incidence of dumping used oil, pet waste, and other materials down stormdrains through public education.	No; however, the Town will need to improve public education and outreach as part of future VPDES Phase II MS4 requirements.	Department of Community Development and Department of Public Works	$6,580 to label each of the Town's 1,293 drainage structures (Town estimate). $496 for printing costs to distribute public education materials to 5,786 households. Does not include staff time. Volunteer time will be required.	Apply for grants from the Virginia Environmental Endowment, the Chesapeake Bay Restoration Fund, and/or the Chesapeake Bay Local Assistance Fund. Potential for business/non-profit sponsorship of education materials.

MATRIX OF RECOMMENDATIONS FOR ACTION

Recommendation/ Suggestion	Purpose	Required for Compliance	Responsibility	Estimated Cost	Funding Source
Develop a public education brochure on the Town's dog waste disposal regulations.	To reduce the incidence of fecal coliform pollution in Town streams caused by improper disposal of pet waste.	No; however, the Town will need to improve public education and outreach as part of future VPDES Phase II MS4 requirements.	Department of Community Development.	Templates exist from neighboring jurisdictions, limiting staff time. Costs depend on amount printed.	Town.
Initiate an annual Household Hazardous Materials Drop-Off and Collection Day for homeowners. Distribute information to Town residents on Fairfax County's Hazardous Household Waste Program.	To reduce the incidence of improper disposal of hazardous wastes by providing an alternative to dumping. To increase awareness and use of the County's program.	No; however, the Town will need to improve public education and outreach as part of future VPDES Phase II MS4 requirements.	Department of Public Works.	Disposal at Fairfax County's I-66 Transfer Station is free. Coordination must be made in advance with the Fairfax County Household Hazardous Waste Program (803-9614). Means of advertising program to be determined. Printing costs not to exceed $496 for 5,786 households. Staff time and use of Town vehicles for collection and transport not included.	Town. See Appendix B for more information.

MATRIX OF RECOMMENDATIONS FOR ACTION

Recommendation/ Suggestion	Purpose	Required for Compliance	Responsibility	Estimated Cost	Funding Source
Implement a permanent Town used oil, filters, and antifreeze collection and recycling program.	To provide a means for disposing of common materials that may otherwise enter a storm drain. Needed due to declining participation by private entities.	No; however, the Town will need to improve public education and outreach as part of future VPDES Phase II MS4 requirements.	Department of Public Works.	The State is considering a program to fund local government efforts of this nature. If funding is not available, it is anticipated that set up costs, exclusive of collection and staff costs, will be in the range of $3,000 to $5,000.	State grant or Town.
Develop a placard, to be placed at all points of sale for oil and antifreeze, alerting the public about the need to recycle these materials and advertising local businesses participating in a recycling program.	To increase awareness of the hazard of not recycling used oil and antifreeze. To increase business participation in used oil recycling.	No; however, the Town will need to improve public education and outreach as part of future VPDES Phase II MS4 requirements.	Department of Community Development.	Cost of placards. Staff time associated with compiling and maintaining a list of businesses selling oil and antifreeze.	Town.
Incorporate civil penalties into the Town's Chesapeake Bay Preservation Ordinance.	To provide the Town with a meaningful and timely way to enforce its Ordinance.	No.	Department of Community Development.	Staff time.	Town.

MATRIX OF RECOMMENDATIONS FOR ACTION

Recommendation/ Suggestion	Purpose	Required for Compliance	Responsibility	Estimated Cost	Funding Source
Eliminate the provision of the Town's Chesapeake Bay Preservation Ordinance, which allows for opting out of RMAs.	To improve Town-wide water quality management and protection.	No; however, cited as an action statement in the Comprehensive Plan.	Department of Community Development.	None to the Town. Marginal cost to the developers (approx. 15% over cost to implement required stormwater volume control) *if* the Town also implements a fee-in-lieu of on-site BMPs for small sites.	Town
Incorporate language in the Town's Chesapeake Bay Preservation Ordinance allowing for the payment of a fee-in-lieu of on-site implementation of stormwater BMPs under certain scenarios.	To eliminate the use of the waivers as a means of escaping water quality protection requirements. To provide the Town with a means of flexibility when on-site implementation is not desirable.	No.	Department of Public Works.	Revenue neutral and revenue generating.	Town.
Implement Section VI "Strategies and Action Statements" of the Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan.	To protect and restore water resources of the Town and to meet obligations of the Chesapeake Bay Preservation Act.	Yes; in order to comply with Phase II requirements of the Chesapeake Bay Preservation Act.	Department of Community Development and Department of Public Works	Various (see Section VII of the Chapter)	Town.
Implement a system of tracking variances and waivers to the Chesapeake Bay Preservation Ordinance.	To ease future compliance with Phase III enforcement of Chesapeake Bay Preservation Act.	No; however, these measures will make future compliance easier.	Department of Community Development.	Staff time.	Town.

MATRIX OF RECOMMENDATIONS FOR ACTION

Recommendation/ Suggestion	Purpose	Required for Compliance	Responsibility	Estimated Cost	Funding Source
Submit Subdivision Ordinance and Zoning Ordinance to Chesapeake Bay Local Assistance Department for preliminary review.	To ensure that these ordinances are mutually supportive of the Chesapeake Bay Preservation Ordinance. Phase III Chesapeake Bay Preservation Act compliance.	Yes; in order to comply with Phase III requirements of the Chesapeake Bay Preservation Act.	Department of Community Development.	Staff time.	Town.
Incorporate a policy that requires the owners of private BMP facilities to provide annual inspections by a certified professional engineer and to provide a report to the Town which addresses the maintenance needs of the facility in accordance with the inspection.	To ensure adequate maintenance of private BMP facilities.	Yes; in order to effectively implement the Town's Chesapeake Bay Preservation Ordinance.	Department of Public Works.	Staff time to revise maintenance agreement forms. Staff time to process inspection reports. More cost effective than having Town staff perform inspections.	Town.
Submit Town's FEMA floodplain map and LOMRs to FEMA's Region III office for remapping consideration.	To ensure that the Town's FEMA floodplain map is a useful resource and to reflect changes in the map caused by development.	No; however, cited as an action statement in the Comprehensive Plan.	Department of Public Works.	Staff time to compile LOMRs and to submit application.	Town.
Adopt a Stormwater Management Ordinance.	To more comprehensively manage stormwater runoff in the Town and to streamline the Town's regulatory process.	No; however, cited as an action statement in the Comprehensive Plan.	Department of Public Works and Department of Community Development.	Staff time to work with NVRC to develop ordinance.	The Northern Virginia Regional Commission has obtained a grant from the Virginia Coastal Program to develop an SMO for the Town.

MATRIX OF RECOMMENDATIONS FOR ACTION

Recommendation/ Suggestion	Purpose	Required for Compliance	Responsibility	Estimated Cost	Funding Source
Identify projects in the Town's Pro Rata Share program for potential funding through State Water Quality Improvement Funds.	To provide a funding supplement to implement eligible stormwater management projects.	No.	Department of Public Works.	Revenue generating.	Town.
Continue to move forward with an update to the Town's Pro Rata Share Program.	To update the Town's program to reflect current stormwater management needs and future build out conditions.	Yes; if the Town wishes to continue to use this funding source.	Department of Public Works.	Revenue generating in long run.	Town.
Consider implementation of Stormwater Utility Fee Program if Fairfax County adopts such a program.	To provide an ongoing source of revenue for Town stormwater management needs.	No.	Department of Public Works.	Revenue generating. Costs associated with program set-up.	Town.

APPENDIX A
RELEVANT FEDERAL AND STATE STORMWATER MANAGEMENT REGULATIONS

Appendix A provides an overview of all major federal and State stormwater management regulations and programs which either directly or indirectly affect the Town. Part I of the main report examines in depth those regulations which impose existing or future mandates on the Town.

A.1 FEDERAL REGULATIONS

Most federal mandates, regulations, and programs affect the Town indirectly by requiring Virginia to adopt and implement minimum water quality and quantity regulatory requirements. As a result, almost all mandates affecting the Town can be traced to federal legislation and regulations. Since many of Virginia's programs simply implement federal regulations and programs by reference, it is useful to look at the originating federal source of these mandates. Federal requirements and programs covered in this section include:

- **Clean Water Act**
- **National Flood Insurance Act and Flood Disaster Protection Act**
- **Chesapeake Bay Agreement**

CLEAN WATER ACT

Impacts on Herndon

- National Pollution Discharge Elimination System (NPDES) Phase II Municipal Separate Storm Sewer System (MS4) Permit (Future Town)
- NPDES Industrial/Wastewater Treatment Discharge Permits (Current Private Sector and Blue Plains Wastewater Treatment Facility)
- Water Quality Standards, Reporting, and Swimmable and Fishable Water Quality Goals (Current Virginia Department of Environmental Quality and Department of Conservation and Recreation)
- Wetlands Protection under Virginia Department of Environmental Quality Water Protection Permit (Current Development Community)

The Clean Water Act (CWA), U.S.C. §1251 *et seq*., is the federal government's primary water quality protection tool. Under the CWA, the U.S. EPA and its partners are responsible for ensuring that the nation's pristine rivers, lakes, and estuaries remain unpolluted and for working to clean up already polluted water bodies. Major sections of the CWA that have impacts on the State and local levels include the following.

- REPORTING (Sections 303 and 305): Section 303 requires each state to identify and report to the EPA those waters within its boundaries which do not meet water quality standards based on an assessment of chemical and biological monitoring data. Virginia

submits a "303(d) Total Maximum Daily Load Priority List Report" to the EPA every other year. Neither Broad Run nor Sugarland Run are listed as "impaired waters" in the 1996 report.

Section 305 requires each state to prepare and submit to the EPA a description of water quality, an analysis of the extent to which navigable waters provide for the protection and propagation of aquatic life, an analysis of the extent to which the elimination of the discharge of pollutants have been or will be achieved, and a description of the nature and extent of nonpoint sources of pollutants. Virginia submits a "Virginia Water Quality Assessment and Nonpoint Source Pollution Watershed Assessment Report" to the EPA every other year. Sugarland Run and Broad Run are designated as "high priority" by the Virginia Department of Conservation and Recreation under the *1996 Nonpoint Source Pollution Potential Priorities* guidelines contained in this report.

- NONPOINT SOURCE MANAGEMENT PROGRAM (Section 319): This section requires that each state develop and implement a management program for controlling pollution contributed by nonpoint sources. Virginia's nonpoint source management programs are tailored to meet the requirements of Section 319.

- PERMITS AND LICENSES (Section 401): This section establishes a system for requiring permits for any activity that may result in any discharge into navigable waters, including the fill of wetlands. The Virginia Department of Environmental Quality is the State agency responsible for carrying out most Section 401 permitting requirements.

- NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (Section 402): The U.S. EPA regulates point source and nonpoint source pollution primarily through the National Pollutant Discharge Elimination System (NPDES). The initial thrust of the NPDES program, which was established in 1972, was to reduce point source discharges of pollution from industrial processing plants and municipal wastewater treatment facilities.

  Congress amended the CWA in 1987 to require phased NPDES requirements for municipal stormwater discharges. Under the CWA, an NPDES Municipal Separate Storm Sewer System (MS4) permit will be issued to a subjugated locality on a system-wide basis if:

  (1) the municipality implements enforceable measures to prohibit non-stormwater discharges to the stormsewer; and,
  (2) the municipality demonstrates that it has implemented stormwater management controls to reduce the discharge of pollutants to the maximum extent practicable.

  Phase I of NPDES (which is already being implemented) requires a two-part application process for discharges from systems serving large (500,000 or more people) or medium (100,000 to 500,000 people) municipalities. In general, Part I of the application requires identification of pollutant sources, compilation of existing precipitation and water quality

data, and a field screening analysis for illicit connections and illegal dumping. Part II of the application is the municipality's proposed stormwater management program.

Regulations for smaller urban municipalities (Phase II) with populations under 100,000 are currently being promulgated. Herndon is noted specifically as being subject to NPDES Phase II under 40 CFR Parts 122 and 123. Affected localities will have no more than three years and 90 days from the rule's promulgation to either obtain a Phase II MS4 permit or submit a Notice of Intent (NOI) to comply with the terms of a general permit issued by the State. Additional flexibility is built into the process under a third option where Phase II municipalities can piggyback on larger Phase I permits (such as Fairfax County's). Under this option, both large and small localities must abide by rules of mutual cooperation.

Despite streamlining, all Phase II permit holders are likely to have additional burdens placed on them to more closely account for, and minimize nonpoint source pollution within their borders. At a minimum, Phase II localities opting to comply with a general permit will be required to meet six minimum control measures. Although still in proposed rule format (40 CFR Parts 122 and 123, February 9, 1998), these minimum control measures are likely to include the following.

(1) Public Education and Outreach on Stormwater Impacts. This minimum control will require that the locality take actions to provide materials or develop outreach programs to inform individuals and households about steps that can be taken to reduce stormwater pollution, such as ensuring proper septic system maintenance, limiting the use and runoff of garden chemicals to appropriate amounts, properly disposing of used motor oil or household hazardous wastes, and becoming involved in local stream restoration activities. Other possible outreach materials could encourage citizens to participate in the municipal program by performing such services as roadside litter pickup and stormdrain stenciling, or highlight the potential public health risks to children if exposed to pollution when playing near stormdrains. In addition, some of the materials should be directed towards targeted groups of commercial, industrial, and institutional entities likely to have significant stormwater impacts.

(2) Public Involvement/Participation. The municipal stormwater management program will need to include a public participation component that complies with applicable State and local public notice requirements. The public should participate as a partner in developing, implementing, and reviewing the overall stormwater management program.

(3) Illicit Discharge Detection and Elimination. Discharges from stormwater drainage systems often include wastes and wastewater from non-stormwater sources. Illicit discharges enter the system through either direct connections or indirect connections (infiltration into the stormdrain or spills collected by drain inlets). Any NPDES permit issued to an owner or operator of a regulated small municipal system will, at a minimum, require the development of an illicit

discharge detection and elimination program. The operator will have to show an awareness of the system using maps or other existing documents and will also be required to develop a stormsewer system map showing the location of major pipes, outfalls, and topography. The map should identify areas of concentrated activities likely to be a source of stormwater pollution.

The locality will be required to effectively prohibit illicit discharges into the stormwater sewer system through ordinance, order, or similar means, to the extent allowed under State law, and implement appropriate enforcement procedures and actions as needed. This measure will also require the locality to develop and implement a plan to detect and address illicit discharges including illegal dumping to the system.

Finally, the measure would require the locality to inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste. Actions would include stormdrain stenciling; a program to promote, publicize, and facilitate public reporting of illicit connections or discharges; and, and a program to facilitate distribution of outreach materials. Recycling and other public outreach programs should be developed to address potential sources of illicit discharges, including used motor oil, antifreeze, pesticides, herbicides, and fertilizers.

Activities not regulated include water line flushing, landscape irrigation, diverted stream flows, rising groundwater, uncontaminated groundwater infiltration, uncontaminated pump water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, foot drains, lawn watering, individual residential car washing, flows from riparian habitats, dechlorinated pool water, and street wash water.

(4) Construction Site Stormwater Runoff Control. Implementation of this minimum control will require localities to develop, implement, and enforce a pollutant control program to reduce pollutants in stormwater runoff from construction activities that result in land disturbance of one (1) or more acres. The program will also need to ensure control of other waste at construction sites that could adversely impact water quality including discarded building materials, concrete truck wash out, and sanitary waste. The U.S. EPA acknowledges that localities already administer local erosion and sediment control programs; however, they believe that requiring an NPDES permit will strengthen the base level of water quality protection.

(5) Post-Construction Stormwater Management in New Development and Redevelopment. The U.S. EPA rule will require the development, implementation, and enforcement of a program that includes a plan to address stormwater runoff from new development and redevelopment projects to their municipal separate stormsewer system using site appropriate structural and nonstructural BMPs. The program will need to ensure that controls are in place

that would prevent or minimize water quality impacts. The program should ensure adequate long-term operation and maintenance of BMPs. Redevelopment refers to alterations of a property that change the footprint of a site or building in such a way that results in the disturbance of equal to or greater than one (1) acre of land. The U.S. EPA intends to provide guidance on appropriate planning considerations, structural and non-structural controls, and post construction operation and maintenance of BMPs.

The U.S. EPA proposes that municipalities establish requirements for the use of BMPs that minimize water quality impacts and attempt to maintain pre-development runoff conditions. In other words, post-development conditions should not be different from pre-development conditions in a way that adversely affects water quality. The municipal program should include structural and/or nonstructural BMPs. The U.S. EPA encourages locally based watershed planning and the use of preventative measures including nonstructural BMPs which are generally lower in cost than structural BMPs. Examples include policies and ordinances that result in the protection of natural resources and prevention of runoff. These include requirements to limit growth in identified areas, protect sensitive areas such as wetlands and riparian areas, minimize imperviousness, maintain open space, and minimize disturbance of soils and vegetation.

(6) Pollution Prevention/Good Housekeeping for Municipal Operations. Any permit at a minimum will require the operator to develop and implement a cost-effective operation and maintenance/training program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations. This will include: (1) maintenance activities, schedules, and long term inspection procedures for structural and other stormwater controls to reduce floatables and other pollutants discharged from separate storm sewers; (2) controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, and waste transfer systems; (3) procedures for the proper disposal of waste removed from the storm sewer; and, (4) ways to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporation of additional water quality protection devices or practices.

Potential impacts to the Town as a result of Phase II NPDES are discussed under Part II of this report.

- PERMITS FOR DREDGED OR FILL MATERIAL (WETLANDS) (Section 404): Section 404 (in conjunction with Section 10 of the Harbors and Rivers Act) regulates the dredging or fill of navigable waters and is typically used to regulate and protect wetlands. All wetlands are covered by Section 404 due to the "potential" that filling them will impact interstate commerce. However, the 4th Circuit Court, which includes Virginia and Maryland, in *United States v. Wilson*, has recently ruled that the Army Corps of Engineers overstepped the Constitutional bounds of the CWA by regulating fill of isolated wetlands, or wetlands connected to non-navigable waterways. The issue is

currently before the Supreme Court, but its resolution should have relatively little impact on wetland protection in the Town since most of its wetlands are hydrologically connected to the Town's major tributaries.

The U.S. EPA, the U.S. Army Corps of Engineers, and the Virginia Department of Environmental Quality are jointly responsible for enforcing wetland regulations in Virginia. The Town's Zoning Ordinance, Subdivision Ordinance, Site Plan Ordinance, and Chesapeake Bay Preservation Ordinance all require that wetland permits are obtained before development can begin. The U.S. Army Corps of Engineers has established a system of Nation-Wide Permits (NWPs) which allow for expedited review of small wetland/stream channel fill projects. New NWP guidelines became effective February 11, 1997. The most common NWPs, which are described below, are 12, 14, and 26.

NWP 12 allows for discharges associated with excavation, backfill, or bedding for utility lines provided there is no change in preconstruction contours. Excavation activities are included under this NWP and notification is required if any of the following criteria are met:

- mechanized land clearing in a forested wetland;
- a Rivers and Harbors Act §10 permit is required;
- the utility line in waters of the United States exceeds 500 feet; or,
- the utility line is placed within a jurisdictional wetland and it runs parallel to a streambed that is within that jurisdictional wetland.

NWP 14 allows for fill for a road crossing as long as it does not cause a loss of more than one-third acre or is not more than 200 feet in length. The permitee notifies the Corps 30 days prior to the start of construction. NWP 14 cannot be combined with a NWP 26 for the purpose of increasing the footprint of the road crossing.

NWP 26 allows a loss of up to three acres of wetland and 500 linear feet of stream. For fills less than one-third of an acre a developer must submit a report to the Corps within 30 days after completing the work. The report must contain the following information:

- name, address, and phone number of the permitee;
- location of work;
- description of the work; and,
- type and acreage (or square feet) of the loss of waters of the United States. The data collected is used by the Corps to quantify and qualify the types of activities and waters of the United States affected by the use of NWP 26.

For fills greater than one-third acre (and less than 3 acres), a developer must submit a Pre-Construction Notification (PCN) to the Corps 45 days prior to starting work. The following information must be included in the PCN:

- name, address and phone number of the permitee;
- location of the proposed project;
- brief description of the project (project purpose, direct and indirect adverse environmental effects, any other NWPs or other general permits used); and,
- delineation of affected wetlands.

If the proposed fill is more than one acre (and less than 3 acres) the PCN will also be reviewed by the United States Fish and Wildlife Service, the State natural resource or water quality agency (VDEQ), the EPA, the State Historic Preservation Officer, and if necessary, the National Marine Fisheries Service.

Although mitigation is still considered discretionary, the Corps has indicated that most actions involving loss of one-third acre of more will require some level of mitigation. In all instances, discharges must be minimized or avoided to the maximum extent practicable. Although the U.S. Fish and Wildlife Service's National Wetland Inventory (NWI) maps depict the general location of wetlands within Herndon, more recent/updated information conducted as part of a 1998 field investigation is contained in the Town's Chesapeake Bay Chapter to the Town's Comprehensive Plan. Regardless, the U.S. Army Corps of Engineer's *Wetlands Delineation Manual* (January, 1987 version) must be used to delineate site specific wetlands for development purposes.

NATIONAL FLOOD INSURANCE ACT AND FLOOD DISASTER PROTECTION ACT

Impacts on Herndon

- Floodplain Ordinance (Current Town)

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 set up a process that requires local governments to adopt floodplain management criteria developed by the Federal Emergency Management Agency in order for residents in flood prone areas to qualify for federal flood insurance. The minimum federal floodplain protection criteria are contained in 44 CFR 60.3. The primary enforcement mechanism for this program is by local ordinance. The only means of enforcement from FEMA is random "Community Assistance" visits that are designed to check or monitor the floodplain ordinance and to assess whether the community is enforcing its ordinance. Assistance on the State level for compliance is administered by the Virginia Department of Conservation and Recreation.

The Community Rating System is an optional element of the National Flood Insurance Program which provides a premium reduction for communities exceeding minimum criteria. FEMA and the Department of Conservation and Recreation provide technical assistance to communities wishing to participate in the CRS.

CHESAPEAKE BAY AGREEMENT

Impacts on Herndon

- Chesapeake Bay Preservation Ordinance (Current Town)
- Shenandoah and Potomac River Basins Tributary Nutrient Reduction Strategy (Voluntary/Cooperative Town)

The 1983 Chesapeake Bay Agreement, fostered through the U.S. EPA, established a cooperative effort among Virginia, Maryland, Pennsylvania, and the District of Columbia to improve water quality in the Chesapeake Bay. The primary pollutants of concern for the Chesapeake Bay are nutrients, which when present in excessive amounts, results in algae blooms and a depletion of life-sustaining dissolved oxygen levels. The most widely known result of this agreement in Virginia is the Chesapeake Bay Preservation Act of 1988 which is implemented in Herndon as the Chesapeake Bay Preservation Ordinance. For a number of reasons, phosphorus was chosen as the keystone pollutant from which the performance criteria of the Act are measured. In 1987, the cooperative agreement was amended to include a goal of reducing the flow of nutrients to the Chesapeake Bay by 40% from a base year of 1985. This initiative, know as Tributary Strategies, focuses on both nitrogen and phosphorus reduction and resulted in the acceptance of the Shenandoah and Potomac River Basins Tributary Nutrient Reduction Strategy by the General Assembly in 1997. The Strategy is unique in that nutrient reduction goals are to be met through a cooperative/voluntary arrangement and paid for under a 50/50 grant matching program established by the Virginia Water Quality Improvement Act of 1997.

A.2 STATE REGULATIONS

The Commonwealth of Virginia has adopted a range of mandates, regulations, and programs aimed at improving water quality and controlling the affects of increased water volume that results from urban development. State requirements and programs covered here include:

- **Virginia Pollutant Discharge Elimination System**
- **Virginia Water Protection Permit**
- **Chesapeake Bay Preservation Act**
- **Tributary Strategies**
- **Stormwater Management Act**
- **Erosion and Sediment Control Law**

VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM

Impacts on Herndon

- Virginia Pollution Discharge Elimination System (VPDES) Phase II Municipal Separate Storm Sewer System (MS4) Permit (Future Town)
- VPDES Industrial Discharge Permits (Current Private Sector)

Section 402 of the federal Clean Water Act, which requires a permit for any discharge to the waters of the United States, is administered in Virginia by the Department of Environmental Quality. DEQ requires a VPDES permit for all point source discharges to surface waters by businesses, governments, or individuals. The U.S. EPA maintains authority to review applications and permits for major dischargers, a distinction based on discharge quantity and content. The CWA amendments of 1987 also require permits for larger municipal stormwater systems (Phase I) and certain industrial stormwater discharges. DEQ also regulates these stormwater discharges through VPDES permits.

Once NPDES Phase II MS4 permit requirements are finalized by the U.S. EPA, it is very likely that the Department of Environmental Quality will be responsible for reviewing, granting, and enforcing these permits, including Herndon's.

VIRGINIA WATER PROTECTION PERMIT

Impacts on Herndon

- Wetlands Protection under Virginia Department of Environmental Quality Water Protection Permit (Current Development Community)

If a project requires a federal permit for discharges of dredged material into waterways or wetlands, or for other instream activities, the Department of Environmental Quality will review the project for issuance of a Virginia Water Protection (VWP) permit, formerly called 401 certification.

CHESAPEAKE BAY PRESERVATION ACT

Impacts on Herndon

- Chesapeake Bay Preservation Ordinance (Current Town)
- Chesapeake Bay Preservation Chapter to the Town of Herndon Comprehensive Plan (Current Town)
- Chesapeake Bay Preservation Program Reporting (Future Town)

The Chesapeake Bay Preservation Act, and its resultant Chesapeake Bay Preservation Area Designation and Management Regulations, specifically addresses nonpoint source pollution contributed to the Chesapeake Bay from the Tidewater portion of its Virginia watershed. The Act is administered through the Chesapeake Bay Local Assistance Department and is implemented through 84 affected local governments. Localities implement and enforce the program through their land use management tools including comprehensive plans, zoning ordinances, and subdivision ordinances.

The Chesapeake Bay Local Assistance Department (CBLAD) has approached Bay Act implementation in three phases. Phase I is program development and ordinance adoption. Phase II is the incorporation of water quality into local comprehensive plans. Phase III involves (1) reconciliation of all local ordinances involving water quality and (2) establishing a system of State oversight over local program implementation.

- PHASE I (PROGRAM DEVELOPMENT AND ORDINANCE ADOPTION): The Regulations specify eleven performance criteria that apply to proposed land use activities within sensitive lands designated by local governments as Chesapeake Bay Preservation Areas. Performance criteria applied to these areas ensure that the Chesapeake Bay and local water resources are not adversely affected by activities on the land. The locally designated CBPA consists of two components: the Resource Protection Area (RPA) and the Resource Management Area (RMA).

RPAs are lands at or near water courses/shorelines that have intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts that may cause significant degradation to the quality of State waters. At a minimum, RPAs include:

- tidal shores;
- tidal wetlands;
- nontidal wetlands contiguous to tidal wetlands and tributary streams; and,
- a 100-foot buffer landward of these features and along tributary streams.

In addition, local governments may include other lands that are deemed to be significant in the protection of State waters. Development in the RPA is limited to water dependant facilities or the redevelopment of existing facilities, provided these activities adhere to the performance criteria specified in the Regulations.

RMAs are land types that, if improperly used or developed, have a potential for causing significant water quality degradation or diminishing the functional value of the RPA. The RMA must encompass a land area large enough to provide significant water quality protection. The following categories must be considered by the locality for inclusion in the RMA:

- floodplains;
- highly erodible soils, including steep slopes;
- highly permeable soils;
- nontidal wetlands not included in the RPA; and,
- other lands necessary to protect the quality of State waters.

The "General Performance Criteria" that apply to all land within CBPAs include the following.

(1) No more land shall be disturbed than is necessary to provide for the desired use or development.

(2) Indigenous vegetation shall be preserved to the maximum extent possible consistent with the use and development allowed.

(3) Where the best management practices utilized require regular or period maintenance in order to continue their functions, such maintenance shall be ensured by the local government through a maintenance agreement with the owner or developer or some other mechanism that achieves an equal objective.

(4) All development exceeding 2,500 square feet of land disturbance shall be accomplished through a plan of development review process consistent with §15.1-491(h) of the Code of Virginia.

(5) Land development shall minimize impervious cover consistent with the use or development allowed.

(6) Any land disturbing activity that exceeds an area of 2,500 square feet (including construction of all single family houses, septic tank drainfields, etc.) shall comply with the requirements of the local erosion and sediment control ordinance.

(7) Onsite sewage treatment systems not requiring a VPDES permit shall:

(a) have pump-out accomplished for all such systems at least once every five years; and,

(b) for new construction, provide a reserve sewage disposal site with a capacity at least equal to that of the primary sewage disposal site.

(8) For new development, the post-development nonpoint source pollution runoff load shall not exceed the predevelopment load based upon average land cover conditions. Redevelopment of any site not currently served by water quality best management practices shall achieve at least a 10% reduction of nonpoint source pollution in runoff compared to the existing runoff load from the site. Post-development runoff from any site to be redeveloped that is currently served by water quality best management practices shall not exceed the existing load of nonpoint source pollution in surface runoff.

(9)(10) [Requirements relating to agricultural activities and silvicultural activities, respectively.]

(11) Local governments shall require evidence of all wetlands permits required by law prior to authorizing grading or other non-site activities to begin.

In addition to these general criteria are specific performance criteria for application in Resource Protection Areas.

(1) A "Water Quality Impact Assessment" is required for any proposed development in a Resource Protection Area.

(2) To minimize the adverse effects of human activities on the other components of the Resource Protection Area, State waters, and aquatic live, a 100-foot "buffer area" of vegetation that is effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff must be retained if present and established where it does not exist. Sections §4.3.B.1,2,3, and 4 provide information on buffer modification requirements.

The Regulations also provide for administrative waivers and exemptions in §4.5.

- PHASE II (COMPREHENSIVE PLANS): The Regulations state that local governments shall review and revise their comprehensive plans to incorporate water quality considerations. Requirements include:

(1) Local governments should establish an information base from which to make policy choices about future land use and development that will protect the quality of State waters. This element of the plan should be based on the following:

- information used to designate Chesapeake Bay Preservation Areas;
- other marine resources;
- shoreline erosion problems and location of erosion control structures;
- conflicts between existing and proposed land uses and water quality protection; and,
- a map or map series accurately representing the above information.

(2) As part of the plan, local governments should clearly indicate local policy on land use issues relative to water quality protection. Local governments should ensure consistency among the policies developed.

- Local governments should discuss each component of Chesapeake Bay Preservation Areas in relation to the types of land uses considered appropriate and consistent with the goals and objectives of the Act, these regulations and their local programs.

- At a minimum, local governments should prepare policy statements for inclusion in the plan on the following issues:
  - physical constrains to development, including soil limitations, with an explicit discussion of soil suitability for septic tank use;
  - protection of potable water supply, including groundwater resources;
  - relationship of land use to commercial and recreational fisheries;
  - appropriate density for docks and piers;
  - public and private access to waterfront areas and effect on water quality;
  - existing pollution sources; and,
  - potential water quality improvement through the redevelopment of Intensely Developed Areas.
- For each of the policy issues listed above, the plan should contain a discussion of the scope and importance of the issue, alternative policies considered, the policy adopted by the local government for that issue, and a description of how the local policy will be implemented.
- Within the policy discussion, local governments should address consistency between the plan and all adopted land use, public services, land use value taxation ordinances and policies, and capital improvement plans and budgets.

Local government comprehensive plans are reviewed and certified by the Chesapeake Bay Local Assistance Board.

- PHASE III (RECONCILIATION AND ENFORCEMENT): The Regulations require that affected Tidewater localities review and revise their zoning ordinances, plans of development review, and subdivision ordinances to ensure that the are mutually supportive of, and comply with the Act.

  In addition, it has long been the intention of the Chesapeake Bay Local Assistance Department to establish a system of local government reporting on ordinance enforcement. In this manner, CBLAD can ensure a level playing field in ordinance implementation. CBLAD will solicit input from local governments on how to ensure enforcement while minimizing administrative burdens on local government staff.

The Chesapeake Bay Preservation Area Designation and Management Regulations are currently undergoing review and it is likely that changes will be made. Discussions with CBLAD staff has

indicated that any changes affecting Herndon should be minor and may require very slight administrative amendments.

More significantly, the General Assembly, in 1998, amended the Act itself to specifically allow localities to incorporate provisions for civil penalties into local ordinances for violations in Chesapeake Bay Preservation Areas. This new power, which allows for a penalty of $1,000 per day per penalty up to $10,000, is contained in §10.1-2109.E of the Code of Virginia.

VIRGINIA TRIBUTARY STRATEGIES
VIRGINIA WATER QUALITY IMPROVEMENT ACT

Impacts on Herndon

- Indirectly through Blue Plains WWTF Rates
- Voluntary Nonpoint Source Pollution Stormwater Retrofit (Voluntary Town)

By 1987, it had become apparent that in order to protect the health of the Chesapeake Bay, it would be necessary to further reduce the flow of nutrients and other harmful pollutants entering the Bay (previous efforts were focused on a no-net-increase approach). As a result, the Chesapeake Bay Agreement was amended in that year to include a goal of reducing the flow of controllable nutrients (phosphorus and nitrogen) to the Bay by 40% by the year 2000.

The idea behind Tributary Strategies is to address water quality problems on a watershed-wide basis as opposed to individual development sites or even jurisdictions. While individual jurisdictions are expected to play a major role in its implementation, the purpose of Tributary Strategies is to recognize that the protection of water resources requires a comprehensive and flexible approach. Under the program, each tributary to the Chesapeake Bay must arrive at a Tributary Strategy which documents and gives credit to existing programs, and determines where new programs may be implemented most cost effectively. On the State level, coordination of Tributary Strategies is a cooperative effort among the Department of Conservation and Recreation, the Department of Environmental Quality, and the Chesapeake Bay Local Assistance Department. The DCR is the lead agency in the State regarding nonpoint source pollution while the DEQ is the lead agency regarding point source pollution control.

While they overlap, Tributary Strategies covers a more extensive geographic area than the existing Chesapeake Bay Preservation Act boundaries (the entire Chesapeake Bay basin of Virginia, or almost two thirds of the State, versus Tidewater). It should be recognized that local Chesapeake Bay ordinances deal primarily with new development, and therefore do not count towards the 40% reduction goal. Local ordinances are intended to avoid future increases in nutrients to the Bay as a result of new development. Only in the case of redevelopment is there any reduction in nutrients (10%) to the Bay.

The State's Tributary Strategies include identification of new activities, management measures, and increased use of BMPs to achieve the 40% nutrient load reduction. Urban retrofit may be accomplished either structurally (through the establishment of regional BMPs or by modifying existing flood control facilities) or nonstructurally (through the implementation of source control programs such as public education, or through the implementation of vegetative BMPs).

In 1997, and after much negotiation, the General Assembly accepted the *Shenandoah and Potomac River Basins Tributary Nutrient Reduction Strategy*. In general, the Northern Virginia strategy calls for achieving nutrient reduction through:

- increased use and coverage of nonpoint source BMPs (through retrofit of existing land uses) for both agricultural and urban lands; and,
- retrofit of all wastewater treatment plants in the region, with a design capacity of 0.5 million gallons per day or greater, with year around biological nutrient removal (BNR) or equivalent technology.

Nearly 90% of the cost of achieving Northern Virginia's nutrient reduction goals comes from proposed retrofit of regional wastewater treatment facilities. The Virginia Association of Municipal Wastewater Agencies (VAMWA) has produced a position paper on how to meet those goals and is generally accepted as the primary implementation mechanism. The primary funding mechanism for Tributary Strategies is the Virginia Water Quality Improvement Fund created by the Virginia Water Quality Improvement Act of 1997. This fund will pay for up to 50% of the cost of nutrient reduction projects on a competitive basis.

While Herndon is not mandated to achieve any specific nutrient reductions since it does not own or operate a wastewater treatment facility, it may contribute voluntarily through participation in the Water Quality Improvement Fund grant program.

STORMWATER MANAGEMENT ACT

Impacts on Herndon

- Optional Adoption of Stormwater Management Ordinance

In 1989, the General Assembly adopted the Stormwater Management Act (§10.1-603.1 *et seq* of the Code of Virginia) enabling the establishment of comprehensive stormwater management programs. The Department of Conservation and Recreation promulgated the Virginia Stormwater Management Regulations in 1990, which were substantially amended in 1998 as 4VAC3-20 *et seq*. The State stormwater management program addresses the permanent changes in stormwater runoff that occur as a result of land development. The Regulations specify minimum technical and administrative requirements for local programs and State agency projects.

Local adoption of a stormwater management program is optional. However, localities choosing to adopt a stormwater management program *must* comply with the general technical criteria outlined in 4VAC3-20-60 and the technical provisions for flooding contained in 4VAC3-20-85. Technical provisions relating to stormwater runoff quality (4VAC3-20-71), stream channel erosion (4VAC3-20-81), and watershed or regional stormwater management plans (4VAC3-20-101) may be adopted at the option of the locality. Stormwater management programs that contain these optional provisions must comply with the guidelines contained in the Regulations.

Localities also have the option of adopting more stringent requirements than those outlined in the Regulations.

- GENERAL TECHNICAL CRITERIA: General technical criteria which *must* be included in a local program include the following.
  - A. Determination of flooding and channel erosion impacts to receiving streams due to land development projects shall be measured at each point of discharge from the development project and such determination shall include any runoff from the balance of the watershed which also contributes to that point of discharge.
  - B. The specified design storms shall be defined as either a 24-hour storm using the rainfall distribution recommended by the U.S. Soil Conservation Serve when using SCS methods, or as the storm of critical duration that produces the greatest required storage volume at the site when using a design method such as the Modified Rational Method.
  - C. All pervious lands in the site shall be assumed prior to development to be in good condition, with good cover, or with conservation treatment regardless of conditions existing at the time of computation.
  - D. Construction of stormwater management facilities or modifications to channels shall comply with all applicable laws and regulations.
  - E. Impounding structures that are not covered by the Impounding Structure Regulations shall be engineered for structural integrity during the 100-year storm event.
  - F. Pre-development and post-development runoff rates shall be verified by calculations that are consistent with good engineering practices.
  - G. Outflows from a stormwater management facility shall be discharged to an adequate channel, and velocity dissipaters shall be placed at the outfall of all stormwater management facilities and along the length of any outfall channel as necessary to provide a nonerosive velocity of flow from the basin to a channel.
  - H. Proposed residential, commercial, or subdivisions shall apply these stormwater management criteria to the land development as a whole. Individual lots in new subdivisions shall not be considered separate land development projects, but rather the entire subdivision shall be considered a single land development project. Hydrologic parameters shall reflect the ultimate land development and shall be used in all engineering calculations.
  - I. All stormwater management facilities shall have a maintenance plan which identifies the owner and the responsible party for carrying out the maintenance plan.
  - J. Construction of stormwater management impoundment structures within a Federal Emergency Management Agency designated 100-year floodplain shall be avoided to the extent possible.
  - K. Natural channel characteristics shall be preserved to the maximum extent practicable.
  - L. Land development projects shall comply with the Virginia Erosion and Sediment Control Law and attendant regulations.

- FLOODING CRITERIA: Flooding technical criteria that must be included in a local program include the following.
  - A. Downstream properties and waterways shall be protected from damages from localized flooding due to increases in volume, velocity and peak flow rate of stormwater runoff in accordance with the minimum design standards set out in this section.
  - B. The 10-year post-developed peak rate of runoff from the development site shall not exceed the 10-year pre-developed peak rate of runoff.
  - C. In lieu of subsection B of this section, localities may, by ordinance, adopt alternative design criteria based upon geographic, land use, topographic, and geological factors, or other downstream conveyance factors as appropriate.
  - D. Linear development projects shall not be required to control post-developed stormwater runoff for flooding, except in accordance with a watershed or regional stormwater management plan.

- STREAM CHANNEL EROSION CRITERIA: Stream channel erosion technical criteria, that may be included in a local program, include the following.
  - A. Properties and receiving waterways downstream of any land development project shall be protected from erosion and damage due to increases in volume, velocity, and peak flow rate of stormwater runoff in accordance with the minimum design standards set out in this section.
  - B. The plan approving authority shall require compliance with subdivision 19 of 4VAC50-30-40 of the Erosion and Sediment Control Regulation.
  - C. The plan approving authority may determine that some watersheds or receiving stream systems require enhanced criteria in order to address the increased frequency of bankfull flow conditions brought on by land development projects. Therefore, in lieu of the reduction of the 2-year post-developed peak rate of runoff as required in subsection B of this section, the land development project being considered shall provide 24-hour extended detention of the runoff generated by the 1-year, 24 hour duration storm.
  - D. In addition to subsections B and C of this section, localities may, by ordinance, adopt more stringent channel analysis criteria or design standards to ensure that the natural level of channel erosion, to the maximum extent practicable, will not increase due to land development projects. These criteria may include, but are not limited to, the following:
    1. Criteria and procedures for channel analysis and classification.
    2. Procedures for channel data collection.
    3. Criteria and procedures for the determination of the magnitude and frequency of natural sediment transport loads.
    4. Criteria for the selection of proposed natural or man-made channel linings.

- WATER QUALITY CRITERIA: Water quality technical criteria that may be included in a local program include the following.
  - A. Compliance with the water quality criteria may be achieved by applying the performance-based criteria or the technology-based criteria to either the site or a planning area.

Performance-based criteria are those that are currently used under the provisions of the Chesapeake Bay Preservation Area Designation and Management Regulations. Technology-based criteria provide for the water quality criteria to be met if a particular technique is used and maintained under specific development (imperviousness) conditions.

- REGIONAL STORMWATER MANAGEMENT PLANS: This section enables localities to develop regional stormwater management plans. The objective of a regional stormwater management plan is to address stormwater management concerns in a given watershed with greater economy and efficiency by installing regional stormwater management facilities versus individual, site–specific facilities. If developed, a regional plan shall, at a minimum, address the following.
  - A. The specific stormwater management issues within the targeted watersheds.
  - B. The technical criteria in 4VAC3-20-50 through 4VAC3-20-85 as needed based on subdivision A. of this section.
  - C. The implications of any local comprehensive plans, zoning requirements, and other planning documents.
  - D. Opportunities for financing a watershed plan through cost sharing with neighboring agencies or localities, implementation of regional stormwater utility fees, etc.
  - E. Maintenance of selected stormwater management facilities.
  - F. Future expansion of the selected stormwater management facilities in the event that development exceeds the anticipated level.

EROSION AND SEDIMENT CONTROL LAW

Impacts on Herndon

- Erosion and Sediment Control Ordinance (Current Town)

The Erosion and Sediment Control Law of 1988 deals primarily with the control of erosion and sediment during the development process. The Virginia Erosion and Sediment Control Law is codified as Title 10, Chapter 5, Article 4 of the Code of Virginia. Section 10.1-562 addresses local erosion and sediment control program requirements that are to be consistent throughout the Commonwealth. The regulatory program is implemented State-wide through 171 local erosion and sediment control ordinances and the Department of Conservation and Recreation. Minimum criteria, standards, and guidelines are established in the Virginia Erosion and Sediment Control Handbook. The regulations are applicable to land development projects disturbing 10,000 square feet or more, except in locally designated Chesapeake Bay Preservation Areas, where the Regulations are applicable at 2,500 square feet of disturbance. Local governments not subject to the Chesapeake Bay Preservation Act may voluntarily reduce the land disturbance threshold at which the Regulations apply.

As part of each local program, any person engaging in land-disturbing activities must submit an erosion and sediment control plan prior to undertaking these activities. The local authority must

provide periodic inspections of the activity and may require monitoring and reports from responsible persons. General criteria for controlling erosion and sediment under this legislation includes measures for the stabilization of soil stockpiles and graded areas, as well as requirements for the establishment of permanent vegetation and for the installation of sediment traps, basins, diversion, and terraces. The general criteria also include stormwater management criteria for controlling off-site erosion.

APPENDIX B
COSTS AND CONTACTS

The following is a more detailed account of the various costs associated with Matrix of Recommendations for Action.

B.1 SANITARY AND STORMSEWER LINE GIS

In October, 1997, the Northern Virginia Planning District Commission, (now the Northern Virginia), was awarded $5,863 by the Chesapeake Bay Local Assistance Department to develop water and sanitary sewer layers for the Town of Vienna, Virginia. Staff time included 48 hours of a program manager and 220 hours of a GIS technician.

The methodology used by the NVPDC will enable the implementation of future network and routing modeling by Herndon's staff. The actual cost of developing sanitary sewer and stormsewer lines for the Town of Herndon will largely depend upon the quality of the existing mapped information.

B.2 STORMDRAIN LABELING PROGRAM

The Department of Community Development has investigated the cost of retrofitting 1,293 of the Town's 1,293 drainage structures with *das* Manufacturing Inc. non-reflective, duracast stormsewer markers.

Price/marker		Non-reflective	Reflective
(minimum 1,000)	Standard:	$1.60	$2.90
	Duracast:	$4.80	$6.10

*The more purchased, the cheaper the cost. If other jurisdictions agree on the same size and color, more could be bought at a cheaper price. The wording can be different without affecting price.

Cost of adhesive: 10 oz. Caulk tube – $7.80/tube (12 tubes/case)
$93.60/case

Approximate cost for all 1,293 drainage structures using non-reflective duracast:

Markers:	$6,206.40
Adhesive (4 cases):	$374.40
Total:	$6,580.80

In addition to labeling materials, there is a cost for printing educational materials to be distributed prior to actual labeling. This is necessary to provide a heads-up to residents about what is going on and why, and what they can do to help improve water quality on their own. The *Nonstructural Urban BMP Handbook* (NVPDC, 1996) contains examples of pre-labeling

education materials. In addition, the Northern Virginia Soil and Water Conservation District has also produced educational materials relating to stormdrain labeling programs.

Cost of printing:	5,786 households	
	8.5 x 14 colored paper	
	Automated folding	
	One color ink	
	Total:	$496.00

B.3 HOUSEHOLD HAZARDOUS MATERIALS PROGRAM AND USED OIL/ANTIFREEZE RECYCLING PROGRAM

According to staff of the Fairfax County Household Hazardous Waste Program, there is no cost to the Town for disposal of collected materials at the County's I-66 Transfer Station on West Ox Road in Fairfax. However, the County discourages frequent hazardous waste collections by localities or organizations for the following reasons.

- The Transfer Station operates from Wednesday to Saturday. Since most pick-ups occur on Saturdays, it is often necessary for an organization to store the hazardous materials for three to four days.
- Large quantities of hazardous waste entering the Transfer Station all at once can overwhelm County staff if proper coordination is not performed.
- The amount of hazardous waste collected during these programs can be rather large.

Rather, the County encourages wide-spread advertising of its drop-off center. The cost of running special pick-ups is also expensive. The cost of a one-day Household Hazardous Waste pilot collection event at the Mount Vernon Government Center in Fairfax County was approximately $13,651 in 1995. A total of 183 customers participated and approximately 6,500 pounds of waste and 175 gallons of used motor oil were collected. The cost break-down for the event was as follows (with no cost for used motor oil disposal since it was recycled at no cost).

• Disposal Cost for Waste Material	$4,803
• Supplies	$825
• Staff Costs (DPW)	$3,846
• Staff Costs (Fire Dept.)	$2,734
• Misc. Costs (Adv., Printing, Trans.)	$1,443
TOTAL	$13,651

The program cost per pound of waste was $2.10 and the cost per customer was approximately $75. While the one-day event was considered successful, it cost the County almost twice as much per customer than collection at its permanent facility ($40). The Town, as an alternative to establishing its own program, may wish to hold a one-time drop-off day and use that opportunity to advertise and increase awareness of the County's program. The Town must contact the County at 803-9614 well prior to any drop-off program to make appropriate arrangements.

The cost of establishing a permanent used oil and antifreeze collection center is considerably more reasonable. According to research conducted by the Northern Virginia Regional Commission in 1999, a used oil and antifreeze collection center can be established for roughly $3,000 to $5,000 in infrastructure costs. Pick-up for used oil and antifreeze is in the realm of $0.25 per gallon. However, pick-up may be less or free depending on market conditions and volume collected.

APPENDIX C
COMPREHENSIVE PLAN IMPLEMENTATION TABLE

The following table presents information on the degree to which the recommendations presented in Part V address the action statements of the Chesapeake Bay Preservation Chapter to the Herndon Comprehensive Plan (outlined on page I.2). The degree addressed is defined in the following manner:

Fully addressed:	The recommendations of this report will fully implement the Town's Comprehensive Plan.
Partially addressed:	The recommendations of this report will serve to implement the Town's Comprehensive Plan. However, additional work/programs will be required to fully implement the intent of the Comprehensive Plan.
Future date:	This element of the Town's Comprehensive Plan will be fully or partially implemented under a future work element of NVPDC Contract #98-2.
Not addressed:	This element of the Town's Comprehensive Plan is outside of the scope of work of NVPDC Contract #98-2 or the work components of a typical stormwater management plan.

	Comprehensive Plan Action	Degree Addressed by Part V Recommendations for Action
(1)	Strengthen the requirements to qualify for the Town's CBPO [Chesapeake Bay Preservation Ordinance] opt-out provisions or eliminate the opt-out provision altogether to require the use of stormwater quality BMPs for all development.	Recommend elimination of opt-out provision. Fully addressed.
(2)	Plan and implement cooperative/regional stormwater management controls, where appropriate, to improve overall water quality management and decrease the overall maintenance burden.	Update Town Pro Rata Share Program. Partially addressed.
(3)	Perform a review of the Town's Zoning and Subdivision ordinances to identify opportunities for reducing impervious surface space requirements during the site plan development and review process.	Submit Subdivision Ordinance to Chesapeake Bay Local Assistance Department for review. Partially addressed.

Comprehensive Plan Action		Degree Addressed by Part V Recommendations for Action
(4)	Amend the Town's Zoning Ordinance to include site design guidelines that encourage clustering in order to preserve sensitive soil areas as permanent open space.	Not addressed.
(5)	Adopt and implement a Stormwater Management Ordinance that will comprehensively regulate stormwater volume in addition to stormwater quality.	Recommend adoption of Stormwater Management Ordinance. Funding source identified. Fully addressed.
(6)	Update FEMA floodplain maps to reflect the new development, loss of wetlands, and fill occurring in and around the Town.	Recommend submission of map and LOMRs with explanation of changes in the Town to FEMA. Fully addressed.
(7)	Establish a Town Household Hazardous Materials Drop-Off and Collection Program for homeowners, to operate at specific times, such as during Fall and Spring clean ups. The Town would arrange for transfer to Fairfax County facility, perhaps with special volunteer assistance.	Recommend one-time drop-off day and distribution of materials to highlight the availability of Fairfax County's ongoing program. If change in recommendation is accepted, this element is fully addressed.
(8)	Work closely with the Northern Virginia Soil and Water Conservation District to implement a strategic nonpoint source pollution program for the Town that will prevent pollution at its sources.	Implement a stormdrain labeling program and pre-labeling public education program. Partially addressed.
(9)	Implement a public education campaign aimed at enforcing and strengthening the Town's animal waste control laws.	Develop a public education brochure on the Town's dog waste disposal regulations. Fully addressed.
(10)	Develop a database of households with above ground storage tanks and implement an education program aimed at preventing accidental discharges.	Not addressed.
(11)	Implement a water conservation education program using water billing statements as a distribution vehicle. Use the City of Fairfax's program as a model.	Not addressed.

Comprehensive Plan Action		Degree Addressed by Part V Recommendations for Action
(12)	Implement a systematic, Town-wide program to update environmental and water quality baseline data to ensure that incorrect or outdated information is not carried forward into future planning and assessment efforts.	Update FEMA floodplain maps. Continue with proactive mapping of non-tidal/isolated wetlands. Partially addressed.
(13)	Expand the Town's water quality monitoring efforts through the use of local volunteers and environmental grounds or by contracting with the Fairfax County Health Department.	Not addressed. Can be addressed in this report if Town desires.
(14)	Map mature forest areas and groves within the Town in order to better utilize the Town's Urban Forestry and Landscaping Ordinance and to provide the Town with a better picture of how reforestation and protection can better link existing resources.	Not addressed.
(15)	Develop and implement a Town-wide watershed restoration and protection plan in order to improve water quality and wildlife habitat. Use water quality monitoring data in order to pinpoint potential sources of pollution and a stream reach assessment, including an inventory of denuded stream reaches, as the basis of the plan. To the extent practicable, incorporate these restoration and planning principles into the Town's Stormwater Management Plan currently under development.	Will be partially addressed at a future date.
(16)	Help coordinate or provide proper maintenance to the newly reforested section of Sugarland Run from Dulles Toll Road to the W&OD Trail.	Not addressed.
(17)	Devise and incorporate detention capabilities into denuded sections of Sugarland Run between Dulles Toll Road and the W&OD Trail.	Not addressed.