



**PLANNING COMMISSION  
WORK SESSION AGENDA**

Heritage Conference Room

October 6, 2016

(Immediately following regular meeting)

- 1) **Call to Order** – Vice Chair Chip Paciulli
- 2) **Vice Chair’s Comments**
- 3) **Discussion of Current Planning Documents: Public Services & Infrastructure**
- 4) **Adjournment**

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**STAFF REPORT**  
**WORK SESSION ITEM**

Item # 3

**SUBJECT:** Discussion of Current Planning Documents: Public Services & Infrastructure

**DATE OF MEETING:** October 6, 2016

**STAFF CONTACT:** Daniel Galindo, AICP – Senior Planner

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**SUMMARY:**

The Planning Commission will begin a discussion of public services and infrastructure based on its review of the:

1. *Purcellville, Virginia 2025 Comprehensive Plan*, and
2. the three draft reports summarizing and analyzing each of the first three rounds of public engagement for the Comprehensive Plan Update.

**NOTE:** Other documents may also be discussed if determined to be relevant by the Planning Commission or Town Staff.

**ATTACHMENTS:**

1. Public Services chapter (pg. 69-76) of the *Purcellville, Virginia 2025 Comprehensive Plan*
2. Public Infrastructure – Utilities chapter (pg. 77-87) of the *Purcellville, Virginia 2025 Comprehensive Plan*

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## Public Services

Public services for a community provide the necessary support for residents to maintain their health, welfare and safety. Typically, these services include public facilities and associated services such as schools, police, fire and rescue emergency services, and human services.

### 1998 Comprehensive Plan Recommendations

The 1998 Comprehensive Plan provided an overview of the discussions of various community facilities and public services including, police, fire and rescue, and schools. The following information is relevant to the updated Comprehensive Plan:

Police – In 1998, the Purcellville Police Department consisted of 7 sworn officers, including the Police Chief. At that time, Purcellville provided a service level of 2.8 officers/1,000 residents which was higher than the national average of 2.4 for jurisdictions with 2,500 or fewer residents. Purcellville was served by the County's 911 emergency dispatch communication system that was being upgraded. Police had just implemented a computerized incident-based reporting (IBR) system to automate and improve reporting and record keeping. The 1998 Plan recommended providing sufficient police protection for Town residents by employing, training and equipping a municipal police department.

Fire and Rescue – In 1998, fire and rescue services were provided by a volunteer system affiliated with the Loudoun County Fire and Rescue Services. Purcellville was served by the Purcellville Volunteer Fire Company No. 2 and the Purcellville Volunteer Rescue Squad Company No. 14. The Companies planned to move to a larger facility by 2003. The 1998 Plan recommended ensuring that adequate fire protection and emergency medical/rescue services was provided for Town residents by assisting in the funding of the volunteer squad and considering proffers for facilities when evaluating new development.

Schools – In 1998, three public schools were operated by Loudoun County in Purcellville. These facilities were Emerick Elementary, Blue Ridge Middle School, and Loudoun Valley High. Enrollments at each had steadily increased over the years. The Plan noted that both Blue Ridge Middle School and Loudoun Valley High served the greater western Loudoun County and therefore, were more affected by population growth (20% increase since 1993). Renovations to Loudoun Valley High were completed in 1997 and renovation and expansion of Emerick Elementary was planned. The Plan indicated that new and/or expanded school facilities would be needed to accommodate projected growth.

## 2005 Existing Conditions

Existing public service facilities in Purcellville are shown on the map on the following page.

### Schools

Five public schools serve students in Town and other County residents. Three are located in the Town of Purcellville, one is located in the JLMA, north of the Route 7 Bypass, and one is located outside of the JLMA east of Purcellville near the Town of Hamilton. All the schools are operated by Loudoun County. In 2004-05, all five schools were fully accredited by the Commonwealth of Virginia and met the recommended Standards of Learning in English, Mathematics, History/Social Science, and Science. These schools and their enrollment in 2004-05 are shown in the following table.

**Figure 19. Enrollment in Purcellville Area Schools – 2004-05**

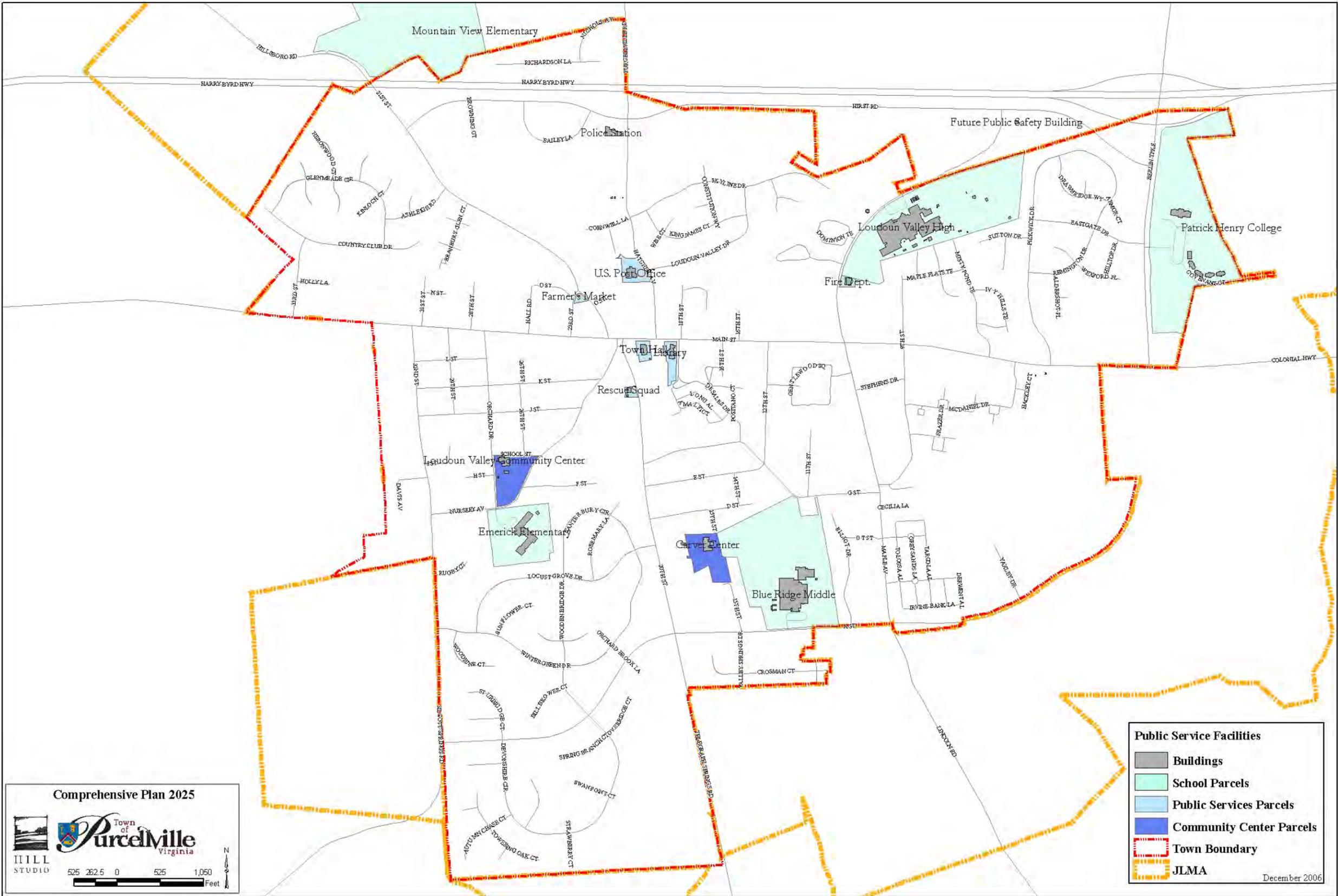
School	Grades	2004-05 Student Enrollment
Loudoun Valley High School	10-12	1322
Blue Ridge Middle School	6-7	970
Emerick Elementary School	K-5	454
Harmony Intermediate School	8-9	987
Mountain View Elementary School	K-5	575

*Source: Loudoun County Schools, 2004-05.*

The student population for all five schools has continued to increase over the past few years with rising County and Town population. Renovations of the elementary and middle schools have been undertaken in recent years to accommodate the increased number of students.

Patrick Henry College is a private accredited Christian college located within the Town limits. The College is located on 106 acres; 40 are within the Town of Purcellville (1998 annexation) and 66 are in the JLMA. In 2004, the enrollment was 273 students (251 on-campus & 22 off-campus). By 2011, the projected enrollment is expected to be 600 students. By 2025, the projected enrollment is expected to be 1600 students (1400 on-campus and 200 off-campus).

The campus in 2006 contains 5 dormitories and 1 multi-purpose building (Founder's Hall). The College's 2004 Master Plan proposes additional facilities over the next 20 years including: student center, library, chapel, amphitheater, athletic fields and facilities, additional residential housing, school of law, academic center, maintenance building, and additional parking. The college has completed over \$9 million in construction projects in the last five years (2000-2004) and expects to spend an additional \$42 million over the next seven years (by 2011). Buildings to be constructed over the next seven years include a student center, additional dormitories, academic center, chapel and library. By 2012, the College expects to employ 100 persons.



Comprehensive Plan 2025

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## **Police, Fire and Rescue Services**

The Town operates a staffed police department that includes ten sworn officers and a police chief. The Police Department is currently pursuing State accreditation status. Calls for service have been increasing as a result of community growth and an increase in population. Citizen interest has been expressed for community policing and crime watch programs. Interest also has been expressed for bicycle patrols for trails.

In 2005, service calls averaged 1,000 per month. It is the Town's goal to add staff to be consistent with the U.S. Department of Justice recommended public safety standard of 2.5 officers per 1,000 population; at the present time, the ratio is 1.7. Due to the limited space available at the Town Hall, the police department was relocated in 2005 to leased space on Hatcher Avenue adjacent to the Route 7 Bypass. The Purcellville Citizens Support Team aids and supports Purcellville police in crime prevention and promoting safety. Citizens complete a recruit training program and assist the department in routine street patrol or traffic control during public events or when there is a special need.

Purcellville Fire Department and Rescue Squad are staffed by volunteers and limited career personnel and serve the Town and the surrounding County (Purcellville Volunteer Fire Company No. 2 and Purcellville Volunteer Rescue Squad Company No. 14). The current fire station is located on North Maple Avenue and the Rescue Squad building is located on South 20<sup>th</sup> Street in the downtown area.

## **Town Government Services**

The existing Town Hall administrative offices are located on Main Street in a building that was renovated in 1991. With the increase in governmental functions and staff, there is a need for additional administrative space. A temporary trailer on the property provides some expanded space for personnel. In 2005 the Police Department offices were temporarily moved to a leased location on Hirst Road, easing the need for office space. A space study is planned for 2006 to determine future needs. As part of the Downtown Planning effort undertaken in 2005, one development scenario was proposed that would locate a new Town Hall building in the same general area adjacent to a new Town Green. That development scenario would create new public space and a focal point on Main Street, as well as address traffic congestion issues at 20<sup>th</sup> Street, Nursery Avenue and Main Street. An additional benefit of this location is that it maintains the governmental center in close proximity to historic Main Street and Downtown which supports revitalization efforts and encourages activities in the central portion of Town.

## **Library**

The Purcellville Library is a regional library for the western portion of the Loudoun County Library System. Located on Main Street in the Town's historic district in an architecturally contributing building, the library was renovated and expanded in 1993. The library has a wide

selection of books, magazines, music, videos, and extensive collection of books for all ages, as well as reference services. Two community meeting rooms are available for public use. The library is equipped with personal computers and printers. Internet access is available.

## **Community Centers**

Loudoun County operates recreational programs in 2 community centers within the Town of Purcellville.

- Loudoun Valley Community Center offers recreational programs, as well as pre-school and after-school programs and a senior center/café operated by the Area Agency on Aging.
- As of June 2006 renovations are being completed by the County to permit the Carver Center to operate as a senior center. Located in the former George Washington Carver School (1948), the building was the first modern elementary school for African Americans in Loudoun County. The senior programs at the Community Center are being shifted to the Carver Center. Activities planned include a café, computer classes, fitness programs, support groups, table games, educational programs, cultural events and social activities. Also, a weekday Adult Day Care Program is planned. Carver Center will provide general public and meeting space for residents of all ages during evenings and weekends.

## **Human Services**

Loudoun County Department of Social Services (in Leesburg) provides general social services to residents needing assistance. Programs include nutritional and financial assistance to low-income families, community employment and training services, youth shelter and detention center, foster care, protective services for adults and children, child care assistance and referrals, and emergency housing among others.

Various state and private agencies partner with County Social Services to provide services to special needs populations and youth in the community. Human services are available for youth, families, seniors, disabled persons, mentally challenged individuals, and others. In 2005, there were three group care facilities in Purcellville addressing human service needs.

## **Health Care**

A variety of health care facilities are located within the Town, with a concentration of medical facilities and offices adjacent to East Main Street. Services provided in Town range from family physicians, dentists, chiropractors, specialists and counselors. A dialysis center is also located in Town. An INOVA Loudoun Hospital Regional Medical Center is under construction at the corner of Hirst Road and Hatcher Avenue.

Cornwall Emergency Center and INOVA Loudoun Hospital in Leesburg and Lansdowne provide services for Town residents. In addition, the Loudoun County Health Department in Leesburg provides health care services and facilities, as well as recommendations and assistance in public health matters, including restaurant inspections, disease control, environmental monitoring and emergency preparedness.

Loudoun County has established policies to promote County-wide health care to provide high quality health care services, appropriate access for all residents, appropriate range of services with appropriate distribution, and a system of providers commits to provide care to all persons. It is desired that facilities be located within a 20-minute drive time during peak hours.

### 2025 Public Services Issues and Opportunities

Loudoun Valley High School is near capacity. The County School Board has determined that a second high school is needed and is projecting the opening of this school in 2008. \$63.5 million in general obligation bonds for the project were approved by referendum in November 2005. The School Board has identified the Fields Farm in the JLMA as a preferred location for the new high school. The property has also been approved for recreational fields to be operated as a public-private partnership between the non-profit Upper Loudoun Youth Football League and the Loudoun County Department of Parks and Recreation. As of the end of July 2006, there is considerable disagreement between the Town and the County regarding this location. Issues include utilities, transportation capacity and the approval process. The current PUGAMP Ultimate Land Use Map shows part of the property planned for very low density residential use and another part adjacent to the Rt 7 Bypass for office/light industrial use.

An expanded public safety facility is needed to house the Fire Department and Rescue Squad. A partnership agreement between the Volunteer Fire and Rescue Companies and the County was signed in 2005 to construct a new fire & rescue facility in Purcellville. The collaborative facility is to be funded by the County with operational costs primarily funded by the fire and rescue units. In November 2005, \$8 million was approved for a new Public Safety Building and land was purchased for the facility at the southeast corner of Hirst Road and North Maple Avenue. The Town of Purcellville is cooperating with the County regarding annexation of this parcel and extension of Town utilities for the facility.

A new facility is also needed for the Police Department, which was temporarily relocated in 2005 to a commercial building on Hatcher Avenue. No decision has been made with respect to a future, more permanent location for the Town's Police Department.

Based on early public input for this Comprehensive Plan, an emergency/urgent care facility is desirable, as well as a closer hospital to serve western Loudoun County. In addition, there may be other human service needs in the community that have not been identified. To ensure that any needs are adequately planned for, more detailed investigations and discussions are needed with human service agencies serving Purcellville. Initially, a meeting with agencies to share information would assist in understanding community issues and needs. From there, a

community survey could be used to identify needs and more detailed plan of action to address any important deficiencies could be developed.

## 2025 Public Services Policies & Implementation Strategies

Relevant goals from the 1998 Plan are integrated into the following public service policies. These updated policies reflect the desired future direction and new initiatives recommended for Purcellville relative to services for schools, public safety, health care, human services and community facilities. Associated implementation strategies are included for each policy. **Timeframes and participants involved in implementation are defined in the Implementation Strategy Matrix shown in Section IV, Comprehensive Plan Implementation.**

- 1. *Quality Education:* Encourage quality educational programs and facilities within the community that promote excellence in education and continuous learning opportunities for persons of all ages. Promote coordination, cooperation and partnership among private and public organizations and local government to provide facilities and programs that are recognized as outstanding in the region.**

### Implementation Strategies:

- 1.1 Establish a Committee for Continuous Learning Excellence consisting of representatives from the Town, local schools, Patrick Henry College, citizens and businesses to discuss educational needs and continuous learning opportunities for community residents.
- 1.2 Encourage expanded use of school and public facilities after business hours.

- 2. *Public Safety:* Provide a safe environment for residents, businesses and visitors. Ensure effective public safety by providing responsive police, fire and rescue facilities to serve the residents of Purcellville. Promote beneficial partnerships in providing public safety services. Encourage excellence in operations through professional training, affiliations and accreditation.**

### Implementation Strategies:

- 2.1 Support and pursue construction of the joint Town-County Public Safety Building for fire and rescue emergency personnel.
- 2.2 Provide collaboration and partnership funding, as determined necessary, to sustain safe, effective and equitable volunteer fire and rescue services for Purcellville residents.
- 2.3 Include administrative and capital public safety improvements in Town adopted budgets and capital improvement plans. Work with police, fire and rescue personnel to determine needed facilities, staff and equipment to effectively meet public safety needs in accordance with recommended safety standards. Achieve a desired standard of 2.5 police officers per 1,000 residents ratio in the Purcellville Police Department.
- 2.4 Develop and host a citizen's police academy. Host special events that spotlight police, fire and rescue personnel. Publicly recognize Purcellville Citizens Support Team (police) and volunteer fire and rescue teams.

2.5 Develop a fiscal model that can be used to assist the Town in evaluating the effect on public safety services associated with new development; encourage applicable proffers that will assist in addressing any increased needs for police, fire and rescue services.

- 3. Accessible Health Care and Human Services: Ensure that quality health care facilities are available and easily accessible to residents of Purcellville. Promote public and private collaboration and coordination of health care facilities to support a wide range of health care services for community residents. Ensure that facilities are diversified to meet the various health care needs of residents. Encourage health care facilities that enhance community character and well-being and are sited in accordance with established land use and development guidelines.**

Implementation Strategies:

3.1 Cooperate and work with Loudoun County to conduct a health care and human service needs survey for Purcellville. Develop an action plan for addressing important health care service deficiencies in Purcellville.

3.2 Support the efforts of health care service providers to establish health care facilities within the town.

- 4. Community Facilities and Services: Provide for a coordinated system of community facilities and services that will maintain and enhance the quality of life in Purcellville. Ensure that adequate community facilities and activities for all ages are available to serve residents of Purcellville. Encourage the efficient use of public schools, libraries, and public buildings in providing desired community educational and recreational programs.**

Implementation Strategies:

4.1 Pursue the necessary street connections and property acquisitions that will enable the future realignment of 20th Street/Nursery Avenue at Main Street and the potential development of a new or expanded Town Hall and public green.

4.2 Pursue partnerships and encourage development of public space for special community events.

4.3 Pursue and maintain open, regular communications with Loudoun County regarding community programs and facilities serving Purcellville residents, especially with respect to expanded and coordinated use of facilities to meet public needs. Seek out opportunities to provide leadership in joint discussions and activities.

4.4 Discuss the 2005 Parks and Recreation Master Plan with Loudoun County Department Parks and Recreation and develop a joint strategy for addressing the plan's recommendations. Partner with other applicable organizations (e.g. Loudoun County Schools, Loudoun County Social Services, etc.) to identify specialized needs and gaps in programs and facilities.

## Public Infrastructure – Utilities and Transportation

Adequate public utilities and an effective multi-modal transportation network are essential elements in accommodating existing and future community development. These elements of public infrastructure are driving factors for development. Their qualities, capacities and design greatly influence daily lives of residents and the operations of businesses in the community. Planning for the future requires careful consideration of public infrastructure in order to provide for the public's health, welfare and safety. Capital improvements and expenditures must be planned for and phased to ensure financial stability and future capacity for growth.

### Utilities

#### **1998 Comprehensive Plan Recommendations**

The provision of public facilities sufficient to meet residential growth demands faced Purcellville in 1998. With the completion of a Water and Sewer Master Plan in 1996, the Town recognized the need to address water supply and wastewater treatment for the long-term. The following background information is helpful in understanding the utility issues of Purcellville in 2005 and in the future.

**Water:** Purcellville has owned and operated its public water service since 1930. In 1998, the system included surface (J. T. Hirst Reservoir) and groundwater sources (3 well systems), a treatment plant (1986), two storage tanks (1930, 1986), and a distribution network. The average daily demand for water in 1995 was 210,000 gallons per day; the Town was able to safely provide an average daily production of 422,000 gallons per day. In 1997, it was noted that the Town's branched distribution system was aged, causing issues with water pressure and aesthetic quality. Replacement of inadequate and deteriorated lines was recommended. At the time, the 1996 Water and Sewer Master Plan indicated that the water supply was adequate for the short-term, but additional supply would be needed for the long-term. The 1998 Comprehensive Plan recommended that the Town continue to operate and maintain a water system and that the potable water capacity be expanded to meet projected growth. It also recommended that improvements to the existing system be undertaken to improve water quality and efficiency (e.g. replacement of deteriorated and undersized transmission lines). Furthermore, the Plan recommended limiting development to the phasing adopted in the PUGAMP.

**Wastewater Facilities:** In 1998, Purcellville was served by a wastewater collection system and treatment plant with 500,000 gallons per day capacity. The plant constructed in the late 1940s was expanded in 1977. Much of the central system lines dated to the 1940s and infiltration and maintenance were noted as issues. Based on population projections in 1997, it was noted that plant

capacity for future service was an issue. A 1996 Water and Wastewater Facilities Master Plan recommended several options to meet future demands, including plant improvements and regional solutions. The 1998 Comprehensive Plan recommended that the Town continue to own and operate a wastewater system, that the wastewater treatment plant be improved (expanded or a new one constructed), and infiltration be reduced or eliminated.

## **2005 Existing Conditions**

The Town of Purcellville provides public water and sewer to most residents and businesses within the Town limits. There are only a few properties that are not served by public sewer and/or water within the Town limits. Pursuant to PUGAMP, the Town is also the designated provider of central sewer and water service to any new development in the JLMA (Joint Land Management Area, referred to as the UGA in PUGAMP) outside of the Town limits unless another provider is approved by both the Town and the County.

### ***Water***

**Sources of Water:** The Town uses several water supply sources, including the J. T. Hirst Reservoir, three groundwater well systems, and two water storage tanks. The Town experienced droughts in 2002 and in 2005. The last drought forced the Town to implement mandatory water restrictions in addition to recommending conservation measures.

The Town has pursued the development of additional wells and an additional surface water reservoir (Centennial Reservoir) to ensure a safe and adequate supply of water for Town residents. This reservoir is proposed outside of the Town limits in a 1,300-acre watershed. It is currently under review for permitting and, if constructed, is expected to add approximately 400,000 gallons per day of water capacity. The additional projected capacity of Centennial Reservoir and the Forbes and Jeffries Wells with projected capacities of 56,000 and 36,000 gallons per day, respectively, would increase the Town's total water capacity to 1,104,763 gallons per day.

The Town owns and operates a water treatment facility that presently has a treatment capacity of 400,000 gallons per day. Although the water treatment facility is permitted to treat 400,000 gallons per day, the safe yield of the J. T. Hirst Reservoir limits the capacity to an average of 300,000 gallons per day. Water from wells is treated in separate facilities at each well system. The production capacity of existing wells is 312,000 gallons per day. A summary of Town water supply compared to existing and projected Town water use is provided in Figure 20 below.

Figure 20. Schedule of Sources and Uses of Water - Town of Purcellville

	Average Gallons Per Day					
	1995	2000	2005	Projected Low	Projected Mid	Projected High
<b>Sources of Water</b>						
JT Hirst Reservoir (Existing)	300,000	300,000	300,000	300,000	300,000	300,000
Centennial Reservoir (Projected)				400,000	400,000	400,000
Existing wells	122,800	122,800	312,763	312,763	312,763	312,763
Forbes well (Online 4/06)				56,000	56,000	56,000
Jeffries well (Projected)				36,000	36,000	36,000
<b>Total Sources of Water</b>	<b>422,800</b>	<b>422,800</b>	<b>612,763</b>	<b>1,104,763</b>	<b>1,104,763</b>	<b>1,104,763</b>
<b>Uses of Water</b>						
Actual Demand	210,000	404,000	572,000			
Projected Demand				757,333	1,471,048	1,762,465
<b>Total Uses of Water</b>	<b>210,000</b>	<b>404,000</b>	<b>572,000</b>	<b>757,333</b>	<b>1,471,048</b>	<b>1,762,465</b>
	Actual	Actual	Actual	Projected	Projected	Projected
<b>Estimated Surplus (Deficit)</b>	<b>212,800</b>	<b>18,800</b>	<b>40,763</b>	<b>347,430</b>	<b>(366,285)</b>	<b>(657,702)</b>
<b>Population</b>	<b>2118</b>	<b>3584</b>	<b>6071</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

*Note: Actual Water Demand is based upon Town Water Production data. Projected Water Demand was developed by the Town based upon residential buildout densities shown on the Planned Land Use Map and commercial buildout based upon current zoning and projected redevelopment included in the Downtown Plan. Population data is an estimate from the US Census Bureau for 1995, is from the US Census for 2000, and is an average number from Town occupancy permits for 2005. See Appendix A for Complete Assumptions and Methodology.*

**Water Delivery:** In addition to focusing on obtaining additional sufficient supplies of water and effectively providing for its distribution, it is essential to implement infrastructure improvements to improve the delivery of water. The efficiency and quality of the supply system can be improved through the systematic replacement of deteriorated and undersized transmission lines. Many of the Town's water distribution lines are over 50 years old. These aged lines sometimes create problems for customers with respect to water quality and quantity. In addition, some lines need improvement to provide better fire flow. An updated assessment of the condition of the distribution system is needed.

### Wastewater

The Town currently owns and operates the Basham Simms Wastewater Treatment Facility which was completed in 2002. The plant has a treatment capacity of 1 MGD. The Town has started the design to upgrade the facility to treat 1.5 MGD and to improve nutrient removal to meet stricter environmental regulations required in 2010. The upgraded facility is expected to be on-line in 2010.

Seven pump stations are provided throughout the existing sewer system. Three of the pump station systems need to be upgraded to meet Town Facilities Standards Manual standards (West End, Davis Drive and Holly Hill). Pump station sizing appears to be adequate for in-town growth. The East End pump station would need upgrading and possible relocation to accommodate growth within the Purcellville Joint Land Management Area. The Skyline pump station would need to be upgraded and relocated as well.

Because of the age of the existing sewer lines, the inflow and infiltration of storm water during periods of rain are issues. This excess storm water put into the lines creates substantial flow increases which adversely affects treatment at the wastewater treatment plant. A study of inflow and infiltration was conducted in 2004. Approximately \$1.7 million in improvements have been identified for implementation by 2010 which should decrease the flow to the treatment plant during rain events by as much as 30%.

### ***Storm Water Management***

The last Storm Water Management Plan for the Town was completed in 1985. A new plan is to be undertaken in 2006. The goals of the study are to develop a complete map of the storm drain system, identify locations where the storm drain system is inadequate, and to determine the improvements that are needed including costs, priority, and recommended phasing.

In addition to public facilities for storm water management, there are a diversity of private storm water facilities that have been constructed by residential and business developments to meet the Town's adopted development requirements for managing runoff. These facilities are typically maintained by private property owners or property owners associations. Proper maintenance and operation of these facilities is important, and annual inspections by the Town or other responsible public agencies are recommended to ensure that the facilities are in good condition.

### ***Other Public Utilities and Telecommunications***

Several utility companies provide electrical, telephone, cable and telecommunication services to residents, businesses and public entities, including Dominion Virginia Power, Adelphia Communications, Verizon Communications, Cingular Wireless, Nextel/Sprint, and Roadstar Internet. Like other public utilities, these companies provide essential services for daily activities and operations. It is important that they be included in long-term planning for Purcellville to ensure that service is adequate to meet development needs and consistent with the desired environmental standards. Also, with the proximity of Purcellville to the Washington Metropolitan area, it is important that there be expanded and upgraded technology systems that can support off-site employment, higher education, and new economy business opportunities.

## 2025 Public Utilities Future Issues and Opportunities

### *Land Use & Water Resource Planning*

Being the fastest growing town in the fastest growing county has brought its share of challenges to Purcellville. That this growth has brought challenges related to water is no surprise. Growth affects costs of water infrastructure, demand for water and efficiency of water delivery. However, the relationship is a dynamic one: water policies influence growth decisions and outcomes, which in turn affect infrastructure and water resources. Purcellville faces two growing and related issues: large financial needs for water infrastructure and concern about the availability of water.

Water availability and cost are also related to the quality of existing and potential source waters. Utilities must use more chemicals and other treatment methods to bring polluted water up to national standards for drinking water, thus increasing its cost. The quality of the source waters depends on the ability of surrounding land to filter out potential pollutants.

Our population and economic growth have created demand for water. How that growth takes place affects how much additional water is needed and how much it will cost to deliver. The most common characteristics of new conventional growth – relatively large lots, low density and dispersed development, all increase the cost of delivering water. Homes on large lots and commercial facilities often consume large quantities of water for lawns and landscaping. Low-density dispersed development requires longer pipes, which lose more water through leakage and raise transmission costs. Infrastructure investments that support water system expansion over the upgrading and maintenance of existing networks can lead to increasingly inefficient systems, greater waste, and higher capital and operating costs.

Almost all water systems leak. They leak through both pipes and joints. Depending on their condition, drinking water systems lose 6 to 25 percent of their water through leaks and breaks nationally. Two major factors determining leakage are length and system pressure. Longer systems leak more than shorter ones; systems that operate under higher pressure leak more than systems that operate under lower pressures. Systems in low-density areas must use higher pressures to push water through longer mains. Because low-density areas tend to have higher water usage demand for items such as lawn care, water supply must be increased even more during dry months. Once again, the form of development affects water use.

Purcellville has a relatively old distribution system through most parts of the older sections of town. Older pipes and joints leak more than newer ones and all pipes need to be replaced at the end of their useful lives. The leakage and breaks common to older pipes grow, and the cost of operating an increasingly inefficient system grows with them. Replacing obsolete infrastructure simply to maintain existing service will require utilities to find new revenue.

Once development is in place, the Town is obligated to serve it. Making development predictable is a key principle of this Comprehensive Plan Update. Further, the better that our community understands its future water availability and the best options to protect water quality, the more likely it is to support a realistic and sustainable approach to growth that minimizes demand, improves efficiency, and protects water quality and future supply. Lack of coordination between land use planning and water planning can frustrate a predictable development decision process. A water budget can help our community to better understand the locally available water resources and compare them to the water demand.

This Plan is consistent with the Community Goal for public utilities and transportation that, “Water and sewer facilities will be planned and designed to appropriately address desired future land use patterns.” The community planning process and business roundtables identified the need to coordinate utility capacity for new development. Perhaps the most challenging aspect of the future planning for the Town is how to tie future land use decisions to the ability of the Town to provide water and sewer service. Over the years the Town has employed numerous strategies to evaluate future demand for public utilities, specifically water and sewer. All efforts have to make assumptions about water demand in three areas: (1) what will the future population or residential density be; (2) what types of businesses will locate in non-residentially zoned land; and (3) what will be the average water consumption either on a per capita basis or land use type. It becomes more challenging to project for the future, as the Town’s population likely will not undergo the magnitude of increase it has experienced during the past decade. The neighboring areas will, however, and they use the Town as the commercial center for western Loudoun. Given these potential changes it is recommended that the Town’s future water use needs be based upon zoning, rather than current in-town population.

### *Previous Studies*

Purcellville draws on a series of studies to plan for its water needs. These studies are listed below with their highlights:

**1976 Bengsten-DeBell, Inc. Study.** This study identified that existing water demand was growing with the increase in population of Purcellville.

**1995 Water & Sewer Master Plan.** This plan by *R. Stuart Royer & Associates* was completed as required under the PUGAMP agreement. The purpose of that master plan was to “identify the water and sewer needs and provide cursory evaluation of the alternatives available to meet the needs of the Town of Purcellville and the Urban Growth Area (now referred to as the Joint Land Management Area, or JLMA) which may be served in the future by Purcellville’s utilities”. The report noted that, “even with steps taken to extend the useful life of the present system, the needs of the area will exceed the supply within the next decade”. This report also suggested that the existing system would require supplementation beginning in the year 2000 if service was extended into the JLMA. This study estimated a future water demand of 2.02 million gallons per day for buildout of the Town and JLMA.

**2000 Water Resource Study.** This study by *Anderson & Associates* updated the 1995 Water and Sewer Master Plan. Projected water demand due to full build-out in Town and the associated wastewater flows were estimated. The projected in-Town water demand was estimated at 990,000 gallons per day and Phase 1 JLMA residential water demand was estimated at 300 gallons per day per dwelling unit for a total of 1,323,700 gallons per day.

**2005 Dewberry & Davis Study.** This study estimated that the total water demand from by-right density within the Town at buildout would be 2,890,000 gallons per day.

While various strategies have been employed historically, the Town's ability to absorb fluctuations in water demand has diminished as its surplus supply has dwindled, as evidenced in Figure 20, primarily due to the rapid growth experienced in the past decade. Of particular current concern is non-residential water demand under by-right zoning. Some approved and proposed non-residential development projects have the potential to use an amount of water per day which is much greater than historical non-residential uses. These include:

- Carver Senior Center
- INOVA medical office complex
- Buildout of Browning Industrial Park
- East Main Street gym/mixed use project
- Loudoun Valley Shopping Center redevelopment
- Downtown redevelopment
- Cole Farm property
- West Main Street redevelopment

Thus, while existing non-residential uses demand only 168,500 gallons per day, it is likely that the amount of water required for additional by-right uses will increase noticeably, especially given the potential for residential development in surrounding areas of western Loudoun County. Purcellville will continue to serve as Western Loudoun's main commercial outlet whether the Town grows in population or not.

**Proposed Land Use.** The impact on the range of water needed to support current by-right land uses today is problematic given that the Town has virtually no excess capacity. One of the challenges faced in estimating future water demand is that the water demand for a given zoning district can vary tremendously based upon the actual uses that develop within the district. The Plan update, therefore, provides a range of future water demands. It is important to note that even if major supply projects come on line in 2010, the Town will not have adequate water supply to serve proposed land uses. Additional resources and strategies for conservation and system efficiency need to be developed. The potential shortfall will range from 100,000 gallons per day on the low end to 600,000 gallons per day on the high end depending upon specific development and water use assumptions.

**Recommendations.** This Plan recommends a multi-faceted approach to deal with this water demand challenge. First, continue to implement the remaining measures identified in the 2000 Water Resource Study, such as well field development in the Purcellville JLMA along the

transmission line. Second, apply for funding under the Virginia Department of Health drinking water supply state revolving fund for a more detailed and current water supply management effort. Finally, review permitted development types by land use to require more exact measures relating to water demand, such as a special use permit process for larger users of water.

### ***Stormwater Management***

In the future, nutrient loading standards for nitrogen and phosphorus for facility discharges will be revised and be more stringent. By 2010, this most likely will require that storm water be treated to meet the standards. Therefore, any new streetscape facilities and open space areas should consider environmental design features that will help address nutrient loading (e.g., vegetation, bio-filters, inlet collection devices, etc.). It is more cost effective to handle and treat storm water at the source rather than increase the sewage treatment plant capacity to treat it. Purcellville should take advantage of available grant funding for bio-retention and bio-treatment, as well as proactively use any new alternative methods to reduce nutrient and other pollutants from stormwater runoff.

Since the Town's Facilities Standards Manual was adopted in 1999, many new technologies and processes have been developed to meet today's best practices. The manual is being revised as of the end of June 2006, but may need further revisions once this Plan update is adopted in order to incorporate Plan recommendations for new public infrastructure and facilities and accommodate use of the best technology and management practices.

### ***Other Public Utilities***

Overhead electric, telephone and cable lines should be located underground where feasible or located to the rear of properties to minimize views on major streetscapes, such as Main Street and 21<sup>st</sup> Street. The Town should adopt appropriate resolutions and facilities guidelines to ensure new development and redevelopment complies.

Similar consideration should be given to improving the appearance of neighborhood areas and streets. One option to consider is establishing utility corridors in specified locations in Town where lines and facilities are placed along rear lot lines or in less visible locations than along street frontages. This approach could simplify utility location and reduce public controversy for such things as substation locations and telecommunication towers. The Town must also be proactive in engaging utility companies regarding their plans for regional improvements in utility capacity that might affect the Town.

A telecommunication policy also should be adopted to provide direction and design guidance for the location of cell towers and other similar facilities. Co-location on existing facilities should be encouraged rather than locating new cell towers within the Town limits. This policy should also promote improvements in telecommunications infrastructure access for Town residents and businesses.

### Public Utilities Goals:

- Purcellville will set the regional standard for effective, integrated utility planning and growth management. Water and sewer facilities will be planned and designed to appropriately address desired future land use patterns.
- Utility systems will be encouraged to be cost-effective, efficient, and inclusive of state-of-the-art technology that promotes environmental protection, conservation and green development.

### 2025 Public Utilities Policies and Implementation Strategies

The following policies will help to implement the Public Utilities Goals outlined above and guide Purcellville in establishing the public infrastructure necessary for successful growth management and community development. Associated strategies are recommended to help implement each policy. Timeframes and participants involved in implementation are defined in the Implementation Strategy Matrix shown in Section IV, Comprehensive Plan Implementation.

- 1. *Provision of Utilities: Provide and operate a coordinated system of public water and sewer utilities that will enhance the quality of life for residents and businesses in Purcellville. Upgrade and maintain, water, sewer and storm drainage facilities and systems to promote the public health, welfare and safety.***

#### Implementation Strategies:

- 1.1 Review and update fundamental utility infrastructure plans at least every 5 years to ensure effective long-term planning and implementation of public systems. Plans shall include the Water and Sewer Master Plan, Storm Water Management Plan, and the Facilities Standards Manual.
- 1.2 Expand water capacity as necessary to meet the Town's desired and projected future growth needs with direction from an updated Water and Sewer Master Plan.
- 1.3 Continue to implement measures identified in the 2000 Water Resource Study, such as well field development in the UGA along the transmission line.
- 1.4 Complete the Centennial Reservoir and add another water storage tank, as appropriate.
- 1.5 Repair and replace aged water lines.
- 1.6 Upgrade the water treatment plant, as appropriate.
- 1.7 Upgrade wastewater treatment plant to address new environmental standards or implement alternative measures to address nutrients. Upgrade in accordance with direction from the updated Water and Sewer Master Plan.
- 1.8 Repair and replace aged sewer lines to reduce infiltration and inflow.
- 1.9 Expand sewer line service as appropriate to areas intended for growth on the future land use map.

**2. *Cost-effective Public Facilities and Services: Provide facilities and services at reasonable costs that are equitably and fairly distributed.***

Implementation Strategies:

- 1.1 Establish and adopt fiscal policy guidelines and appropriate water, sewer and storm drain system funding plans that reflect best practices management to promote a healthy, self-supporting utility enterprise fund for utility facility improvements and expansion.
- 1.2 Apply for funding under the Virginia Department of Health drinking water supply state revolving fund for a more detailed and current water supply management effort.

**3. *Conservation and Responsible Best Management Practices: Encourage conservation of water and natural resources. Use best management practices for resource protection, usage and service delivery. Be proactive in protecting and providing adequate and safe supply of public water. Be proactive in preventing or addressing water pollution in order to reduce public water treatment requirements.***

Implementation Strategies:

- 3.1 Address the quality/quantity of storm water infiltration and inflow to reduce treatment requirements through proactive best management practices and new environmental technologies. Implement infiltration and inflow corrective measures.
- 3.2 Maintain a tiered rate approach for users of the Town's water supply to encourage conservation and equitable distribution of costs for supply and distribution.
- 3.3 Consider alternative methods to increase the available supply of potable water, including advanced treatment technologies, water recycling and green building techniques.
- 3.4 Revise the Zoning Ordinance to require new development that requires high volumes of water (>2,000 gallons per day) be permitted only by special exception.

**4. *Capital Improvement Program: Undertake improvements in accordance with an adopted capital improvement program.***

Implementation Strategies:

- 4.1 Prepare and adopt an annual Capital Improvement Program (CIP) based on this Comprehensive Plan under the guidance of the Planning Commission pursuant to Section 15.2-2239 of the Code of Virginia.
- 4.2 Ensure that the Town's capital budget is in conformance with the CIP.

5. ***Appropriate Location of Utilities: Locate utilities underground, where feasible, or in areas where there is minimal intrusion on important community streetscapes and views. Co-locate utilities, where possible.***

Implementation Strategies:

- 5.1 Maintain a location policy that requires the underground placement of utilities, where feasible. Locate above ground utilities only in locations that are less visible from the street or public areas. Demonstrate commitment to the policy through exemplary public action on public projects.
- 5.2 Identify suitable corridors in Town for community and neighborhood utility services that are located underground within public rights-of-way or along rear lot lines or other less visible areas.
- 5.3 Expand high speed and wireless internet service in Town. Conduct feasibility study for providing free wireless internet access throughout the Town.

6. ***Regional Coordination of Utilities: Promote regional cooperation and long-range planning for public utility facilities and services, including electric and natural gas/propane services, to provide the Town and the Region with the highest quality services that are the most efficient, effective, equitable and appropriate, while having the least possible negative impacts on the town and its environs.***

Implementation Strategies:

- 6.1 Monitor plans and proposals by public utility companies to install or expand regional public utility corridors in and around Purcellville and advocate utility expansions that minimize negative impacts, such as undergrounding of utilities.
- 6.2 Coordinate and cooperate with other towns and the County in the planning and promotion of regional utility services that are in the best interest of the Western Loudoun region.