

Exhibit A



Stafford County Virginia



Comprehensive Plan 2016-2036



2021 5-Year Update



Prepared by the Planning Commission on September 22, 2021
Adopted by the Board of Supervisors on November 16, 2021

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Resolution R21-367 – Plan Adoption (November 16, 2021)
Resolution R23-10 – AMENDMENT – Solar and Energy Storage (May 16, 2023)
Resolution R23-214 – AMENDMENT – Data Center (October 17, 2023)

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1.0 Introduction

Stafford County is a dynamic community. It includes a mix of suburban neighborhoods and rural areas. Retail centers and office and industrial parks provide shopping and employment opportunities throughout the County. The County is strategically located at a crossroads of major transportation routes which carries both positive and negative impacts to the quality of life. The built environment of Stafford County is relatively new. Since the construction of Interstate 95 in the 1960's through the County, the population has doubled every 20 years.

The result of Stafford's burgeoning growth has been prosperity for most, but with prosperity comes valid concerns. Increasing traffic, the effects of development on the County's natural and cultural resources, the effects on the overall environment, as well as housing affordability and the ability to provide adequate public services are all increasing concerns for residents of the County.

As the community continues to grow, the need for detailed planning is ever greater. This document serves as a general guide for future development of Stafford County over the next 20 years.

The Plan tells us where we are today and through goals and objectives, policies, and implementation tools, guides the physical development of the county--the location, type, and intensity of future land use. The plan includes goals, objectives and policies for sustainability; fiscal responsibility; the environment; health, safety and welfare; housing; transportation; economic development; education; and heritage resources.



View of Crow's Nest from Accokeek Creek

The future is bright for Stafford County and the Comprehensive Plan emphasizes enhancing and maintaining a high level quality of life for its existing and future residents.

1.1 Background

Stafford County is located approximately 40 miles south of Washington, D.C., and sixty miles north of Richmond, Virginia. The County covers 277 square miles of generally level to rolling land, with elevations ranging from sea level to 425 feet. The County is bordered by Prince William County on the north, Fauquier County and Culpeper County on the west, Spotsylvania County, Caroline County and the City of Fredericksburg below the Rappahannock River to the south, and the Potomac River and King George County on the east.

Established in 1664, Stafford County has a rich history from pre-colonial days to the industrialization of the nineteenth century. The County has important associations with major events and people in our nation's history.



Stafford County in Regional Context

This history is documented by the County's bountiful archaeological and architectural remains.

Stafford remained mostly a rural community until the construction of Interstate 95 during the late 1960s. Since that time, the County has experienced a growth rate that, for a period of time, ranked it among the fastest growing jurisdictions in the nation.

The County's proximity to major industrial and commercial markets, combined with its high percentage of vacant land, is attractive for residential, commercial, and industrial development. Since Stafford County is located within commuting distance of major

employment centers to the north and south, it continues to be an attractive location for new development. While the rate of growth has slowed in recent years, residential and commercial development is still occurring to meet the demand for housing and services in this region.

1.2 Purpose of the Plan

The purpose of the Comprehensive Plan is to guide the physical development of Stafford County. The Comprehensive Plan:

- Documents local characteristics and trends regarding resident population composition, land use, the natural environment, economic development and service provision;

- Provides a benchmark for evaluating the compatibility of individual development proposals with the long range development objectives of the community;
- Identifies future service needs;
- Serves as a comprehensive source of information that can be used to secure state and federal funding and market the area to potential developers;
- Promotes open space conservation designed to preserve the rural heritage of the community and enhance the overall quality of life;
- Attracts appropriate development to the County through the identification of community goals and objectives for the next 20 years;
- Lays the foundation for future cooperative efforts between the County and its neighbors

An important function of the Comprehensive Plan is to provide a framework for assessing development proposals that come before the County. The Comprehensive Plan is a lens through which development proposals should be evaluated. Each proposal should answer the question: Will this development further the vision of the future as articulated in the Comprehensive Plan? If the proposal is not consistent with the Plan, either the proposal should be rejected or revised to accurately reflect the vision of the future.

1.3 Format of the Plan

After this Introduction, the plan begins with Goals and Objectives, Policies, and Implementation Tools. Following those are the main Land Use and Public Facility Needs, and lastly, the existing conditions and public input that support the Plan. The inter-relationship between these elements of the Plan are further explained:

Goals and Objectives – identify a desired future condition for various elements of growth such as land use or transportation. Goals and Objectives are the lens through which the future of Stafford is imagined.

Policies – provide guidance to the County leaders as they make decisions. The policies serve as the filter through which the future of the built environment is directed and through which new development proposals and new directions are evaluated.

Implementation Tools – identify the specific actions that should be taken by the County to follow specified policies. An Implementation Matrix is included to prioritize tasks and identify responsible agencies.

Land Use Policies and Map – are included with this document to provide a recommended foundation for future land use decisions.

Transportation Plan – is included to identify funded transportation improvements, planned network improvements for next 20 years and anticipated road improvements that may exceed the 20 year planning horizon based on build-out of the planned land uses.

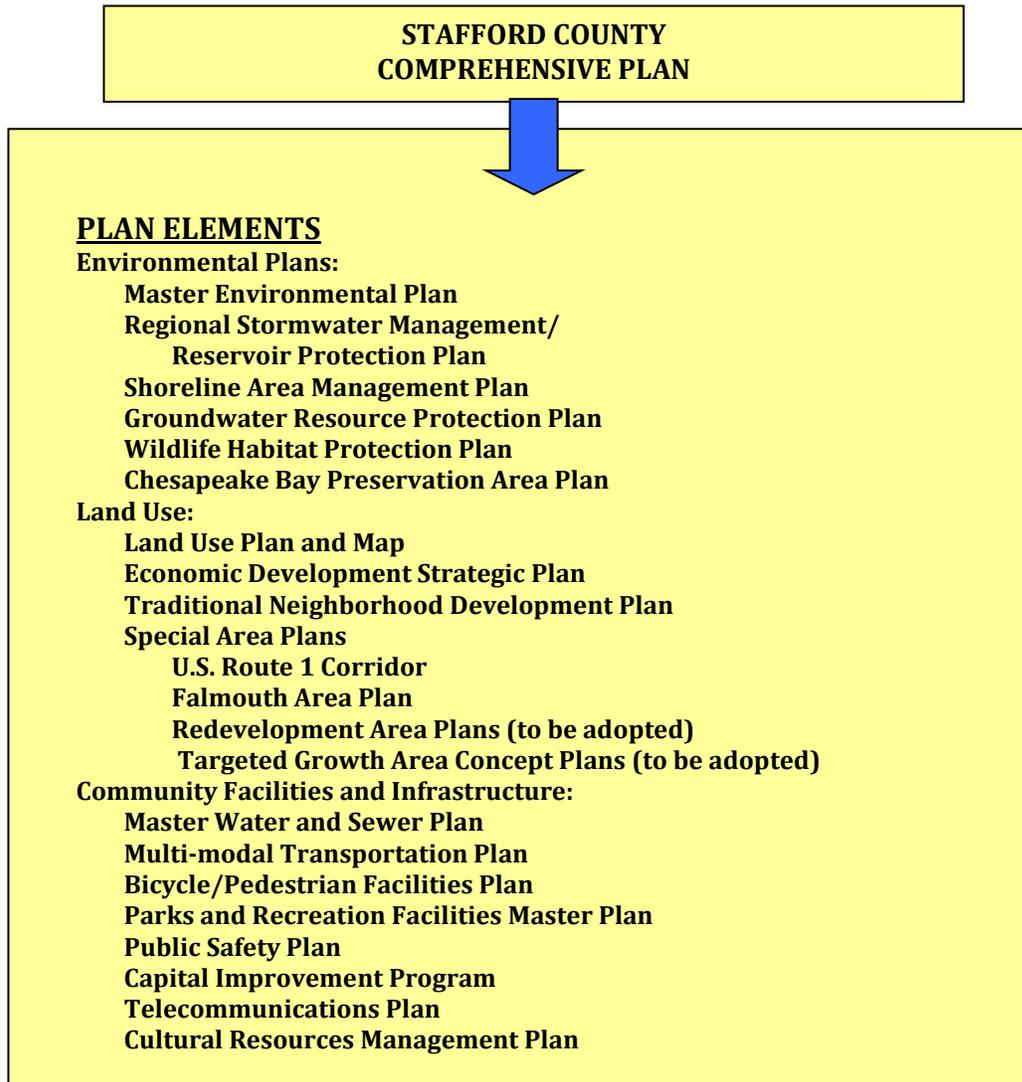
Public Facility Projections – are estimated based on the anticipated growth over the next 20 years. These facilities include schools, fire and rescue stations, parks, libraries, and government facilities.

Background Data – is provided that identifies the existing conditions and public input provided in developing this Plan. This Background Data provides a basis for the future direction envisioned in this Plan.

1.4 Relationship to other Plan Elements

The Comprehensive Plan is the main document guiding land use policy in the County. It provides the framework for public policy and land use decisions.

Plan elements provide more detailed strategies regarding specific components of land use planning, consistent with the guidance provided in the Comprehensive Plan. These Plan elements are appended to the Comprehensive Plan by reference, and upon review by the Planning Commission and adoption by the Board of Supervisors, are a part of the Comprehensive Plan. These documents may have different planning horizons, or have a purview significant enough that they require a stand-alone plan. Together, these plans are the components of the Comprehensive Plan.



1.5 Legal Basis for the Plan

The Code of Virginia requires each jurisdiction to adopt a Comprehensive Plan for its physical development. The Plan shall be prepared by the Planning Commission and adopted by the Board of Supervisors. The purpose of the Plan is to guide and accomplish 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, including the elderly and persons with disabilities.

The Code of Virginia includes specific expectations of a locality's Comprehensive Plan. It identifies what shall be required and may be included:

"The comprehensive plan shall be general in nature, in that it shall designate the general or approximate location, character, and extent of each feature, including any road improvement and any transportation improvement, shown on the plan and shall indicate where existing lands or facilities are proposed to be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed in use as the case may be.

1. As part of the comprehensive plan, each locality shall develop a transportation plan that designates a system of transportation infrastructure needs and recommendations that include the designation of new and expanded transportation facilities and that support the planned development of the territory covered by the plan and shall include, as appropriate, but not be limited to, roadways, bicycle accommodations, pedestrian accommodations, railways, bridges, waterways, airports, ports, and public transportation facilities. The plan shall recognize and differentiate among a hierarchy of roads such as expressways, arterials, and collectors. In developing the plan, the locality shall take into consideration how to align transportation infrastructure and facilities with affordable, accessible housing and community services that are located within the territory in order to facilitate community integration of the elderly and persons with disabilities. The Virginia Department of Transportation shall, upon request, provide localities with technical assistance in preparing such transportation plan.
2. The transportation plan shall include a map that shall show road and transportation improvements, including the cost estimates of such road and transportation improvements from the Virginia Department of Transportation, taking into account the current and future needs of residents in the locality while considering the current and future needs of the planning district within which the locality is situated.
3. The transportation plan, and any amendment thereto pursuant to § 15.2-2229, shall be consistent with the Commonwealth Transportation Board's Statewide Transportation Plan developed pursuant to § 33.2-353, the Six-Year Improvement Program adopted pursuant to subsection B of § 33.2-214, and the location of routes to be followed by roads comprising systems of state highways pursuant to subsection A of § 33.2-208. The locality shall consult with the Virginia Department of Transportation to assure such consistency is achieved. The transportation plan need reflect only those changes in the annual update of the Six-Year Improvement Program that are deemed to be significant new, expanded, or relocated roadways.
4. Prior to the adoption of the transportation plan or any amendment to the transportation plan, the locality shall submit such plan or amendment to the Department for review and comment. The Department shall conduct its review and provide written comments to the locality on the consistency of the transportation plan or any amendment to the provisions of subdivision 1. The Department shall provide such written comments to the locality within 90 days of receipt of the

plan or amendment, or such other shorter period of time as may be otherwise agreed upon by the Department and the locality.

5. The locality shall submit a copy of the adopted transportation plan or any amendment to the transportation plan to the Department for informational purposes. If the Department determines that the transportation plan or amendment is not consistent with the provisions of subdivision 1, the Department shall notify the Commonwealth Transportation Board so that the Board may take appropriate action in accordance with subsection F of § 33.2-214.

6. If the adopted transportation plan designates corridors planned to be served by mass transit, as defined in § 33.2-100, a portion of its allocation from (i) the Northern Virginia Transportation Authority distribution specified in subdivision B 1 of § 33.2-2510, (ii) the commercial and industrial real property tax revenue specified in § 58.1-3221.3, and (iii) the secondary system road construction program, as described in Article 5 (§ 33.2-351 et seq.) of Chapter 3 of Title 33.2, may be used for the purpose of utility undergrounding in the planned corridor, if the locality matches 100 percent of the state allocation.

7. Each locality's amendments or updates to its transportation plan as required by subdivisions 2 through 5 shall be made on or before its ongoing scheduled date for updating its transportation plan.

The comprehensive plan, with the accompanying maps, plats, charts, and descriptive matter, shall show the locality's long-range recommendations for the general development of the territory covered by the plan. It may include, but need not be limited to:

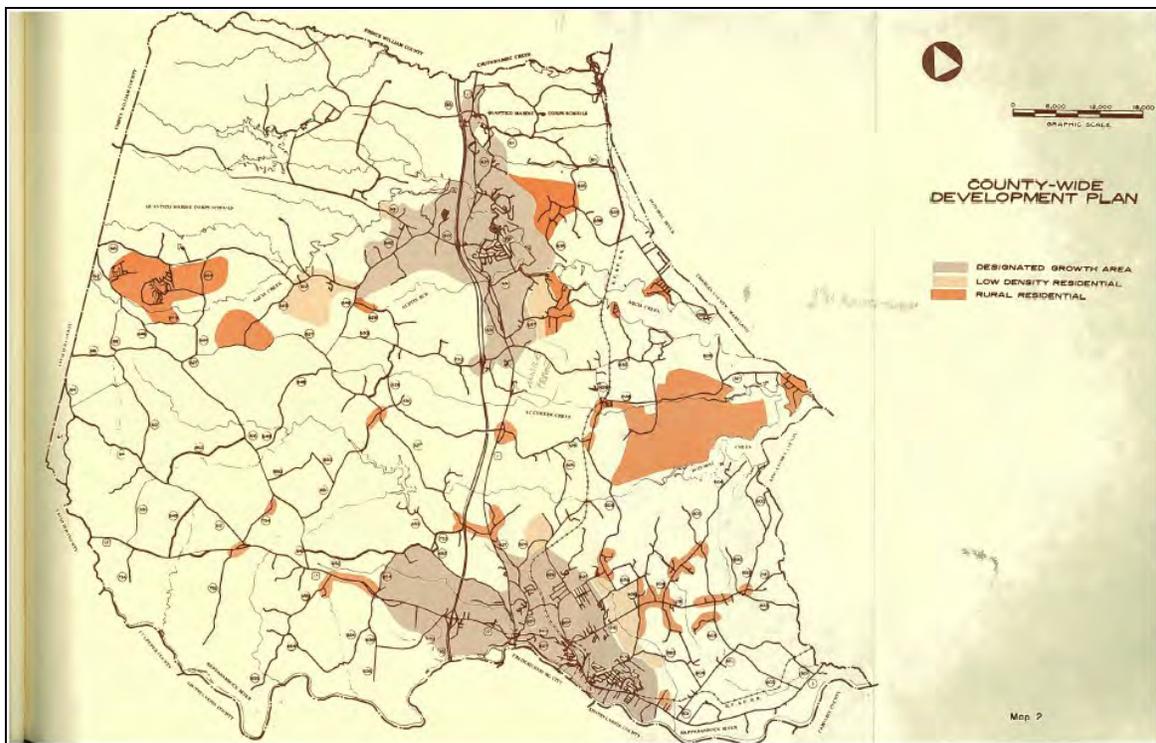
1. The designation of areas for various types of public and private development and use, such as different kinds of residential, including age-restricted, housing; business; industrial; agricultural; mineral resources; conservation; active and passive recreation; public service; flood plain and drainage; and other areas;
2. The designation of a system of community service facilities such as parks, sports playing fields, forests, schools, playgrounds, public buildings and institutions, hospitals, nursing homes, assisted living facilities, community centers, waterworks, sewage disposal or waste disposal areas, and the like;
3. The designation of historical areas and areas for urban renewal or other treatment;
4. The designation of areas for the implementation of reasonable measures to provide for the continued availability, quality, and sustainability of groundwater and surface water;
5. A capital improvements program, a subdivision ordinance, a zoning ordinance and zoning district maps, mineral resource district maps and agricultural and forestal district maps, where applicable;
6. The location of existing or proposed recycling centers;
7. The location of military bases, military installations, and military airports and their adjacent safety areas; and
8. The designation of corridors or routes for electric transmission lines of 150 kilovolts or more.

The comprehensive plan shall include the designation of areas and implementation of measures for the construction, rehabilitation and maintenance of affordable housing, which is sufficient to meet the current and future needs of residents of all levels of income in the locality while considering the current and future needs of the planning district within which the locality is situated.

The comprehensive plan shall consider strategies to provide broadband infrastructure that is sufficient to meet the current and future needs of residents and businesses in the locality. To this end, local planning commissions may consult with and receive technical assistance from the Center for Innovative Technology, among other resources.” (Va Code 15.2-2223)

1.6 History of the Comprehensive Plan in Stafford County

During the 1960's and early 1970's, Stafford County's in-house planning function was primarily regulatory, involving administration of the subdivision and zoning ordinances. Comprehensive planning efforts were, for the most part, made possible through the assistance of state and regional agencies. The Governor's Office, Division of Industrial Development and Planning, assisted the Stafford County Planning Commission in compiling eight reports studying the County's existing natural resources, land uses, public facilities, and trends in population, employment, income, and industry and trade. These reports culminated in the *Future Land Use Plan (Report No. 9)* and the *Major Streets and Highways Plan (Report No. 10)*. These plans, including maps and descriptive matter (the preceding eight reports), were adopted by the Stafford County Board of Supervisors on July 8, 1964, as Stafford County's first master plan.



The Comprehensive Development Plan - 1979

Comprehensive planning efforts continued into the early 1970's primarily through the assistance of the regional planning agency, Rappahannock Area Development Commission (RADCO), now referred to as George Washington Regional Commission (GWRC). In 1973, increases in staff permitted a greater focus on long-range planning issues. Further impetus to bolster comprehensive planning efforts resulted from growth pressures during the 1970's, as well as changes in planning legislation made by the 1975 Virginia General Assembly. The 1975

General Assembly amended the law to require all Virginia local governments to adopt comprehensive plans by July 1, 1980. As a result of these combined factors, the Stafford County Board of Supervisors adopted a new comprehensive plan, the *Comprehensive Development Plan*, on April 17, 1975. This Plan was amended in June 1979, and July 1980. In February 1986, the Central Stafford U.S. Route 1 Corridor Development Plan was added.

In May 1986, the County began the process of developing a new Land Use Plan which would represent the first in a series of component documents that now comprise the Stafford County Comprehensive Plan. The Land Use Plan was to direct residential, commercial, and industrial growth in suitable areas. This process was initiated with the development of extensive environmental, land use, and historic inventories, which was used as a foundation in determining appropriate land uses. The location of major transportation routes, existing public utilities, and existing public facilities was also considered. The intention was to identify areas for growth that limited impacts on environmental and historic resources and took advantage of major existing roads and public utilities, while ensuring that new development was able to utilize existing park, school, library, and fire/rescue facilities effectively.

These efforts culminated in the adoption of a new County Land Use Plan as the first component of the County's Comprehensive Plan, in July 1988. That Land Use Plan provided a basis for the development of numerous Comprehensive Plan components and planning documents. Those plans identified the various needs for the County relative to parks, schools, utilities, public safety, and transportation, while also identifying a course for development of plans to protect sensitive environmental resources. The Land Use Plan was being used to determine the needs of the County in several important areas. Water and sewer lines were sized to accommodate future land uses in the Plan, road improvements were directly related to the Plan, as were the potential needs of the County for parks, schools, fire/rescue, libraries, and other services. The Land Use Plan was subsequently revised in 1996 and 2003.

The many different elements of the Comprehensive Plan have been adopted at different times and have not been reevaluated and updated on a synchronized schedule. Several documents have not been updated since their initial adoption while others have been updated on a more regular basis.

Beginning in 2006, extensive work led to the development of a new version of the Comprehensive Plan that was adopted in 2010. Initially a Steering Committee of appointed and elected local officials, citizens and developers met over a two-year period and developed an initial draft of the Plan. Subsequently, in 2008 and 2010 two separate Planning Commission Subcommittees completed the draft of the Comprehensive Plan. The effort involved review of extensive documentation and mapping resources, focus group sessions with community leaders and interest groups, visioning sessions, and interactive public meetings. One of the key features of the 2010 Comprehensive Plan was establishment of Urban Development Areas (UDAs). State Code provision 15.2-2223 made it a mandatory requirement for localities to plan for all of its future growth to be accommodated in those areas. The legislation was very proscriptive and specified minimum density requirements for single-family homes, townhomes and multi-family dwellings.

1.7 Preparation of the 2016 Plan

In 2012, The Board of Supervisors started the process of amending the Comprehensive Plan with the Planning Commission to replace the construct of UDAs after the Virginia General Assembly modified the UDA State Code provision in 2011 and 2012 due to overall concerns about its proscriptive nature and lack of flexibility. The Virginia Code was amended under House Bill 869 to provide flexibility for the designation of UDAs, making them no longer a mandatory requirement of Comprehensive Plans. The statute also provides flexibility to establish development densities for UDAs, rather than required minimum development densities.

The Board of Supervisors and Planning Commission considered the new Comprehensive Plan during regular meetings, sub-committee work sessions, and special meetings. Information was exchanged with the Board, who provided general direction, and the Planning Commission developing general concepts. Input was solicited from the public, members of the land development community, real estate professionals, banking industry and others interested parties, which included a survey on how to best address UDAs. A common theme that arose during the process was the desire to remove UDAs as a future land use term while retaining the higher density growth concept as a growth management tool. This resulted in the new Targeted Growth Area (TGA) land use designation, replacing UDAs.

In January 2015, the Board of Supervisors provided the Commission additional direction regarding the Comprehensive Plan amendments, in the form of 11 points or directives that serve as general guidelines for the Planning Commission to follow. Subsequently, these points were presented to the Planning Commission who established a committee to focus on the amendments. From February to early April, the committee met several times and developed amendments to be responsive to the Board direction.

During the summer of 2015 and early winter 2016 the Board of Supervisors provided the Planning Commission additional guidance towards the TGAs and areas of special interest identified in the Economic Development Strategic Plan. The Planning Commission reconstituted its committee. The committee conducted two community outreach meetings with mapping exercises. The resulting maps gave the Planning Commission input on where the public participants thought future development should occur. In addition to the public outreach meetings, the committee conducted several other meetings where public comment was received and accepted. The public input had a significant impact on the new Comprehensive Plan.

On May 25, 2016, the Planning Commission voted 5 to 2 to recommend approval of the amendments to the Comprehensive Plan. Subsequently on August 16, 2016, the Board of Supervisors voted 7 to 0 to enact the amendments to the Comprehensive Plan, pursuant to Resolution R16-175.

Current Update

In January 2021, the Board of Supervisors directed the Planning Commission to conduct the required five (5) year update of this Plan. This review considered growth trends that have occurred over the last five years since adoption of the 2016 Plan. Over the time period, Stafford experienced a continuation of growth pressure on rural and suburban areas of the County, and limited development interest in the Targeted Growth Areas. Furthermore, the update is

occurring in the midst of the coronavirus health pandemic, which has affected the way people live. With a constituted Sub-committee, full Commission engagement, and extensive input from the public, this updated Plan includes new maps, updated demographics and development trends, and updated recommendations that address desired development priorities.

Implementation

Goals, policies and actions are developed to guide land use and policy decisions for the next 20 years. The goals, policies and actions were developed based in large part upon the visioning sessions, the results of the community survey, and public and other community input. These goals, objectives and policies are intended to lead to the overall improvement of Stafford County and a better quality of life for all County residents.

Revisions to the Plan

The Plan should be evaluated on an on-going basis to ensure it meets current and changing expectations. This introduces flexibility through time to evaluate changes that are unanticipated by the Plan. When the Planning Commission and/or the Board of Supervisors identify a need to amend the Comprehensive Plan, such amendments should be based on a general County need, not specific development proposals.

The entire Comprehensive Plan should be revisited and updated every five years. These revisions should reflect changes in the economic, demographic and other aspects of the community and should incorporate changing goals, objectives and policies. The five-year review is the time to accommodate changes in philosophy or direction. This Plan is reflective of the five-year update process.

1.8 Use of the Plan

This Plan will serve as a resource for those who seek general information as to how the County envisions change over the next 20 years. Crafting the Comprehensive Plan indicates a commitment to a vision for the future. As the County's primary planning document, it is of interest to elected officials, County staff, as well as the public.

Board of Supervisors: Ensure the Plan is regularly updated to reflect the community's vision for the future and provide a reliable source of information for those seeking to do business in the County. The Board will use the Plan to guide decisions and focus efforts to ensure the stable growth and development of the County.

Planning Commissioners: Measure the desirability of proposed developments by their conformity with the Plan; use the Plan to identify areas in which to initiate changes to development related regulations; and guide its recommendations regarding transportation planning and capital improvements.

County employees: Use the Plan when evaluating development proposals and prioritizing work efforts.

The Public: Use the Plan as a reference when making investment decisions in property for residential location choices, determining where to locate a business, and evaluating the effectiveness of local government.

2.0 The Foundation for the Future

2.1 Introduction

The purpose of the Comprehensive Plan is to guide the physical development of our County. The Comprehensive Plan is a policy document that lays out a vision of the future with specific recommendations, including a Future Land Use Plan and changes to zoning and land use regulations to implement the Future Land Use Plan. It is a guide to land use decision-making in Stafford.

2.2 Goals, Objectives and Policies

The goals, objectives and policies provide a framework to guide physical development and change in Stafford County. They set a standard for the County and its residents to meet and provide a benchmark for evaluating the progress of the implementation of the Plan.

The goals are the general aims of Stafford County. The objectives are more specific, providing mid-range strategies to accomplish the goal. Policies are operational actions, usually for the purpose of relatively short-term implementation.

Community Economic Development

Economic Development is about encouraging, leveraging, and facilitating private investment and job growth. Community Development is about building a sense of place, a culture, and programs that foster quality of life. There is no “and” between Community and Economic Development.

Community Development is about community assets, services, and programs. It includes assuring quality water, sewer, broadband, safety, education, and the bricks and mortar that support a quality of life. Community development helps define “Place.” Community Development are the softer (that does not suggest less important) aspects for building a cohesive community and Place.

Economic Development is about the economics of Place. Economic Development is about generating income and, thus, more focused on business. It is about supporting and encouraging existing business growth. It is about attracting new business growth, and the tools to do so. It’s about attracting investment (capital) into the community. New investment is private capital in the form of a new business, capital to help finance business opportunities, and the attraction of dollars from community visitors (tourism).

To encourage economic development, Stafford focuses on helping its existing business expand, fostering entrepreneurship in those existing and potential “startup” businesses, and attracting new business. As important and to support these primary community economic development activities is the “messaging” the County and its Commissions send to the business and investment community—a message of encouragement and invitation while sustain and improving the quality of life for its residents.

Economic growth in Stafford County will have two distinct benefits: it will diversify and expand the tax base and it will provide jobs closer to home for Stafford residents. Over the past two decades, the percentage of workers commuting out of the County for employment has gone down. In 2000, 71 percent of Stafford workers commuted out of the County for work. In 2008, this number decreased to approximately 58 percent, and by 2019, it further decreased to 55.5%, according to the U.S. Census Bureau’s American Community Survey. Continuing to provide more jobs closer to home would have a collateral benefit of taking pressure off the overstressed regional transportation network.

Goal 1. Support the economic vitality of Stafford County through land use policies.

Objective 1.1. Establish targets for commercial and business growth for development and re-development.

Policy 1.1.1. Minimum floor area ratios (FAR) should be established, and maximum FAR requirements should be relaxed for commercial development within mixed use redevelopment and Targeted Development Areas (TDAs), previously referred to as “Targeted Growth Areas (TGAs)”. Encourage an appropriate mix of uses, with a minimum of 25% land and/or building area designated for commercial or business use, depending on the land use.

Objective 1.2. Ensure that land use policies are consistent with attracting and retaining high quality employment options for Stafford residents.

Policy 1.2.1. A rezoning to a commercial or industrial use on land adjacent to the Urban Services Area will support approval of an expansion of the Urban Services Area boundary to extend water and/or sewer to the commercial or industrial zoned property.

Policy 1.2.2. Encourage the continued promotion of the County's Technology Zone Ordinance, which provides incentives for economic growth that will foster the development, maintenance, and expansion of commercial and industrial businesses engaged in technological research and design.

Policy 1.2.3. The County will encourage the development of accessible, convenient and attractive commercial and industrial locations within the Urban Services Area.

Policy 1.2.4. Retail and other commercial nodes in mixed use areas and office and industrial parks will serve local residential communities and be accessible to transportation including roads, rail and air.

Policy 1.2.5. For the purpose of attracting and retaining businesses that offer highly skilled and well-paying jobs, the County will continue to market and promote its many assets including a highly educated workforce, excellent school system, abundant interstate access, a state-of-the-art regional airport, a variety of shopping, lodging, dining and recreation opportunities, and its many heritage tourism assets.

Objective 1.3. Promote alternative rural economic development (i.e., agri-tourism, eco-tourism, home-based businesses, and telecommuting.).

Policy 1.3.1. Land use policies should establish incentives for rural economic development and facilitate the development of these economic opportunities.

Policy 1.3.2. The County will capitalize on its location and wealth of cultural, historical and natural resources.

Sustainability

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. A sprawling growth pattern of low-density development, which disperses residents over a wide area and consumes resources at a rate greater than can be replenished would be a detriment to sustainable growth.

"Smart growth" encapsulates a range of development and conservation strategies that help protect our health and natural environment and make our communities more attractive, economically stronger, and more socially diverse. Smart growth is our approach to development based on 10 established principles that encourage a mix of building types and uses, diverse housing and transportation options, and infill development within existing neighborhoods. Smart Growth policies are recognized nationwide and are promoted by the U.S. Environmental Protection Agency and other partner organizations. More information on Smart Growth is available at www.epa.gov/smartgrowth.

The location of roads and infrastructure shapes future development patterns. Builders and developers look for land with good access, water, and sewer extension as major growth-inducing factors. Road improvements, construction of public facilities, and water and sewer service can be used to direct growth into designated development areas.

Good road access and water and sewer utilities are only a part of the picture. Other facilities that serve a community include schools, emergency services, parks, and libraries. Communities strive to maintain adequate public facilities as they grow. Providing adequate facilities while accommodating growth and development is a balancing act. New development creates additional demand on public infrastructure. Newly developing areas may lack the necessary infrastructure to adequately serve citizens in these areas. Certain essential facilities such as water and sewer utilities and road access are required for new development in the Urban Services Area (USA). Other facilities, that are not essential for the individual development, but are important to achieve a high quality of life, often occur later as buildout and needs increase. Many of these facilities benefit an entire area, such as a school or regional park and most often extend beyond that of an individual project. While it is unfair for individual projects to carry the burden of upgrading facilities for an entire area, allowing development to occur prior to adequate facilities in place can have negative consequences, such as unsafe roads or overcrowded classrooms. **The County should strive to ensure that adequate public facilities throughout the County are provided at a pace commensurate with the level of growth.**

Goal 2. Manage growth and development in a smart and sustainable manner.

Objective 2.1. Make development, land use, transportation, utility and other public facility decisions consistent with the Comprehensive Plan.

Policy 2.1.1. Review of all development proposals should include an analysis on consistency with the Comprehensive Plan. Proposals that are inconsistent with the Comprehensive Plan should be revised or denied.

Policy 2.1.2. Stafford County should encourage development proposals that are consistent with the Comprehensive Plan, and land use and other regulations.

Policy 2.1.3. Future development proposals should strive to incorporate the following characteristics, many of which are consistent with Smart Growth principles:

- Maintains or improves the quality of life for all residents.
- Is sustainable or enhances sustainability
- Serves a range of transportation needs
- Protects natural, cultural and historic resources
- Considers aesthetic values
- Provides adequate provisioning of public facilities necessitated by the development
- Minimizes impact to the environment, including conservation of green space and tree preservation.
- Provides appropriate mitigation for degraded levels of service
- Incorporates energy conservation measures
- Contributes to a pleasing community character
- Minimizes land use conflicts

Policy 2.1.4. Plans that are incorporated as elements in this Plan by reference should be updated to be consistent with the goals, objectives and policies of this Plan.

Policy 2.1.5. Amendments to the Comprehensive Plan should be made to serve the general public interest. Amendments should be based on a general need in response to the current context of development patterns and community vision, and not based solely on a specific development proposal.

Policy 2.1.6. The Erosion and Sediment Control, Stormwater Management, Water, Sewer and Sewage Disposal, Wetlands, Subdivision and Zoning and any other relevant chapters of the Code of Stafford County should be updated to be consistent with the goals, objectives and policies of the Comprehensive Plan.

Policy 2.1.7. This Plan should be implemented with respect to and in consideration of private property rights.

Objective 2.2. Direct growth into the Urban Services Area.

Policy 2.2.1. Establish a clear Urban Services Area boundary in a location that is suitable to accommodate residential and commercial development characterized by the presence of public facilities, utilities, and government services.

Policy 2.2.2. The County will establish measures to direct new development within the USA to reduce the growth pressure in the rural parts of the County.

Policy 2.2.3. Expansion of the USA boundary is discouraged. However, any increase of the USA boundaries that expands areas of higher density development and extension of or connection to public water and sewer should only be permitted after demonstration of conformance with the following criteria:

- The new boundary is consistent with the goals and objectives of the Comprehensive Plan;
- The proposed expansion would not lead to extension of water and/or sewer to additional lands outside the USA;
- The boundary change and associated land use will have minimal impact on land, land uses, public facilities or transportation outside of the new boundary;
- There is a presence of adequate services -OR-
- Extensions to sewer lines would provide the benefit of minimizing the potential impact of existing failing septic drainfields on the watershed -OR-
- The land area in whole or in part must have been zoned commercial or industrial as of the original date of adoption of this Plan.
- And in all cases, with consideration of input from area residents and property owners.

Policy 2.2.4. The County shall designate Targeted Development Areas (TDAs) in locations appropriate to accommodate higher density residential, and more intense commercial, mixed-use, or industrial development, in proximity to adequate transportation facilities, and within the current USA. The TDAs in total should be sufficient to accommodate half of the projected residential and commercial growth for the 20-year planning period. Each TDA may have its own appropriate type of targeted “development”, be it residential, commercial (retail), office, or more intense industrial uses.

Policy 2.2.5. The County shall establish mixed-use districts and design standards for development in the TDAs. These districts should have a residential density of at least four dwelling units per acre, and minimum commercial floor area ratio of 0.40. The design standards should incorporate principles of smart growth, new urbanism and traditional neighborhood development.

Policy 2.2.6. The County shall encourage within the TDAs pedestrian-oriented neighborhoods and town centers composed of a variety of housing types and densities, incorporating shopping and workplace opportunities, and public facilities.

Policy 2.2.7. Dense, compact mixed-use developments should meet the following criteria:

- Preferably be within the Targeted Development Areas
- Have a sufficient density and scale to support a mix of uses, walkability, and public transit
- Be designed, located, and programmed to offer alternatives to single occupancy vehicle trips, by enabling safe and effective pedestrian and bicycle access to multiple uses and activities and by being accessible to public transportation
- Be sensitive to existing environmental features and protect natural resources
- Incorporate sustainable design features
- Include a mix of housing types for all income levels
- Mitigate its impacts to County services, ensuring acceptable levels of service are maintained

- Ensure safe ingress and egress from new developments onto major arterials and collector roads.

Policy 2.2.8. To the extent possible, feasible and consistent with other goals of the Comprehensive Plan, the County may adopt financial and other incentives to direct development into the TDAs.

Policy 2.2.9. New development projects for residential neighborhoods and commercial sites located within the Urban Services Area should be connected to the public water supply and the public sewer system.

Policy 2.2.10. At least 80 percent of the future cumulative residential growth should be located inside the Urban Services Area. The progress toward this policy should be evaluated on an annual basis through the tracking of building permit activity. Appendix C of the Comprehensive Plan outlines the 2021 evaluation of this policy.

Policy 2.2.11. Cluster subdivisions within the Urban Services Area, including those with increased density should meet the criteria established in Section 3.9 of the Land Use chapter of the Comprehensive Plan.

Objective 2.3. The County will consider infill development and redevelopment within the USA, including TDAs. Infill development includes the process of development on vacant, bypassed and underutilized land within built up areas of existing communities where infrastructure is already in place, and redevelopment of sites in these areas.

Policy 2.3.1. Redevelopment and infill development should be of an appropriate building scale and compatible character with surrounding uses.

Policy 2.3.2. The County will work with the private sector in efforts to revitalize commercial, office and industrial areas and corridors.

Policy 2.3.3. In-fill and redevelopment efforts will be considered in appropriate areas in the Urban Services Area, and the County's consideration will focus on Boswell's Corner, Downtown Stafford, Falmouth Village, Falmouth Gateway (east of I-95), and Berea (west of I-95). Special Area plans should be adopted as elements of this Comprehensive Plan for these areas for the purpose of establishing future land use patterns, types, and intensities, and circulation and building design.

Policy 2.3.4. The County shall, where appropriate, consider alternatives to conventional zoning regulations to support a development pattern consistent with the goals and objectives of the Redevelopment Areas and allow infill development that minimizes impact on adjacent uses. Examples include performance and incentive zoning, sometimes referred to as form-based codes.

Objective 2.4. Discourage growth in the Rural areas outside the Urban Services Area.

Policy 2.4.1. Areas outside of the USA will be characterized by large lot residential subdivisions, agricultural activities, and open land. These rural areas will have limited public services, utilities and facilities.

Policy 2.4.2. Water and/or sewer should not be extended beyond the current boundaries of the USA with the following exceptions:

- Allow for the extension of public sewer utilities outside of the USA only where there has been documented risk to public health due to a failure of an on-site septic system or known failures to septic systems in the nearby area, and where there is limited potential for future expansions of the public sewer system, and application of the current pump and haul policy would be financially excessive to County Utility rate payers.
- Allows for the extension of public water utilities outside of the USA only to improve water quality by completing loops for water lines previously constructed.
- Allow the extension of public sewer and water utilities outside of the USA for industrial zoned properties only in cases where such utilities had previously been extended to the properties and/or are located adjacent to the property.
- On a case by case basis, allow for the extension of public water and sewer utilities outside the USA for data center sites.

Policy 2.4.3. Road improvements should be focused on the TDAs, and to a lesser extent on the USA to support the areas of targeted growth. Safety and general welfare of the public should be the primary consideration for road improvements outside the USA.

Policy 2.4.4. The subdivision and zoning ordinances should be updated to incorporate the highest standards allowable under Virginia statutes for building and developing in agricultural areas.

Policy 2.4.5. The County should educate residents and developers that public facilities and access to public services may be limited outside the Urban Services Area.

Objective 2.5. The County may from time to time establish water and sewer service areas in locations outside of the designated Urban Services Area where a documented need exists for the protection of public health, safety, and welfare relative to existing uses and developments, and not to promote new development.

Policy 2.5.1. Allow for the extension of public water and sewer utilities to established rural residential neighborhoods and crossroads that may not be contiguous with the main Urban Services Area and where the sizes of lots preclude the construction of new systems and aging private systems are no longer sustainable.

Policy 2.5.2. Designate limited water and sewer utility service areas in the vicinity of Lake Arrowhead, Hidden Lake, and the Roseville neighborhoods, and the Hartwood Elementary School area as defined within this Plan. The mapping should be amended if the need arises in additional areas.

Policy 2.5.3. Funding for the utility lines to serve the areas referenced in Policy 1.5.2 shall be achieved by obtaining grants, establishing service districts, or by other means, and not at the expense of the utility rate payers.

Policy 2.5.4. Public water and sewer lines may need to be located outside of the Urban Services Area or Water and Sewer Service Areas to reach the designated service areas. This policy does not support the rezoning of land along these lines that would increase the intensity of development outside of the designated service areas nor does this policy support the extension of utility lines to serve by-right residential subdivisions or commercial development.

Objective 2.6. Preserve rural and agricultural areas of Stafford County and establish mechanisms for ensuring their continued protection from development.

Policy 2.6.1. The County should continue to monitor progress of the Transfer of Development Rights (TDR) Program.

Policy 2.6.2. The County should continue support of the Purchase of Development Rights (PDR) program, and other land conservation programs.

Policy 2.6.3. The County should encourage private landowner dedication of conservation easements and provide educational opportunities regarding land conservation.

Policy 2.6.4. Calculations to establish the number of development rights for a parcel should exclude areas located on slopes of 25% or greater, hydric soils, and 5% of the gross tract size for right of way dedication.

Policy 2.6.5. The County supports the preservation of rural character through the clustering of residential development. Cluster development would permit smaller lot sizes in exchange for preservation of open space, farmland, sensitive resources, and forested areas and should be designed in accordance with the criteria established in Section 3.9 of the Land Use chapter of the Comprehensive Plan.

Policy 2.6.6. Cluster developments are recommended in the areas designated in Figure 3.9 of the Land Use chapter of the Comprehensive Plan. These areas are within or near the USA, public facilities and services.

Policy 2.6.7. Solar facilities and energy storage projects should avoid development of lands with prime agricultural soils that have conservation significance as identified by ConserveVirginia, significant forest tracts, and lands with limited natural buffers for screening, and/or in close proximity to residential developments and public drinking water sources.

Objective 2.7. Phase growth to coincide with the establishment of necessary public infrastructure and services.

Policy 2.7.1. Implementation of TDAs should be phased based on the availability of public services and adequate infrastructure, projected population growth and projected residential and commercial growth.

Policy 2.7.2. New development proposals for projects that require a zoning reclassification and are located within the USA boundaries, that are dependent upon future infrastructure and services, should not develop until the projected infrastructure and services have been implemented or are under construction. Provision of future improvements can be achieved through proffered contributions.

Objective 2.8. Integrate land use and transportation decisions.

Policy 2.8.1. The County shall apply the requirements of Virginia Administrative Code Chapter 527, the traffic impact analysis regulations, to all projects potentially eligible under the statute to properly understand the impacts that land use changes may have on the transportation network. Land use proposals that have a negative impact on the transportation network should fully mitigate impacts to achieve adequate levels of service.

Policy 2.8.2. The County will prioritize road, pedestrian and transit improvement within the Urban Service Areas to include consideration of Levels of Service as well as Transportation Bond Projects.

Policy 2.8.3. Prior to constructing new roads or adding capacity to roads outside the Urban Services Area, the County should conduct an impact assessment of the potential for increased development as a result of the road project.

Policy 2.8.4. The County should maintain its Traffic Model to gauge the effect of growth, development, road improvements and changing transportation patterns on the transportation network.

Fiscal Responsibility

Residential development, although sometimes necessary to accommodate population growth, on average does not pay for itself. As of calendar year 2008, on average, each new “by-right” single-family dwelling in Stafford County (developed without cash proffers to mitigate the cost of public services) creates capital infrastructure costs of an estimated \$185,446. Infrastructure includes roads, schools, parks, and other public facilities. The dollar amount is based on a linear projection, showing that as population increases all future facilities would be developed to achieve a desired service level without consideration for deficiencies or excess capacity. The number may vary based on inflation and construction costs. This does not include operating costs, such as maintenance cost and personnel salaries.

In contrast, depending on how it is maintained, open space is budget neutral or “gives back” more in revenues than it uses in public services, and commercial development generates more revenues than the cost of public services that it consumes.

Exploding housing growth creating an imbalance of residential to commercial development can have the effect of decreasing acceptable levels of public services and increasing County debt.

Goal 3. Ensure that growth and development is managed in a fiscally responsible manner.

Objective 3.1. Adopt a land use plan and establish a growth management system that will accommodate the projected year 2036 population of 198,815.

Policy 3.1.1. To the extent possible, the future land use map should limit potential residential growth to the number of dwelling units needed to accommodate forecasted population growth.

Policy 3.1.2. Amendments to the Comprehensive Plan, including the Land Use Map, should not create additional excess residential capacity.

Policy 3.1.3. The County will maintain and update population and housing data and future projections that will be used to:

- Evaluate development proposals
- Provide adequate housing opportunities for all residents
- Assure that adequate levels of service are met
- Deliver adequate public services
- Generate employment opportunities to meet the needs of a growing population
- Ensure adequate transportation planning
- Measure growth trends against the Comprehensive Plan

Objective 3.2. Stafford County should use Level of Service Standards to assist in identifying which existing lands, facilities or services should be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed due to current or future developments.

Policy 3.2.1. At a minimum, the Level of Service standards should address roadway systems, transit, libraries, storm water quantity and quality, parks and recreation, solid waste collection and disposal, public safety, schools, water, sanitary sewer and administration.

Policy 3.2.2. The Comprehensive Plan should incorporate Levels of Service Standards for which the inputs are now known.

Policy 3.2.3. The County should identify missing information needed to establish some Levels of Service Standards and implement a plan to obtain this information. The Board of Supervisors should initiate an amendment to the Comprehensive Plan to incorporate additional Levels of Service Standards as needed.

Objective 3.3. The Board of Supervisors should use the Public Facilities Plan, as included in Chapter 5 of this document, as a needs assessment for the annual Capital Improvements Plan (CIP).

Policy 3.3.1. The Public Facilities Plan should assess existing and future public facility needs, forecasting when and where expanded and new public facilities will be needed to most efficiently and conveniently serve all County residents.

Policy 3.3.2. The Public Facilities Plan should be implemented to apply the Levels of Service Standards for public facilities and services.

Objective 3.4. Identify the public costs of residential growth and development, and its potential impact on the County's budget and property taxes.

Policy 3.4.1. The County should adopt a Financial Impact Model as an element of the Comprehensive Plan and prepare and present an annual update to the Board of Supervisors.

Policy 3.4.2. The Financial Impact Model should incorporate the Levels of Service Standards, and model for a period of twenty years the projected revenues and expenses for the County based on projected population growth, and projected residential and commercial development.

Policy 3.4.3. The Comprehensive Plan should estimate the incremental capital costs of new residential units.

Objective 3.5. Ensure that impact statements are complete and incorporated into the development review process.

Policy 3.5.1. Where not specified by state statute, the County should establish standards for impact statements.

Policy 3.5.2. Development proposals or amendments to the Comprehensive Plan that do not include required and complete impact statements should be rejected.

Objective 3.6. Use infrastructure as a tool to guide development into locations where the land is most cost effectively served.

Policy 3.6.1. Future public facilities should be encouraged to be located within the USA. Exceptions may be made when the only way to meet Level of Service Standards or location criteria contained in the Public Facilities Plan is to locate the facility outside the USA or when land is dedicated to the County and the development of the site and any required infrastructure would not be cost prohibitive.

Policy 3.6.2. Priority should be given to meeting capital improvement, road and other infrastructure needs within the TDAs, and to a lesser extent the remainder of the USA.

Objective 3.7. To the maximum extent possible, the County should collect funds from land development projects to pay for the costs of growth and development.

Policy 3.7.1. The County should maintain an up-to-date assessment of the capital costs of residential and non-residential development.

Policy 3.7.2. The County should maximize the collection of transportation impact fees pursuant to Virginia Code Sec. 15.2-2317 et seq.

Policy 3.7.3. The County should collect proffers on rezoning applications to the extent possible and as allowed by Virginia Code to meet capital improvement needs.

Policy 3.7.4. Providing adequate monetary proffer contributions for a development proposal shall not be the sole deciding factor when considering a zoning reclassification.

Policy 3.7.5. For land development located within a dam break inundation zone, the County should establish a system for collecting fifty percent of the costs for necessary upgrades to impounding structures, pursuant to Sec. 15.2-2243.1.

Policy 3.7.6. The County should regularly update and/or recalculate transportation impact fees based on an updated transportation model to reflect future costs and mitigate degraded transportation Levels of Service.

Policy 3.7.7. Consider the need to develop, amend or repeal proffer guidelines pursuant to the latest State Code directives.

Environment

Our decision to occupy and alter Stafford County's landscape has resulted in increased volumes and concentrations of specific pollutants in the air, in surface and ground waters, and in the soil. These pollutants can harm both the natural and the human environment.

Although Stafford County does not have to contend directly with the more serious forms of pollution associated with heavy industry, discharges from factories in other parts of the region and country and pass-through traffic on Interstate 95, U.S. Route 1, and U.S. Route 17 have indirectly created a negative effect on air and water quality in the County. Within the County, the conversion of land to urban uses and our dependence on the automobile have resulted in increased amounts of pollution.

- The County has attained National Ambient Air Quality Standards as part of the Clean Air Act.
- Some streams and lakes in Stafford County, and the Potomac River, are characterized by poor water quality.
- Removal of natural vegetation along stream banks and shorelines has increased stream bank erosion. Land use and development activities have altered stream flows, and transported pathogens and pollutants into streams, wetlands and lakes.
- The County continues to lose open space, much of which is significant for protecting environmental resources. It is desirable to conserve portions of the County's land in a condition that is as close to a predevelopment state as is practical.
- Development impacts have led to increased light and noise pollution as well as an increase of flooding on low-lying roads.
- The County is located in the Chesapeake Bay watershed and as such, its' tidal water bodies are subject to sea level rise which can adversely affect water dependent activities and waterside properties.
- Roads in the County subject to recurring flooding, including, but not limited to Brooke Road, Andrew Chapel Road, and Harrell Road, create a public safety hazard and require regular costly maintenance.

Although faced with many threats, Stafford is rich in diverse, natural resources. These resources present opportunities for education, recreation, eco-tourism and buffers to the impacts of development. Chief among these resources are the Crow's Nest and Widewater peninsulas. Located approximately seven miles east of the County Courthouse, Crow's Nest encompasses 3,884 acres of contiguous forestland. It is bounded by Brooke Road (Rt. 608) on the West, Accokeek Creek to the North, and Potomac Creek to the South. The confluence of these creeks and the Potomac River is at the eastern tip of the peninsula. Similarly situated, the Widewater peninsula is located on the Potomac River and Aquia Creek. Widewater State Park, situated on approximately 1,200 acres, comprises most of the peninsula.

In addition to natural assets, there are significant cultural and historical resources on the Peninsulas. The continued protection of the Crow's Nest peninsula as a public Natural Area Preserve and development of Widewater State Park will provide public access for low-impact educational and recreational activities; provide additional public water access points in the Chesapeake Bay watershed; preserve important historical and archeological sites; and protect natural/open spaces. Suitable uses for the parks include fishing, wildlife observation and photography, environmental and historical education, hiking, and limited deer hunting dependent upon needs for deer population maintenance and control.

Shoreline and Streambank Erosion

Stafford County contains miles of tidal and non-tidal shoreline. These shorelines provide valuable environmental and economic assets to the County. Erosion can contribute to the sedimentation and pollution of streams, rivers, and the Chesapeake Bay, resulting in the loss of wildlife habitat and reduced water quality and, when severe, threatening property. The increased rate and volume of stormwater runoff associated with development can accelerate the natural process of erosion. Protecting these assets from erosion is important. Monitoring and management of the shorelines has occurred and will continue to occur to prevent degradation of the County's shoreline assets.

As of 2015, 53% of the land use along county shoreline riparian areas is forested, with nearly a third of this forested area being along the Rappahannock River. About a quarter of the land use is residential with nearly 83% of residential land use occurring along the Potomac River and its tributaries. This means that homeowners are largely given the burden of shoreline management in developed areas. Typically, when shorelines exhibit erosion, property owners have hardened the shoreline.

Historically, shoreline erosion rates have been very low across the county. However, there are some areas of critical erosion such as the Potomac River and the lower reaches of Aquia Creek and Potomac Creek tributaries. Erosion in these areas is caused by the fetch and energy of the particular water body, the topography, condition of the existing shoreline, and previous alteration of the shoreline.

Erosion is common among non-tidal streams in the county. Streambank erosion has resulted from increased development pressures. As the amount of impervious surfaces increase on developed land, rainfall gets routed directly off-site rather than getting a chance to permeate through the ground. This increases water volumes in streams and causes erosion along the stream bank.

Proper monitoring and mitigation of erosion along streambanks ensures the County remains in compliance with the Chesapeake Bay Act regulations. Protecting the assets the shorelines provide ensure a healthy economy. A healthy economy and a healthy Chesapeake Bay are integrally related.

Goal 4. Stafford County encourages its citizens and businesses to preserve and protect Stafford's natural and environmental resources through voluntary efforts.

Objective 4.1. Ensure that environmental protection efforts meet federal and state mandates with minimal impacts on the County.

Policy 4.1.1. Stafford County recognizes that certain environmental requirements are mandated by federal and state regulations, including, but not limited to, the state Chesapeake Bay Preservation Act, Wetlands Code, the federal Clean Water Act, Clean Air Act, and National Flood Insurance Program and planning for sea level rise. When trying to meet the objectives of state and federal mandates and a menu of options are provided to meet objectives, emphasis should be placed on incentive-based measures.

Policy 4.1.2. Stafford County should encourage and support community and staff level education programs to educate the public, its citizens and businesses about green programs, environmental best management practices, risks of flooding and sea level rise and other federal and state environmental mandates and requirements.

Policy 4.1.3. Development proposals that are projected to cause a substantial increase in auto related air pollutants should provide a transportation management strategy which minimizes dependence on single occupant automobiles. This shall apply to residential and non-residential development proposals that meet the requirements to submit a traffic impact analysis in accordance with VDOT criteria. The types of strategies employed may include, but not be limited to:

- Provision of an interconnected street network within a development and to adjoining property to potentially shorten trip lengths
- Incorporation of pedestrian and bicycle facilities into the design of the development
- Promotion of ride sharing programs by employment centers
- Design commercial projects to limit vehicle trips within the shopping complex
- In mixed use developments, focus residential uses within ¼ mile of shopping and employment opportunities, with the design, configuration, and mix of uses emphasizing a pedestrian oriented environment.
- Enhancement of telecommunications infrastructure to promote work from home opportunities
- Provision of shuttle buses to transportation nodes.

Objective 4.2. Preserve and improve air quality.

Policy 4.2.1. Establish land use patterns and transportation facilities that encourage the use of public transportation and reduce trip lengths to reduce emissions of nitrous oxide, carbon monoxide, and hydrocarbons from automobiles.

Policy 4.2.2. Implement transportation strategies that reduce auto travel and improve traffic flow, thereby reducing auto emissions.

Policy 4.2.3. Encourage the application of state-of-the-art technology toward the reduction of emissions from stationary sources of air pollution.

Objective 4.3. Prevent and reduce pollution of surface and groundwater resources. Protect and restore the ecological integrity of streams in Stafford County.

Policy 4.3.1. Continue to study and evaluate the need for the establishment of a Stormwater Utility.

Policy 4.3.2. Maintain a best management practices (BMP) program for Stafford County, ensure that new development and redevelopment complies with the County's BMP requirements and recommended BMP practices from the Virginia Institute of Marine Sciences (VIMS) Center for Coastal Resources Management, and monitor the performance of BMPs. Update BMP requirements as newer, more

effective strategies become available.

Policy 4.3.3. Preserve the integrity and the scenic and recreational value of stream valleys when locating and designing storm water detention and BMP facilities. In general, such facilities should not be provided within stream valleys unless they are designed to provide regional benefits or unless the stream has been significantly degraded.

Policy 4.3.4. When facilities within the stream are appropriate, encourage the construction of facilities that minimize clearing and grading, such as embankment-only ponds, or facilities that are otherwise designed to maximize pollutant removal while protecting, enhancing, and/or restoring ecological integrity.

Policy 4.3.5. Update erosion and sediment regulations and enforcement procedures as new technology becomes available. Minimization and phasing of clearing and grading are the preferred means of limiting erosion during construction.

Policy 4.3.6. Where practical and feasible from a design and cost standpoint, retrofit older stormwater management facilities to perform water quality functions to better protect downstream areas from degradation.

Policy 4.3.7. Protect water resources by maintaining high standards for discharges from point sources.

Policy 4.3.8. Establish a program to monitor Stafford County's surface and groundwater resources.

Policy 4.3.9. Encourage land use activities to protect surface and groundwater resources.

Policy 4.3.10. For new development and redevelopment, apply better site design and low impact development (LID) techniques, and pursue commitments to reduce stormwater runoff volumes and peak flows, to increase groundwater recharge, and to increase preservation of undisturbed areas.

Policy 4.3.11. Encourage watershed management planning and consider any watershed management plans that are adopted or endorsed by the Board of Supervisors as a factor in making land use decisions.

Policy 4.3.12. Optimize stormwater management and water quality controls and practices for redevelopment consistent with revitalization goals.

Policy 4.3.13. Natural wetlands should not be used as silt ponds, or serve as the receiving area for stormwater.

Objective 4.4. Protect the Potomac Estuary, the Rappahannock, and the Chesapeake Bay from the avoidable impacts of land use activities in Stafford County.

Policy 4.4.1. Ensure that new development and redevelopment complies with the

County's Chesapeake Bay Preservation Ordinance, as applied to Chesapeake Bay Preservation Areas adopted by the Board of Supervisors.

Policy 4.4.2. Evaluate the need to strengthen the County's Chesapeake Bay Preservation Ordinance by amending the Ordinance to include, but not be limited to, additional protection of streams as allowed under the State statute. Implement all recommendations contained in the *Chesapeake Bay Preservation Area Plan* element of the Comprehensive Plan.

Policy 4.4.3. Where tidal shoreline erosion control measures are needed, consider recommendations contained in the "Shoreline Protection Policies" in the *Chesapeake Bay Plan* element of the Comprehensive Plan dated November 2001.

Policy 4.4.4. Boating and other tidal shoreline access structures should be sited, designed, and constructed in a manner that minimizes adverse environmental impacts and account for storm surges and sea level rise. Where County approval of tidal shoreline access structures is needed, the following guidelines should be consulted and considered in the decision-making process: the Chesapeake Bay Program's document entitled "Chesapeake Bay Area Public Access Technical Assistance Report;" and the following guidelines issued by the Virginia Marine Resources Commission; "Shoreline Development BMPs," "Wetlands Guidelines," "Subaqueous Guidelines," and "Integrated Guidance for Tidal Shorelines;" and utilize VIMS Decision Trees for onsite review and subsequent selection of appropriate erosion control/BMPs:
<http://ccrm.vims.edu/decisiontree/index.html>

Policy 4.4.5. Support efforts to mitigate or compensate for losses of wetlands impacted by shoreline structures and development through mechanisms such as in-lieu fees for tidal wetlands impacts and preserving open spaces adjacent to marsh lands to allow for inland retreat of the marshes under rising sea level.

Objective 4.5. Conserve and restore tree cover on developed and developing sites.

Policy 4.5.1. Establish and implement tree cover requirements, prioritizing tree preservation over tree planting where existing tree cover exists, specifically on new site developments.

Policy 4.5.2. Protect or restore the maximum amount of tree cover on developed and developing sites consistent with planned land use and good silvicultural practices.

Policy 4.5.3. Use open space/conservation easements as appropriate to preserve woodlands, monarch trees, and/or rare or otherwise significant stands of trees, as identified by the County.

Objective 4.6. Establish mechanisms to protect scenic and/or sensitive environmental resources in perpetuity.

Policy 4.6.1. Create open space and conservation easement policies.

Policy 4.6.2. Create an Environmental Quality Corridor (EQC) system to identify, protect and restore areas that have a desirable or scarce habitat; provide “connectedness” for wildlife movement; desirable aesthetic features; and/or pollution reduction capacities, prioritizing stream valleys.

Policy 4.6.3. Encourage incentives for private placement of land in open space and conservation easements, and within a protected EQC.

Policy 4.6.4. Preserve and protect the natural beauty of Stafford County’s topography, including its view sheds, waterways and signature rolling hills and valleys.

Objective 4.7. Encourage parks and natural areas to include low-impact recreational and educational uses.

Policy 4.7.1. Incorporate plans for natural areas and parks for low impact uses into the Parks and Recreation Master Plan.

Policy 4.7.2. Permanently protect the remaining portions of the Crow’s Nest peninsula in the areas designated on the Land Use Map.

Policy 4.7.3. Incorporate requirements and standards for open and green spaces and natural areas into land use districts.

Objective 4.8. Minimize light emissions to those necessary and consistent with general safety.

Policy 4.8.1. The County should establish the use of lighting plans to reduce glare, eliminate over-illumination and reduce sky glow, and follow Crime Prevention Through Environmental Design (CPTED) principles.

Policy 4.8.2. Light sources for parking lots and signage should use the minimum intensity necessary to accomplish the light's purpose.

Policy 4.8.3. Full cutoff fixtures should be used in exterior lighting for development and redevelopment projects.

Policy 4.8.4. Lighting plans should incorporate the latest technology in lighting that provides effective illumination and enhanced energy efficiency whenever possible.

Objective 4.9. Prevent and reduce shoreline and streambank erosion resulting from natural or man-made occurrences.

Policy 4.9.1. Update County GIS maps to show shoreline/streambank conditions and areas of concern.

Policy 4.9.2. Promote the use of the Shoreline Erosion Advisory Service (SEAS) administered by the Virginia Department of Conservation and Recreation to provide technical assistance for shoreline erosion problems.

Policy 4.9.3. Utilize the Stafford County Coastal Resource Management Portal provided by the Virginia Institute of Marine Sciences (VIMS) to monitor and manage the shoreline erosion problems within the County.

Policy 4.9.4. Encourage future development projects to mitigate any streambank erosion problems that may exist.

Objective 4.10. Integrate environmental planning and implementation efforts into a single Master Environmental Plan.

Health, Safety and Welfare

Maintaining and improving the health, safety and welfare of the residents of the County improves the overall livability of a community. In ensuring that Stafford is a great place to live, work, learn, and play, the County must be mindful of the challenges involved in maintaining a high quality of life and in response establish policies to address these issues.

Unlike some parts of the United States, Stafford County has not experienced widespread destruction due to natural disasters. However, the County is not free from being impacted by natural events and manmade hazards.

The geologic conditions in Stafford create a variety of challenges. There are hazards to property in some areas of the County posed by wet or unstable soils. Marine clay soils found in the eastern part of the County and shrink-swell clay soils found primarily in the western area can cause foundation failures, cracked and shifting walls, and in extreme cases, catastrophic slope failure. Asbestos bearing soils may pose a health risk to construction workers requiring special precautions during excavation.

Increasing urbanization often creates an imbalance between developing important natural resources and protecting quality of life and overall community values. The location of mineral resources, such as sand and gravel, and crushed stone, depends upon geological reserves. As residents locate nearer to these areas, extraction of these resources may threaten their safety and well-being.

Stafford must be mindful of its ability to sustain basic needs during short term natural events, as well as in the long term. In the short term, emergency preparedness will allow residents to better deal with disruptions to food, water, power, and fuel supplies, as seen during past hurricane or major snow events. In the long term, the County shall be mindful of its water resources, to ensure land use practices do not impact surface and groundwater reserves.

The County offers a superb network of parks, abundant recreation opportunities, and unique natural areas. As the County continues to grow, a challenge will be to ensure proper resources are provided to maintain adequate recreational opportunities and open space. Parks, recreational facilities and open space are designed to improve the health of the residents of Stafford County by providing for their need for exercise and relaxation, but they also help to protect the County's natural resources and environment. Because of its dramatic growth, Stafford County must be particularly mindful of the need to set aside land for future parks and open space as well as provide adequate facilities for the active and passive recreational requirements of its current and future population.

Goal 5. Ensure the health, safety and well-being of Stafford County residents.

Objective 5.1. Through land use policies, maintain and enhance the capacity of Stafford County to meet the basic needs of citizens during times of crisis and in the face of diminishing resources.

Policy 5.1.1. Establish mechanisms to encourage continued active agricultural uses, and to re-establish active agricultural uses outside the Urban Services Area.

Policy 5.1.2. Encourage the local production and purchase of food and fiber through establishment and support of viable farmers markets and agri-tourism events, establishment of standards for community gardens in major residential developments, and promotion of individual garden plots.

Policy 5.1.3. To ensure an adequate supply of energy resources, promote conservation measures such as property tax credits for use of alternative energy sources or use of high efficiency appliances or building practices including Leadership in Energy and Environmental Design (LEED) standards.

Objective 5.2. Protect drinking water resources.

Policy 5.2.1. Encourage that development and redevelopment sites that may have been subject to contamination by toxic substances or other hazardous materials be remediated to the extent they will not present unacceptable health or environmental risks for the specific uses proposed for such sites.

Policy 5.2.2. Implement a groundwater management ordinance in accordance with the Groundwater Management Plan element of the Comprehensive Plan.

Policy 5.2.3. Ensure the quality of drinking water reservoirs is maintained through a pre-treatment monitoring program. If water quality degradation is detected, then appropriate mitigation measures should be implemented.

Policy 5.2.4. Establish reservoir overlay district standards for the long-term protection of the County's public water supplies.

Policy 5.2.5. Ensure development proposals that include the use and storage of hazardous materials comply with all state and federal regulations.

Policy 5.2.6. Support education to minimize the application of fertilizers, pesticides, and herbicides to lawns and landscaped areas through, among other tools, the development, implementation, and monitoring of integrated pest, vegetation and nutrient management plans.

Objective 5.3. Minimize development on erodible, hydric, and other soils deemed unsuitable for development.

Policy 5.3.1. Discourage development on erodible and hydric soils, and cluster development away from steep slopes and potential problem areas.

Policy 5.3.2. Require new development on problem soils such as shrink swell and low pH (acidic) soils to provide appropriate engineering measures to minimize geotechnical hazards.

Objective 5.4. Minimize the potential impacts of flood hazards, storm surges, and high-water levels.

Policy 5.4.1. Create awareness of Stafford County waters that may be susceptible to a rise in tidal water levels and storm surge and assess the potential impacts through implementation of Flood Insurance Rate Map “V” zones.

Policy 5.4.2. Discourage development of new buildings and structures within dam inundation zones.

Policy 5.4.3. The Comprehensive Plan should include a map identifying all parcels wholly or partly within dam break inundation zones.

Policy 5.4.4. With assistance from the Virginia Institute of Marine Sciences pursuant to Virginia Code provision 15.2-2223.2 and 15.2-2223.3 the Comprehensive Plan should include coastal resource management guidance and strategies to combat projected sea-level rise, recurrent flooding, and shoreline erosion.

Objective 5.5. Support the expansion of electric and pipeline utilities in a manner that minimizes the exposure of County residents to potential pipeline ruptures and visual impacts and environmental hazards associated with electrical generation transmission, and distribution facilities.

Policy 5.5.1. The Comprehensive Plan should include a map designating major gas and petroleum pipelines, and electrical transmission and distribution facilities.

Policy 5.5.2. Public Service Corporations should have their easements and facilities well marked and they should provide regular public education on the location and hazards associated with major gas and petroleum pipelines, and electrical transmission and distribution facilities.

Policy 5.5.3. The County should identify critical surface and ground water resource areas in the vicinity of pipelines, and the pipeline operators should share with the County contingency plans for emergency response in case of an accident.

Policy 5.5.4. Electric utility and telecommunication providers should design their systems to minimize electromagnetic field impacts on nearby residential uses, schools, and businesses.

Policy 5.5.5. Above ground transmission lines, sub-stations, and switching stations should be sited and designed in a manner to minimize visual and environmental impacts on adjacent land uses. Within the Urban Services Area, the County strongly encourages the underground placement of all electric transmission lines when new lines are installed or existing lines relocated. Above ground transmission lines of 150 kilovolts or more, and associated facilities such as sub-

stations and switching stations should provide adequate screening and buffering.

Policy 5.5.6. The County discourages future residential development from locating in the vicinity of existing and future electric transmission lines of 150 kilovolts or more, and associated facilities such as substations and switching stations without adequate screening and buffering.

Policy 5.5.7. Solar facilities and energy storage projects should be sited and designed in a location and manner consistent with the recommendations established in this Plan in Chapter 3, Future Land Use, Section 3.10, Solar Energy Generation and Energy Storage Facilities.

Objective 5.6. Minimize potential impacts of mineral extraction on nearby properties.

Policy 5.6.1. To meet future demands, allow mineral extraction activities, including, but not limited to, sand, gravel, stone, and rock, to occur only in areas of known geological reserves, as determined by the Virginia Department of Mines, Minerals and Energy, Division of Mineral Resources.

Policy 5.6.2. Encourage existing mining/ extraction operations to fully utilize adjoining areas that have suitable mineral resources by relocation of existing operations at the appropriate time, rather than relocate to other sites within the County.

Policy 5.6.3. Require proposals for mineral extraction to obtain a Conditional Use Permit (CUP) to mitigate impacts to nearby properties.

Policy 5.6.4. Require berms and/or other screening measures to minimize visual intrusions.

Policy 5.6.5. Restrict operating hours to preclude disturbances from vehicles and equipment.

Policy 5.6.6. Encourage existing mining/extraction operations to provide for appropriate re-use of mined areas, after mining and reclamation procedures have been completed. Appropriate re-use may include dedication of portions of the reclaimed site for public infrastructure needs such as parkland and/or reservoirs.

Objective 5.7. Create a diversity of recreational opportunities for Stafford residents of all ages.

Policy 5.7.1. The County will evaluate its future need for public parks, recreational facilities and passive open space on an on-going basis and identify areas for acquisition to fill this need to conform to the County's Level of Service Standard incorporated into the Comprehensive Plan.

Policy 5.7.2. Where practical, expansion of existing parks should be considered when a future need is identified. Development proposals should consider donation of land to adjacent parks if a need exists and the need is reasonably related to the development proposal.

Policy 5.7.3. Criteria for parks and recreation will be guided by the Virginia Outdoors Plan and National Recreation and Parks Association standards.

Policy 5.7.4. A Parks and Recreation Master Facilities Plan should be updated every three years and be incorporated as an element of the Comprehensive Plan.

Policy 5.7.5. The recommendations of the Bicycle and Pedestrian Facilities Plan should be implemented to increase recreational opportunities, and to enhance non-motorized access to public parks.

Objective 5.8. Ensure the noise impacts, vibration impacts, and potential safety hazards generated by the live fire ranges and aircraft overflight and aviation impacts in general at Marine Corps Base (MCB) Quantico are well known to developers.

Policy 5.8.1. Amend the existing Military Facility Impact Overlay District boundary map to include the following areas as depicted in the Marine Corp Base Quantico Joint Land Use Study, dated June 2014:

- All land shown within the Military Influence Area zones.

Policy 5.8.2. Amend the Military Facility Impact Overlay District ordinance to encourage the following residential densities within the District in areas outside of the County's Urban Services Area:

- Within the Military Influence Area Zones 2.1 and 2.4, reduce or maintain a density at one (1) dwelling unit per six (6) acres.

These densities should be accomplished through means such as conservation easements, Purchase of Development Rights, Transfer of Development Rights, and continuation and establishment of agricultural uses and coordination with the Base on their encroachment control plans.

Policy 5.8.3. Amend the Military Facility Impact Overlay District ordinance to include Noise Level Reduction (NLR) requirements in building codes for structures within the District.

Policy 5.8.4. Require written noise disclosure, as permitted by law, for potential purchasers and lessees within the Military Facility Impact Overlay District of military operation impacts through means that include, but are not limited to, the requirement of a note on subdivision plats or exploring the possibility of revisions to the County's Noise Ordinance.

Policy 5.8.5. Amend the zoning ordinance to establish a maximum height restriction of 450 feet above mean sea level for towers, structures, buildings or objects in areas within the Quantico MCB Range Safety Zone C depicted in the Quantico MCB 2006 RCUZ Study.

Policy 5.8.6. Evaluate the need to adopt regulations that promote compatible land uses in areas outside the Military Facility Impact Overlay District, but within

sufficient proximity to MCB Quantico to experience noise and/or vibration impacts.

Policy 5.8.7. Designate the boundaries of an Airport Impact Overlay Zone for the approach to the MCB Quantico air facility. The primary approach to the landing strip at Quantico, known as Turner Field, is a north south orientation located over the eastern portion of the County, including areas such as Crow's Nest and the Widewater peninsula. It is illustrated in Figure 5.14 of this document.

Policy 5.8.8. Notify the Commander and Community Plans and Liaison Officer of MCB Quantico and the Civilian-Military Community Relations Council, of any proposed extension of water or sewer service outside the Urban Services Area on lands within five miles of the boundary of MCB Quantico.

Policy 5.8.9. Work cooperatively with MCB Quantico to limit land uses to those compatible with military training activities within the Military Facility Impact Overlay Noise Zones and Range Safety Zones as recommended in the June 2014 Joint Land Use Study and included in Chapter 3 of this document.

Objective 5.9. Minimize the noise impacts and potential safety hazards generated by general aviation at public and private airfields in the County.

Policy 5.9.1. The County should develop land use compatibility standards for new development to conform to within the aircraft approach patterns of airports and landing strips.

Objective 5.10. Provide appropriate public safety resources, properly distributed, to maintain community safety standards and to respond to threats to life and property.

Policy 5.10.1 Plan for and locate public safety facilities to maintain or improve public safety service standards.

Policy 5.10.2. Provide Public Safety Plans to support the delivery of community public safety service standards.

Housing

Home ownership expands individual opportunities to accumulate wealth, enables a family to exert greater control over their living environment, creates incentives for households to better maintain their homes, and may benefit children of homeowners. Homeownership also benefits local neighborhoods since owner-occupiers have a financial stake in the quality of the local community.

Stafford County's housing stock continues to grow. The US Census Bureau in 2020 determined that there were 52,793 dwelling units in the County. This is an increase of 20 percent or 8,815 dwelling units since the year 2010. 38.7 percent of those homes were built in the past 20 years. Single family detached homes comprise the largest percentage of housing in the County at 74.5% followed by 14.1% single family attached units, 7.4% multi-family and 4.0 percent manufactured homes. Homes within the County are fairly large with the median dwelling unit having 8 rooms and 45.2 percent of dwelling units having 9 or more rooms. Another likely indicator that the County has large homes is that 40% of households have 3 or more cars. Homes with extensive driveways and garages tend to be larger lots and can take up a larger footprint than homes on smaller lots. The median home price for an owner-occupied dwelling in 2019 was \$366,000. The median mortgage payment is \$2,199 per month and the median gross rental payment is \$1,383 per month.

In Stafford County, increases in housing costs have the effect of limiting opportunities for affordable home ownership. Affordable housing is safe, decent housing where costs (mortgage or rent plus utilities) do not exceed 30 % of gross household income. This should apply across the spectrum of income levels. The mid-range income level, known as "workforce housing" applies to households that earn between 50% and 120% of the median household income, or between \$55,223 and \$132,535 based on a median income of \$110,446 in 2019. The lower end of this level includes the community's sheriff deputies, firemen, school teachers, nurses and retail associates who often are priced out of the market. Households that spend more than 30% of their gross income on housing costs are considered to be cost burdened. These households may also be classified as Asset Limited, Income Constrained, Employed (ALICE). They make enough money not to be classified as being in poverty but may have difficulty affording essentials such as childcare, healthcare and housing. Nearly half of all renters in the County (45.2%) are ALICE.

A key component of attracting new business and the expansion of existing business is the ability of those enterprises to attract a qualified workforce. We are blessed with a wide variety of skilled labor in our larger labor market region that may sustain new business expansions. Much of that labor force may desire to live closer to their places of work in Stafford and new residents may too choose to do so if there is a wider variety of housing types. Stafford should consider how to encourage a wider variety of housing types, for a wide range of incomes, to continue to foster existing and new business growth.

Stafford County is a member of the George Washington Regional Commission (GWRC). GWRC adopted a 2020 Housing Affordability Study and Action Plan in November 2020. The major findings of the Study were:

- Rental housing will continue to be unaffordable without intervention. One in two renters in the region are cost-burdened. An overwhelming majority of those cost burdened renters are low-and moderate-income households.

- There is little rental housing that is dedicated to low-and moderate-income households in the region. Only 7% of all the new homes built in the region over the past decade use public assistance to provide below market rents.
- The price of homeownership continues to increase as supply dwindles. Over the past five years, the price of a home has risen nearly 20%.
- First-time homebuyers are being priced out of the market. As of June 2020, 1 in 5 home resales were below \$250,000. Of all new construction sales in 2019 and 2020, only 3% were below \$250,000.
- Homebuyers are looking for homes that aren't being built. The average new home constructed is over 3,000 square feet, but the highest demand is for smaller homes.
- The Covid-19 Pandemic increased the desire and need for multigenerational housing, flexible living spaces, and broadband access.
- Senior housing needs will be a significant portion of the future housing demand. One in five residents in the region will be 65 years or older by 2040.
- Active duty military and veterans have bolstered homeownership over the past decade. The growth in VA home loans since 2008 is twice that of conventional loans.

Goal 6. Promote affordable and quality housing.

Objective 6.1. Identify need for and potential solutions to creating new and maintaining existing affordable housing.

Policy 6.1.1. Provide ongoing support to Regional Affordable Housing efforts.

Policy 6.1.2. Incorporate criteria in the County's monetary proffer guidelines that offer credit for providing affordable housing.

Policy 6.1.3. Consider adopting a local ordinance to waive specified development application fees for affordable housing as permitted by State Code.

Policy 6.1.4 When new development proposals would displace aging and affordable housing stock, the means to relocate the residents to other affordable housing should be considered, including, but not limited to:

- Assisting with relocation search and costs
- Including affordable dwelling units within the new development.
- Payment into an affordable housing fund.

Objective 6.2. Identify opportunities for private/public partnerships to increase the stock of affordable housing where sustainable home ownership can be achieved that will not create a burden on the County. The types of units may include townhomes, multi-family units, and reasonably sized detached homes.

Policy 6.2.1. Create land-use incentives for private development of affordable housing.

Policy 6.2.2. Identify publicly owned properties that could be redeveloped as housing for public employees.

Policy 6.2.3. Encourage developers and land owners to work with organizations such as the Greater Fredericksburg Habitat for Humanity and Virginia Statewide Community Land Trust to increase the number of affordable homeowner dwelling units in the County.

Objective 6.3. Promote housing opportunities for all income ranges and ages, including housing for elderly, disabled and low-income residents, workforce housing, and executive housing.

Policy 6.3.1. Community areas should include a mix of housing types and have access to local services, infrastructure, community facilities and employment opportunities.

Policy 6.3.2. Affordable housing will be encouraged in TDAs, as designated on the Land Use Plan Map.

Policy 6.3.3. Development and redevelopment proposals should promote housing choices for those who own or rent, and where residents have the opportunity of a livable home at an affordable price that promotes opportunity and a better quality of life in a secure and attractive environment.

Policy 6.3.4. Housing should include universal design features to be accessible to the elderly and handicapped allowing residents to age in place.

Policy 6.3.5. Pedestrian facilities in communities should be appropriately designed and well lit for safe accessibility.

Policy 6.3.6. The County should promote the conservation of stable neighborhoods, revitalization of older neighborhoods, and maintenance of quality housing and property values through entities such as the Virginia Statewide Community Land Trust and available grant funding.

Transportation

Adequate transportation systems promote a high quality of life by ensuring the ability of residents, workers, students, shoppers, tourists and others to move freely between home, work, school, recreation, commerce and other venues.

The growth in Stafford County and the surrounding region has contributed to roadway congestion and resulted in a need for transportation solutions that will meet current and future demand for better, safer and less congested roads.

Goal 7. Create an intermodal system of transportation which implements the Land Use Plan by providing a safe, efficient and affordable means for our people and products to move safely in and through Stafford County.

Objective 7.1. Maintain a safe road system.

Policy 7.1.1. Road safety improvements can be prioritized over capacity improvements.

Policy 7.1.2. Prioritize secondary road funds for small, spot safety improvements that can be completed within a year and lead to immediate benefits.

Policy 7.1.3. Road improvements should improve safety by incorporating features that ensure protection from unhealthful levels of transportation related noise.

Policy 7.1.4. Emphasize and encourage inter-parcel connections and reverse frontage streets to minimize vehicle conflict points onto busy streets.

Objective 7.2. Provide and maintain a multi-modal public transit system.

Policy 7.2.1. The County should establish incentives for development proposals to include support for alternative modes of transportation including bus, rail, commuter parking, and car/van pooling.

Policy 7.2.2. Encourage the future expansion and development of an efficient transit system inside the Urban Services Area and Targeted Development Areas to serve higher density employment, retail and residential areas and sectors of the population with limited mobility. Where practical, transit systems should provide access from residential areas to commuter rail stations and park and ride lots.

Policy 7.2.3. Promote regional rideshare and para-transit programs.

Policy 7.2.4. Continue to support the development of the Stafford Regional Airport to serve economic development interests.

Objective 7.3. Create a system of sidewalks, bike paths and trails to provide non-motorized transportation alternatives.

Policy 7.3.1. Residential and Commercial development proposals should establish sidewalks and greenways to connect local neighborhoods with activity centers such as shopping, employment, and schools and with one another.

Policy 7.3.2. Support development of bicycle and pedestrian facilities that connect to local, regional and statewide trail and park systems.

Policy 7.3.3. The Comprehensive Plan should designate inter- and intra-County bike networks.

Policy 7.3.4. The County will support public and private organizations in their efforts to develop and fund inter- and intra-County bike route networks.

Policy 7.3.5. The County should explore the creation of bicycle and pedestrian trails in pipeline, electrical and other easements, particularly when the use of easements for non-motorized movement will create connectivity between open space areas and neighborhoods.

Policy 7.3.6. Encourage development to construct pedestrian access points where public streets do not connect.

Policy 7.3.7. Support the implementation of trails and sidewalks along road improvements and new roads.

Objective 7.4. Create more efficient patterns of traffic flow and circulation.

Policy 7.4.1. New residential subdivisions should provide more than one point of ingress/egress and should conform to the VDOT secondary street acceptance regulations.

Policy 7.4.2. New residential subdivisions should provide inter-subdivision connectivity based on the number of units in the subdivision. Connections should be designed to minimize the effects of cut-through traffic using measures such as constructing spine roads that utilize reverse frontage, multiple means of access through neighborhoods and street alignments that provide indirect travel routes between neighborhoods.

Policy 7.4.3. Circulation systems within commercial developments should be adequate to handle peak loads internally and at traffic lights and provide inter-parcel connectivity.

Policy 7.4.4. Continue the use of Highway Corridor Overlay Districts and promote the use of access management principles along main thoroughfares.

Policy 7.4.5. Promote alternative routes to relieve congested corridors.

Objective 7.5. Retain and enhance the visual landscape along major transportation corridors to acknowledge the unique culture and historical development patterns.

Policy 7.5.1. Future improvements to roadway corridors should be done in a manner that provides transportation functionality while not detracting from or significantly altering the cultural landscape of the roadside viewshed.

Policy 7.5.2. Design transportation facilities to avoid encroachment upon historic resources where possible.

Policy 7.5.3. Ensure that roadside signage and lighting is sensitive to the existing development pattern while including necessary safety and traffic control.

Objective 7.6. Provide transportation facilities that promote economic development.

Policy 7.6.1. Plan for sufficient access and adequate transportation facilities to serve existing and future business and industry.

Policy 7.6.2. Support the expansion of funding programs that facilitate the development of business and industry.

Policy 7.6.3. Consider alternative means of financing for existing and future economic centers such as public and private partnerships, community development authorities, tax increment financing, and service districts.

Objective 7.7. Plan future transportation facilities that can be implemented from a physical, fiscal, and community standpoint.

Policy 7.7.1. Plan and develop transportation facilities to minimize destruction of environmental assets such as wetlands, floodplains, unique forest areas and wildlife habitats, prime agricultural lands and environmentally sensitive soils.

Policy 7.7.2. Plan future transportation facilities that are financially feasible through identified funding sources such as federal and state allocations, transportation service districts, transportation impact fees, and grant opportunities.

Policy 7.7.3. Design transportation facilities such that communities are not physically divided or otherwise adversely impacted and that are supported by the citizens and business community.

Policy 7.7.4. Construct utilities such that they are located outside of the ultimate right-of-way design to prevent costly relocations when roadways are widened.

Policy 7.7.5. Coordinate construction of transportation facilities with federal, state, regional and local agencies to minimize undesirable community impacts.

Policy 7.7.6. Ensure that development provides necessary transportation improvements in a timely manner.

Policy 7.7.7. Transportation facility improvements to be constructed with development projects should be designed to maintain a Level of Service (LOS) C for impacted intersections and/or road segments. Where achieving a LOS C is not practical given existing transportation deficiencies, improvements should be designed to not further degrade the LOS.

Education

Stafford County prides itself on having a superb public school system. The citizens of Stafford County expect and support a quality educational system. As the 3rd fastest growing locality in the state, Stafford County is challenged to construct and maintain adequate facilities for all students while continuing the quality educational programs Stafford residents expect.

Our students score above the state and national averages on standardized tests and earn awards at the regional, state and national levels. Approximately 71% of our high school graduates continued their education by enrolling in post-secondary education (college, trade, or technical school) within 16 months of graduation.

Goal 8. Support Stafford County as a community for superior education.

Objective 8.1. Land use policies and the Comprehensive Plan should support education in Stafford County.

Policy 8.1.1. Education facilities, including technical skill training centers should be incorporated into the Levels of Service Standards.

Policy 8.1.2 Construction of future schools should be completed to ensure no school operates at more than 100% design capacity.

Policy 8.1.3. Future schools should be located within the Urban Services Area (USA). The Board of Supervisors and School Board will work together to acquire school sites in advance of Stafford County Public School's short and long-term future needs.

Policy 8.1.4. When considering new school locations, the safety and well being of the students should be a priority, with consideration of the following factors:

- Locate near existing and planned residential areas to promote walking zones and/or minimize the length of bus trips.
- Locate schools proximate to other public facilities and services necessary to the site (i.e. potable water, etc.) and means to assure safe access to schools (i.e. sidewalks, turn lanes, signalization, etc.).
- Locate schools away from major electric transmission lines.

Policy 8.1.5. With the limited availability of large tracts of land within the Urban Services Area, the County should focus on maximizing the use of usable available land to meet educational needs.

- Consider relaxing of minimum size standards for school sites.
- Ensure school sites are suitable for development with gentle topography, good soils, and limited sensitive resources.
- Ensure that estimates of public infrastructure costs are included in location decisions.

Heritage Resources

Stafford County is rich in heritage resources, which are central to the community's identity and culture. Protection and preservation of our heritage resources are fundamental to sustaining Stafford County's uniqueness, sense of place, and economic sustainability.

Heritage resources are those buildings, sites, structures, objects, or districts, including their physical settings that exemplify the cultural, architectural, economic, social, and political heritage of the County and its communities. Such sites or buildings are 1) listed on, or are eligible for listing on, the National Register of Historic Places or the Virginia Landmarks Register; 2) contributing resources within a historic district listed on, or eligible for listing on, the National Register of Historic Places or the Virginia Landmarks Register; 3) resources located within a Stafford County Historic Resource Overlay District; or 4) resources listed on, or eligible for listing on, the Stafford County Cultural Resource Inventory, as determined by the Stafford County Historical Commission Architectural Review Board, or Historic Preservation Planner.

Goal 9. Promote Stafford County's heritage and maintain a sense of place by identifying, protecting, preserving, and interpreting Stafford County's historic and cultural resources.

Objective 9.1. Establish County land use policies that protect and preserve Stafford County historical and cultural resources.

Policy 9.1.1. The Stafford County Cultural Resource Management Plan should be updated and implemented as a part of the Stafford County Comprehensive Plan.

Policy 9.1.2. Stafford County should maintain its Cultural Resources Inventory. The inventory should be updated as new resources are discovered.

Policy 9.1.3. Applications for reclassification, conditional use permit, preliminary subdivision or site plan, major site plan, or grading plan should determine the possible presence, extent, and significance of heritage resources and prepare follow-up archeological and/or historic structures reports. A historic preservation ordinance should be adopted that creates development plan review procedures based on the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation and/or Virginia Department of Historic Resources "Guidelines for Conducting Cultural Resource Survey in Virginia".

Policy 9.1.4. Certificate of Appropriateness applications should be submitted to the Stafford County Architectural Review Board to review proposed exterior alteration, relocation, or demolition of heritage resources located within Stafford County Historic Resource Overlay Districts.

Policy 9.1.5. Development and redevelopment, including the construction of buildings, site improvements, or land clearing and grading, should be completed in such a way that protects and enhances, rather than harms, heritage resources and cultural landscapes.

Policy 9.1.6. The Cemetery Ordinance should be updated to protect all Stafford County cemeteries. The ordinance should include procedures for identifying, preserving, interpreting, and maintaining all cemeteries.

Policy 9.1.7. Stafford County should encourage the use of federal, state and local programs to ensure long term preservation of heritage resources, such as the Stafford County Historic Tax Abatement Program.

Policy 9.1.8. The design guidelines for the Stafford County Historic Resource Overlay Districts and Historic Overlay Corridors should be updated to protect heritage resources and their viewsheds.

Objective 9.2. The County should establish and maintain a long-term stewardship program to care for all County-owned historical and cultural resources.

Policy 9.2.1. Long term management and stewardship plans should be written for all County-owned heritage resources with the assistance and recommendations from the Stafford County Architectural Review Board, Historical Commission, and designated Planning staff.

Policy 9.2.2. Comprehensive architectural and archaeological studies should be conducted on all County-owned heritage resources to determine historic integrity, significance, and best treatment plan for each resource.

Policy 9.2.3. Easements or other protective measures should be placed on all County-owned heritage resources, as determined by the results of architectural and/or archaeological studies.

2.3 Implementation

Chapter 7 of this document serves as the Implementation Plan for the Comprehensive Plan Goals, Policies and Objectives. The Implementation Plan contains: Concrete actionable steps; Identifies responsible parties; Identifies available and needed resources, and Completion dates. The actionable steps are prioritized in order of importance for implementing the Plan. The highest priority shall be given to aligning elements of the Comprehensive Plan and ordinances to comply with the goals, objectives and policies of this document. Priorities are identified as short term, mid-term and long-term actions. Short term actions are items that can be accomplished within one year of plan adoption. Mid term items can be accomplished within two to five years. Long term actions may take five to ten years to complete.

The Planning Commission, other boards and commissions, staff and Board of Supervisors shall review the Implementation Plan periodically to determine its applicability in the current context of community desires and needs and amended as needed.

3.0 The Land Use Plan

3.1 Overview

The Land Use Plan for Stafford County is a key element of the Comprehensive Plan, guiding the physical form of the County by directing the location, type, and intensity of land uses. The Plan has been developed after taking into account factors such as existing development patterns and conditions, the potential for existing land use regulations to accommodate projected growth, and opportunities and constraints.

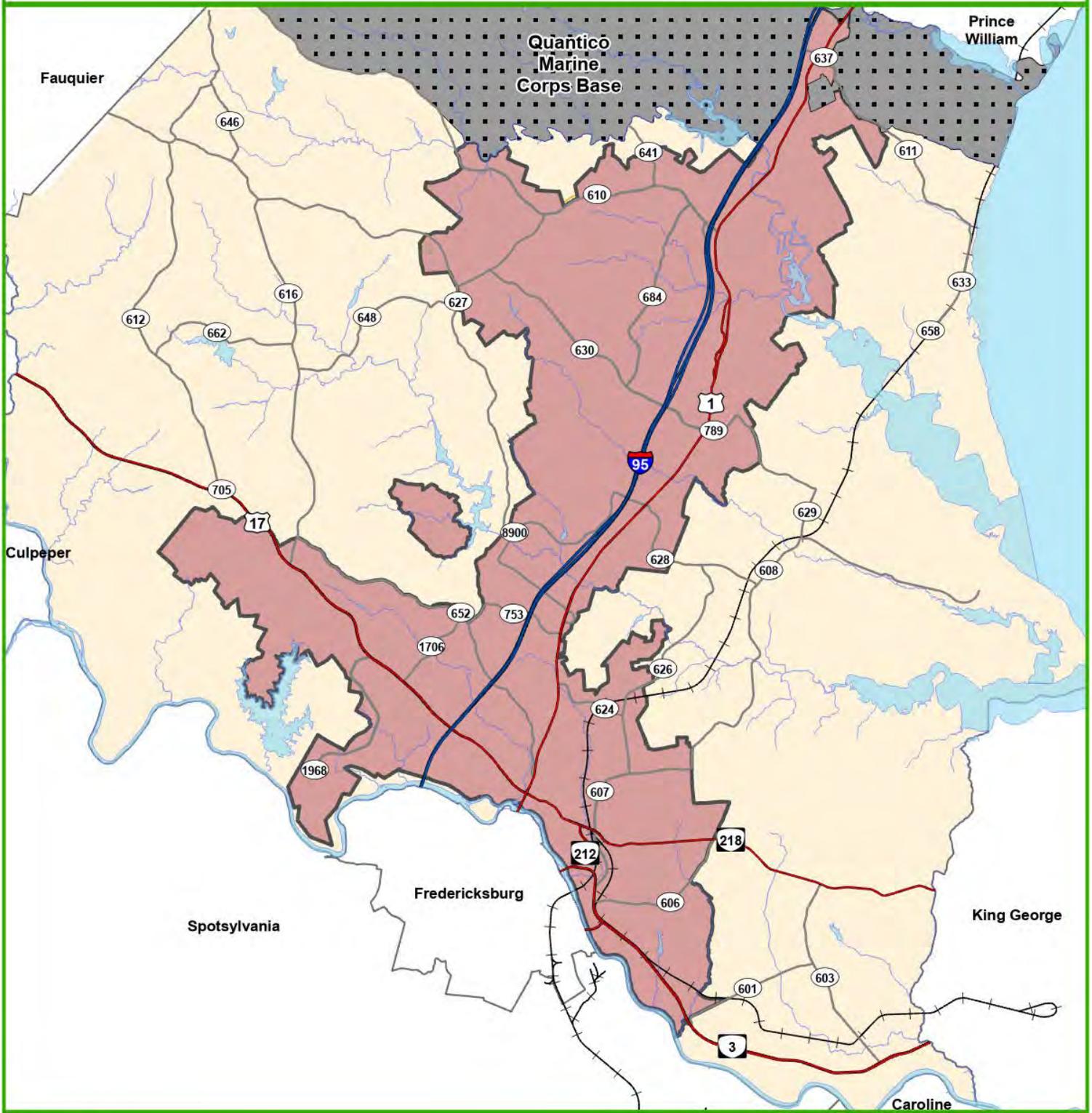
The key points of the Plan are:

- The Land Uses within the Urban Services Area (USA) have been generalized as Targeted Development Areas, Suburban areas, and Business and Industry areas.
- The USA boundary has been designated to consider infill development to access public water and sewer in the established suburban and industrial areas. The majority of future residential and commercial development is being recommended along the I-95 and U.S. Route 1 corridors.
- Establishes five (5) Targeted Development Areas (with a mix of residential and commercial land uses) located in the vicinity of primary road networks, transportation hubs, and along the rail corridor to maximize the use of public transportation.
- Business and Industrial land uses are encouraged around established and developing business areas.
- Residential development in agricultural and rural areas should have a maximum gross density of one (1) dwelling unit per six (6) acres, with a minimum lot size of at least three (3) acres for conventional subdivisions, and one and one-half (1.5) acres for cluster subdivisions which incorporate significant farming and forest lands into the required minimum open space land.

3.2 Basis for the Plan

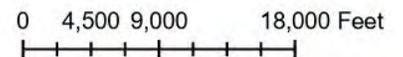
The Land Use Plan has been developed on the premise that much of the projected 20 years of future growth can occur within the previously established USA with minimal expansion, given the amount of available vacant and underutilized land and previously approved but unbuilt projects. Considering development on infill parcels or other parcels in close proximity to existing development will maximize the efficiency of existing infrastructure and services.

FIGURE 3.1
Urban Services Areas
Stafford County Comprehensive Plan
Stafford County, Virginia
September 17, 2024



Legend :

 Urban Services Area



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

3.3 Key Features of the Plan

3.3.1. Growth Management and Urban Services Area

The Plan recognizes the need to direct growth into the USA and discourage growth in the agricultural areas. This is accomplished, in part, by establishing the location of public water and sewer facilities. The location of the USA generally dictates what land areas may be served by public water and sewer lines.

Within the USA, newly constructed houses and buildings will be required to connect to the public water supply and the public sewer system.

In several situations, existing or previously approved water and sewer lines may be located outside of the designated USA. In these situations, the lines will be maintained in these locations, but new extensions of public sewer will be allowed only to serve areas of actual or impending drain field failures and extensions of public water will be allowed only to improve water quality by looping existing water lines.

LIMITED WATER AND SEWER UTILITY AREAS

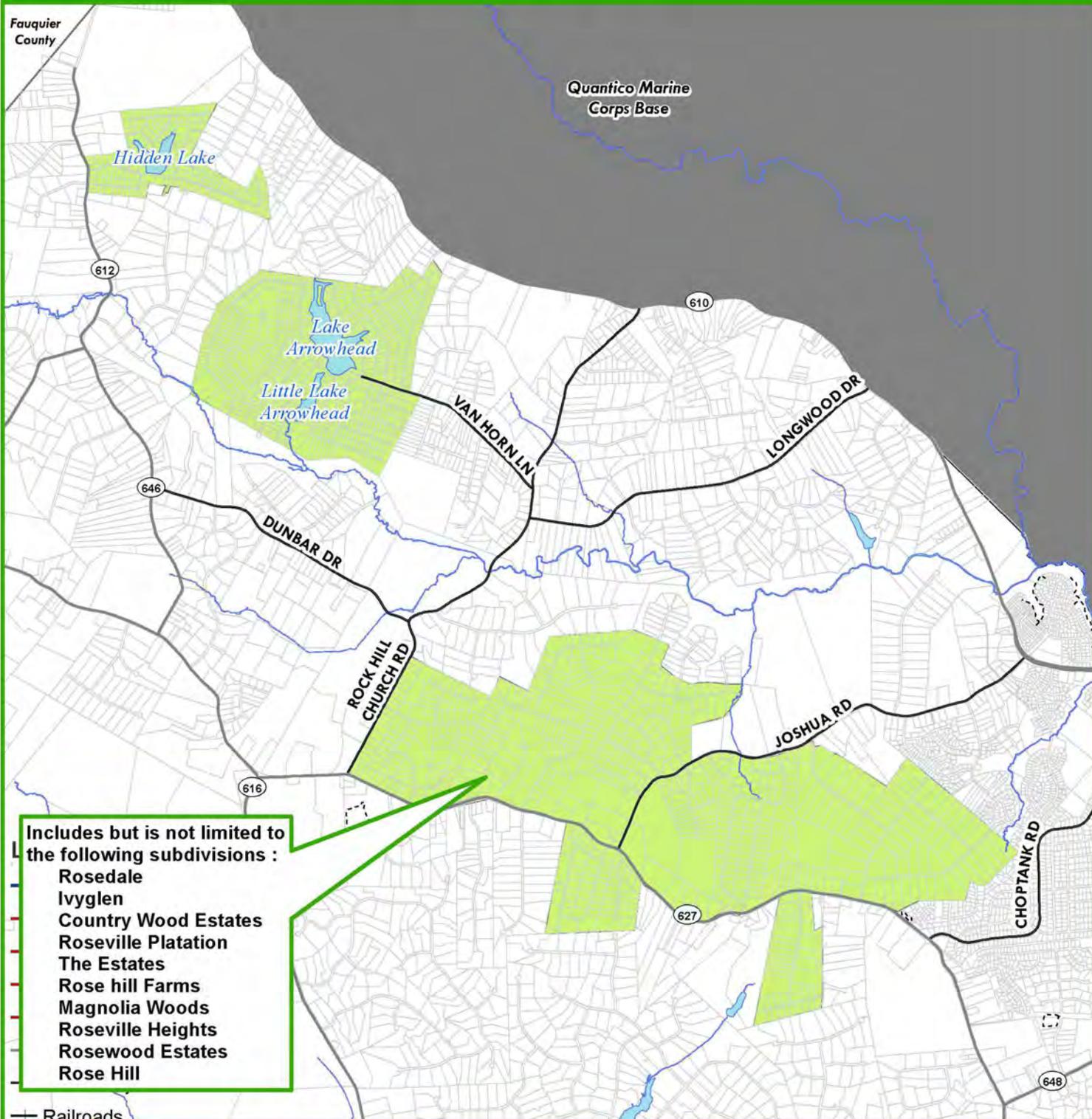
Rock Hill Sewer Service Area – this area includes several rural residential communities in the northwest corner of the County. The area, identified in Figure 3.2, is primarily built out and is characteristic of older rural residential neighborhoods with 1 to 3 acre lots that utilize private wells and septic drainfields. Drainfield failures have occurred on several properties in this area. The purpose of this service area is to provide future sewer service to the existing residents and protect public health. The area includes, but is not limited to, the following subdivisions: Hidden Lake, Lake Arrowhead, Country Wood Estates, The Estates, Ivyglen, Rosedale, Roseville Plantation, Rose Hill Farm, Roseville Heights, and Rosewood Estates. The area is not intended for future higher intensity development.

Hartwood Water Service Area – this area is in the vicinity of the intersection of Warrenton Road and Hartwood Road, and includes Hartwood Elementary School and Hartwood Volunteer Fire Department. These facilities utilize well water. A future need is anticipated for water service upgrades in this area, specifically to Hartwood Elementary School. It is the intent of this area to be served by a future connection to the public waterline network. It is not the intent of this plan to promote higher intensity land uses in this service area and if the school was ever to be replaced and no longer used for such purpose, the service area should be removed. The geographic extent of this area is identified in Figure 3.3.

Clift Farm Road Sewer and Water Service Area – this area reflects several parcels of land that are located outside of the USA, but situated between two areas located inside the USA. The area is designated as Agricultural/Rural on the Future Land Use map in this chapter and not planned for higher-density development. However, by necessity, public water and sewer lines may be located within this area in order to adequately serve the properties to the north and south that are inside the USA. The water and sewer lines will be designed such that it will not accommodate more development than what is currently planned for in the area. The geographic extent of this area is identified in Figure 3.4.



FIGURE 3.2 Rock Hill Sewer Service Area Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Includes but is not limited to the following subdivisions :

- Rosedale
- Ivyglen
- Country Wood Estates
- Roseville Platation
- The Estates
- Rose hill Farms
- Magnolia Woods
- Roseville Heights
- Rosewood Estates
- Rose Hill

— Railroads

--- Trails

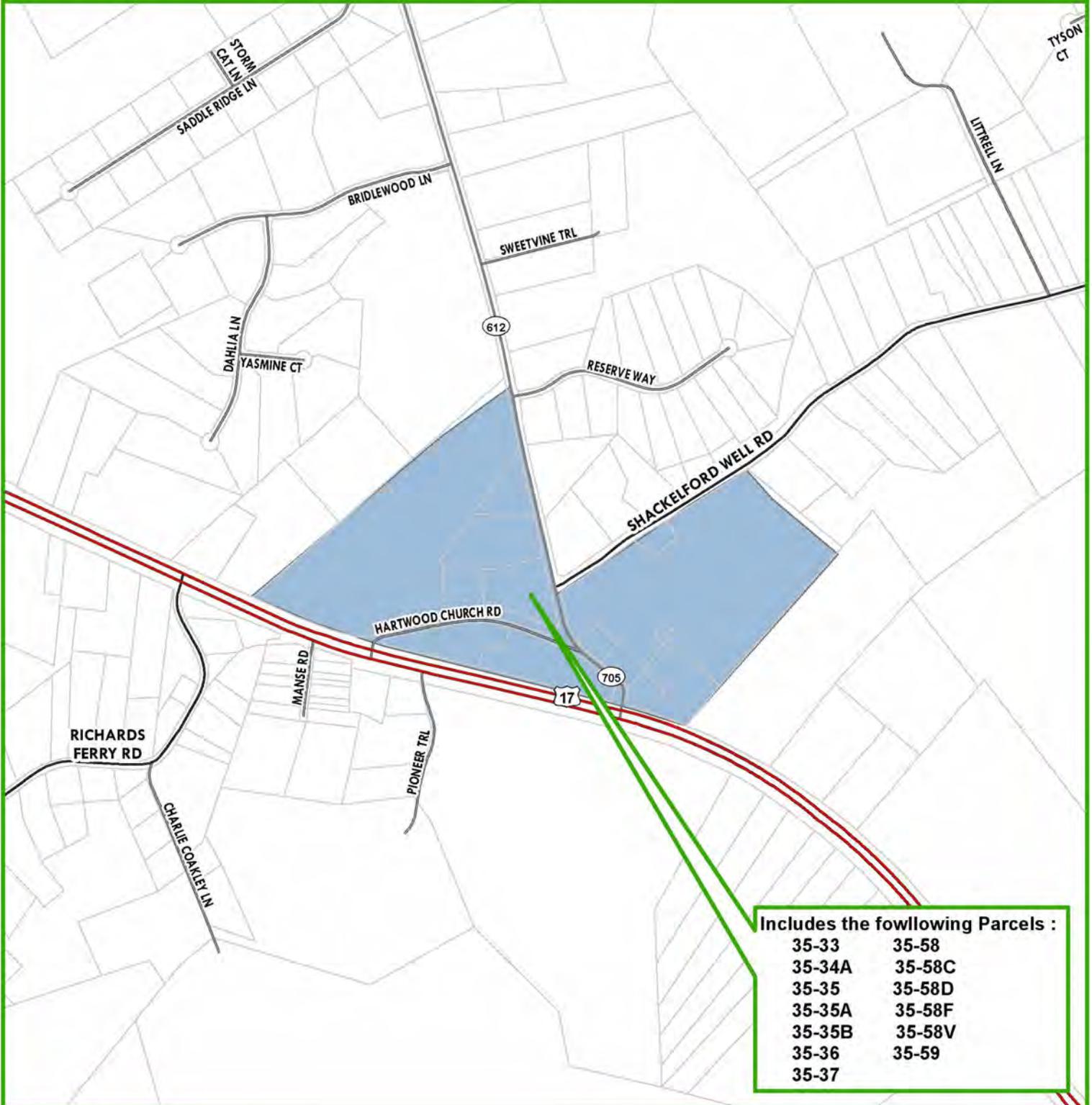
Rock Hill Sewer Service Area

0 1,250 2,500 5,000 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.



FIGURE 3.3 Hartwood Water Service Area Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021

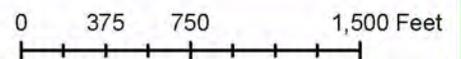


Includes the following Parcels :

35-33	35-58
35-34A	35-58C
35-35	35-58D
35-35A	35-58F
35-35B	35-58V
35-36	35-59
35-37	

Legend :

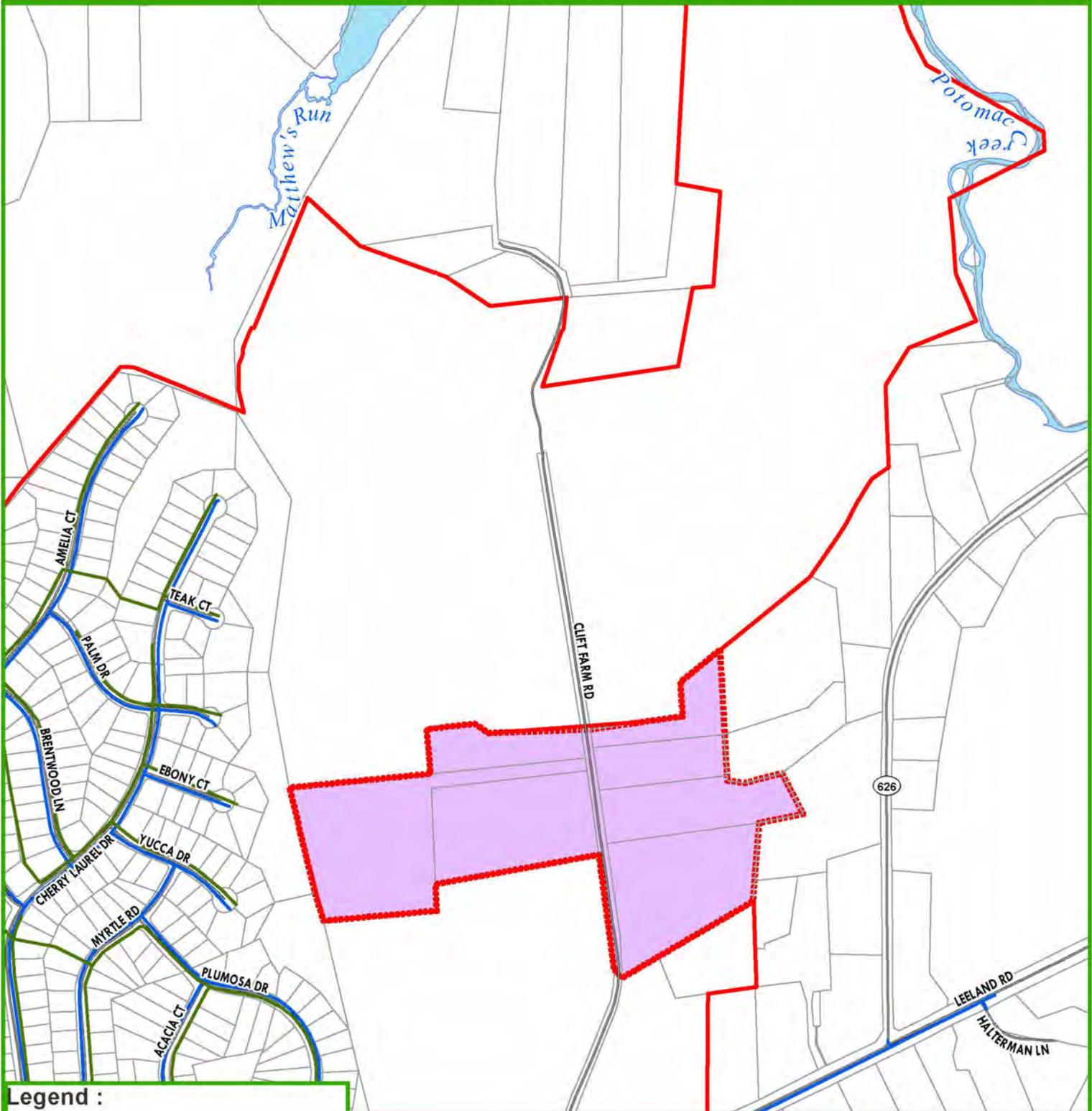
 Hartwood Water Service Area



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

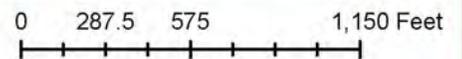


FIGURE 3.4 Clift Farm Road Water And Sewer Service Area Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend :

-  Sewer Lines
-  Water Lines
-  Urban Services Area
-  Clift Farm Road Water and Sewer Area



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

3.3.2. Targeted Development Areas

The Plan establishes five (5) Targeted Development Areas (TDAs) in the County in the general locations of previously designated Urban Development Areas. The exact boundaries, number and development parameters for the TDAs are shown on the future Land Use Map (Figure 3.6) and are further described in Section 3.6 of this chapter.

The purpose for this designation is to highlight the locations where a significant amount of new development and redevelopment (both commercial and residential) is recommended to occur. This is where much of the County's infrastructure and other public facility planning should be focused. Land uses recommended in each TDA vary dependent on the location, and may include residential, commercial (retail), mixed-use, or targeted economic sector development (e.g. cyber and tech, distribution, tech manufacturing, and tourism development). The scale and intensity of the residential and mixed-use areas range from urban to suburban. TDAs emphasize where approximately 50 percent of the County's residential growth is recommended.

3.4 Military Facility Impacts

Marine Corps Base (MCB) Quantico encompasses 33,000 acres (19%) of land area within the boundaries of Stafford County. This section of the Plan identifies areas in the County outside of the Base that may be impacted by military activities. Military activities on Quantico include realistic air and ground combat exercises and explosive ordnance demolition training. This training occurs on ranges located to the west of Interstate 95 near the Garrisonville Road corridor. Aircraft maneuvers that occur as part of this training extend off base into airspace over various areas of the County. Noise impacts associated with both the ordnance demolition and aircraft extend well into the North Stafford, Hartwood, and Widewater areas of the County. The location of noise contours that factor into determining the influence areas are included in figure 3.5.

Joint Land Use Study (JLUS)

The MCB Quantico Joint Land Use Study (JLUS), completed in 2014, was a cooperative land use planning initiative between the Marine Corps, Stafford County, Prince William County, and Fauquier County, as well as others responsible for planning, development and communications in the region. The document serves as an on-going framework for those local governments and military actions necessary to encourage compatible growth around MCB Quantico and improve the quality of life in the surrounding communities.

Military Influence Area Analysis and Zones

A key result of the JLUS was development of a Military Influence Area Analysis. Due to the size and complexity of land uses on MCB Quantico, the degree to which activities on base affect the adjacent communities varies significantly from one location to another. Therefore, a Military Influence Area (MIA) was developed that is jurisdiction-specific and includes the land uses off base that could reasonably affect, or be affected by, military operations on base. This influence area and corresponding zones are shown in Figure 3.6 and is based on a number of features, such as noise contours, buffer areas from the ranges, aviation safety zones, and a 3,000-foot notification boundary around the base established by state law. The MIA is further divided into subzones which are appropriate for specific recommendations based on the degree of potential impact

experienced from base operations and, conversely, the degree potential land use changes within these areas could affect base operations. The MIA zones specific to Stafford County are depicted in Figure 3.7.

MIA Zone 2 captures the portion of Stafford County within the 3,000-foot notification boundary and the three-mile range buffer. Zone 2 is subdivided primarily based on county policy, including the designated urban service area and county growth and redevelopment areas.

Zone 2.1 includes the portion of eastern Stafford County directly south of MCB Quantico Main Side and within the 3,000-foot notification boundary. Land uses on base consist of training areas, while the adjacent portion of the county is largely forested with some low density residential. The area is outside the designated urban service area.

Zone 2.2, bounded by Zone 2.1 to the east and I-95 to the west, contains the Route 1 corridor, including the Boswell's Corner designated growth area. Most of Zone 2.2 is within the three-mile range buffer and therefore subject to the potential for noise impacts due to MCB Quantico training and range operations.

Zone 2.3 includes the portion of the county west of I-95 and within the USA, including the Garrisonville Road corridor. The outer edge of the area is formed by the three-mile range buffer.

Zone 2.4 includes the western portion of the county within the three-mile range buffer and outside the USA. This zone is more rural in nature than areas to the east, with lower density residential uses.

Zone 6.1 represents the portion of the approach-departure to MCAF falling outside the 3,000-foot notification boundary, and is split between Prince William County to the north and Stafford County to the south. In Stafford County, the zone is located along the Potomac River shoreline in the Widewater area, which is currently forested open space. This area has been subject to proposals for residential development which are undergoing review.

Zone 6.2 represents the MCB Quantico MOA including the portion of the MOA outside of the five-mile range buffer in portions of Fauquier, Stafford, and Culpeper Counties. The focus of this zone is on airspace restrictions and coordination.

Land Use Compatibility

U. S Department of Defense instruction provides guidelines for compatibility within designated operational noise zones. In order to consider a more holistic compatibility analysis, factors in addition to average noise contours were considered in this JLUS, including peak/impulse noise propagation, night training activities, airspace requirements, and legislative notification boundaries adjacent to MCB Quantico. Each of the MIA zones were analyzed for the potential to experience impacts due to military operations, as well as the potential to adversely affect military missions now or in the future based on local land uses and planning policies. To analyze land use compatibility, a detailed review of potential land uses was conducted for the MIA zones closest to the base (Zones 2.1 - 2.4). Again, the degree of compatibility varies widely by zone depending on proximity to the MCB Quantico ranges and other training operations. The JLUS summarizes the land uses within each zone that experience impact from the current MCB Quantico training operations or can negatively impact this training. Generally, the land uses that experience the

greatest degree of impact are noise sensitive land uses located in proximity to the ordnance ranges, such as high density residential, hospitals, day care and nursing facilities, religious buildings, schools, outdoor amphitheaters and other similar uses. Land uses that are incompatible because they can potentially affect night training operations include some commercial uses, sports fields and arenas, amusement parks and other uses with significant outdoor night lighting. Cell towers and other tall objects are also not compatible near certain parts of the base since they can interfere with helicopter and other low-flying aircraft used for training purposes. The most compatible uses generally include low density residential, agriculture, forestry and park lands with limited development. There are other uses that fall in between that can be affected by the base or vice-versa, but the degree of this impact can be mitigated through real estate disclosure, sound attenuation, lighting controls and other measures incorporated in the project design or construction. Table 3.1 shows the compatible land uses by MIA zone.

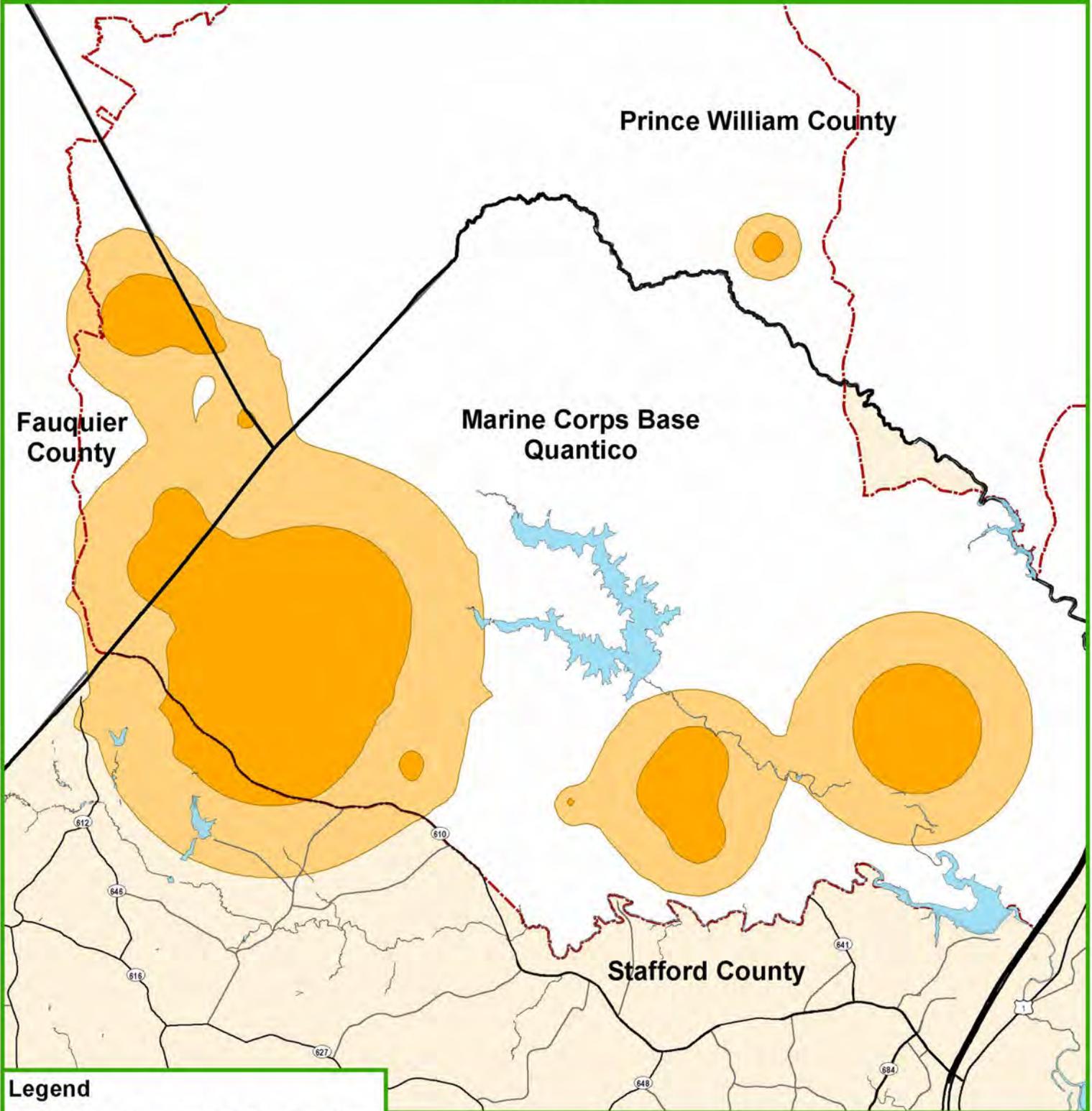
The study concluded with jointly developed recommendations to address compatibility issues. A number of these are specific to the individual zones included in the MIA, while others are more policy oriented and affect the entire region. These recommendations are strategies for enhancing the relationship between MCB Quantico and the surrounding JLUS communities over time. The recommendations, as well as implementation strategies are described in detail in the JLUS document, but generally fall into eight different categories as follows:

- Coordination
- Communication
- Military Operations
- Transportation Systems
- Utility/ Municipal Services
- Virginia Legislative Initiatives
- Community Development/Planning
- Environmental/Conservation/Open Space



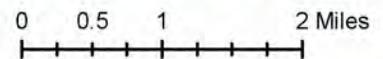
FIGURE 3.5 Day-Night Average Noise Levels Heavy Weapons Training Areas Stafford County Comprehensive Plan Stafford County, Virginia

September 8, 2021



Legend

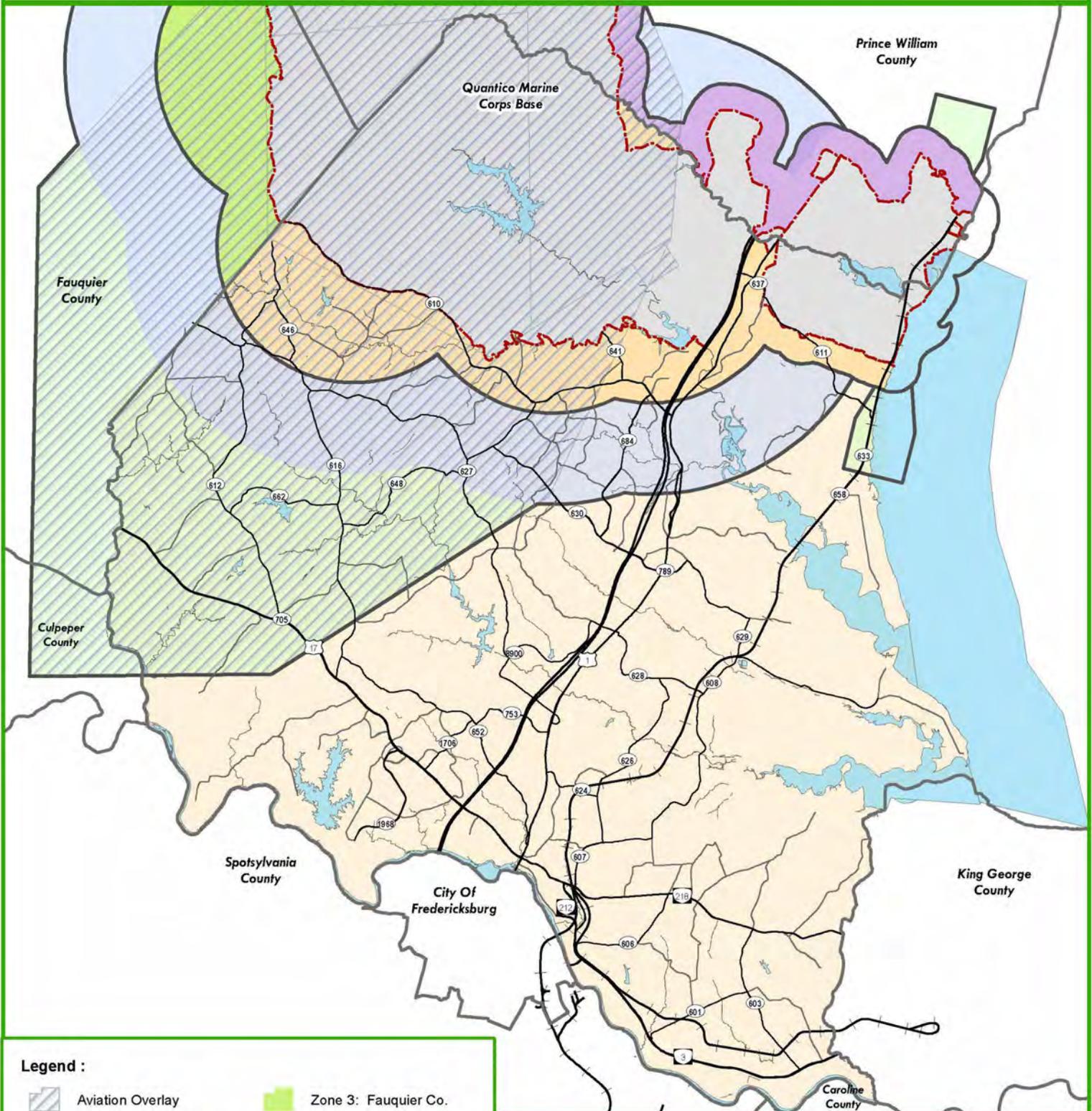
-  Noise Zone II (62-70 dB CDNL)
-  Noise Zone III (>70 dB CDNL)
-  MCB Quantico Boundary
-  County Boundaries



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.



FIGURE 3.6 Military Influence Area - Zone Overview Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend :

- Aviation Overlay
- MCB Quantico Boundary
- Military Influence Area Zones :**
- Zone 1: Prince William Co.
- Zone 2: Stafford Co.
- Zone 3: Fauquier Co.
- Zone 4: Town of Quantico
- Zone 5: Range Buffer
- Zone 6: Aviation Buffer

0 6,250 12,500 25,000 Feet

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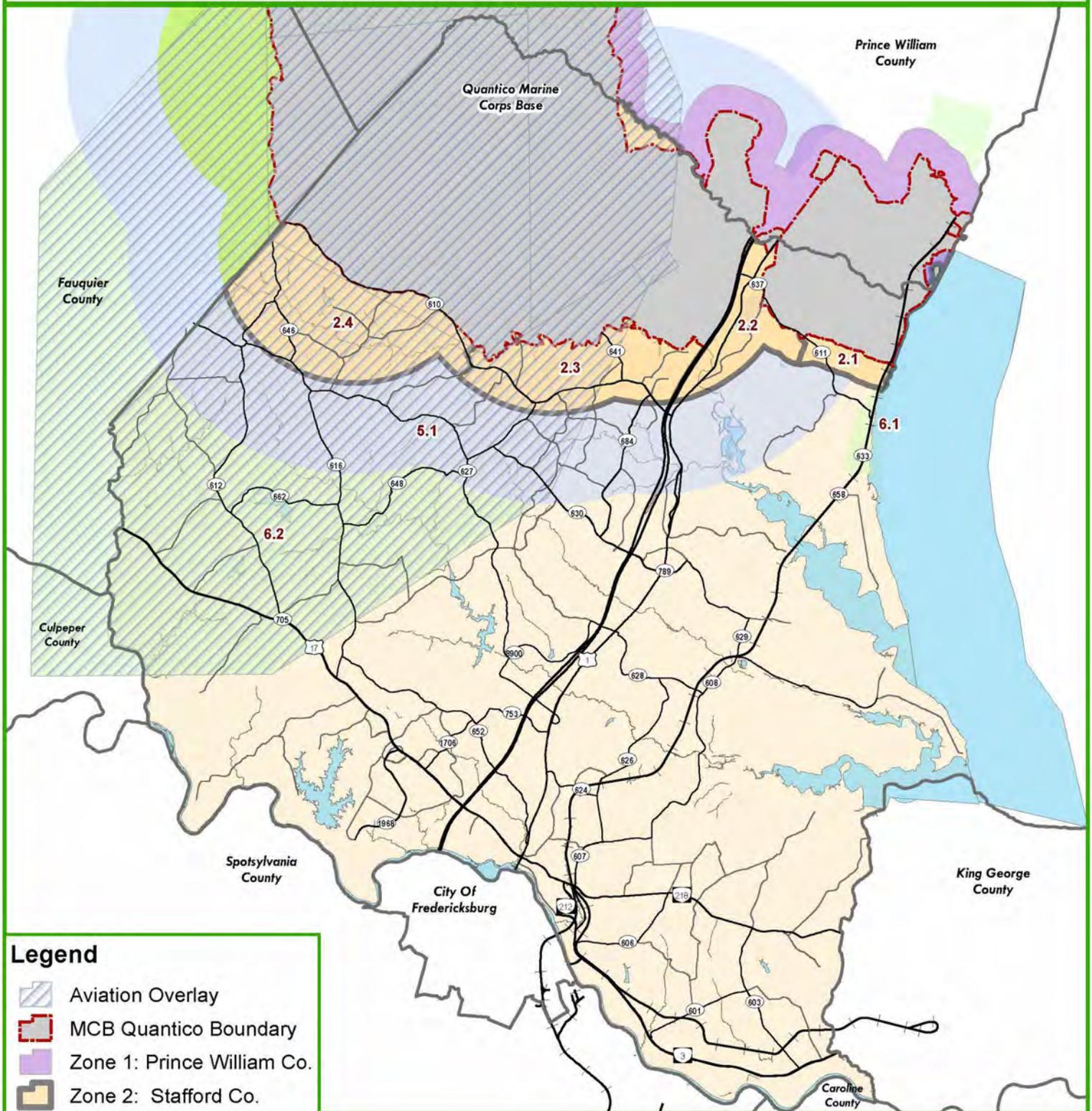
FIGURE 3.7

Military Influence Area - Land Use Compatibility Zones

Stafford County Comprehensive Plan

Stafford County, Virginia

September 8, 2021



Legend

-  Aviation Overlay
-  MCB Quantico Boundary
-  Zone 1: Prince William Co.
-  Zone 2: Stafford Co.
-  Zone 3: Fauquier Co.
-  Zone 4: Town of Quantico
-  Zone 5: Range Buffer
-  Zone 6: Aviation Buffer

0 6,250 12,500 25,000 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Table 3.1 Military Influence Area Suggested Land Use Compatibility

MIA Zone	Low Impact	Moderate Impact*	High Impact
2.1 2.4	Low Density Residential Fire / Police / Municipal Offices Parks / Passive Recreation Farming / Forestry / Resource Preservation	Schools Religious Assembly Parks / Active Recreation Cell Towers	Med-High Density Residential Commercial Industrial Outdoor Amphitheaters / Sports Arenas Amusement Parks Hospitals / Assisted Living / Day Care
2.2 2.3	Commercial Industrial Parks / Recreation Municipal Services Farming / Forestry / Resource Preservation	Residential Schools Religious Assembly Hospitals / Assisted Living / Day Care Cell Towers	Outdoor Amphitheaters / Sports Arenas Amusement Parks
5.1	Not Applicable – Aviation Safety Buffer		
6.1	Not Applicable – Aviation Safety Buffer		
6.2	Not Applicable – Aviation Safety Buffer		

* Land use impacts can be mitigated if sound attenuation, height limits, lighting controls, and/or special reviews are included.

3.5 Airport Compatibility

The Stafford Regional Airport is located in center of the County on the west side of Interstate 95, between Ramoth Church Road and Mountain View Road. This is an area of the County that is anticipated to experience growth in the future. The area surrounding the Stafford Regional Airport was primarily agricultural and rural residential with very low density housing when it was initially sited in 1987. The growth pattern in the area has changed since that time with the construction of the Centerport Parkway in 2006 and amendments to the Future Land Use Plan in 2010 which allowed for the potential of higher density development. A 1,000-foot extension of the existing runway is currently under construction, with an anticipated completion of the second quarter of calendar year 2022. It is anticipated that the extension will result in an increase in operations. Objective 4.9 of this Plan is to: minimize the noise impacts and potential safety hazards generated by general aviation at public and private airfields in the County.

Stafford Regional Airport Land Use Compatibility Study

A Compatible Land Use Study “the Study” (see Appendix H) was prepared in 2014 as a joint effort between the Stafford Regional Airport Authority and Planning Commission to further define and address the specific planning considerations related to land use compatibility including potential impacts related to exposure to aircraft noise, land use safety with respect both to people on the

ground and the occupants of aircraft; the protection of airport airspace; and general concerns related to aircraft overflights. The Study was based on industry standards and utilized the comprehensive Airport Cooperative Research Program Report sponsored by the Federal Aviation Administration (FAA) and model guidelines from other states and jurisdictions. The Study established: Impact Zones based on aircraft maneuvers around the airport; Goals and Policies; a Compatible Land Use Matrix; Additional Review Standards; and Implementation recommendations. The following pages include a map depicting the Airport Impact zones, definitions of each zone, and the Land Use Compatibility Matrix.

Airport Impact Zone Definitions

The Airport Impact Zones designated in the Study and depicted in the previous map closely correspond with the existing Airport Impact Zoning Overlay District. The zones are utilized in establishing the corresponding land use compatibility standards. The following is a description of each zone.

Approach zones reflect the approach and departure areas for the runway and are divided into several sub areas.

Approach – Final, Runway Protection Zone (AP-1). The closest area at the end of each runway, beginning 200-feet from the end of each runway, extending approximately two thousand five hundred (2,500) feet to the east and one thousand seven hundred (1,700) feet to the west.

Approach – Mid (AP-2). The area that fans out from the Runway Protection Zone, extending fourteen thousand (14,000) feet to the east and ten thousand (10,000) feet to the west.

Approach – Outer (AP-3). The area that fans out to the east of the runway that extends from fourteen thousand (14,000) feet to fifty thousand (50,000) feet from the runway.

Approach – Transitional (AP-T). A 5,000-foot wide area extending along each side of the Outer Approach, beyond the Conical zone.

Transitional (T). The area that fans away perpendicular to any airport runway centerline and approach surfaces

Horizontal zones include the area that is established by swinging arcs of ten thousand (10,000) feet radii from the center of the end of the primary surface of an airport runway and connecting adjacent arcs by drawing lines tangent to those areas. The horizontal zone excludes the approach and transitional zones. The area is divided into two sub-areas for the purpose of land use compatibility.

Horizontal – Inside Flight Pattern (H-1). The inner portion of the Horizontal zone that encompasses the majority of the existing and future aircraft traffic patterns.

Horizontal – Outside Flight Pattern (H-2). The outer portion of the Horizontal Zone that encompasses the outer edge of the Jet/Turboprop (large) aircraft traffic patterns.

Horizontal – Turning Areas (H-3). The area of the Horizontal zone that encompasses the portion of the traffic pattern area where turning movements occur, where aircraft generate louder noise and there is increased accident probability.

Conical (C). The area that surrounds and commences at the periphery of the horizontal zone (10,000 feet from the Runway Clear Zone) and extends outward from there for four thousand (4,000) feet.

Compatible Land Use Recommendations

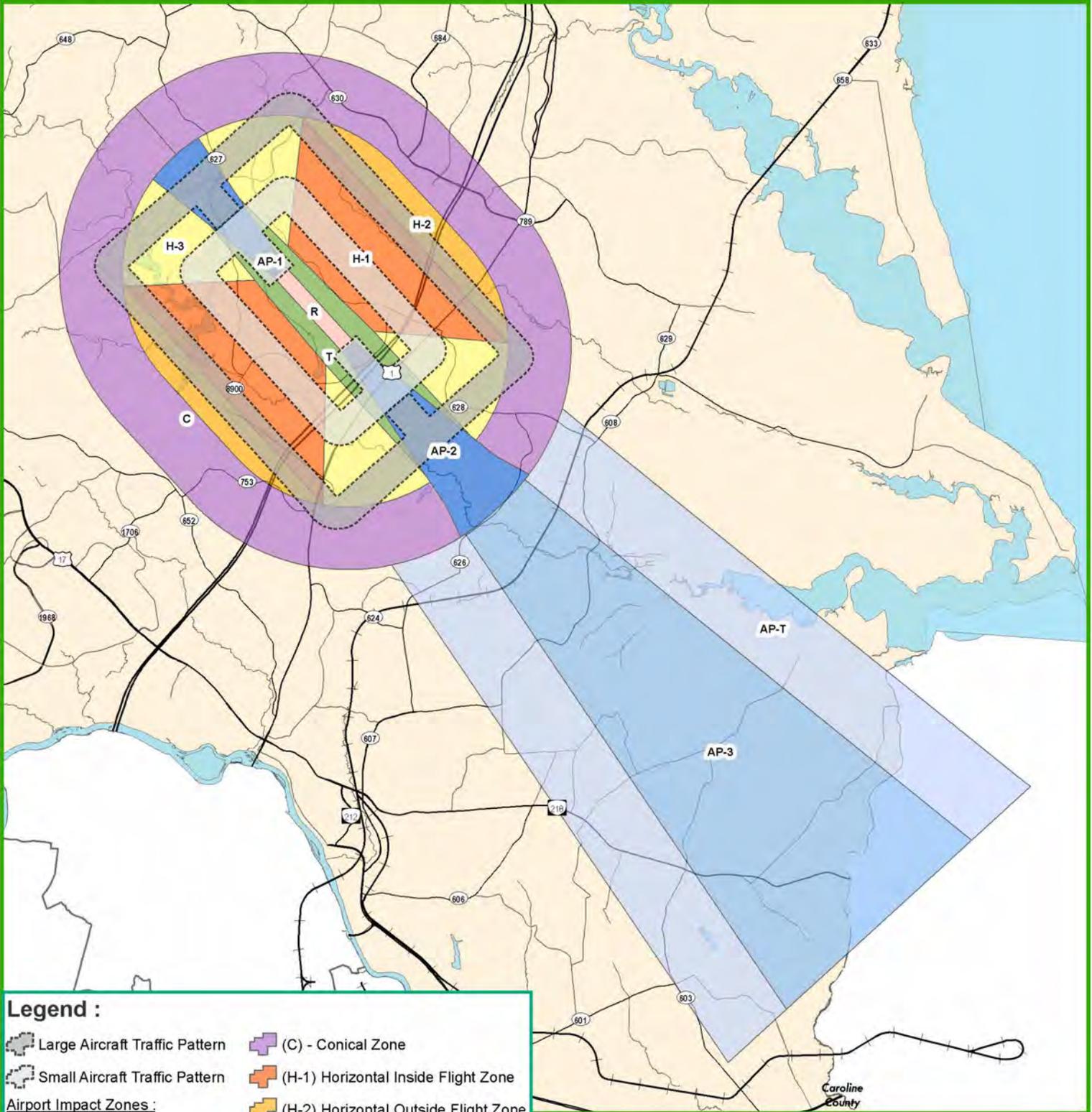
To support a future land use pattern that promotes safety and quality of life of the population around the airport and economic viability of the airport itself, the compatible land uses recommended in the Study have been incorporated into the Future Land Use recommendations in Section 3.6 of this Chapter.

These recommendations are not mandatory and do not take away the by-right zoning uses granted to property owners. The purpose is to serve as guidelines to inform decision makers when evaluating rezoning or conditional use permit requests of what uses might need additional review or considered incompatible.

Sub-areas of the affected land use districts are identified based on airport impact zones. Within each sub-area, the Plan identifies uses otherwise recommended in the land use district that would not be considered compatible or may require additional review to be considered compatible. Uses requiring additional review should comply with the recommendations provided in the Airport Compatible Land Use Study. Recommendations include site layout, use intensity, building material, and notification considerations.

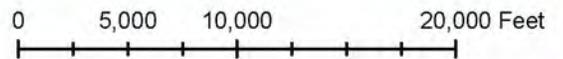


FIGURE 3.8 Airport Land Use Compatibility Zones Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend :

- Large Aircraft Traffic Pattern
- Small Aircraft Traffic Pattern
- Airport Impact Zones :**
- (AP-1) Approach - Final
- (AP-2) Approach - Mid
- (AP-3) Approach - Outer
- (AP-T) Approach - Transitional
- (C) - Conical Zone
- (H-1) Horizontal Inside Flight Zone
- (H-2) Horizontal Outside Flight Zone
- (H-3) Horizontal Turning Zone
- (R) Runway
- (T) Transitional



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

TABLE 3.2: CONSOLIDATED LAND USE COMPATIBILITY MATRIX

ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH – MID -14,000’ EAST -10,000’ WEST	APPROACH – OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL – TURNING ZONE	CONICAL ZONE
USES									
INSTITUTIONAL									
<i>Assembly</i> (schools, place of worship, daycare)	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Hospitals</i>	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Community</i> (Police, fire and rescue, neighborhood centers)	NC	AR	AR	C	AR	AR	C	AR	C
<i>Vertical Infrastructure</i> (Electric Transmission, Water Towers, Telecommunication Towers)	NC	NC	AR	AR	NC	AR	AR	AR	AR
RESIDENTIAL									
<i>Single-Family - Rural</i> (Maintain 3 acre density with min. lot size of 1 acre outside the USA, while inside the USA, lot sizes can be smaller than 1 acre if significant areas are retained for open space and the lowest density recommendations of the land use plan are not exceeded)	NC	AR	AR	C	NC	AR	AR	AR	C
<i>Single-family - Small Lot</i> (<1 acre) & <i>Townhomes</i>	NC	NC	AR	C	NC	AR ¹	AR ¹	NC	C
<i>Multi-Family</i> (Three or more units per building)	NC	NC	AR	C	NC	AR ¹	AR ¹	NC	C
<i>Group Living</i> (Nursing homes, group homes)	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Transient Lodging</i>	NC	AR	C	C	NC	AR	AR	AR	C
COMMERCIAL (RETAIL/OFFICE)									
<i>General Retail & Service</i> (shopping centers & stores, restaurants, convenience, vehicle fueling)	NC	AR	C	C	AR	AR	C	AR	C
<i>Automobile related</i> (sales lot, repair, storage)	NC	C	C	C	AR	C	C	C	C
<i>Low-rise Office</i> (1-3 stories)	NC	AR	C	C	AR	AR	C	AR	C
<i>Mid/High-rise Office</i> (4+ stories)	NC	NC	AR	C	NC	AR	AR	NC	C
INDUSTRIAL									
<i>Light</i> (Light Manufacturing, Storage, Warehouse)	NC	AR	C	C	AR	AR	C	C	C
<i>Heavy</i> (Landfill, Heavy Manufacturing, bulk fuel storage, mining, uses that emit smoke or create sun glare)	NC	NC	NC	AR	NC	AR	AR	AR	AR

¹ Residential uses within zones H-1 and H-2 are discouraged. Individual projects may be considered appropriate if it is determined that it satisfactorily addresses the Additional Review factors highlighted in Table 2.

TABLE 3.2: CONSOLIDATED LAND USE COMPATIBILITY MATRIX

ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH - MID -14,000' EAST -10,000' WEST	APPROACH - OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL - TURNING ZONE	CONICAL ZONE
USES									
ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH - MID -14,000' EAST -10,000' WEST	APPROACH - OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL - TURNING ZONE	CONICAL ZONE
USES									
RECREATION AND OPEN SPACE									
<i>Passive</i> (trails & natural areas)	NC	AR	C	C	NC	AR	C	AR	C
<i>Active</i> (community sports fields, golf, indoor facilities)	NC	AR	AR	C	NC	AR	C	AR	C
<i>Amusement</i> (Stadiums, amusement parks, fairgrounds)	NC	NC	AR	C	NC	AR	AR	NC	C
AGRICULTURAL									
<i>Grazing, Crops</i>	AR	AR	C	C	AR	AR	C	AR	C
<i>Processing</i> (Lumber mill, grain elevators and silos)	NC	NC	C	C	NC	AR	AR	AR	AR
OTHER									
<i>Aboveground storage tanks of fuel and flammable materials (except residential uses)</i>	NC	NC	NC	C	NC	NC	C	NC	C

Key: C = Compatible

AR = Additional Review – uses or activities that may be compatible with airport operations depending on their location and specifics of each project. Refer to design standards.

NC = Not Compatible – uses or activities that should not be permitted

3.6 Future Land Use Recommendations

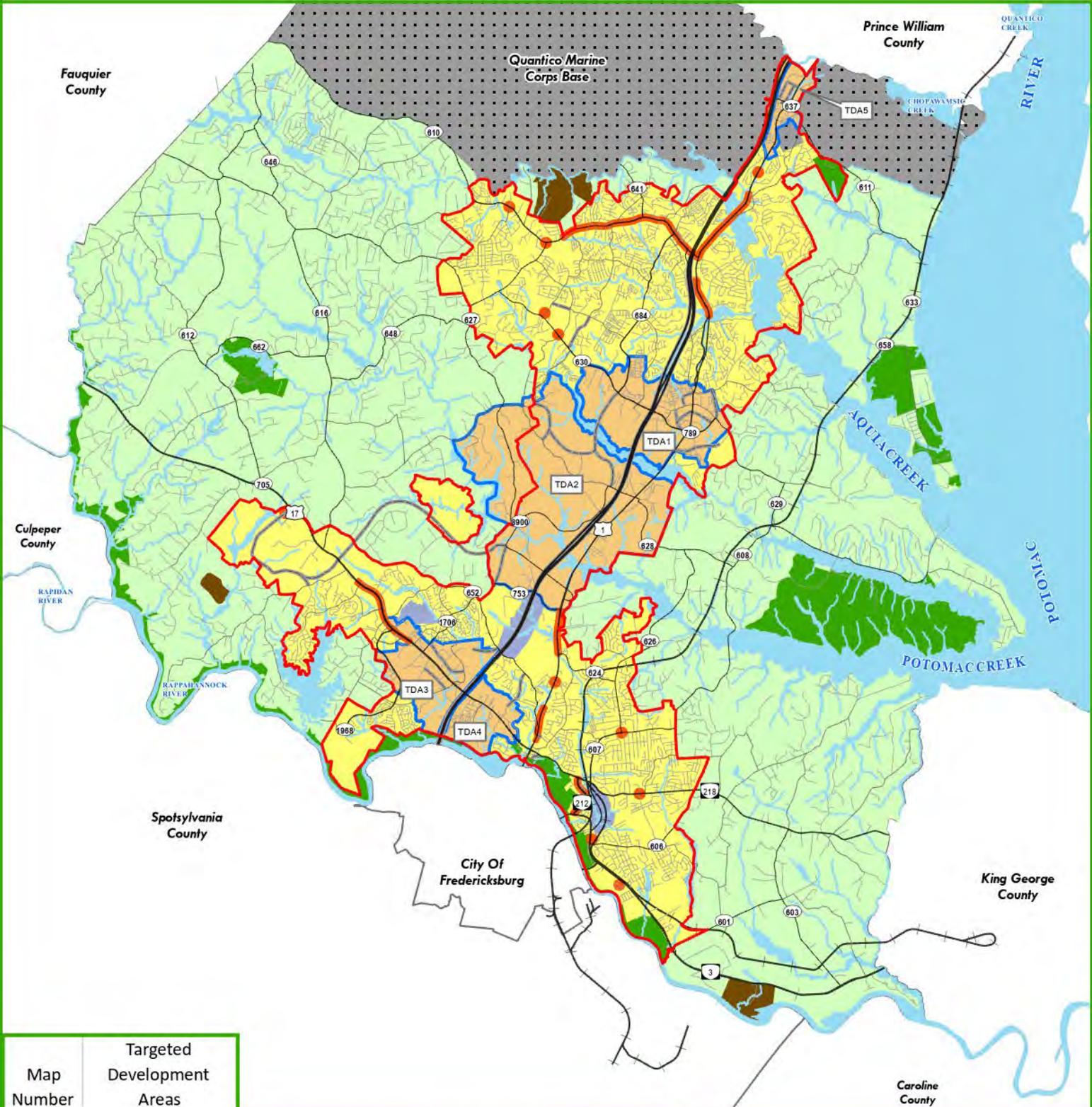
The recommended future use of land in the County is designated in Figure 3.9, the Future Land Use Map. The type of development that is recommended in each land use designation, as depicted in the map, is described in detail in this section.

Urban Services Area

Urban Services Areas (USAs) are areas designated within the County where more compact development patterns are recommended. Provision of government and community services and facilities will be focused in these areas. Such services will include public sewer and water utilities, location of schools and other public and community buildings as well as provision of transit services. Improvements to the utility system, road networks, pedestrian accommodations, street lights and community facilities may be required to support the land development in these areas. The area will be comprised of the following land use designations:

- Targeted Development Areas (TDAs),
- Suburban Areas, and
- Business and Industry Areas.

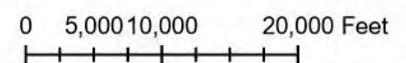
FIGURE 3.9 Future Land Use Stafford County Comprehensive Plan Stafford County, Virginia September 17, 2024



Map Number	Targeted Development Areas
TDA1	Courthouse
TDA2	Central Stafford
TDA3	Berea
TDA4	Falmouth Gateway
TDA5	Boswell's Corner

Legend:

Urban Services Area	Targeted Development Areas	Resource Protection
Railroads	Suburban	Parks
Proposed New Roads	Business and Industry	
Commercial Node	Agricultural/Rural	
Commercial Corridors	Mining	
Targeted Development Areas	Federal	



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Targeted Development Areas

Targeted Development Areas (TDAs), previously called “Targeted Growth Areas (TGAs)”, highlight the locations where a significant amount of new development and redevelopment (both commercial and residential) is expected to occur. This is where much of the County’s infrastructure and other public facility planning will be focused.

By its name, TDAs emphasize where development will be targeted. Each TDA, by its very location, has a different mix of targeted development that may be residential, mixed-use, commercial (retail), and “industrial”. In general, at least 50 percent of the County’s future residential and business development is recommended in these areas.

TDAs are areas of the County where a potential concentrated urban or higher density suburban development pattern is most appropriate. These areas will support a more intense, pedestrian and transit-oriented form of development, located in close proximity to primary road networks and transportation hubs. The land use recommendations in the TDAs are consistent with Section 15.2-2223.1 of the Code of Virginia pertaining to Urban Development Areas.

Areas with a more urban form of development will allow residents to work, live, shop and play within a relatively small area without fully relying on the automobile. Focus should be on the form of development, incorporating principles of traditional neighborhood design, including, but not 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) and mixed-use neighborhoods. Various types of dwellings, community uses and business activities may locate within the same block or within a single building. Town centers may include a mix of retail commercial enterprises on the first floor with residential or office condominium units located on the second and higher-level floors as a preferred development pattern to ensure that residents have the ability to shop and work within walking distance of where they live.

The suburban form of development should provide the same benefits as an urban development, but will have an appearance and form similar to the established suburban communities.

Residential – Commercial Land Use Mix and Phasing

It is expected that residential development within TDAs utilizing urban level densities will include a mix of housing types and a mix of uses (residential and commercial). Such mix of housing types and uses will generally occur on the subject parcel(s). Where such parcel(s) are not of sufficient size, the mix of housing types and/or commercial uses may be sited on adjacent or nearby parcel(s). Unless directly connected to a previously approved multi-use project, the mix of housing types and commercial uses shall be in addition to what is already in place or otherwise already approved but not yet completed. Applicants may work in partnership with other developers to satisfying this expectation. In such cases, the partnership to achieve the mix of housing types and uses shall be identified in a consolidated concept and/or master plan.

Additionally, development of the residential uses in a TDA utilizing urban level densities shall be phased contingent/consistent with new commercial development to help offset the impacts.

Residential Density Requirements

A goal of the TDAs, as originally adopted in 2016, has been to accommodate 50 percent of the projected population growth over the 20 year period between 2016 and 2036. This requires the

creation of one or more TDAs within the Comprehensive Plan that provide for the construction of approximately 10,570 new residential units. This should support over half of the projected 56,900 -person population growth and 18,355 dwelling units over the 20-year planning horizon. This estimate is derived by Weldon Cooper Center estimates of future growth trends. The total dwelling unit growth projected between 2016 and 2036 is derived by dividing the 20-year population growth (56,900) by the average persons per household of 3.1 (from the 2020 Census).

The Plan recommends that 10,570 dwelling units be distributed across the five (5) designated TDAs. Each TDA describes the desired number and types of dwelling units. The Plan recommends a maximum dwelling unit figure by unit-type or the maximum commercial square footage for an individual TDA.

Target densities for development within the TDAs include 12.0 condominiums or apartments, 6.0 townhouses, or 4.0 single-family homes per acre where residential development occurs and a minimum density of 0.4 floor area ratio (FAR) where commercial development occurs. To provide flexibility and allow for variations in individual projects, zoning district standards created for TDAs should incorporate the following density ranges:

- 3 to 6 dwelling units per acre for single-family detached homes,
- 5 to 8 dwelling units per acre for townhomes,
- 11 to 14 dwelling units per acre for condominiums or apartments, and
- 0.4 to 1.0 floor area ratio for commercial development

However, in the Downtown Stafford area of the Courthouse TDA, higher density development is permitted as outlined in the Courthouse TDA section of this chapter.

A variety of single-family detached units are supported in these areas. To achieve these higher densities, smaller lot sizes than typically found are anticipated, particularly when located in mixed-use areas and in close proximity to multi-modal transportation.

TDA Development Promotion and Incentives

In the past five years, development of the TDAs has lagged behind other areas of the County. It has been noted by the development community that the zoning entitlement process in these locations can be more costly, time consuming and has higher risk. To promote the appropriate amount of development in TDAs as recommended in this Plan, without sacrificing the necessary evaluation, efforts should be explored by staff to identify and recommend to the Board of Supervisors and Planning Commission appropriate modifications to the review and approval process. Some of the process improvements may include:

- Pursue the development of Small Area Plans in each of the TDAs to clarify desired development patterns.
- Consider a phased approach to zoning reclassification requests that would minimize risk and provide greater comfort level to potential developers.
- Simplify application requirements - impact assessments and development concept details.
- Establish criteria that may allow for an expedited review process.
- Consider modifying application fees.
- Establish standard development guidelines and impact mitigation criteria.

Locations

To encourage smart growth and reduce the impact of unintended and negative impacts upon I-95 and commute times for Stafford residents, Stafford County has included five (5) TDAs within the comprehensive plan. TDAs provide for concentrated areas of development rather than distributing future development across the USA and Agricultural/Rural areas. The TDAs have been located to minimize encroachment concerns with Marine Corps Base Quantico and the Stafford Regional Airport.

TABLE 3.3 TDA Development Summary

Targeted Development Area		Residential (dwelling units)				Commercial (total square feet)
		Single Family	Townhouse	Multi-family	Total	
1	Courthouse	1,500	750	3,190	5,440	5,500,000
2	Central Stafford	550	200	1,000	1,750	12,075,000
3	Berea (Warrenton Rd West)	500	400	750	1,650	3,750,000
4	Falmouth Gateway (Warrenton Road East)	500	400	750	1,650	1,000,000
5	Boswell's Corner	--	80	--	80	1,000,000
Total		3,050	1,830	5,690	10,570	22,325,000

Transfer of Development Rights (TDR)

Furthermore, up to an estimated 1,490 dwelling units could be made possible by the transfer of development rights from properties outside the TDAs as part of the TDR Program. For residential purposes, 1 residential development right in the sending area is equivalent to 1 by-right residential development right in the receiving area. For non-residential purposes, 1 residential development right in the sending area is equivalent to by-right construction of 3,000 square feet of commercial space in the receiving area.

Public Infrastructure and Services

The TDAs should include transportation, recreational, public safety, and educational amenities. For example, smaller yards and open spaces within the required dense developments makes the provision of parks and other recreational facilities essential for a healthy lifestyle for the residents. Therefore, the Comprehensive Plan provides for the creation of 575 acres of new public park space in or around the TDAs. It also provides for the creation of an additional large recreational facility similar in size and amenities to Embrey Mill Park.

The types of Parks developed will provide different uses, they may be active or passive in nature. It is not the intent of this Plan to require all of the 575 acres within the limits of the TDAs designated on the Land Use Map. At the same time, the recommended Park land should be within reasonable proximity of the population within each TDA. The following is a list of criteria for the suitable location of parks in relation to each TDA. The types of parks are further described in the Development Control Policy Guidelines for Parks and Recreation Land Requirements.

- Neighborhood Parks/Civic Uses – should be located within the limits of the TDA, be within a 5 to 10 minute walk, or ¼ to ½ mile of the residents within the TDA, and include safe pedestrian and bicycle access.
- Community Parks should be located within 2 miles of the TDA they are intended to serve.
- District Parks shall be located within 15 to 20 minutes driving time of the TDA they are intended to serve.

The requirement for educational facilities will also be driven by such dense development. Traditionally, such facilities are located within the residential areas of the communities. The Comprehensive Plan identifies future need for the construction of three (3) new elementary schools, two (2) new middle schools, and one (1) new High School, which may include a Center for Technical Education. It also provides for the upgrade to one (1) existing fire and rescue facility and construction of four (4) new fire and rescue facilities to meet the increased public safety demands of the planned TDAs as well as a new Stafford Parkway, the extension of Mine Road, and other road upgrades to mitigate the local transportation impacts. These facilities should be sited within or in close proximity to the TDAs.

The above infrastructure improvements are essential components of the more concentrated suburban and traditional neighborhood design recommended in the TDAs and would be required components for approval of rezoning changes within the planned TDAs. Without the upgrades, approval should not be given for rezoning changes because the impact of the development would not be sufficiently mitigated. The infrastructure needs of the TDAs, Suburban and Rural areas relate to Chapter 5 with the Public Facilities Plan and corresponding methodology to calculate anticipated infrastructure needs in Appendix B.

Small Area Plans

To establish the desired land use pattern in each TDA, Small Area Land Use Plans should be developed and adopted as part of the Comprehensive Plan. A Small Area Plan was created for a portion of the Courthouse Area. That Plan provides a finer level of detail, identifying how the recommended land uses and density should be distributed throughout the Courthouse Area in an urban, traditional neighborhood design. The Plan includes a recommended street network.

Site Design

Use of buffering, screening and extensive building setbacks should be limited except when bordering the edge of a TDA. Buildings should not exceed six stories in height. Development in these areas should accommodate the need for affordable housing. Both on-street and off-street parking will be anticipated. In the most densely developed areas, structured parking should be encouraged. Parking structures should be sited and include architectural features to complement surrounding buildings. Development around primary transportation hubs should accommodate commuter parking while respecting the more urban form of development. Future developments should include open common areas or public spaces for residents and/or employees to enjoy leisure time activities. Streets and buildings should be designed to encourage physical and visual interaction at the street level. Street lighting and sidewalks are essential elements to ensure vibrant communities. These areas could also be designated as receiving areas in the County's transfer of development rights program.

Form-Based Codes

Should an urban, traditional neighborhood design be desired in a given area, the use of Form-based Code may be desired as Stafford County continues its evolution. For the purposes of this 20-year view, Form Based Code will be defined by the following:

Form-based codes address the relationship between building facades and the public realm, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks. The regulations and standards in Form-based codes, presented in both diagrams and words, are keyed to a regulating plan that designates the appropriate form and scale (and therefore, character) of development rather than only distinctions in land-use types. This is in contrast to conventional zoning's focus on the micromanagement and segregation of land uses, and the control of development intensity through abstract and uncoordinated parameters [e.g., FAR, dwellings per acre, setbacks, parking ratios, traffic levels of service (LOS)] to the neglect of an integrated built form. Not to be confused with design guidelines or general statements of policy, Form-based codes are regulatory, not advisory.

Form-based codes are drafted to achieve a community vision based on time-tested forms of urbanism. Ultimately, a Form-based code is a tool; the quality of development outcomes is dependent on the quality and objectives of the community plan that a code implements. The County should make every effort to use Form Based Codes to achieve the desired outcomes for RDAs and the TDAs that are proposed and or contained within this Comprehensive Plan.

Fiscal Balance

The TDAs recommend a fiscally balanced amount of commercial and residential development, as discussed in the prior section of this chapter titled: "Residential – Commercial Land Use Mix and Phasing". To mitigate any increased tax burdens on current residents, it is recommended that each TDA develop over time in a balanced and phased manner, with adequate commercial development to offset the demands on community facilities and infrastructure that residential development brings. This can be accomplished by ensuring appropriate phasing of larger mixed-use projects and tracking the amount and type of growth in each TDA on a regular basis.

Airport Impacts

Two of the TDAs (Courthouse and Central Stafford Business Area) are in the vicinity of the flight patterns for to the Stafford Regional Airport and its aircraft operations. An Airport Compatible Land Use Plan has been developed which recommends appropriate land uses and development standards in relation to different air traffic pattern areas. To ensure the safety of people and property on the ground and aircraft flying overhead, and the long-term viability of the Airport, any development proposals in these TDAs should be in conformance with the recommendations of the Airport Compatible Land Use Plan.

Specific TDA Locations

The following pages describe the five (5) designated TDAs.

Courthouse Targeted Development Area

Situated in a central location in the County, the Courthouse TDA consists of approximately 2,580 acres. The area is located along Courthouse Road, and bisected by Interstate 95. On the east side of the Interstate, the area incorporates the Historic Courthouse and extends south of the Stafford Hospital Center, along U.S. Route 1. The area extends west along Courthouse Road to Colonial Forge High School, incorporating land that includes portions of Austin Ridge and Embrey Mill to the north and south to Accokeek Creek.

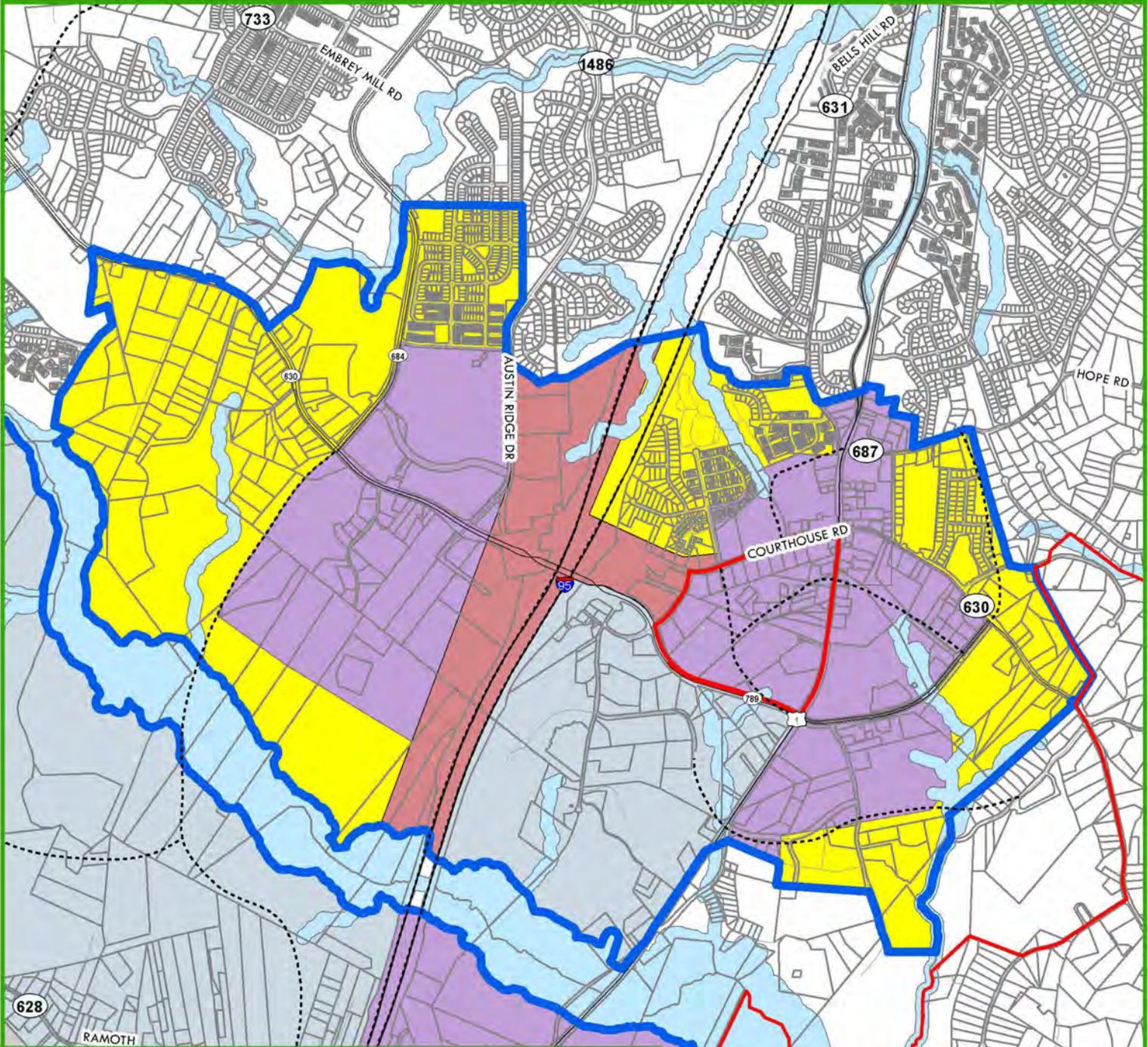
In total, the TDA is recommended to include 5,440 residential dwelling units, including 3,190 multi-family, 750 townhouse, and 1,500 single-family units, and 5,500,000 square feet of commercial development.

Land Use Concept

Figure 3.10 provides a generalized land use concept plan to guide the future development of the Courthouse Targeted Development Area.



FIGURE 3.10 Courthouse Targeted Development Area Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend

- Proposed New Roads
- Urban Services Area
- Targeted Development Areas

Land Use Classification:

- Business and Industry
- Commercial - Retail and Office
- Mixed Use - Commercial/ Residential
- Downtown Stafford - Mixed Use
- Residential
- Stafford Regional Airport

0 1,150 2,300 4,600 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

The development areas can be further defined by three subareas: (1) East - Downtown; (2) Embrey Mill, and; (3) Southwest. Each sub-area will include a town center or one or more commercial centers to serve the new residents in this area of the County.

East - Downtown

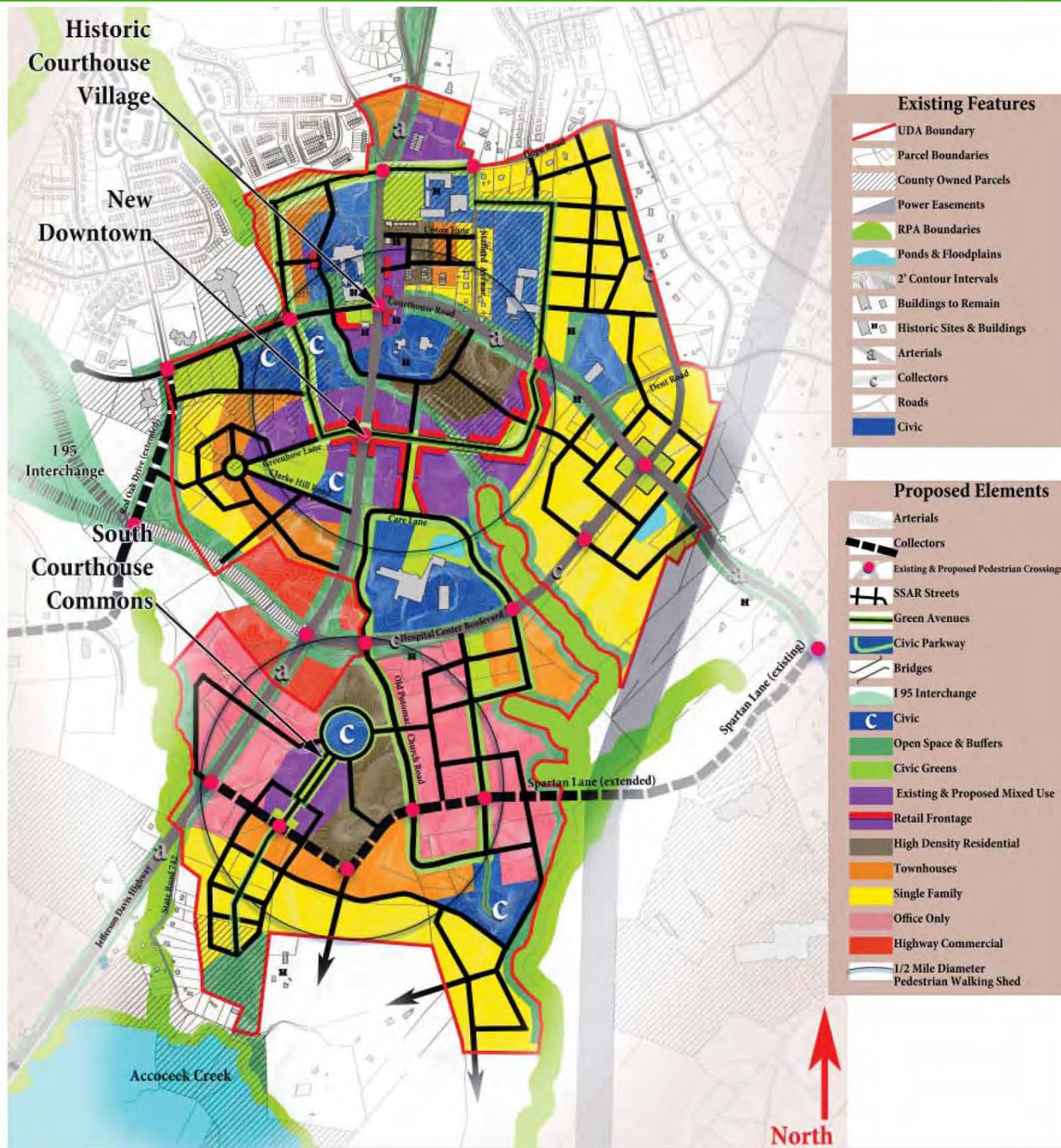
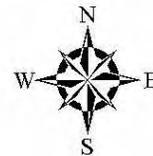
This area east of Interstate 95 includes the area around the historic Courthouse area. Over the past several years, the community has supported the concept of developing the area as a downtown. It has been identified as an Economic Development Priority Focus Area, more specifically as a Redevelopment Area, and the *Courthouse Small Area Plan* provides a more detailed land use concept plan for this area. The most recent effort focuses on the area envisioned as the urban core of the new downtown. Development in the Courthouse TDA would be centered around several commercial nodes, including a New Downtown, east of Interstate 95. The following describes the *Courthouse Redevelopment Area Plan* and *Courthouse Small Area Plan*, *Economic Development Strategic Action Plan*, and *new Downtown Stafford Plan*.

COURTHOUSE SMALL AREA PLAN

As part of the past efforts toward the planning for the development of the Courthouse area, a Small Area Plan was adopted as an element of the Comprehensive Plan. This Plan has established the recommended land use patterns for the portion of the TDA to the east of Interstate 95. The Plan identifies three commercial nodes: Historic Courthouse Village (adjacent to the Courthouse); New Downtown (between the Courthouse and Hospital); and South Courthouse Commons (south of the Hospital). These nodes will include a mix of commercial and retail uses at their core, surrounded by residential uses. The Small Area Plan establishes the desired roadway network in the Courthouse Area, designed to provide a hierarchical system of interconnected streets and recognizes the dual purpose and functionality of U.S. Route 1. A comprehensive access management plan should be developed to mitigate the impact of new development. Furthermore, an additional 400-space park and ride lot with a bus stop shelter has been completed to offset increased vehicle volumes on Interstate 95 during peak commute periods.



FIGURE 3.11
Courthouse Small Area Plan
 Stafford County Comprehensive Plan
 Stafford County, Virginia
 September 8, 2021



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

DOWNTOWN STAFFORD PLAN

Downtown Stafford is envisioned as a mixed-use pedestrian friendly community, conducive to supporting retail and entertainment venues, community uses, offices, and residential development. Community uses may include uses such as a Public Plaza and Cultural Center/Museum. The area is generally defined as being bordered by Courthouse Road and the County Government Center to the north, U.S. Route 1 to the east, Hospital Center Boulevard to the south, and Interstate 95 to the west. The road improvements around the new Interstate 95 Exit 140 interchange, completed in 2020, will improve access to this area. Highway commercial uses are recommended in the area along Courthouse Road, closest to Interstate 95.

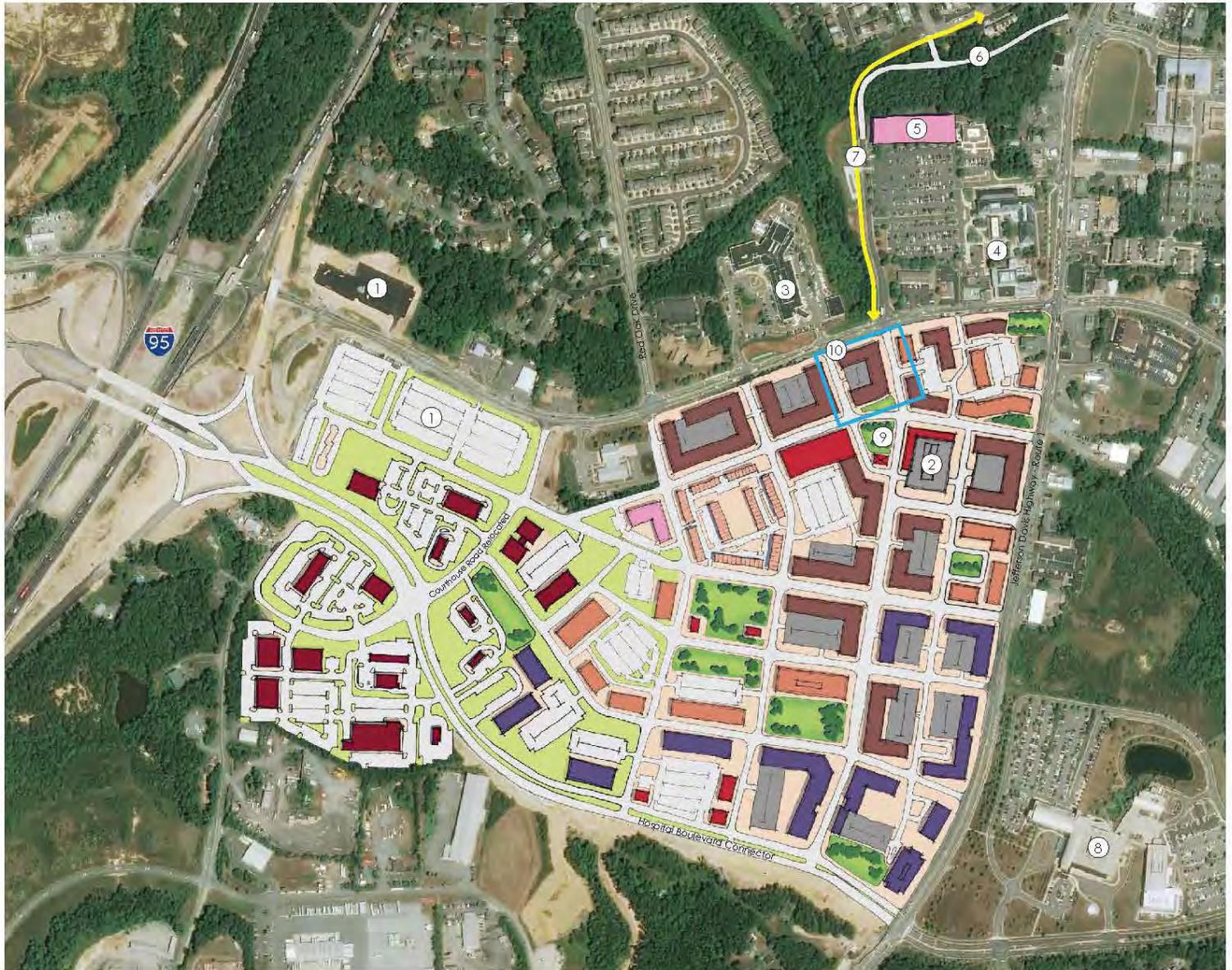
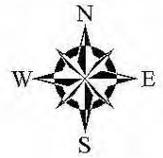
The first phase of Downtown is planned along the south side of Courthouse Road, across from the Government Center and Public Safety Building. Much of this land is County-owned. Additional privately owned land may be included in Phase 1. Access to Phase 1 is envisioned across from the current Government Center Access Road. Other connection points will be needed from US-1 and Courthouse Road to minimize traffic impacts, and to improve access to interior properties and promote walkability.

This area is envisioned as complementing the adjacent County Government Center. Improvements to the Government Center include the construction of a new Circuit Court building on a portion of the parking lot on the northern end of the site. This will require the relocation of parking in the complex. This plan recommends parking be accommodated in the Downtown area. In the initial phase, a temporary surface parking lot would be utilized. Ultimately, a multi-level public parking deck is recommended to be integrated into the development of Downtown. The parking deck will not only serve patrons of the government center, but may also support new area businesses and community events.

The Future Land Use Concept Plan represents a recommended development pattern for the buildout of the entire Downtown area beyond Phase 1. The Concept Plan highlights some of the public facilities and infrastructure recommended to serve this area. Flexibility should be provided to allow for the realities of site constraints and market trends.



FIGURE 3.12
Downtown Stafford
Stafford County Comprehensive Plan
Stafford County, Virginia
 September 8, 2021



- ① North Park and Ride Lot
- ② Proposed County Parking Garage
- ③ Stafford Sheriff's Office
- ④ Stafford Government Center
- ⑤ Proposed New Courthouse
- ⑥ Proposed Bells Hill Road/Jefferson Davis Highway Road Link
- ⑦ Bells Hills Road Pedestrian Connection
- ⑧ Stafford Hospital
- ⑨ Downtown Stafford
- ⑩ Temporary Courthouse Parking

Proposed Land Use Legend

- Open Space
- Civic
- Community Retail
- Highway Retail
- Mixed Use - Residential
- Mixed Use - Office
- Multifamily Residential

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

The following is a summary of the potential buildout of Phase 1 and all of Downtown, as represented in this concept plan. Note that this is a maximum potential and it is more likely that a lesser amount may be realized given site constraints.

Phase 1 Estimated Buildout:

- 50,856 square feet of retail
- 64,145 square feet of office
- 979 residential dwelling units
 - 957 multi-family units
 - 22 townhouse units

Complete Buildout of Downtown:

- 288,256 square feet of retail
- 941,945 square feet of office
- 2,490 multi-family residential dwelling units
 - 2,418 multi-family units
 - 72 townhouse units

Note that the multi-family dwelling unit buildout estimate in the Downtown Plan (2,418) exceeds the original estimate for all of the Courthouse Planning Area (1,500). It is estimated that 728 of the original 1,500 dwelling units would be accommodated in this area under the original density recommendations. The remaining 1,690 units are added to the original 1,500 units for a total of 3,190 future multi-family units in the Courthouse TDA. The 72 townhouse units are considered part of the original recommended 750 units.

Good planning practice dictates that at least 1,000 dwelling units should be located within walking distance of the commercial core to make a downtown viable. This density would ensure enough households to patronize businesses during non-peak hours and improves the chances to succeed. The overall buildout recommendations and estimated public facility needs of the Courthouse TDA should be reevaluated and adjusted during the next 5-year review of the Comprehensive Plan.

The following is a summary of the recommended Public facilities and Infrastructure:

Government Center Area – North side of Courthouse Road

- New Circuit Court Building
- Renovation and expansion of existing Courthouse
- Bypass Road and Pedestrian Trail (connecting Bells Hill Road to the Government Center)

Downtown Stafford Area – South side of Courthouse Road

- Surface Parking lot (temporary – if Circuit Court building precedes permanent parking garage construction)
- Multi-level parking garage (permanent)
- Downtown Public Plaza
- Cultural Center/Museum

Smart Downtown

Downtown Stafford and the Government Center campus has the opportunity to become a first-of-its-kind model “Smart Community” in Virginia, demonstrating smart technologies and serving as a model for other communities. A Smart Community is one with technological infrastructure that

enables it to collect, aggregate, and analyze real-time data to improve the lives of its residents, businesses and visitors. Through a partnership with the Center for Innovative Technology, Downtown Stafford has been identified as a “Testbed” for the Commonwealth. This will allow for the acquisition of state funds and promote the private investment of the necessary infrastructure. Applications from this technology include 5G wireless, smart meters, smart street lighting, surveillance cameras, automated vehicle technology, ride sharing, smart parking, and real-time energy monitoring. These efforts serve to improve community safety, including safety of pedestrians and vehicles, reduce traffic congestion, and cut energy consumption,

Density and Design Recommendations

The following development standards are recommended. The current UD Zoning District regulations should be amended to accommodate these standards.

Downtown Area

- Buildings shall be no more than 5 stories/75 feet in height.
- Any buildings taller than 5 stories shall require a Conditional Use Permit with consideration given to impacts on adjacent properties.
- A mix of uses is encouraged, including retail restaurants, entertainment, and other commercial uses, offices, and residential uses.
- To ensure that no one project uses a disproportionate share of the recommended dwelling units, the location, amount and type of land uses shall be generally consistent with the land use recommendations in the Downtown Stafford Concept Plan.
- To ensure a mix of commercial and residential development, consistent with the buildout amount and location of uses, as envisioned in the Downtown Stafford Plan, the following ratios of commercial development to residential development should be achieved in each development proposal:
 - In Phase 1, the County property / JPI property, provide a ratio of approximately 100 square feet of commercial development per 1 dwelling unit;
 - In the remaining Downtown Stafford area, provide a ratio of approximately 700 square feet of commercial development per 1 dwelling unit;
- Any development proposing a higher ratio of residential to commercial development than what is prescribed above should prepare a fiscal impact analysis to ensure the project would generate positive revenue for the County;
- In no event should the number of total dwelling units in the Downtown Stafford Area exceed the recommended 2,490;
- The commercial development (existing or approved) should be within walking distance or within the pedestrian shed of the residential units and not impeded by any natural or physical barriers.
- Proposed commercial development shall be appropriately phased-in with the construction of the residential units.
- Commercial development referenced herein should consist of retail, restaurants, entertainment, office, or other uses that provide a service to the area residents.
- Mixed use buildings are permitted.
- Primarily multi-family residential is recommended in this urban setting.
- Residential densities up to 50 multi-family dwelling units per acre are permitted, with lesser densities as you move out from the urban center, including 12 townhouse dwelling units per acre and 6 single family dwelling units per acre.
- A maximum 3.0 floor area ratio is permitted for commercial development.

- Density bonuses would be permitted through the provision of transferable development rights.
- Building setbacks will be minimal with sidewalks and street trees.
- Outdoor dining areas should be incorporated into the design of sidewalks and planting strips in commercial areas. These areas may be located adjacent to the building or within the planting strip area. Outdoor dining areas shall be situated to maintain a minimum 10-foot wide sidewalk clearance, and may include a physical barrier no taller than 36 inches.
- Minimum parking requirements should be relaxed with the provision of public parking.
- Shared parking should be encouraged to minimize the footprint of parking areas and allow for more developable areas/green space.
- Utilization of both private and public parking garages is encouraged.
- Public parking garages shall be conveniently located.
- On-street parking shall be provided.
- Buildings shall incorporate high quality building materials and design.
- Buildings are encouraged to be designed to achieve the U.S. Green Building Council's Leadership in Energy and Environment Design (LEED) certification.
- Incorporation of green roof elements into the design of buildings to reduce the urban heat island affect and to provide an alternative means of stormwater management should be considered.
- The materials and design of buildings in the vicinity of the Courthouse and other historic structures should be compatible with the historic nature of those buildings and the area.
- Lighting and landscaping and public spaces shall be designed to incorporate Crime Prevention Through Environmental Design (CPTED) principles.
- Green space/parks shall be interspersed through the downtown area to serve as community gathering spaces and amenities for area residents, with an overall purpose of maintaining a high quality of life and mitigating the effects of climate change.
- It is expected that all developments within the designated Downtown Stafford Area will provide or otherwise support community amenities within the Downtown Stafford Area. The community amenities identified in the Downtown Stafford Concept Plan should achieve the desired quality of life for the residents of Stafford. Additional amenities to support this goal should also be provided.
- Such community amenities can and should include usable open space, parks, trails, picnic areas, playground equipment, stages, gazebos, benches and support recreational activities.
- For those developments where the identified amenities are fully within the boundaries of such developments, they are expected to provide the amenity/amenities in total. For those developments that partially contain the area where such amenities are identified, or which abut the area where amenities are identified, the developments are expected to partner to provide such amenities and/or contribute toward amenities within the Downtown Stafford Area, as permitted by state code. Alternatively, the development(s) may provide the identified amenities elsewhere within the Downtown Stafford Area as may otherwise be feasible and as approved by the county as an alternate location.
- For those developments not within or adjacent to amenities identified in the Concept Plan, and which have not otherwise partnered with others to provide identified amenities within the Downtown Stafford Area, such developments are expected to provide their own community amenities, partner with others to provide amenities, and/or contribute toward amenities within the Downtown Stafford Area beyond those identified in the Concept Plan, as permitted by state code. The additional amenities, or the contribution, is

expected to be in proportion to the size, scope and location of such developments in relationship to the overall Concept Plan.

- An interconnected network of streets shall be planned to relieve traffic congestion and ease of pedestrian access.
- One or more “festival streets” should be incorporated into the downtown area. A festival street shall be a segment of a road that can be closed off to vehicle traffic to allow for special events. The ability to provide alternative vehicle access shall be considered in the planning of this type of street.
- Pedestrian and bicycle accommodations should be provided where safe and feasible, including wide sidewalks, signalized crossings, clearly designated bike routes, and supporting infrastructure such as bike racks & benches. Complete Street Design Concepts shall be referenced when addressing this factor.

Highway Commercial

- Highway commercial uses such as vehicle fueling stations, fast food restaurants, hotels and other similar retail uses should be oriented toward the Interstate 95 interchange.
- Access points should be limited onto the main highway corridor.
- Building materials and design should be of high quality to provide for an attractive gateway into the County and Downtown Area.

Embrey Mill

This area incorporates the southern portion of the approved Embrey Mill Subdivision. The center of this area of the TDA would include a town center, which should be modeled using the principles of new urbanism. It should be pedestrian oriented with a mix of commercial space and condominiums on 80 acres. Buildings may include single story retail and multi-level single-use or mixed-use buildings up to four stories in height. A residential neighborhood located to the north of the town center and east of Mine Road has been completed with a mix of townhouses and single-family homes. To the west of Mine Road, is the Embrey Mill Park with rectangular athletic fields and an indoor swimming complex that serves the needs of the new residents in this area and serve as an asset to the entire County and region.

Southwest Quadrant

This area west of Interstate 95 and south of Courthouse Road would include either: a town center, which should be modeled using the principles of new urbanism with buildings three to four stories in height, or one or more commercial centers serving nearby residential uses; and stand-alone commercial areas with a mix of retail, office and industrial uses. Town centers should consist of a mix of commercial and residential uses.

OTHER COURTHOUSE TARGETED DEVELOPMENT AREA RECOMMENDATIONS

The following section of the Courthouse TDA includes area-wide recommendations regarding: Building and site design, and Public Facility needs.

Area Building and Site Design Standards

Architectural standards (i.e., building height, mass, materials, amenities, and signage), minimum and maximum setback requirements, environmentally friendly materials, and other design features should be incorporated into any development, consistent with the Neighborhood Design Standards Plan. The Plan supports a mix of uses following the concepts of a traditional neighborhood design.

Public Facilities

Getting the residents of the Courthouse Area to and from work and other destinations without creating an undue hardship on them and other residents of Stafford County and the Commonwealth of Virginia will require the provision of adequate transportation facilities (beyond the internal community road network).

VDOT recently completed the reconstruction of the Courthouse Road / Interstate-95 interchange, which included the extension of Hospital Center Boulevard, providing a new connection from the interchange to U.S. Route 1. This improvement has coincided with the recently completed first phase of the widening of Courthouse Road from two to four lanes west to Winding Creek Road and Ramoth Church Road. The project includes a new 10-foot wide shared use path along its entire length and extends to the east side of the interstate.

To avoid burdening any single interchange, Mine Road extended from Courthouse Road through the Southwest sub-area and beyond to Ramoth Church Road will need to be built to distribute the traffic volume between the Courthouse Road and Centerport Parkway interchanges. As part of the Courthouse Road interchange reconstruction, the park-and-ride lot has been relocated to the east side of the interstate. An additional transit facility including a park and ride lot with bus stop shelter, as well as a commuter van pool and bus transit station will need to be completed to reduce increased vehicle volumes on I-95 during peak commute periods.

Because of the amount of new residential density planned, the provision of adequate parks and recreational facilities is necessary. This will require that developers provide park property suitable for passive and active recreational activities, plazas and congregational spaces, as well as cultural activity, consistent with the recommendations of the Plan — not encumbered by restrictive easements and capable of supporting athletic fields and a network of trails. Dedication of open space to support these activities will be required. Parkland should meet the characteristics of having gradual terrain with limited sensitive resources and allow for flexible design and location of park facilities. Although the parks are not required to be located entirely within the TDA, they should conform to the location criteria provided in the introduction of the TDA section of the Plan.

The development of so many new dwelling units will by their nature increase the demand on Stafford County schools. To offset the capital cost of that demand, new schools will need to be constructed. A proffered elementary and middle school site is located within the Embrey Mill Subdivision and should be considered for future school construction.

The public facility needs are not limited to the items previously listed. The proposed residential development in the Courthouse TDA, would have an estimated 16,864 residents, creating the need for the below listed public facilities. These facilities should be provided for within the TDA or in areas outside the TDA within close proximity and within the Urban Services Area.

Parks and Recreation	202 acres
Fire and Rescue	0.90 stations
Public Schools	
Elementary Schools	1.25 schools
Middle Schools	0.50 schools
High Schools	0.40 schools
Libraries	0.67 libraries

The data tables that serve as a basis for these public facility needs are provided in Appendix B of this document.

As previously mentioned in the TDA summary section entitled “Public Infrastructure and Services,” these new infrastructure requirements listed above, are the result of the new development, its density and location, and **therefore will be the responsibility of the developer or developers of the Courthouse Area properties.**

Consistent with this goal, a proposed zoning change should offset the impacts of the new development. Impacts may be offset by voluntary proffers of such things as cash contributions, land dedication for a public facility, or construction of a public facility, as appropriate. Proffers may also include restrictions on the intensity and type of development. In the case of uses requiring a conditional use permit or special exception, the approving body may impose conditions to offset the impacts of the new development.

Phasing of Development

Near-term:

Courthouse (Undeveloped land). The number one area where growth should be targeted given the completed improvements to Courthouse Road and interstate interchange reconstruction, proximity to the interstate express lanes, and proximity to the hospital, and other public facilities. The near-term potential for development of vacant property is greatest in this area as new development projects are being planned. This area includes the Embrey Mill subdivision near the Interchange. The proximity to active development and proximity to public facilities makes the northern portion of this TDA the logical next step for growth extending south from the Garrisonville Road corridor.

Mid-term:

Courthouse (Redevelopment). The area, primarily focused on the intersection of Courthouse Road with U.S. Route 1, includes properties with older, underutilized, and some historic structures. The assembling of parcels for redevelopment may take additional time. Near-term development of vacant parcels may spur the redevelopment of underutilized property.

Summary

Projected New Dwelling Units: 5,440

Projected New Business Sq. Footage: 5,500,000

Minimum Facility needs within the limits of the TDA (accounting for a portion of the total facility needs identified to serve the TDA):

Upgraded road network, as shown in Figure 4.2 of the Transportation Plan

Passive and active recreational uses, plazas, and civic spaces

Central Stafford Targeted Development Area

Located in the geographic center of the County, the Central Stafford Targeted Development Area (TDA) includes 6,742 acres. It extends from Accokeek Creek, south to the vicinity of the Centerport interchange and Enon Road, along Interstate 95 and U.S. Route 1, within the USA. The area surrounds the Stafford Regional Airport and extends to the west, outside of the USA, to include areas underneath the aircraft traffic patterns.

Due to the proximity to the Stafford Regional Airport and major transportation corridors, the area is intended to serve as an employment center in the County, where business and industrial uses are recommended. In total, the TDA is recommended to include 12,075,000 square feet of commercial development.

The area also includes two mixed use areas where residential dwelling units could be supported. In total, the TDA is recommended to include 1,750 dwelling units, including 1,000 multi-family, 200 townhouse, and 550 single-family units.

Southern Mixed Use Area: The southern area includes 1,000 dwelling units. In this area, development rights exist for 600 multi-family units along Centerport Parkway. An additional 400 units (100 multi-family, 50 townhouse, and 250 single-family units) are recommended between Centerport Parkway and Enon Road.

Northern Mixed Use Area: The remaining 750 units (300 multi-family, 150 townhouse, and 300 single-family units) are recommended along U.S. Route 1, north of American Legion Road and Eskimo Hill Road.

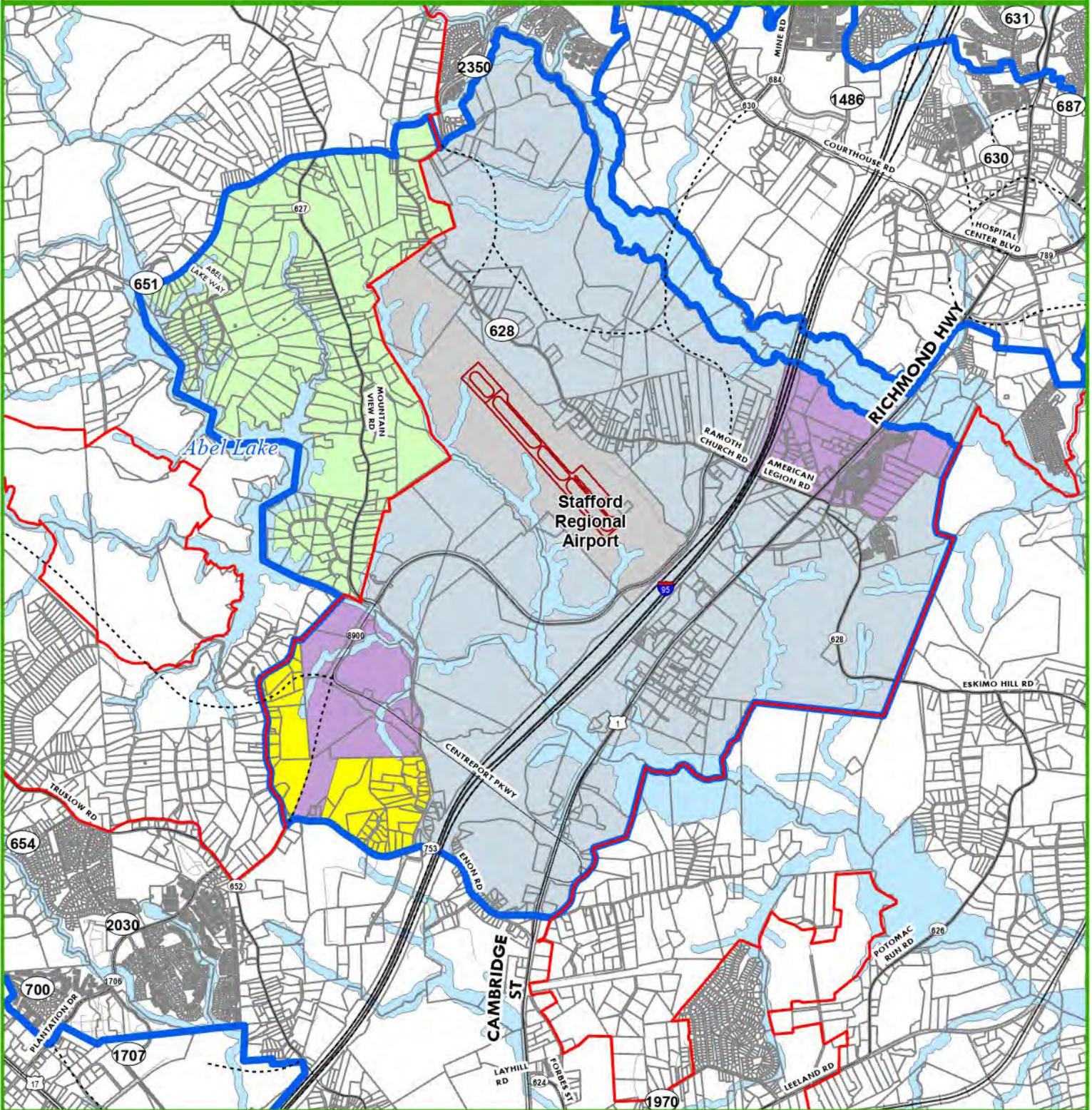
Proximity to other Community Attributes

The area is located between the 2 main residential concentrations in the County. Additional residential development is planned in these areas, in close proximity to Central Stafford. This will provide the opportunity for employees to reside in close proximity and reduce commute times. The adjacent Courthouse Area includes existing and planned community resources that will benefit this area. Resources include the Stafford Hospital Center, County Courthouse and Government Center, and a planned Germanna Community College Campus. Germanna Community College can provide technical training for the business complex. This area is also planned for mixed use development, with commercial retail.

Land Use Concept

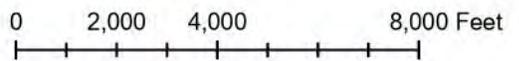
Figure 3.13 illustrates the land use concept plan for the area. The recommended land use areas are described below. Additional recommendations regarding land use compatibility with the airport are described in more detail in the Stafford Regional Airport section.

FIGURE 3.13 Central Stafford Targeted Development Area Stafford County Comprehensive Plan Stafford County, Virginia September 17, 2024



Legend

Proposed New Roads	Land Use Classifications :	Residential
Urban Services Area	Agricultural/Rural	Stafford Regional Airport
Targeted Development Areas	Business and Industry	
	Mixed Use - Commercial/ Residential	



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Business and Industry

The area is recommended to serve as one of the employment centers in the County, as a location that could accommodate a wide range of commercial activities, serving small business entities to larger corporations. Uses include, but are not limited to, research and technology, data centers, general office, industrial related warehousing and manufacturing, airport related operations, hotels and conference space, and complementary retail uses. The area may develop in commercial neighborhoods, each serving different purposes. Several large land bays are within the district that may allow for the development of large scale campus style office parks and light industrial parks.

Mixed Use

The two mixed use areas with residential potential, identified in the north and the south, is located in close proximity to existing population centers and services for residents. Development of these areas should be modeled using the principles of new urbanism with buildings three to four stories in height, or one or more commercial centers serving nearby residential uses; and stand-alone commercial areas with a mix of retail, office and industrial uses. Town centers should consist of a mix of commercial and residential uses.

Residential

Residential areas are recommended on the perimeter of the southern targeted growth area, that are located in the proximity of Centerport Parkway and south to Enon Road. Primarily single-family detached residential unit types are recommended in these areas, along with complimentary recreation and community uses.

Agricultural/Rural (Outside of the USA)

This area is located along Mountain View Road and Kellogg Mill Road, outside of the USA. The area consists of primarily large lot residential uses and vacant properties. This area is included in the district as it is identified as being located under the traffic patterns for the airport. While there are no near term plans for expansion of the USA, commercial development would be a potentially more compatible use. Generally residential uses are considered an incompatible use with airport operations, due to noise and safety concerns. The level of incompatibility is of a lesser degree with large-lot rural residential. These recommendations do not prohibit any current or future rural residential use as allowed by-right. Rather it highlights the potential land use conflicts.

Stafford Regional Airport & Airport Compatible Land Use

Improvements are planned for the Stafford Regional Airport that will expand its range of use. The business and industry uses in this area are for the most part compatible with the operations associated with the Stafford Regional Airport with some exceptions. While commercial development is generally acceptable and consistent with airport operations, there are some considerations that should be made for compatible commercial development adjacent to an airport.

Building and Site Design

This area is highly visible to residents and visitors traveling through the area. To ensure a high quality business park, uses fronting on primary road corridors, including Interstate 95, U.S. Route 1, and Centerport Parkway should design structures in accordance with the Architectural Guidelines in the Neighborhood Design Standards Plan element of the Comprehensive Plan. Enhanced building design is recommended, including all building facades fronting on and facing Interstate 95. To minimize visual clutter, signage should be coordinated with the primary building

design. Efforts should be taken to screen loading docks and storage areas from view of the primary corridors.

Public Facilities

The recommended amount of commercial and residential development in this area could have a significant impact on the road network. The following improvements will be needed to provide adequate transportation facilities:

- Widening of Centerport Parkway (from 2 lanes to 4 lanes)
- Extension of Mine Road (from Courthouse Road to Ramoth Church Road and Centerport Parkway to Enon Road)
- Widening of U.S. Route 1 (from 4 lanes to 6 lanes)
- New Stafford Parkway extending to Warrenton Road.

To determine the full impacts and needs, a transportation modelling exercise should evaluate the total transportation needs, such as the number and location of additional travel lanes.

The development of new dwelling units will by their nature increase the demand on Stafford County schools, parks, libraries, and fire and rescue services. The proposed residential development in the Central Stafford TDA would have an estimated 5,425 residents, creating the need for the following public facilities. These facilities should be provided for within the TDA or in areas outside the TDA within close proximity and within the Urban Services Area.

Parks and Recreation	65.1 acres
Fire and Rescue	0.29 stations
Public Schools	
Elementary Schools	0.42 schools
Middle Schools	0.17 schools
High Schools	0.12 schools
Libraries	0.22 libraries

The data tables that serve as a basis for these public facility needs are provided in Appendix B of this document.

Consistent with this goal, a proposed zoning change should offset the impacts of the new development. Impacts may be offset by voluntary proffers of such things as cash contributions, land dedication for a public facility, or construction of a public facility, as appropriate. Proffers may also include restrictions on the intensity and type of development. In the case of uses requiring a conditional use permit or special exception, the approving body may impose conditions to offset the impacts of the new development.

Phasing of Development

Near-term:

Central Stafford TDA (South of Ramoth Church Road). This area, which includes land in close proximity to the airport, currently has limited utility infrastructure and is largely undeveloped. It is a logical area to target future commercial growth given its proximity and access to the airport and interstate.

Mid-term:

Central Stafford TDA (North of Ramoth Church Road). This area currently has limited utility infrastructure and lacks needed road infrastructure and public facilities. It is a logical area to target future growth given the proximity to Interstate 95 and location along the planned extension of Mine Road, providing a north-south transportation link.

Development Incentives

To promote and accelerate development of the Business Area, the County should consider implementing the following incentives:

- Construct sewer and water utility and road capital improvements.
- Accelerate development approvals.
- Provide tax incentives.
- Designate the area as a TDR receiving area whereby residential development rights may be converted to commercial floor area, consistent with the desired land use in the area.
- Forgive existing proffer requirements for qualifying businesses.

Berea (Warrenton Road West) Targeted Development Area

Situated along Warrenton Road (US-17), on the west side of Interstate 95, the Berea Targeted Development Area (TDA) consists of approximately 1,647 acres. The area extends to International Parkway and includes portions of land along Celebrate Virginia Parkway.

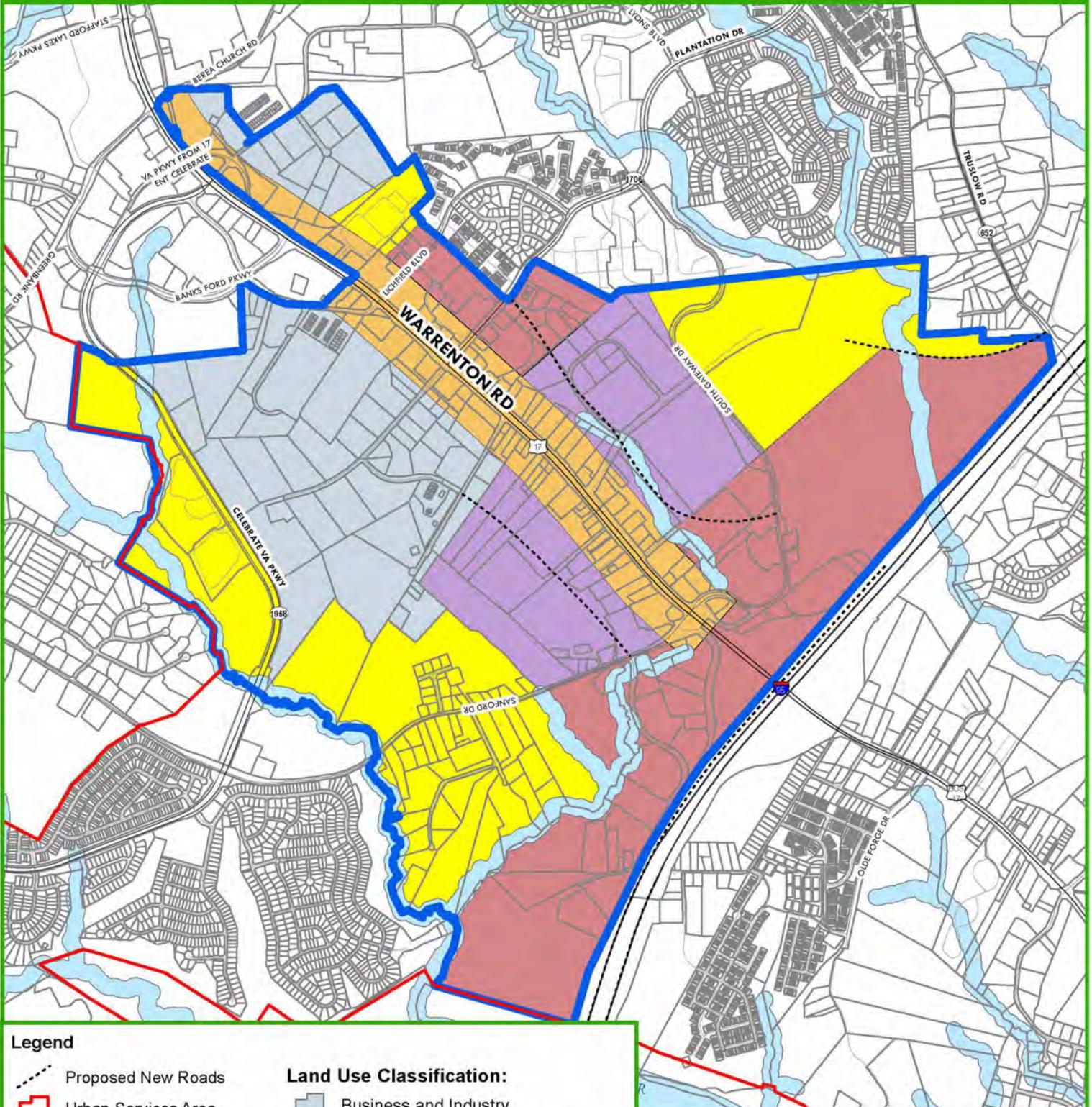
In total, the Berea TDA is recommended to include 1,650 residential dwelling units, including 750 multi-family, 400 townhouse, and 500 single-family units, and 3,750,000 square feet of business development.

Land Use Concept

Figure 3.14 provides a generalized land use concept plan to guide the future development of the Berea TDA.



FIGURE 3.14
Berea
Targeted Development Area
Stafford County Comprehensive Plan
Stafford County, Virginia
 September 8, 2021

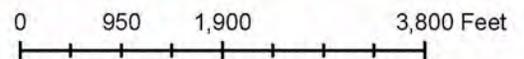


Legend

- Proposed New Roads
- Urban Services Area
- Targeted Development Areas

Land Use Classification:

- Business and Industry
- Commercial – Retail and Office
- Highway Commercial
- Mixed Use – Commercial/ Residential
- Residential



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

The area is traversed by Warrenton Road, a major East-West connector for vehicular traffic, and acts as an important link for trucks between Interstate 95 (I-95) and Interstate 81 (I-81), carrying approximately 60,000 vehicles daily.

Currently, Berea is developed with a mix of low-density retail and commercial uses with several hotels located closer to Interstate 95 (I-95). Several office buildings are located along Riverside Parkway adjacent to Interstate 95 (I-95). The England Run residential community is located north of Warrenton Road along Plantation Drive and Lichfield Boulevard, although it is not a part of Berea. The Celebrate Virginia North planned development currently under construction is located beyond the western end of the redevelopment area (but not a part of it) along McWhirt Loop and Celebrate Virginia Parkway.

Partially within and adjacent to the TDA, Celebrate Virginia North is a 2,400 acre development. It was originally envisioned as a retail, corporate office, and tourism hub. However, this development concept never materialized. Uses include commercial retail and restaurant uses are located along Warrenton Road, a training facility and apartment complex in the middle of the project, and a large age-restricted community located near the southern end of the development. Several undeveloped parcels of land remain.

The area surrounding Berea is emerging as an employment center, including the GEICO operations center and other office space. The area is also home to the University of Mary Washington's Graduate and Professional campus, servicing approximately 1,000 students.

The position of this TDA on Interstate 95 (I-95) makes it attractive for hotels. The availability of road access and ample services and employment may also make this an attractive residential location.

Design

Architectural standards (i.e., building height, mass, materials, amenities, and signage), minimum and maximum setback requirements, environmentally friendly materials, and other design features should be incorporated into any development, consistent with the Neighborhood Design Standards Plan. Where appropriate, a mix of uses following the concepts of a traditional neighborhood design is recommended.

Public Facilities

Getting the residents of the Berea TDA to and from work and other destinations without creating an undue hardship on them and other residents of Stafford County and the Commonwealth of Virginia will require the provision of adequate transportation facilities (beyond the internal community road network).

The roadway network should be designed and developed to provide a hierarchical system of interconnected streets and recognize the dual purpose and functionality of Warrenton Road (Route 17). A comprehensive access management plan should be developed to mitigate the impact of new development. Furthermore, upgrades to the existing transit facility on Warrenton Road may be necessary to offset increased vehicle volumes on I-95 during peak commute periods, including adding parking spaces to the existing park and ride facility.

It is recommended that this TDA include passive and active recreational uses, plazas and congregational spaces, as well as cultural activity. Dedication of open space to support these activities will be required.

The development of so many new dwelling units will by their nature increase the demand on Stafford County schools. To offset the capital cost of that demand, new schools will need to be constructed within this TDA.

The public facility needs are not limited to the items previously listed. The proposed residential development in the Berea TDA would have an estimated 5,115 residents, creating the need for the following public facilities. These facilities should be provided for within the TDA or in areas outside the TDA within close proximity and within the Urban Services Area.

Parks and Recreation	61 acres
Fire and Rescue	0.27 stations
Public Schools	
Elementary Schools	0.42 schools
Middle Schools	0.17 schools
High Schools	0.12 schools
Libraries	0.20 libraries

The data tables that serve as a basis for these public facility needs are provided in Appendix B of this document.

As previously mentioned in the TDA summary section entitled “Public Infrastructure and Services,” these new infrastructure requirements are the result of the new development, its density and location, and therefore will be the responsibility of the developer or developers of properties in the area.

Consistent with this goal, a proposed zoning change should offset the impacts of the new development. Impacts may be offset by voluntary proffers of such things as cash contributions, land dedication for a public facility, or construction of a public facility, as appropriate. Proffers may also include restrictions on the intensity and type of development. In the case of uses requiring a conditional use permit or special exception, the approving body may impose conditions to offset the impacts of the new development.

Phasing of Development

Near-term:

Berea (Undeveloped Land). Seen as an area where growth should be focused to support the businesses along the corridor. The potential for near-term development on vacant parcels is high. The development that has recently occurred in this corridor has followed the highway commercial development pattern.

Mid-term and Long-term:

Berea (Redevelopment). The area consists of a mix of highway commercial and industrial uses that do not fit in with the long-term vision of the Redevelopment Area plans. Widespread redevelopment of the area will take significant time and effort to achieve. It is suggested that the development phase will extend through the mid- and long-term time horizons.

Summary

Projected New Dwelling Units: 1,650

Projected New Commercial Sq. Footage: 3,750,000

Minimum Facility needs within the limits of the TDA (accounting for a portion of the total facility needs identified to serve the TDA):

Upgrades to Warrenton Road (Route 17) and other roads as shown in Figure 4.2 of the Transportation Plan

Passive and active recreational uses, plazas, and civic spaces

Falmouth Gateway (Warrenton Road East) Targeted Development Area

Situated along Warrenton Road (US-17), on the east side of Interstate 95, the Falmouth Gateway TDA consists of approximately 866 acres. The area extends to Washington Drive and the historic Falmouth Village area. This aging commercial corridor has the potential for redevelopment.

In total, the Falmouth Gateway TDA is recommended to include 1,650 residential dwelling units, including 750 multi-family, 400 townhouse, and 500 single-family units, and 1,000,000 square feet of business development.

Land Use Concept

Figure 3.15 provides a generalized land use concept plan to guide the future development of the Falmouth Gateway TDA.

The area is traversed by Warrenton Road, a major East-West connector for vehicular traffic, and acts as an important link for residents and other visitors to South Stafford and the City of Fredericksburg. Currently, the area is developed with a mix of aging highway oriented commercial uses. A mix of older and newly developing residential neighborhoods are located on the south side of Warrenton Road.

The position of this TGA on Interstate 95 (I-95) makes it attractive for hotels. The availability of road access and ample services and employment may also make this an attractive residential location. Additionally, historic Falmouth Village is a relatively easy to reach, creating an added attraction.

Design

Architectural standards (i.e., building height, mass, materials, amenities, and signage), minimum and maximum setback requirements, environmentally friendly materials, and other design features should be incorporated into any development, consistent with the Neighborhood Design Standards Plan. A mix of uses following the concepts of a traditional neighborhood design is recommended.

Public Facilities

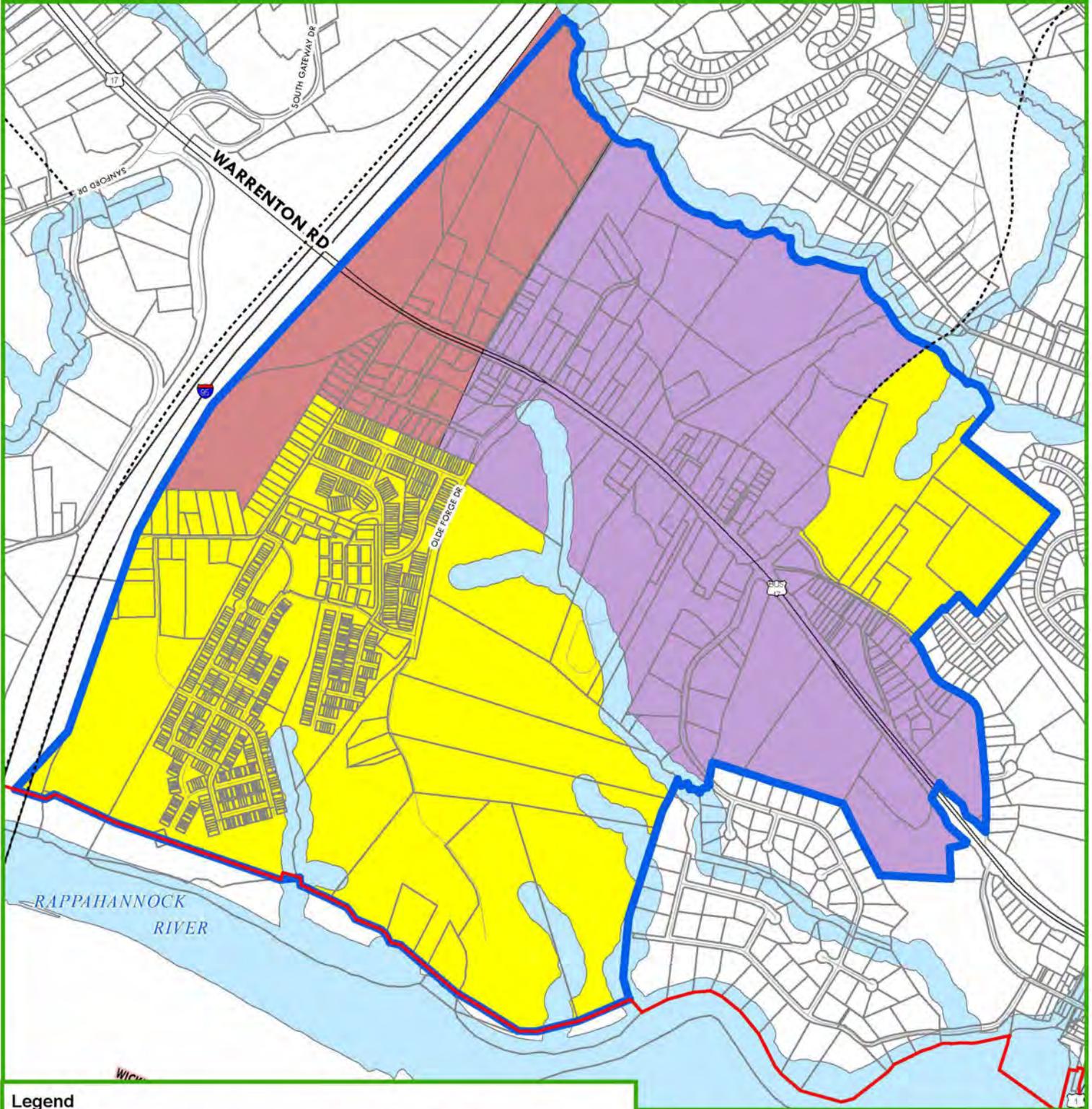
Getting the residents to and from work and other destinations without creating an undue hardship on them and other residents of Stafford County and the Commonwealth of Virginia will require the provision of adequate transportation facilities (beyond the internal community road network).

The roadway network should be designed and developed to provide a hierarchical system of interconnected streets and recognize the dual purpose and functionality of Warrenton Road (Route 17). A comprehensive access management plan should be developed to mitigate the impact of new development. Furthermore, upgrades to the existing transit facility on Warrenton Road may be necessary to offset increased vehicle volumes on I-95 during peak commute periods, including adding parking spaces to the existing park and ride facility.

It is recommended that this TDA include passive and active recreational uses, plazas and congregational spaces, as well as cultural activity. Dedication of open space to support these activities will be required.



FIGURE 3.15 Falmouth Gateway Targeted Development Area Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend

- Proposed New Roads
- Urban Services Area
- Targeted Development Areas

Land Use Classification:

- Commercial – Retail and Office
- Mixed Use – Commercial/ Residential
- Residential

0 600 1,200 2,400 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

The development of so many new dwelling units will by their nature increase the demand on Stafford County schools. To offset the capital cost of that demand, new schools will need to be constructed within this TDA.

The public facility needs are not limited to the items previously listed. The proposed residential development in the Falmouth Gateway TDA would have an estimated 5,115 residents, creating the need for the following public facilities. These facilities should be provided for within the TDA or in areas outside the TDA within close proximity and within the Urban Services Area.

Parks and Recreation	61 acres
Fire and Rescue	0.27 stations
Public Schools	
Elementary Schools	0.42 schools
Middle Schools	0.17 schools
High Schools	0.12 schools
Libraries	0.20 libraries

The data tables that serve as a basis for these public facility needs are provided in Appendix B of this document.

As previously mentioned in the TDA summary section entitled “Public Infrastructure and Services,” these new infrastructure requirements are the result of the new development, its density and location, and therefore will be the responsibility of the developer or developers of properties in the area.

Consistent with this goal, a proposed zoning change should offset the impacts of the new development. Impacts may be offset by voluntary proffers of such things as cash contributions, land dedication for a public facility, or construction of a public facility, as appropriate. Proffers may also include restrictions on the intensity and type of development. In the case of uses requiring a conditional use permit or special exception, the approving body may impose conditions to offset the impacts of the new development.

Phasing of Development

Near-term:

Falmouth Gateway (Undeveloped Land). Seen as an area where growth should be focused to support the businesses along the corridor. The potential for near-term development on vacant parcels is high. The development that has recently occurred in this corridor has followed the highway commercial development pattern.

Mid-term and Long-term:

Falmouth Gateway (Redevelopment). The area consists of a mix of highway commercial and industrial uses that do not fit in with the long-term vision of the Redevelopment Area plans. Widespread redevelopment of the area will take significant time and effort to achieve. It is suggested that the development phase will extend through the mid- and long-term time horizons.

Summary

Projected New Dwelling Units:	1,650
Projected New Commercial Sq. Footage:	1,000,000

Minimum Facility needs within the limits of the TDA (accounting for a portion of the total facility needs identified to serve the TDA):

- Upgrades to Warrenton Road (Route 17) and other roads as shown in Figure 4.2 of the Transportation Plan

- Passive and active recreational uses, plazas, and civic spaces

Boswell's Corner Targeted Development Area

Boswell's Corner is largely defined by Interstate 95 (I-95) to the west, the Marine Corps Base Quantico to the west, north and east, and Telegraph Road to the east. U.S. Route 1 runs north-south through the middle of the area. This area generally consists of roughly 354 Parcels that contain approximately 491 acres of land area.

Boswell's Corner is identified as a Targeted Development Area due to its location characteristics and development potential. As opposed to the other TDAs, where there is generally a more balanced mix of residential and commercial development, the primary focus of this TDA recommends business and industry development.

Boswell's Corner's location at the northern gateway into Stafford County, and proximate to Marine Corps Base Quantico (Quantico) and Interstate 95 (I-95), make the area attractive for redevelopment, especially with the anticipated growth at Quantico as a result of the Base Realignment and Closure (BRAC) actions. The biggest driver for the area is Marine Corps Base Quantico and those who serve the government operations.

Currently, development in the area is limited to a few service and automotive retail locations intermixed with industrial and residential. However, Quantico Corporate Center has been developing over the past decade and is nearing buildout. The area includes several class A office buildings, hotels, and complementary retail uses. The development is planned to continue southward with the extension of Corporate Drive to Telegraph Road.

Efforts to focus commercial development in this area date back many years. Boswell's Corner was targeted for redevelopment by Stafford County upon the presentation of Stafford County's Economic Development Plan of 2006, which states that this area exists as future economic development site due to location, road access, and the Quantico Marine Corps Base, which is expected to see significant gain in employment through the BRAC process. Boswell's Corner "stands as the gateway to Stafford County from the north. Development of high-quality office space and supporting retail would announce that Stafford County is an area for economic progress and not solely a bedroom community."

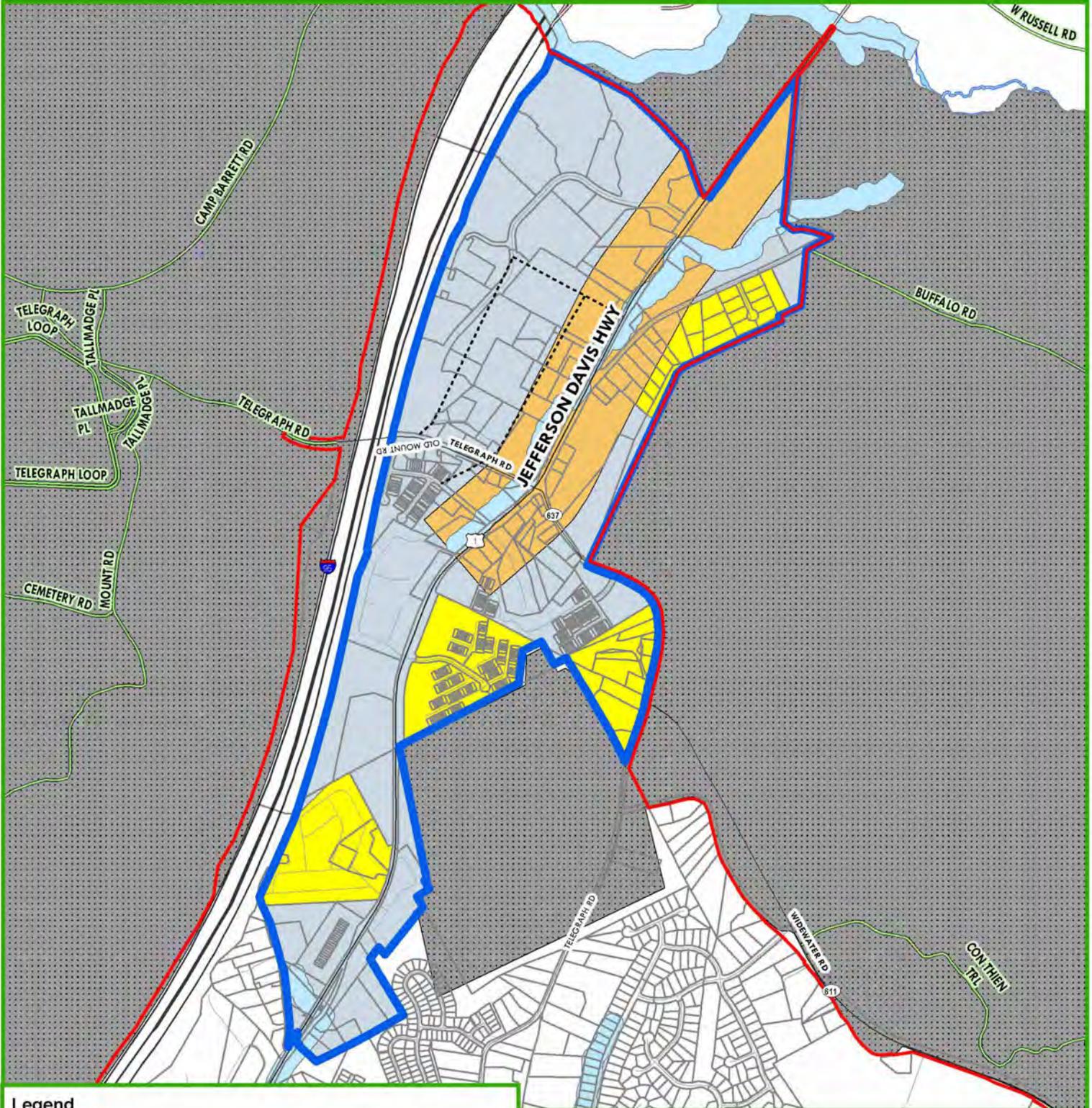
There are also several established housing developments interspersed throughout the area. One new 80-unit residential townhouse community known as Quantico Village is under construction. No additional residential developments are recommended in this area of the County due to the areas' proximity to Quantico and potential land use conflicts.

Land Use Concept

Figure 3.16 provides a generalized land use concept plan to guide the future development of the Boswell's Corner TDA. The area is recommended as a primarily Business and Industry future Land Use. Highway Commercial is recommended along U.S. Route 1 from the boundary with Prince William County to a point south of Telegraph Road. There are approximately 518 existing dwelling units in the area. No more than 80 additional dwelling units, anticipated in the approved Quantico Village development, is recommended.



FIGURE 3.16
Boswell's Corner
Targeted Development Area
Stafford County Comprehensive Plan
Stafford County, Virginia
September 8, 2021



Legend

- Proposed New Roads
 - Urban Services Area
 - Targeted Development Areas
- Land Use Classifications:
- Business and Industry
 - Highway Commercial
 - Residential

0 700 1,400 2,800 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Design

Architectural standards (i.e., building height, mass, materials, amenities, and signage), minimum and maximum setback requirements, environmentally friendly materials, and other design features should be incorporated into any development, consistent with the Neighborhood Design Standards Plan. A mix of uses following the concepts of a traditional neighborhood design is recommended.

Public Facilities

Getting the residents to and from work and other destinations without creating an undue hardship on them and other residents of Stafford County and the Commonwealth of Virginia will require the provision of adequate transportation facilities (beyond the internal community road network).

The roadway network should be designed and developed to provide a hierarchical system of interconnected streets to minimize the impact on U.S. Route 1, the main artery through this area. A comprehensive access management plan should be developed to mitigate the impact of new development.

The commercial development focus of this area with very few additional residential units will have a very slight impact on public facility needs. The limited residential development recommended in Boswell's Corner would add an estimated 248 residents, creating the need for the following public facilities.

Parks and Recreation	3 acres
Fire and Rescue	0.01 stations
Public Schools	
Elementary Schools	0.02 schools
Middle Schools	0.01 schools
High Schools	0.006 schools
Libraries	0.01 libraries

The data tables that serve as a basis for these public facility needs are provided in Appendix B of this document. These limited additional facility needs can be provided for as other nearby facilities are expanded or improved.

Consistent with this goal, a proposed zoning change should offset the impacts of the new development. Impacts may be offset by voluntary proffers of such things as cash contributions, land dedication for a public facility, or construction of a public facility, as appropriate. Proffers may also include restrictions on the intensity and type of development. In the case of uses requiring a conditional use permit or special exception, the approving body may impose conditions to offset the impacts of the new development.

Phasing of Development*Near-term:*

Expansion of Quantico Corporate Center is seen as near-term development as it is actively developing, and the expansion to the south is the logical next step in the development of this area. Other infill commercial development may occur on a piecemeal basis as opportunities arise.

Mid-term:

Other infill or redevelopment of commercial retail and office along this corridor may stretch into the mid-term planning horizon. The process of redeveloping existing uses and consolidating smaller parcels generally takes longer than development of raw land.

Summary

Projected New Dwelling Units: 80

Projected New Commercial Sq. Footage: 1,000,000

Minimum Facility needs within the limits of the TDA (accounting for a portion of the total facility needs identified to serve the TDA):

Upgrades to US Route 1 and other roads as shown in Figure 4.2 of the Transportation Plan

Suburban Areas

Suburban Areas of the County are areas where suburban scale of development is most appropriate. Suburban scale of development is considered single-family detached dwelling units, typically on $\frac{1}{4}$ to $\frac{1}{2}$ acre lots, and $\frac{1}{2}$ to 1 acre lots or larger towards the boundary of the USA, which may include community amenities and are buffered from any adjacent commercial development. Lot sizes less than $\frac{1}{4}$ acre may be supported if located adjacent to higher density residential or commercial development. These areas are intended to serve as infill development in proximity of the established communities in the northern and southern areas of the County and in proximity to major existing or planned transportation networks.

Focus should be on the form of development and its relationship with existing communities. Such areas will be primarily residential in nature but will be complimented by neighborhood and community oriented activity centers, places of worship, parks and play areas, and retail and business activities. Development densities should not exceed three (3) dwelling units per acre for residential development and a floor area ratio (FAR) of 0.4 for non-residential development. New dwelling unit types should be limited to single-family detached homes. Townhomes and apartments are permitted where land is already zoned for these types of dwelling units or under *Special Conditions for Townhomes and Multi-family Units* described in the following Residential section. Otherwise, all structures should be low rise in nature and not exceed three stories in design. Site lay-out and building design shall be oriented to compliment, be in scale with and minimize undesirable effects to existing neighborhoods and communities. Preservation of unique or sensitive environmental features should be incorporated into development design. Parking areas should be primarily off-street. Sidewalks and pedestrian trails should be located within neighborhoods and provide access between residential and non-residential uses. Commercial development should be oriented along arterial transportation corridors or at nodes where arterial and collector roads intersect.

More detailed design parameters are provided regarding residential, commercial and industrial uses within the Suburban land use designations.

RESIDENTIAL

The Plan recommends that new residential development in Suburban Areas should be limited to single-family detached housing types with the exception of projects that meet the *Special Conditions for Townhomes and Multi-family Units* provisions. Single-family detached units may be developed at a maximum density of three (3) units per acre. On land that has previously been rezoned or approved for a more urban form of residential development, single-family attached units (townhomes) may be developed at a density of three and a half (3.5) to seven (7) units per acre and apartment/condominiums may be developed at a density of seven (7) to fifteen (15) units per acre.

Special Conditions for Townhomes and Multi-family Units

A goal of the Plan is to locate at least 80% of the future cumulative residential growth within the Urban Services Area, and outside of the Agriculture/Rural Area. The design and construction of infill development, including mixed-use projects, will be considered to further this goal and reduce impacts on the environment and best utilize existing infrastructure. The use of reduced perimeter buffers and clustering will allow in-fill development to utilize higher densities without impacting adjoining properties. The opportunity for residents to live, work, and play within the same

development reduces impact on regional highways, reduces sprawl, and increases each citizen's satisfaction with their community.

If the land has not been previously rezoned or developed, single-family attached units (townhomes) and apartment/condominiums may be developed under the following special situations:

- A. As infill development in the Suburban land use district if:
 - 1) It is located on land where 60 percent or more of the linear footage of the property perimeter physically abuts property that has been or is currently approved for the same type of dwelling unit (e.g. townhomes next to townhomes, and condominiums next to condominiums) or a higher density dwelling unit type (e.g. proposed townhomes next to existing or planned condominiums);
 - 2) The density and design of the units would be compatible with the current pattern of development of adjacent parcels; and
 - 3) The infill development appropriately mitigates visual impacts from existing or planned lower density dwelling unit types or other incompatible uses through buffering or site design.

- B. As mixed-use infill development on property within and adjacent to designated Commercial Corridors in the Suburban land use district if:
 - 1) It is located on land where 60 percent or more of the linear footage of the property perimeter physically abuts property that has been or is currently approved for commercial, industrial, or residential development and is inside of the Urban Services Area;
 - 2) The development is located on a major County transportation corridor such as Garrisonville Road, Courthouse Road, U.S. Route 1, or Warrenton Road;
 - 3) It is located within two (2) miles of any existing or planned ramp accessing Interstate 95;
 - 4) The development includes a mix of commercial and residential uses, with uses integrated into the same building(s) or as part of a unified project, and commercial uses of sufficient scope based on the entirety of the project;
 - 5) A phasing plan is proffered for the development that demonstrates that a significant portion of the non-residential uses will be built before all residential dwellings are constructed;
 - 6) Residential uses are designed to be integrated into existing or planned adjacent commercial uses, if practical, by providing vehicular and pedestrian connections;
 - 7) The infill development appropriately mitigates visual impacts from the perspective of existing or planned lower density dwelling unit types or other incompatible uses through buffering or site design; and
 - 8) When structures are proposed to exceed three stories, consideration is given to the need for mitigation of impacts to adjacent properties through enhanced buffering, landscaping, screening or other site design considerations. Mitigation may include wider transitional buffers, retention of existing trees, increased new tree plantings, or utilizing evergreen trees, berms, or fences.

- C. If a project does not meet these special situations, dwelling units other than single-family detached may be allowed on a case by case basis, provided that they are compatible with the existing nearby development and do not exceed a density of 3.0 dwellings per acre.

Residential development should be designed and located with consideration given to the local road network. Single-family detached housing developments generally have access to collector streets. Residential developments should be designed to provide adequate and safe traffic flow and emergency service access. Interconnecting local streets should be planned between residential subdivisions.

Buffering should be required along major arterial and collector roads to limit road noise in residential areas. Residential development should be appropriately buffered and set back from commercial and industrial uses. In Planned Development districts, site specific evaluations can determine if buffers and setbacks can be reduced.

Residential developments should be designed to provide an aesthetically pleasing community with open space areas and in proximity to public parks and schools. Infill lot development which makes use of existing public infrastructure investments should be considered.

The use of innovative development techniques (clustering, zero lot lines and planned unit developments) are encouraged to allow for development with minimal impact on sensitive natural resources (steep slopes, poor soils, floodplains, and drainage ways). Developments are encouraged to preserve twenty-five (25) to fifty (50) percent of the site for a combination of natural and usable open space.

Staffordshire:

An approved residential project known as Staffordshire is identified in a Suburban Land Use area west of Abel Reservoir, separated from the larger Suburban areas. This project was approved with proffers that limited the site to a maximum of 336 dwelling units. It is the purpose of this Plan to maintain the existing limitation on the number of dwelling units.

COMMERCIAL RETAIL AND OFFICE

Development of commercial areas should be conducted in a manner to minimize noise, social, transportation and visual impacts on established residential neighborhoods. The Plan identifies commercial corridors and nodes within Suburban and Urban Areas where commercial development has occurred or is envisioned. Residential development within commercial corridors or nodes should only be allowed in accordance with the *Special Conditions for Townhomes and Multi-family Units* section of this chapter. It is not intended for commercial development to be limited only to the commercial corridors and nodes designated on the map.

Commercial activities should be located where there are adequate transportation facilities to accommodate the use. Development along commercial corridors should incorporate limited points of road access or shared access points to limit the number of turning movements, thereby placing fewer restrictions on traffic flow and reducing the potential for vehicle conflicts. Development of less intensive service-oriented suburban commercial uses are encouraged near major residential developments along major collector roadways with secondary access to other collector streets.

Infill development and the reuse of vacant commercial sites will be considered along existing commercial corridors, including U.S. Route 1, Courthouse Road, Garrisonville Road, Warrenton

Road, and Kings Highway. Infill development in this case is defined as new construction or significant reconstruction of existing commercial sites, with the exception of historically significant structures.

Commercial uses adjacent to residential uses should be designed such that the commercial use is integrated into and accessible to the community and designed so as to be unobtrusive to and compatible with the community. Provisions for shared parking to minimize impervious cover should be considered. Adequate parking for both residential and non-residential uses should be ensured.

Development of commercial and office areas should include mitigation of potential environmental impacts through preservation of significant features and natural vegetation, as well as site design and layout to incorporate open spaces and green areas.

The following design criteria should apply to business development along arterial and major collector roadways (including, but not limited to, U.S. Route 1, Courthouse Road, Garrisonville Road, Warrenton Road, and Kings Highway) to minimize the potential for vehicle conflicts:

- *Shared access for site entrances should be provided along the corridor highways;*
- *Building setbacks and design should be consistent to the greatest extent practical;*
- *Inter-parcel access between commercial uses should be provided;*
- *Adequate street buffers should be provided;*
- *Sidewalks should be provided along all street fronts;*
- *Adequate lighting should be provided. Fixtures within parking lots should be cutoff style. Street and sidewalk lighting should be designed to complement the nearby community character. Lighting should be directed away from abutting properties and the corridor highway;*
- *Monument signage should be of a coordinated color and design with principal structures with limitations on the height and size;*
- *The use of carnival style flags, banners, balloons and other devices that may be seen as a distraction to vehicular travel should not be allowed.*

Vehicle sales are highway-oriented businesses and should be limited to major arterials, at or near major intersections. In the Suburban Area designation, new and used vehicle sales, including automobiles and boats, should be limited to the area along U.S. Route 1 near the intersection with Ramoth Church Road; and near the intersection with Garrisonville Road.

The following design criteria should apply to neighborhoods serving commercial development in Suburban Areas adjacent to existing or approved single-family detached or attached development.

- *Structures should be low rise and situated such that they are integrated with the surrounding community;*
- *Maximum floor area ratio should not exceed 0.35 and open space ratio should be at least 0.4;*
- *Sidewalks should be provided along all street fronts;*
- *Adequate lighting should be provided. Fixtures should be cutoff style and not exceed twenty feet in height. Lighting should be directed away from abutting properties;*
- *All loading areas abutting residential uses should be screened with opaque fencing and natural vegetation. Where natural vegetation is insufficient, a variety of evergreen and deciduous landscaping may be substituted;*

- *Inter-parcel access between commercial uses should be provided;*
- *Pedestrian trails should be extended off-site to access secondary streets and other trail systems;*
- *Architectural design should be compatible with the neighborhood character and architectures. Massing, texture and materials should be similar to those predominantly used by nearby residences. Front facades should consist at least partly of brick or equally suitable materials. All facades immediately visible from any public street or nearby residence should have architectural treatment of brick, textured masonry or siding;*
- *Maximum building height should be 35 feet;*
- *All parking areas should be landscaped;*
- *Structures should be located in such a way as to maximize pedestrian accessibility.*

Recommended uses in Commercial nodes adjacent to residential development should be low to medium intensity. High intensity uses require a conditional use permit to protect against potential negative impacts. The use of drive-thru windows should be limited. Single use sites should be discouraged. Recommended uses include the following:

- *Bakery*
- *Bank and lending institution*
- *Barber/beauty shop*
- *Convenience center*
- *Dance studio*
- *Drug store*
- *Dry cleaner/laundry*
- *Florist*
- *Gift/antique shop*
- *Low intensity commercial retail*
- *Medical and dental clinics and Offices*
- *Medium intensity commercial retail*
- *Place of worship*
- *Professional office*
- *Restaurant*
- *Retail food store*
- *Tailor shop*

The Plan encourages the location of office uses in commercial nodes and corridors, and as a transition between more intense commercial uses and residential uses. Office developments should be located along or in close proximity to major collector or minor arterial roadways with secondary access to other collector streets. Office developments may be free-standing structures or office parks. The following design criteria apply to office development:

- *Office development should be in scale with adjacent residential development. Where there is no existing residential development adjacent to office uses, the development of the structures should be in a manner to be in scale with the planned development pattern;*
- *Sidewalks should be provided along all street fronts and tie into existing pedestrian facilities;*
- *Adequate lighting should be provided for parking lots and on-site pedestrian walkways. Fixtures should not exceed twenty feet in height. Lighting should be directed away from residential properties;*
- *All loading areas and refuse disposal sites should be screened from view of any public street or residence;*

- *Mechanical or telecommunications equipment should be screened from view of any public street or residence;*
- *Architectural design should be compatible with the neighborhood character and architecture. Architectural treatment such as brick, stone, stucco, split face block, wood or glass should be encouraged, while materials such as unadorned cinder block, corrugated or sheet metal should be discouraged.*
- *Vegetated, pervious green space, should be incorporated into overall design, as well as amenities including plazas or other gathering spaces for employees*

INDUSTRIAL

Areas designated for clean, non-nuisance industrial uses which are not water intensive and are located near railroad lines and/or major highways. Preferable industrial development in Suburban Areas provides goods and services to nearby businesses and residences, including warehousing, wholesaling, manufacturing, processing operations, mixed-use commercial/industrial development, and flex office space.

The following design criteria should apply to industrial development in Suburban Areas.

- *Industrial development should be adequately screened and set back from nearby residential uses to minimize visual and noise impacts.*
- *Maximum floor area ratio should not exceed 0.35 and open space ratio should be at least 0.20;*
- *All loading areas abutting residential uses should be screened with opaque fencing and natural vegetation. Where natural vegetation is insufficient, a variety of evergreen and deciduous landscaping may be substituted;*
- *Maximum building height should be 40 feet;*
- *All parking areas should be landscaped;*
- *Adequate lighting should be provided. Fixtures should be cutoff style and not exceed twenty feet in height. Lighting should be directed away from abutting properties.*

Business and Industry Areas

Areas of the county where large-scale business and industry activities are encouraged. These areas are to be the primary economic engines for the County. Such businesses and industries would primarily serve markets that stretch beyond the County borders. Activities will typically include retail, wholesale, corporate and professional offices, research and development, entertainment, manufacturing, distribution and transportation. Special consideration shall be given when locating heavy industrial uses in these areas. Buildings would typically be large in nature with extensive setbacks, parking and lot coverage requirements. They should be located in proximity to major transportation facilities. Residential activities in the area should be discouraged. Where such areas abut existing residential communities, berms, buffers, noise attenuation measures and additional setbacks may be necessary to minimize community conflicts.

It is noted that new and used vehicle sales, including automobiles and boats, shall also be considered in Business and Industry areas along major arterials, where compatible uses exist. This includes areas along U.S. Route 1 between Ramoth Church Road and Potomac Creek.

Agricultural/Rural Areas

Areas of the county where farming, forestry and land conservation activities are encouraged. Location of new single-family detached dwelling units are to be discouraged; however, such uses may be developed at a maximum density of one (1) unit per six (6) acres. These areas are located beyond the limits of the Urban Service Area and would have limited community services. Agricultural service establishments and community service retail establishments may be located at significant crossroads. As a means to support agriculture and the existing rural character, some of these areas are designated as sending areas in the current transfer of development rights (TDR) program. They are also the focal point for the County's purchase of development rights (PDR) programs and voluntary land conservation efforts.

To help preserve the rural character, the following design criteria for development are recommended for the Agricultural/Rural area:

- useable open space shall be preserved for agriculture, forestry, and conservation purposes
- areas containing steep slopes greater than 35%, Resource Protection Areas, and floodplains should be excluded from the developable area
- a building setback of 100 feet should be maintained from the perimeter boundary where located adjacent to existing agricultural uses
- a building setback of 100 feet to be maintained along existing state-maintained roads to help retain the scenic quality of rural county roads
- wildlife migration corridors to be maintained where identified. Connectivity of open space areas shall be considered to enhance wildlife movement
- large stands of trees shall be maintained to the greatest extent possible on forested tracts of land
- the preservation of cultural resources to be considered in accordance with the Cultural Resources Management Plan
- cluster subdivisions should be encouraged where permitted
- Low Impact Development (LID) practices should be encouraged for stormwater management

Mining and Extraction

This designation identifies the location where mining and extraction activities are actively occurring or planned through previously approved expansions to existing operations or new operations. These areas correspond with the M-2, Heavy Industrial zoning designation. Associated processing uses may occur in this area, including asphalt and sand and gravel manufacturing. These uses shall be well buffered from residential uses so as to minimize noise and visual impacts.

Parks

Areas identified for parks and recreation that may attract visitors from the County, region and state. These parks are comprised of expansive land holdings that are owned and or managed by local government and state agencies. They may have limited or focused recreational activities. Extensive areas would be devoted to passive recreation and conservation. These areas do not

reflect all parkland in the County, such as neighborhood scale parks located in Suburban and Urban Areas.

OTHER LAND USE CONSIDERATIONS - NOT SPECIFICALLY DESIGNATED ON THE FUTURE LAND USE MAP

Special Uses

The educational opportunities in the region are enhanced by higher education institutions and cultural and performing art venues. The continued expansion of these uses is encouraged. Although not specifically designated on the Land Use Map, general location criteria are provided. Within the Urban Services Area, the County supports the continued expansion of higher education facilities and performing art venues. These facilities should be in close proximity to major population centers and be sited and designed for minimal impact on the existing community and transportation networks.

The location of cultural venues such as museums may be less reliant on urban services, although the impact on transportation and the surrounding uses and landscape should be a major consideration.

Tree Preservation Guidelines

Preservation of trees and forest cover is a priority over replanting where existing tree cover exists. Preservation of existing trees provide many benefits to the environment and community. Mature trees and forest cover improve air quality, provide, for healthy streams and wildlife habitat, reduce the urban heat island effect, and community benefits include providing visual and sound buffering from road traffic or other conflicting land uses, and provides recreational opportunities. The following standards should be considered in the planning and evaluation of new development proposals.

- Any new development should be designed with a goal of preserving existing mature tree cover over removal.
- Any rezoning proposal should include an environmental inventory map that identifies all sensitive environmental resources, including streams, wetlands, steep slopes, 100-foot CRPA, and tree cover.
- Site design should prioritize development outside of identified sensitive areas.
- Consideration of tree preservation areas should consider the existing characteristics on adjacent properties, with a goal of maintaining uninterrupted forest areas or stream and wildlife habitat corridors.
- Avoidance of clearing into stream corridors should be a top priority. If this is unavoidable, encroachment and clearing should be the minimum necessary to access development areas.
- Retention of mature tree cover is recommended for the purpose of buffering uses from adjacent properties or developments.
- Invasive, dead, diseased or dying trees may be removed and replaced with a variety of native species.

- Clearing and grading limits should avoid critical root zones to maximize.
- Tree replanting should be considered where land clearing cannot be avoided.

Development adjacent to High-voltage Electric Transmission Lines

To minimize land use conflicts adjacent to high-voltage transmission lines, the following guidelines are recommended for development inside the Urban Services Area:

For residential development:

- Locate residential lots outside of the powerline easements.
- Retain existing trees between the easement and any residential lots.
- Designate community open space within the easement areas,
- Neighborhood streets required to traverse these easements should do so at 90-degree angles
- Provide consideration to viewsheds within the neighborhood. For example, sight vista terminations along neighborhood streets should avoid powerline towers.

For commercial development:

- Orient main entrances to stores and shopping areas away from power lines.
- Limit use of powerline easement areas for overflow parking or open space.

Other Economic Development Primary Focus Areas

The County's Economic Development efforts cover all corners of the County and have different focus. Although the majority of the efforts are focused on attracting businesses to our Targeted Development Areas, this section highlights some of the other efforts and areas outside the TDA that deserve special attention. These primary focus areas can be categorized as: Commercial/Retail; Industrial; Tourism, and; Water Access/Recreation. The following notes the locations within each category. Figure 3.17 identifies the location of each of these primary focus areas in the County.

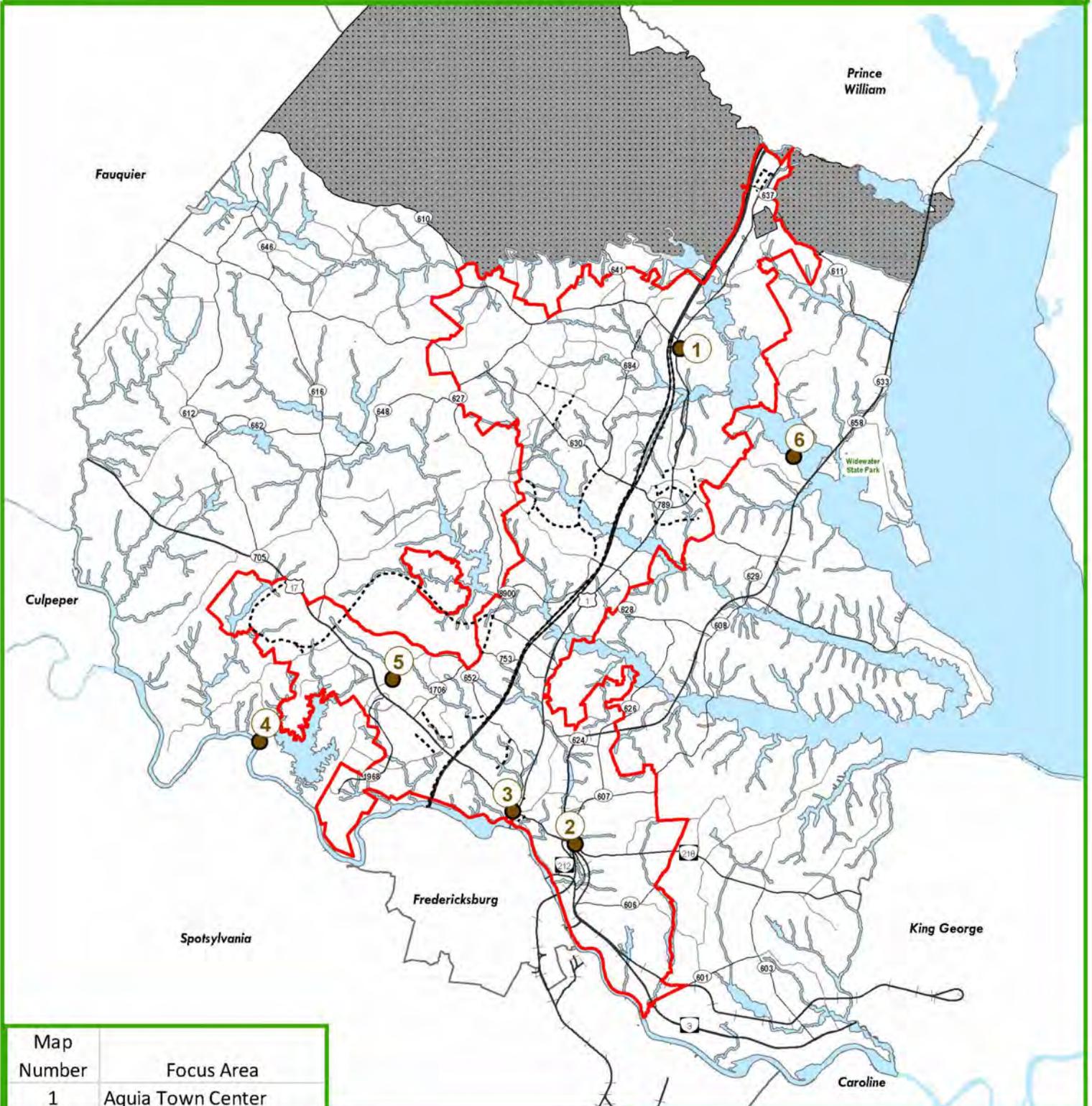
Commercial/Retail Primary Focus Area

- **Aquia Town Center**

This Planning Area represents the Aquia Town Center private redevelopment project. Aquia Town Center consists of 75 acres and is located along U.S. Route 1, on the east side of Interstate 95 (I-95) at the Garrisonville Road/Aquia exit. The site is located adjacent to the entrance into Aquia Harbour. The original shopping center was demolished and redevelopment of the site was planned to include a mix of uses. However, redevelopment has gone stagnant. A Class-A office building and apartments are existing. Commercial retail uses are envisioned in the remainder of the site. Properties fronting on U.S. Route 1 include existing highway commercial uses. These uses are recommended to continue.



FIGURE 3.17
Other Economic Development
Primary Focus Areas
Stafford County Comprehensive Plan
Stafford County, Virginia
 September 8, 2021



Map Number	Focus Area
1	Aquia Town Center
2	Cool Spring Road
3	Historic Falmouth Village
4	Old Banks Recreation
5	Stafford Industrial Park
6	The Marina District

Legend

- Proposed New Roads
- Urban Services Area

0 7,500 15,000 30,000 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Industrial Primary Focus Areas

- **Stafford Industrial Park / International Parkway**
- **Cool Spring Road**

Stafford Industrial Park / International Parkway is located along Warrenton Road, west of Interstate 95, and represents a dedicated industrial park. The Cool Spring Road area represents the properties along this collector road. The area is not a dedicated industrial park, but rather has grown over time into a collection of various industrial uses. These areas are highlighted as locations that support the continued growth of light industrial and manufacturing uses.

Tourism Primary Focus Area

- **Falmouth Village**

The heart of Falmouth Village, located at the southern portion of Stafford County, is generally defined as the crossroads of Warrenton Road (US-17) and Cambridge Street (US-1). The redevelopment area is generally bounded by Truslow Road to the north, the Rappahannock River to the south, Colonial Avenue to the east and Melcher Drive to the west. This area generally consists of roughly 200 parcels within approximately 146 acres of land area.

One of the earliest colonial settlements in the area, historic Falmouth Village presents a unique opportunity to preserve, enhance and develop a cultural attraction in Stafford County. This village, setting adjacent to the Rappahannock River, is already recognized as a National Register Historic District and contains some of the most significant historic sites in Stafford County.

Current land uses include commercial uses, intermixed with residential communities. Much needed access improvements were identified as vital to its potential to provide another center to foster economic opportunity that could add to Stafford County's strength. A Master Interpretive Plan for the Historic Falmouth District was adopted by the Board in May, 2014. This document is part of ongoing efforts by the County to preserve important history while also considering the opportunities for tourism and economic development. The plan offers a way forward to help focus decisions in communicating the stories of the Historic Falmouth District, a once prosperous town that is now a quiet residential community. The effort will require investments in parking, interpretive media and a sustained plan involving public-private partnership.

Water Access/Recreation Primary Focus Area

- **Marina District**
- **Old Banks River Access**

The Marina District represents the area along Aquia Creek that includes several private marinas. These are located off of Willow Landing Road, Hope Road, and Aquia Creek Road. The Old Banks Area represents a potential public access point along the Rappahannock River at the location of the water intake station for the Lake Mooney Reservoir. This is located via an access easement off of Old Banks Drive.

Access to the riverfront areas in the County is identified as a Priority Focus Areas in the Economic Development Strategic Plan. These areas are identified as potential locations where

the County can promote access to the County's water resources through appropriate commercial development. The County has not been able to tap into its waterfront amenities because a significant amount of waterfront land is in conservation districts or privately owned. A challenge is that many of the waterfront sites are underserved by road and utility infrastructure. The Economic Development Plan identifies that the Marina District should be considered for attractive, high-end restaurants, niche retail, marinas or other complementary uses such as eco-tourism businesses. The Old Banks Area is one of the few potential public access points to the upstream portion of the Rappahannock River

3.7 Land Use Map Growth Projections

This section of the Plan includes an evaluation of the projected residential and commercial growth of the County under the draft Land Use Plan. The Growth projections look at the amount of growth that can be expected over the 20 year planning horizon from 2016 to 2036. The year 2021 update modifies this same 20-year projection based on the latest available data.

Growth Projections

Growth projections have been applied to the Land Use Map to identify where the County desires growth to occur over the next 20 years. The projections anticipate the amount of future growth inside the Urban Services Area (USA) in suburban areas, targeted growth areas (TDAs), and business and industry areas, as well as outside the urban services area. Growth projections are based on County projections and County commercial growth estimates. Determining how growth is divided across the County is based on the following facts and assumptions or goals:

- Assumes the addition of 18,355 future dwelling units countywide between years 2016 and 2036. This future growth estimate is derived by County staff based on the most recent population estimates and past building permit trends.
- Projects a total population growth of 56,900 additional residents between 2016 and 2036 (derived by multiplying the number of future dwelling units by the average persons per household of 3.10).
- Future residential growth includes a goal to achieve 80 percent of future growth inside the USA
- Conversely, assumes 20 percent of the future residential growth will occur in Rural Areas outside of the Urban Services Area
- Plans for over half of future population growth, or 10,570 future dwelling units, within designated TDAs.
- The following assumptions have been made for non-residential growth:
 - Countywide, at least 1 million square feet of non-residential growth per year is anticipated based on past growth (i.e., 10 million square feet over 10 years)
 - Projects 500,000 square feet of non-residential growth per year outside of TDAs in industrial, suburban and rural areas (half of the anticipated growth)
 - Projects that additional non-residential growth will occur in TDAs beyond past growth levels. Some TDAs will take a different form of development than previously seen in the County. Non-Residential development will likely be better integrated into the traditional neighborhood development fabric.

The outcome of the growth projections can be found in Table 3.4. The table divides the growth projections among the areas designated on the future land use map. The County should track the location of future growth on a regular basis to evaluate how new development is conforming to these projections.

Projected Dwelling Unit Types

Provided below is an estimation of the dwelling units by type in each of the land use designations that support residential development. The unit totals correspond with the growth projections in Table 3.4. To clarify the chart, the Suburban category includes an estimated number for each dwelling unit type. The particular mix of unit types will vary depending on market conditions. An

assumption made in this chart is, regardless of the unit mix, the end result is to meet the goal of 4,114 dwelling units in Suburban areas. The TDA dwelling unit mix reflects the recommendations within the individual TDAs.

<u>Dwelling Unit Type</u>	<u>TDA</u>	<u>Suburban</u>	<u>Rural</u>	<u>Total</u>
Single-Family	3,050	3,114	3,671	9,835
Townhouse	1,830	500	---	2,330
Multi-family	5,690	500	---	6,190
Total	10,570	4,114	3,671	18,355

Table 3.4 Land Use Map Growth Projections

INSIDE THE URBAN SERVICES AREA					
SUBURBAN					
Sub-Area	Net Acreage	Residential Units			Projected Non-Residential Square Footage (5)
		Existing	Projected (1)	Total	
North	13,567	18,674	2,501	21,175	1,500,000
South	13,774	13,355	3,715	17,070	2,000,000
Staffordshire	617	-	336	336	-
Sub-Total	27,958	32,029	6,552	38,581	3,500,000
PLANNING AREAS (2)					
Courthouse	2,580	1,255	3,750	5,005	5,000,000
Central Stafford	5,311	224	1,750	1,974	12,075,000
Warrenton Road	2,587	772	3,300	4,072	4,750,000
Leeland Town Station	328	151	780	931	123,660
Brooke Station	212	26	240	266	40,000
Boswells Corner	621	518	-	518	1,000,000
Aquia Town Center	75	2	-	2	-
Historic Falmouth Village	146	63	-	63	-
Sub-Total	11,860	3,011	9,820	12,831	22,988,660
BUSINESS/INDUSTRY					
Central Stafford Corridor	341	27	-	27	700,000
Stafford Industrial Park	165	-	-	-	250,000
Cool Spring Road	169	6	-	6	250,000
Sub-Total	675	33	-	33	1,200,000
OTHER					
Resource Protection Area	4,570	357	-	357	-
Park	532	7	-	7	-
Total	5,102	364	-	364	-
INSIDE THE URBAN SERVICES AREA TOTALS					
Total	Acreage	Residential Units			Projected Non-Residential Square Footage
		Existing	Projected (3)	Total	
Total	45,595	35,437	16,372	51,809	27,688,660

OUTSIDE THE URBAN SERVICES AREA					
AGRICULTURAL/RURAL AREA					
Sub-Area	Net Acreage	Residential Units			Projected Non-Residential Square Footage (5)
		Existing	Projected (1)	Total	
All Agricultural/Rural Areas	75,487	9,647	4,168	13,815	250,000
Total	75,487	9,647	4,168	13,815	250,000
PLANNING AREAS (2)					
Central Stafford	1,431	169	-	169	
The Marine District	337	38	-	38	
Potomac Landing	2	-	-		
Old Banks Recreation	5	-	-		
Rappahannock Recreation	373	1	-	1	
Widewater	1,453	103	-	103	
Sub-Total	3,601	311		311	
OTHER					
Resource Protection Area	17,855	99	-	99	
Mining	1,014	5	-	5	
Park	4,734	-	-	-	
Federal	32,221	-	-	-	
Total	55,824	104	-	104	
OUTSIDE THE URBAN SERVICES AREA TOTALS					
	Acreage	Residential Units			Residential Square Footage
		Existing	Projected (3)	Total	
Total	134,912	10,062	4,168	14,230	250,000
COUNTYWIDE PROJECTIONS					
	Acreage	Residential Units			Projected Non-Residential Square Footage
		Existing	Projected (3)	Total	
Inside the USA	45,595	35,437	16,372	51,809	27,688,660
Outside the USA	134,912	10,062	4,168	14,230	250,000
Total	180,507	45,499	20,540	66,039	27,938,660

3.8 Transfer of Development Rights

The Board of Supervisors adopted the Transfer of Development Rights Ordinance, O13-21, on February 19, 2013, establishing a Transfer of Development Rights (TDR) program in Stafford County. The Board of Supervisors then adopted Ordinance O15-06 on February 17, 2015, and Ordinance O17-19 on June 20, 2017, further enabling the TDR program.

The purpose of the TDR program is to provide a mechanism by which a property owner can transfer by-right residential density from sending areas to receiving areas and/or to a transferee without relation to any particular property. This is a voluntary process intended to permanently conserve agricultural and forestry uses of lands, reduce development densities on those and other lands, and preserve rural open spaces and natural and scenic resources.

The TDR program complements and supplements County land use regulations, resource protection efforts, and open space acquisition programs. The TDR program also encourages increased residential and commercial density in areas that can better accommodate this growth with less impact on public services and natural resources.

Sending Areas are defined as those authorized areas from which development rights can be severed and transferred to a receiving area or transferee without relation to any particular property. Figure 3.8, Sending and Receiving Areas Map, shows the sending area, outlined in blue, which is land located east of the CSX rail line, north of Potomac Creek, and south of Aquia Creek. To qualify as a sending area, property shall be:

- (1) Designated for agricultural, rural, or park land use(s), in the Comprehensive Plan;
- (2) Located within areas designated as sending areas on the map entitled “Figure 3.8 Transfer of Development Rights Sending and Receiving Areas Map” in the Comprehensive Plan; and
- (3) Zoned A-1 (Agricultural) or A-2 (Rural Residential) on the Zoning Map and meet one of the following criteria:
 - (i) A separate parcel in existence on the effective date of the Transfer of Development Rights ordinance that is at least twenty (20) acres;
 - (ii) Contiguous parcels in existence on the effective date of the Transfer of Development Rights Ordinance comprising at least twenty (20) acres and are under the same ownership on the date of application; or
 - (iii) A separate parcel in existence on the effective date of Transfer of Development Rights Ordinance that is at least two (2) acres and designated as Park on the Land Use Map in the Comprehensive Plan.

Receiving Areas are defined as areas authorized to receive development rights transferred from a sending area. Figure 3.18, Sending and Receiving Areas Map, shows the receiving area, outlined in red. To qualify as a receiving area, property shall be:

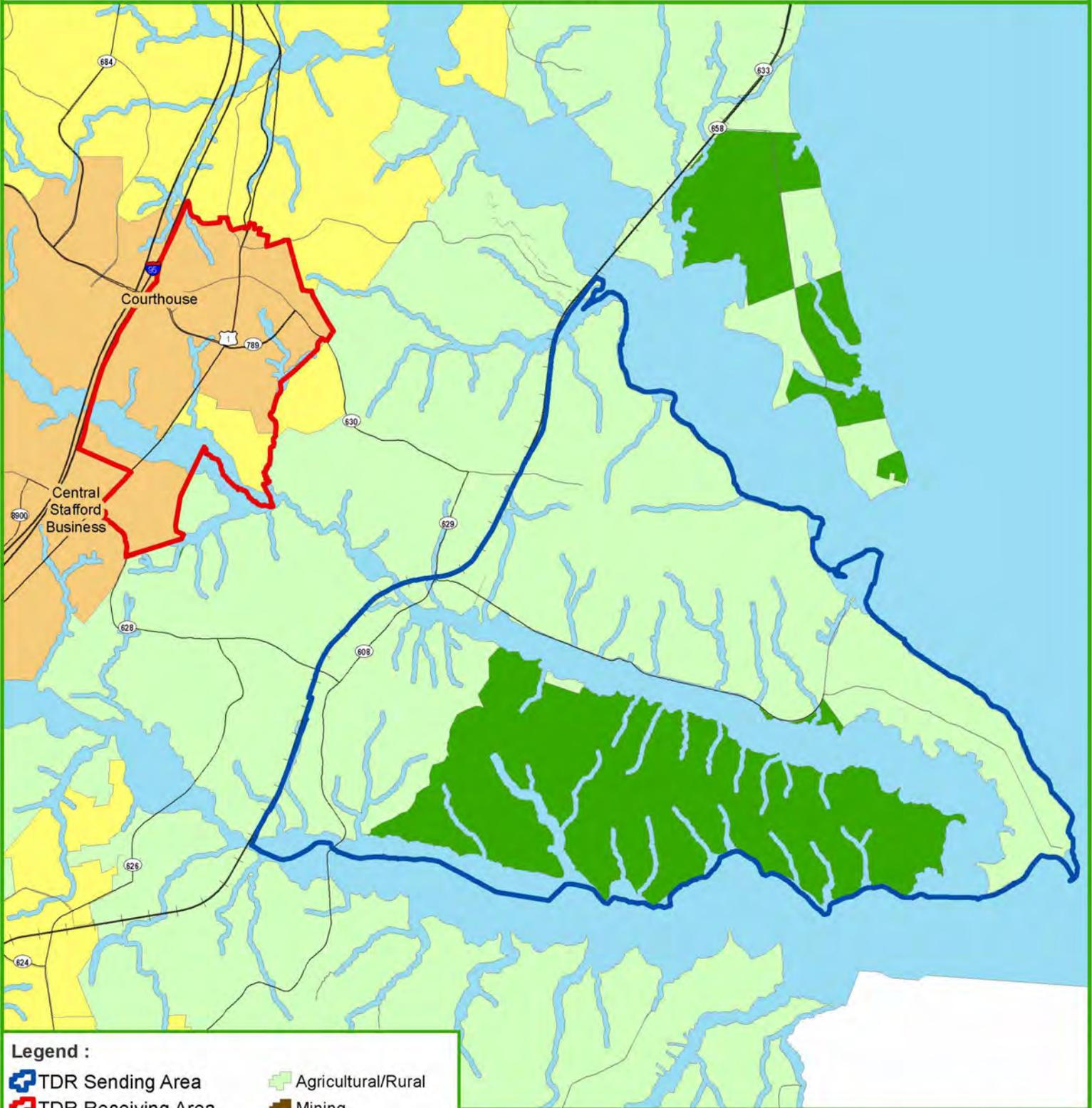
- (1) Located in one of the following zoning districts: A-1, Agricultural; R-1, Suburban Residential; PD-1, Planned Development -1, PD-2, Planned Development-2; P-TND, Planned Traditional Neighborhood Development; UD, Urban Development; and B-3, Office;
- (2) Located within a receiving area on the Sending and Receiving Areas Map;
- (3) Located within the USA by the Comprehensive Plan; and
- (4) Included in an assessment of the infrastructure in the receiving area that identifies the ability of the area to accept increases in density and the plans to provide necessary utility services within any designated receiving area.

Under the TDR program, the sending area could send up to an estimated 1,490 units and the receiving area could accommodate up to an estimated 3,081 future units. The success of the TDR program may alter the number of units built in the rural areas but it will not change the number of units in the overall Comprehensive Plan.

Architectural Design of structures constructed within the receiving area should utilize materials, quality, appearance, and details pursuant to the Neighborhood Design Standards Plan element of the Comprehensive Plan.



FIGURE 3.18
Transfer of Development Rights
Sending and Receiving Areas
Stafford County Comprehensive Plan
Stafford County, Virginia
September 8, 2021



Legend :

-  TDR Sending Area
-  TDR Receiving Area
- Future Land Use - Proposed**
-  Targeted Development Areas
-  Suburban
-  Business and Industry
-  Agricultural/Rural
-  Mining
-  Federal
-  Resource Protection
-  Parks

0 2,600 5,200 10,400 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

3.9 Cluster Subdivisions

Cluster Subdivision Areas

The State Code allows localities to provide standards, conditions, and criteria for the clustering of single-family dwellings and the preservation of open space on a minimum of 40 percent of the unimproved land contained in residential and agricultural zoning district classifications. In accordance with State Code, cluster subdivisions are recommended within an area of the County that contains a minimum of 40 percent of the unimproved land in residential and agricultural zoning districts, as designated on the map Figure 3.19, Cluster Subdivision Area. These areas include all of the land within the Urban Services Area and a portion of the land adjacent to and outside of the Urban Services Area. For the purpose of designating these areas, unimproved land includes:

- Land without a dwelling or taxable structure, and
- Parcels of two or more acres in size,

And excludes:

- Land owned or controlled by the County, Commonwealth, or Federal Government,
- Land subject to a conservation easement, and
- Unimproved lands that were part of dedicated open space for a subdivision.

Cluster subdivisions may occur on improved land and unimproved land assuming the proposed subdivision is in conformance with the cluster subdivision development standards.

Cluster subdivisions are a subdivision development design technique that concentrates detached single-family dwellings in specific areas on a site to allow the remaining land to be used for recreation, common open space, and preservation of environmentally sensitive features and rural character.

- A. Any cluster subdivision should meet the following county-wide criteria:
- Cleared natural resource area should be restored through the provision of increased landscaping in open space, buffer areas and on residential lots.
 - Viable areas of natural resources should be avoided when possible as part of the development design.
 - Impacts of the development should be mitigated where existing public facilities are inadequate.
 - Environmentally sensitive areas should be preserved within open space areas, including wetlands, floodplain, alluvial soils, slopes greater than 25%, designated trees and significant tree stands.
 - Open space areas should be a contiguous land mass that is not fragmented by the development of the subdivision and shall be of sufficient size and shape to support its intended use.
 - The proposal should be consistent with airport land use compatibility standards, if the subdivision will be located within the Airport Impact Overlay District, as outlined in Section 3.5 of the Land Use chapter and Appendix H of the Comprehensive Plan, including but not limited to:
 - a. the provision of a minimum area of usable open space, as described in the airport land

- use compatibility standards.
 - b. clustering dwelling units away from aircraft traffic patterns.
 - c. locating dwelling units at least 3,000 feet from the runway centerline.
 - d. noise mitigation measures in building standards.
 - e. disclosure notices where applicable.
- o The proposal should be consistent with military facility land use compatibility standards that are in accordance with Chapter 3.4 of the Land Use chapter, and provide for real estate disclosure notices, noise mitigation measures in building standards, and other sound attenuation measures where applicable, if the subdivision will be located within Quantico Military Impact Zones.
- B. Cluster subdivisions inside the Urban Services Area should meet the following criteria, in addition to the county-wide recommendations noted in sub-section A above:
- o Subdivisions proposing additional density should be located in areas of the County where public facilities (including schools, transportation, parks and recreation, water/sewer, emergency services) have capacity to absorb the demand of the additional density.
 - o Open space areas should include adequate areas of usable open space, in addition to areas that may be designated for stormwater management and utility easements and environmentally sensitive areas.
 - o The minimum side yard setback for each residential lot should be ten (10) feet or a fire suppression system should be provided within each dwelling unit.
- C. Cluster subdivisions outside the Urban Services Area should meet the following criteria, in addition to the county-wide recommendations noted in sub-section A above:
- o Viable areas of active agricultural and forestry uses should be avoided when possible as part of the development design.
 - o Open space areas should include adequate areas of active agricultural and forestry uses, in addition to areas that may be designated for stormwater management and utility easements and environmentally sensitive areas.

3.10 Solar Energy Generation and Energy Storage Facilities

SOLAR ENERGY GENERATION

Solar energy generation facilities, sometimes referred to as solar farms or solar facilities, provide an expanding alternative to generation of electricity as they are becoming more cost effective. A solar facility is defined as a facility primarily consisting of activities, applications or devices designed to convert sunlight into electricity for storage and/or distribution from one property to others through the utility grid.

Solar facilities can be classified into two different types, Community Scale and Utility Scale. Both types of solar facilities are similar in design. The main defining factor is the amount of power that is generated, which correlates to the size of the project. The following defines the two types:

Community Scale: consists of a series of solar arrays, typically ground mounted, that generate up to 5 MW of electricity. Roughly 10 acres of land are needed for every 1 MW of power generation, or 50 acres of land in total, or lesser amounts under optimal site conditions. The electricity generated feeds into the local distribution lines, the lines that run along area streets to a nearby transfer station. The concept allows area residents to purchase their electricity that is generated from this community scale project.

Utility Scale: this is the largest application of solar generation that follows the same development concept as community scale projects but at a larger scale. This category includes any project that generates over 5 MW of electricity. These projects generally require more than 50 acres of land, and often require hundreds and even thousands of acres of land. Siting such large scale facility is encouraged to not exceed 300 acres. They usually connect directly into the transmission network, which are the large overhead high voltage power lines that carry electricity over long distances. The solar arrays in these projects have the same dimensions as in a community scale project. Utility scale solar is expected to be secured and screened just as community scale solar would.

As solar energy facilities are being proposed in Stafford, the following siting and design guidelines are intended to ensure that solar facilities are developed in a manner that is consistent with the goals of the community and do not negatively impact surrounding properties.

These guidelines do not apply to residential or non-residential properties containing solar technology used primarily to generate electricity for on-site use.

SOLAR ENERGY RECOMMENDATIONS:

Siting Guidelines:

The following siting guidelines are included that are specific to Utility Scale and Community Scale solar facilities, along with guidelines that apply to all solar projects, regardless of the type.

Utility scale solar facilities should conform with the following location standards:

- Located outside of the Urban Services Area.
- Located on property that is within 1,000 feet of major electric transmission lines.
- The total parcel area of a project should not exceed 300 acres.

Community scale solar projects should conform with the following location standards:

- Encouraged to be located outside of the USA.
- Consideration of projects inside the Urban Services Area under the following criteria:

- Project areas should not exceed fifty (50) acres. Project areas are defined as the areas bounded by the fenced solar array areas and any surrounding landscape buffers.
- Discouraged on property where future housing, commercial, or industrial development may be viewed as a better use of the land.

All solar projects should conform with these location standards:

- To reduce visual impacts, solar energy facilities are encouraged to be located on sites with established and/or preserved vegetative and/or forested buffers of enough depth or density to effectively screen the facility as determined by viewshed analysis along public roadways, nearby or adjacent residential properties, and/or significant cultural or historic resources.
- To preserve rural character and ecological integrity, avoid locating on sites with active agriculture, high levels of biodiversity, and/or mature forests.
- To minimize land use conflicts, avoid locating near and within the viewshed of dense residential developments, cultural or historic resources, and/or near public drinking water sources. For this purpose, dense residential developments are defined as any residential subdivision with typical lot sizes less than one (1) acre in size.
- In urbanized settings, encourage placement on rooftops of industrial or other large buildings.
- Encourage solar projects on land that has limited redevelopment potential, such as capped landfills, brownfield sites, abandoned industrial sites, completed and decommissioned surface mining sites near major electric transmission lines.
- Consider the placement on open water surfaces, such as decommissioned mines or other reservoirs.

Individual Site Design Criteria:

All solar facility projects should incorporate the following design features into the development of the project.

- Locate mechanical equipment such as inverters and transformers internal to the property or away from any residential or incompatible uses.
- Prioritizing retention of existing tree cover over planting of new trees; Considering berms as an additional optional means of screening.
- Provide for adequate emergency access by providing a travelway around the perimeter of each group of solar arrays and minimize fire hazards by providing adequate spacing between brush vegetation and the ground-mounted panels and equipment.
- Minimize environmental impacts by avoiding developing in environmentally sensitive areas, including Critical Resource Protection Areas, wetlands, and floodplains, while retaining existing trees outside of the project area and preserving stream drainage channels and associated wetlands that may run through a site.

- Maintain wildlife corridors by providing separate fence enclosures for each group of solar arrays and consider fence design to allow passage of smaller wildlife.
- Where possible, utilize the site as grazing lands for sheep and other appropriate livestock.
- Incorporate development techniques that can facilitate conversion of the land back to agricultural uses upon decommissioning of the facility.
- Minimize impacts during the construction phase by: Placing limits on the hours of construction; Consider establishment of preferred truck delivery routes, and; Require repair of road damage after construction or decommissioning.
- Solar panels should not exceed a maximum height of 15 feet from the finished ground elevation at maximum tilt. Exceptions to this height limitation may be appropriate where complete and adequate screening from view is provided or sudden changes in topography would preclude a consistent height of adjacent solar panel arrays.
- Solar panels should retain a minimum ground clearance of 12 inches from the finished ground elevation at maximum tilt to allow for vegetation maintenance.

ENERGY STORAGE

Energy storage allows for increased effectiveness and reliability of electricity power distribution from both non-renewable and renewable energy sources, such as solar energy facilities. This is accomplished by storing energy then releasing it later when needed, such as during peak usage events (hot summer days) or during periods when solar electricity generation is diminished (nights or long periods of cloudy or snowy weather). Energy storage facilities are defined in the Code of Virginia as the energy storage equipment and technology within an energy storage project that is capable of absorbing energy, storing such energy for a period of time, and redelivering such energy after it has been stored.

The predominant form of energy storage currently is with battery energy storage systems (BESS), and specifically Lithium Ion batteries. A facility would consist of a series of lithium-ion battery banks, located within either a building, several shipping container structures, or smaller equipment cabinets. These facilities would most likely need to be sited within or in close proximity to utility transfer stations or accompany a solar energy facility.

Land Use Compatibility:

Energy storage facilities are characteristic of industrial uses, with larger cleared areas, metal structures, and void of landscaping. This type of development would not be visually compatible with most non-industrial uses. The structures that house the batteries need to be climate controlled, thus requiring the use of air conditioning units. Across a site, there may be several larger units that may generate higher levels of noise. Due to the industrial nature of the use, potential noise impacts, and fire safety concerns, these facilities should be appropriately separated and screened from incompatible land uses such as residential uses, schools, and highly visible commercial corridors.

ENERGY STORAGE RECOMMENDATIONS:

The following recommendations should be considered when considering the siting of an energy storage facility in Stafford County:

The following location siting criteria are recommended:

- The preferred location for energy storage facilities is within areas designated Business and Industry on the Future Land Use map.
- For energy storage facilities proposed within areas designated Business and Industry on the Future Land Use map, the following siting considerations include:
 - Screening from non-industrial uses should be provided.
 - Providing a connection to public water is preferred.
- If an energy storage facility is installed in conjunction with a solar facility, consider siting the energy storage facility internal to the solar panel arrays.

However, other locations may be considered appropriate based on the following criteria.

- For energy storage facilities proposed within areas designated Agricultural / Rural on the Future Land Use map, the facility should be adequately set back from adjacent properties.
- Should a facility be proposed in the vicinity of an electricity transfer station within a designated Suburban area on the Future Land Use map, the following siting criteria are recommended:
 - Locations adjacent to higher density residential development or other incompatible uses are discouraged.
 - The facility should be appropriately screened from view with a combination of existing trees, new vegetation, opaque fencing, and/or berms.
 - Providing a connection to public water is preferred.

Fire Safety:

Energy Storage Facilities are not free from fire and explosion hazards and risks. The primary concern with energy storage units usually involves thermal runaway of the battery cells and units. The by-products of this thermal runaway include toxic and flammable gasses and ultimately risk of explosion or deflagration. As such, incidents at these facilities are essentially hazardous material incidents that require a long-duration incident with specialized resources. Currently, those specialized hazardous materials response resources would come from the Virginia Department of Emergency Management for incidents in Stafford County. The following are location, design, and operation recommendations for fire safety at energy storage facilities:

Location and Design:

- 1) Provide adequate water for fire protection by limiting future facility locations to the urban services area where a water supply is available or require adequate setback from buildings and property lines.

Operations:

- 2) Ensure access to battery management system information by providing a separate facility for battery management system information and hazardous gas monitoring display for first responders.
- 3) Ensure site management coordination by posting facility operator information as well as 24-hour emergency contact information at the entrance to the facility.
- 4) Provide an emergency response plan and associated training for first responders that is site-specific.

3.11 DATA CENTERS

Data centers are facilities that house computer systems used for the purpose of data storage and processing. Supporting equipment includes batteries, back-up power generators, and cooling systems. Data centers come in various scales, from a small equipment cabinet to large warehouse scale facilities that are in multiple large buildings that can total millions of square feet of floor area. For the purpose of this section, the focus is on the large-scale facility. In this case, each building is typically greater than 100,000 square feet in floor area.

Data centers can be seen as a valuable component of the County's economic development strategy to diversify the economy and tax base. Data center investments in real estate, capital, and equipment can generate significant tax revenue and can employ those with higher-than-average wages. Based upon economic analysis performed by the Stafford County Economic Development Department and the Commissioner of the Revenue, in total one million (1,000,000) square feet of data center development provides an estimated annual fiscal impact of approximately \$18.5 million of new tax revenue. Consequently, the 2015 Economic Development Strategic Plan identifies data centers as a priority with an objective that encourages the County to "continue to identify and support sites suitable for high technology data centers."

Infrastructure needs of data centers are critical to the success of the industry, which would include the use and close proximity of high-voltage electricity, as well as the ability to cool equipment by using significant amounts of water and/or other cooling methods. Sites targeted by the data center industry must have these resources nearby in order to be considered for development and have taken significant measures to ensure data centers are located in these areas while limiting impacts on residential communities and strains on public resources.

Any consideration of data centers in Stafford County would include information associated with traffic impacts, building/site design, environmental constraints, as well as any potential opportunities to promote and/or provide for additional amenities and capital improvements.

Data centers often rely on a significant amount of electricity to power processing and storage hardware and cooling systems. As a result, these facilities are typically located near high voltage power corridors. The facilities are low traffic generating uses, as the facilities are manned by a relatively small number of high-tech employees to monitor and service equipment as needed.

A. Land Use Compatibility:

1. Data centers are typically characteristic of industrial uses, with large buildings and large cleared areas. This type of development may not be visually compatible with many non-industrial uses. The buildings need to be climate controlled, thus

requiring the use of air conditioning units or other cooling units which may generate higher levels of noise. Due to the industrial nature of the use, including potential noise impacts, visual impacts, as well as fire safety concerns, these facilities should be appropriately separated and screened from incompatible land uses, and/or designed to be aesthetically compatible with surrounding development uses.

2. Data center projects are encouraged to meet or exceed the standards outlined below.

B. Location and Siting:

The following recommendations should be considered when considering the siting of a data center facility in Stafford County:

1. The preferred location for data centers is within areas designated Business and Industry on the Future Land Use map, within the Urban Services Area (USA).
2. The preferred location for data centers is proximate to and no greater than 0.5 miles from existing electric transmission corridors or other suitable electrical sources in order to minimize the creation/expansion of infrastructure, such as new high-voltage transmission lines and substations.
3. A project located outside the USA may be consistent with this Plan, considerate of the following parameters:
 - a) Location of the project is within a half (1/2) mile of the boundary of the USA.
 - b) Rural agricultural and/or forestal character is effectively maintained along roads and adjacent land uses through site design elements including, but not limited to: enhanced building setbacks, preservation of existing forested areas, street and transitional screening buffers of an appropriate depth and/or vegetative mix to visually mitigate development scale conflicts with the surroundings.
 - c) A minimum of fifty (50) percent open space on the site is encouraged.
 - d) Facilities should utilize water reuse systems (purple pipe) or closed-loop systems for cooling. If reuse water capacity is available, water reuse should be utilized as the preferred method of cooling as long as it does not violate section d. of these Siting Guidelines.
 - e) Should public water and sewer utilities not be available, private wells and septic drainfields may be used for facility bathrooms and kitchens.

- f) Subject to determination by the Board of Supervisors that the extension of public water to the site is appropriate, when necessary.

C. Site Design:

1. Data center sites should contain increased setbacks from adjoining properties with residential, mixed-use, schools, day care centers, parks, assisted living facilities, nursing homes, and other similar uses.
2. Data center sites should orient noise generating features (backup generation systems, cooling equipment) away from residential, mixed-use, schools, day care centers, parks, assisted living facilities, nursing homes, and other similar uses. Data center buildings, screens, enclosures, and site topography may be utilized to meet this goal.
3. To minimize visual impacts, reduced building heights for buildings near the property line abutting residential properties are recommended. Set-back standards that would permit a taller building height as it is set back further from the property line may be utilized.

D. Sound/Noise:

1. Operational noise impacts (i.e., HVAC, equipment cooling, backup generation systems), especially in relation to nearby residential development, schools, day care centers, parks, assisted living facilities, nursing homes, and other similar uses should be minimized.
 - a) Noise mitigation may be required for noise generating equipment or facilities, and achieved by a variety of acoustic measures such as, but not limited to site design (location and orientation of buildings), building design and materials, building setbacks, screening and buffering, locating all mechanical equipment behind sound walls, or utilizing equipment accessories such as sound baffles or wind bands.
 - b) Scientific sound studies that demonstrate attenuation of noise generating equipment are encouraged, as necessary.
 - c) The use of state-of-the-art on-site monitoring equipment to measure noise is recommended.
2. Low frequency noise generated from data centers should be considered and appropriate mitigation determined through a combination of equipment placement, sound dampening building materials, or screening of noise sources. Ongoing measurement and monitoring of low frequency noise is encouraged.

E. Backup Generators:

1. To minimize noise and air pollution from backup generators, data center facilities are encouraged to apply state of the art technology. Mitigation measures may include the following: limiting the time of day and duration of generator testing and incorporating a combination of insulation, encasement, and noise diffusers.
2. The use of Tier IV or greater classification of generators and on-site air quality monitoring devices are encouraged. Additionally, innovative alternatives to diesel fuel should be considered such as hydrogenated vegetable oil.

F. Visual Impacts:

1. To reduce visual impacts, data center facilities, including corresponding electric substations, are encouraged to be located on sites with established and preserved vegetative and forested buffers of enough depth and density to effectively screen the facility.
2. Berms should be considered in combination with new landscaping as a means of screening where existing forested buffers are not present and a viewshed analysis proves it to be effective.
3. Data center campuses should be significantly set back from the Rappahannock River and Potomac River to be screened from view to the maximum extent practical.
4. A viewshed analysis should be submitted for any development adjacent to non-industrial or non-commercial properties, public roadways, and cultural/historic resources to demonstrate that the existing and proposed buffers sufficiently screen the use.
5. Lighting should be diffused and hooded or screened from adjacent properties and roadways.

G. Building Design:

1. Any building facade visible from adjacent properties or public streets should be consistent in terms of design, materials, details and treatment, and should incorporate the following for every 100 horizontal linear feet of the façade or less:
 - a) Differentiation that breaks the mass of the facade by changes that include building height and facade step-back or recesses; and
 - b) Incorporation of at least two of the following design elements: fenestration, façade materials, pattern, texture, color, or use of accent materials.

2. Windows, doors, or similar fenestration design features such as faux windows should be distributed horizontally and vertically across the façade and comprise a minimum of 15% of each visible building façade. A green-wall treatment may be provided to meet up to half of the 15% area.
3. The following elements should be included in the building design:
 - a. A main entrance feature that is differentiated from the remainder of the façade;
 - b. High albedo or light-colored roof; and
 - c. Shrouds for any exhaust stacks.
4. At least two of the following primary facade materials should be incorporated: tinted textured masonry block, pre-cast concrete, tilt-up concrete panels, brick or stone veneer, glass (clear or architectural panels), stucco and external insulation finish system that simulates a stucco appearance, metal panel systems, structural metal siding, or smooth-faced concrete blocks. All metal panels should be fully engineered, architectural quality systems.
5. Secondary accent or trim materials should also be incorporated to include least two of the following: any of the primary facade materials, wood, fiber cement, vinyl, or composite trim.

H. Security:

1. Security fencing is recommended to be eight feet in height.
2. Security fencing is recommended to consist of a quality design such as “Ameristar Palisade” or other substantially similar style.

I. Land Conservation:

1. To preserve rural character and ecological integrity, data centers should avoid locating on sites with active agriculture, high levels of biodiversity, threatened and endangered species habitat, and large tracts of mature forests. Consideration should be given for connectivity of forested corridors and/or stream buffers to permit wildlife passage. Applicants are encouraged to seek certification through programs that help corporate landholders demonstrate a long-term commitment to managing quality habitat for wildlife, conservation education and community outreach initiatives.

2. Preservation of existing mature trees to the maximum extent practical is considered a high priority.
3. When in close proximity to passive and active parks and conservation properties, projects should enhance setbacks and buffers. A minimum one-mile buffer zone should be considered from the boundary lines of Crow's Nest Natural Area Preserve, the Rappahannock River, and the Potomac River.
4. To minimize land use conflicts, projects should avoid locating near and within the viewshed of residential developments, cultural/historic resources, and/or near public drinking water sources (i.e., water reservoirs).
5. Protection of Chesapeake Bay Resource Protection Area buffers by increasing the setbacks of retaining walls and impervious surfaces is encouraged.
6. Impacts to nearby wells should be evaluated, and data center projects should assist in the connection to the public water network should unforeseen impacts to neighboring wells arise.

J. Facility Cooling:

1. Projects are encouraged to use innovative, low-impact alternatives to public water-based cooling systems, such as immersion based cooling and other approaches and efficiencies that reduce cooling demands and power consumption.
2. Any proposal should identify the proposed cooling approach with corresponding water demands.
3. Discourage use of private wells that would draw water from the water table to be used for non-office uses and cooling systems.
4. Discourage direct water withdrawals from the Rappahannock River, Potomac River or major tributaries.
5. If water-based cooling systems are employed, the following criteria should be met:
 - a) Reuse water (purple pipe) should be utilized as an alternative to potable water sources.
 - b) Any water-based cooling system associated with a data center should be evaluated to determine whether existing public water and sanitary sewer conveyance and treatment facilities are adequate for the proposed use, and whether there is sufficient water capacity available to supply the proposed use.

- c) Onsite water storage should be utilized to reduce daily demands and provide for emergency backup. Potable water should be limited to when the reuse supply is not available.
 - d) If potable water is employed as a cooling source, work with County utilities to develop a water management plan to ensure adequate capacities to serve the surrounding communities remain in place in case of drought.
 - e) Data center uses should not permanently utilize potable water for industrial cooling.
 - f) Ground water or raw surface water not obtained through the municipal water supply system should not be utilized for data center cooling.
 - g) All facilities will be issued an individual Significant Industrial User (SIU) discharge permit to ensure compliance with all federal, state and local regulations.
 - h) Any improvements to the sanitary sewer system will be made by the facility to ensure that all impacted County sanitary sewer collection systems and treatment plants have adequate capacity to handle increased flows caused by the facility.
6. Potential water quality concerns may be addressed through the monitoring of cooling system discharge into the wastewater system and, if needed, providing pre-treatment.

K. Electricity Demands:

1. Ensure the electrical grid can support power demands of the end user without negatively impacting the supply of power to the surrounding community.
 - a) Encourage the use of on-site power generation systems, including, but not limited to, micro-grid systems, to reduce the demand on the existing electrical grid. While renewables are encouraged as a preferred energy source, other on-site power generation sources may be appropriate. Additionally, data center operators are encouraged to invest in off-site renewables to offset power generation needs.
 - b) Encourage energy efficiency in building and/or campus design (i.e., Leadership in Energy and Environmental Design (LEED) Data Center Silver Certification or greater as example).
 - c) Encourage underground placement of new private power transmission lines.

- d) At the time of application, proposed data center projects should provide documentation from the electric service provider that confirms the availability/capacity and timing of electrical service required to serve the development. Documentation should include assessments of future energy needs as it relates to existing and planned power infrastructure.

L. Public Safety:

1. Develop an emergency management action plan with Stafford County Public Safety divisions to ensure site safety management coordination and provide 24-hour emergency contact information at the entrance to the facility.
2. Any multi-story building constructed on the Property should contain a NFPA 14 Standpipe system for fire department operations.
3. Any data center building constructed should be fully fire sprinklered with floor control valve assemblies on each level. Said sprinklers should be a NFPA 13 standard or the standard in effect at the time of construction.
4. Any other public safety considerations identified as a need for a specific location upon consultation with appropriate County staff should be implemented into the project.

M. Construction Mitigation:

Data center projects should mitigate any roadway damage resulting from the construction phase. Pavement damage to roads, including shoulders and aprons, attributable to construction of the project should be repaired by the developer within a reasonable timeframe following issuance of the final certificate of occupancy. If the project causes roadway damage that is deemed unsafe, the developer should provide more immediate repairs.

4.0 Transportation

4.1 Introduction

Land use and transportation are interrelated. How land is used affects how the public moves between home, shopping, work, school, and elsewhere. As a result of expanded land use, traffic on roads also increases. Improving existing roads and constructing new ones help reduce congestion and improve safety. This chapter of the Comprehensive Plan spells out the required transportation improvements needed to achieve the optimal performance of our roadways.

The Virginia Department of Transportation (VDOT) maintains the County's public roads. Property owners' associations and management companies maintain private streets in residential areas and commercial centers. The County works with VDOT and the Fredericksburg Area Regional Metropolitan Planning Organization (FAMPO), to plan for and improve our transportation infrastructure.

This chapter of the Comprehensive Plan identifies future expansion and improvement of existing roadway facilities supplemented by the strategic construction of new roadways, the expansion of existing transit and commuter parking facilities, and the construction of new facilities to support increased options for transportation. This chapter intends to implement the goals and objectives identified in the County's Comprehensive Plan to meet our current and future transportation needs.

This chapter of the Comprehensive Plan identifies anticipated transportation improvements in the county, in addition to projects' scope, estimated costs, funding sources as well as estimated project timelines. In 2020 County staff began developing the foundation for a Transportation Master Plan and are working with key stakeholders including the public, VDOT and the Fredericksburg Area Metropolitan Planning Organization (FAMPO). Once complete, the Transportation Master Plan will provide more detailed strategies regarding specific components of this chapter. The Master Plan will guide transportation decision making into 2050 with data driven projections utilizing advanced software and planning techniques and will also be reviewed annually and updated on an as needed basis to reflect any necessary changes.

There are a number of key factors that influence County-wide transportation planning and the County's ability to make infrastructure improvements. These include but are not limited to:

- Economic Climate
- Revenue streams and funding sources, including grant programs and budgetary appropriations
- Existing and Future Conditions including population growth and land use
- Coordination with federal, state and regional agencies including Federal Highway Administration (FHWA), VDOT and FAMPO
- Multi-modal facilities including transit, bicycle and pedestrian accommodations
- Operating levels system constraints

- Right-of-way requirements including public access
- Roadway Access management and residential traffic management
- Secondary Street Acceptance Requirements (SSAR)
- Road improvement projects in approved capital improvement programs
- New local and regional transportation improvements
- Technological advancements

4.2 Existing and Future Conditions

Roads

Stafford County has a transportation system typical of a suburban locality strategically located near major population and employment centers. The County is influenced by the expansion of the Washington, D.C. metropolitan region and growth of the Fredericksburg metropolitan area. The County's rural transportation system includes narrow, constrained roads that are often incompatible with the evolving land use patterns as the County's zoned agricultural areas continue to undergo substantial development. Road systems within the County's rural/agricultural areas are automobile dependent and prone to major peak period delays.

I-95 and U.S. Route 1, serve as the major north-south corridor for local residents, regional commuters, vacationers, business travel, and commercial freight. In addition, (U.S. Route 17) and Kings Highway (SR-3) provide strategic east-west links for major transportation activities. Several millions of dollars in commercial goods and activity flow in every direction throughout Stafford County daily.

I-95 is the main north-south Interstate Highway on the East Coast of the United States, running from U.S. Route 1 (U.S. Route 1) in Miami, Florida to the Houlton-Woodstock Border Crossing between Maine and the Canadian province of New Brunswick. Virginia's statewide transportation plan (VTrans) categorizes I-95, US Route 1, and US Route 17 (Warrenton Road) as Corridors of Statewide Significance (CoSS). These include facilities and services which comprise the multimodal network connecting major centers of activity Regional Networks and Urban Development Areas (RNs and UDAs) and accommodate inter-city travel between these centers as well as interstate traffic.

Travel within the County also places additional demand on our transportation facilities. Strategic local roadway corridors include Mine Road, Telegraph Road, Centreport Parkway, Garrisonville Road, Courthouse Road, Brooke Road, Poplar Road, Mountain View Road, Hartwood Road, Ramoth Church Road, Kellogg Mill Road, Eskimo Hill Rd., Berea Church Rd., Deacon Road, Forbes St., Shelton Shop Road, Truslow Road, Enon Road, Leeland Road., and White Oak Road. These corridors are not principally for travel outside of Stafford County, but serve the citizens of Stafford and allow them to avoid interstate congestion. For Example, the Mine Road / Centreport Parkway corridor provides a north/south reliever road to U.S. Route 1 and I-95. Garrisonville Road provides a connection from Interstate 95 and destinations within Fauquier County. Courthouse Road is an east-west transportation route that links a number of schools and residential areas to Interstate 95 and U.S. Route 1. Brooke Road is a north-south route that serves much of the eastern part of the county. Similarly, Poplar Road is a north-south route that serves the western part of the county providing a linkage between Garrisonville Road and Warrenton Road.

Rail

There are two rail corridors within the County. The CSX Corporation owns and operates a main rail line that traverses the eastern portion of the County from Quantico to Fredericksburg. There is a spur line known as the Dahlgren Spur that branches off from the main line and parallels US-3 (Kings Highway) and serves only freight. The main rail line serves both freight and passenger trains. There are currently two commuter rail stations in the County at Brooke Road and Leeland Road. Virginia Railway Express (VRE) provides passenger service from a starting point at Union Station in Washington, D.C. and continues from these stations to both the Fredericksburg and Spotsylvania train stations.

The foundation for identifying future roadway improvements in this chapter of the Comprehensive Plan will be derived from the County's Master Transportation Plan and Travel Demand Model. County staff are working with various regional stakeholders in the development and future launch of an enhanced Travel Demand Model which will utilize modern data gathering techniques and synthesizing methods. This Travel Demand Model will examine existing and future land use, existing road networks and capacity, and future build scenarios.

The purpose of this model will be to evaluate future year conditions and allow for the testing of various roadway improvement alternatives in order to achieve an overall operating Level of Service (LOS) equal to or better than C (see Level of Service, Section 4.6). In order to more accurately evaluate the impact on the roadway system, an iterative process is used, which projects growth on the transportation system over time based on the Land Use Plan. The results of this modeling process will allow the County to better implement effective transportation solutions that keep in pace with ongoing growth and development.

With the exception of most of the residential streets, all roadways are included in the modeling process for greater flexibility and accuracy. Modeling evaluates both roadway segments and intersections based on a volume-to-capacity ratio. Due to the varying rate and location of development in the County, the final transportation network proposed in our upcoming master plan will be dynamic and refined continuously over time. Future detailed studies will determine the exact locations and design features of the master plan's recommended investments to the Board of Supervisors.

Even with the extensive road facility improvements and the establishment of new roadways, several roadways in the County are anticipated to continue operating at levels of service C or better. To alleviate these congested areas and maximize the capacity of the transportation network, transportation demand management along with congestion mitigation analysis and other transportation alternatives are being evaluated and implemented through the County and beyond its borders in collaboration with our neighboring municipal partners.

4.3 Transportation Coordination

FAMPO, is the federally designated Metropolitan Planning Organization (MPO) for the Fredericksburg Area. Its serves as the forum for comprehensive, continuing and cooperative regional coordination around transportation plans, policies and projects. The MPO houses our region's Policy Committee which is composed of representatives from Fredericksburg City, Stafford County, and

Spotsylvania County who work together to guide transportation decision making throughout the area.

Funding sources that are facilitated through FAMPO include Congestion Mitigation and Air Quality (CMAQ) and Surface Transportation Block Grant (STBG) funds for transportation improvements. FAMPO also coordinates the development of a Transportation Improvement Program (TIP) for the region in addition to a Constrained Long-Range Transportation Plan (CLRTP). For more information about FAMPO and the regional transportation planning process please visit: [www.https://www.fampo.gwregion.org/](https://www.fampo.gwregion.org/).

The Virginia Department of Transportation (VDOT) has primary responsibility for maintaining public streets within the County. The County works closely with VDOT to plan and program road improvement projects. The County also approves an annual secondary road improvement budget and Secondary Six-Year Plan (SSYP) in conjunction with VDOT. These two actions program state-allocated funds for secondary road projects. Interstate and primary system funds are allocated by the Commonwealth of Virginia in coordination with FAMPO through the TIP process. In addition, the County coordinates safety-related transportation projects with VDOT and other stakeholders to improve the safety of our roadways.

4.4 Multi-Modal Transportation Facilities

4.4.1 Car Pool and Van Pool

The George Washington Regional Commission (GWRC) coordinates carpool and vanpool options for the region through the GWRideConnect program. The GWRideConnect program maintains a database of participating individuals seeking to coordinate collective transportation and helps individuals locate one another. The Commonwealth of Virginia, through the Department of Rail and Public Transit and the federal Urbanized Area Formula Funding program (49 U.S.C. 5307), provide financial resources that fund GWRC's coordination. In 2019, there were 89 formal carpools 5 buses, and 387 vanpools in the region. On every onramp to I-95, residents are presented with informative signage regarding how to engage in carpool and van pool activities and to how to access various other sources of commuter information and resources, by dialing 1-800-745-RIDE.

The County fully endorses the expansion of carpool and vanpool operations and actively advocates for the continued expansion of this program for our residents. For more information on GWRideConnect, please visit their website at <https://www.gwrideconnect.org/>.

4.4.2 Park and Ride Lots

Four Virginia Department of Transportation (VDOT) commuter parking lots serve Stafford County. Each lot is located near one of the Interstate 95 interchanges. There are two lots adjacent to Garrisonville Road; one on the north side of Staffordboro Boulevard and the Mine Road lot on the south side of Garrisonville Road. Recently the lot on Courthouse Road was relocated with increased capacity. Additionally, the south end of the County services the Warrenton Road lot.

The Park & Ride lot on Courthouse Road in Stafford County has moved to its new permanent location, east of the Interstate 95 interchange at Exit 140. The new commuter lot has been relocated as part of the diverging diamond interchange at Exit 140. It is now located at Old Courthouse Road. It contains approximately 600 parking spaces, which is 50 more spaces than the former commuter lot. Once complete the final lot will have a total of 850 parking spaces. It will also include a dedicated carpool, vanpool and bus pickup and drop-off area to assist with High Occupancy Vehicle (HOV) use.

In the future, the County plans to acquire land adjacent to or nearby the Warrenton Road commuter parking lots for future expansion when additional capacity is needed and funds are available. In the upcoming years, County staff will continually explore federal and state grant funding program opportunities to gather the resources necessary to complete this expansion endeavor.

Commuter parking has not been established at the Centreport Parkway (SR- 8900) interchange, but should be considered in the future as development occurs in that area. The FAMPO 2040 Long Range Transportation Plan projects the future 2050 need for an additional 8,827 Parking spaces in the region at an estimated cost of \$31.7 million.

In conjunction with these efforts, joint use parking areas at centrally located commercial and office centers should be considered. Specific areas could be designated at major centers for commuters. Larger residential developments should also incorporate commuter parking areas for their residents. The intent of these parking lots is to act as a supplement parking area for commuters for established car and vanpools and not to replace the primary commuter parking lots.

4.4.3 Bus

Fredericksburg Regional Transit (FRED) serves as the local and regional bus provider in the County. FRED provides bus routes within Stafford which connect the County with the Fredericksburg metropolitan area.

The County also supports the expansion of privately operated bus services. Bus service is most efficient when serving large concentrations of commuters in subdivisions or at central parking areas. All future central parking areas used for commuters should be designed to accommodate bus stops. In addition, developers of large communities should be encouraged to support transit programs and provide a coordinated effort to accommodate bus and commuter parking services.

Currently, Bus Rapid Transit is provided to residents via the recently established I-395 Commuter Choice Program. This program provides commuter services from the Staffordboro Commuter Lot to both the Pentagon and Washington DC. The County in collaboration with the Potomac and Rappahannock Transportation Commission (PRTC) Omni Ride service plan to continue and expand service to the region into the future.

4.4.4 Commuter Rail

Virginia Railway Express (VRE) is supported by Stafford County, Spotsylvania County, Fairfax County, Arlington County, City of Alexandria, Prince William County, City of Manassas, City of Manassas Park, and the City of Fredericksburg. Commuter rail service is primarily a work-related commuting option operating in the morning from Fredericksburg and Manassas to Washington, D.C. and reversing itself

for the evening commute. However, in the future, VRE trains will also run on weekends. Access to the commuter rail lines is provided in the county via the Brooke Road and Leeland Road stations.

From FY15 to FY20 VRE parking capacity utilization decreased significantly from August 2014. Leeland station utilization decreased by 8% and Brooke station utilization decreased by over 12%. The most recent 5-year average for VRE utilization for Leeland and Brooke stations is 81% and 76% respectively. These data indicate that there is opportunity for the county to invest in increased utilization of these two stations by county residents who can, but do not choose this method of commuting.

Stafford County is also within the Washington D.C. to Richmond section of the Southeast High-Speed Rail project. This multi-state and multi-agency effort aims to improve the performance and capacity of passenger rail service in the corridor. The project plans for the construction of a third set of rail tracks through the County. Alternative routes around the City of Fredericksburg are currently being considered which may have impacts to areas of the County near the Dahlgren Spur Line. Construction of the third rail line is currently underway between Arkendale and Quantico in the northern part of the County. The construction of a third rail will require the expansion of VRE facilities including an additional passenger platform at both the Brooke Road and Leeland Road stations. The new platforms will be of greater length than the current platforms in order to accommodate longer trains.

4.4.5 Telecommuting

Stafford County supports alternatives that will help reduce traffic congestion. A program that has direct benefit in this area is telecommuting. Technological advances in recent years has dramatically influenced employer acceptance of this means of working. Although telecommuting does not necessarily imply working at home, this alternative is widely used and will continue to grow in utility as broadband communication networks expand. Appropriately equipped remote working centers, can also serve employees of both the public and private sectors as a practical means of reducing traffic congestion and vehicle emissions throughout the region, telecommuting centers should be encouraged and developed in areas where the greatest number of individuals may be served.

4.4.6. Stafford Regional Airport

The Stafford Regional Airport was developed by an authority comprised of representatives from Prince William County, Stafford County, and the City of Fredericksburg, and began operations in December 2000. It is located along Centreport Parkway on the south side of Ramoth Church Road, west of I-95 in central Stafford County. The airport site is approximately 500 acres in size. The runway is 5,000 feet in length with a full parallel taxiway system. . In 2022 the airports runway will be extended another 1000 ft. allowing aircraft to take on additional fuel and pay-loads and make the airport more attractive to corporate users for cross country and international flights.

The Stafford Regional Airport is a reliever airport. A reliever airport is a general aviation airport which the Commonwealth of Virginia and the Federal Aviation Administration (FAA) have identified as being close enough to a commercial airport (Reagan National and Dulles International Airports) to provide congestion relief for commercial air traffic. General aviation airports serve business and personal transportation, emergency rescue, express delivery, and news reporting flights. Most general aviation aircraft are small single and twin-engine aircraft as well as business and corporate jets with wing spans up to 80 feet.

The Stafford Regional Airport accommodates both fixed-wing and helicopter aircraft. The airport accommodates up to 100 based aircraft and 75,000 flights annually. Ultimate design of the airport includes hangar space for 120 non-corporate aircraft; 200,000 square feet of corporate hangar space; and tie-down space for 150 aircraft.

4.4.7 Bicycle and Pedestrian Facilities

In 2019, the County's Board of Supervisors approved the Bicycle and Pedestrian Facilities Plan. The plan identified locations for bicycle and pedestrian facilities in an effort to meet growing demand, to provide viable and safe alternatives to automobile transportation, to expand recreational opportunities, and to identify strategies and resources for providing these facilities. Also, the plan allows for more effective prioritization of projects, and opportunities to maximize the use of limited available funds. In the future, County staff will recommend amendments to the Bicycle and Pedestrian Facilities Plan to include a new Cannon Ridge Trail. This trail would connect existing pedestrian trails in the Celebrate Virginia North development to the Belmont-Ferry Farm Trail with proposed trails along the Rappahannock River.

Consistent with the Bicycle and Pedestrian Facilities Plan, all new, reconstructed, or expanded roadways should include bicycle and pedestrian routes. Inside the Urban Service Area, subdivisions should accommodate pedestrian and bicycle facilities in compliance with VDOT standards. Because U.S. Bicycle Route 1 traverses Stafford County, the County will be encouraging bicycle accommodations along the Virginia portion of this route.

Most of the trails in Stafford County are privately owned and constructed as part of individual neighborhoods. Providing a series of connecting trails and sidewalks is a priority for the County. Trails projects include the planned Belmont-Ferry Farm trail and the Warrenton Road Corridor Trail. Where roads cannot be constructed to connect adjacent existing neighborhoods, pedestrian and bicycle trails should be considered to create connectivity.

Stafford County participated in the FAMPO 2045 Bicycle and Pedestrian Plan. The purpose of the Plan was to develop a safe, comprehensive and connected regional network of on-road and off-road bicycle and pedestrian corridors and related facilities. The 2045 Bicycle and Pedestrian Plan is part of FAMPO's regional 2045 Long Range Transportation Plan (LRTP). This regional plan identifies several facility enhancements in various locations including the installation of bike lanes, shoulder improvements, shared road signage, sidewalks, shared-use paths, and signalized pedestrian cross walk.

4.5 Transportation Demand Management

Transportation Demand Management (TDM) aims to reduce roadway congestion, decrease pollution, and promote healthy travel options, by optimizing the movement of people within the transportation system. A major goal of TDM is to reduce the dependence on and use of single-occupant vehicles. Alternative modes of travel include public transit, carpooling, vanpooling, ridesharing, walking, and cycling. Some conceptual models also include telecommuting as a TDM topic.

4.6 Level of Service

The Level of Service (LOS) is a measure of a road's effectiveness to operate in an efficient manner. The operating characteristics of a roadway include, but are not limited to, the number of lanes, pavement width, design speed, traffic controls, shoulder condition, and horizontal and vertical alignments. Levels of Service are divided into six categories from LOS A (best operating conditions) to LOS F (worst operating conditions). At a minimum, LOS should be maintained at LOS C or better.

LOS A	Free flow; low volumes and no delays; volume less than 60% of capacity; delay at signals 0-10 seconds.
LOS B	Stable flow; speeds restricted by travel conditions; minor delays; volume 60-70% of capacity; delay at signals 10-20 seconds.
LOS C	Stable flow; speeds and maneuverability closely controlled due to higher volumes; volume 70-80% of capacity; delays at signals 20-35 seconds.
LOS D	Stable flow; speeds considerably affected by change in operating conditions; minor delays; high density traffic restricts maneuverability; volume 80-90% of capacity; delays at signals 35-55 seconds.
LOS E	Unstable flow; low speeds; considerable delay; volume at or near capacity; freedom to maneuver extremely difficult; volume 90-100% of capacity; delay at signals 55-80 seconds.
LOS F	Forced flow; very low speeds; volume exceeds capacity; long delays; stop and go traffic; delays at signals more than 80 seconds.

LOS is used in transportation modeling to determine the impacts of a particular development project or the addition of a new transportation facility on the operation of the existing road network. Development applications that meet specified thresholds will be required to submit a traffic impact analysis (TIA) in accordance with VDOT Chapter 527 requirements. Stafford County will review the TIA based on LOS C. Where LOS C cannot be attained, development applications will be evaluated by "non-degradation" and "offsetting impact" policies discussed below:

The Non-Degradation Policy requires applicants to ensure that the transportation system affected by the application performs no worse after the project is developed than it would otherwise. This approach is primarily a performance based approach which requires applicants to provide improvements or other guarantees to maintain certain performance levels. These levels would be measured by levels of service or other measures as deemed appropriate by the County and VDOT.

The Offsetting Impact Policy requires applicants to contribute to transportation improvements. The contributions would be proportional to the traffic generated by the project and the amount of transportation capacity required to accommodate that traffic, presumably based on lane-miles. However, this policy would not ensure that the localized performance of the transportation system would be maintained. Instead, it recognizes that in some instances, it may be impossible for performance to be maintained or for one individual applicant to provide the transportation improvements which may be needed.

In general, the Non-Degradation Policy would be pursued in reviewing development applications, with the Offsetting Impact Policy employed in those instances where the Non-Degradation policy is not appropriate.

4.7 Access Management

The VDOT latest Access Management Regulations were adopted in 2009 and amended in 2011, 2012, and 2014. Recognizing the benefit of minimizing impacts to roadways by development and the community benefits, the County follows the established regulations. The regulations are designed to preserve the performance of the existing highway and retain capacity through reduction in conflicting traffic movements. This will extend the transportation infrastructure capacity and promote economic development.

Typical techniques used in access management are use of reverse frontage, inter-parcel access and combining street entrances. Reverse frontage and/or inter-parcel connectors are required by the County's zoning ordinance along arterial and collector roads. In the Highway Corridor Overlay District (HCOD), the requirement supports the County's transportation objective to maximize the efficiency of roadway facilities. Principal arterials primarily accommodate through travel movements. However, direct access to and from these highways occurs frequently. In general, the provision of many access points reduces the efficiency and capacity of an arterial road. This reduction is caused by the interruptions in smooth traffic flow due to turning movements into and out of driveway entrances. Reverse frontage and inter-parcel connectors provide for the separation of the access and travel functions along roadways. When correctly planned and built, their use allows the adjacent parallel roadway to operate more efficiently, with increased capacity and safety. At the same time, access to adjacent properties is provided and oriented to controlled access points. These alternatives also allow for purely local inter-parcel trips to be made without disrupting the through traffic on the adjacent arterial.

Since October 2002, Stafford County has served as a liaison between residents and VDOT regarding traffic related concerns through the County's Residential Traffic Management Plan (RTMP). This plan, which closely follows the VDOT Traffic Calming Guide for Neighborhood Streets, ensures that various programs are available to citizens and communities to address residential traffic related problems for streets and roads operated and maintained by VDOT. In addition, the RTMP provides the minimum criteria (if any) to be satisfied, the steps citizens need to follow to obtain assistance with traffic related requests, and the process that the County will follow to resolve those requests.

As traffic issues in residential areas may have various sources, the following programs are available to address most concerns:

- Residence District – Additional \$200 Fine Signs
- Residential Cut-Through Traffic
- Through Truck Restriction
- Traffic Calming
- Watch for Children Signs
- Restricted Parking Area Program

4.8 VDOT Secondary Street Requirements

In March 2009, VDOT implemented its revised Secondary Street Acceptance Requirements (SSAR). These standards were further revised in 2011. The purpose of these requirements is to ensure that streets built by developers will enhance the overall capacity of the transportation network by providing additional transportation connections to adjacent developments. A disconnected local street network reduces the effectiveness of the overall regional and local roadway system by forcing local trips onto the regional network. A connected transportation system provides benefits to citizens and residents. The revised requirements expand street connectivity and improve traffic circulation. It also reduces the number of one single-entrance subdivisions. This should also enhance emergency access to neighborhoods, improving safety for the residents of Stafford. The County supports the VDOT Secondary Street Acceptance Requirements. Roads that are designed in accordance with these requirements may qualify for acceptance into VDOT's secondary system of highways for public maintenance.

4.9 Funding Sources

Road improvements in Stafford County are financed from various sources including the federal government usually through the Federal Highway Administration (FHWA), the Commonwealth of Virginia through VDOT, FAMPO, and with developers as well as County contributions. Funding sources include, but are not limited to:

- VDOT Six-Year Improvement Program for Interstate and Primary Systems (SYIP) — determined through VDOT. Funding is based on the Code of Virginia formula and approved by the Commonwealth Transportation Board (CTB).
- VDOT Six-Year Improvement Program for Secondary System (SSYP) — determined by VDOT. Funding is based on the Code of Virginia formula and approved by the Board of Supervisors and the CTB.
- Congestion Management and Air Quality (CMAQ) Program funds—federal monies allocated by FAMPO negotiated and based on formula
- Surface Transportation Block Grant (STBG) — federal funds allocated by FAMPO
- VDOT Revenue Sharing Program
- SMART SCALE: VDOT administered multi-modal transportation funding program
- Legislative appropriations (others not currently programmed)
- Advance construction funds through VDOT
- Federal Highway Administration (FHWA) Bonus Obligation Funds
- Federal earmarks
- County general funds
- Debt issued by the County for road projects
- 2.1% fuel sales tax
- Transportation Impact Fees
- Transportation Service District Tax
- The 2019 Bond Referendum
- Developer funds and improvements
 - Proffers
 - Built directly
 - Financial securities, usually supplemented by other funds for projects abandoned or unfinished by developers.

- Transportation Enhancement Grants — federal grants allocated through the CTB
- Other grants—there are a wide variety of grant programs

4.9.1 Transportation Service Districts

The Transportation Service Districts are special taxing districts in which commercial properties contribute to transportation improvement projects within the service district areas. Three transportation service districts serve the County, one in the Garrisonville Road (SR-610) area, one in the Warrenton Road (U.S. Route 17) area, and another in the Rockhill district in the Lynhaven Lane area below the northwest portion of Courthouse Road. The County began collecting revenues in 2008. All funds must be expended on transportation improvements within the respective service areas.

4.9.2 2.1% Fuel Sales Tax

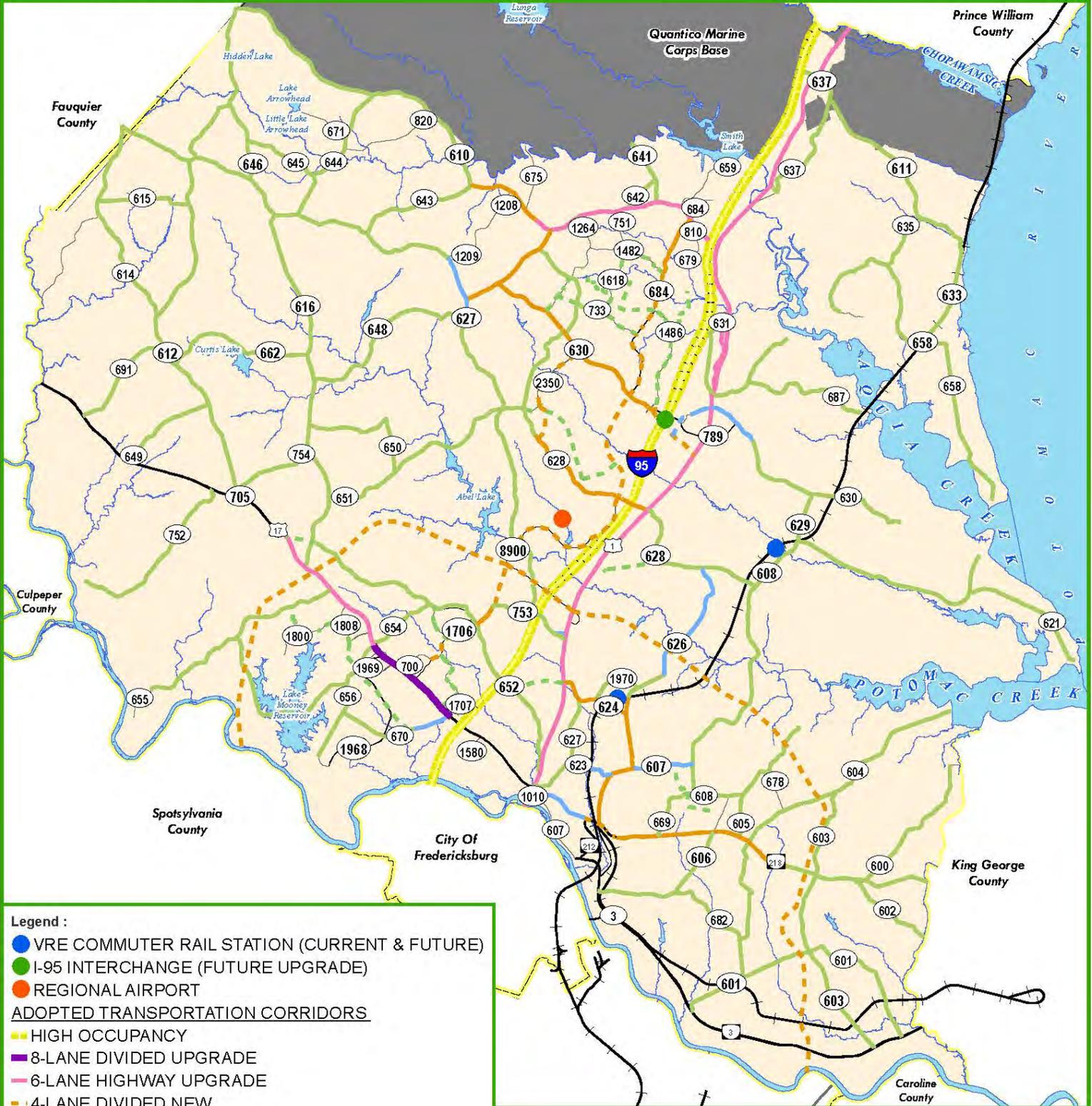
As a member of the Potomac and Rappahannock Transportation Commission, (PRTC), a 2.1% motor fuels sales tax is collected and paid monthly by registered retail outlets in the County. The tax is, in effect, assessed at the pump. The revenue collected through this tax is used for transportation improvements in the County. PRTC is the management agency for the fuels tax collected within Stafford County's borders. Except for a small annual PRTC administrative fee, all of the fuels tax revenue collected in the County is used in the County. The County is obligated to use these funds to off-set the subsidy for VRE ridership within the County. Any remaining funds beyond what is required for the subsidy can be used by the County for other transportation improvement projects.

4.10 Anticipated Transportation Needs

A summary of all of these anticipated transportation needs in are listed in Table 4.1. Some of the transportation needs are graphically represented in Figure 4.1

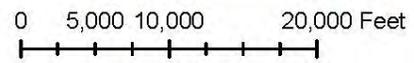


FIGURE 4.1 Anticipated Transportation Needs Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend :

- VRE COMMUTER RAIL STATION (CURRENT & FUTURE)
- I-95 INTERCHANGE (FUTURE UPGRADE)
- REGIONAL AIRPORT
- ADOPTED TRANSPORTATION CORRIDORS**
- HIGH OCCUPANCY
- 8-LANE DIVIDED UPGRADE
- 6-LANE HIGHWAY UPGRADE
- 4-LANE DIVIDED NEW
- 4-LANE DIVIDED UPGRADE
- 4-LANE UNDIVIDED NEW
- 4-LANE UNDIVIDED UPGRADE
- 2-LANE NEW
- 2-LANE UPGRADE



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Table 4.1 Anticipated Transportation Needs

Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
1	Cambridge Street / U.S. Route 1	Fredericksburg County Line	Accokeek Creek Bridge	6	160	Urban	\$135.72
1	U.S. Route 1	Accokeek Creek Bridge	Hope Road	6	120	Urban	\$31.49
1	U.S. Route 1	Hope Road	Prince William County Line	6	160	Urban	\$156.43
17	Warrenton Road	Interstate 95	Berea Church Road	8	160	Urban	\$108.11
17	Warrenton Road	Berea Church Road	Truslow Road Extended	6	145	Urban	\$53.87
212	Butler Road	Cambridge Street	Chatham Heights Road	4	110	Urban	\$18.98
218	White Oak Road	Deacon / Cool Springs Road	Caisson / Newton Road	4	110	Urban / Rural	\$55.13
218	White Oak Road	Caisson / Newton Road	King George County Line	2	60	Rural	\$7.06
600	Bethel Church Road	White Oak Road	King George County Line	2	60	Rural	\$9.90
601	Forest Lane Road	Kings Highway	Caisson Road	2	60	Urban / Rural	\$9.22
601	Hollywood Farm Road	Caisson Road	Kings Highway	2	60	Rural	\$8.84
602	Chapel Green Road	White Oak Road	King George County Line	2	60	Rural	\$5.58
603	Caisson Road	Kings Highway	White Oak Road	2	60	Rural	\$11.88
603	Newton Road	White Oak Road	Belle Plains Road	2	60	Rural	\$5.38
604	Belle Plains Road	White Oak Road	End of State Maintenance	2	60	Rural	\$15.05
604	McCarty Road	Forest Lane Road	White Oak Road	2	60	Rural	\$8.98
605	New Hope Church Road	White Oak Road	End of State Maintenance	2	60	Rural	\$9.57
606	Ferry Road	Kings Highway	White Oak Road	2	60	Urban	\$12.43
607	Deacon Road	Leeland Road	Brooke Road	4	110	Urban	\$18.14
608	Brooke Road	New Hope Church Road	End of State Maintenance	2	60	Urban / Rural	\$38.19
610	Garrisonville Road	Fauquier County Line	Joshua Road	2	60	Urban / Rural	\$19.03
610	Garrisonville Road	Joshua Road	Shelton Shop Road	4	110	Urban	\$28.56
610	Garrisonville Road	Shelton Shop Road	U.S. Route 1	6	135	Urban	\$72.93
611	Widewater Road	Telegraph Road	Arkendale Road	2	60	Urban / Rural	\$13.93
612	Hartwood Road	Poplar Road	Warrenton Road	2	60	Rural	\$23.40

Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
612	Heflin Road	Poplar Road	Tacketts Mill Road	2	60	Rural	\$3.96
615	Skyline Drive	Cropp Road	Hartwood Road	2	60	Rural	\$5.94
616	Poplar Road	Warrenton Road	Fauquier County Line	2	60	Urban / Rural	\$33.04
621	Marlborough Point Road	Brooke Road	End of State Maintenance	2	60	Rural	\$8.42
624	Layhill Road	Forbes Street	Cambridge Street	4	110	Urban	\$2.52
624	Morton Road	Leeland Road	Primmer House Road	2	60	Urban	\$4.44
626	Leeland Road	Deacon Road	Morton Road	4	110	Urban	\$25.70
626	Leeland Road	Morton Road	Potomac Run Road	2	60	Urban / Rural	\$1.90
626	Potomac Run Road	Eskimo Hill Road	Leeland Road	2	60	Rural	\$7.69
627	Forbes Street	Cambridge Street	Layhill / Morton Road	2	60	Urban	\$9.61
627	Mountain View Road	Poplar Road	Choptank Road	2	60	Urban / Rural	\$11.77
627	Mountain View Road	Choptank Road	Stefaniga Road	4	120	Urban	\$20.83
627	Mountain View Road	Stefaniga Road	Centreport Parkway	2	60	Urban / Rural	\$14.76
628	Ramoth Church Road	Woodcutter Road extended	Interstate 95	4	110	Urban	\$38.30
628	American Legion Road	Interstate 95	U.S. Route 1	4	110	Urban	\$5.54
628	Eskimo Hill Road	U.S. Route 1	Brooke Road	2	60	Urban / Rural	\$9.97
628	Winding Creek Road	Courthouse Road	Shelton Shop Road	2	60	Urban	\$8.87
630	Courthouse Road	Spartan Drive	End of State Maintenance	2	60	Rural	\$11.25
630	Courthouse Road	Shelton Shop Road	Austin Ridge Drive	4	135	Urban	\$64.51
631	Bells Hill Road	U.S. Route 1 South	U.S. Route 1 North	2	60	Urban	\$7.76
633	Arkendale Road	Widewater Road	Brent Point Road	2	60	Rural	\$6.93
635	Decatur Road	Widewater Road	End of State Maintenance	2	60	Rural	\$9.74
637	Telegraph Road	Interstate 95	Woodstock Lane	2	60	Urban	\$10.40
639	Woodstock Lane	Telegraph Road	U.S. Route 1	2	60	Urban	\$0.83

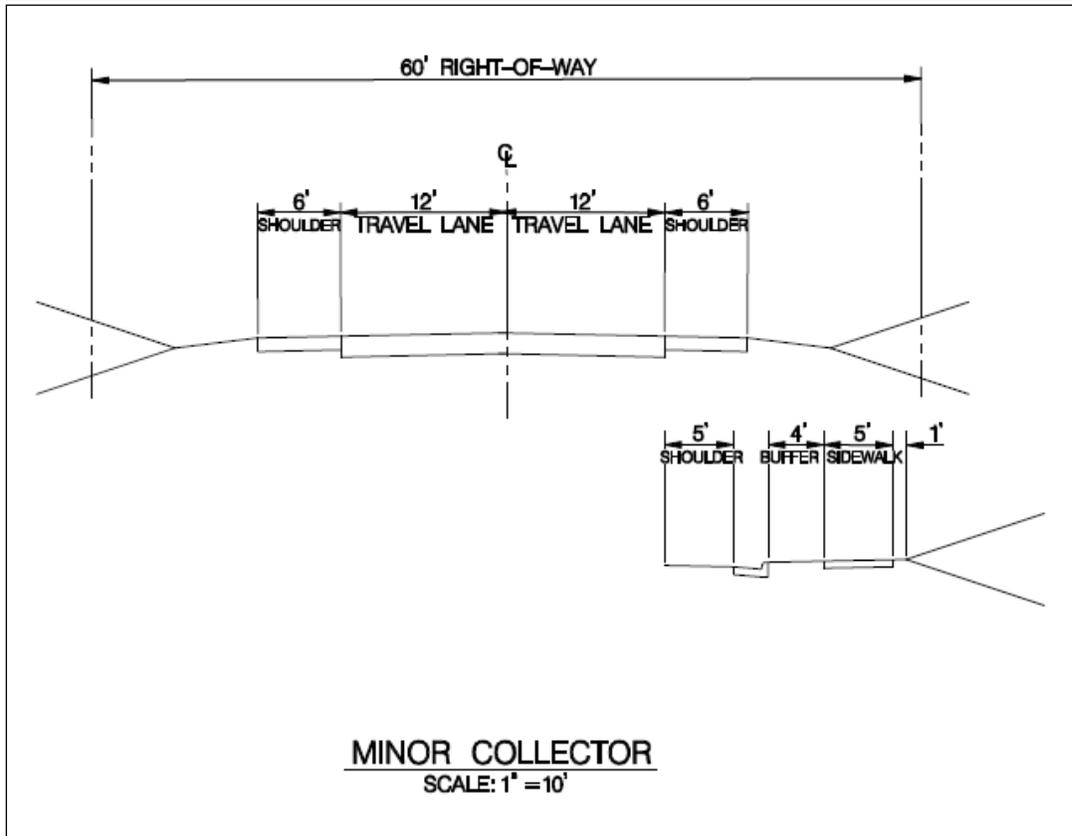
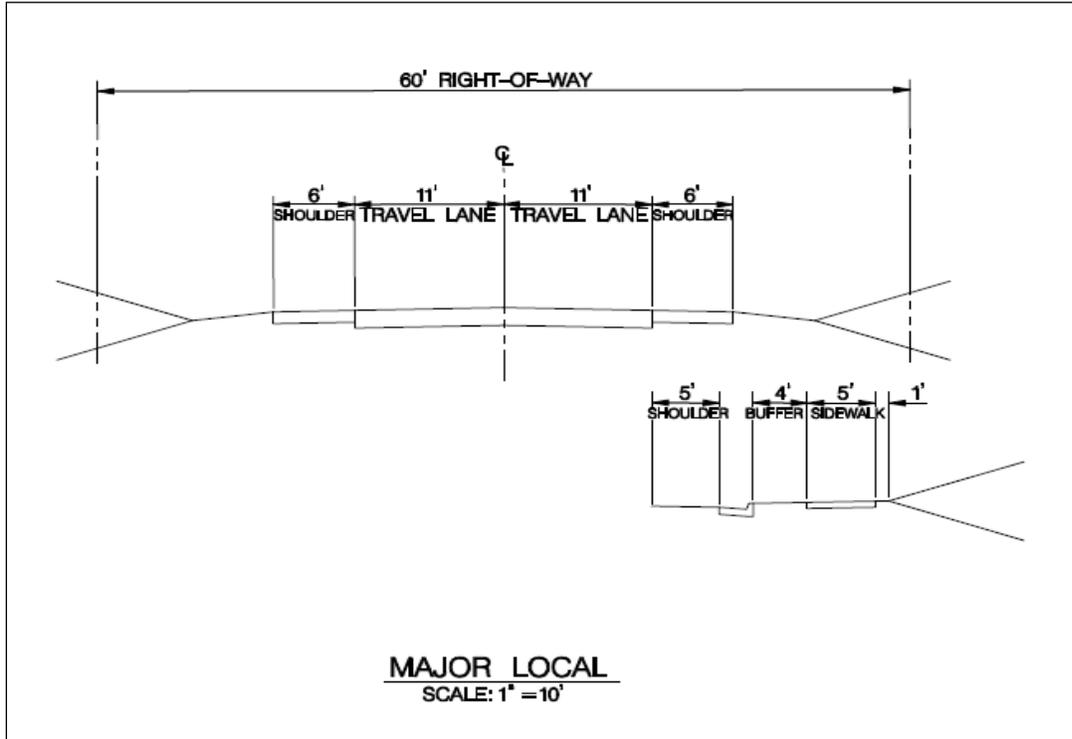
Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
641	Onville Road	Garrisonville Road	Quantico Marine Corp Base	2	60	Urban / Rural	\$4.83
642	Barrett Heights Road	Garrisonville Road	Onville Road	2	60	Urban	\$3.23
643	Joshua Road	Garrisonville Road	Mountain View Road	2	60	Urban / Rural	\$8.47
644	Rock Hill Church Road	Mountain View Road	Garrisonville Road	2	60	Rural	\$9.04
645	Dunbar Road	Tacketts Mill Road	Rock Hill Church Road	2	60	Rural	\$4.95
646	Tacketts Mill Road	Poplar Road	Fauquier County Line	2	60	Rural	\$9.90
640	Porter Lane	Enon Road	End of State Maintenance	2	60	Urban	\$1.06
648	Shelton Shop Road	Mountain View Road	Garrisonville Road	4	110	Urban	\$33.43
648	Stefaniga Road	Poplar Road	Mountain View Road	2	60	Rural	\$11.78
649	Richland Road	Warrenton Road	Hartwood Road	2	60	Rural	\$6.27
650	Mount Olive Road	Poplar Road	Kellogg Mill Road	2	60	Rural	\$9.21
651	Kellogg Mill Road	Poplar Road	Ramoth Church Road	2	60	Rural	\$14.06
652	Truslow Road	Poplar Road	Cambridge Street	2	60	Urban	\$31.23
654	Berea Church Road	Truslow Road	Warrenton Road	2	60	Urban	\$6.14
654	Rocky Run Road	Holly Corner Lane	River Acres Lane	2	60	Rural	\$4.85
654	Rocky Run Road	Greenbank Road	Burgess Lane	2	60	Rural	\$2.38
655	Holly Corner Road	River Ridge Lane	Warrenton Road	2	60	Urban / Rural	\$14.30
656	Greenbank Road	Warrenton Road	End of State Maintenance	2	60	Urban / Rural	\$8.32
658	Brent Point Road	Decatur Road	End of State Maintenance	2	60	Rural	\$16.43
670	Sanford Drive	Greenbank Road	Paul Lane	2	60	Urban / Rural	\$5.99
670	Sanford Drive	Paul Lane	Warrenton Road	4	110	Urban	\$11.26
682	Colebrook Road	Ferry Road	McCarty Road	2	60	Urban / Rural	\$6.39
684	Staffordboro Boulevard	Garrisonville Road	Sunningdale Drive	4	110	Urban	\$2.69
684	Staffordboro Boulevard	Sunningdale Drive	Pike Place	2	60	Urban	\$0.96
687	Hope Road	U.S Route 1	End of State Maintenance	2	60	Urban / Rural	\$12.86
691	Stony Hill Road	Hartwood Road	Poplar Road	2	60	Rural	\$9.57

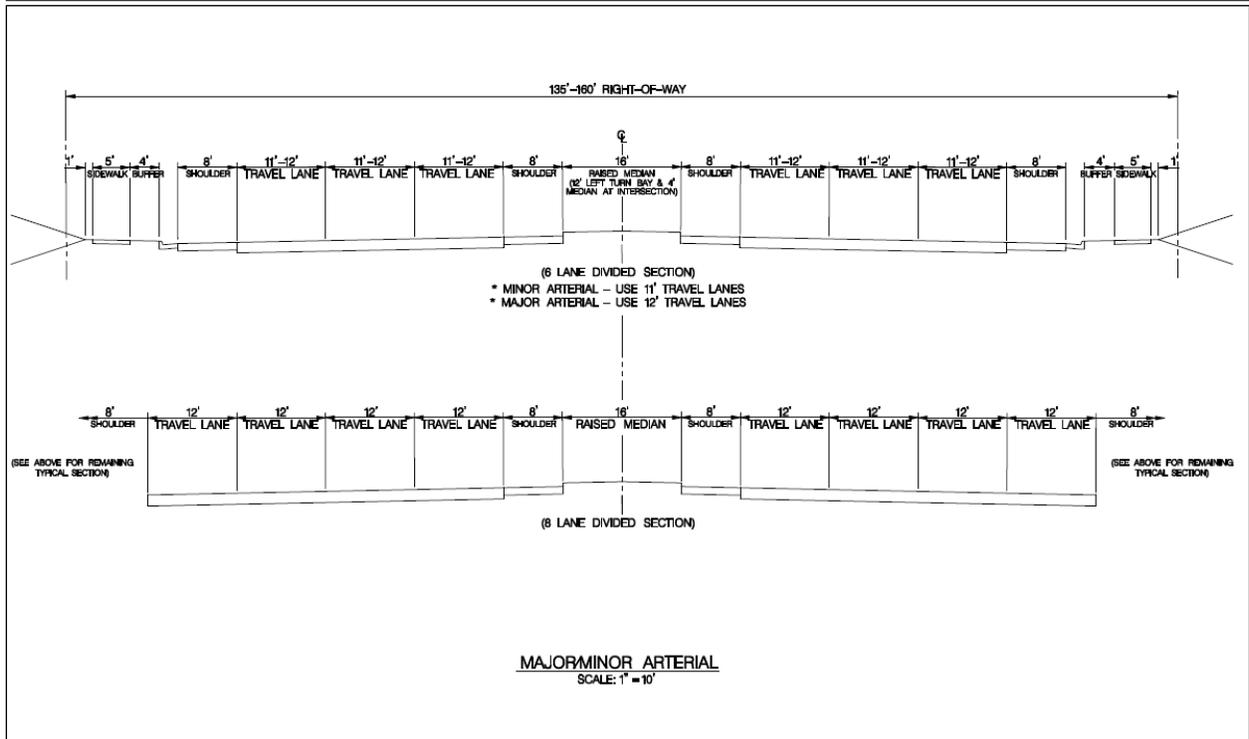
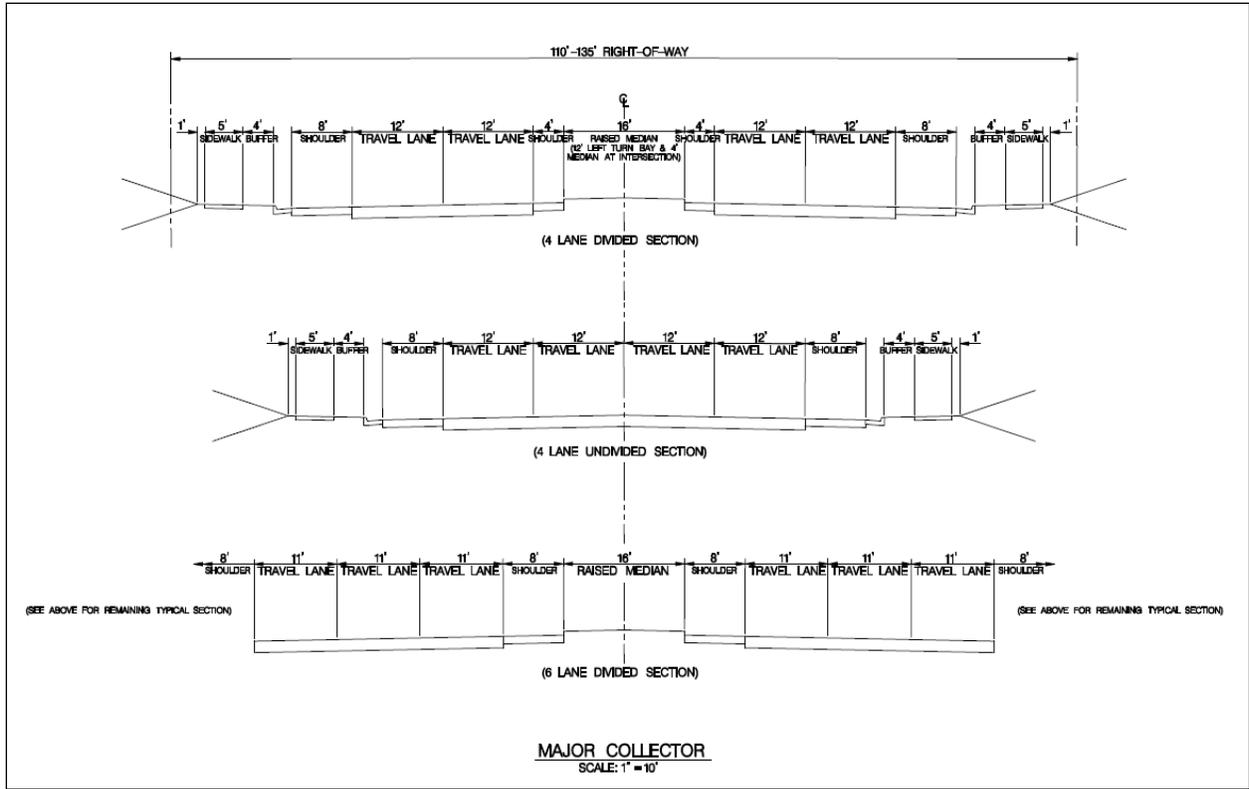
Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
691	Storck Road	Warrenton Road	Hartwood Road	2	60	Rural	\$6.86
721	Olde Concord Road	Hope Road	End of State Maintenance	2	60	Urban	\$5.17
753	Enon Road	Porter Lane	U.S. Route 1	4	110	Urban	\$3.53
753	Enon Road	Hulls Chapel Road	Truslow Road	4	110	Urban	\$6.89
753	Enon Road	Porter Lane	Hulls Chapel Road	2	60	Urban	\$1.57
754	Shackelford Well Drive	Hartwood Road	Poplar Road	2	60	Rural	\$6.01
1264	Parkway Boulevard	Garrisonville Road	Kimberly Lane	2	60	Urban	\$5.61
1706	Plantation Drive	Lichfield Boulevard	Truslow Road	4	110	Urban	\$19.15
2140	Pine View Drive	Centreport Parkway	Enon Road	2	60	Urban	\$2.91
8900	Centreport Parkway	Ramoth Church Road	Berea Parkway (new)	4	110	Urban	\$50.74

New Roads

Road Name	From	To	Future	R/W	Urban / Rural	Cost (in millions)
New I-95 Connector East	U.S. Route 1	Courthouse Road East	4	110	Urban	Unknown
Mine Road Extension	Austin Ridge Drive	Ramoth Church Road	4	110	Urban	\$96.77
Mine Road Extension	Centreport Parkway	Enon Road	4	110	Urban	\$20.43
Woodcutter Road	Courthouse Road	Kellogg Mill Road	4	110	Urban	\$35.75
Woodcutter Extended	Kellogg Mill Road	Ramoth Church Road	4	110	Urban	\$6.99
Austin Ridge Drive Extended	Eustace Road	Parkway Boulevard	2	60	Urban	\$12.10
Embrey Mill Road extended East	Embrey Mill Road	Mine Road	2	60	Urban	\$6.05
Embrey Mill Road extended West	Embrey Mill Road	Walpole Street	2	60	Urban	\$2.87
Eskimo Hill Connector	U.S. Route 1	Eskimo Hill Road	2	60	Urban / Rural	\$7.75
Kellogg Mill Road extended	Woodcutter Road	Mine Road extended	2	60	Urban	\$17.39
Truslow Road Connector	Truslow Road	U.S. Route 1	2	60	Urban	\$7.56
Warrenton Road Parallel Road	Sanford Drive	Stafford Lakes Parkway	2	60	Urban	\$14.52
Truslow Road extended	Poplar Road	Warrenton Road	4	110	Urban	\$10.75

Typical Roadway Sections





4.11 Right of Way Requirements

In an effort to preserve land for roadway improvements and to decrease delays in land acquisition, roadway plans are identified in Table 4.1 in the previous section. The right-of-way specified therein should be planned for through the development approval process (e.g. zoning reclassification, conditional use permit, site plan, etc.) as applications are submitted to the County or through their purchase by the County. The County ordinance sets forth transportation standards for right-of-way protection. In locations where roadway plans are identified in the Comprehensive Plan, or approved by either VDOT or the County Board of Supervisors, for road improvements, setbacks for any new construction shall be calculated based on the planned right-of-way area. The provision of these rights-of-way will allow for future road improvements to be constructed with adequate ancillary features such as turning lanes, sidewalks, trails, and buffering, while minimizing impacts on properties which are subsequently developed. It should be stressed, however, that the ultimate roadway designs will recognize available right-of-way to the extent possible; the intent of these plans is not to impose a rigid right-of-way swath through areas or mature neighborhoods, but rather to secure additional right-of-way needed for road improvements as development or redevelopment occurs.

Figure 4.1 depicts the anticipated road network improvements within the county based on the 20-year growth projection and build-out of the land use plan. Right of way plans for specific road segments are identified as future improvements on the map and are described in more detail in Table 4.1. Many of these projects are not currently funded and may be constructed beyond the 20-year plan horizon. However, it is important to identify these needed roadway improvements for future planning purposes. In the future, funding opportunities may come available for corridor improvements and safety improvements as new projects and lane widening and shoulder improvements as maintenance projects. Appendix H also contains diagrams depicting typical street sections with extents of desired right-of-way, number of lanes to be provided, median sizes and types and treatments for the of the roadway.

4.12 Targeted Development Area Improvements

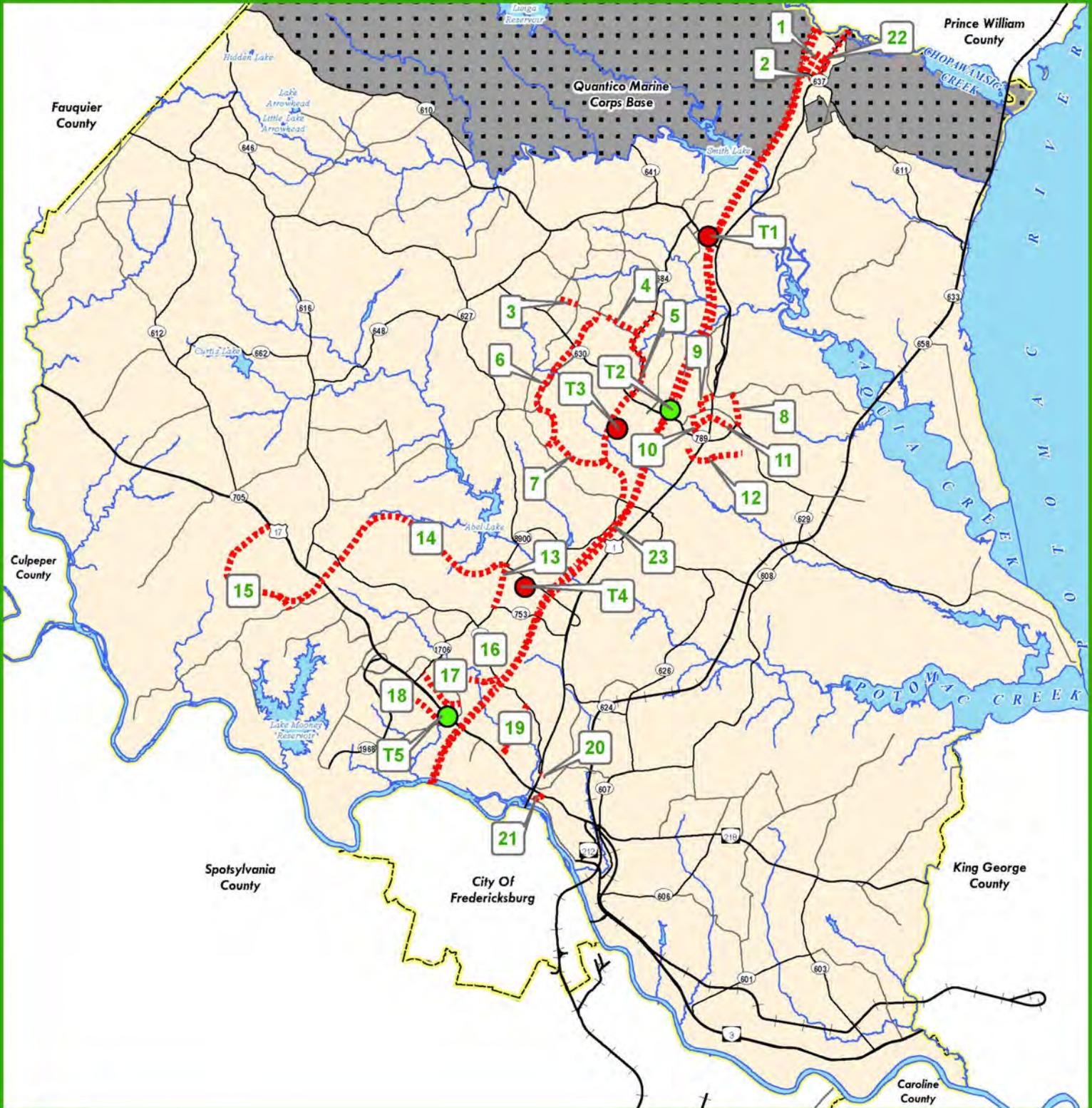
New roads will be required to support additional traffic generated by the growth patterns identified in the Targeted Development Areas (TDAs) of the Land Use Plan. Some of these roads have been previously identified on the Transportation Element Map and Land Use Plan Map. The new roads have many benefits. In the designated TDAs, proposed road segments are intended to meet the vision of these areas by creating a grid pattern street network that serves to relieve existing congested roadways. In new growth areas, collector roads will be required to move residents to work, shopping and other activities. The map in Figure 4.3 identifies the new improvements to the road network and transit facilities.

The map in Figure 4.3 identifies the new improvements to the road network and transit facilities.



FIGURE 4.2 Targeted Development Area Improvements Stafford County Comprehensive Plan Stafford County, Virginia

September 8, 2021



Legend

-  New Transit / Park & Ride Facility
-  Improvement to Existing Facility
-  New Road Segments

0 5,000 10,000 20,000 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Table 4.2. Targeted Development Area Improvements

Map Number	Road Name	Estimated Cost
1	Corporate Drive Extension (to Telegraph Road)	Unknown
2	US Route 1 Parallel Roads (Corporate Drive to Telegraph Road)	Unknown
3	Embrey Mill Road Extension West (to Walpole Street)	Unknown
4	Embrey Mill Road Extension East (to Mine Road)	Unknown
5	Mine Road Extension (Austin Ridge Drive to Ramoth Church Road)	Unknown
6	Woodcutters Road (Eustace Road to Ramoth Church Road)	Unknown
7	George Washington Village Connector Road	Unknown
8	Northeast Courthouse Bypass (Courthouse Road to Hope Road)	Unknown
9	Northwest Courthouse Bypass (US Route 1 to Government Center Access Drive)	Unknown
10	Jason Mooney Drive Extension (Courthouse Road to US Route 1)	Unknown
11	Courthouse Road Parallel Road (Jason Mooney Drive to Hospital Center Blvd)	Unknown
12	Venture Drive Extension/South Campus Blvd	Unknown
13	Centerport Parkway Extension (south to Enon Road)	Unknown
14	Berea Parkway (Centerport Parkway to Warrenton Road)	Unknown
15	Westlake Parkway (Loop Road off of Warrenton Road)	Unknown
16	Falls Run Drive Extension (South Gateway Drive to Truslow Road)	Unknown
17	US Route 17 Parallel Road (North side - from Plantation Dr to South Gateway Dr)	Unknown
18	US Route 17 Parallel Road (South side - extension of Capital Ave to Sanford Dr)	Unknown
19	Lendall Lane Extension (Warrenton Road to Truslow Road)	Unknown
20	Clearview Avenue Extension (to US Route 1)	Unknown
21	Rowser Road Extension (River Road to Butler Road)	Unknown
22	Jefferson Davis Highway Widening (Telegraph Road to Prince William County Line)	Unknown
23	Interstate 95 High Occupancy Toll (HOT) Lanes	Unknown
T1	Garrisonville Road Transit Center	Unknown
T2	Courthouse Road Park and Ride Lot Expansion	Unknown
T3	George Washington Village Transit Center and Park and Ride Lot	Unknown
T4	Centerport UDA Transit Center and Park and Ride Lot	Unknown
T5	Warrenton Road/Southern Gateway UDA Park and Ride Lot Expansion	Unknown

4.13 Road Improvement Program Projects

Several transportation improvements are close to becoming reality. Programs at the County and Regional level have been identified as funding sources for projects.

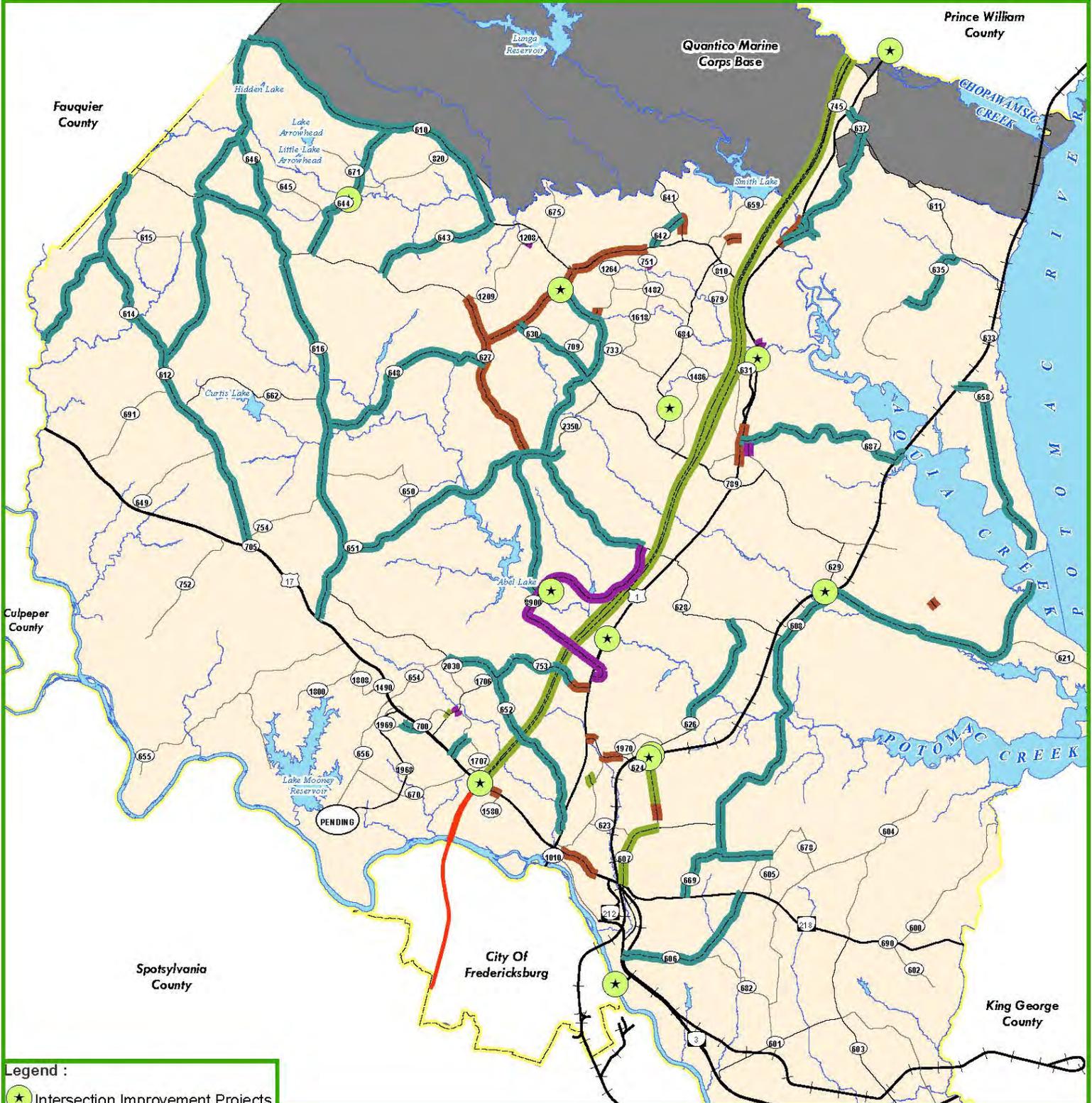
- The 2019 Transportation Bond that was approved by the citizens identified 18 projects. Most of these projects consist of capacity and safety improvements to existing roads. For more information on the 2019 Bond Referendum please visit: https://www.staffordcountyva.gov/residents/projects_and_programs/2019_bond.php
- The VDOT Six Year Improvement Program is a list of designated transportation improvements that will be undertaken by VDOT. The list is developed by VDOT (for the interstate and primary systems) and in consultation with county staff (for the secondary system). For more information on the program please visit: <http://syip.virginiadot.org/Pages/allProjects.aspx>

A summary of all of these road improvement projects in approved programs are listed in Table 4.3. Some of the projects are graphically represented in Figure 4.3.



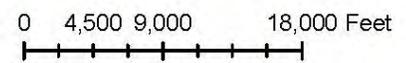
FIGURE 4.3 Road Improvement Program Projects Stafford County Comprehensive Plan Stafford County, Virginia

September 8, 2021



Legend :

- Intersection Improvement Projects
- 2019 Transportation Bond
- FAMPO CLRP
- FY22 Capital Improvement Program
- VDOT SYIP



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Table 4.3 Road Improvement Program Projects

VDOT Route Number	Street Name	Termini From	Termini To	Project Scope	Length (miles)	Program	Est. Cost (In millions)
1	U.S. Route 1	0.207 miles north of Hope Road	0.199 miles south of Courthouse Road	Reconstruction w/Turn Lanes	0.62	FY22 Capital Improvement Program	\$19.94
1	U.S. Route 1	0.082 miles south of Telegraph Road	0.184 miles north of Woodstock Lane	Intersection Improvements	0.70	FY22 Capital Improvement Program	\$9.81
627	Mountain View Road	Stefaniga Road	Lightfoot Drive	Roundabout	0.10	FY22 Capital Improvement Program	\$3.70
17	Warrenton Road	Short Street	Olde Forge Drive	Pedestrian Improvements	0.17	FY22 Capital Improvement Program	\$9.76
218	Butler Road	Carter Street	Castle Rock Drive	Study	0.78	FY22 Capital Improvement Program	\$0.20
N/A	Emergency Access Drive	Windermere Drive	Crestwood Lane	New Construction	0.17	FY22 Capital Improvement Program	\$1.54
608	Brooke Road	Raven Road	Maplewood Drive	Reconstruction	0.45	FY22 Capital Improvement Program	\$7.50
753	Enon Road	U.S. Route 1	Beauregard Drive	Reconstruction	0.60	FY22 Capital Improvement Program	\$10.60
648	Shelton Shop Road	Mountain View Road	Garrisonville Road	Reconstruction and Intersection Improvements	1.85	FY22 Capital Improvement Program	\$29.83
624	Layhill Road	U.S. Route 1	Forbes Street	Intersection Improvements	0.16	FY22 Capital Improvement Program	\$8.40
641	Onville Road	Worth Avenue	Barrett Heights Drive	3-lane Widening and Intersection Improvements	0.28	FY22 Capital Improvement Program	\$10.86
624	Leeland Road	Julian Drive	Walnut Drive	3-lane Widening	0.35	FY22 Capital Improvement Program	\$7.01
624	Morton Road	Forbes Street	Primmer House Road	Shoulder Improvements	0.34	FY22 Capital Improvement Program	\$1.60
627	Mountain View Road	Choptank Road	Stefaniga Road	Shoulder Improvements	1.21	FY22 Capital Improvement Program	\$9.38
627	Mountain View Road	Stefaniga Road	Kellogg Mill Road	Shoulder Improvements	1.92	FY22 Capital Improvement Program	\$4.80
610	Garrisonville Road	Shelton Shop Road	Eustace Road	6-lane Widening	1.40	FY22 Capital Improvement Program	\$52.39
709	Flatford Road	Winding Creek Road	Parkway Boulevard	Sidewalk	0.22	FY22 Capital Improvement Program	\$0.85
684	Staffordboro Boulevard	Juggins Road Connector	Crater Lane/Pike Place	Sidewalk	0.23	FY22 Capital Improvement Program	\$1.08
810	Salisbury Drive	Garrisonville Road	Mine Road Commuter Lot	Sidewalk	0.17	FY22 Capital Improvement Program	\$0.95

VDOT Route Number	Street Name	Termini From	Termini To	Project Scope	Length (miles)	Program	Est. Cost (In millions)
I-95	Interstate 95	Exit 133	Exit 143	HOT Lanes Extension	10.00	VDOT SYIP	\$35.00
I-95	Interstate 95	Exit 133	Exit 133	Bridge Replacement	0.03	VDOT SYIP	\$13.33
I-95	Interstate 95	U.S. Route 17 (Warrenton Rd)	Russell Road	Reconstruction w/Added Capacity	10.00	VDOT SYIP	\$488.20
1	U.S Route 1	0.096 miles south of Potomac Creek	0.133 miles north of Potomac Creek	Bridge Replacement	0.23	VDOT SYIP	\$7.01
1	U.S. Route 1	0.37 miles south of Russell Road	0.086 miles south of Russell Road	Bridge Replacement	0.28	VDOT SYIP	\$7.75
3	Kings Highway	0.044 miles west of City/County line	0.256 miles east of City/County line	Bridge Rehabilitation	0.30	VDOT SYIP	\$20.82
Various	Various	Various	Various	Shoulder Rumble Strips	N/A	VDOT SYIP	\$6.51
607	Deacon Road	Butler Road	Leeland Road	Sidewalk	1.13	VDOT SYIP	\$1.05
626	Leeland Road	0.025 miles south of Walnut Drive	0.12 miles north of Primmer House Road	Shared-Use Path	0.73	VDOT SYIP	\$2.87
644	Rockhill Church Road	0.087 mile south of Aquia Creek	0.098 miles north of Aquia Creek	Bridge Replacement	0.18	VDOT SYIP	\$6.48
648	Shelton Shop Road	Intersection with Winding Creek Road	Intersection with Winding Creek Road	Sight Distance Improvement	0.01	VDOT SYIP	\$0.05
1005	Manning Drive	James Madison Drive	Forbes Street	Sidewalk	0.17	VDOT SYIP	\$0.32
700	Lichfield Boulevard	Harrogate Road	Plantation Drive	Sidewalk	0.07	VDOT SYIP	\$0.25
VRE	Brooke Road Station	N/A	N/A	VRE Platform Extension	N/A	VDOT SYIP	\$7.40
VRE	Leeland Road Station	N/A	N/A	VRE Platform Extension	N/A	VDOT SYIP	\$15.26
VRE	Leeland Road Station	Leeland Road Parking Lot	Leeland Road Parking Lot	Parking Expansion	N/A	VDOT SYIP	\$5.52
639	Woodstock Lane	End	U.S. Route 1	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$19,569.00
618	Falls Run Drive	South Gateway Drive	U.S. Route 17	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$48,923.00

VDOT Route Number	Street Name	Termini From	Termini To	Project Scope	Length (miles)	Program	Est. Cost (In millions)
608	Brooke Road (New Hope Church to Eskimo Hill)	Eskimo Hill Road	New Hope Church Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$396,821.00
651	Kellogg Mill Road	Woodcutters Road	Stefaniga Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$506,626.00
646	Tacketts Mill Road (Heflin Rd to Aquia Rd)	Fauquier County	Heflin Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$163,077.00
612	Heflin Road	Tacketts Mill	Poplar Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$145,682.00
658	Brent Point Road (Arkendale to End)	End	Arkendale Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$282,667.00
700	McWhirt Loop	U.S. Route 17	Banks Ford Parkway	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$21,744.00
648	Stefaniga Road	Mountain View Road	Poplar Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$378,339.00
652	Truslow Road (Cambridge St to Berea Church)	Berea Church Road	U.S. Route 1	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$360,944.00
612	Hartwood Road	Poplar Road	U.S. Route 17	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$761,026.00

VDOT Route Number	Street Name	Termini From	Termini To	Project Scope	Length (miles)	Program	Est. Cost (In millions)
614	Spotted Tavern Road	Hartwood Road	Cropp Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$253,313.00
635	Decatur Road	End	Norman Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$390,298.00
669	Little Whim Road	Brooke Road	White Oak Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$130,462.00
626	Potomac Run Road	Eskimo Hill Road	Leeland Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$253,313.00
644	Rock Hill Church Road	Garrisonville Road	Mountain View Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$297,887.00
614/615	Cropp Road	Poplar Road	Fauquier County	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$242,441.00
608	Brooke Road (Eskimo Hill to End)	End	Eskimo Hill Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$629,477.00
646	Tacketts Mill Road (Poplar to Heflin)	Heflin Road	Poplar Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$191,344.00
628	Ramoth Church Road	Courthouse Road	Centreport Parkway	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$483,795.00

VDOT Route Number	Street Name	Termini From	Termini To	Project Scope	Length (miles)	Program	Est. Cost (In millions)
616	Poplar Road (Rt. 17 to Stefaniga)	Stefaniga Road	U.S. Route 17	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$391,385.00
628	Winding Creek Road	Shelton Shop Road	Embrey Mill Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$141,333.00
637	Telegraph Road	U.S. Route 1	U.S. Route 1	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$385,949.00
643	Joshua Road	Garrisonville Road	Mountain View Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$250,051.00
610	Garrisonville Road (Joshua to Lake Arrowhead)	Arrowhead Drive	Joshua Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$396,821.00
753	Enon Road (Stafford Indians to Truslow)	Truslow Road	Stafford Indians Lane	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$142,421.00
630	Courthouse Road (Winding Creek to Shelton Shop)	Shelton Shop Road	Winding Creek Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$170,687.00
606	Ferry Road	White Oak Road	Route 3	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$292,451.00
628	Winding Creek Road (Courthouse to Embrey Mill)	Embrey Mill Road	Courthouse Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$121,764.00

VDOT Route Number	Street Name	Termini From	Termini To	Project Scope	Length (miles)	Program	Est. Cost (In millions)
642	Barrett heights Road	Onville Road	Garrisonville Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$119,590.00
627	Mountain View Road (Centreport to Kellogg Mill)	Centreport Parkway	Kellogg Mill Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$354,421.00
687	Hope Road	End	U.S. Route 1	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$351,159.00
610	Garrisonville Road (Lake Arrowhead to Fauquier)	Fauquier County	Arrowhead Drive	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$215,262.00
616	Poplar Road (Stefaniga to Hartwood)	Hartwood Road	Stefaniga Road	Road Widening Safety Improvements. 2 ft. should wedge widening performed by VDOT with overlay		2019 Transportation Bond	\$554,462.00
1706	Plantation Drive Sidewalk	Southern Gateway	Plantation Drive	Construct 500' of sidewalk along east side of Plantation Drive from South Gateway to Knight's Court		FAMPO CLRP	\$1.34
Private?	Foreston Woods Drive Sidewalk	Foreston Woods Drive	U.S. Route 1	Construct 500' of sidewalk along north side of Foreston Woods from Susa Drive to U.S. Route 1 and crosswalk and ped signal to cross U.S. Route 1		FAMPO CLRP	\$1.34
1208	Furnace Road Sidewalk	?	?	Construct 750' of sidewalk along east side of Furnace Road from Choptank to rear entrance to North Stafford Complex Center		FAMPO CLRP	\$1.38

VDOT Route Number	Street Name	Termini From	Termini To	Project Scope	Length (miles)	Program	Est. Cost (In millions)
1304	Stafford Avenue Sidewalk	Hope Road	U.S. Route 1	Construct 1,060' of sidewalk along west side of Stafford Avenue from Courthouse Road to Stafford Community Center		FAMPO CLRP	\$1.85
751	Eustace Road Sidewalk	?	?	Construct 850' of sidewalk along the west side of Eustace Road from Appalachian Drive to Cabin Court		FAMPO CLRP	\$1.48
U.S. Route 1	U.S. Route 1 & Coal Landing Road	Coal Landing Road	Coal Landing Road	Left turn lane extension on U.S. Route 1 at Coal Landing Road		FAMPO CLRP	\$3.05
8900	Centreport Parkway Study	U.S. Route 1	Ramoth Church Road	Traffic study of Centreport Parkway area for future development and roadway improvements		FAMPO CLRP	\$200,000.00

4.14 Transportation Impact Fees

In 2000, and as amended in 2007 the Virginia General Assembly granted the County the authority to impose transportation impact fees for new development in order to generate revenue for the costs of reasonable road improvements “necessitated by and attributable to new development.” The Transportation Impact Fee program has been in place since 2003. The purpose of the program is to require new development to assist in the funding of future road improvements, the need for which results from the additional demand generated. The impact fee service area encompasses all land located in the county, except any land located within the boundary of Marine Corps Base Quantico. Transportation Impact Fees are unique to Stafford County. Currently, no other locality in Virginia has taken advantage of this legislative authority. The County will be conducting a new impact fee study that is anticipated to generate a framework for amending the currently imposed policy.

The transportation impact fee program identifies specific road improvements that are necessary to accommodate new growth.

The identified improvements for the Stafford County are:

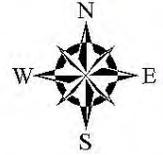
- Upgrade Richards Ferry Road (SR-752) from Warrenton Road (U.S. Route 17) to Cotton Lane (private road) to a rural two lane major local standard
- Upgrade Holly Corner Road (SR-655) from Warrenton Road (U.S. Route 17) to Hall Lane (SR- 726) to a rural two lane major local standard
- Upgrade Ramoth Church Road (SR-628) from Courthouse Road (SR-630) to Kellogg Mill Road (SR-651) to a rural two lane major local standard
- Upgrade Embrey Mill Road (SR-733) from Winding Creek Road (SR-628) to Eustace Road (SR-751) to an urban two lane major local standard
- Widen Courthouse Road (SR-630) from an urban two lane major local to a four-lane divided major collector from Austin Ridge Drive (SR-1486) to Walpole Street (SR-709)
- Widen Enon Road (SR-753) from an urban two lane major local to a four-lane divided major collector from Hulls Chapel Road (SR-653) to Truslow Road (SR-652)
- Upgrade Enon Road (SR-753) from Porter Lane (SR-640) to Hulls Chapel Lane (SR-653) to an urban two lane major local standard
- Widen Enon Road (SR-753) from an urban two lane major local to a four-lane undivided major collector from Cambridge Street (U.S. Route 1) to Porter Lane (SR-640)
- Widen Cambridge Street (U.S. Route 1) from a four-lane undivided minor arterial to a six-lane divided major arterial from the Fredericksburg City Line to Warrenton Road (U.S. Route 17) / Butler Road (SR-218)
- Widen Eustace Road (SR-751) from an urban two lane major local to a four-lane divided major collector from Embrey Mill Road (SR-733) and Garrisonville Road (SR-610)
- Upgrade Kellogg Mill Road (SR-651) from Poplar Road (SR-616) to Ramoth Church Road (SR-628) to a rural two lane major local standard
- Upgrade Eskimo Hill Road (SR-628) from U.S. Route 1 to Potomac Run Road (SR-626) to a rural / urban two lane major local standard
- Upgrade Brooke Road (SR-608) from New Hope Church Road (SR-605) to Andrew Chapel Road (SR-629) to a rural / urban two lane major local standard
- Widen U.S. Route 1 from a four--lane divided major arterial from Garrisonville Road (SR-610) to Telegraph Road (SR- 637)

- Upgrade Andrew Chapel Road (SR-629) from Courthouse Road (SR-630) to Brooke Road (SR-608) to a rural / urban two lane major local standard
- Upgrade Winding Creek Road (SR-628) from Courthouse Road (SR-630) to Shelton Shop Road (SR-648) to an urban two lane major local standard
- Upgrade Staffordboro Boulevard (SR-684) from Sunningdale Drive (private) to Pike Place (private) to an urban two lane major local standard
- Widen Staffordboro Boulevard (SR-684) from an urban two lane major local to a four-lane divided minor collector from Garrisonville Road (SR-610) to Sunningdale Drive (private)
- Upgrade Mine Road (SR-684) from Garrisonville Road (SR-610) to Settlers Way (SR-1460) to a four-lane major collector standard
- Upgrade Truslow Road (SR-652) from Cambridge Street (U.S. Route 1) to Poplar Road (SR-616) to a rural / urban two lane major local standard
- Upgrade Garrisonville Road (SR-610) from Rock Hill Church Road (SR-644) to Joshua Road (SR-643) to a rural / urban two lane major local standard
- Widen Plantation Drive (SR-1706) from an urban two-lane minor collector to a four-lane divided minor collector from Lichfield Boulevard (SR-700) to Lyons Boulevard (SR- 2030) / Gladstone Drive (private)
- Upgrade Joshua Drive (SR-643) from Garrisonville Road (SR-610) to St. George's Drive (SR-1250) to an urban two lane major local standard

Figure 4.4 provides a map of the County-wide impact fee road projects.



FIGURE 4.4 Transportation Impact Fee Area Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend :
Impact Fee Eligible Road Projects

0 5,500 11,000 22,000 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

4.15 2018 Countywide Comprehensive Road Evaluation

The County has initiated and helped fund 22 road improvement projects for an investment of \$57,000,000 since 2010. In 2018, the Stafford County Board of Supervisors initiated an objective, data-driven Comprehensive Road Evaluation to determine how best to plan for future road improvements in the County while identifying sources for funding.

To view information, data, and presentations related to this ongoing effort, please visit:

https://staffordcountyva.gov/government/departments_p-z/public_works/captial_design_and_construction/transportation_engineering/comprehensive_road_study.php

5.0 The Public Costs of Growth and Development

5.1 Introduction

Stafford County anticipates increases in population and business growth within the next 20 years. Although the County may not grow as quickly as projected on a continuous basis, the County is mindful of its continued responsibility to provide adequate levels of public services for residents and businesses. Increased residential growth requires adequate school facilities, social services, health service, and recreation facilities. All residents, businesses and commuters require sheriff and fire and rescue protection and support. Some growth will require expansion of existing public utilities. This chapter details expected Level of Service Standards, estimated capital costs of growth, and actions that can be taken to ensure that new development pays its share of the additional costs to meet expected Level of Service Standards. This chapter also projects out future public facilities needs (the Public Facilities Plan) based on projected population growth and land use and identifies how the financial impact of growth can be estimated with a Financial Impact Model that takes into account anticipated revenues and expenses. The information in this chapter may be used to assess the impact of proposed development projects, and to support planning for capital improvement projects.

5.2 Level of Service Standards

5.2.1 Background

Pursuant to Section 15.2-2223 of the Code of Virginia, Stafford County may identify which existing lands, facilities or services should be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed for use. Level of Service (LOS) Standards can assist in this effort.

The LOS Standards are designed to clearly articulate expectations for County service delivery in terms of staffing and the construction and/or improvement of public facilities. The location, size and timing of needed improvements are related to the development patterns identified in the Comprehensive Plan.

Generally, LOS Standards for capital facilities can be measured based on size of facilities, carrying capacity, services provided, and location and design criteria.

The LOS Standards are the basis for inputs that can be used to calculate the capital costs per residential unit, to develop a public facility plan and to estimate the financial impact of growth and development over the twenty-year course of the Comprehensive Plan.

LOS standards can also be used in evaluating a zoning reclassification request.

5.2.2 Definition

LOS Standards are benchmarks by which to measure the quantity and/or quality of service provided by a government agency. The types of services that are measured include schools, transportation, parks, libraries, emergency services, water utilities, wastewater utilities, and solid waste management. There are two types of LOS Standards: capital capacity and operational effectiveness. Capital capacity is geared towards ensuring there are an adequate number of facilities while operational effectiveness addresses issues such as staffing levels or response times. Although they are different, one influences the other.

5.2.3 Purpose and Intent

Level of Service (LOS) standards are measured on a County-wide basis for services. The LOS Standards provide an objective justification for assessing and mitigating the impacts of proposed development projects. Proffers are the most common method for mitigating impacts and can be based on established LOS. LOS can be integrated into the methodology for determining recommended proffers, calculating comprehensive impact fees, projecting future public facility needs, estimating the financial impact of growth, and the funding mechanism of the Capital Improvement Plan (CIP). Location, size and timing of needed improvements are directly related to the future development patterns identified in the Comprehensive Plan. LOS standards ensure the connection between growth and its consequences and ensure adequate facilities are available to support development.

The CIP is a dynamic document that is updated annually as part of the adopted budget; in this way, it reflects the capital capacity projects that are deemed necessary to meet and maintain the LOS Standards. The Proffer Guidelines are also updated annually and utilize a methodology which reflects the capital capacity projects on the CIP.

The Board of Supervisors has adopted debt limitation policies to protect and enhance the County Bond Rating. The debt limitation policies are used in the CIP to determine the affordability of proposed capital projects for public facilities but should not be used to delay necessary construction of required facilities. The public facility projections in this plan are intended to be informative and are not reflective of projected debt pursuant to those limitation policies. Development of the CIP and review of and development applications should be done in accordance with those stated limitations.

5.2.4 Benefits

- Establishing LOS Standards in a community is a beneficial tool in providing adequate public facilities consistent with citizen and business needs.
- The location, number, and type of facilities can be directly related to future development identified in the Comprehensive Plan.
- Allows for the prioritizing of projects in the CIP.
- Sound fiscal policy through planned debt service based on capital facility needs.

- LOS Standards can be integrated into the methodology for determining recommended proffer guidelines and required transportation impact fees to mitigate impacts from new development.
- High service levels may be used as selling points to promote Economic Development.
- Meeting these goals by providing adequate facilities can foster civic pride and a positive impression of the community.

5.2.5 Facilities

5.2.5.1. Schools

The Stafford County Public School System is currently comprised of seventeen elementary schools, eight middle schools, five high schools and Gari Melchers complex, which includes Head Start and alternative education programs, a Support Service complex, and the Alvin York Bandy Administrative complex that houses all central office administration. Rapid residential growth in the County impacts the capacity of the public school system and increases the demand for new schools. Subsequently, new school construction has become a standard component of the County's capital budget and Capital Improvement Plans. During the 2008-2016 timeframe, residential growth only slightly increased, however as the County's residential growth rebounds and new census figures are released, future school facility planning needs must be addressed and planned for with LOS Standards in mind.

The estimated average daily membership for the 2021 school year dropped from previous years due to the COVID-19 Pandemic that closed most schools and moved most of the teaching to a virtual environment. The expectation is that for the 2021-2022 school year the enrollment will return to pre-COVID levels and could even slightly increase. The last full year of enrollment for which we have good numbers is 2019-2020. At that point elementary school enrollment was at 90.6% of capacity, middle schools were at 87.9% and high schools were at 91.3%. Out of all the public schools in the County, four elementary schools (Kate Waller Barrett, Conway, Hampton Oaks, and Moncure) exceed their program capacity. Positive action will be required in the immediate future to mitigate these situations.

GOAL: Ensure school capacity is capable of meeting the current level and expected increase of students from residential development.

Policies to achieve this goal include:

1. The desired design area required for elementary schools should be a minimum of 107,500 square feet on at least 20 buildable acres; for middle schools, a minimum of 146,000 square feet on at least 40 buildable acres and for high schools a minimum of 290,000 square feet on at least 70 buildable acres.
2. School enrollment should not exceed their design capacity. Design capacities at each school varies and is provided in Table 6.21.
3. To ensure all schools operate at their most efficient level, student enrollment should not exceed 90 percent of the design capacity of each school.
4. Constantly review attendance zones and when necessary, realign school zones to relieve overcrowding of facilities while minimizing disruptions to families and communities whenever possible.

5. Begin the process to construct new schools when overall student enrollment is greater than 90% of total Design capacity for all County schools.
6. Expand permanent seat capacity if possible at existing schools as the first response to student growth.
7. Establish new attendance zones based on the factors identified in school board policy 1403:
 - a. Proximity of schools to student residences,
 - b. Forecasted school enrollment and capacity;
 - c. Walking distances,
 - d. Busing times and cost;
 - e. Walking and busing safety,
 - f. Natural and man-made geographic features,
 - g. Impact on neighborhoods,
 - h. School feeder patterns,
 - i. Contiguous school attendance areas,
 - j. Capital Improvement Plan,
 - k. Student Accommodation Reports,
 - l. Socioeconomic characteristics of school populations,
 - m. Distribution of programs and resources,
 - n. Overall impact on families,
 - o. Comparative long-term costs,
 - p. Parental Input, and
 - q. Frequency of previous changes for affected neighborhoods.
8. Reduce land costs for new schools through advance acquisition of optimal locations.
9. Where possible, seek to cluster schools together to take advantage of benefits derived from economies of scale such as shared facility or athletic field use.
10. Provide varied and viable instructional alternatives for students and their families.

5.2.5.2. Parks, Recreation and Community Facilities

The Parks, Recreation and Community Facilities Department provides leisure services and facilities to all citizens in order to improve social, mental and physical development. In addition, the Parks and Recreation Department coordinates cost effective, year-round management and maintenance of parks and facilities, aquatics, gymnastics, community recreation, youth and adult sports and senior citizen programs. The Parks and Recreation Department is divided into six divisions: Sports, Gymnastics, Aquatics, Community Recreation, Administration and Parks Maintenance. The Parks Maintenance Division is responsible for managing over 1,445 acres of County-owned recreation and parkland (1,093 developed and 352 undeveloped acres), not including school athletic fields.

It is the intent of the County to provide an appropriate balance of both active and passive recreation opportunities for the community. The County recognizes that an ideal park system provides a wide variety of multi-use recreation facilities that accommodate the varied recreation needs of all the community's citizens. Existing recreational facilities should be used as a base for future development. As additional parks are developed, consideration of the balance between

conservation and preservation of open space and the provision of active recreation becomes an important ingredient in the park development process.

GOAL: Provide a highly rated parks and recreation system for the enjoyment of all ages of Stafford County residents.

Policies to achieve this goal include:

1. Satisfy a LOS standard of 12 acres of developed parkland for each 1,000 county residents, consistent with standards established in the County's Development Control Policy for Parks and Recreation.
2. Develop a system of Parks and Recreation facilities distributed throughout the community, providing equitable opportunity for all residents to utilize recreational programs, recognizing that unique County features, attractions and landscape may dictate in some areas the location of certain facilities.
3. Develop a system of greenways, water trails, and bicycle, pedestrian and vehicular trails throughout the County, with connections to other regional systems; relate the system to an ecotourism initiative.
4. Develop comprehensive relationships, using established agreements, with quality outside youth and adult sports organizations to improve and enhance the quality and opportunity for County youth and adults to participate in recreational sports.
5. Develop a strong network of summer programs that are specifically designed to meet the needs of elementary and middle school students.
6. Adopt development guidelines and policies that support the Parks and Recreation system and master plan to produce compatible public amenities and open spaces.

5.2.5.3. Libraries

Central Rappahannock Regional Library (CRRL) provides library services within Stafford and Spotsylvania Counties as well as the City of Fredericksburg. Stafford County provides financial assistance for operations based upon the County population usage. As of March 2010, forty-five percent (45%) of the total 79,072 cardholders within the CRRL library system resided in Stafford County with most of them located in the southern portion of the County. The County will be providing maintenance to two County-owned branch facilities when the newest library opens.

The CRRL Headquarters Library is in Fredericksburg. The John Musante Porter Library Branch is located on Parkway Boulevard in the northern portion of Stafford County. The England Run Library, opened in the fall of 2010 and built to Leadership in Engineering and Environmental Design (LEED) standards, is located on Lyons Boulevard in the southern portion of the County. Based on a current LOS standard of 1 square foot of library floor area per person, Stafford County has a need for approximately 124,166 square feet of public library space. The square footage of Porter (approximately 23,000 square feet) and England Run (approximately 30,000 square feet) combined with 45% of the Headquarters space (approximately 17,000 square feet, based on 45% of the total cardholders residing in Stafford County) results in a total of 70,000 square feet. The square footage provided has a direct impact on the collection counts provided.

GOAL: Provide adequate library services to meets the needs of the current and future residents.

Policies to achieve this goal include:

1. Provide and maintain a LOS standard of 1.0 square foot of library floor area per capita, consistent with national and state standards.
2. Provide and maintain a LOS standard collection of 2.5 books/materials per capita.
3. Locate libraries within a 5 to 15-minute drive of the population they serve
4. Build new facilities at a 25,000 square footage standard in order to provide enough space to meet the demand for services “close to home.”
5. Locate future facilities to allow equitable distribution of services among the population.
6. Recognize the changing role of the library as a provider of information technology services and space for community meetings, classes and training.

5.2.5.4. Fire and Rescue

LOS Standards allow the County to plan for the number and location of facilities required to meet the service needs of the residents. Standards are applied to an anticipated growth pattern (from the Land Use Plan) to determine facility needs. The intent is to identify these standards within the Comprehensive Plan. Fire and Rescue LOS Standards are defined as travel/response time as well as workload capacity. Workload capacity has been quantified as building square footage, acreage and equipment needed to provide fire and rescue service that meets LOS standards for suburban and rural populations expressed as cost per capita for residential development. New development presents increased demands for County-wide fire and rescue services that affects the ability of current facilities to meet established LOS Standards. It is important, therefore, that Stafford County provides fire and rescue services countywide to address these demands.

Response and ISO Rating: Stafford County is rated by the Insurance Services Office (ISO) which has a direct impact on insurance premiums established by private insurance companies for residential, commercial and industrial structures. ISO is an independent company that serves insurance companies, communities, fire departments, insurance regulators and others by providing information about risk. ISO’s expert staff collects information about municipal fire suppression efforts in communities throughout the United States. In each of those communities, ISO analyzes the relevant data and assigns a Public Protection Classification (PPC) – a number from 1 to 10. Class 1 represents an exemplary fire suppression program and Class 10 indicates that the area’s fire suppression program does not meet ISO’s minimum criteria. In September of 2014, ISO established the latest Public Protection Classification (PPC) rating for Stafford County at a Class 4/4y level. This “split” classification applies the rating of “4” to properties within 5-road miles of a recognized fire station and within 1,000 feet of a recognized water source. The rating of “4y” then applies to structures within 5 miles of a fire station but not within 1,000 feet of a recognized water source.

GOAL: Ensure adequate fire protection response and emergency medical services for the County’s residents, businesses and tourists.

Policies to achieve this goal include:

1. Improve upon a LOS Standard of an ISO Rating of 4/4y countywide.
2. Strive towards full-time staffing all Fire and Rescue facilities 24 hours a day, 7 days a week with at least one staffed ground transport unit (6 FTE) and one staffed fire suppression unit (12 FTE) per station.
3. Respond to 90% of all fire and emergency medical calls within Center for Public Service Excellence (CPSE) response time standards for suburban (5 minutes) and rural (8 minutes) demand zones.
4. Districts with units exceeding 20% of Unit Hour Utilization and/or exceeding 2,000 calls annually should be evaluated for staffing additional Fire and Rescue units.
5. Existing and new stations and other facilities shall be refurbished, modernized, and constructed to maintain adequate service levels consistent with growth levels.

5.2.5.5. Law Enforcement

The Stafford County Sheriff's Office operates from the Ford T. Humphrey Public Safety Building located in the Stafford Courthouse area. The Office is organized into eight primary divisions: Field Operations, Special Operations, Administrative Services, Criminal Investigation, Civil Process/Court Security, Emergency Communications, Animal Control and Professional Standards Unit. There are 297 total authorized positions that includes sworn officers, animal control personnel, civilian personnel, and emergency communication center personnel.

A multi-year year comprehensive study of line level staffing, supervision and workload was undertaken by the Sheriff's Office in 2013 and later adopted by the Board of Supervisors. This study involved looking at accepted formulas for determining staffing levels, customizing those formulas to local conditions, collecting local data and then applying the data to the formulas to determine the need for additional staffing in the various divisions of the Sheriff's Office. In all but a few cases, calculations were based on workload and the availability calculations of personnel. In other cases, national best practices or fixed position calculations were utilized. The study indicated a need for additional sworn law enforcement officers, animal control officers and staff, emergency communications personnel and civilian support personnel.

The most critical needs were identified in the patrol function where the staffing determinations were based upon a formula using operational and operational support workload time and proactive patrol time. The set standard is no more than 70% of a law enforcement officer's time should be devoted to operational and operational support workload time and no less than 30% of their time should be devoted to proactive patrol time. Operational workload and operational support time are defined as the time dedicated to responding to calls for service or initiation of criminal investigations, time to meet fair labor standards, service vehicles, report documentation, case preparation, meeting, training, etc. Proactive time is defined as the time used to solve potential crime problems, engage the community, patrol, traffic safety, etc. The study revealed that the County's present operational and operational support workload comprises 70-90% of a law enforcement officer's time, leaving only 10-30% of their time for proactive policing.

Response Time: The Sheriff's Office records all "Calls for Service" as workload. These calls are prioritized into five individual categories:

- A. Priority 1: Emergency call life threat or similar; respond with all haste generally lights and siren.
- B. Priority 2: Emergency but not quite to the level of #1; respond expeditiously.
- C. Priority 3: Urgent non-emergency; respond ASAP.
- D. Priority 4: Non-emergency respond, within a certain time frame.
- E. Priority 5: Non-emergency respond, when you are free from other duties.

The "gold standard" for response time to emergency and "in-progress" calls for service is 3 minutes. The national recommended average for emergency response time has been set at under 5 minutes and is a more realistic goal for the County. Due to traffic congestion, distances in some areas and personnel constraints, the response time to these types of calls has averaged more than 7 minutes during the study period. Response time for non-emergency calls for service is recommended to be under 10 minutes. During the study period, the County's field response time for non-emergency calls for service averaged over 12 minutes.

GOAL: Ensure a higher level of ethical, compassionate, fair and professional crime prevention and public safety protection by the Sheriff's Office for the County's residents, businesses and tourists, by employing the best personnel and using the best tools and technology available.

Policies to achieve this goal include:

- 1. Provide crime prevention services and education to all segments of the community, reaching at least 40% of the residents annually.
- 2. Maintain appropriate facilities, equipment and staffing to dispatch Sheriff's and Fire and Rescue units to emergency calls, ensuring timely processing of request for assistance and the initial deployment of the most appropriate emergency resources.
- 3. Deliver a comprehensive, data driven, law enforcement program approach to reduce fatalities and serious injuries on Stafford roads while addressing community traffic concerns.
- 4. Respond to 100% of all emergency calls for service within 5 minutes or less, on average, of being dispatched.
- 5. Respond to 100% of all non-emergency calls for service within 10 minutes or less, on average, of being dispatched.
- 6. Decrease the percentage of a law enforcement officer's time dedicated to operational and administrative workload activities to 70%.
- 7. Increase the percentage of a law enforcement officer's time dedicated to proactive activities to 30%.
- 8. Provide criminal investigation services to 100% of crimes requiring follow-up.

The goal and objectives can be achieved through appropriate and contemporary law enforcement facilities and equipment, properly distributed, and staffed by highly trained personnel to meet community safety and response standards.

5.2.5.6. Water Utilities

The Stafford County Department of Utilities is the sole provider of public water service to the County. The public water service area is the entire Urban Service Area (USA) of the County and certain areas outside of the USA.

The County's water supply and treatment system consists of three surface water reservoirs and two water treatment facilities. Lake Mooney reservoir, completed in 2015, has a safe yield of 12.0 million gallons per day (mgd) and is a pump storage facility from the Rappahannock River. Lake Mooney is the sole source of raw water to the Lake Mooney Water Treatment Facility, which has a maximum treatment capacity of 9.1 mgd and an ultimate capacity of 20 mgd. The Smith Lake reservoir has a safe yield of 7.7 mgd. It is the sole source of raw water to the Smith Lake Water Treatment Facility which has a maximum treatment capacity of 12.5 mgd. The Abel Lake reservoir has a safe yield of 6.1 mgd. It can be made available for future use with a water treatment facility on site or as a raw water source for the Lake Mooney Water Treatment Facility.

The water transmission and storage system consists of three ground level water storage tanks, eleven elevated water storage structures, five major water pumping stations, six standby pumping stations, and approximately 715 miles of water mains ranging in size from 2-inch to 30-inch diameter. The County currently has six individual pressure zones.

GOAL: Provide an adequate and quality public drinking water supply, treatment, transmission, storage, and distribution system to serve existing and proposed developments as reflected in the County's Land Use Plan (LUP). The public drinking water system is to be economically feasible and environmentally sensitive.

Policies to achieve this goal include:

1. Design and construct all water supply, treatment, and distribution facilities in accordance with the Stafford County General Water Improvement Plan and Capital Improvement Plan (CIP). Water facilities shall be planned and designed in accordance with the land uses, densities, intensities and locations as shown in the LUP.
2. Water system improvements shall be constructed in accordance with the schedule shown in the Stafford County General Water Improvement Plan and the CIP.
3. The capital costs of system expansions and increases in system capacity shall be the responsibility of new development.
4. The County's water supply and water treatment capacity shall be monitored and shall be increased as required in order to provide a sufficient water supply within Stafford County on an as-needed basis.
5. Expansions of the service area and improvement of the water transmission system shall be done in accordance with criteria set forth in the Comprehensive Plan.
6. User Fees, Availability Rates, Pro Rata Rates, and other fees will be reviewed on an annual basis.
7. All future development within the USA shall be required to utilize the public water system.
8. Only developments within the USA will be allowed to connect to the public water system, except for those properties that satisfy Policy 1.4.2.

9. Extension and improvements of public water facilities shall not be used as a justification for increasing the residential densities beyond what is shown in the LUP.
10. Operate the water system at a level of service (LOS) to ensure full compliance with state and federal standards.
https://staffordcountyva.gov/government/departments_p-z/public_works/utilities/water/water_quality_report.php
11. Design the water distribution system to meet a LOS that has a normal operating pressure of between 40-80 pounds per square inch (psi).
12. Provide fire protection to the USA in accordance with the Stafford County Water and Sewer Standards. It is recognized that currently portions of the county do not have this standard of fire protection. Upgrading the entire service area to this level will require a minimum of ten years.
13. Design Standards shall meet the following LOS:
 - a. Water treatment facilities shall be designed to provide a maximum daily water demand that is 1.5 times the annual average daily water demand.
 - b. Water pumping stations shall be designed to pump the maximum daily water demand with one pump out of service.
 - c. Pipelines shall be designed to provide:
 - i. The maximum hour domestic flow plus fire flow.
 - ii. A maximum velocity of 5 feet per second (fps).
 - iii. A maximum head loss of 2-5 feet/1000 feet of pipeline.

5.2.5.7. Wastewater Utilities

The Stafford County Department of Utilities is the sole provider of public sewer service to the County. The public sewer service area is the entire Urban Service Area (USA) of the County and includes very limited areas outside of the USA.

Stafford County has two wastewater treatment facilities:

- Little Falls Run facility serves the southern portion of the USA and currently has a capacity of 8.0 mgd.
- Aquia facility serves the northern portion of the USA and currently has a capacity of 10.0 mgd.

These two wastewater treatment facilities are expected to serve Stafford County through buildout or approximately 2060. The facilities will be expanded once VPDES permit thresholds are reached.

There are five major interceptor sewer systems that are defined by the drainage basins they serve. The Claiborne Run and Falls Run Interceptors convey wastewater to the Little Falls Run Facility. The Accokeek Creek, Austin Run, and Aquia Creek Interceptors convey wastewater to the Aquia Facility. Smaller drainage basins are pumped into these major interceptors. These sewer systems are comprised of 94 wastewater pumping stations, 476 miles of pipe ranging from 8 to 48 inches in diameter, and 78 miles of pressure force main ranging from 1.5 to 24 inches in diameter.

GOAL: Provide a quality wastewater treatment, conveyance, and collection system which serves the existing and proposed development as reflected in the County's LUP. The system is to be economically feasible and environmentally sensitive.

Policies to achieve this goal include:

1. Design and construct all wastewater treatment, transmission, and collection facilities in accordance with the Stafford County General Sewer Improvement Plan and the CIP. Sewer facilities shall be planned and designed in accordance with the land uses, densities, intensities, and locations as shown in the LUP.
2. Sewer system improvements shall be constructed in accordance with the schedule shown in the Stafford County General Sewer Improvement Plan and the CIP.
3. The capital costs of system expansions and increases in system capacity to serve new development shall be the responsibility of new development through connection fees and pro-rata fees.
4. The County's wastewater treatment capacity shall be monitored and shall be increased to accommodate projected needs as required.
5. Expansions of the service area and improvements of the wastewater transmission system shall be done in accordance with criteria in the Comprehensive Plan.
6. User Fees, Availability Rates, Pro Rata Rates, and other fees will be reviewed on an annual basis.
7. All future development within the USA shall be required to utilize the public wastewater system.
8. Only developments within the USA will be allowed to connect to the public wastewater system, except for those properties that satisfy Policy 1.4.2.
9. Extension and improvements of public sewer facilities shall not be used as a justification for increasing the residential densities that are shown in the Land Use Plan.
10. Operate the wastewater system so that it is in full compliance 100% of the time with the requirements of the Virginia Pollutant Discharge Elimination System (VPDES) permits for each treatment facility.
11. Design Standards:
 - a. Wastewater treatment facilities shall be designed to treat the maximum daily flows.
 - b. Pipelines and pumping stations shall be designed to provide:
 - i. Dry weather flow of 64 gpd per capita (80% of average residential water demand).
 - ii. Infiltration allowance of 500 gpdidm (gallons per day per inch-diameter mile) for existing pipes.
 - iii. A peaking factor of 3.5 to account for diurnal flow variations and inflow.

5.2.5.8. Solid Waste Management

The mission of the Rappahannock Regional Solid Waste Management Board (R-Board) is to provide professional, courteous, and intelligent service and solutions to the waste disposal needs of citizens residing in Stafford County and the City of Fredericksburg.

The R-Board's vision is to operate the best landfill in Virginia. Being the best landfill includes environmentally sound solid waste management policies, having an active Reduce, Reuse, and Recycling program, all coupled with outstanding customer service. The R-Board intends to continually strive to be a leader in the waste management industry and to set an example for others to emulate. The R-board is run entirely through usage fees and does not require additional resources from the County.

GOAL: Provide for efficient collection and disposal of solid waste while maintaining an adequate waste disposal capacity.

Policies to achieve this goal include:

1. Establish a LOS for land-filled waste based on a daily generation rate of 4.4 pounds per day per person, which is to be used in designing landfill capacity.
2. Continue to maintain or exceed 25%, measured by weight, as a recycling goal for residential and nonresidential waste stream.

5.2.5.9. Transportation

All public roads in the County should operate at a Level of Service (LOS) of C or better. All new public roads should be built to Virginia Department of Transportation (VDOT) design specifications. Additional LOS Standards may need to be established to address specific situations within designated areas.

5.2.5.10. Stormwater Facilities

LOS Standards for stormwater management should be established.

5.3 Capital Costs per Residential Unit

5.3.1 Introduction

As population and commercial growth continues in the County, the demand increases for public facilities. This section presents a summary of the capital costs per type of residential unit, and the mechanisms available to the County to recover a portion of these costs, with the goal of ensuring that development pays its share of the impact.

Table 5.1: Summary of Capital Costs by Residential Unit Type

Housing Unit Type	Parks and Recreation	Schools	Libraries	Fire and Rescue	Transportation	Law Enforcement	Government	Total Monetary Contribution
Single Family	\$ 17,653	\$ 45,762	\$ 2,257	\$ 3,071	\$ 114,599	\$ 1,293	\$ 811	\$ 185,446
Townhouse	\$ 16,412	\$ 33,471	\$ 2,098	\$ 2,855	\$ 80,219	\$ 1,202	\$ 754	\$ 137,011
Multi Family	\$ 14,495	\$ 10,915	\$ 1,853	\$ 2,521	\$ 45,840	\$ 1,061	\$ 666	\$ 77,351
Mobile Home	\$ 10,660	\$ 24,204	\$ 1,363	\$ 1,854	\$ 55,008	\$ 781	\$ 490	\$ 94,360

Appendix A provides the methodology for calculating these costs. Proffers and impact fees may be used to recover a portion of these capital costs.

These data are based on a trend analysis assuming linear growth and cost increases. Growth projections are bound by state estimates, which may fluctuate. Fire and Rescue costs are based on assumed fixed population per fire and rescue station, rather than response times, which is a driving factor in determining facility need. Desired Parks and Recreation levels are based on public parkland and do not account for private recreation facilities which may fill some of the community needs.

5.3.2 Proffers

Proffers are voluntary contributions made by an applicant to offset the impacts of a change in land use through a rezoning. A locality cannot unilaterally impose proffers. They are offered by the applicant and the locality votes on whether to accept them as part of the rezoning. Proffers may be in the form of cash contributions, land dedication for a public facility, or construction of a public facility, and may also include restrictions on the intensity and type of the development.

The General Assembly passed a law, effective July 1, 2016, which applies to proffers relating to new residential developments and residential components of mixed-use properties. Such law was amended again in 2019, effective July 1, 2019. The law, Virginia Code § 15.2-2303.4 as currently stated (the “Statute”), makes it unlawful for a locality to require an “unreasonable proffer.” In order to ensure compliance with the Statute, unless proffers are deemed reasonable by the applicant and owner, certain applications for zoning reclassification must include an analysis demonstrating how each proffer made complies with the Statute’s requirements.

5.3.3 Transportation Impact Fees

In May of 2014, the County modified its Transportation Impact Fee Program and presently collects transportation impact fees Countywide for residential uses. The fee rate is \$2,999 for all types of residential dwelling units.

GOAL: Collect impact fees to ensure new development pays its share of the capital costs to build or expand transportation facilities to serve that development.

Policies to achieve this goal include:

1. Evaluate the potential to apply impact fees Countywide and update and revise the two existing areas.
2. Impact fees should be established to capture the public facility needs generated by each new residential dwelling unit and non-residential uses.
3. The impact fee areas and potential for new projects should be reevaluated on a 2-year cycle.

Action Strategies:

1. Adopt new ordinance and/or amend existing ordinance in order to maximize collection of transportation impact fees.
2. Continue to track affected parcels and collect impact fees as required.
3. Establish guidelines for the appropriate expenditure of collected impact fees.
4. Establish a process to regularly reevaluate and adjust the impact fee amounts.

5.3.4. Payments for upgrading impounding structures (Dams)

Sec. 15.2-2243.1 of the Code of Virginia provides localities with the ability to collect funds from developers and subdividers to offset 50% of the costs of upgrading dams, effective July 1, 2009. These funds may be collected by the locality if the Department of Conservation and Recreation (DCR) determines that a plan of development proposed by a developer or subdivider is wholly or partially within a dam break inundation zone and would change the spillway design flood standards of an impounding structure pursuant to Sec. 10.1-606.3.

These payments are collected on a project specific basis and must be used to improve the specific project within six years. The County may issue an extension of up to an additional four years for the use of the funds if the dam owner shows that sufficient progress is being made.

If the County chooses not to collect these payments, then the developer or subdivider must make payments to the Virginia Dam Safety, Flood Prevention and Protection Assistance Fund instead.

GOAL: Collect payments for upgrades to dams when new development or subdivisions in a dam break inundation zone create the need for improvements to the dam.

Policies to achieve this goal include:

1. Developers and subdividers of land within dam break inundation zones should share in the costs of maintaining dam safety.
2. The County should explore the possibility of collecting payments to offset the costs of upgrading dams when these upgrades are needed because of development within the dam break inundation zone.

Action Strategies:

1. The County shall amend its subdivision and zoning ordinances to require applicants to provide an engineering study in conformance with the Virginia Soil

and Water Conservation Board's standards under the Virginia Dam Safety Act (§ 10.1-604 et seq.) and the Virginia Impounding Structure Regulations (4 VAC 50-20) when DCR determines that the proposed plan lies within a dam break inundation zone.

2. Establish a payment system for collecting 50% of costs of improvements needed to meet spillway design flood standards and associated administrative fees.

5.4 Public Facilities Plan

5.4.1 Goal of the Plan

To provide the public facilities and services needed to serve the existing population and new growth through efficient, equitable, safe and accessible delivery of public services as well as forecast when and where expanded and new public facilities will be needed.

5.4.2 Background

The anticipated economic and population growth of Stafford County will require an increased level of public services. More population will mean more school-aged children as well as more health services, social services and recreation facilities. Economic growth will require expanded utilities, improved fire and rescue protection and coordination with the business community.

5.4.3 Purpose and Scope

The purpose of the Public Facilities Plan is to assess the current and future public service and facility needs and provide a plan for addressing these needs in an efficient and cost-effective manner. The Plan seeks to aid County staff when considering site selection and acquisition, facility location and timing of facility development. The plan will aid the County in the site selection process, reclassification and comprehensive impact fee processes as well as assist the County in the development of the Capital Improvement Program (CIP).

The County's Plan must be carefully coordinated with land use and transportation plans to integrate the provision of services with anticipated growth, revenues and available funding. The principal goals of this Comprehensive Plan regarding the provision of public facilities and utilities are:

- Provide community facilities/services to serve existing and new development in an efficient and cost effective manner.
- Provide emergency services and law enforcement to protect citizens and allow them to enjoy a safe and secure environment.
- Promote an integrated information system for the County, supporting the education and the enrichment of all its citizens.
- Serve the recreational needs of the community through a comprehensive system of recreational facilities and programs.
- Provide a system of high-quality educational opportunities that meet the future educational needs of all citizens.
- Provide safe and adequate facilities and educational programs for the removal, disposal and reduction of solid waste; and

- Provide a sufficient supply of high-quality drinking water and a distribution system to serve the domestic, recreational, industrial, commercial, and fire protection needs of the community at the most economical price possible.

5.4.4 Key Objectives

The Public Facilities Plan should serve as the foundation for future decisions concerning the location and timing of public facilities. In making these decisions, the following objectives should be considered:

- Locate new facilities within the existing Urban Services Area (USA). Exceptions may be made when the only way to meet LOS Standards or locations criteria contained in the Public Facilities Plan, is to locate the facility outside the USA.
- Locate new facilities to provide convenient service to the greatest number of users.
- Construct or expand facilities in accord with established Level of Service Standards.
- Coordinate the location of public facilities with the recommendations of the Comprehensive Plan.
- Provide equitable distribution of public facilities between established and developing parts of the county.
- Consider maintenance or replacement needs in established areas to encourage healthy communities.
- Acquire sites for future facilities in advance of, or in conjunction with, development.
- Provide co-located facilities wherever possible to provide greater efficiency and cost savings.
- Use this plan to determine whether proposed facilities are in accord with the Comprehensive Plan as required by state law.

It is not the intent of the Comprehensive Plan to address funding availability, debt capacity or other financial concerns. The plan also does not address facility design, equipment or operation factors, unless such factors directly relate to system-wide facility planning.

The Plan recommends construction of the following new (and expansion to existing facilities which are not built to the County's current standards) public facilities by facility type by 2035. The Plan references the Public Facilities Impact Model (PFIM) to help keep track of the capital needs with the growth population on an annualized basis. This Plan is based on per-capita demand and does not reflect actual ability to afford or ability to construct these facilities.

The PFIM tracks the amount of building square footage by facility type as well as the number of acres of County parkland needed based on the year's projected increase. Using the County's current standards for each facility type, especially the building size of which County facilities are constructed, the PFIM can determine the total number of facilities needed by 2036. Where standards have not been established, the PFIM uses current data to establish the provided service level by the County. This service level is assumed to be provided by the County as the population increases over the next 20 years. During the twenty-year period of 2016 - 2036 covered by this Comprehensive Plan, there is a projected need for the following, additional public facilities:

- Six (6) elementary schools.
- Two (2) middle schools.
- Two (2) high schools.

- Two (2) Fire and Rescue stations for a total of 42,000 square feet of space.
- 940 acres in land for parks and recreational facilities (502.7 acres for future population growth).
- Four (4) libraries for a total of 100,000 square feet of space (2 libraries for future population growth).
- Other government facilities totaling 137,215 square feet of space.

As of this revision of the Comprehensive Plan, the Public Facilities Plan does not address the need to upgrade existing facilities to the Level of Services Standards. The Public Facilities Plan background is provided in Appendix B.

5.5 Financial Impact Model

A financial impact model (FIM) is a simplified representation of public revenue and expenditure flows. It estimates in a systematic manner how economic, land use, and population changes affect government finances. The model can be used to estimate the impact of residential and non-residential growth and development over the twenty-year period of the Comprehensive Plan.

Objective 2.4 of this Plan recommends the County adopt a FIM. The FIM should be designed to facilitate analysis of future trends or forecasts in population, expenses and revenues for the county and show the financial impact of alternate scenarios. The FIM is only a part of the total planning process. It is designed to show the potential fiscal result of planning choices, not what those choices should be. It does not address land use, environmental impact, transportation, health and safety, community design, or economic development except as a reflection of how decisions in those areas might impact the County's fiscal condition.

6.0 The People and the Place

This section of the Plan provides the existing characteristics of the community regarding the built environment, population, economy, types of services provided, and the natural environment. Section 15.2-2223 of the State Code states that in preparation of the Comprehensive Plan, the Planning Commission shall make careful and comprehensive surveys and studies of the existing conditions and trends of growth. The elements included in this chapter are listed below.

- Land Use
- Population
- Housing
- Economy
- Historic and Cultural Resources
- Mineral Resources
- Community Facilities
- Parks and Recreation
- Infrastructure
- Transportation
- Natural Resources

Please note that some of the data tables provided are based on data from the 2019 US Census Bureau American Community Survey, and the 2020 Decennial Census.

6.1 Land Use

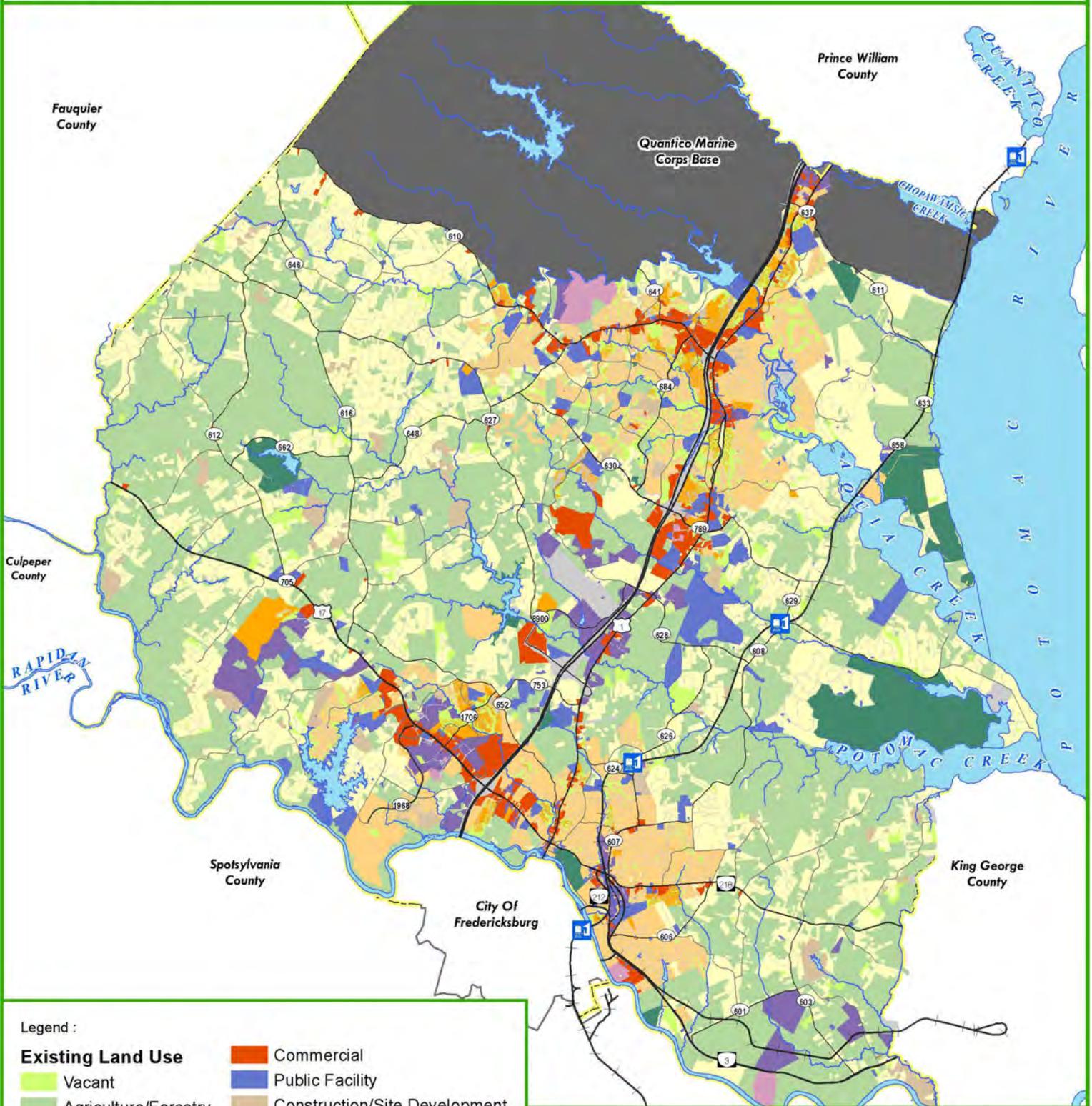
The existing, observable land use of each parcel in Stafford County is important because it reveals the pattern of past growth, the location of areas that should be preserved and the potential locations for future development. The analysis of existing conditions forms the basis of the future land use plan for the County.

Land Use

- Current Land Use
- Zoning Districts
- Future Zoning Buildout



FIGURE 6.1 Existing Land Use Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend :

Existing Land Use

- | | | | |
|--|----------------------|--|-------------------------------|
| | Vacant | | Commercial |
| | Agriculture/Forestry | | Public Facility |
| | Parks_Rec | | Construction/Site Development |
| | Rural Residential | | Industrial Manufacturing |
| | Suburban Residential | | Mining and Extraction |
| | Urban Residential | | Transportation/Utilities |
| | | | Military |

0 6,500 13,000 26,000 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.1.1 Current Land Use

An inventory of land uses by parcel reveals how the land in Stafford County is currently being used and is helpful in identifying areas that should be preserved and potential locations for future development. Parcel mapping data was obtained from a data layer in the County's GIS with a large number of very specific land uses. These were simplified into broad categories for ease of discussion.

Table 6.1 Existing Land Use – 2021 (Stafford County)

Land Use	Acres	Percent
Agriculture/Forestry	54,215.44	30.52%
Commercial	3,712.08	2.09%
Construction/Site Development	2,624.49	1.49%
Industrial/Manufacturing	4,199.99	2.36%
Military	32,882.34	18.51%
Mining and Extraction	782.31	0.44%
Parks and Recreation	5,119.98	2.88%
Public Facility	5,326.35	3.00%
Rural Residential	35,702.50	20.10%
Suburban Residential	12,340.78	6.95%
Transportation and Utilities	9,856.83	5.55%
Urban Residential	5,131.72	2.89%
Vacant	5,762.99	3.24%
Total	177,658.49	100.00%

Source: Stafford County GIS

Stafford County consists of 177,658.49 acres that have been classified into 13 general land use categories and a brief description of each category is provided:

Agricultural and Forestry

Approximately 30.52% (52,215 acres) of the land area in Stafford County is classified as agricultural and forestry uses. These uses are dispersed throughout the County but larger farming operations are located along King's Highway and Poplar Road and Hartwood Road areas.

Commercial

Commercial uses include retail sales and services, auto sales and service, hotels, food and beverage establishments, financial institutions and offices. Land devoted to commercial use account for 2.09% (3,712 acres) of the County's land area. This land use is primarily located on Garrisonville and Warrenton Roads in the vicinity of I-95 and along U.S. Route 1.

Construction/Site Development

This land use category identifies land that is undergoing development, in the process of being transformed, typically from a vacant use to a more intense use. These areas cover 1.48% (2,624 acres) of the County.

Industrial and Manufacturing

Industrial land uses include manufacturing and warehousing facilities, truck terminals, salvage yards and wholesale trade. These account for 2.36% (4,199 acres) of the County's land area and are primarily located along Warrenton Road and U.S. Route 1.

Military

The military category represents the land occupied by Marine Corps Base Quantico in the northern section of the County. Marine Corps Base Quantico occupies 18.51% (32,882 acres) of the County's land area.

Mining and Extraction

This land use category includes the location of surface mining operations, which covers 0.44% (782 acres) of the County. These areas are located on the north side of Garrisonville Road and along King's Highway.

Parks and Recreation

Recreation uses account for 2.88% (5,119 acres) of Stafford County's total acreage. The recreation category includes all public and private parks, marinas, golf courses and community centers in the County. Recreation sites vary in size and are located throughout the County.

Public Facilities

This category refers to those uses that provide services to residents such as health, education, religion and public safety. Approximately 3.0% (5,326 acres) of Stafford's land area is devoted to this use.

Rural Residential

Rural residential is the second largest land use category in Stafford County, accounting for 20.10% (35,702 acres) of the County's land area. The rural residential category includes single-family detached dwellings on lots at least 1 acre in size. This land use is dispersed throughout the County. The largest concentration of this type of land use is in the northwest part of the County, south of the Marine Corps Base Quantico.

Suburban Residential

The Suburban Residential land use category includes single-family detached residential dwellings located within the Urban Services Area and is typically on ¼ to ½-acre sized lots. This land use accounts for 6.95% (12,340 acres) of the County and is located primarily in North Stafford, south of the Marine Corps Base Quantico, and in the area north of the City of Fredericksburg.

Transportation and Utilities

This land use category includes utilities and public works facilities that provide infrastructure support to residents. These uses include power lines, railroad lines, cellular communication tower lots, commuter parking lots, airports, and right-of-ways. This land use accounts for 5.55% (9,856 acres) of the County's total acreage.

Urban Residential

The urban residential category includes apartment complexes, townhouses, condominiums and the common areas that surround them. This land use accounts for 2.89% (5,131 acres) of the County's land area. This land use can be found near the I-95 corridor.

Vacant Land

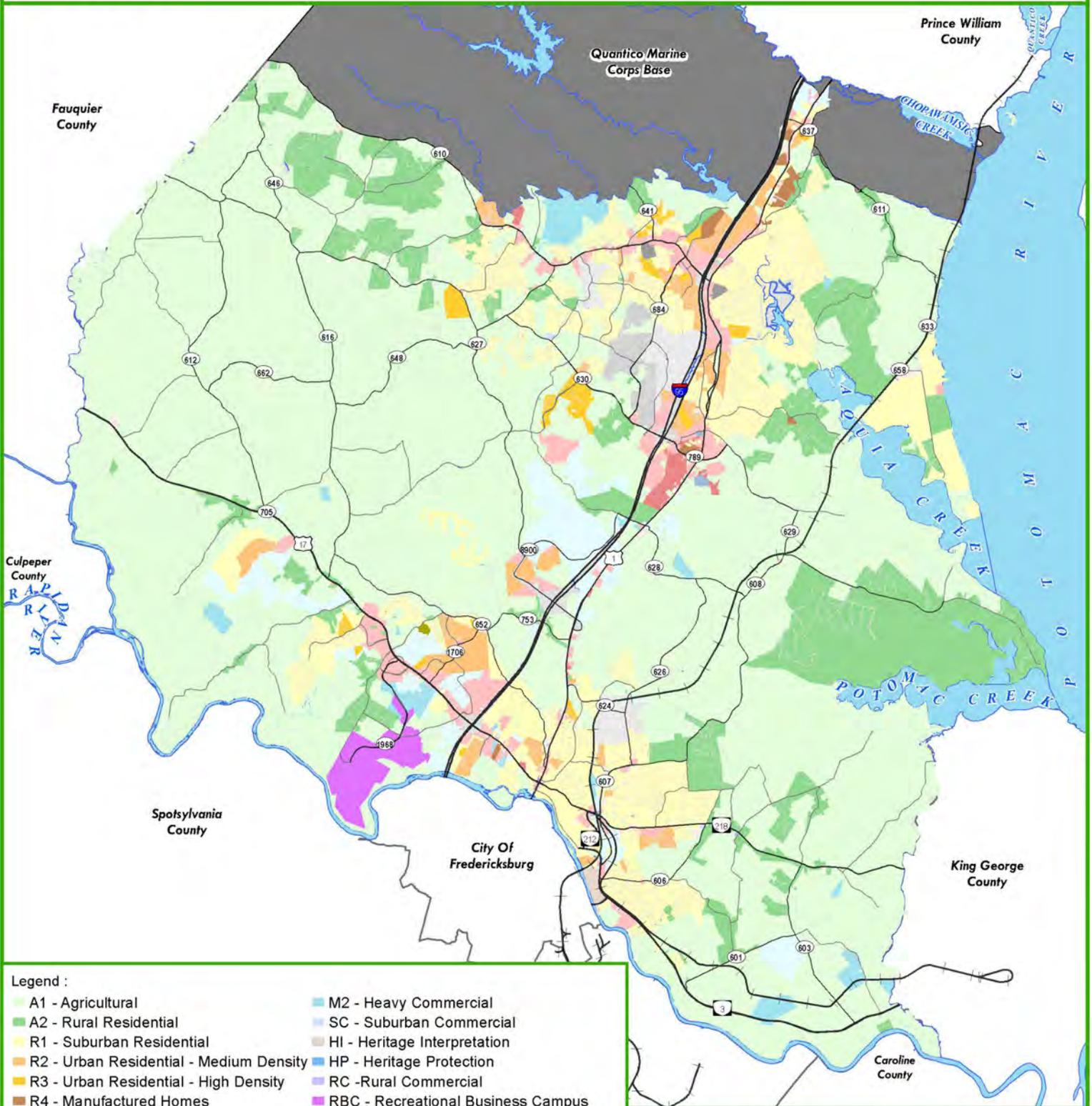
Vacant land is any land that does not have any active uses, and excludes any farming or forestry lands. This land use category accounts for 3.24% (5,762 acres) of the County's land area.

6.1.2 *Zoning Regulations*

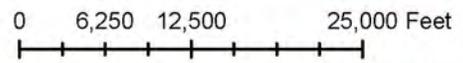
Stafford County last recodified its Zoning Ordinance in 1994, and it routinely updates the Ordinance on a quarterly basis. The Zoning Ordinance establishes, among other things, permitted uses, minimum lot sizes, minimum front, side and rear setbacks for principal and accessory buildings, maximum building heights, maximum building and lot coverage, and maximum floor areas. The Zoning Ordinance is a critical tool for controlling the type, density, and design of development within the County. The Zoning Ordinance for Stafford County establishes 22 districts. The Ordinance contains provisions for the establishment of five types of planned development districts. In addition to these districts, there are seven overlay districts, which were created to protect resources and mitigate conflicts around certain facilities. In 2015, the County enacted Transfer of Development Rights (TDR). TDR allows for enhanced density in specified zoning districts where the County plans for additional development while enabling the preservation of selected areas. TDR operates similar to overlay districts as they provide for additional regulations beyond what is proscribed for the underlying zoning district.



FIGURE 6.2 Zoning Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



- Legend :
- A1 - Agricultural
 - A2 - Rural Residential
 - R1 - Suburban Residential
 - R2 - Urban Residential - Medium Density
 - R3 - Urban Residential - High Density
 - R4 - Manufactured Homes
 - R5 - Age-Restricted Housing
 - LC - Life Care/Retirement
 - B1 - Convenience Commercial
 - B2 - Urban Commercial
 - B3 - Office
 - M1 - Light Industrial
 - M2 - Heavy Commercial
 - SC - Suburban Commercial
 - HI - Heritage Interpretation
 - HP - Heritage Protection
 - RC -Rural Commercial
 - RBC - Recreational Business Campus
 - UD - Urban Development
 - PD1 - Planned Development 1
 - PD2 - Planned Development 2
 - PTND - Planned-Traditional Neighborhood
 - QMB - Quantico Marine Base



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

The following table presents a breakdown of the zoning districts by area. The table was generated using the County's geographic information system (GIS), which summarized the parcel areas based on assessment data. This accounted for the area in which "No Data" was available. The Marine Corps Base Quantico is not a zoning district, but an area over which the County has no land use control.

Table 6.2 Existing Zoning Districts - 2021 (Stafford County, VA)

	Zoning District	Acres	Percentages
Rural	A1 - Agricultural	87,818.86	49.43%
	A2 - Rural Residential	14,654.68	8.25%
Residential	R1 - Suburban Residential	14,233.42	8.01%
	R2 - Urban Residential - Medium Density	2,474.95	1.39%
	R3 - Urban Residential - High Density	1,088.58	0.61%
	R4 - Manufactured Homes	322.55	0.18%
	R5 - Age-Restricted Housing	6.15	0.003%
	LC - Life Care/Retirement	21.77	0.01%
	Commercial	B1 - Convenience Commercial	308.93
B2 - Urban Commercial		3,392.50	1.91%
B3 - Office		409.95	0.23%
RC -Rural Commercial		4.90	0.003%
SC - Suburban Commercial		23.45	0.01%
Industrial	M1 - Light Industrial	4,206.72	2.37%
	M2 - Heavy Commercial	1,488.98	0.84%
Planned Development/Mixed Use	PD1 - Planned Development 1	1,125.84	0.63%
	PD2 - Planned Development 2	657.17	0.37%
	PTND - Planned-Traditional Neighborhood	79.92	0.04%
	RBC - Recreational Business Campus	1,177.49	0.66%
	UD-Urban Development	27.03	0.02%
Other	HI - Heritage Interpretation	103.48	0.06%
Unzoned Land	Water Features	2,532.13	1.43%
	Military/Federal Land	32,988.78	18.57%
	Street Right-Of-Way	8,510.27	4.79%
	Total	177,658.49	100.00%

Rural Districts

The County has two districts dedicated to rural development. These are the A-1 Agriculture District and A-2 Rural Residential District.

The **A-1** District allows for a greater number of uses, which are associated with agriculture and large lots, such as farming, forestry, mulching facilities, sawmills, nurseries and slaughterhouses. The District occupies almost half (49%) of the County and is dominant in the western half and southeast portion of the County.

The **A-2** District is intended as a transition between agriculture and more intense development. Single-family homes and community facilities are permitted on lots of at least one acre. The largest A-2 area is located around Brooke Road near Marlborough Point. Many of the A-2 areas exist as pockets within the A-1 District.

Residential Districts

There are five residential districts in Stafford County, which combined, represent roughly 10% of the County. The districts vary in residential use density. Community and public facilities are permitted in all of the districts.

The **R-1** Suburban Residential District is intended for single-family homes with a maximum density of 1.5 units per acre. R-1 Districts are primarily concentrated in the Garrisonville area south of the Marine Corps Base Quantico and north of Fredericksburg.

The **R-2** Urban Residential District allows duplexes and townhouse developments with a maximum density of 3.5 units per acre. Most R-2 Districts are adjacent to R-1 developments.

The **R-3** Urban Residential – High Density District allows the same uses as the R-2 District with a maximum density of 7.0 units per acre. Overall, 0.6% of the county is designated as **R-3** and is primarily located near commercial areas south of Marine Corps Base Quantico.

The **R-4** Manufactured Home District is reserved for manufactured home developments, with a maximum density of 7.0 units per acre. They are located near the I-95 corridor north of Garrisonville Road.

The **R-5** Age-Restricted Housing District is reserved for residential dwelling for persons fifty-five years in age or older, and allows single family homes, duplexes, townhomes, and multi-family developments, with a maximum density of 15.0 units per gross acre.

The **LC** Life Care/Retirement Community District is intended to provide areas for the continuing care of the elderly, providing for transitional housing, progressing from independent units and culminating in nursing home care. Such districts are to be located only where approved water and sewerage are available and where transportation systems are adequate.

Commercial Districts

Stafford County has six commercial districts. The districts vary in the mix of retail and office development as well as intensity. Overall, 2.3% of the County is designated for commercial use.

The **B-1** Convenience Commercial District is intended for small commercial development that serves the surrounding population. These districts are scattered throughout the County with concentrations found on White Oak Road and U.S. Route 1 in both central and northern Stafford County.

The **B-2** Urban Commercial District allows high-density retail sales and service developments with a regional or County-wide market area. These retail centers are located along Garrisonville Road, Courthouse Road and Warrenton Road near interchanges off I-95.

The **B-3** Office District is intended to provide an area for professional offices near retail areas. These areas are spotted throughout the County with the largest concentration just added in the Courthouse area.

The **SC** Suburban Commercial District also provides a location for small retail businesses that serve the immediate neighborhood. The difference between the SC and B-1 districts is that the SC District need not be located near a major transportation network and it provides for a greater open space ratio. There are three small areas that are designated as SC Districts in Stafford County.

The **RC** district allows commercial uses at major intersections that serve the nearby rural population. Only two parcels are designated as the RC District.

Industrial Districts

Stafford County has two zoning designations for industrial uses. Together, they constitute 3.2% of the County's area.

The **M-1** Light Industrial District sets aside areas for certain business and industrial uses which are relatively free from offensive activities and are generally compatible with nearby residential uses. Industrial parks are encouraged within the M-1 District. The largest concentration of M-1 development is found in the center of the County around U.S. Route 1. Other developments exist around Warrenton Road west of I-95, Cool Spring Road, Forest Lane Rd, and on U.S. Route 1 near the Marine Corps Base Quantico.

The **M-2** Heavy Industrial District provides for the location of industrial uses that are not be compatible with residential uses due to potential nuisances or hazards. These districts are found in the southern section of the County, around Celebrate VA Parkway, and south of the Marine Corps Base Quantico off of Garrisonville Road.

Planned Developments/Mixed Use

There are two types of Planned Development Districts. They allow for the creation of innovative, neo-traditional developments with a mix of commercial and residential use. They differ in the size of the overall development, residential and commercial densities, and open space ratios.

The **PD-1** Planned Development District allows for greater residential density on developments less than 500 acres. The PD-1 District has been utilized in the Park Ridge, Austin Ridge, and Leeland Station communities.

The **PD-2** Planned Development District is for developments between 500 and 850 acres. PD-2 developments are allowed a greater commercial density. The Embrey Mill development on Courthouse Road near I-95, is an example of this zoning district.

The **P-TND** Planned – Traditional Neighborhood Development provides for areas of the county which are suitable for an approach to land-use planning and urban design that promotes the development or redevelopment of pedestrian-friendly neighborhoods with a mix of uses, housing types and prices, lot sizes and density, architectural variety, a central civic building and use, a network of streets and alleys that may include on-street parallel parking, and defined development edges. P-TND Districts have been established for the proposed developments for

Town Center at Aquia on US-1 near I-95, and The Garrison at Stafford on Garrisonville Road near Onville Road.

The **RBC** Recreational Business Campus District provides an area for professional offices, executive housing, and senior housing as well as other developments that will benefit from a natural campus-like setting with open space. The Celebrate VA North development is an example of this zoning district.

The **UD** Urban Development District was created for town center areas within the targeted growth area. They generally allow for more intense development than seen in other areas of the County. This type of zone can apply to a larger overall area, which may include one or more smaller areas or sub-districts. The Abberly Waterstone Apartment Complex is an example of this zoning district.

Other Zoning Districts

Areas of the County include unique characteristics and uses that may not conform with typical development design standards that apply across the County.

The **HI** Heritage Interpretation District was established for the purpose of reserving areas in all regions of the county for interpretation of heritage sites, retaining the setting and feeling of the cultural landscape, permitting restoration, preservation, conservation, education, research and business activities related to the operation of a museum and other historic sites, providing heritage tourism opportunities, and promoting the preservation and enhancement of unique Stafford County cultural resources. George Washington's Ferry Farm is an example of this zoning district.

Overlay Districts

In addition to the base zoning districts, the Stafford County Zoning Ordinance contains eight overlay districts. The purposes of the districts vary from protecting historical and environmental resources, reducing conflicts between established facilities, and mitigating potential hazards.

Overlay districts add a variety of standards to the underlying districts. These standards could include use restrictions, preservation requirements, or stricter density regulations. The following is a list of the overlay districts used in Stafford County:

- **AD** Airport Impact - Provides an overlay zone in areas subject to intense and/or frequent emissions of noise and vibration from airports and prevents obstructions of airport zones which may result in an air navigation hazard
- **FH** Flood Hazard - Provides an overlay zone with limitations on development in areas likely to be inundated by the 100-year flood event, as defined by current flood insurance rate maps, for Stafford County to protect life and property and to prevent or minimize flood damage
- **HC** Highway Corridor - Provides an overlay zone along developed and rapidly developing high traffic road facilities where appropriate special standards would address access and design needs
- **HG** Historic Gateway Corridor - Is intended to implement the goals of the Comprehensive Plan by protecting cultural resources by guiding new development along major entrance routes along arterial streets to the designated areas

- **HR** Historic Resources - Is intended to provide for the protection of historic resources in the County through architectural design control of new construction
- **MZ** Military Facility Impact - Is intended to provide an overlay zone to address the interaction between military facilities and surrounding land uses
- **RP** Reservoir Protection - Is intended to provide an overlay zone that requires best management practices and other protective measures in areas critical to the integrity of public water supplies, rivers, streams and other sensitive features.
- **ICTP Integrated Corporate and Technology Park** - Is intended to provide an overlay zone that promotes the integration of uses to facilitate the growth and development of large-scale corporate office and technology parks.

Conditional Zoning

The Zoning Ordinance for Stafford County allows a developer to request a change in the zoning designation on a piece of property. In most zoning cases, voluntary proffers made by the applicant are included with the request. Proffers are intended to mitigate negative impacts of the land use proposal on the surrounding community and Level of Service deficiencies. A proffer could be the construction of roads, provision of infrastructure, dedication of open space, or a cash contribution in lieu of the actual provision of an improvement. Generally, a conditional zoning change to be approved, the proffer must be related to the requested zoning change and the zoning change must not adversely affect the character of the area in which it is located. Any monetary contributions must be attributable to the impacts of the proposed development to schools, roads, parks and fire and rescue stations that provide a direct and material benefit to that new development. The County Board of Supervisors is responsible for deciding zoning change requests following a public hearing and a recommendation of the Planning Commission on the request.

6.1.3 Future Build-out Under Existing Zoning

To assess the impact the current zoning regulations would have on future land development in the County, a build-out analysis was conducted. This assumes that all available land builds out to its maximum potential based on the maximum allowable densities.

Table 6.3 Zoning Buildout - Inside the Urban Services Area

Zoning Districts	Existing Dwelling Units	Future Dwelling Units			Total Buildout (Existing Plus Future)	Potential Buildout Commercial Square Footage
		In approved Subdivisions	Based on Zoning Potential	Total		
A1 - Agricultural	1,101	358	2,901	3,259	4,360	0
A2 - Rural Residential	659	34	460	494	1,153	0
B1 - Convenience Commercial	15	0	0	0	15	4,395,201
B2 - Urban Commercial	51	0	0	0	51	55,887,298
B3 - Office	4	0	0	0	4	9,004,955
HI - Heritage Interpretation	3	0	0	0	3	0
LC - Life Care/Retirement	2	0	0	0	2	0
M1 - Light Industrial	8	0	0	0	8	52,935,145
M2 - Heavy Commercial	1	0	0	0	1	7,242,335
PD1 - Planned Development 1	2,118	48	1,373	1,421	3,539	0
PD2 - Planned Development 2	131	1,159	0	1,159	1,290	0
PTND - Planned-Traditional Neighborhood	0	287	17	304	304	0
R1 - Suburban Residential	18,529	1,891	16,506	18,397	36,926	0
R2 - Urban Residential - Medium Density	8,058	673	6,247	6,920	14,978	0
R3 - Urban Residential - High Density	3,482	508	4,191	4,699	8,181	0
R4 - Manufactured Homes	1,447	0	2,001	2,001	3,448	0
RBC - Recreational Business Campus	493	782	5,132	5,914	6,407	49,871,046
RC -Rural Commercial	0	0	0	0	0	21,404
SC - Suburban Commercial	2	0	0	0	2	358,090
UD - Urban Development	0	0	0	0	0	0

Table 6.4 Zoning Buildout - Outside the Urban Services Area

Zoning Districts	Existing Dwelling Units	Future Dwelling Units		Total	Total Buildout (Existing Plus Future)	Potential Buildout Commercial Square Footage
		In approved Subdivisions	Based on Zoning Potential			
A1 - Agricultural	6,890	1,552	13,741	15,293	22,183	0
A2 - Rural Residential	3,698	115	3,732	3,847	7,545	0
B1 - Convenience Commercial	1			0	1	1,763,680
B2 - Urban Commercial	0			0	0	474,064
B3 - Office	0			0	0	0
HI - Heritage Interpretation	0			0	0	0
LC - Life Care/Retirement	0			0	0	0
M1 - Light Industrial	1			0	1	7,693,503
M2 - Heavy Commercial	1			0	1	15,348,940
PD1 - Planned Development 1	0		0	0	0	0
PD2 - Planned Development 2	0		0	0	0	0
PTND - Planned-Traditional Neighborhood	0		0	0	0	0
R1 - Suburban Residential	13		2,082	2,082	2,095	0
R2 - Urban Residential - Medium Density	5		12	12	17	0
R3 - Urban Residential - High Density	0		0	0	0	0
R4 - Manufactured Homes	11		94	94	105	0
RBC - Recreational Business Campus	0		0	0	0	21,563
RC -Rural Commercial	0			0	0	74,584
SC - Suburban Commercial	0			0	0	0
UD - Urban Development	0			0	0	0

6.1.4 Findings

- Stafford County consists of 177,658 acres
- The land use categories that account for the largest land areas in Stafford County are agricultural/forestry (30.52%), rural residential (20.10%), and military (18.51%).
- Stafford County’s Zoning Ordinance includes: 22 zoning districts, including 5 planned development/mixed use districts and 8 overlay districts

6.2 Population

An understanding of current and expected future population allows the County to adequately prepare for its potential impacts on land use and community resources. This section examines several characteristics of the population of Stafford County. Using data obtained from the US Census Bureau, Stafford County is compared to surrounding counties, the City of Fredericksburg, and the State as a whole, to get an understanding of its current characteristics and future role within the State.

Over the last five decades, as the population in Stafford County has grown, the character of the landscape has also changed. The once primarily rural County is being transformed through the development of suburban and urban centers. The challenge for the County is to accommodate growth while maintaining the quality-of-life residents have come to expect; a component of which is the availability of an adequate amount of open space, which includes undisturbed natural habitat and wildlife corridors.

6.2.1 Historical Trends

In 2020, the population in Stafford County was 21% higher (156,927) than it was in 2010 (128,961). During that same time period, all comparison areas experienced population increases, but only Prince William had a population increase (20%) similar to that of Stafford County. The population of Stafford County increased at a significantly faster rate than the State as a whole (7.9%).

Table 6.5 Population Change 1950-2020 (Stafford County, VA and Comparison Areas)

	1950	1960	1970	1980	1990	2000	2010	2020	Percent Change 2010-2020
Stafford County	11,902	16,876	24,587	40,470	61,236	92,446	128,961	156,927	21.7%
Fauquier County	21,248	24,066	26,375	35,889	48,741	55,139	65,203	72,972	11.9%
King George County	6,710	7,243	8,039	10,543	13,527	16,803	23,584	26,723	13.3%
Prince William County	22,612	50,164	111,102	144,703	215,686	280,813	402,002	482,204	20.0%
Spotsylvania County	11,920	13,819	16,424	34,435	57,403	90,395	122,397	140,032	14.4%
City of Fredericksburg	12,158	13,639	14,450	15,322	19,027	19,279	24,286	27,982	15.2%
State of Virginia	3,318,680	3,966,949	4,648,494	5,346,818	6,187,358	7,078,515	8,001,024	8,631,393	7.9%

Source: US Census Bureau

As indicated in the table above, Stafford's population has steadily increased since 1950. However, the rate of increase has slowed somewhat since 1980. Between 1970 and 1980, Stafford's population increased by 65%. The rate of change in the population decreased to 51% between 1980 and 1990 and remained the same for the 1990 to 2000 period, but declined to 21.7 % from 2010 to 2020. Overall, the County has experienced a doubling of its population for every 20 year period since 1950.

Table 6.6 Population Estimates and Projections (Stafford County, VA and Comparison Areas)

	2010 Census	2020 Census		2030 Weldon Cooper Projection	2040 Weldon Cooper Projection	Percent Change 2020 to 2040
Stafford County	128,961	156,927		183,161	209,250	33%
Fauquier County	65,203	72,972		78,698	84,851	16%
King George County	23,584	26,723		31,053	35,180	31%
Prince William County	402,002	482,204		571,844	656,178	36%
Spotsylvania County	122,397	140,032		158,025	177,369	26%
City of Fredericksburg	24,286	27,982		34,015	38,094	36%
State of Virginia	8,001,024	8,631,393		9,331,666	9,876,728	14%

Source: US Census Bureau and the Weldon Cooper Center for Public Service

According to population projection figures prepared by the Weldon Cooper Center for Public Service, continued growth is expected for Stafford County's population between 2020 and 2040, but at a slower rate as a percentage than was experienced during the previous two decades. Stafford's population is expected to grow by 16.7% between 2020 and 2030, and by 14.2 percent between 2030 and 2040. A similar pattern of continued growth is also projected at the state level, but at a slower rate than the County. The State's population is projected to grow by approximately 8.1% between 2020 and 2030, and 5.8% between 2030 and 2040.

Although population continues to grow, the County has experienced a decline in the rate of increase in recent years. Based on the 2020 U.S. Census data, the County population grew by 21.7% between 2010 and 2020. The local and national economies went through an economic recession during the first five years of that decade.

Table 6.7 shows the Weldon Cooper and County population estimates and projections. County projections were developed by extrapolating historical occupancy permit data and projecting them forward to 2036 as shown on Table 6.8. Occupancy permit data from 2010 to 2020 generally follow a shape of a bell-curve. Following that same trend leads to a projected additional 14,426 dwelling units from 2021 to 2036. The number of dwelling units is multiplied by a factor of 3.1 persons per household to estimate the population.

Table 6.7 Population Estimates and Projections

Year	US Census Bureau	Weldon Cooper Center		Stafford County Planning and Zoning
	(Decennial Census)	July 1 Population Estimates	Population Projections – As of 2019	New Residential Units
2010	128,961			
2011		131,067		
2012		132,719		
2013		135,141		
2014		138,230		
2015		140,176		
2016		141,915		
2017		145,699		
2018		149,110		
2019		151,689		
2020	156,927	-	154,093	-
2021			159,550	1760
2022			162,174	846
2023			164,797	846
2024			167,421	846
2025			170,044	846
2026			172,668	846
2027			175,291	846
2028			177,915	846
2029			180,538	846
2030			183,161	846
2031			185,770	842
2032			188,379	842
2033			190,988	842
2034			193,597	842
2035			196,206	842
2036			198,815	842
2037			201,424	
2038			204,033	
2039			206,642	
2040			209,250	

Comp Plan Time Horizon 2016 - 2036

Total: **14,426**

Table 6.8 County Residential Occupancy Permit Projections

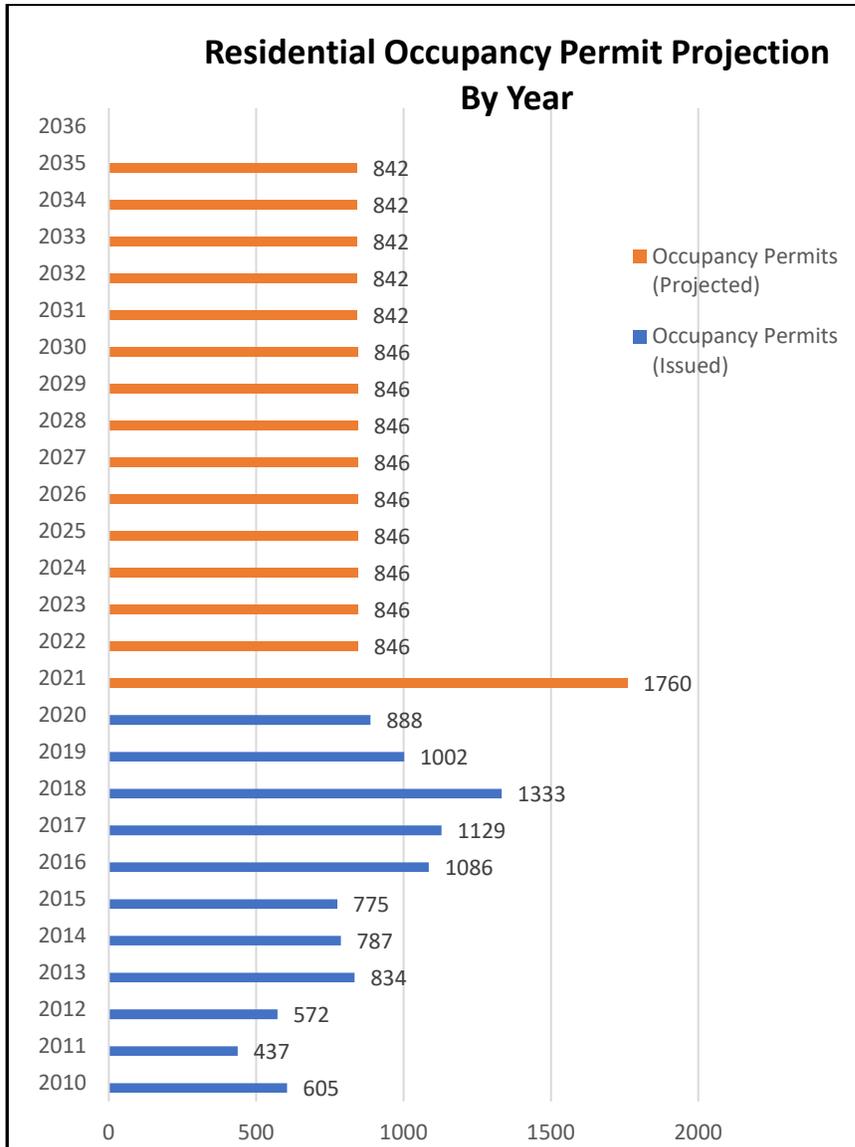
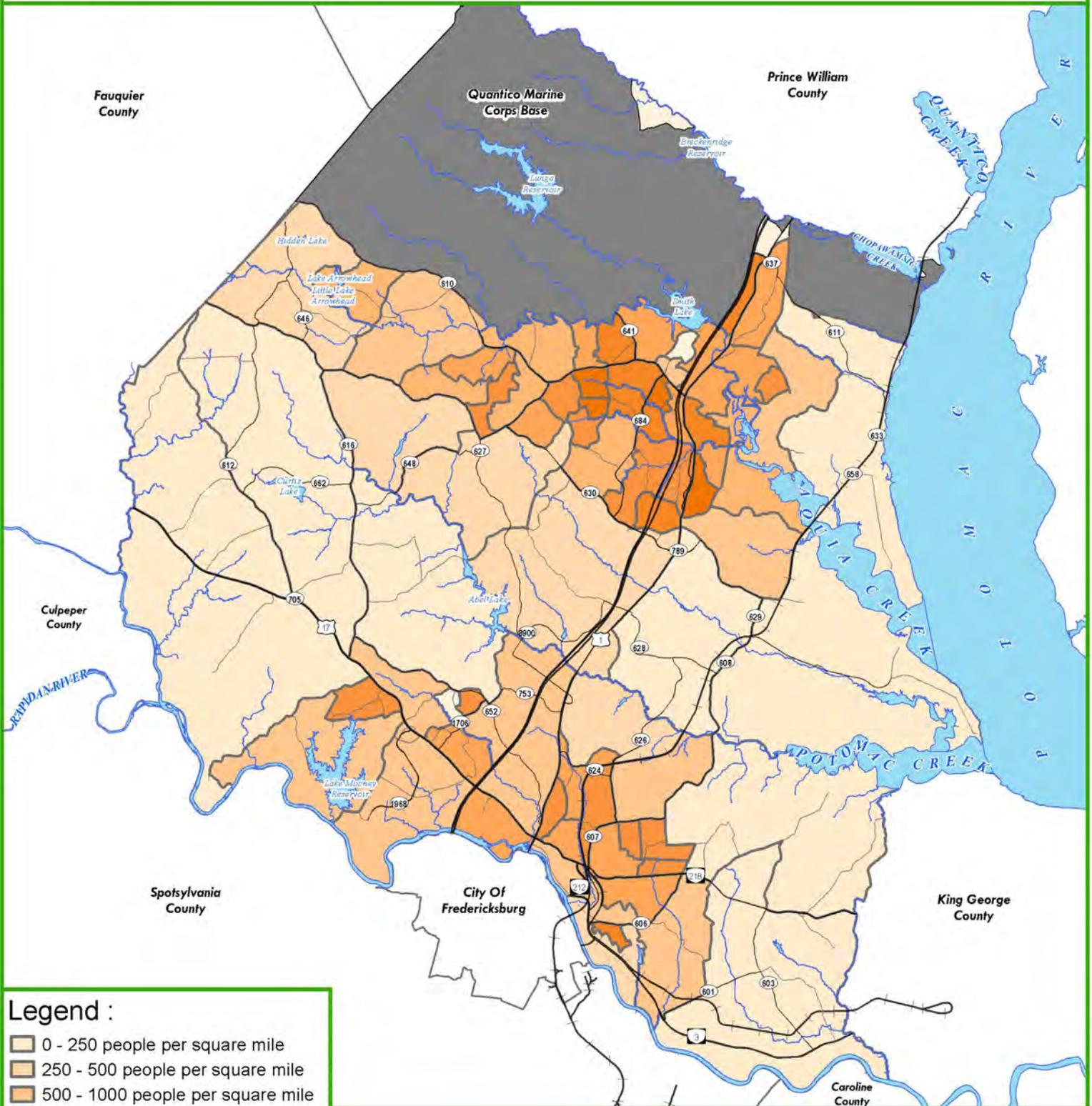




FIGURE 6.3 Population Density Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend :

- 0 - 250 people per square mile
- 250 - 500 people per square mile
- 500 - 1000 people per square mile
- 1000 - 1500 people per square mile
- 1500 - 2500 people per square mile
- 2500 - 3500 people per square mile
- 3500 - 5000 people per square mile
- 5000 - 8000 people per square mile

0 7,000 14,000 28,000 Feet

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.2.2 Composition

In 2019, Stafford County's population was primarily white (71%) and there was an almost equal proportion of males and females. Among comparison areas, Fauquier County and King George County had less racially diverse populations (87% and 78% white, respectively), while Prince William County and the City of Fredericksburg had the most racially diverse populations (62% white). Although Stafford County was predominantly white in 2019, the percentage of non-whites increased between 2010 (28%) and 2019 (29%). Most comparison areas experienced a similar pattern of increased diversity. The table that follows summarizes major population characteristics in 2019.

Table 6.9 Population Characteristics 2019 (Stafford County VA, and Comparison Areas)

	Stafford County	Fauquier County	King George County	Prince William County	Spotsylvania County	City of Fredericksburg	State of Virginia
White	70.9	87.0	77.9	62.4	75.4	62.3	69.4
Black	20.0	7.8	16.1	22.2	17.5	22.1	19.9
Asian	3.6	1.7	1.6	9.4	2.8	2.7	7.1
American Indian / Alaska Native	0.8	0.5	0.8	1.1	0.5	0.2	0.5
Native Hawaiian / Pacific Islander	0.2	0.1	0.1	0.2	0.2	0.1	0.1
Multiracial (2 or more)	4.5	2.8	3.5	4.7	3.6	7.1	3.2
Hispanic / Latino Origin (Any Race)	14.2	9.2	5.8	24.5	10.7	10.7	9.8
Male:	50.5	49.4	50.6	50.0	49.2	45.4	49.2
Female:	49.5	50.6	49.4	50.0	50.8	54.6	50.8
Under 18 years	26.0	23.1	25.3	26.9	24.9	21.0	21.8
18 to 34 years	21.9	19.2	20.5	22.0	20.0	36.7	23.2
35 to 49 years	22.4	18.5	20.9	22.4	20.3	16.1	19.6
50 to 64 years	19.0	22.3	20.5	18.4	20.2	15.5	19.6
65 years and over	10.7	16.9	12.8	10.4	14.6	10.8	15.9
Median Age (in years)	36.7	40.2	37.4	35.5	38.1	30.4	38.5
High School Diploma	25.1	25.9	26.5	18.1	28.6	23.7	23.6
Associate Degree	7.2	8.3	8.7	8.2	9.5	4.9	8.0
Bachelor's Degree	24.3	22.5	21.9	25.9	20.0	22.6	22.4
Post Graduate Degree	15.6	13.0	14.0	17.4	11.6	18.3	17.2

Source: US Census Bureau, 2019 American Community Survey

In 2019, 26% of the population in Stafford County was under the age of 18. This was a higher percentage than all comparison areas except for Prince William County. At the other end of the spectrum, Stafford County had a lower percentage (10.7%) of residents over 65 years of age than

all comparison areas, also with exception to Prince William County. The median age of residents in Stafford was 36.7 years, which was lower than Fauquier, King George, and Spotsylvania Counties and the state as a whole. The percentage of the population in Stafford County that was 50 years of age or older increased from 24% in 2010 to 30% in 2019.

Stafford County residents, 25 years and older, had a higher level of educational attainment than most comparison areas in 2019. Forty-seven percent of residents had earned an associate degree or higher and 40% had a bachelor's degree or higher. Among comparison areas, only Prince William County had a higher percentage of residents with an associate degree or higher (51%).

6.2.3 Findings

- Stafford County's population has more than doubled over every 20 year period between 1950 and 2010, and by 21.7% between 2010 and 2020.
- Weldon Cooper Center for Public Service projects that Stafford County's population will grow at more than four times the rate of the State as a whole between 2010 and 2040.
- In 2019, the median age of residents in Stafford County was 36.7 years, which was lower than the State as a whole.
- Stafford County residents had a higher level of educational attainment than most comparison areas in 2019.

6.3 Housing

Housing conditions in Stafford County are evaluated to ensure that there is adequate housing for current and future residents of the County. This is accomplished through a review of the total number of housing units, total units in each structure, median age of the housing stock, housing occupancy and vacancy, number of building permits issued, value of housing and median contract rent.

6.3.1 *Housing Availability*

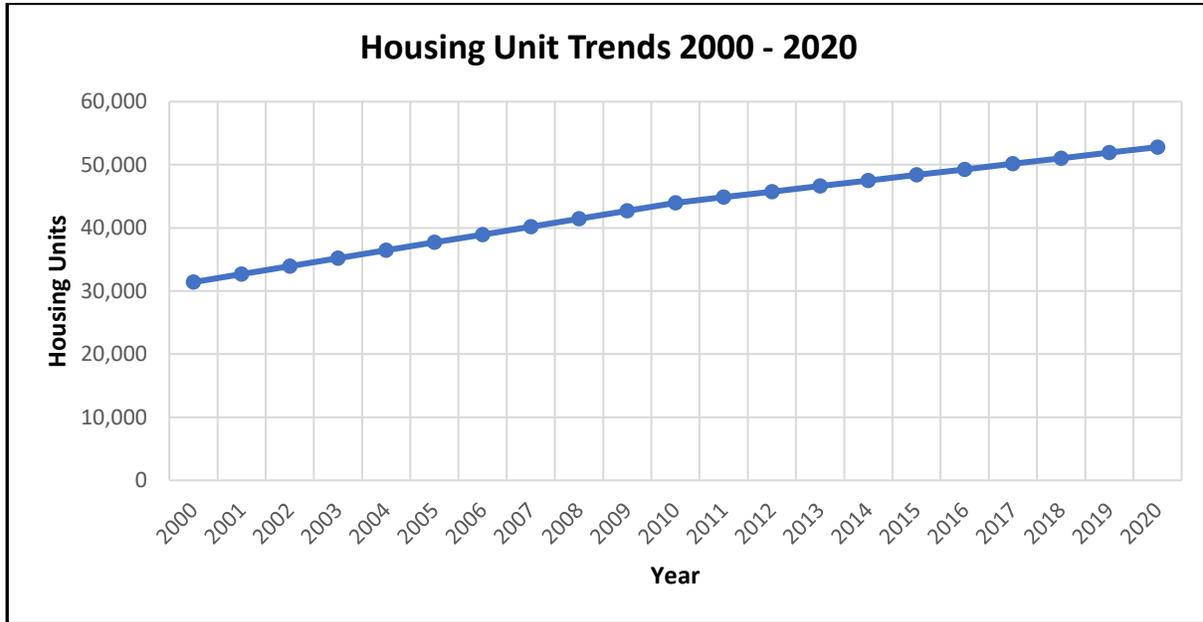
The US Census Bureau estimated that the County had 52,793 housing units in 2020. That was an increase of 8,815 units from the year 2010. More than half of the housing stock was constructed since 1990. 93.6 % were occupied while 6.4% were vacant. Vacancy rates were higher for rental properties at 7.5% compared to owner occupied dwellings which were 0.4%.

Over the last twenty years, housing units in the County increased from 31,405 in 2000 to 52,793 in 2020. Over the ten year period from 2000 to 2010, the County experienced an annual increase of 1,257 housing units. During the last decade the rate of increase slowed, and from 2010 to 2020, an annual increase of 881 housing units occurred. The annual housing unit data is provided in Table 6.10 and the accompanying chart.

Table 6.10 Annual Housing Trends - Stafford County VA (2000-2020)

Year	Housing Units	Year	Housing Units
2000	31,405	2011	44,859
2001	32,662	2012	45,740
2002	33,919	2013	46,621
2003	35,176	2014	47,502
2004	36,433	2015	48,383
2005	37,690	2016	49,264
2006	38,947	2017	50,145
2007	40,204	2018	51,026
2008	41,461	2019	51,907
2009	42,718	2020	52,793
2010	43,978		

Source: US Census Bureau, 2000, 2010, and 2020 Decennial Census



Source: US Census Bureau, 2000, 2010, and 2020 Decennial Census

A variety of housing is available in Stafford County, but the predominant housing type is the single-family detached dwelling. Single-family detached units accounted for 74.5% of all dwellings, followed by single-family attached at 14.1%, multi-family at 7.4% and manufactured homes at 4.0%. This trend is changing. Based upon recent permit data from 2010 through 2020, single-family detached units were 66.94%, single-family attached units were 18.26%, and multi-family units were 14.79%.

Table 6.11 Housing Permits

Permit Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Single Family Detached	413	313	472	641	532	534	602	742	788	749	857
Townhouse and Duplex	129	117	91	194	166	181	239	229	194	164	108
Multi-Family	0	35	89	202	144	69	550	256	84	39	0
Total	542	465	652	1,037	842	748	1,391	1,227	1,066	952	965

Source: Department of Development Services

The housing stock in Stafford County is relatively new. Over 50% of the homes in Stafford County were constructed after 2004 (the median year of homes constructed in the County). Among comparison areas, Spotsylvania, King George, and Prince William all have experienced the same housing growth trend.

Residential and commercial development is continuing in Stafford County. The table that follows indicates the number of new construction permits that were issued between 2000 and 2020. Residential construction permits have been issued for single-family, mobile home/agriculture,

townhouse, duplex, multi-family and condominium dwellings. New residential development remained strong through 2005, but experienced a decline, consistent with the national economic slowdown during 2006 and 2007

The level of new home construction remained flat during 2008 – 2012. The year 2013 saw a spike in new home starts but was at a lower level than seen in the early part of the previous decade. Home construction for 2014 and 2015 were level, but spiked again in 2016. New residential development has declined since 2016, but remained at a rate higher than the first half of this decade. Commercial construction activity dropped off significantly in 2009 and remained relatively slow and steady through 2020.

Table 6.12 Permit Activity 2000-2020 (In Millions of Dollars)

New Construction	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Residential	1,970	1,581	2,096	1,398	1,981	1,641	860	758	413	516	546
Residential Construction Value	\$205	\$227	\$293	\$243	\$315	\$375	\$239	\$188	\$87	\$114	\$111
Commercial	24	27	44	151	68	86	81	60	47	38	11
Commercial Construction Value	\$15	\$51	\$15	\$55	\$45	\$552	\$96	\$110	\$51	\$33	\$12
New Construction	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Residential	466	640	1,004	825	785	1,391	1,227	1,066	952	965	
Residential Construction Value	\$98	\$143	\$219	\$197	\$177	\$247	\$257	\$258	\$237	\$240	
Commercial	14	11	14	13	13	38	33	19	9	13	
Commercial Construction Value	\$66	\$20	\$50	\$36	\$14	\$35	\$55	\$11	\$11	\$39	

Source: Department of Development Services

6.3.2 Value and Rent

In 2019, the median value of a home in Stafford County was \$366,000, as compared to \$299,300 in 2010, which was higher than Spotsylvania and King George Counties. The median gross monthly rent was lower in 2019 (\$1,383) as compared to \$1,428 in 2010. This may be partially explained by the Great Recession of 2007 – 2009, which forced many families out of home ownership and into rentals. As homeownership rebounded, rental prices likely stabilized. Additionally, the region saw an increase in rental housing construction post 2012. Rental affordability improved in the County from the year 2014 to 2019. This may be reflective of the increase in rental vacancies, as renter households that are moderately to severely cost burdened also decreased from 50% to 44.7%.

According to the US Department of Housing and Urban Development, housing is generally considered affordable if costs do not exceed 30% of household annual income. Households that have housing expenses exceeding 30% of their gross income are considered to be Asset Limited Income Constrained Employed (ALICE), with 45.2% of renters in the County meeting this criteria. Per the US Census Bureau, renter households that have incomes between \$20,000 and \$35,000 had the highest incidence of being cost burdened (84.7%).

Recent Real Estate Trends

To assess real estate trends in recent years, home sales data from Metropolitan Regional Information Systems, Inc. was reviewed. Home sales data was derived from public records provided by County offices, and The Fredericksburg Area Association of Realtors (FAAR).

The average sale price and home sales volume peaked between 2005 and 2006, after which a severe drop occurred. From 2005 to 2007, home sales volume was cut in half, decreasing from 2,962 units to 1,473 units. Average sale prices declined throughout what was referred to as the “Great Recession”, from late 2007 through June 2009. Home prices have continued to see a gradual upward trend since 2012. The median price of a home in the summer of 2021 was \$442,500 with 638 homes listed for sale.

6.3.3 Findings

- 93.6% of housing units in Stafford County were occupied in 2019. The vacancy rate for rental units was 7.5% compared to 0.4% for owner occupied units.
- In 2019, most dwellings in Stafford County were single-family detached units.
- The amount of new residential development declined from 2010 to 2020.
- In 2019, 45.2% of renters in Stafford spent more than 30% of their income on rent, and are classified as being cost burdened. This is an improvement from 2010 when 51.7% of renters were cost burdened

6.4 Economy

The economy of Stafford County is evaluated through an examination of characteristics such as labor force, industries of employment, occupations of residents and their income levels. Employment characteristics reveal which industries are important to the economic viability of the locality. The income characteristics of residents are an indicator of the County's financial stability and its ability to pay for governmental services. Multiple income characteristics are usually examined because no one statistic accurately demonstrates the economic character of an area.

6.4.1 Labor Force

In 2019, Stafford County had a lower percentage (67%) of its residents 16 years of age or older in the labor force than all comparison areas except King George County and Spotsylvania County. The size of the labor force provides an indication of the availability of workers in the community for businesses seeking to relocate into the area.

Table 6.14 Labor Force Characteristics 2019 (Stafford County, VA and Comparison Areas)

	Stafford County	Fauquier County	King George County	Prince William County	Spotsylvania County	City of Fredericksburg	State of Virginia
Total Labor Force (includes Armed Forces)	82,282	38,607	13,941	258,110	71,207	16,645	4,537,998
Employed (Civilian)	75,708	37,506	13,065	243,225	66,206	15,717	4,229,399
Unemployed	2,661	947	413	8,528	4,024	787	175,528
Percent in Labor Force (Civilian)	67.0%	68.0%	65.9%	70.3%	66.4%	71.3%	64.0%
Percent in Labor Force Unemployed	3.4%	2.5%	3.1%	3.4%	5.7%	4.8%	4.0%

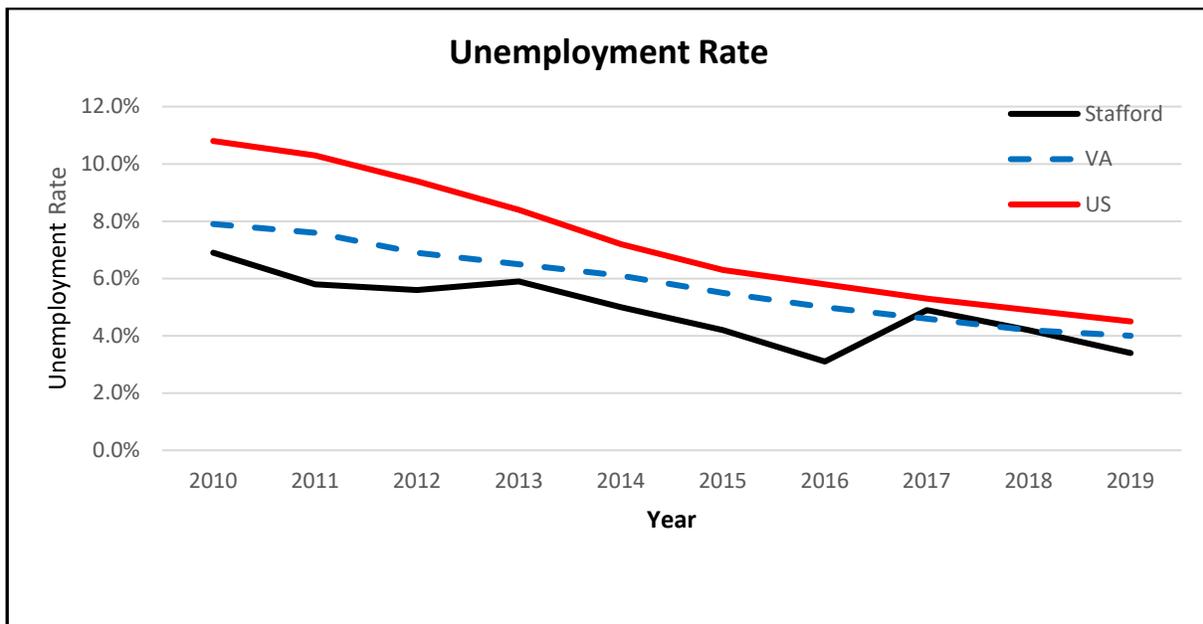
Source: US Census Bureau, 2019 American Community Survey

The unemployment rate is an indicator of the level of employment in the area. The table and graph that follows shows that between 2010 and 2019, Stafford County has consistently had a lower unemployment rate than both the State and Nation as a whole.

Table 6.15 Unemployment Rate 2010 - 2019

Unemployment rates	Stafford	VA	USA
2010	6.9%	7.9%	10.8%
2011	5.8%	7.6%	10.3%
2012	5.6%	6.9%	9.4%
2013	5.9%	6.5%	8.4%
2014	5.0%	6.1%	7.2%
2016	3.1%	5.0%	5.8%
2017	4.9%	4.6%	5.3%
2018	4.2%	4.2%	4.9%
2019	3.4%	4.0%	4.5%

Source: US Bureau, American Community Survey



Source: US Bureau, American Community Survey

6.4.2 *At-Place Employment*

In 2019, the primary employment sector in Stafford County was educational services, health care, and public assistance (20.8%). Stafford County had a higher percentage of jobs in this employment sector than all comparison communities except the City of Fredericksburg (25%). Other important employment sectors for Stafford County were public administration (18%), professional services (15.9%), and retail trade (10.7%). The following table shows employment distribution by work categories for Stafford and other municipalities.

Table 6.16 Industries of Employment 2019 (Stafford County, VA and Comparison Areas)

	Stafford County	Fauquier County	King George County	Prince William County	Spotsylvania County	City of Fredericksburg	State of Virginia
Agriculture, forestry, fishing and hunting, and mining	0.1%	2.2%	1.0%	0.2%	0.4%	0.5%	0.8%
Construction	6.4%	10.5%	8.0%	10.3%	9.1%	5.7%	6.8%
Manufacturing	3.1%	3.9%	4.2%	3.2%	2.9%	3.4%	7.0%
Wholesale trade	1.4%	1.6%	1.8%	1.1%	2.6%	1.3%	1.6%
Retail trade	10.7%	10.9%	11.2%	10.7%	13.9%	11.4%	10.2%
Transportation and warehousing, and utilities	6.9%	5.3%	4.4%	4.7%	4.4%	2.4%	4.7%
Information	0.9%	2.1%	1.1%	1.7%	0.7%	2.2%	1.7%
Finance and insurance, and real estate and rental and leasing	3.7%	4.2%	3.9%	5.7%	5.3%	6.3%	6.3%
Professional, scientific, and management, and administrative and waste management services	15.9%	18.8%	13.7%	17.7%	18.1%	15.0%	15.6%
Educational services, and health care and social assistance	20.8%	20.2%	17.0%	18.3%	19.2%	25.8%	22.40%
Arts, entertainment, and recreation, and accommodation and food services	7.7%	8.5%	7.4%	9.7%	6.9%	10.7%	9.1%
Other services, except public administration	4.2%	3.6%	4.0%	5.5%	5.9%	3.9%	5.3%
Public administration	18.0%	8.1%	22.4%	11.1%	10.6%	11.2%	8.4%

Source: US Census Bureau, 2019 American Community Survey

The highest paying employment sectors in 2020 were management of companies and enterprises (\$126,480), finance and insurance (\$80,680), and construction (\$53,940) based on national average salaries generated by the US Bureau of Labor Statistics. The lowest paying industries of employment were accommodation and food services (\$27,650), personal care services (\$32,610), and agriculture, forestry, fishing and hunting (\$33,310). Employment sectors important to Stafford County had the following average salaries: public administration \$52,180; retail trade \$45,750; construction \$53,940; health care \$32,250; and transportation and warehousing \$36,680.

Occupations of Stafford County Residents

In 2019, the predominant occupation types for Stafford County residents, regardless of their work location, were professional and management related occupations (44.8%), sales and office occupations (19.4%), and service occupations (16.6%). Stafford County had the highest

percentage of professional and management related occupations noted among all other comparison communities, except the City of Fredericksburg (47.5%).

Table 6.17 Occupations – 2019 (Stafford County, VA and Comparison Areas)

OCCUPATION	Stafford County	Fauquier County	King George County	Prince William County	Spotsylvania County	City of Fredericksburg	State of Virginia
Management, professional, and related occupations	44.8%	42.3%	44.6%	44.1%	41.6%	47.5%	45.4%
Service occupations	16.6%	19.0%	17.7%	19.2%	20.1%	23.4%	17.1%
Sales and office occupations	19.4%	18.3%	19.0%	18.9%	21.5%	17.2%	19.0%
Natural resources, construction, and maintenance occupations	7.4%	10.8%	7.9%	10.0%	8.0%	5.0%	7.8%
Production, transportation, and material moving occupations	11.8%	9.6%	10.9%	7.8%	8.8%	6.9%	10.7%

Source: US Census Bureau, 2019 American Community Survey

6.4.3 Resident Income

Per capita and median household incomes are two measures of a community's wealth. Per capita income better reflects the wealth of the community while median household income better reflects the distribution of income within the community. Per capita income is determined by dividing the total income of residents by the population. The median household income is the level at which the number of households with higher incomes is equal to those with less.

According to the US Census Bureau, Stafford County's median household income in 2010 was \$97,110 compared to \$76,754 within the State as a whole. Census Bureau estimates from 2019 show the median household income increased to \$110,446, with a per capita income of \$42,822. Stafford County had the highest median income across all other comparison areas, and had the highest per capita income except for Fauquier County. Stafford County also had the lowest poverty rate (5.9%) among all comparison areas with exception to King George County (5.1%), and the City of Fredericksburg had the highest (15.5%).

Table 6.18 Income Characteristics – 2019 (Stafford County, VA and Comparison Areas)

	Stafford County	Fauquier County	King George County	Prince William County	Spotsylvania County	City of Fredericksburg	State of Virginia
Less than \$10,000	3.0%	2.0%	1.9%	2.5%	3.5%	6.1%	4.8%
\$10,000 to \$14,999	0.7%	3.3%	2.1%	1.1%	2.6%	4.3%	3.2%
\$15,000 to \$24,999	2.3%	3.9%	3.9%	3.8%	5.3%	7.4%	7.0%
\$25,000 to \$34,999	3.5%	3.1%	5.6%	4.9%	6.1%	8.4%	7.2%
\$35,000 to \$49,999	8.1%	6.7%	10.1%	6.7%	10.5%	11.1%	10.7%
\$50,000 to \$74,999	14.0%	15.0%	15.1%	12.9%	13.3%	17.3%	16.3%
\$75,000 to \$99,999	14.4%	13.3%	15.9%	13.8%	13.1%	14.6%	13.0%
\$100,000 to \$149,999	19.4%	23.7%	22.2%	23.8%	24.1%	13.8%	17.0%
\$150,000 to \$199,999	19.1%	13.0%	12.2%	12.9%	11.1%	8.1%	9.0%
\$200,000 or more	15.5%	16.1%	10.8%	17.6%	10.4%	8.8%	11.9%
Median Household Income (2019)	\$110,446	\$104,809	\$94,274	\$106,861	\$91,073	\$65,641	\$76,456
Per Capita Income (2019)	\$42,822	\$46,149	\$38,739	\$41,988	\$38,282	\$35,731	\$40,635
Percent below Poverty	5.9%	6.5%	5.1%	6.3%	6.4%	15.5	9.9%

Source: US Census Bureau, 2019 American Community Survey

6.4.4 *Business Activity*

The number of businesses in Stafford County grew by 38% between 2000 and 2005, from 1,394 to 1,928, according to statistics provided by the Stafford County Department of Economic Development. Between March 2000 and March 2005, 6,336 new jobs were created, a 27% increase. During the same time period, the State's rate of new job creation was 2% annually compared to the County's rate of 5%. At-place employment continues to rise in the County. Stafford County led the state in job growth from 2009 to 2014. In 2015, the County surpassed 40,000 jobs.

Table 6.19 Largest Employers – 2020 (Stafford County, VA)

	Firm	Type
1	GEICO	Insurance
2	Stafford County Schools	Education
3	U.S. Federal Bureau of Investigation	Government
4	U.S. Department of Defense	Government
5	Walmart	Retail Merchant
6	Stafford County Government	Government
7	McLane Mid-Atlantic	Wholesale Merchant
8	Intuit	Information
9	Mary Washington Hospital	Health Care
10	Lowe's Home Centers, Inc.	Retail Merchant
11	Giant Food	Retail Merchant
12	Simventions, Inc.	Prof, Scientific, and Tech. Services
13	Target Corp	Retail Merchant
14	Brothers RC Contractors, LLC	Construction
15	McDonald's	Restaurant
16	VDOT	Government
17	WaWa	Retail Merchant
18	Mantech Advanced Systems, Inc.	Prof, Scientific, and Tech. Services
19	Weis Markets	Retail Merchant
20	Hilldrup Moving and Storage, Inc.	Transportation / Shipping
21	Flexrn & Co.	Health Care Services
22	Patricio Enterprises, Inc.	Prof, Scientific, and Tech. Services
23	Publix Nc Employee Services, LLC	Retail Merchant
24	Cox Automotive Corporate	Auto Repair and Maintenance
25	Comfort Keepers	Health Care Services
26	U.S. Postal Service	Government
27	Greencore USA (formerly Market Fare Foods)	Food Production
28	Surgi-Center of Central Virginia	Health Care Services
29	YMCA	Civic and Social Organization
30	Pohanka Honda of Fredericksburg	Retail Merchant
31	Davis Defense Group, Inc.	Prof, Scientific, and Tech. Services
32	The Home Depot	Retail Merchant
33	Minnieland Private Day School	Educational / Social Assistance
34	FedEx Ground	Transportation / Shipping
35	Rappahannock Area Community Services Board	Health Care Services
36	One on One Care	Health Care Services
37	Sheehy Toyota of Fredericksburg	Retail Merchant
38	Southern Building Service, Inc.	Construction

39	Professional Building Maintenance	Janitorial / Building Maintenance
40	Morgan Properties Payroll, Inc.	Real Estate and Leasing
41	Lifecare	Health Care Services
42	Catholic Diocese of Arlington	Other – Religious Organization
43	Panera Bread	Other – Food Services
44	Coca-Cola Bottling Company	Wholesale Merchant
45	Falls Run Nursing and Rehab	Health Care Services
46	Federal Express	Transportation / Shipping
47	XCorp Solutions, Inc.	Prof, Scientific, and Tech. Services
48	Dominion Virginia Power	Utilities
49	CVS Pharmacy	Retail Merchant
50	Jeff Rouse Swim and Sport Center	Recreation

Source: Virginia Employment Commission and US Bureau of Labor Statistics

6.4.5 *Marine Corps Base Quantico*

Marine Corps Base Quantico is home to the Marine Corps Combat Development Command and the Presidential Helicopter Squadron. Quantico occupies 32,753 acres in Stafford County. Over 6,000 Marines are stationed at the base and most live with their families in the surrounding area. The Base also employs approximately 7,500 civilians. Quantico has an annual military payroll of \$348 million and an annual civilian payroll of \$471 million. The FBI Academy and the FBI National Crime Lab are also located on the Quantico Marine Corps Base. The FBI National Crime Lab relocated to Stafford in 2003 and has over 900 employees. The US Drug Enforcement Administration has a facility on-site. The Military Investigative Services for the various branches of the military have nearly 4,000 employees at the Russell-Knox Complex. The Marine Corps University and several advanced training schools are also located at Quantico. The Marine Corps Systems Command is a tenant on the base that has both civilian and military employees.

6.4.6 *Agriculture*

Although agriculture's economic role has been diminished in the County, it is still a defining characteristic of the area. According to the 2017 USDA Census of Agriculture, the most recent year for which information was available, Stafford County had 243 farms in operation that occupied 17,253 acres of land. The average farm size was 71 acres and the market value of production was \$6,125,000. Each of these statistics showed an increase between 1997 and 2002, and began to decrease in 2007. In comparison with the last census in 2017, the number of farms in operation increased from 215 (2012), the number of acres being farmed increased from 15,260 (2012), the average farm size remained consistent, and the market value of production increased significantly from \$2,739,000 (2012) to \$2,798,000.

6.4.7 *Comprehensive Economic Strategic Plan*

The Economic Development Strategic Action Plan was most recently readopted in 2015. This plan built on the previous 2006 version and the Economic Development 10-Point Plan from 2011. The

economic climate for the County was reevaluated and growth trends were identified. This 2015 plan identified 10 Goals for the future:

- Goal 1:** Continue to expand business growth and employment becoming a more progressive center of employment within the greater Washington D.C. Metropolitan Area.
- Goal 2:** Accelerate infrastructure upgrades serving critical commercial and industrial sites.
- Goal 3:** Continue to seek new and upscale retail restaurants within the County both to attract new development and to enhance the quality of life of County residents.
- Goal 4:** Continue to build and support technology and entrepreneurship growth and fully support the Stafford Technology and Research Initiative (STRC) to retain and grow high-tech jobs and businesses.
- Goal 5:** Continue Redevelopment Area programs focusing on creating a sense of place.
- Goal 6:** Leverage and grow the medical/allied health care base.
- Goal 7:** Focus the County's objectives and continue to be more proactive in building an enviable environment.
- Goal 8:** Promote economic development and business expansion while living the Comprehensive Plan's vision of preserving rural land outside the growth area.
- Goal 9:** Consider available and appropriate riverfront areas in the County for compatible commercial development.
- Goal 10:** Continue progress improving the overall development review and permitting processes, keeping taxes low, in an effort to further our "business friendly community" goals.

Progress towards these goals are measured monthly and quarterly and tracked by the Economic Development Department.

6.4.8 Findings

- Stafford County has had a consistently lower unemployment rate than the State and the Nation for over a decade.
- In 2019, the primary employment sectors for residents of Stafford County were education, health and social services.
- The most common occupation types for County residents in 2019 were professional and management related occupations at 45% of the workforce
- Stafford County had the highest median income and one of the lowest poverty rates among comparison areas in 2019.
- Job creation occurred at a faster rate in Stafford County than the State from 2000 to 2015.
- The County's Economic Development Strategic Action Plan identified a series of 10 goals to be monitored and measured aimed at increasing the County's economic competitiveness, increasing employment opportunities and diversifying the local economy.

6.5 Historic and Cultural Resources

6.5.1 *A Brief History of Stafford County*

Stafford County was established in 1664 and originally encompassed most of northern Virginia, including the areas which later became the Counties of Arlington, Fairfax and Prince William, and the City of Alexandria.

Stafford County's prehistory is documented with fossil remains of small sea creatures that can be found along the rivers and tributaries. Artifacts identified through archaeological study tell us that prehistoric man occupied Stafford County from the Paleo-Indian Period (ca. 10,000-8,000 B.C.) through the Archaic Period (ca. 8,000-500 B.C.), during which people lived in seasonal, nomadic groups, and the Woodland Period (ca. 500 B.C.- A.D.1600), which is characterized by the establishment of permanent settlements and an emphasis on agricultural practices.

In 1608, John Smith mapped the major rivers, tributaries, and Native American settlements of the Chesapeake Bay area, including substantial portions of Stafford County. Powhatan, chief of the Potowomeks, and his daughter Pocahontas, were associated with these settlements, which included the large village of Potowomek, located at what is now Marlborough Point.

Stafford County has strong connections to events that shaped our nation's history. Rich arable land and early colonial industries, such as iron manufacturing and quarrying of sandstone and granite, attracted important families, such as the Brents, Carters, Masons, Fitzhughs, Mercers, and Washingtons. During the Revolutionary War, James Hunter's Iron Works contributed significantly to earning our freedom from British rule by supplying weapons and implements to the Continental Army and Navy.

Falmouth, founded on the north side of the Rappahannock River, was a prominent port town throughout the 18th century and the first quarter of the 19th century. It was the terminus for goods, including tobacco and flour, transported east from Warrenton and shipped to England in exchange for a variety of products. Enslaved Africans were also shipped to Falmouth where slave auctions were held.





Like other port towns of the colonial period, Falmouth attracted Scottish entrepreneurs, such as Basil and Samuel Gordon. The Gordons established a thriving marketing industry. The town also supported several water mills that flourished mostly due to the transition from tobacco cultivation to grain.

Stafford County residents rallied to defend the country during the War of 1812 by establishing the 45th Virginia Militia Regiment, which defended both Stafford and Westmoreland Counties. British troops rampaged through areas of the County en route to Washington, D.C.

In the first half of the 19th century, Stafford County experienced the rise of the railroad. In 1834, the Richmond, Fredericksburg and Potomac Railroad opened its first segment, connecting Fredericksburg with Richmond. Then in 1842, the railway was extended north to Aquia Landing and eventually to Washington, D.C.

Situated halfway between the Union and Confederate capitals, Stafford County became a crossroads of military activity during the Civil War. The federal forces arrived en masse in the latter part of 1862. During the Fredericksburg and Chancellorsville campaigns, November 1862 through June 1863, Stafford County was occupied by more than 100,000 troops. The effect of the Federal Army's presence on the Stafford County landscape and economy was devastating. The army denuded the County of its trees and fences, agricultural fields were trampled and neglected, and foraging troops "liberated" food and other essentials from the civilian population. Four years of warfare left Stafford County barren and ravaged. The effects of the Civil War remained visible on the landscape into the 20th century.



After the Civil War, Stafford County struggled to regain its former economic stability. The agricultural practices of Stafford at this time were characterized by a transition from grain crops to dairying and market gardening. Large family farms were still present, but several were subdivided—many producing only enough to sustain the immediate family and their livestock. This period also saw the rise of the fishing industry in Stafford County.

From the early 20th century through the end of World War II, Stafford County witnessed growth with the construction of U.S. Highway 1, expansion of Marine Corps Base Quantico to the north, and establishment of Fort A. P. Hill to the south and Dahlgren Naval Base to the east. With the rapid expansion of the Washington, D. C. metropolitan area and the construction of the Federal Interstate Highway System (I-95) in the late 1960s, Stafford County witnessed the creation of many suburban residential communities and commercial developments.

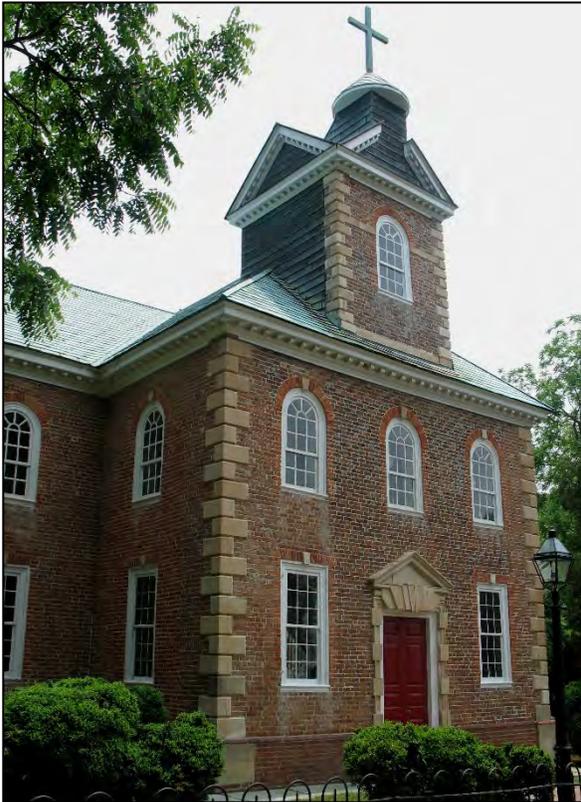
Stafford's long agricultural heritage is now being offset by an increasing emphasis on commercial enterprise. Stafford is faced with issues of growth, conservation of natural and heritage resources, and maintaining a sense of community and place.

6.5.2 Known Heritage Resources

Stafford County's heritage resources are identified and evaluated through several mechanisms, including the National Register of Historic Places Program, the Virginia Landmarks Register Program, the Stafford County Historic Resource Overlay District designation, the National Historic Landmarks Program, and the Stafford County Cultural Resource Inventory designation.

The National Register of Historic Places, which is administered by the National Park Service, is the nation's official list of cultural resources worthy of preservation. Stafford County currently has 26 listings in the National Register of Historic Places, but several other properties have been determined eligible for this prestigious listing.

The Virginia Landmarks Register, administered by the Virginia Department of Historic Places, is the state's official list of properties that are significant to Virginia's history. There are currently 25 Stafford County resources listed in the Virginia Landmarks Register.



The Stafford County Board of Supervisors designates historic places as Stafford County Historic Resource Overlay Districts by ordinance. Properties included within historic overlays must have public value and warrant conservation and preservation. There are now 22 individual Stafford County Historic Resource Overlay Districts, in addition to Falmouth Historic District, which includes more than 70 individual properties.

The National Historic Landmark Program designates nationally significant historic places that possess exceptional value or quality in illustrating or interpreting the heritage of the United States. Today, fewer than 2,600 historic places in the United States bear this distinction. While there are many important historic places in the United States, only a small number qualify for the National Historic Landmark Program. Three Stafford County sites—Belmont, Ferry Farm, and the Aquia Episcopal Church—have been designated as National Historic Landmarks.

6.5.3 *Stafford County Cultural Resource Inventory*

As a Certified Local Government, Stafford County is required to periodically update and maintain an inventory of known cultural resources. The Department of Planning & Zoning maintains the Stafford County Cultural Resource Inventory. As of July 1, 2021, over 2,400 resources were included in the inventory. Resources include historic buildings, archaeological sites, and over 540 family and community cemeteries.

6.5.4 *Significant Cultural Resources*

The table below lists some of Stafford County's most significant cultural resources. Most are currently listed in the National Register of Historic Places or Virginia Landmarks Register or designated as a National Historic Landmark or Stafford County Historic Resource Overlay District. Properties recorded with no distinction have been determined eligible for the National Register of Historic Places. As more intensive survey continues in the County, additional resources may be determined worthy of listing.

Table 6.20 Significant Heritage Resources 2021 (Stafford County, VA)

Property	Location	National Register	Virginia Landmark	Stafford County Historic Resource Overlay District	National Historic Landmark	Eligible for National Register but not Currently Listed
Accokeek Furnace Site	Address Restricted	X	X	X		
Aquia Episcopal Church	3938 Jefferson Davis Highway	X	X	X	X	
Belmont (Gari Melcher Home)	224 Washington Street	X	X	X	X	
Bloomington House Site & Adie Cemetery	Patowomack Park					X
Aquia Landing Aquia Landing Battlefield	Aquia Creek & Potomac River					X
Aquia Landing Aquia Creek Battlefield	2846 Brooke Road					X
Advanced Courthouse Road Redoubt	15 Old Fort Road	X	X	X		
Bethlehem Primitive Baptist Church	135 Chapel Green Road	X	X			
Brent Cemetery	Address Restricted			X		X
Carlton	501 Melchers Drive	X	X	X		
Chatham (within Fredericksburg-Spotsylvania National Military Park)	120 Chatham Lane	X	X			
Clearview	22 Strawberry Lane	X	X	X		
Civil War fortifications (4), encampments (2), corduroy road, 18 th -19 th century quarries (2), sandstone bridge abutments & roadbed (Old Potomac Church Road)	Rappahannock Regional Landfill					X
Clifton Chapel	60 Clifton Chapel Lane					X
Crucifix Monument	3140 Jefferson Davis Highway			X		X
Duff Green House	638 Kings Highway					
Ebenezer Methodist Church	168 Onville Road			X		X
Falmouth Historic District	Hwy 1 & Hwy 17	X	X	X		
Ferry Farm	240 Kings Highway	X	X		X	
Fort McLean	End of Courthouse Road. 40-56B			X		X
Government Island	Aquia Creek & Austin Run	X	X	X		
Stafford Training School (Rowser Building)	1739 Jefferson Davis Highway	X	X			
Hartwood Manor	335 Hartwood Road	X	X	X		
Hartwood Presbyterian Church	50 Hartwood Road	X	X	X		
Hunter's Iron Works	138 Blaisdell Lane	X	X			
Ingleside	219 Ingleside Drive			X		
Irvin House	1791 Warrenton Road					X
Little Whim	375 White Oak Road			X		X

Property	Location	National Register	Virginia Landmark	Stafford County Historic Resource Overlay District	National Historic Landmark	Eligible for National Register but not Currently Listed
Long Branch Mill Sites	Long Branch down to Poplar Rd, West Stafford					X
Marlborough Point Site (Town of Marlborough Archaeological Site)	Marlborough Point	X	X	X		
Moncure Conway House	305 King Street	X	X	X		
Mud March, Union 5 th Corps Advancement along River Road, Battle of Chancellorsville	Stafford & Spotsylvania Counties		X			X
Norman-Towson Cemetery	Quarry Road					X
Potomac Church Site	1090 Brooke Road	X	X			
Potomac Creek Site (Potowomek Indian Village)	Address Restricted	X	X			
Rappahannock River Historic Overlay District	see historic overlay map			X		X
Richland	945 Widewater Road					X
Robertson-Towson House Site & Quarry	Austin Ridge Subdivision, adjacent to community pool					X
Sanford-Burgess Enslaved Persons Quarters	500 Greenbank Road					
Sherwood Forest	971 Kings Highway 59-71D, 59-71.					X
Smith-Forbes House	58 Westebe Lane			X		X
Stafford County Courthouse	2119 Jefferson Davis Highway			X		
Stafford County High School (Stafford School Board Offices)	31 Stafford Avenue					X
Tennessee Camp		X	X			
Thompson House	122 Cambridge Street			X		X
Union Church and Cemetery	Carter Street	X	X	X		
White Oak Museum (White Oak Elementary School)	985 White Oak Road			X		X
White Oak Primitive Baptist Church	8 Caisson Road	X	X	X		

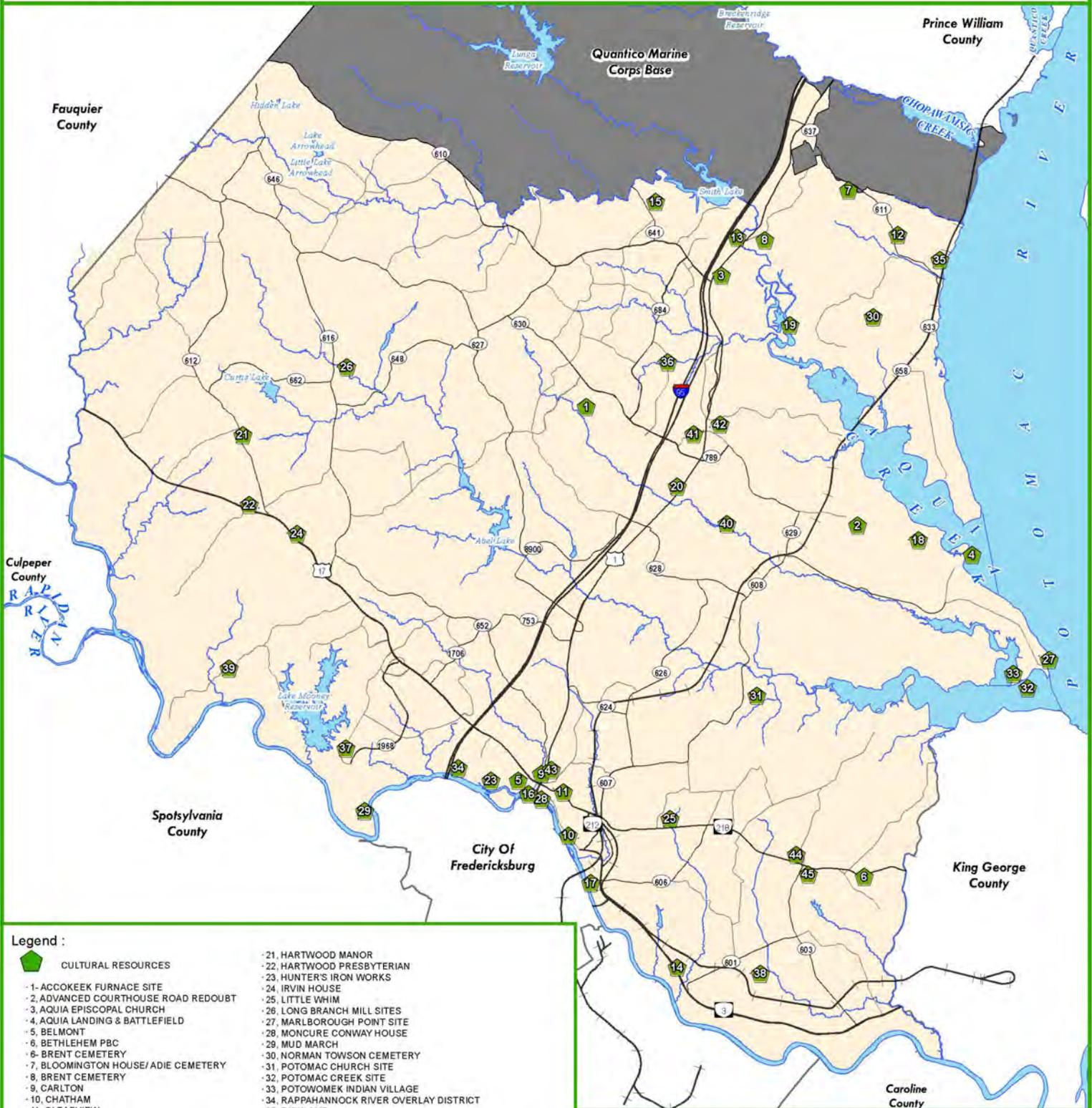
Source: Stafford County Department of Planning & Zoning * A State Owned Resource

6.5.5 Findings

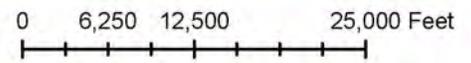
- Many historic and cultural resources are located in Stafford County.
- The Cultural Resources Management Plan uses the land development process to identify and protect cultural resources.
- Procedures for identification and protection of historic and cultural resources are recommended but not mandatory; the County’s adoption of the Cemetery ordinance codifies these procedures for cemeteries. Adoption of a Historic Preservation Ordinance would further strengthen the protection of historic and cultural resources.



FIGURE 6.4 Cultural Resources Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



- Legend :**
- CULTURAL RESOURCES
- | | |
|---|---|
| <ul style="list-style-type: none"> -1. ACCOKEEK FURNACE SITE -2. ADVANCED COURTHOUSE ROAD REDOUBT -3. AQUIA EPISCOPAL CHURCH -4. AQUIA LANDING & BATTLEFIELD -5. BELMONT -6. BETHLEHEM PBC -6. BRENT CEMETERY -7. BLOOMINGTON HOUSE/ADIE CEMETERY -8. BRENT CEMETERY -9. CARLTON -10. CHATHAM -11. CLEARVIEW -12. CLIFTON CHAPEL -13. CRUCIFIX MONUMENT -14. DUFF GREEN HOUSE -14. EBENEZER METHODIST CHURCH -15. EBENEZER METHODIST CHURCH -16. FALMOUTH HISTORIC DISTRICT -17. FERRY FARM -18. FORT MCLEAN -19. GOVERNMENT ISLAND -20. H.H. POOLE HIGH SCHOOL/ROWSER BUILDING | <ul style="list-style-type: none"> -21. HARTWOOD MANOR -22. HARTWOOD PRESBYTERIAN -23. HUNTER'S IRON WORKS -24. IRVIN HOUSE -25. LITTLE WHIM -26. LONG BRANCH MILL SITES -27. MARLBOROUGH POINT SITE -28. MONCURE CONWAY HOUSE -29. MUD MARCH -30. NORMAN TOWSON CEMETERY -31. POTOMAC CHURCH SITE -32. POTOMAC CREEK SITE -33. POTOWOMEK INDIAN VILLAGE -34. RAPPAHANNOCK RIVER OVERLAY DISTRICT -35. RICHLAND -36. ROBERTSON-TOWSON HOUSE SITE & QUARRY -37. SANFORD-BURGESS ENSLAVED PERSONS QUARTERS -38. SHERWOOD FOREST -38. SMITH-FORBES HOUSE -40. STAFFORD CIVIL WAR PARK -41. STAFFORD COUNTY COURTHOUSE -42. STAFFORD COUNTY HIGH SCHOOL (SCHOOL BOARD OFFICES) -43. THOMPSON HOUSE -44. WHITE OAK MUSEUM (WHITE OAK ELEMENTARY SCHOOL) -45. WHITE OAK PRIMITIVE BAPTIST CHURCH |
|---|---|



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.6 Community Facilities

The ability to provide adequate services help to shape a community and make it a desirable place to live. These services include public safety, education and cultural amenities, and waste management. This section explores the services that are provided in Stafford County. Several maps in this section identify the location of community services in the County.

6.6.1 Public Schools

Prior to 2018, Stafford County Public Schools used average daily membership (ADM) in the calculation of school enrollment. Although ADM is still used for state funding purposes, Stafford County Public Schools uses the term “official count” when referring to student enrollment.

As Stafford County’s population has steadily increased, so too has its student enrollment figures. The official count for Stafford County Public Schools in 1995 was 16,520 students, and has since climbed to 29,576 students for the 2019/2020 school year. As of September 30, 2019, the Stafford School District had 12,665 elementary school students, 7,186 middle school students and 9,725 high school students. With the rapid growth in Stafford County, the School Board projects that enrollments will continue to increase through 2026 to 33,094 students.

Currently the County operates 30 schools (17 elementary schools, 8 middle schools and 5 high schools), including 2 early childhood education centers (North Star and Rising Star), and The Phoenix Center for Innovative Learning. The table below provides basic data on each school and a map identifies their location in the County.

Community Facilities

- Schools
- Law Enforcement
- Correctional Facilities
- Fire and Rescue
- Libraries
- Hospitals
- Waste Management

Table 6.21 Stafford County Public Schools

School	Location	Official Count 2019-2020	Design Capacity	Construction Date
Elementary Schools (K-Grade 5)				
Kate Waller Barrett	150 Duffey Dr.	858	950	2002
Margaret Brent	2125 Mountain View Rd.	805	950	2004
Anthony Burns	60 Gallery Rd.	760	950	2006
Conway	105 Primmer House Rd.	885	950	2006
Falmouth	1000 Forbes St.	649	794	Renovation/Addition - 2013
Ferry Farm	20 Pendleton Rd.	645	732	1957; Additions - 1963, 1989, 1992, and 2020
Garrisonville	100 Wood Dr.	543	768	1981; Addition- 1999
Grafton Village	501 Deacon Rd.	722	754	1967; Additions -1977, 1996, and 2014 Renovation/Addition - 2014
Hampton Oaks	107 Northampton Blvd.	871	950	1992; Addition - 1996
Hartwood	14 Shackelford's Well Rd.	548	649	1963; Additions - 1966, 1989, and 1993
Anne E. Moncure	75 Moncure Ln.	882	964	1966; Additions - 1973, 1997; Rebuilt - 2019
Park Ridge	2000 Parkway Blvd.	793	843	1990; Addition - 1994
Rock Hill	50 Wood Dr.	668	843	1989; Addition - 1994
Rocky Run	95 Reservoir Rd.	845	950	2000
Stafford	1349 Courthouse Rd.	726	794	Renovation/ Addition - 2013
Widewater	101 Den Rich Rd.	662	843	1988; Addition - 1995
Winding Creek	475 Winding Creek Rd.	803	925	1997
Middle Schools (Grades 6-8)				
			Design Capacity	
Dixon-Smith	503 Deacon Road	805	1,100	2006
Edward E. Drew	501 Cambridge St.	630	650	1951; Additions - 1957,1990 and 1998
T. Benton Gayle	100 Panther Drive	950	1,100	2002
Shirley C. Heim	320 Telegraph Road	990	1,100	2008
H. H. Poole	800 Eustace Rd.	896	1,100	1995; Addition - 1998
Stafford Middle	101 Spartan Dr.	985	1,100	1991
Rodney E. Thompson	75 Walpole St.	1,032	1,100	2000
A. G. Wright	100 Wood Dr.	898	920	1981; Addition - 1999
High Schools (Grades 9-12)				
			Design Capacity	
Brooke Point	1700 Courthouse Rd.	1,951	2,125	1993; Addition - 2016
Colonial Forge	550 Courthouse Rd.	2,003	2,175	1999; Addition - 2016
Mountain View	2135 Mountain View Rd.	1,983	2,150	2005; Addition - 2017
North Stafford	839 Garrisonville Rd.	1,788	2,050	1981; Addition - 2003
Stafford	33 Stafford Indian Ln.	2000	2,150	1975; AIMIE Bldg - 1981; Rebuilt - 2015

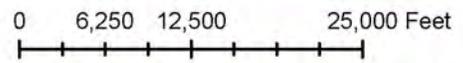
Source: Stafford County Public Schools as of September 2019;



FIGURE 6.5 Schools Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



- Legend :**
-  Elementary Schools
 -  Middle Schools
 -  High Schools
 -  Proposed Schools



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Between 1986 and 2010, the County constructed 10 elementary schools, five middle schools and three high schools, and added multiple classroom additions to elementary and middle schools. However, since 2010, with the exception of a limited increase in overall capacity, there has been no significant increase for middle or high schools. Due to school rebuilds, there has been no new schools constructed.

Between 2010 and 2020, the County completed major renovations and additions to four elementary schools (Falmouth, Stafford, Grafton Village, and Ferry Farm) and three high schools (Brooke Pointe, Colonial Forge, and Mountain View) and rebuilt one elementary school (Moncure) and one high school (Stafford). With rapid growth in Stafford County, a significant investment will be required by the Board of Supervisors and the School Board to ensure school capacity keeps pace with projected growth.

The Stafford County Public Schools Capital Improvement Program (CIP) for fiscal years 2022 - 2031 includes High School #6, Elementary School #18, Drew Middle School renovation (adds capacity), and Middle School #9.

Adult Education

Germanna Community College offers undergraduate degrees and certification programs. Facilities in Stafford County are leased space of the Aquia Park Commerce Center and Taylor-Bott Industrial Park. The County worked with Germanna to secure land for a permanent campus, located on Jumping Branch Road in central Stafford. Efforts are underway to expand training and other higher education opportunities for county residents.

The University of Mary Washington offers both undergraduate and graduate degrees, and has a permanent campus in Stafford, located off of Warrenton Road near Stafford Lakes Village.

6.6.2 Law Enforcement

The Stafford County Sheriff's Office provides countywide law enforcement services. Supplemental services are also provided to the Counties of Spotsylvania, Prince William, Fauquier, and King George and the City of Fredericksburg with whom the County has mutual aid agreements. The Sheriff's Office has a total of 306 employees that includes sworn officers, animal control personnel, civilian personnel, and emergency communication center personnel. In addition, the Sheriff's Office cooperates with numerous state and federal law enforcement agencies that have jurisdiction in the County. These include, but are not limited to, the Virginia State Police, Virginia Conservation Police, Virginia Alcohol Beverage Control Authority Bureau of Law Enforcement, the Federal Bureau of Investigation, the Drug Enforcement Administration and the Bureau of Alcohol, Tobacco, Firearms and Explosives.

During 2020 the Sheriff's Office Emergency Communications Center (ECC) processed 160,161 law enforcement incidents of which 73,638 (42%) were law enforcement calls for service. In addition, the ECC processed an additional 54,454 Computer Aided Dispatch law enforcement activities. Law Enforcement Calls for Service in 2020 increased 8% over calls for service in 2015.

The Sheriff's Office headquarters are in the Ford T. Humphrey Public Safety Building located on Courthouse Road adjacent to the County Administration Complex. The Sheriff's Office occupies about 90,000 sq. ft of the public safety building, housing the Sheriff's Office, Field Operations, Special Operations, Emergency Communications, Administrative Services, Professional

Standards, Court Services and Criminal Investigations. In addition, a large garage building houses specialized equipment for rapid deployment when needed. The public safety complex is expected to meet the facility needs of the Sheriff's Office for approximately the next 15 years.

The Sheriff also operates an Animal Shelter on Frosty Lane where the shelter staff and Animal Control Officers are located. The current Shelter was opened in June of 2018 to provide modern facilities to house and care for animals, provide adequate operating support facilities for Animal Control Officers, and to provide better access to the public. The 15,936 square foot facility provides administrative and public areas (16), cat enclosures (91), dog enclosures (76), small animal enclosures (12) and animal support and care areas. It is forecasted that the facility has a 20-year life cycle remaining. The former animal shelter located on Eskimo Hill Road was decommissioned and turned over to the R-Board for solid waste operations.

Furthermore, the Sheriff's Office operates a law enforcement firearms training facility (range) at the Rappahannock Regional Landfill located on Eskimo Hill Road. The range was constructed in 2005 by Stafford County to meet or exceed National Rifle Association standards and current environmental standards. It was certified by the Virginia Department of Criminal Justice Services in December of 2005. The range is used to certify and maintain Stafford County and City of Fredericksburg law enforcement officer's firearms skills to state and industry standards for law enforcement. Improvements to the range have been made on a piece-meal basis over the years to include improved firing lanes and target mechanisms, temporary shelter and improved berms and backstops. Additional improvements are needed, including classroom space and improvements to the parking lot and drill facilities. The current configuration of this facility is estimated to have 10 years of life remaining.

6.6.3 Correctional Facilities

The Rappahannock Regional Jail, located at 1745 Jefferson Davis Highway, serves the adult corrections needs of the Counties of Stafford, Spotsylvania, and King George, and the City of Fredericksburg. A new 264,000 square foot, state-of-the-art corrections facility was opened in June 2000 which has a 662-bed capacity that can expand to 1,200.

The Rappahannock Juvenile Detention Center is an 80-bed, 59,000-square-foot facility located at 275 Wyche Road that opened in December 2000. The facility provides pre-dispositional and post-dispositional juvenile detention housing.

The Stafford Correctional Unit #21 located on Eskimo Hill Road is operated by the Commonwealth of Virginia and houses male inmates.

6.6.4 Fire and Rescue

The Fire and Rescue Department serves the entire County and is headquartered at the Ford T. Humphrey Public Safety Building on Courthouse Road. The Department was established in 2005 as an "all hazards" agency that provides fire, rescue, basic and advanced life support emergency medical service, ambulance transportation and environmental hazard (Haz-Mat) response and mitigation. Other responsibilities of the Department include emergency management, explosive ordnance disposal, building plan review and fire code enforcement, fire and environmental crime

investigation, and public education and preparedness. Mutual aid agreements exist with the Counties of Fauquier, King George, Prince William, Spotsylvania, the City of Fredericksburg, as well as the Marine Corps Base Quantico. In 2020, fire and rescue personnel responded to 15,455 calls for service calls; an increase of more than 20% from 2010 when the Department responded to 12,693 calls for emergency service.

The Fire and Rescue Department has a workforce of 120 career firefighter/EMTs and firefighter/paramedics, 16 civilians, and 150 volunteers that deploy from 15 fire and rescue stations, which are currently organized into two battalions. Battalion 1 serves the southern portion of the County and Battalion 2 serves north Stafford. Nine stations are combined fire and rescue facilities; the remaining six are stand-alone fire or rescue stations. New facilities are designed and built as combination stations. Fire and Rescue Station 14, is the newest station near the Shelton Shop Road and Garrisonville Road intersection, serves as a new station constructed to address community growth in northern Stafford. The table that follows lists the stations and their locations.

Table 6.22 Fire and Rescue Stations (Stafford County, VA)

Station	Location
Fire-Rescue Co. 1 – Falmouth	250 Butler Road
Fire-Rescue Co. 2 – Stafford	305 Jason Mooney Drive
Fire-Rescue Co. 3 – Widewater	749 Widewater Road
Fire Co. 4 – Mountain View	924 Kellogg Mill Road
Rescue Co. 4 – Mountain View	1268 Mountain View Road
Fire-Rescue Co. 5 – Brooke	222 Andrew Chapel Road
Fire-Rescue Co. 6 - Hartwood	67 Hartwood Church Road
Fire Co. 7 – White Oak	12 Newton Road
Rescue Co. 7 – White Oak	535 White Oak Road
Fire Co. 8 – Rockhill	2133 Garrisonville Road
Rescue Co. 8 – Rockhill	1565 Garrisonville Road
Fire-Rescue Co. 9 – Aquia	1001 Washington Drive
Fire-Rescue Co. 10 – Potomac Hills	3528 Jefferson Davis Highway
Fire-Rescue Co. 12 – Berea	20 Sebring Drive
Fire-Rescue Co. 14 – Garrisonville	54 Shelton Shop Road

Source: Stafford County Fire and Rescue Department

The Capital Improvements Program for fiscal years 2020 - 2029 identifies the need for major repairs and upgrades to numerous volunteer stations.

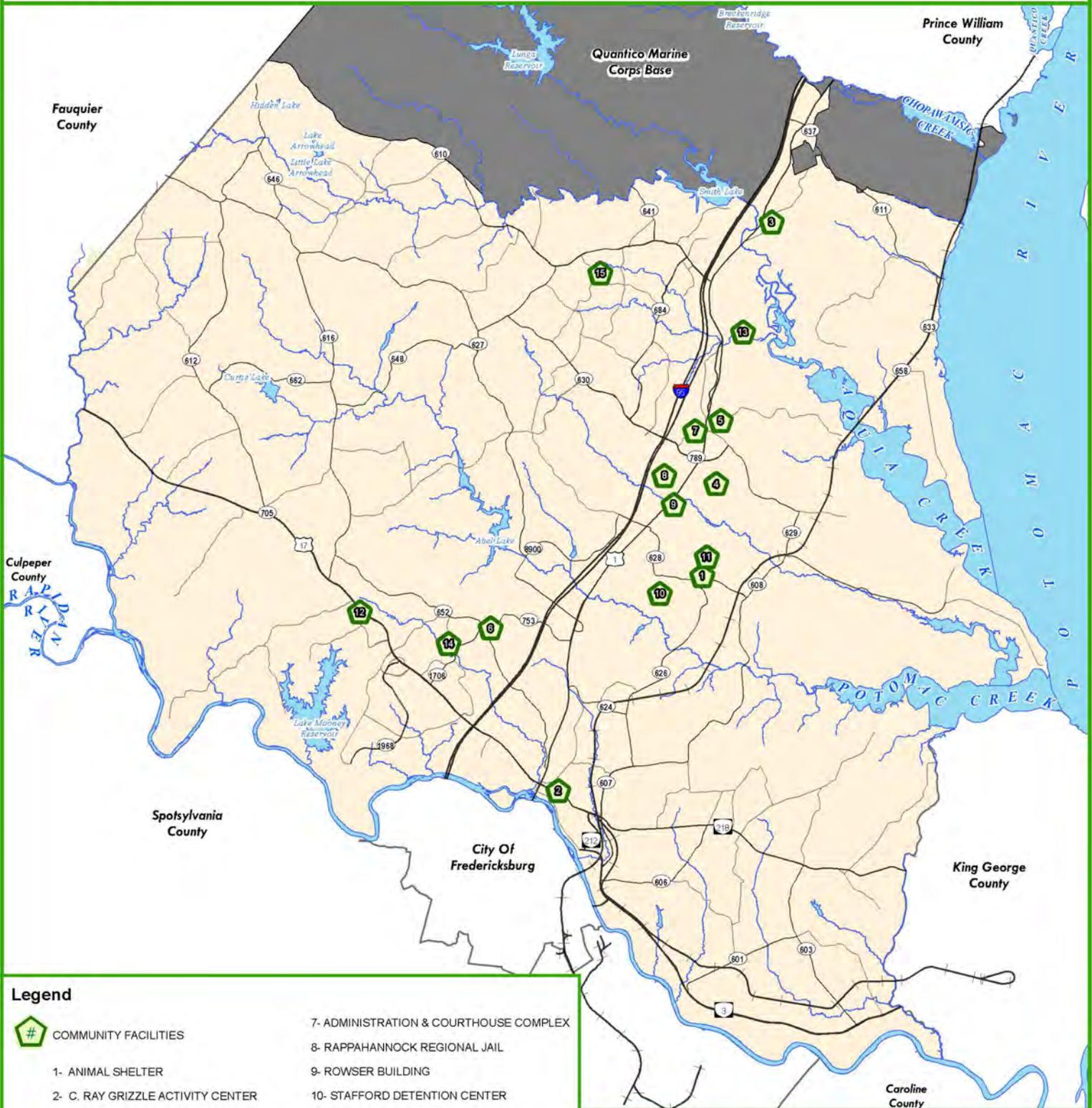
6.6.5 Hospitals

Stafford Hospital Center, the first hospital in Stafford County, opened in 2009 on a 70-acre site on the southeast side of U.S. 1 and Courthouse Road. The hospital is designed to hold up to 100 beds. The site presently includes one medical office building. The facility is operated by MediCorp, the parent company of Mary Washington Hospital.

The next closest facilities are Mary Washington Hospital about 9 miles from central Stafford in the City of Fredericksburg and Sentara Northern Virginia Medical Center about 16 miles from central Stafford in Woodbridge, VA.



FIGURE 6.6
Community Facilities
Stafford County Comprehensive Plan
Stafford County, Virginia
 September 8, 2021

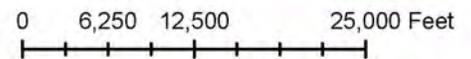


Legend



COMMUNITY FACILITIES

- 1- ANIMAL SHELTER
- 2- C. RAY GRIZZLE ACTIVITY CENTER
- 3- CARL LEWIS COMMUNITY CENTER
- 4- STAFFORD HOSPITAL CENTER
- 5- COURTHOUSE COMMUNITY CENTER
- 6- ENON COMMUNITY CENTER
- 7- ADMINISTRATION & COURTHOUSE COMPLEX
- 8- RAPPAHANNOCK REGIONAL JAIL
- 9- ROWSER BUILDING
- 10- STAFFORD DETENTION CENTER
- 11- STAFFORD REGIONAL LANDFILL
- 12- UNIV OF MARY WASH GRAD CAMPUS
- 13- UTILITIES FIELD OPERATIONS
- 14- HOWELL MEMORIAL LIBRARY
- 15- PORTER MEMORIAL LIBRARY



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.6.6 *Libraries*

The John Musante Porter and the William J. Howell Branches of the Central Rappahannock Regional Library system are the only Libraries within the County. The Porter Branch is located at Parkway Boulevard in the Garrisonville area, and the England Run Branch is located on Lyons Boulevard in the Falmouth area. The Central Rappahannock Regional Library system consists of eight different branches in the City of Fredericksburg and in Spotsylvania, Stafford, and Westmoreland counties.

The Porter Branch of the Central Rappahannock Regional Library is housed in a 23,000 square foot building that was constructed in 1992. It has an 80- theater which can be partitioned into smaller meeting rooms. The England Run Branch opened in 2010 and is 30,000 square feet building with meeting rooms that can accommodate up to 180 seats. Both branches provide free access to computers and Wi-Fi communications.

6.6.7 *Solid Waste*

The Rappahannock Regional Solid Waste Management Board operates the landfill in Stafford County. Residents may deposit household garbage at minimal charge. Commercial refuse haulers serving residents must pay to use the landfill. The landfill is completely self-sufficient and does not require operating funds from the surrounding counties. The landfill accepts newspaper, aluminum cans, glass, plastic, cardboard, steel can, oil and office paper for recycling. The landfill is located on 700 acres of land. The County is currently working to open a new cell for depositing refuse. There is an estimated 40-year life of the facility.

6.6.8 *Virginia Cooperative Extension*

Using a combination of paid and volunteer staff, the Virginia Cooperative Extension (VCE) provides research-based information to County residents in the fields of agriculture/horticulture, 4-H youth development, food, nutrition and health, and family and consumer sciences. Educational programs in Agriculture and Natural Resources programs help to sustain the profitability of agriculture and forestry production, while protecting and enhancing the quality of land and water resources. The Food, Nutrition and Health Program and the Smart Choices Nutrition Education Program improve the quality of life of residents by encouraging appropriate and safe food choices and improving health literacy. Through the 4-H program, youth aged 5-19 receive hands-on learning experiences and develop leadership skills.

6.6.9 *Rappahannock Area Community Services*

The Rappahannock Area Community Services Board (RACSB) is a regional government agency that provides comprehensive services to individuals with mental health, mental retardation and substance abuse problems in Planning District 16 (including Stafford and Spotsylvania Counties). Established in 1970, the agency is managed by a board of 15-volunteer members who are appointed by member jurisdiction's local governing bodies. Two RACSB service sites are Stafford County: the Stafford Clinic and the Leeland Road Group Home.

6.6.10 Findings

- Significant resources need to be allocated for the construction of additional educational facilities to accommodate Stafford County's growing school population.
- The Ford T. Humphrey Public Safety Building that houses the Sheriff's Office and Fire and Rescue Department should meet these agencies' needs over the next 25-year period.
- The Rappahannock Regional Landfill has areas to expand for the future.
- Stafford County's Fire and Rescue Department is staffed by 120 career officers, 16 civilians, and approximately 150 volunteers.
- A 100-bed hospital opened in 2009 near the Courthouse.
- The John Musante Porter Library and the William J. Howell Library serve Stafford County.

6.7 Infrastructure

Adequate access to water, sewage disposal and electric and gas utilities is generally considered essential to the health and well being of residents. This section presents a discussion of infrastructure facilities that are available in Stafford County. A map is included to identify infrastructure locations in the County.

6.7.1 *Water and Sewer*

The Stafford County Department of Utilities (DOU), under the direction of the County Board of Supervisors, has provided public water and sewer services to Stafford County residents for over two decades. During that time, the service area population and demand for services have more than quadrupled and continue to grow. The public utility customer base is currently increasing at an annual rate of 5%. The DOU provides services to over 25,000 residential customers and more than 700 non-residential customers. It operates as an enterprise fund that is separate from the County's General Fund and is funded solely by the revenues received from its customers.

Infrastructure

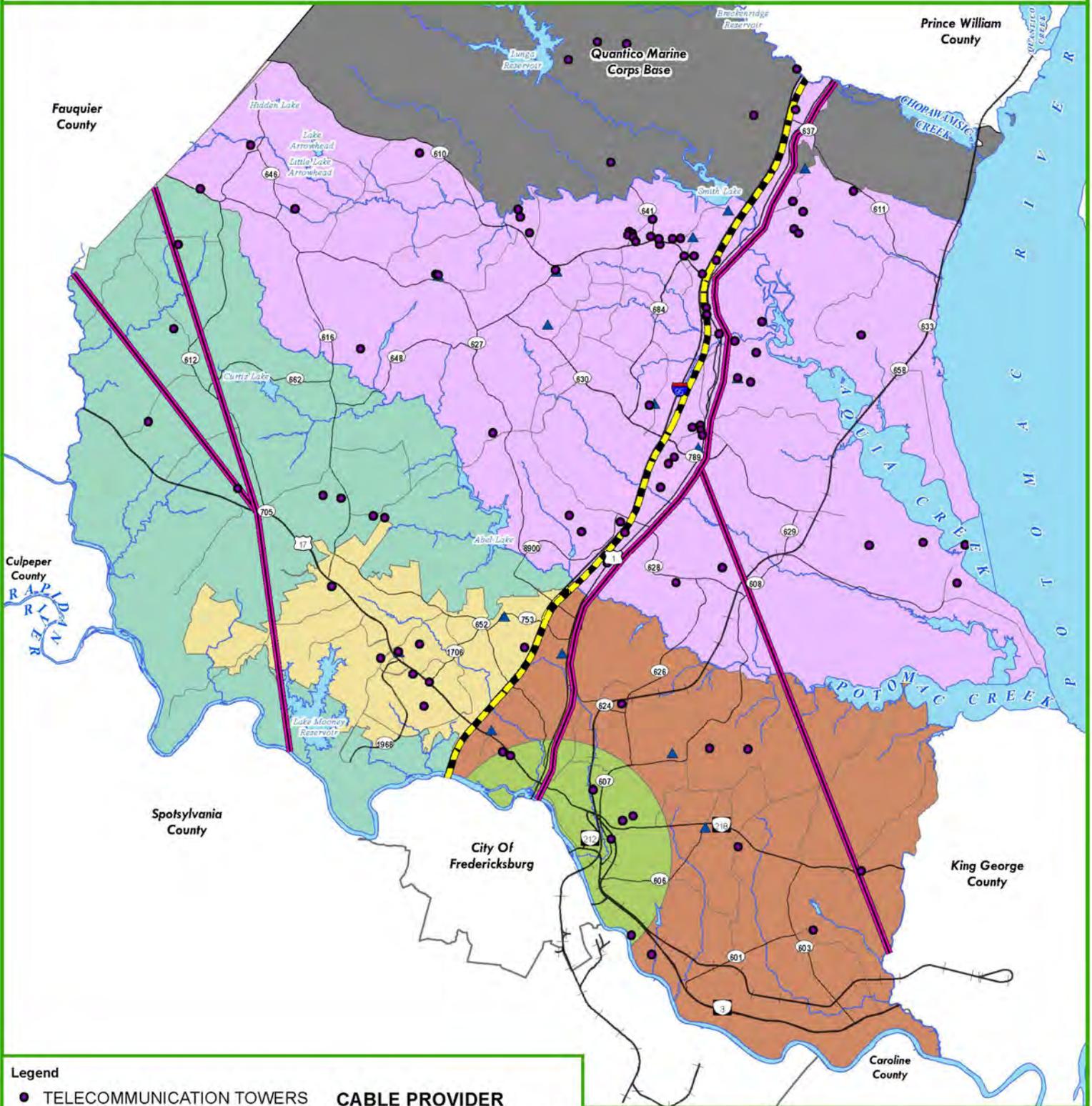
- Water and Sewer
- Stormwater Management
- Natural Gas
- Electric
- Telecommunications & Cable

Not all residents have access to public water and sewer services. The County only provides public water and sewer to the Urban Services Area (USA), which is the portion of the County that has been designated for residential, commercial and industrial development, with some minor public water exceptions. The designation of USAs, which limit the location of sewer line expansion, serves to limit residential densities in rural areas. Outside the USAs, approximately 10,000 dwellings use private wells and septic tanks to meet their water and sewage disposal needs.

Public drinking water is obtained from two surface water reservoirs (Smith Lake and Lake Mooney). The Lake Mooney Reservoir is located in south Stafford, and the Smith Lake Reservoir is located in North Stafford. The combined safe yield of these reservoirs is approximately 17 million gallons a day (MGD) (7.77 MGD from Smith Lake, and 9.4 MGD from Lake Mooney). The County's annual average daily demand is 9.4 MGD and the peak 90-day average is 13.2 MGD. The Abel Lake Reservoir is located in Central Stafford. While this reservoir is not currently used as a water source, it could be reinstated for use as either a direct-use reservoir or to augment flow to the Lake Mooney reservoir. The safe yield for Abel Lake is 6.1 MGD.



FIGURE 6.7 Infrastructure Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021

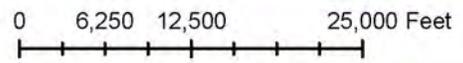


Legend

- TELECOMMUNICATION TOWERS
- ▲ WATER TANKS
- ▬ DARK FIBER
- ▬ FIBER OPTIC CABLE SERVICE

CABLE PROVIDER

- CAVALIER/COX/VERIZON
- COMCAST
- COMCAST/COX
- COMCAST/COX/VERIZON
- COX/VERIZON



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Water treatment occurs at the Smith Lake Water Treatment Facility and at the Lake Mooney Water Treatment Facility. The Smith Lake facility supplies water to the northern region of Stafford County while Lake Mooney supplies the southern region. The maximum daily capacity for the two facilities is 21.64 MGD (Smith Lake at 12.5 MGD and Lake Mooney at 9.1 MGD). After treatment, the water from both facilities meets or exceeds Virginia Department of Health and the Federal Safe Drinking Water Act Amendments of 1986 standards. The water distribution system stores approximately 17.2 million gallons of water in three ground storage tanks, one standpipe and 10 elevated tanks. The system also includes five primary pumping stations, and six standby pumping stations.

Sewage treatment is provided at Little Falls Run Wastewater Treatment Facility and Aquia Wastewater Treatment Facility. They have permitted capacities of 8 MGD and 10 MGD, respectively. The Little Falls Run facility is in the southeast part of the County and the Aquia facility is in the north. The wastewater collection and transmission systems consist of approximately 475 miles of gravity sewers, 90 pump stations, 63 miles of associated sewer force mains and 15 miles of low pressure mains.

With these resources and future planned improvements, the County anticipates being able to meet the water and sewer needs of its residents within the USA to the year 2055.

6.7.2 *Stormwater Management*

Stormwater Management is a mechanism for controlling water from rain or snowmelt that flows over the land surface and is not absorbed into the ground and urban and industrial stormwater that is discharged through conveyances, such as separate storm sewers, ditches, channels or other conveyances. The purpose of stormwater management is the mitigation of the adverse effects that land use changes and increased impervious land cover have on flooding and the aquatic environment. Adverse effects include downstream erosion, water quality degradation, and water channel flooding.

Stafford County's Stormwater Management Ordinance (Chapter 21.5 of the County Code) establishes minimum stormwater management requirements. All land development projects must comply with the requirements of this ordinance. Both the Stormwater Management Ordinance and the Zoning and Subdivision Ordinances encourage the use of Best Management Practices (BMP). BMP is an innovative stormwater management approach whose 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.

Stafford County's stormwater infrastructure consists of more than 650 stormwater management facilities that fall into the following general categories: ponds; miscellaneous; manufactured/underground; and infiltration trenches. Roughly 60% of the stormwater BMPs being used in the County are a type of pond. Overall, about 40% of the County's BMPs were classified as being in "Good" condition, 30% in "Fair" condition, and 15% in "Poor" condition. The condition of 15% of the BMPs was unknown because they could not be located or accessed.¹ Most

¹ U.S. Army Corps of Engineers, Baltimore District. Stafford County, Virginia Stormwater Infrastructure and Watershed Management Study, July 2005.

facilities are under private or community association ownership. The County requires Maintenance Agreements to be recorded in the County's land records.

6.7.3 *Natural Gas*

Residents, businesses and industries in Stafford County are provided natural gas service by Columbia Gas of Virginia, a member of the Columbia Energy Group Company. Columbia Gas of Virginia is the third largest distributor of natural gas in the State. A major natural gas pipeline bisects the County.

6.7.4 *Electric*

Four companies provide electric power in Stafford County: Dominion Virginia Power; Rappahannock Electric Cooperative; Northern Virginia Electric Cooperative, and Northern Neck Electrical Cooperative.

Major high voltage power lines bisect the County, generally from north to south; one through the eastern half of the County and one through the west. Other undeveloped easements exist as well. Figure 6.8 identifies the location of major power and gas transmission lines.

6.7.5 *Telecommunications*

Residents and businesses in Stafford County have access to an array of telecommunications services including high-speed Internet access, cable and wireless services. Several major national and international phone carriers provide local and long-distance service. Unfortunately, access to these services is not universal. Certain areas of the County have limited access to the various technologies.

To accommodate the needs of the telecommunications industry while protecting the public safety and welfare of its residents and the character and aesthetics of the community, Stafford County adopted a Telecommunications Plan Element of the Comprehensive Plan which encourages the co-location of new telecommunications facilities on existing structures. This reduces the need for the construction of new towers. When this is not possible, the preferred locations for new towers are within Virginia Department of Transportation rights-of-way near interchanges along I-95, within the existing right-of-way for overhead power lines, within the railroad right-of-way adjacent to industrial or agricultural districts, or on industrial, commercial and public lands that are suitably buffered from residential areas.

Several initiatives in 2020 were launched in order to provide wireless broadband to unserved residents in the southwestern and northeastern areas of the County. A collaborative effort between the County, Stafford County Schools, and The Center for Innovative Technology (CIT) secured grant funds for a pilot program in the Hartwood area to provide wireless broadband to numerous residents, allowing school-aged children to continue at-home learning during the Covid-19 pandemic. In addition, the County obtained a Virginia Department of Housing and Community Development (DHCD) Virginia Telecommunication Initiative (VATI) grant to provide wireless internet services to underserved areas of Widewater, including Widewater State Park; Marlborough Point and vicinity; and a northern part of King George County; by bringing over two

gig signals from King George County using the combination of fiber and radio waves. A new VATI grant received in 2021 would allow for additional expansion to other parts of Hartwood and the Rock Hill area.

6.7.6 Findings

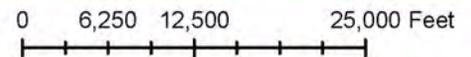
- Water and Sewage treatment facilities are projected to meet the needs of Stafford County residents until 2050.
- 650 stormwater management facilities control surface runoff throughout the County.
- Utilities and an array of telecommunications services are available in Stafford County, but certain areas of the County still have limited access to these services.



FIGURE 6.8 Major Electric and Gas Lines Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



- Legend**
- - - Gas Pipelines
 - Approximate Dominion Power Easement



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.8 Parks and Recreation

Parks and Recreation amenities in the County are provided and managed by numerous entities. The County Department of Parks and Recreation maintains twenty-four facilities countywide that offer sports, recreation and cultural activities for all ages. Curtis Park, Aquia Landing, Willowmere Park, Patawomeck Park, Duff McDuff Green Park, Chichester Park, Embrey Mill Park, Stafford Civil War Park and Smith Lake Park are the largest facilities, providing the greatest variety of recreational opportunities. Smaller, more specialized facilities are located throughout the County. The County charges a user fee for the use of some facilities, and at some sites, charges more for non-Stafford residents. An 18-hole golf course, The Gauntlet, operated by New Direction Golf, Inc., is located at Curtis Park. Private organizations provide recreation facilities to their members. In addition to County facilities, the Fredericksburg and Spotsylvania National Military Park is located at Chatham Manor on River Road. Figure 6.9 shows the location of parks and recreation resources in the County.

- In November 2009, County voters approved a bond referendum to secure funding in the form of General Obligation Bonds for the purpose of various park and recreation improvements, design and construction of new park facilities, and acquisition of land suitable for new park locations. The specific facilities in the referendum included: Development of three (3) new park facilities (Chichester Park, Musselman Park, and Duff McDuff Green Park)
- Development of three (3) new trail systems (Belmont to Ferry Farm Trail, Dominion Virginia Power Easement Trail, and Cannon Ridge Trail)
- Renovations at several parks
- Land acquisition for future parks

Bond referendums have been approved in the past for parks. In November, 1993, and again in November, 2002, County voters approved a bond referendum for new park facilities. While not all proposed projects were completed, funding from previous bond referendums was utilized for the following facilities:

- Belmont-Ferry Farm Trail – multiple phases
- Chichester Park
- Curtis Park pool renovation
- Duff McDuff Green Park
- Embrey Mill Park – including the indoor recreation center and aquatics facility
- Smith Lake Park – design only
- Willowmere Park
- Woodlands Pool

Development of these parks has greatly enhanced the array of facilities available within the County.

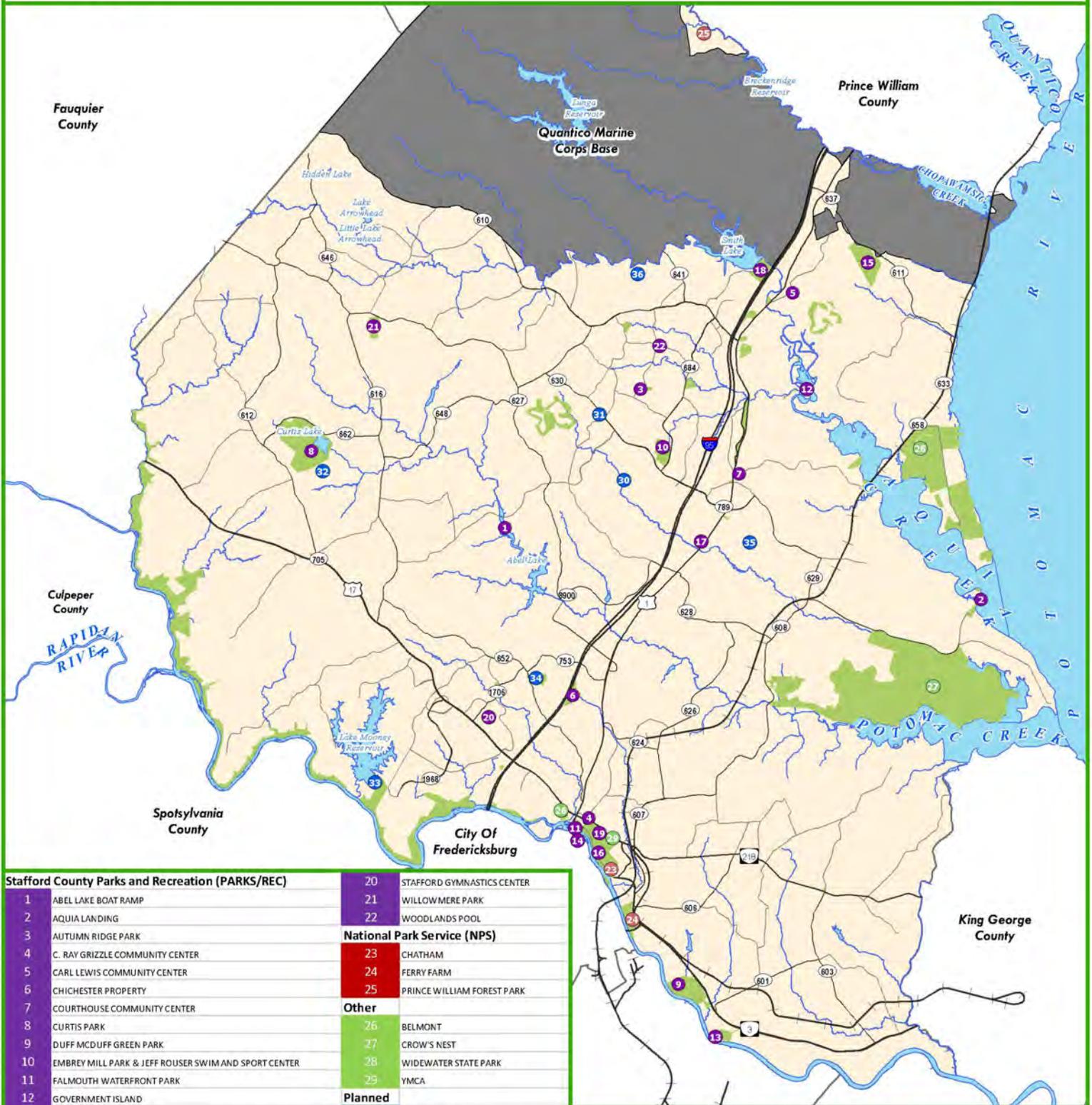
Table 6.23: Facilities Managed by the Department of Parks and Recreation

<u>Abel Lake Reservoir</u>	<u>Duff McDuff Green Memorial Park</u>	<u>River Road Park</u>
1 Boat Ramp	2 Rectangle Fields	1 Open Grass Area
	3 Diamond Fields	
<u>Aquia Landing Park</u>	1 Restroom Facility	<u>Rowser Complex</u>
1 Restroom Facility	2.2 Mile Hiking Trail	1 Kitchen
3 Pavilions	3 Pavilions	1 Meeting Room
2 Horse shoes	3 Dog Parks	1 Diamond Field
1 Beach Area	1 Playground	1 Gymnasium
	2 Corn Hole Games	1 Bocce Ball
<u>Autumn Ridge Park</u>	1 Foot Pool Table	
1 Open Grass Area	1 RC Race Track	<u>Smith Lake Park</u>
1 Diamond Field	1 RC Crawler Course	1 Playground
1 Pavilion	1 Scenic River Overlook	2 Multi Use Synthetic Turf Fields
1 Playground		3 Diamond Fields
	<u>Embrey Mill Park</u>	1 Restroom
<u>Belmont Ferry Farm Trail</u>	6 Multi Use Synthetic Turf Fields	1.29 Mile Walking Trail
2.5 Miles of Multi Use Trail	5 Grass Rectangle Fields	2 Pavilions
	3 Restrooms	
<u>Carl Lewis Field and Community Building</u>	1 Playground	<u>Stafford Civil War Park</u>
1 Open Grass Area	Jeff Rouse Swim and Sport Center- managed by ESM	1 Pavilion
1 Meeting Room		1 Restroom Facility
1 Kitchen	<u>Government Island</u>	1.45 Mile Hiking Trails
1 Restroom	1 Mile Hiking/Walking Trail	3 Bunkers with cannon displays
	1 Historic Stone Quarry	1 Replica Winter Hunt
<u>Chichester Park</u>		1 Historic Stone Quarry
5 Diamond Fields	<u>Historic Port of Falmouth</u>	
2 Restrooms	1 Natural Area	<u>Stafford Gymnastics Center</u>
1 Pavilion		1 Gymnasium
1 Playground	<u>Lake Mooney Park</u>	
1 Mile Hiking Trail	1 Boat Ramp	<u>St. Clair Brooks Memorial Park</u>
	2.09 Walking/Hiking Trail	1 Playground
<u>Courthouse Community Center</u>	1 Bathroom	2 Basketball Courts
1 Gymnasium		2 Diamond Fields
2 Restrooms	<u>Little Falls Boat Ramp</u>	1 Pavilion
3 Meeting Rooms	1 Boat Ramp	2 Restroom Facilities
		1 Skate Park
<u>Curtis Memorial Park</u>	<u>Patawomeck Park</u>	1 Open Grass Area
1 Boat Ramp	2 Rectangle Fields	1 Outdoor Volleyball Court
1 Fishing Pier	2 Diamond Fields	
5.5 Mile Hiking Trails	2 Playgrounds	<u>Willowmere Park</u>
1 Skate Park	1 Restroom	4 Rectangle Fields
1 Playground	1 Pavilion	4 Diamond Fields
3 Tennis Courts	.75 Mile Hiking/Walking Trail	1 Restroom
2 Outdoor Volleyball Courts		1 Pavilion
1 Amphitheater	<u>John L. Pratt Memorial Park</u>	.75 Mile Walking Trail
1 Open Grass Area	1.1 Mile Walking/Biking Trail	1 Open Play Area
8 Pavilions	1 Playground	1 Playground
3 Restrooms	4 Tennis/Pickleball Courts	
1 18 Hole Disc Golf Course	1 Bankshot® Basketball Court	<u>Woodlands Pool</u>
Mark Lenzi Pool at Curtis Memorial Park	2 Pavilions	1 Outdoor Pool
18 Hole Golf Course- managed by New Direction	1 Restroom Facility	1 Restroom
	1 Diamond Field	
	1 18 Hole Disc Golf Course	
	1 Celebration Stage	

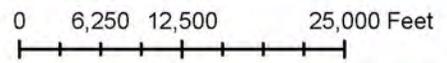
Source: Stafford County Department of Parks and Recreation



FIGURE 6.9 Parks & Recreational Facilities Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Stafford County Parks and Recreation (PARKS/REC)	
1	ABEL LAKE BOAT RAMP
2	AQUIA LANDING
3	AUTUMN RIDGE PARK
4	C. RAY GRIZZLE COMMUNITY CENTER
5	CARL LEWIS COMMUNITY CENTER
6	CHICHESTER PROPERTY
7	COURTHOUSE COMMUNITY CENTER
8	CURTIS PARK
9	DUFF MCDUFF GREEN PARK
10	EMBRY MILL PARK & JEFF ROUSER SWIM AND SPORT CENTER
11	FALMOUTH WATERFRONT PARK
12	GOVERNMENT ISLAND
13	LITTLE FALLS BOAT RAMP
14	OLD MILL PARK
15	PATAWOMECK PARK
16	PRATT PARK
17	ROWSER COMPLEX
18	SMITH LAKE PARK
19	ST. CLAIR BROOKS MEMORIAL PARK
20	STAFFORD GYMNASTICS CENTER
21	WILLOW MERE PARK
22	WOODLANDS POOL
National Park Service (NPS)	
23	CHATHAM
24	FERRY FARM
25	PRINCE WILLIAM FOREST PARK
Other	
26	BELMONT
27	CROW'S NEST
28	WIDEWATER STATE PARK
29	YMCA
Planned	
30	ACCOKEEK FURNACE
31	AUGUSTINE NORTH
32	CURTIS PARK EXPANSION
33	LAKE MOONEY BOAT RAMP
34	MUSSELMAN/JONES PARK
35	STAFFORD RECREATION SOCCER LEAGUE
36	VULCAN QUARRY SITE



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

School Maintained Recreation Facilities

The County School Board maintains the playfields and other facilities at the County schools. Although these facilities were developed primarily for the use of students, some of the fields, gymnasiums, and other facilities are available for public use. The County Parks and Recreation Department coordinates recreational programs in several sports which take place on School Board property.

Table 6.24 School Board Owned Recreational Facilities

School	Recreational Facilities
Elementary Schools (PK-Grade 5)	
Anthony Burns	1 Playground
Conway	1 Playground, 1 Basketball Court
Falmouth	2 baseball fields, 2 playgrounds, 1 soccer field, 2 basketball courts
Ferry Farm	1 playground, 1 little league field, 1 soccer field
Garrisonville	1-¼ mile fitness trail, 2 playgrounds, 2 soccer fields, 1 little league field, 1 gymnasium
Grafton Village	1 playground, 1 soccer field
Hampton Oaks	1 Playground, 1 soccer field
Hartwood	1 playground, 2 softball fields, 1 football field, 2 basketball courts
Kate Waller Barrett	1 playground
Margaret Brent	1 playground
Anne E. Moncure	1 playground, 1 little league field
Park Ridge	1 playground, 1 soccer field, 1 baseball field
Rockhill	1 playground
Rocky Run	1 soccer/softball field
Stafford	1 baseball field, 1 practice field, 2 soccer fields
Widewater	1 little league field, 2 soccer fields, 1 practice field
Winding Creek Elementary	1 playground, 1 softball/soccer field
Middle Schools (Grades 6-8)	
Dixon-Smith	1 gymnasium, 1 football field, 1 softball field, 1 soccer field, 4 tennis courts, ¼ mile track, auxiliary gym
Edward E. Drew	¼ mile track, 1 softball field, 1 football field, 4 tennis courts, 1 gymnasium, 1 indoor basketball court, 1 soccer field
T. Benton Gayle	¼ mile track, 2 baseball/softball fields, 1 football field, 2 soccer fields, 1 gymnasium
H. H. Poole	1 softball field, 1 baseball field, 1 football field, 2 soccer fields, 1 open field, ¼ mile track, 1 gymnasium
Rodney Thompson	1 gymnasium, 1 auxiliary gym, 1 football field, 4 multi-purpose fields, ¼ mile track
Stafford	1 baseball field, 1 dual purpose field, 1 practice field, 1 playground, ¼ mile track, 1 indoor basketball court, 1 gymnasium
A. G. Wright	1 softball fields, 1 football fields
High Schools (Grades 9-12)	
Brooke Point	2 baseball fields, 1 softball field, 1 gymnasium, 1 football field, 2 soccer fields, 2 practice fields, ¼ mile track
Colonial Forge	1 gymnasium, 6 lighted multi-purpose fields, 1 lighted baseball field, 1 lighted softball field, 3 softball/baseball fields, 5 soccer/field hockey fields, 6 tennis courts, 1 auxiliary gym
Mountain View	1 gymnasium, 1 lighted multi-purpose field, 1 lighted softball field, 1 baseball field, 5 soccer/field hockey fields, 6 tennis courts, 1 auxiliary gym
North Stafford	2-mile hiking trail, 1 baseball field, 1 softball field, 1 lighted multi-purpose field, 6 tennis courts, 2 practice fields, 1 gymnasium, ¼ mile track
Stafford	2-mile fitness trail, ¼ mile track, 1 lighted baseball field, 1 softball field, 1 lighted dual-purpose field, 6 tennis courts, 1 gymnasium

Source: Stafford County Parks and Recreation Department

6.8.1 *National Parks*

Chatham Manor

Chatham Manor is the Fredericksburg and Spotsylvania National Military Park headquarters located at 120 Chatham Lane overlooking Fredericksburg. Chatham Manor is a former hospital for Union soldiers during the Civil War.

6.8.2 *State Parks*

Widewater State Park

Widewater State Park is at located 101 Widewater Road State Park Road, and lies on a peninsula of land where Aquia Creek and the Potomac River meet. The park provides access to both bodies of water, including a visitor center, picnic shelters, playgrounds, canoe and kayak launch areas, and a hiking trail

6.8.3 *Other Area Parks*

Belmont

Gari Melchers Home and Studio, also known as Belmont is located at 224 Washington Street, and overlooks the Rappahannock River and the City of Fredericksburg. Belmont is the historic home and art studio of famous American artist Gari Melchers. The 27-acre estate provides tours of the home, art studio and galleries, as well as other historic buildings and gardens, and several miles of walking trails.

George Washington's Ferry Farm

Ferry Farm is located at 268 Kings Highway, and is the boyhood home of George Washington overlooking the Rappahannock River. The farm offers guided tours of the Washington house replica, as well as a visitor center, displays of colonial and Civil War artifacts, an archaeology lab, gardens, and hiking trails.

6.8.4 *Other Recreational Facilities and Organizations*

In addition to the recreation facilities that are owned and operated by Stafford County or the Stafford County School Board, there are other recreational resources that are available to residents. These include local creeks and rivers, hunting acreage on the Marine Corps Base Quantico, various golf courses and marinas, recreation centers, and community swimming pools. Private organizations such as the American Legion, Girl Scouts of America and YMCA maintain private facilities. In addition, youth sports are organized by private organizations such as the Stafford Baseball League, Stafford Area Soccer Association, Stafford Lacrosse Association, and the Stafford Youth Football Coaches Association.

6.8.5 *Future Park Facilities*

Stafford County has realized the importance of developing new parks as its population grows and the needs of its residents change. There are properties that the County has acquired or is pursuing in order to actively transform them into viable public parks, including

- Musselman/Jones Property (40 acres)
- Duff Green Park (126 acres)
- Patawomeck Park (160 acres)
- Mountain View Park (2 parcels – total 26 acres)
-

In addition, there are properties owned by other entities that are proposed for park development or preservation of natural resources. These include:

- Crow's Nest Natural Area Preserve
- City of Fredericksburg owned riparian land along the Rappahannock River

Stafford County is a fast growing community. There is a need for more parks in order to meet the population demands and conform with the guidelines set in this Plan. Acquiring new park land is difficult but important to meet the changing recreational and athletic needs of county residents. The cost of property in Stafford County is increasing rapidly. Buying large (i.e. 100-200+ acres) parcels may no longer be financially feasible. It is recommended that smaller parcels be purchased (between 20-50 acres). These small parcels should be designed as neighborhood parks that pedestrians can readily access without having to drive to the facility. parcels should be located in the northern and southern ends of the County, but it is essential that they be close to Interstate 95 so residents can access them easily.

A Park Utilization Study – Phase I, was completed in 2014. The focus of this study was on future athletic field needs. An additional study was completed in 2017, Park Utilization Study – Phase II, to identify other recreational amenity needs beyond athletic fields.

6.8.6 *Potomac Heritage National Scenic Trail*

In December 2006, the National Park Service designated three trails in Stafford as part of the Potomac Heritage National Scenic Trail, a 425-mile corridor between the Chesapeake Bay and the Allegheny Highlands. The National Park Service administers, designates and coordinates the trail and local jurisdictions manage their sections of the trail. The selected trails are expected to help boost tourism in the County, since they will be included in National Park Service literature and maps and promoted through the Service's website. The Stafford trails are:

- Government Island Trail – 1.5 miles in length on Government Island highlighting historic quarries, building foundation, roadbed and canal; stone quarried here was used to construct some of the nation's most prominent buildings, including the White House and US Capitol Building. The Trail was completed in 2010.
- Belmont-Ferry Farm Trail – When it is finished, the Trail will connect Belmont to Chatham and Ferry Farm as well as the Historic Port of Falmouth and the Moncure Conway House which is designated in the National Underground Railroad Network to

Freedom. This project is planned to be developed in phases. Currently five of six phases have been built from Belmont through Pratt Park to the Chatham Bridge.

- Aquia Creek Water Trail – This trail, which is yet to be developed, will celebrate the unique Civil War history of the creek as well as the transportation history of Aquia Landing.

6.8.7 Parks Analysis

Area guidelines are used to determine the number of acres of recreational and park lands that are needed by a locality. The 2013 Virginia Outdoors Plan provides an area guideline for recreation and park sites in Virginia of 10 acres per 1,000 people in the population. This figure represents a minimum acreage that should be provided whenever possible. However, Stafford's Parks and Recreation Commission has recommended a standard of 12 acres per 1,000 residents. Based upon this standard, Stafford should have approximately 1,570 acres of recreation and park space. Additionally, the population is growing rapidly and additional park space will be needed in the near future. It is estimated that 1,988 acres would be needed by the year 2036 based on population estimates and the 12 acres per 1,000 population standard.

6.8.8 Findings

- Stafford residents have access to a wide variety of recreation facilities, both publicly and privately owned and operated.
- Additional parkland is required to meet the needs of Stafford's growing population
- There are twenty County-owned recreational facilities within Stafford County.
- Stafford County Board of Education's recreation facilities are also available to be used for community recreational programs.
- Several potential future parks and recreation facilities have been identified
- Several private and nonprofit organizations also sponsor sports programs for youths in Stafford County.

6.9 Natural Resources

Stafford County is characterized by a rolling landscape cut by winding streams and creeks. Bordered to the east by the Potomac River and to the south by the Rappahannock River, surface water is a significant natural feature in the County. In addition, the County's forestlands provide habitat for many different wildlife species. This natural environment provides a desirable place to live, for wildlife and residents.

The County's continued population growth and intense development pressures are threatening the natural resources. Development has caused increases in impervious surfaces, loss of forestlands, open space and farmland and increased transportation pressures. These development factors lead to increases in runoff, channel erosion, and flooding in some low lying areas decreases in groundwater recharge, increases in carbon dioxide releases, displacement of wildlife and non-point source pollution.

The following section provides a basic understanding of what natural resources exist in the County and how they fit together to form the overall natural environment. This information can help guide efforts to maintain the air and water quality, preserve wildlife habitats and minimize the risk of natural hazards. A map on page 6-86 shows the County's natural resources and another on page 6-72 shows the watersheds.

6.9.1 Land Resources

Topography

The topography details the different elevations and describes the overall shape of the land. This information is relevant to understanding the flow of water across the land and determining appropriate land uses.

The topography of Stafford County generally consists of rolling hills with most steep slopes occurring at the County's rivers, streams and creeks. The elevation ranges from sea level to about 450 feet with higher elevations towards the western part of the County. The County's highest elevation is located at the northern tip of the County.

Geology

The geology of Stafford County describes earth's composition below the surface of the land. Knowledge of the geological makeup of the County is important to understanding how development will affect the land.

The geology of the County includes two physiographic provinces, the Piedmont province and the Coastal Plain province. These provinces are landform regions that have similar terrain and have been shaped by a common geological history. Figure 6.13 identifies the location of the geologic zones.

The Piedmont province is the western portion of the County, generally west of Interstate 95. This province has a generally rolling terrain that consists of bedrock that is made up of hard igneous and metamorphic rock. In the eastern portion of the County is the Coastal Plain, a terraced landscape consisting of unconsolidated sediments that are relatively soft compared to the igneous and metamorphic rock of the Piedmont Province. These two provinces are separated by the Fall Line, a low east-facing cliff that extends from New Jersey to the Carolinas.

Several mining operations are present in the County, including sand and gravel, generally in the southeastern part of the County and a type of granite material in the northwestern portion of the County. Figure 6.14A identifies the location and type of mineral resources in the County. Figure 6.14B is the legend associated with the map that describes the resources. The data is from the Virginia Department of Mines, Minerals, and Energy.

Soils

A familiarity with the soil composition is necessary to determine the suitability of various land uses such as farming, construction or septic systems. The compatibility with different land uses depends on several different soil characteristics including drainage and erodibility. Within Stafford County, there are 126 classifications of soil from the National Cooperative Soil Survey of the National Resource Conservation Service (NRCS), each with varying characteristics. The following soil information, gathered from the NRCS, gives a general review of the soil properties in the County as well as the compatible land uses with the County's soil.

The drainage of the soils depends on the percolation capacity of the soil, the topography of the land and the proximity to surface and groundwater discharge. It is important to look at soil drainage because it affects the transport of pollutants and the ability for plants to grow. If a soil drains rapidly, precipitation or irrigation water transports water-soluble pollutants through the soil, potentially affecting the quality of groundwater. Soils that are not drained well may become saturated making it difficult for plants to survive because the roots don't get enough oxygen. The NRCS data shows that though the majority of the County, 64%, is well drained, 12% of the land area of the County is classified as very poorly drained. The majority of this poorly drained area is located just west of the Interstate 95 as it travels through the northern portion of the County.

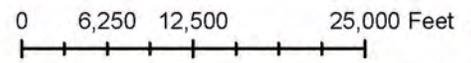


FIGURE 6.10 Natural Resources Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend

	Streams		RPA Buffer
	National Wetlands		Forest



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Table 6.25 Soil Drainage Capacity

Capacity	Acres	Percent
Somewhat Excessively Drained	3,689	2.0%
Well Drained	115,928	63.8%
Moderately Well Drained	21,304	11.7%
Somewhat Poorly Drained	3,981	2.2%
Poorly Drained	22,058	12.1%
Very Poorly Drained	1,340	0.7%
Not Rated	13,380	7.4%

Source: National Cooperative Soil Survey,
National Resource Conservation Service,
United States Department of Agriculture &
design based planning, inc.

Erosion is the transport of soil by wind or water. Susceptibility of a type of soil to erosion is based on the composition of the soil as well as the slope and the vegetative cover of the land. Soil erosion causes a loss of topsoil and creates ruts and gullies in the land. Erosion also causes problems with the transport of materials, polluting downstream waters, clogging creeks, streams and other bodies of water as well as clogging drainage ditches.

Over ¾ of the County is either highly erodible or potentially highly erodible. This figure shows that soil erosion is a significant issue in the County and should be considered as development occurs.

Table 6.26 Soil Erodibility

Erodibility	Acres	Percent
Not Highly Erodible Land	28,508	15.7%
Potentially Highly Erodible	73,049	40.2%
Highly Erodible Land	69,865	38.5%
Not Rated	10,259	5.6%

Source: National Cooperative Soil Survey,
National Resource Conservation Service,
United States Department of Agriculture
& design based planning, inc.

In addition to the soil characteristics, the following information from the NRCS provides what percentage of the County is suitable for dwellings, farming or septic systems. Land use suitability for dwellings, farming and septic systems are all determined by the NRCS based on several factors that affect these land uses. For example, suitability for septic systems is based on flooding, bedrock depth, slope, saturated hydraulic conductivity and other measures. The figures show that nearly all the land is limited in some way; this causes potential competition for suitable lands.

Only 11% of the County is classified as limited suitability for dwellings with basements. In addition, most of the County's soil is either somewhat limited or very limited for septic system suitability. Furthermore, east of the Fall Line most of the soil is very limited for septic system suitability. This area east of the Fall Line is also where there is little prime farmland.

Because the County has such a limited amount of land suitable for septic systems, an alternative type of septic system is being utilized to deal with land with this limitation. This alternative septic

system uses a two-step process rather than the traditional one-step process to treat wastewater effluent.

Table 6.27 Land Use Suitability

Suitability for Dwellings (with basement)	Acres	Percent
Not Limited	20,668	11.4%
Somewhat Limited	65,277	35.9%
Very limited	82,356	45.3%
Not Rated	13,380	7.4%
Farming Soils	Acres	Percent
Areas of Prime Farmland	34,788	19.1%
Farmland of Statewide Importance	50,141	27.6%
Prime Farmland if Drained	2,308	1.3%
Not Prime Farmland	94,444	52.0%
Suitability for Traditional Septic Systems	Acres	Percent
Somewhat Limited	53,347	29.4%
Very Limited	100,496	55.3%
Not Rated	27,838	15.3%

Source: National Cooperative Soil Survey,
National Resource Conservation Service,
United States Department of Agriculture &
design based planning, inc.

Another soil characteristic in the County is the acidity of the soils. The range for the median pH level is 4.3 to 6.8 showing that the soil is generally acidic. This is an important factor in development because the excavation of acidic soil can cause acidic levels in streams to rise, disturbing the stream ecosystem, as a result of runoff from the acidic soils entering the stream. Also, in highly acidic soils, vegetation is not able to grow, and utility lines corrode.

The most important precaution for acidic soils is the knowledge that they exist in an area. This can be accomplished by testing for acidic soils before development occurs. Testing the soil can help prevent environmental disasters such as that of the County's airport where highly acidic soil that was excavated from the site was spread as fill for the site, preventing vegetation growth and damaging the local stream. Although the soil that is below the earth's surface does not reach full acidity until it is excavated, a sulfur test can be conducted to predict the acidity of the covered soil. This knowledge can prevent the excavation and spread of acidic soils, benefiting both the environment and developers.

6.9.2 *Water Resources*

Watersheds

A watershed is an area of land where water drains downhill to a body of water. A watershed may include several sub-watersheds that drain into a larger watershed. In Stafford there are numerous sub-watersheds of both the Potomac River and Rappahannock River.

The Stafford County, Virginia Rappahannock Tributaries Watershed Planning Study found that "runoff from impervious cover and agricultural cover is the primary determinants of water quality in the tributaries (of the Rappahannock), and consequently, the primary parameters through which to address watershed management actions." As a rapidly developing County, the

Watershed Planning Study shows that the most pertinent watershed issue is the increasing amounts of impervious surfaces which has led to a significant increase in flooding in areas, even during minor rain events. Impervious surfaces include rooftops, parking lots, driveways, sidewalks, roads and other surfaces that prevent water infiltration and groundwater recharge. Also, instead of allowing precipitation to penetrate the ground, impervious surfaces cause runoff to travel rapidly across the land, collecting sediments, nutrients and toxics that are carried to streams and creeks of the watershed.

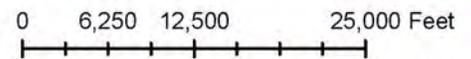


FIGURE 6.11 Watersheds Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend

	ACCOKEEK		POTOMAC RIVER
	AQUIA		RAPPAHANNOCK
	CHOPAWAMSIC		WIDEWATER
	POTOMAC CREEK		



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Table 6.28 Stafford Watershed System

	Major Water Shed	Minor Water Shed	Acres
	Chopawamsic		12,903
	Aquia	Beaverdam	11,066
	Aquia		34,846
	Potomac River	Potomac River	171
	Widewater		2,656
	Widewater	Tank	821
	Rappahannock	Alcotti Run	4,560
	Rappahannock	Deep Run	2,586
	Potomac Creek	Potomac Run	6,719
	Widewater	Potomac River	748
	Aquia	Whitsons Run	1,493
	Aquia	Austin Run	5,239
	Accokeek		14,539
	Potomac Creek	Long Branch	9,595
	Potomac River	Potomac River	1,911
	Rappahannock	Richland Run	3,979
	Potomac Creek		20,547
	Rappahannock	Rappahannock	15,922
	Rappahannock	Horsepen Run	4,920
	Rappahannock	Falls Run	4,209
	Rappahannock	Rocky Pen Run	3,444
	Accokeek	Potomac River	390
	Rappahannock	Claiborne Run	4,242
	Potomac Creek	Beaver Dam Run	2,036
	Potomac Creek	Black Swamp Creek	852
	Rappahannock	White Oak Run	5,238
	Rappahannock	Little Falls Run	3,662

Source: Stafford County and design based planning, inc.

The level of stream impact relates to the percent of impervious cover in the watershed. An area with between 0 to 10% of watershed impervious area relates to low stream impact, an area between 10 to 25% of watershed impervious area relates to moderate stream impact, and an area 25% and higher of watershed impervious area relates to high stream impact. (EPA Center for Watershed Protection, 2005), the protection of watersheds is essential to the preservation of water quality.

The sub-watersheds of the Potomac River, which consist of 70% of the land area in Stafford, are part of a much larger watershed that stretches across Maryland, Pennsylvania, Virginia and West Virginia covering about 14,679 square miles.

The sub-watersheds of the Rappahannock River are part of a larger watershed that crosses the southwestern edge of the County. The Rappahannock Watershed is much smaller than the Potomac River Watershed and is entirely in the State of Virginia traveling from the Blue Ridge Mountains to the Chesapeake Bay. The Watershed covers 2,715 square miles of land. According to the Chesapeake Bay Program, there is only one sub-watershed of the Rappahannock River in Stafford County, the Rappahannock River - Middle Watershed, which is part of the Lower Rappahannock Watershed. Sub-watersheds of the Rappahannock River - Middle Watershed include Horsepen Run, Alcott Run, Falls Run, Richland Run, Claiborne Run, England Run, Rocky Pen Run, Little Falls Run, White Oak Run and Muddy Creek.

Both the Potomac and the Rappahannock River Watersheds are part of the Chesapeake Bay Watershed, an expansive watershed that travels through six states. The watershed drains into the Chesapeake Bay, the largest estuary in the Country supporting 3,600 species of fish, animals and plants. The Chesapeake Bay Watershed is made up of eight sub-watersheds, with two of these sub-watersheds, the Potomac River Watershed and the Rappahannock Watershed, within Stafford County.

As part of the Chesapeake Bay Watershed, the County's water impacts have repercussions to the water quality of the Chesapeake Bay. In 1988, the State of Virginia enacted the Chesapeake Bay Preservation Act to help improve the quality of the water in the Bay. Stafford County is included in the Chesapeake Bay Preservation Areas of the Act in which local governments are required to adopt programs "requiring the use of effective conservation planning and pollution prevention practices when using and developing environmentally sensitive lands." The main goal of the Chesapeake Bay Preservation Act is to reduce nonpoint source pollution.

Nonpoint source pollution is a major threat to waterways. The source of this type of pollution is mainly stormwater runoff from a multitude of common urban, suburban and rural sites. The problem is that the runoff from these areas contains toxics, pathogens, nutrients and sediments that contaminate the water. This type of pollution is especially difficult to deal with because it comes from so many different sources, requiring the need for sound land use planning throughout the watershed.

Impacts from non-point sources of pollution include phosphorus pollution from fertilizers used by farmers and residents, E. coli contamination from poor agricultural practice and low pH levels when soils with low acidity are exposed during development.

6.9.3 Floodplain

A floodplain is an area that is susceptible to full and partial water inundation. Floodplains provide natural flood and erosion control, protect the water quality, offer areas for groundwater recharge and serve as a fish and wildlife habitat. Increased development in a floodplain can result in more severe natural disasters.

Within Stafford County, 12% of the land (20,918 acres) is in a 100-year flood hazard area. According to the Federal Emergency Management Agency (FEMA), the 100-year flood is the flood elevation that has a 1% chance of a flood being equaled or exceeded each year. The County regulates development activities in the flood way, the flood fringe and the 100-year floodplain to minimize natural hazards and development impacts. In addition, Stafford County entered the

National Flood Insurance Program, a program of the FEMA. By actively protecting the floodplain, Stafford County can provide residents the ability to purchase flood insurance through the FEMA program that is administered by the United State Department of Housing and Urban Development. Residents within the 100-year floodplain are required to have flood insurance. This requirement applies to a just over 1,000 residential structures located within the County's 100-year floodplain. Effective May 1, 2011, Stafford County entered the Community Rating System (CRS) with a Class 8 rating, a rating achieved by only 14 other communities within the Commonwealth. This qualifies each eligible National Flood Insurance Policy (NFIP) policyholder for a 10% savings in their flood insurance premium.

6.9.4 *Dam Break Inundation Zones*

A dam is a man-made structure, across or outside of a watercourse, used to impound water or other material. The larger dams are regulated by Virginia Department of Conservation and Recreation (DCR). DCR regulates two groups of dams:(i) dams that are 25 feet or greater in height and impound more than 15 acre-feet of water, and (ii) dams that are six feet or greater in height and impound more than 50 acre-feet of water. A Dam Break Inundation Zone is the area downstream of a dam likely to be inundated or otherwise directly affected because of a dam failure. Any proposal for development to encroach into the Dam Break Inundation Zone shall meet the requirements set forth in Sections 10.1-606.2 and 10.1-606.3 of the Code of Virginia.

There are 22 listed dams in Stafford County, of which 20 are subject to Department of Virginia Conservation and Recreation (DCR) regulations. Two dams located on the Marine Corps Base Quantico are federally owned and not subject to DCR regulation. The list of dams is provided in Table 6.29 and the location of these dams and potential impact areas are identified in Figure 6.12.

Table 6.30 Regulated Dams in Stafford County

No.	DCR Dam No.	Name of Dam	Hazard Potential Classification
1	17901	Lunga Dam	High
2	17902	Potomac Creek Dam #1	High
3	17904	Breckinridge Dam	High
4	17906	Hidden Lake Dam	Significant
5	17907	Little Lake Arrowhead Dam	High
6	17908	Lake Arrowhead Dam	High
7	17910	Kennedy Dam	Significant
8	17911	Aquia Creek Dam	High
9	17912	Lake Curtis Dam	High
10	17913	Potomac Creek Dam #2	High
11	17914	Henderson Dam	Low
12	17915	Rocky Pen Run Regional Pond #4 Dam	Low
13	17916	Rocky Pen Run #2A Dam	High
14	17917	Celebrate VA Pond #12 Dam	Low
15	17918	Hartlake #1 Dam	Low
16	17919	Hartlake #2 Dam	Significant
17	17920	Walden Ten # 1 Dam	Low
18	17922	Seven Lakes Dam	High
19	17923	Bridle Lake Dam	High
20	17924	Pt. Stone Dam	Low
21	17925	Leeland Lake Dam	High
22	17926	Rocky Pen Run Reservoir Dam	High



FIGURE 6.12 Dam Break Inundation Zones Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021

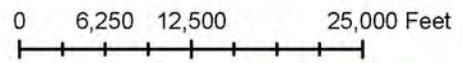


Legend

- DAM BREAK INUNDATION ZONE (DBIZ) OF RECORD
- POTENTIAL DAM BREAK INUNDATION ZONES (PDBIZ)
- FLOODPLAINS

DAM HAZARD LEVEL (ANTICIPATED)

- HIGH HAZARD
- SIGNIFICANT HAZARD
- LOW HAZARD
- UNDER CONSTRUCTION



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.9.5 *Wetlands*

The County has 17,450 acres of wetlands, about 10% of the County's land area. Both tidal and non-tidal wetlands are located within the County. The County's tidal wetlands are affected by the ebb and flow of the tide of the Atlantic Ocean by way of the Chesapeake Bay. The non-tidal wetlands occur inland along streams, lakes and ponds.

According to the U.S. Army Corps of Engineers non-tidal wetlands are "those 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. Tidal wetlands consist of areas found between contiguous to mean low water and mean high water in the portions of the County affected by the tide. Tidal wetlands may be vegetated or non-vegetated. Wetlands generally include swamps, marshes, bogs, wet meadows and similar areas." Wetlands provide important water quality controls by filtering pollutants, providing flood control and providing flood and sediment control. Wetlands also provide wildlife habitats.

6.9.6 *Groundwater*

Groundwater is an available natural resource serving the County. The groundwater is recharged through the percolation of water through soil or through aquifer recharge areas. The quality and quantity of groundwater in Stafford County relate specifically to the two physiographic provinces. In the Piedmont province the groundwater supply relies on fractures in the bedrock. This source of groundwater is generally protected from surface impacts of pollution and runoff. Yet, a major issue for this source of groundwater is deep pumping and drought.

In the Coastal Plain province, the groundwater supply relies on precipitation recharge and permeability of sands and gravels for storage. The groundwater of the Coastal Plain province is not as impacted by deep pumping and drought as in the Piedmont province, yet surface impacts such as pollution and runoff are a much greater threat in this area. The pollution of groundwater is especially harmful because, while surface water can somewhat be treated, once the groundwater is polluted it cannot be treated.

An important part of the County's groundwater sources is the Coastal Plain Aquifer Recharge Area, which is also known as the Fall Zone. In this area the layers that make up the Coastal Plain aquifers slope upward to intersect the surface and most of the groundwater recharge occurs. The Aquifer Recharge Area, which is generally located along Interstate 95, is particularly at risk of contamination from surface impacts such as pollution and runoff as well as a decrease in recharge from increases in impervious surfaces. Also located over the Aquifer Recharge Area is the designated County Urban Services Area (USA). This presents a major environmental concern because, while the purpose of the USA is to concentrate growth and minimize the impacts of development on the land and the community, the location over the Aquifer Recharge Area clusters growth and land cover over an area that should be preserved for the protection of groundwater.

The County's Groundwater Protection Plan provides recommendations of well protection prioritization such as protecting wells far removed from the water system while making wells in proximity to the water system less of a priority. The Plan also emphasizes the need to protect the groundwater recharge from pollution.

Potential mitigation tools the Plan mentions include identifying existing sources of potential pollution and ensuring that essential spill prevention and cleanup measures are in place as well as applying an overlay zoning district to ensure site plans for new development incorporate adequate pollution prevention measures. These measures have not yet been adopted by the County.

6.9.7 Forest and Wildlife Resources

Forestland

In addition to being an important natural resource, the forestland of Stafford County is an essential part of protecting the environmental quality of the whole community. The forestland provides a habitat, nesting ground and food source for the area's wildlife. Forestland also provides an area for water recharge, preventing runoff and soil erosion and filtering pollution, playing a prime role in the prosperity of Stafford's natural environment. An economic benefit from the forestland is the renewable resource it provides. The County forests harvest deciduous hardwoods, mixed soft woods and pine.

Most the County's forested lands are located on private lands. According to Stafford County's Wildlife Habitat Protection Plan using a 1985 report entitled "The Forest Resources of Stafford County", it is estimated that from 1985 to 2000 the County lost 20,200 acres of forestland. The Wildlife Habitat Protection Plan also states that in 2000 the County was estimated to have 100,000 acres of forestland, 21,876 of which is in Quantico Marine Corps Combat Development Command's boundaries. According to the "Urban Ecosystem Analysis for the George Washington Region (PD 16)" prepared by the George Washington Regional Commission (GWRC), Stafford County lost an additional 6.4 percent of the tree canopy area between 1996 and 2009. This equates to more than 8,000 additional acres of forestland being lost. With the County's continued development, the current amount of forestland is likely to be substantially lower than the 100,000 acres estimate of the 2000 Wildlife Habitat Protection Plan. The County should make every effort to preserve forested lands.

Wildlife Habitat

Within Stafford County, the Virginia Department of Game and Inland Fisheries identifies 493 known or likely animal species. The County is also home to a number of Federal and State listed endangered or threatened species.

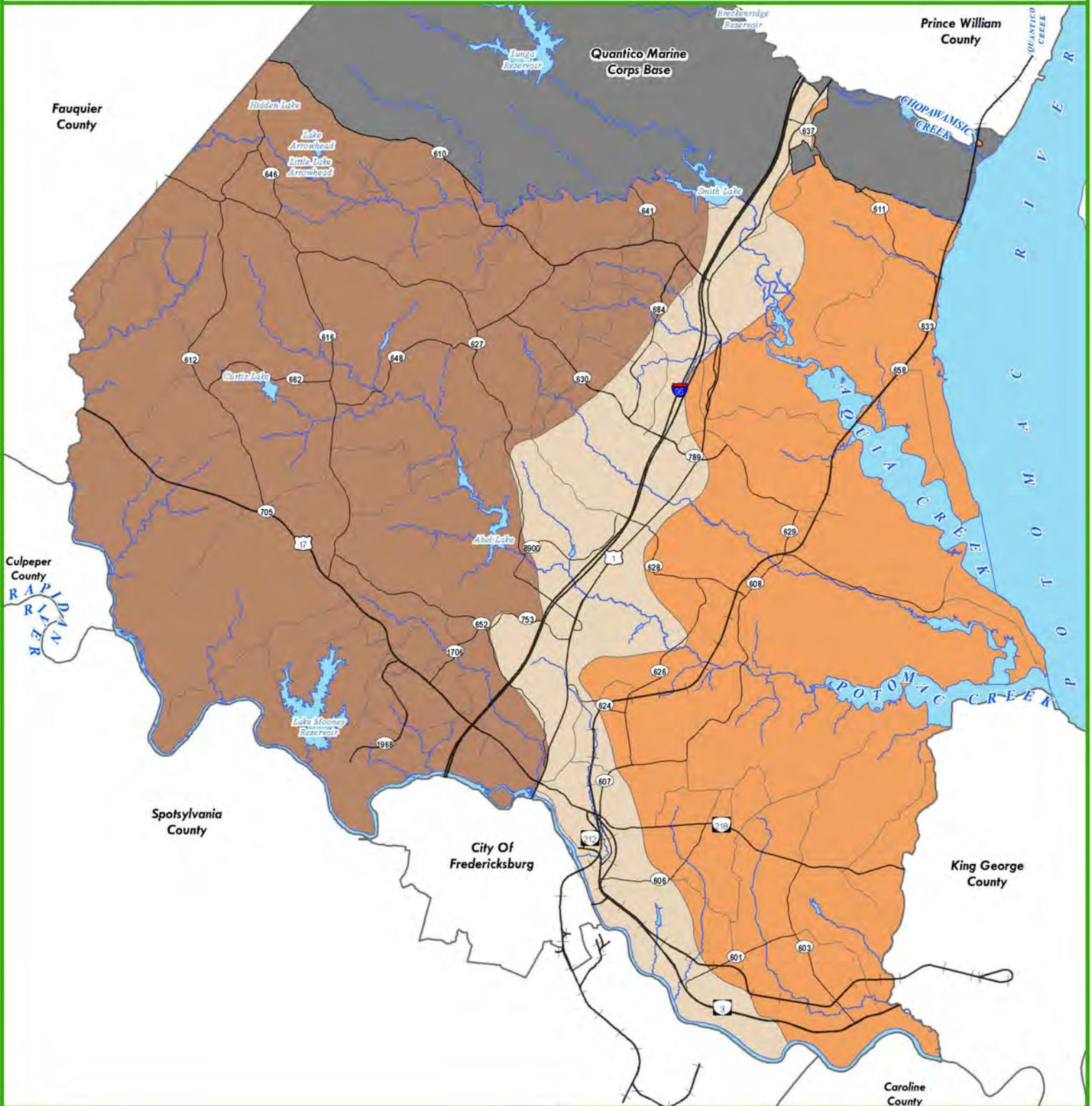
In order to maintain the wildlife habitat, the County needs to maintain the overall quality of natural resources. A successful wildlife habitat means protection of forestlands and water quality which means maintaining quality soils, floodplains, wetlands, etc. Overall protection of wildlife habitat means minimizing impacts of development.

6.9.8 Findings

- Stafford County consists of a rolling landscape with slopes along the County's waterways
- The County is made of two geological provinces, the hard bedrock of the Piedmont province and the soft sediments of the Coastal Plain, which are separated by the Fall Line that crosses the County generally along Interstate 95
- Stafford County is a Chesapeake Bay Preservation Area, meaning that the County must adopt programs that protect the quality of water through land use regulations
- 12% of the County's land area is in a 100-year flood hazard area
- 10% of the County's land area is a tidal or non-tidal wetland
- The County has a substantial amount of groundwater resources east of Interstate 95, but this area is very susceptible to contamination. West of Interstate 95 the groundwater sources are less abundant, but are not as susceptible to contamination
- The Coastal Plain Aquifer Recharge Area, located along Interstate 95, is where most of the County's groundwater recharge occurs and where the groundwater is most susceptible to pollution
- The County's Growth Area is located over the Coastal Plain Aquifer Recharge Area
- From 1996 to 2009 the County lost 6.4 percent of the existing forestlands
- The County has up to 493 wildlife species that depend on the natural resources

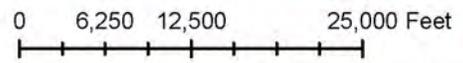


FIGURE 6.13 Geology Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



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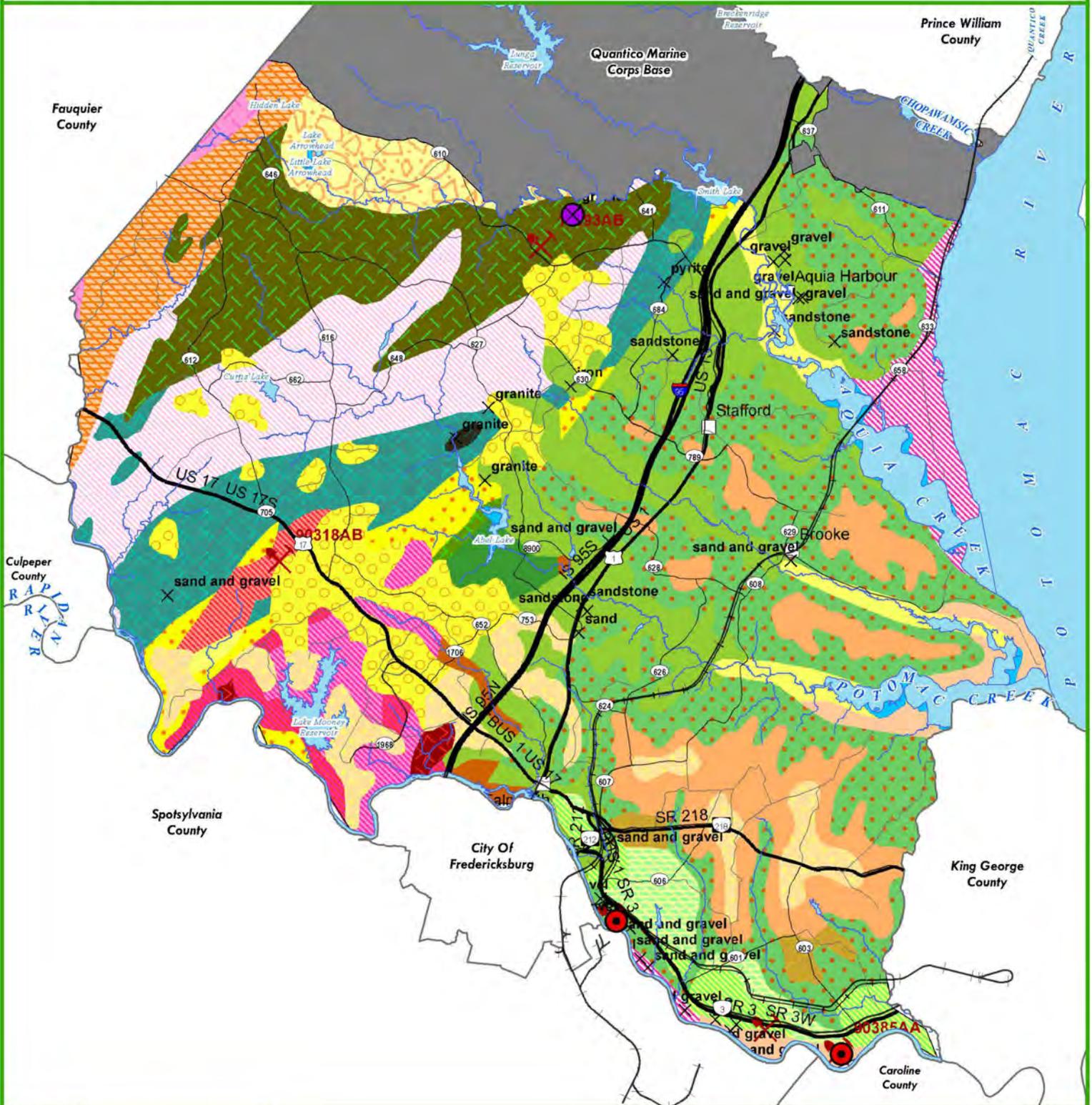
- PIEDMONT**
- AQUIFER RECHARGE AREA PATUXENT FORMATION**
- COASTAL PLAIN**



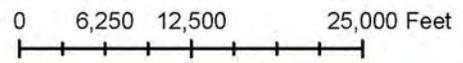
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FIGURE 6.14A Mineral Resources Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021

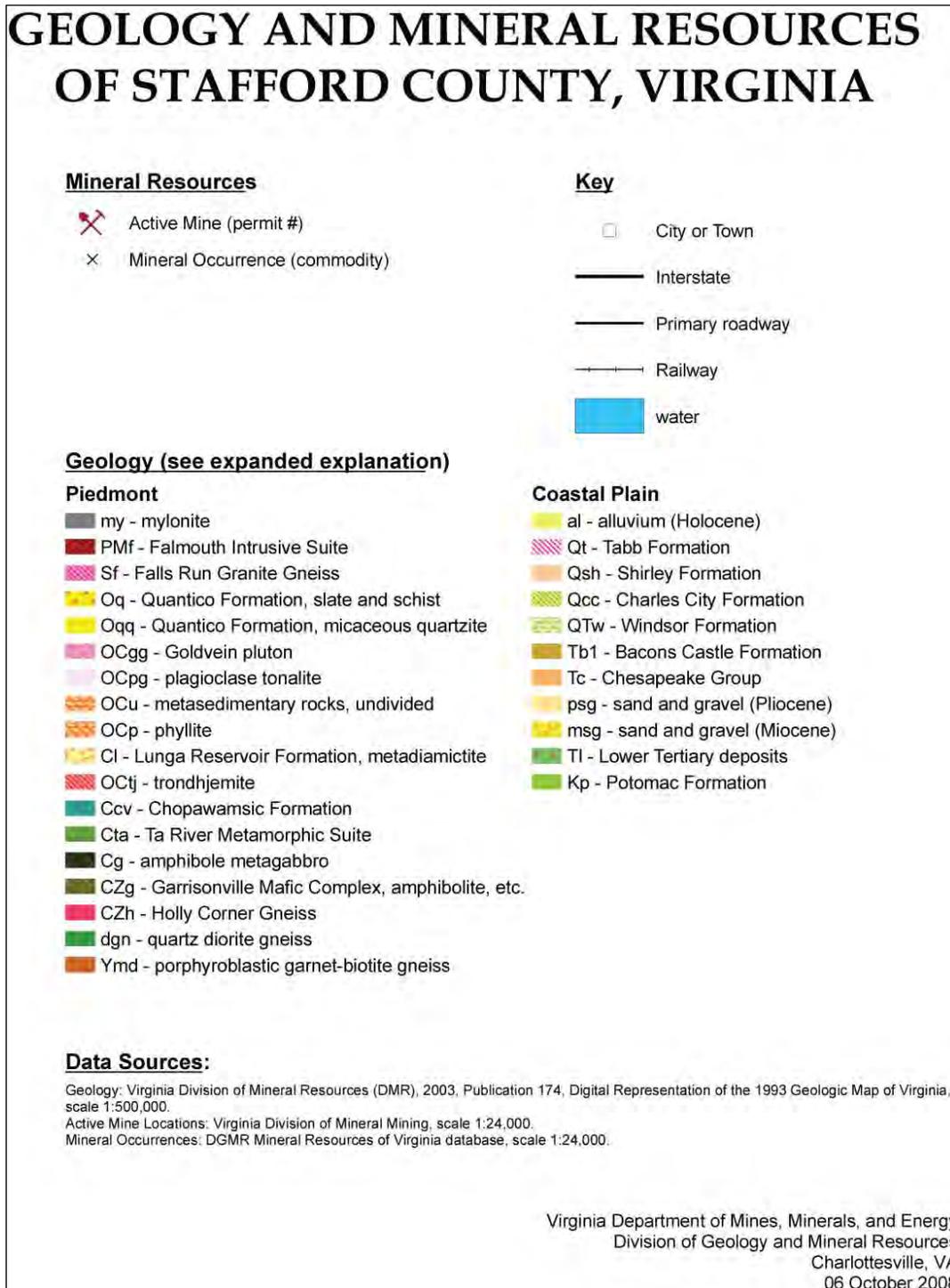


Legend
QUARRIES :
 CRUSHED STONE
 SAND AND GRAVEL



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

Figure 6.14B Mineral Resources Legend



6.10 Transportation

The movement of people and goods around a community is determined by the effectiveness of its transportation network. To assess the existing transportation network in Stafford County and identify areas of deficiency, the following elements were examined: roads; bus service; rail service; air service; and bicycle and pedestrian circulation. Figure 6.15 on the following page shows the existing transportation network and street classifications. Figure 6.16 shows other transportation facilities in the County.

6.10.1 Road Network

Interstates

Interstate 95 passes through Stafford County. I-95 is a major north-south corridor along the east coast which stretches from New England to Florida. More regionally, I-95 provides access to Washington, DC and the state capital of Richmond. I-95 can be accessed at four interchanges in the County located at Garrisonville Road, Courthouse Road, Centreport Parkway and Warrenton Road. The portion of the roadway north of Garrisonville Road within the County has high occupancy toll lanes for directional peak hour traffic.

US Routes

U.S. Route 1 is a major north-south arterial which runs parallel to I-95 through the center of the County. Warrenton Road is a major east-west arterial that runs along the southwest boundary of the County north of U.S. Route 1. Warrenton Road joins U.S. Route 1 as it exits the County into Fredericksburg.

Major State Routes

There are several state routes in Stafford County that provide connections to other counties, as well as function as arterials within the County. Kings Highway travels along the southern boundary of the County from just outside of the Falmouth area to King George County. The Butler Road / White Oak Road corridor is another east-west connection between Falmouth and King George County. Garrisonville Road is an east-west corridor along the northern boundary of the County that provides access between the interstate and Fauquier County.

Remaining Road Network

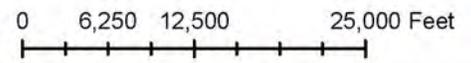
The remaining road network is made up of roads serving as collectors, and local roads in subdivisions. Collector roads often connect several local roads to arterials and help to form the major road network. These roads are primarily narrow roads and as traffic volumes increase, they often experience safety and traffic capacity problems.



FIGURE 6.15 Street Network and Classification Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



- Legend**
- Interstate
 - Other Freeway or Expressway
 - Other Principal Arterial
 - Minor Arterial
 - Major Collector
 - Minor Collector
 - Interstate Ramp
 - Other Freeway or Expressway Ramp
 - Other Principal Arterial Ramp
 - Minor Arterial Ramp



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.10.2 Roadway Jurisdiction

The Virginia Department of Transportation (VDOT) has the primary responsibility for maintaining all public roads in Stafford County. The County works with VDOT to identify necessary road improvements.

6.10.3 Traffic Volume

Based on 2019 road counts from VDOT, I-95 carries approximately 151,000 vehicles daily through Stafford County. U.S. Route 1 carries between 18,000 and 40,000 vehicles on an average day. Depending on the section, Warrenton Road carries between 21,000 and 73,000 vehicles daily. Near the I-95 interchange, Garrisonville Road moves as many as 78,000 vehicles each day. Courthouse Road carries as many as 16,000 vehicles per day near the I-95 interchange. Near Shelton Shop Road, Courthouse Road carries 11,000 vehicles per day. Centreport Parkway from U.S. Route 1 to I-95 carries 15,000 daily vehicles.

6.10.4 Traffic Safety

Traffic accident records are kept by the Stafford County Sheriff's Office. Each accident is recorded using a Global Positioning System (GPS) to identify its location. When these points are plotted on a map, areas where there are high frequencies of accidents can be recognized.

Roadway Management and Improvement

Stafford County actively coordinates with VDOT to promote access management for development. The County also works with the Fredericksburg Area Metropolitan Planning Organization (FAMPO), our local Metropolitan Planning Organization, and the state to identify funding opportunities for transportation improvements. Stafford County seeks to work with new developers to reduce impacts to the roadway network and through proffers and impact fees to help off-set the cost of new development.

6.10.5 Bus Service

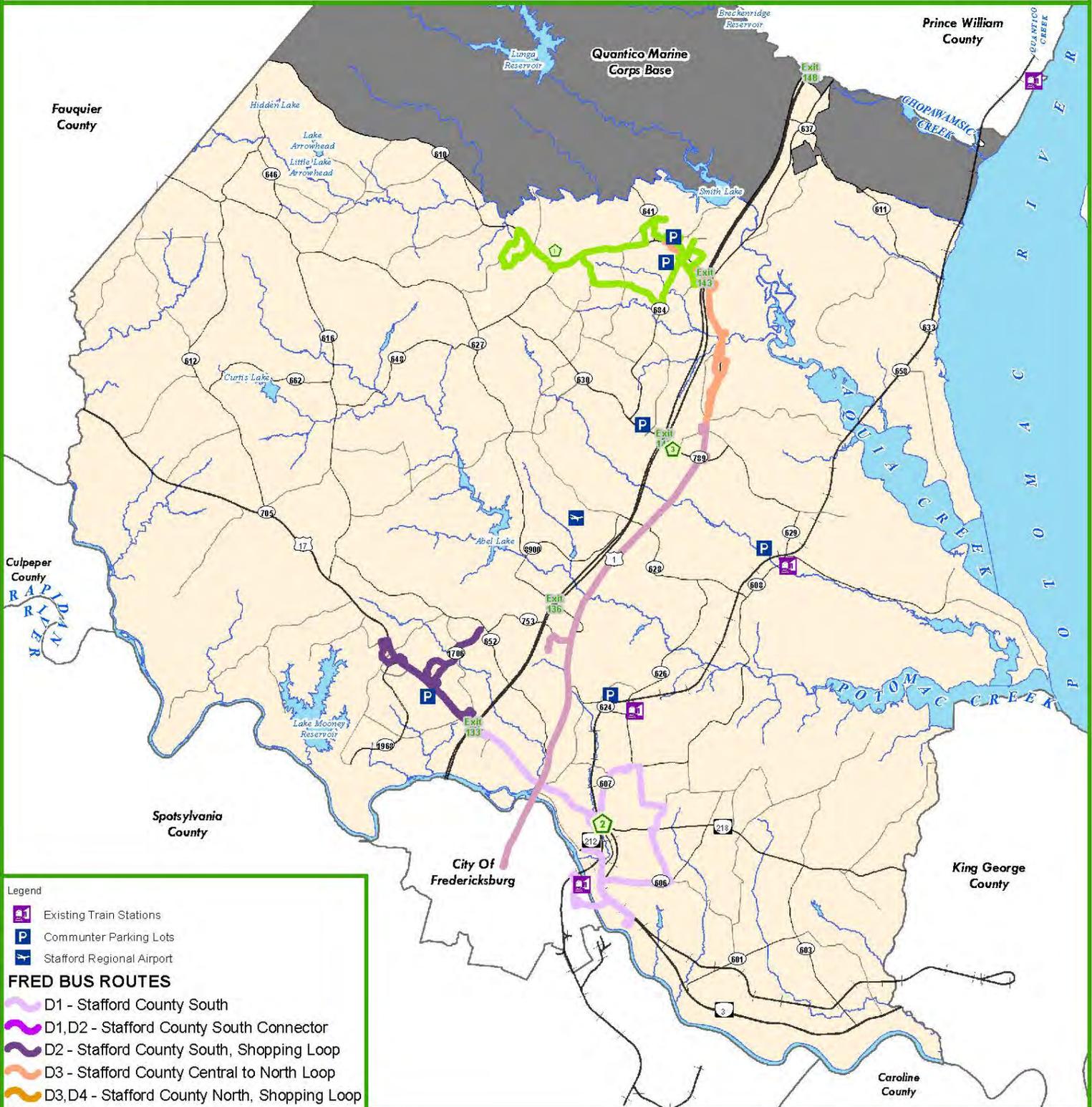
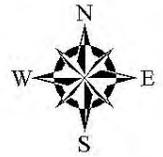
The FREDericksburg Regional Transit (FRED) provides bus service to Stafford, Fredericksburg, and the surrounding area. Connections to Washington, D.C. are by private commuter bus.

6.10.6 Rail Service

The Virginia Railway Express (VRE) operates two rail lines that carry commuters to Washington, D.C. The Manassas Line extends from Prince William County to Washington, and the Fredericksburg Line extends from Spotsylvania County to Washington, serving Stafford County. The Fredericksburg Line has two station in Stafford County, with locations at Leeland Road and Brooke Road. Commuters can also access the VRE at Fredericksburg and Quantico, just outside of the County. Park & Ride facilities are located at all stations.



FIGURE 6.16 Transportation Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021

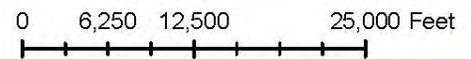


- Legend**
- Existing Train Stations
 - Commuter Parking Lots
 - Stafford Regional Airport

FRED BUS ROUTES

- D1 - Stafford County South
- D1,D2 - Stafford County South Connector
- D2 - Stafford County South, Shopping Loop
- D3 - Stafford County Central to North Loop
- D3,D4 - Stafford County North, Shopping Loop
- D3,D5 - Stafford County Courthouse Loop
- D4 - Stafford County North
- D5 - Stafford County Central to South Loop

- TRANSPORTATION FACILITIES**
- 1- DEPT OF MOTOR VEHICLES
 - 2- VDOT DISTRICT & RESIDENCY OFFICE
 - 3- VDOT STAFFORD AREA HEADQUARTERS



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

6.10.7 Commuter Lots

There are six commuter lots located within Stafford County. Two of them are operated by the Virginia Railway Express (VRE) in conjunction with the rail stations. The other four are maintained by VDOT and are in close proximity to Interstate 95. From these lots, people can take a train, bus, or car pool.

The commuter lot located on Courthouse Road was relocated and expanded as part of the new I-95 interchange project which was completed in 2020. The new lot expanded parking capacity to 850 spaces and includes dedicated carpool, vanpool, and bus pick-up and drop-off areas. Total capacity for all six commuter lots is 6,060 spaces.

However, in 2017 it was noted two of the six available commuter lots had exceeded capacity, with commuters observed parking in unmarked spaces. Those lots included the Mine Road commuter lot, maintained by VDOT, and the commuter lot located at the VRE station located on Leeland Road.

6.10.8 Air Service

Stafford County has its own regional airport and is within a reasonable drive from two major airports.

Stafford Regional Airport is centrally located in the County. An independent authority operates the airport with representatives from Stafford, Prince William, and the City of Fredericksburg. The facility is 550 acres with a 5,000-foot airstrip with an ongoing operation to extend to 6,000 feet. The runway can accommodate private and business class jets with wingspans of up to 80 feet. There is no passenger service at this airport. The airport was built to accommodate up to 75,000 operations per year. The new extension would not change the classification of aircraft at the facility but, will allow aircraft to make longer flights and carry more cargo.

There are also two privately owned airports located within Stafford County. Dogwood Airpark located east of US-1 near Cranes Corner Road, and Chimney View Airport located on Brent Point Road.

6.10.9 Bicycle and Pedestrian Facilities

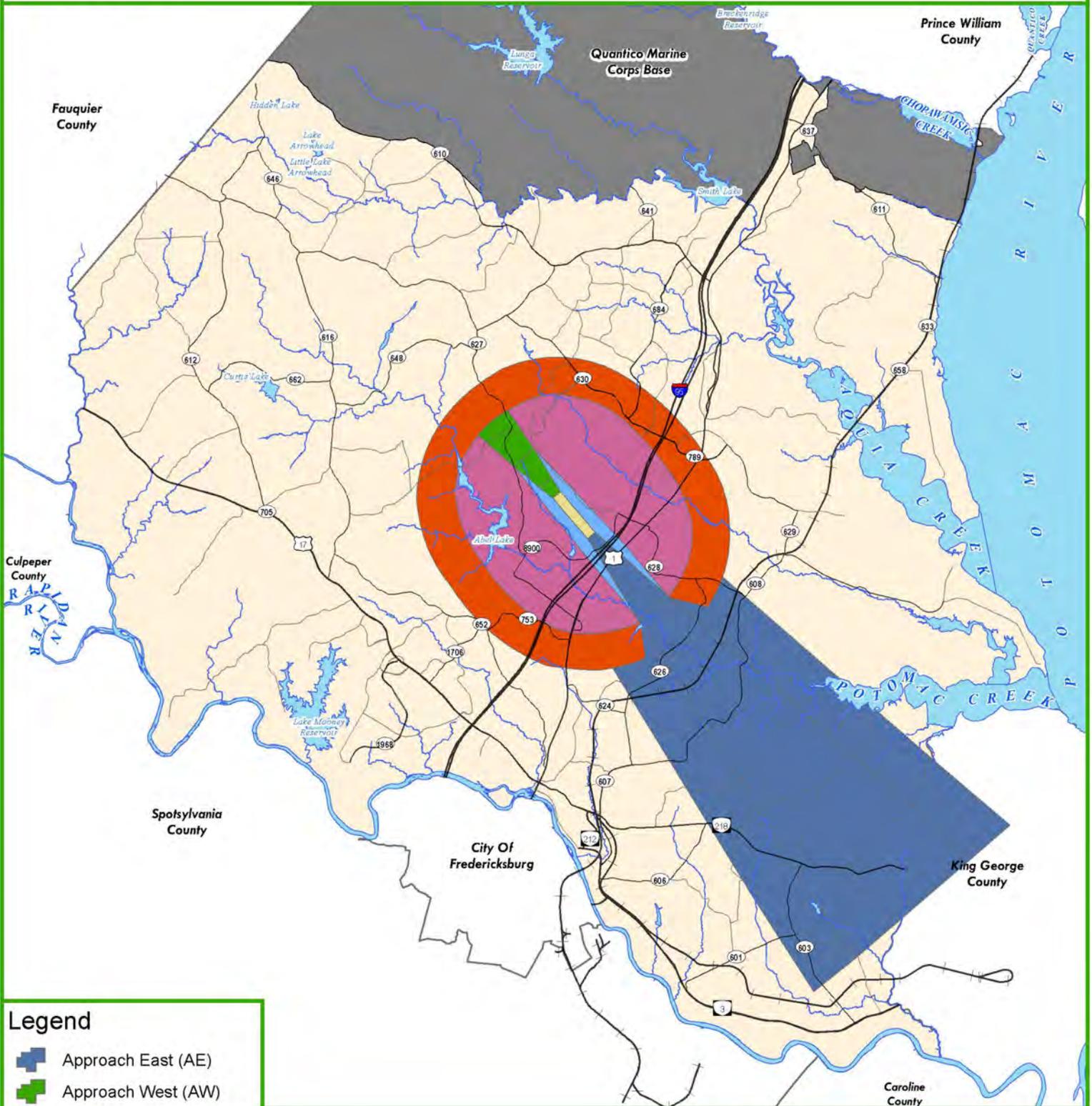
According to the 1996 Bicycle/Pedestrian Facilities Plan, Stafford County is lacking adequate facilities for bicycle and pedestrian transportation and recreation. Many of the roadways in the County are considered unsafe for bicycle and pedestrian use due to width and line of sight. Some trails are available in County parks. The County is working toward establishing a countywide network of trails for bicycle and pedestrian use. The County is also working with the FAMPO to create a regional network and has participated with FAMPO in the Regional Bicycle and Pedestrian Facilities Plan.

6.10.10 Findings

- There are four interchanges on I-95 in Stafford County.
- Increasing population negatively affects the existing roads network.
- Safety is an issue on many of the narrow, winding roads.
- The County works closely with many partners to provide funding for facility improvements.
- Bus service for Stafford County is provided by FREDericksburg Regional Transit (FRED).
- Rail service is available in the County and Quantico for commuters traveling to Northern Virginia and Washington D.C. on VRE.
- Two of the six available commuter lots in Stafford County are at or have exceeded their capacity.
- The County is served by a regional airport.

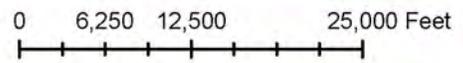


FIGURE 6.17 Airport Overlay Zoning District Stafford County Comprehensive Plan Stafford County, Virginia September 8, 2021



Legend

- Approach East (AE)
- Approach West (AW)
- Conical Zone (C)
- Horizontal Flight Zone (H)
- Runway (R)
- Transitional (T)



Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

7.0 Implementation Plan

This document spells out concrete actionable steps required to implement the Comprehensive Plan. The actionable steps come in various forms: The Implementation Plan includes an Action List, Action Timeline, and Monitoring and Tracking Program.

The **Action List** categorizes tasks into main goal topics, including, but not limited to, Land Use, Transportation, and Housing. The goals objectives and policies in Chapter 2 of the Plan relate to the updating of **Comprehensive Plan elements**, amending **land development ordinances**, and carrying out **short term projects** and **ongoing programs** to implement the goals of the Plan.

The Plan includes an **Action List Timeline** that expands on the Action List by prioritizing the tasks with timing and completion dates, and identification of responsible parties.

A final but important step in Implementation is **Tracking and Measuring** the County's progress toward the established goals, objectives, and policies.

A. ACTION LIST

LAND USE (LU):

- LU1) Area concept plans should be developed for each of the Targeted Development Areas (TDAs) that follow the guiding principles in the policies and recommendations within the Land Use Plan. The order in which the Plans will be developed needs to be prioritized. (2.2.5 – 2.2.9, 2.7.1).

- LU2) Growth Management/Rural Preservation
 - (a) Continue support of the County's Purchase of Development Rights program and other land conservation programs (2.2.2, 2.6.2).
 - (b) Encourage private landowner dedication of conservation easements through the education of programs available and resultant benefits (2.6.3).
 - (c) Establish a program to monitor the effectiveness of development regulations in focusing residential development into the Urban Services Area by tracking the location of new development (2.10).

LU3) Short-term Projects

- (a) Amend the Zoning Ordinance to clean up inconsistencies, bring into accordance with the State Code, and consider recommendations of the Comprehensive Plan. Amendments to the Zoning Ordinance may require a phased approach.
- (b) Amend the Subdivision Ordinance to clean up inconsistencies and bring into accordance with the State Code.
- (c) Establish standards for Impact Statements to be required for new development projects (3.5.1 and 3.5.2).

LU4) Ongoing Programs

- (a) Review development proposals for compliance with goals of the plan (2.1.1 – 2.1.3).
- (b) Notify Marine Corps Base Quantico on any proposed water and sewer line extensions outside the USA and within 5 miles of the Base (5.8.8).

ENVIRONMENTAL (EN):

EN1) Create a Master Environmental Plan that consolidates the following planning documents (Objective 4.10):

- Regional SWM/Reservoir Protection Plan
- Shoreline Area Management Plan
- Chesapeake Bay Preservation Area Plan
- Wildlife Habitat Protection Plan
- Groundwater Resource Protection Plan

EN2) SWM/Reservoir Protection

- (a) Amend and integrate the Regional SWM/Reservoir Protection Plan into a Master Environmental Plan.
- (b) Amend the Stormwater Management Ordinance (4.3.1).
- (c) Establish a Reservoir Overlay District Ordinance (4.3.9).
- (d) Amend the Erosion Control Ordinance to update erosion control methods and enforcement procedures as new technology becomes available (4.3.5).
- (e) Study and evaluate the need for the establishment of a stormwater utility (4.3.1).
- (f) Retrofit older stormwater management facilities to improve the quality of stormwater runoff (4.3.6).
- (g) Establish reservoir pre-treatment monitoring programs (4.3.8).

EN3) Shoreline Area Management

- (a) Amend and integrate the Shoreline Area Management Plan into a Master Environmental Plan.
- (b) Evaluate the need to amend the Wetlands Ordinance.

- EN4) Chesapeake Bay Preservation Area
- (a) Amend and integrate the Chesapeake Bay Preservation Area Plan into a Master Environmental Plan.
 - (b) Evaluate the need to incorporate guidelines to minimize impacts of storm surge and sea level rise (4.4.4 and 4.4.5).
- EN5) Groundwater Resources
- (a) Amend and integrate the Groundwater Resource Protection Plan into a Master Environmental Plan.
 - (b) Establish a Groundwater Management ordinance (4.3.9).
 - (c) Create monitoring program for surface and groundwater resources (4.3.8).
- EN6) Establish tree cover requirements for new development (4.5.1).
- EN7) Provide ongoing education to the public about “green programs” and federal and state mandates (4.1.2).

TR - TRANSPORTATION:

- TR1) Update the County’s traffic model and utilize in the development of the Transportation Implementation Plan.
- TR2) Bike and Pedestrian Facilities Plan
- (a) Update this element of the Comprehensive Plan to identify new pedestrian networks and identify intra- and inter-county bike networks (7.3.3).
 - (b) As part of the development of the Plan, explore the potential for bicycle and pedestrian trails to be in pipeline, electrical, or other easements to provide connectivity between open space and neighborhoods (7.3.5).
- TR3) Multi-modal Transportation
- (a) Amend the County’s development regulations to establish incentives for development proposals that support alternative modes of transportation (7.2.1).
 - (b) Support the expansion of transit in the USA and TGAs (7.2.2).
 - (c) Support and promote regional rideshare and para-transit programs (7.2.3).
- TR4) Ongoing Programs
- (a) Maintain the county-wide traffic model for use in evaluating any potential amendments to the Land Use Plan or future comprehensive updates.
 - (b) Conduct transportation impact assessments on any new or expanded roads proposed outside of the USA to evaluate their potential for increased development as result of the improvement (2.8.3).
 - (c) Support alternative routes to relieve congested corridors (7.4.5).

UTILITIES (U):

- U1) Update the Master Water and Sewer Plan to determine the need for modifications or additions to projected future water and sewer facilities based on the future growth patterns envisioned in the land use plan.
- U2) Evaluate the need to amend the Water Supply Study element of the Comprehensive Plan in conjunction with the update to the Master Water and Sewer Plan.
- U3) Evaluate the need to amend the Utilities Ordinance for compliance with the goals, objectives, and policies in the Comprehensive Plan.

OTHER COMMUNITY FACILITIES AND INFRASTRUCTURE (CF):

- CF1) Update the Telecommunications Plan to ensure the provision of broadband and wireless services with minimal impact to residents while accommodating current and developing technology needs.
- CF2) Amend the Parks and Recreation Facilities Master Plan element of the Comprehensive Plan to plan for the current and projected facility needs (5.7.4). Amendments should consider incorporation of natural areas and low-impact uses (4.7.1), and identification of gaps in park locations (5.7.1).
- CF3) Review and adopt the Capital Improvement Program on an annual basis.
- CF4) Review, modify and/or expand on the Level of Service Standards that are included as part of the “Comprehensive Plan 2016-2036”.
- CF5) Educate citizens that areas outside the USA may have limited services.

HOUSING (H):

- H1) Affordable Housing
 - (a) Provide ongoing support to Regional Affordable Housing Efforts (6.1.1).
 - (b) Establish incentives for the development of affordable housing (6.2.1).
 - (c) Modify proffer guidelines to provide credits for affordable housing (6.1.2.).
 - (d) Consider adopting a local ordinance to waive specified application fees for affordable housing as permitted by State Code. (6.1.3).
 - (e) Identify publicly owned lands that could be redeveloped as housing for public employees (6.2.2).

- H2) Ongoing Programs
 - (a) Maintain and update population and housing data.
 - (b) Promote housing choice by encouraging the inclusion of Universal Design features into new residential uses (6.3.4).

PUBLIC SAFETY (PS):

- PS1) Amend the Public Safety Plan element of the Comprehensive Plan to reflect the current needs of the community.
- PS2) Amend the Zoning Ordinance to establish a military impact overlay district with regulations pertaining to density of development, noise reduction and disclosure and height of structures (5.8.1 – 5.8.6).
- PS3) Establish engineering requirements for development to minimize geotechnical hazards (5.3.2).
- PS4) Resource Sustainability
 - (a) Encourage active agriculture uses through land use management practices such as TDRs, PDR's, conservation easements, and cluster development. (5.1.1).
 - (b) Promote creation of a farmer's market, agri-tourism and community gardens (5.1.2).
 - (c) To ensure adequate energy resources, educate the public on energy conservation measures (5.1.3).
- PS5) Ongoing Programs
 - (a) Work with utilities to mark easements and educate the public regarding safety measures (5.5.2).
 - (b) Educate the public on flooding awareness, tidal water rise and storm surge (5.4.1).
 - (c) To protect drinking water resources, educate the public regarding proper use of fertilizers and pesticides (5.2.6).

FISCAL RESPONSIBILITY (FR):

- FR1) Financial Impact Model
 - (a) Adopt a Financial Impact Model as a new element of the Comprehensive Plan (3.4.1).
 - (b) Prepare an annual update to the Financial Impact Model (3.4.1).
- FR2) Develop, amend, or repeal proffer guidelines pursuant to the latest State Code legislation (3.7.7).
- FR3) Transportation Impact Fees
 - (a) Recalculate transportation impact fees on an annual basis (3.7.6).
 - (b) Continue collection of Transportation Impact Fees (3.7.2).

- FR4) Maintain an up-to-date assessment of the capital costs of development (3.7.1).
- FR5) Base Annual CIP decisions on the Public Facilities Plan and proximity to the USA and UDA.

CULTURAL RESOURCES (CR):

- CR1) Cultural Resources Management
- (a) Adopt a Cultural Resources Master Plan as an element of the Comprehensive Plan (9.1.1).
 - (b) Establish a Historic Preservation Ordinance that incorporates the recommendations of the Cultural Resources Master Plan (9.1.3).
 - (c) Place protective easements on County owned property with cultural resources (9.2.3).
 - (d) Establish a long-term management and stewardship program for county-owned property with cultural resources (9.2.1).
 - (e) Educate citizens about federal state and local incentives for the long-term preservation of heritage resources (9.1.7).
- CR2) Update design guidelines for historic districts and historic gateway corridors (9.1.8).
- CR3) Maintain and update the county-wide cultural resources inventory as resources are discovered (9.1.2).

ECONOMIC DEVELOPMENT (ED):

- ED1) Economic Development Plan
- Incorporate land use incentives into the Economic Development Plan to promote alternative rural economic development (1.3.1)

B. ACTION LIST TIMELINE

This section serves to prioritize all of the recommended actions in the Plan. Projects are categorized in either the short term (year 1 or 2), mid-term, long term, or a combination. The corresponding action number is included before each action for reference.

* See Key to abbreviations on page 7-16.

<i>Action Number</i>	<i>Action Task - Plan Elements</i>	<i>Responsible Entity*</i>	<i>Short Term</i>		<i>Mid Term</i>			<i>Long Term</i>	<i>Complete by:</i>	
			<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>	<i>Year 6 +</i>		
LAND USE	LU1)	Adopt Individual Targeted Development Area Concept Plans (1.2.5 – 1.2.9, 1.7.1)	P&Z / PRCF / PC / BOS	XXXX	XXXX	XXXX				12/31/2024
	LU2)(a)	Support the County PDR program	Co Admin / P&Z / Ag Comm/BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	LU2)(b)	Educate Landowners on land conservation programs	P&Z / COR / Public Information		XXXX		XXXX		XXXX	Ongoing - every other year
	LU2)(c)	Track location of new development to Monitor effectiveness of regulations	P&Z/PW	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	LU3)(a)	Zoning Ordinance - Comprehensive re-write	P&Z / PC / BOS		XXXX	XXXX				12/31/2024
	LU3)(b)	Amend the Subdivision Ordinance	P&Z / PC / BOS		XXXX	XXXX				12/31/2024
	LU3)(c)	Establish standards for Impact Statements	P&Z / PC / BOS		XXXX					9/30/2023
	LU4)(a)	Review development proposals for compliance with the Plan	P&Z / PC / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing - as needed
	LU4)(b)	Notify MCB Quantico of water and sewer extensions	P&Z	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing - as needed

Action Number	Action Task - Plan Elements	Responsible Entity*	Short Term		Mid Term			Long Term	Complete by:
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 +	

ENVIRONMENT	EN1)	Create a Master Environmental Plan (Obj 3.9)	P&Z / DS / PRCF / PC / BOS		XXXX	XXXX					6/30/2024
	EN2)(a)	Amend the Regional SWM Plan and integrate into the Master Env. Plan	P&Z / DS / PRCF/ PC / BOS		XXXX	XXXX					6/30/20 24
	EN2)(b)	Amend the SWM Ordinance and evaluate the need for a stormwater utility	P&Z / DS /CC / BOS			XXXX					12/31/20 24
	EN2)(c)	Zoning - Adopt a reservoir overlay district	P&Z / Utilities Dept / PC / BOS	XXXX							12/31/2022
	EN2)(d)	Amend the Erosion Control Ordinance	DS / BOS	XXXX							12/31/20 22
	EN2)(e)	Evaluate the need for a stormwater utility	PW / Finance / BOS		XXXX						12/31/2023
	EN2)(f)	Retrofit SWM facilities to improve water quality	DS/CC/BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX		Ongoing
	EN2)(g)	Establish reservoir pre-treatment programs	Utilities Dept.		XXXX	XXXX	XXXX	XXXX	XXXX		Ongoing
	EN3)(a)	Amend the Shoreline Area Management Plan and integrate into the Master Env. Plan	P&Z / PRCF / PC / BOS		XXXX	XXXX					6/30/2024
	EN3)(b)	Evaluate need to amend the Wetlands Ordinance	P&Z/PC/BOS				XXXX				6/30/2025
	EN4)(a)	Amend the Chesapeake Bay Preservation Plan and integrate into the Master Env. Plan	P&Z / DS / PRCF / PC / BOS		XXXX	XXXX					6/30/2024
	EN4)(b)	Evaluate the need to incorporate guidelines to minimize impacts of storm surge and sea level rise	P&Z / DS / PC / BOS	XXXX							12/31/2022
	EN5)(a)	Amend the Groundwater Resource Protection Plan and integrate into the Master Env. Plan	P&Z/PC/BOS		XXXX	XXXX					6/30/2024
	EN5)(b)	Establish Groundwater Management Ordinance	P&Z / PC / BOS						XXXXXX		12/31/2027

Action Number	Action Task - Plan Elements	Responsible Entity*	Short Term		Mid Term			Long Term	Complete by:
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 +	

ENVIRONMENT	EN5)(c)	Create surface and groundwater monitoring program	P&Z / DS / BOS					XXXX		12/31/2026
	EN6)	Zoning - Establish tree cover requirements (as part of comprehensive zoning ordinance rewrite)	P&Z / PRCF / PC / BOS		XXXX	XXXX				12/31/2024
	EN7)	Provide education about "green programs" and federal and state mandates	P&Z / PW / PRCF / BOS		XXXX		XXXX		XXXX	Ongoing - every other year

TRANSPORTATION	TR1)	Update the County's traffic model and utilize in developing the Transportation Implementation Plan	CC / P&Z / PC / BOS / Consultant		XXXX					9/30/2023
	TR2)(a)	Update the Bike and Pedestrian Facilities Plan	P&Z / PRCF / PC / BOS				XXXX			12/31/2024
	TR2)(b)	Explore the potential for bicycle and pedestrian trails to be located in pipeline, electrical, or other easements	P&Z / PRCF		XXXX	XXXX				12/31/2024
	TR3)(a)	Establish incentives for development proposals that support alternative modes of transportation	CC / P&Z / PC / BOS		XXXX					12/31/2023
	TR3)(b)	Support the expansion of transit in the USA and TDAs	CC / P&Z / PC / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	TR3)(c)	Support and promote regional rideshare and para-transit programs	CC / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	TR4)(a)	Maintain the county-wide traffic model for use in evaluating any potential amendments to the Land Use Plan	CC / P&Z	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing - Annual update

			Short Term		Mid Term			Long Term		
Action Number	Action Task - Plan Elements	Responsible Entity*	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 +	Complete by:	
TRANSPORTATION	TR4)(b)	Conduct transportation impact assessments on any new or expanded roads proposed outside of the USA to evaluate their potential for increased development CC / P&Z / PC / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing - as needed	
	TR4)(c)	Support alternative routes to relieve congested corridors CC / P&Z / PC / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing - as needed	
UTILITIES	U1)	Update the Master Water and Sewer Plan Utilities Dept / P&Z / UC / PC / BOS / Consultant	XXXX	XXXX					3/31/2023	
	U2)	Amend Water Supply Study element of the Comp Plan Utilities Dept / PC / BOS / Consultant						XXXX	12/31/2027	
	U3)	Evaluate need to amend the Utilities Ordinance Utilities Dept / UC / BOS	XXXX						12/31/2022	
OTHER COMMUNITY FACILITIES AND INFRASTRUCTURE	CF1)	Update the Telecommunications Plan P&Z / IT / Telecom Comm / PC / BOS	XXXX						9/30/2022	
	CF2)	Amend the Parks and Recreation Facilities Master Plan PRCF / P&Z / PC / BOS / Consultant	XXXX						6/30/2022	
	CF3)	Review and adopt the Capital Improvement Program on an Annual Basis Budget / Co Admin / Coord. w/ other Depts. / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Annual	
	CF4)	Review and amend Level of Service Standards P&Z / Coord. w/ other Depts. / PC / BOS			XXXX				12/31/2024	
	CF5)	Inform citizens that areas outside of the USA may have limited services P&Z / Public Information	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing	

Action Number	Action Task - Plan Elements	Responsible Entity*	Short Term		Mid Term			Long Term	Complete by:
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 +	

HOUSING	H1)(a)	Provide ongoing support to Regional Affordable Housing Efforts	Co Admin / P&Z / Soc. Serv. / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	H1)(b)	Establish incentives for development of affordable housing	P&Z / PC / BOS				XXXX			12/31/2025
	H1)(c)	Modify proffer guidelines to provide credits for affordable housing	P&Z / PC / BOS				XXXX			12/31/2025
	H1)(d)	adopt a local ordinance to waive specified application fees for affordable housing	P&Z / DS	XXXX						12/21/2022
	H1)(e)	Identify publicly owned lands that could be developed as housing for public employees	P&Z				XXXX			12/31/2025
	H2)(a)	Maintain and Update population and housing data	P&Z / DS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	H2)(b)	Encourage universal design in new housing	P&Z		XXXX	XXXX	XXXX	XXXX	XXXX	ongoing

PUBLIC SAFETY	PS1)	Amend the Public Safety Plan element of the Comprehensive Plan	F&R / Sheriff / P&Z / BOS	XXXX	XXXX	XXXX				6/30/2024
	PS2)	Zoning - Create a Military Impact Overlay District (as part of the comprehensive zoning ordinance rewrite)	P&Z / PC / BOS		XXXX	XXXX				12/31/2024
	PS3)	Establish requirements to minimize geotechnical hazards	P&Z / DS / PC / BOS				XXXX			6/30/2025
	PS4)(a)	Encourage active agriculture activities	Econ Dev / Va Coop Ext / Ag. Comm. / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	PS4)(b)	Promote farmer's markets, agri-tourism, and community gardens	Econ Dev / PRCF / Va Coop Ext / Ag. Comm. / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	PS4)(c)	Encourage energy conservation measures	P&Z / DS / Public Info / BOS			XXXX	XXXX	XXXX	XXXX	Ongoing

Action Number	Action Task - Plan Elements	Responsible Entity*	Short Term		Mid Term			Long Term	Complete by:
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 +	

PUBLIC SAFETY	PS5)(a)	Mark utility easements and educate the public on safety measures	P&Z / Public Info / Utility Providers			XXXX	XXXX	XXXX	XXXX	Ongoing
	PS5)(b)	Educate the public on flooding awareness, tidal water rise and storm surge	P&Z / Public Info			XXXX	XXXX	XXXX	XXXX	Ongoing
	PS5)(c)	Educate the public regarding proper use of fertilizers and pesticides	PW/PRCF/Tr i- County SWCD / Coop Ext / Public Info			XXXX	XXXX	XXXX	XXXX	Ongoing

FISCAL RESPONSIBILITY	FR1)(a)	Develop and adopt a Financial Impact Model as an element of the Comprehensive Plan	P&Z / Finance / PC / BOS	XXXX	XXXX					3/31/2023
	FR1)(b)	Prepare an annual update to the FIM	P&Z / Finance / PC / BOS	-	-	XXXX	XXXX	XXXX	XXXX	Ongoing
	FR2)	Develop, amend, or repeal proffer guidelines pursuant to the latest State Code legislation	P&Z / Finance	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	FR3)(a)	Recalculate Transportation Impact Fees on an annual basis	CC / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	FR3)(b)	Continue collection of Transportation Impact Fees	CC / P&Z	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	FR4)	Maintain an up-to-date assessment of the capital costs of development	P&Z / Coordinate w Other Depts.		XXXX		XXXX		XXXX	Every other year.
	FR5)	Base CIP on Public Facilities Plan and proximity to USA and TDA	Budget / Co Admin / BOS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing

CULTURAL RESOURCES	CR1)(a)	Adopt a Cultural Resources Master Plan as an element of the Comprehensive Plan	P&Z / PRCF / PC / BOS			XXXX				12/31/2024
	CR1)(b)	Establish an Historic Preservation Ordinance	P&Z / PRCF / PC / BOS				XXXX			12/31/2025
	CR1)(c)	Place easements over county owned cultural resources	P&Z / PW / PRCF / BOS					XXXX		12/31/2026
	CR1)(d)	Establish a management and stewardship program for county-owned cultural resources	P&Z / PW / PRCF / BOS					XXXX		12/31/2026

Action Number	Action Task - Plan Elements	Responsible Entity*	Short Term		Mid Term			Long Term	Complete by:
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 +	

CULTURAL RESOURCES	CR1)(e)	Educate citizens about incentives for the preservation of cultural resources	COR / P&Z / Public Info.		XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing
	CR2)	Update historic design guidelines	P&Z / PRCF / PC / BOS				XXXX			12/31/2025
	CR3)	Maintain the Cultural Resources Inventory	P&Z / PRCF	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	Ongoing

ECONOMIC DEVELOPMENT	ED1)	Include incentives in the Plan to promote alternative rural economic development	Econ Dev. / P&Z / PC / BOS	XXXX	XXXX					6/30/2023
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Key to Abbreviations under Responsible Entity:

Ag Comm - Agricultural Commission

BOS - Board of Supervisors

CC - Capital Construction

Co Admin - County Administration

COR - Commissioner of the Revenue

DS- Development Services

Econ Dev - Economic Development

F&R - Fire and Rescue Department

IT - Department of Information Technology

P&Z - Planning and Zoning

PC - Planning Commission

PRCF - Parks, Recreation & Community Facilities

Public Info - Public Information

Soc Serv - Social Services

Tri-County SWCD - Soil and Water Conservation District

Va Coop Ext - Virginia Cooperative Extension

C. MONITORING AND TRACKING

As this Plan and specific Actions are being implemented, it will be important to evaluate the progress toward meeting the recommended priorities and timelines. To measure progress, a process to annually review and report progress of the action items in the Implementation Plan and metrics for measuring progress should be established.

The following options are provided as possible methods to oversee evaluation and reporting:

- Include status update as part of the Planning Commission's annual report to the Board of Supervisors
- Place oversight of the evaluation and reporting with the Board of Supervisor's Community and Economic Development Sub-Committee.
- Establish a standing Planning Commission Comp Plan Committee to oversee the evaluation and reporting on progress.
- A combination of these efforts.

Metrics for evaluating progress can be accomplished in multiple ways. The tasks that include scheduling and deadlines can be regularly evaluated. Ongoing projects may require the use of indicators. These may include the following:

- Number of sidewalks and bicycle facilities
- Roadway indicators, incl. Levels of Service, accident data
- Housing affordability indicators
- School capacity
- Public Safety response times
- Water quality indicators
- Transit ridership
- Employment data
- Number of lots retired through TDR, PDR, and other conservation easements
- Track location of new development
- Proffer and Impact Fee tracking

APPENDIX

- A. Methodology for Calculating Capital Costs**
 - B. Public Facilities Plan**
 - C. 80-20 Growth Analysis - 5-yr Comp Plan Update**
 - D. TGA Countywide Acreage Needs**
 - E. Affordable Housing Study**
 - F. Stafford Regional Airport Land Use Compatibility Study**
-

A. Methodology for Calculating Capital Costs (by Residential Dwelling Unit Type)

Parks and Recreation

Recommended level of Service for Parks:

12 acres of usable land per 1,000 citizens

Cost per Acre:

\$470,000 to acquire and develop one acre of County Parkland.
 Estimated Mountain View Park development cost of \$220,000 (FY2022 Capital Improvements Program) plus Chichester Park land acquisition cost of \$250,000 per acre.

Source: Stafford County Parks and Recreation Department

Cost per Housing Unit Type:

	A	B	C	(AxBxC)=D
Type of Housing Unit	Housing Unit Size	County Parkland per Capita	Cost/Acre to acquire and develop new parkland	Gross Cost per Housing Unit
Single Family	3.13	0.012	\$470,000	\$17,653
Townhouse	2.91	0.012	\$470,000	\$16,412
Multi-Family	2.57	0.012	\$470,000	\$14,495
Mobile Homes	1.89	0.012	\$470,000	\$10,660

Total Monetary Impact per Housing Unit:

Single Family :	\$17,653
Townhouse:	\$16,412
Multi-Family:	\$14,495
Mobile Home:	\$10,660

Schools

Cost per Student

Elementary:	\$39,102,000	/	964	students	=	\$40,562
Middle:	\$58,634,000	/	1,150	students	=	\$50,986
High:	\$124,703,000	/	2,150	students	=	\$58,001

Source: 2022 Capital Improvements Program

Cost per Housing Unit Type:

Facility + Land	Cost Per Student	Single Family Detached Student Generation	Cost for Single Family Detached by Education Level	Townhouse Student Generation	Cost for Townhouse by Education Level	Multi-Family Student Generation	Cost for Multi-Family by Education Level	Mobile Home Student Generation	Cost for Mobile Home by Education Level
Elementary	\$40,562	0.431	\$ 17,482	0.265	\$ 10,749	0.113	\$4,584	0.26	\$ 10,546
Middle	\$50,986	0.235	\$ 11,982	0.126	\$ 6,424	0.04	\$2,039	0.12	\$ 6,118
High	\$58,001	0.281	\$ 16,298	0.153	\$ 16,298	0.074	\$4,292	0.13	\$ 7,540
TOTAL			\$ 45,762		\$ 33,471		\$ 10,915		\$ 24,204

Monetary Impact per Housing Unit:

Single Family :	\$45,762
Townhouse:	\$33,471
Multi Family:	\$10,915
Mobile Home:	\$24,204

Libraries			
Recommended Level of Service is defined as land, building square footage and material (books, furnishings, and equipment) needed in order to meet county standards.			
Square feet of Library floor area per capita =			1.00
(1) Standard building size (in square feet) =			25,000
(2) Approximate Building Cost of New Library Facility (includes FF&E) =			\$16,276,000
Ideal acreage for one facility =			3.0
Cost Breakdown:			
Square feet/capita =			1.00
Building cost/ square foot =			\$651
Building cost/ capita =			<u>\$651</u>
Number of people served by one Library Facility =			30,000
Acres/capita =			0.000100
(3) Cost/acre =			\$210,000
Acre Cost/capita =			<u>\$21</u>
Subtotal to acquire land and construct a new library facility per capita			<u>\$672</u>
(4) Approximate Capital Equipment (books, materials, furnishings, technology) Cost =			\$1,500,000
Approximate equipment cost per square foot per capita =			<u>\$49</u>
Gross Cost per Capita			<u>\$721</u>
		Cost of Library and Materials per Capita	Cost Per Housing Unit
Type of Housing Unit	Housing Unit Size		
Single Family	3.13	\$721	\$2,257
Townhouse	2.91	\$721	\$2,098
Multi-Family	2.57	\$721	\$1,853
Mobile Home	1.89	\$721	\$1,363
Monetary Impact per Housing Unit:			
Single-Family :	\$2,257		
Townhouse:	\$2,098		
Multi-Family:	\$1,853		
Mobile Home:	\$1,363		
(1) FY2022 Capital Improvements Program			
(2) FY2022 Capital Improvements Program			
(3) Approximate Land Cost for Fire/Rescue Station 14			
(4) Approximate opening day collection cost for Falls Run Library - 75,000 books/materials			

Fire and Rescue			
Recommended Level of Service is defined as land, building square footage, and equipment needed in service Stafford County.			
Total Population of Stafford County as of April 1, 2020			156,927
Total Square Footage for all F&R Facilities =			176,220
Square Feet of Fire and Rescue Building Needed (per capita) =			1.122
(1) Actual building size (in square feet) =			21,000
(2) Approximate Construction Cost (per station) =			\$12,054,000
Building cost/square foot =			\$574
Building Cost/capita =			<u>\$644</u>
Total acres all F&R Facilities are located on =			51.8038
Ideal acreage for one facility =			7.0
Acres/capita =			0.00033
(3) Cost/acre =			\$210,000
Acre Cost/capita =			<u>\$69</u>
(4) Approximate Capital Equipment Cost (per station) =			\$1,750,000
Approximate equipment cost/square foot =			\$83
Total Equipment Cost for all F&R Facilities =			\$21,000,000
Equipment Cost/capita =			<u>\$134</u>
Total Square Footage of the Public Safety Building =			114,960
Square Footage Designated to the F & R Department =			24,176
Utilized Square Footage by the F & R Department =			20,062
Utilized Square Footage by the F&R Department (per capita) =			0.162
Approximate Construction Cost (of utilized square footage) =			\$6,369,720
Building cost/ utilized square foot =			\$318
Building Cost/ capita =			<u>\$51</u>
Gross Cost Per Capita			<u>\$981</u>
Type of Housing Unit	Housing Unit Size	Cost of Fire and Rescue Facility and Equipment per Capita	Gross Cost Per Housing Unit
Single Family	3.13	\$981	\$3,071
Townhouse	2.91	\$981	\$2,855
Multi-Family	2.57	\$981	\$2,521
Mobile Home	1.89	\$981	\$1,854
Monetary Impact per Housing Unit:			
Single Family :	\$3,071		
Townhouse:	\$2,855		
Multi-Family:	\$2,521		
Mobile Home:	\$1,854		
(1) Fire/Rescue Station 9 (2) Approximate Construction Cost for Fire/Rescue Station 9			
(3) Approximate Land Cost for Fire/Rescue Station 14			
(4) Approximate Equipment Cost for Fire/Rescue Station 14			

Transportation

Road Impact Guideline Formula

Units Proposed X (# Secondary Road Lane Miles) X Average Cost of One Lane Mile = Impact of New Project
 # Housing Units in County

OR
1 New Unit X (1,100-0) X \$5,500,000 = \$114,599
 52,793 Existing Units as of April 1, 2020 – 2020 U.S. Census

Source: Comprehensive Road Study Report (Medium Cost for one Mile on Two-Lane Rural Road: \$11,000,000)

Single Family : 10.0 vehicle trips/ day
 Townhouse : 7.0 vehicle trips/ day
 Multi-Family : 4.0 vehicle trips/ day
 Mobile Home : 4.8 vehicle trips/day

Monetary Impact per Housing Unit

Single Family : \$114,599
 Townhouse : \$80,219
 Multi-Family : \$45,840
 Mobile Home : \$55,008

Law Enforcement

Public Safety Building (final contract cost) = 36,500,000

Total Population of Stafford County as of April 1, 2020 156,927

Total Square Footage of the Public Safety Building = 114,960

Square Footage Designated to the Sheriff’s Office = 90,784 79.0%

Utilized Square Footage by the Sheriff’s Office = 90,784 100.0%

Utilized Square Footage by the Sheriff’s Office (per capita) = 0.579

Approximate Construction Cost (of utilized square footage) = \$28,824,078

Building cost/ utilized square foot = \$318

Building Cost/ capita = \$184

Service Level Provided: Stafford County currently has one deputy for every 738 citizens.

Number of Law Enforcement Officers = 213

Capital Equipment Associated per Officer (police cruiser, laptop, etc.) = \$63,151

Total Equipment Cost for all Officers = \$13,451,163

Equipment Cost per Capita =	<u>\$86</u>	
Total Projected Population of Stafford County on July 1, 2036 = Source: Weldon Cooper Center	198,815	
Gross Total of Future Population Growth from 2016 to 2036 =	56,900	28.6%
911 Communications System (building cost from CIP) = 23,000,000		
Building Cost Attributed to Future Population Growth =	\$6,578,000	
Cost/ new capita =	<u>\$116</u>	
Square Footage of Animal Shelter Building Provided =	15,936	
Square Footage of Animal Shelter Building Provided (per capita) =	0.102	
Estimated Building Cost Per Square Foot for an Animal Shelter Building =Building cost/square foot = (Total Cost = \$3,865,924)	\$243	
Building cost/ capita =	<u>\$25</u>	
Number of Animal Control Officers =	7	
Capital Equipment Associated per Officer (animal control truck, laptop, etc.) =	\$52,093	
Total Equipment Cost for all Officers =	\$364,651	
Equipment Cost per Capita =	<u>\$2</u>	
Gross Cost Per Capita	<u>\$413</u>	

Type of Housing Unit	Housing Unit Size	Gross Cost of Law Enforcement per Capita	Gross Cost Per Housing Unit
Single Family	3.13	\$413	\$1,293
Townhouse	2.91	\$413	\$1,202
Multi-Family	2.57	\$413	\$1,061
Mobile Home	1.89	\$413	\$781

Monetary Impact per Housing Unit:

Single Family :	\$1,293
Townhouse:	\$1,202
Multi-Family:	\$1,061
Mobile Home:	\$781

General Government

Building Cost (projects from the CIP)

New Courthouse & Renovation/Addition of existing Courthouse = \$40,600,000

Source: FY2022 Capital Improvements Program

156,927 = 2020 population (U.S. Census Bureau)

Cost/ capita = \$259

Gross Cost per Capita \$259

Type of Housing Unit	Housing Unit Size	Cost of General Government per Capita	Gross Cost per Housing Unit
Single Family	3.13	\$259	\$811
Townhouse	2.91	\$259	\$754
Multi-Family	2.57	\$259	\$666
Mobile Home	1.89	\$259	\$490

Monetary Impact per Housing Unit:

Single-Family : \$811
 Townhouse: \$754
 Multi-Family: \$666
 Mobile Home: \$490

B. Public Facilities Plan

Fire and Rescue

Location Criteria:

- Future new and replacement fire and rescue stations should be strategically located within districts to meet the required LOS Standards.
- Fire and rescue stations should be located at points with quick and easy access to a major arterial or at an intersection of two arterials to gain both east-west and north-south access.
- Fire and rescue stations should be located near or part of mixed-use centers like Targeted Growth Areas (TGAs) and redevelopment areas where possible based on key site planning consideration such as access, safety and response time (locations of intense and dense anticipated growth)
- Response areas for each station should be established for areas in the USA and outside the USA

Site Selection/Design Criteria:

- Separate fire and rescue stations that cover the same district should be combined in new shared facilities.
- Consider co-locating with other public facilities like the Sheriff's Office. Coordination with other county agencies is recommended to provide more efficient services.
- Acquire sites between five to seven usable acres to allow for providing co-location with other public facilities and possible future expansion. Slight variation in lot size may be necessary based upon the anticipated needs and building size construction of Fire and Rescue facilities.
- Encourage sites to be large enough to accommodate equipment storage and to allow maneuverability of the equipment to either pull-through or be backed into the garage bays without hindering traffic flows in the public right-of-way.
- Select and design sites to minimize the adverse impact of sirens and other noise on residential areas.
- Buildings should be a minimum of 15,000 square feet in size and accommodate one, two or three-bay designs depending on the needs within the service area.
- The standard capital equipment for each Fire and Rescue facility should be provided as follows: one engine and one ambulance. However, this does not exclude the need for additional equipment which is based on the location and need of each Fire and Rescue facility.

Facility Recommendations/Timing:

1.122 = Square feet provided per capita as of July 1, 2009 21,000 = Standard F&R Station Building Size (in square feet)							
Year	Total Population	Increase in Population Annually	Accumulating Population Increase	Additional F&R Building Square Footage Needed for this Year	Accumulating F&R Building Square Footage Needed	New Facilities Needed	Total # of Facilities
2020	156,927						15
2021	159,550	2,623	2,623	2,943	2,943	0	15
2022	162,174	2,624	5,247	2,944	5,887	0	15
2023	164,797	2,623	7,870	2,943	8,830	0	15
2024	167,421	2,624	10,494	2,944	11,774	0	15
2025	170,044	2,623	13,117	2,943	14,717	0	15
2026	172,668	2,624	15,741	2,944	17,661	0	15
2027	175,291	2,623	18,364	2,943	20,604	0	15
2028	177,915	2,624	20,988	2,944	23,549	1	16
2029	180,538	2,623	23,611	2,943	26,492	0	16
2030	183,161	2,623	26,234	2,943	29,435	0	16
2031	185,770	2,609	28,843	2,927	32,362	0	16
2032	188,379	2,609	31,452	2,927	35,289	0	16
2033	190,988	2,609	34,061	2,927	38,216	0	16
2034	193,597	2,609	36,670	2,927	41,144	0	16
2035	196,206	2,609	39,279	2,927	44,071	1	17
2036	198,815	2,609	41,888	2,927	46,998	0	17
-	-	-	Totals	46,998	-	2	17

Schools

Site Selection/Location Criteria:

- Future school sites will be located within the existing Urban Services Area (USA). Exceptions may be made when the only way to meet LOS Standards is to locate the school outside the USA.
- Provide locations for new schools that minimize travel distances for current as well as future students
- Elementary schools may be located within residential neighborhoods
- Elementary schools should be located with direct access to a collector road
- Middle and High schools site design should minimize impacts of the recreational areas on adjacent residences; sports facilities and their parking areas should be buffered from nearby homes
- Middle and High schools should be located with direct access to at least one major arterial road
- Pursue acquisition of school sites in projected growth areas of the County as identified on the Land Use Map
- Continue to coordinate school site planning and development with the Parks and Recreation Department in order to maximize community recreational facilities

Design Criteria:

Elementary Schools

- Recommended Site Acreage: At least 20 acres;
- Recommended Capacity: Maximum of 950 students;
- Recommended Classroom Size:
 - a. Special Ed - 10
 - Pre-K -18
 - Kindergarten -20
 - Grades 1-2 - 22
 - Grades 3-5 - 23
- Buildings should be a minimum of 88,000 square feet;
- Buildings should be constructed at a maximum height no greater than two stories;
- Other facility elements include a multi-use/gymnasium facility that should be provided at each elementary school sized to accommodate a regulation basketball court, bleachers, restroom facilities and storage rooms; and
- Grading for outdoor facilities to include the following community use facilities:
 - a. One (1) Little League/Softball Field with a 200-foot playing area with fences for a backstop and dugouts;
 - b. One (1) Soccer/Football Field with minimum dimensions of 65 x 120 yards;
 - c. Restroom access;
 - d. Public Access Playground; and
 - e. Parking adjacent to all facilities.

Middle Schools

- Recommended Site Acreage: At least 40 acres;
- Recommended Capacity: Maximum of 1,100 students;
- Recommended Classroom Size: 25 students;
- Buildings should be a minimum of 146,000 square feet;
- Buildings should be constructed at a minimum height no less than two stories;
- Other facility elements include a multi-purpose room/gymnasium facility that should be provided at each middle school sized to accommodate a regulation basketball court, bleachers, restroom facilities, storage room and locker rooms; and
- Grading for outdoor facilities to include the following community use facilities:
 - a. Two (2) Little/Softball Fields with a 200-foot playing area with fences for a backstop and dugouts;
 - b. Two (2) Soccer/Football Fields with minimum dimensions of 70 x 130 yards. One (1) Field with lights;
 - c. Access to restrooms;
 - d. Tennis Courts/Basketball Courts;
 - e. A Public Access Track; and
 - f. Parking adjacent to all facilities.

High Schools

- Recommended Site Acreage: At least 70 acres
- Recommended Capacity: Maximum of 1,800 students
- Recommended Classroom Size: 25 students
- Buildings should be a minimum of 265,000 square feet
- Buildings should be constructed at a minimum height no less than two stories
- Other facility elements include in addition to the main gymnasium, a second gymnasium (auxiliary gymnasium), that should be provided at each high school sized to accommodate a regulation basketball court, bleachers, restroom facilities, storage room and locker rooms.
- Grading for outdoor facilities to include the following community use facilities:
 - a. Two (2) Regulation Baseball Fields with fully enclosed playing area. One (1) Field with lights;
 - b. Two (2) Softball Fields with fully enclosed playing area. One (1) Field with lights;
 - c. One (1) Regulation Football/Soccer Field with stadium;
 - d. Three (3) Multi-Purpose Football/Soccer Fields with minimum dimensions of 70x 130 yards;
 - e. Access to restrooms;
 - f. Tennis Courts/Basketball Courts;
 - g. A Public Access Track; and
 - h. Parking adjacent to all facilities

Facility Recommendations/Timing:

Elementary Schools:

The methodology that was applied used a minimum threshold of 90 percent of program capacity usage in order to trigger the need for a new elementary school to be built.

Year	New Dwelling Units	Average Students per Dwelling Type			Total New Elementary Students	Cumulative Elementary Students	Cumulative PROGRAM Capacity	Students Relationship to Capacity	PROGRAM Capacity Usage %	New Elem School Needed	Cumulative Elem Schools Needed
		S.F.	T.H.	M.F.							
		0.431	0.265	0.113							
2019						12,665	13,966	-1,301	90.68%	1	1
2020	846	195	28	32	256	12,921	14,930	-2,009	86.54%		
2021	846	195	28	32	256	13,177	14,930	-1,753	88.26%		
2022	846	196	28	32	256	13,434	14,930	-1,496	89.98%		
2023	846	195	28	32	256	13,690	14,930	-1,240	91.69%	1	2
2024	846	196	28	32	256	13,946	15,894	-1,948	87.74%		
2025	846	195	28	32	256	14,202	15,894	-1,692	89.36%		
2026	846	196	28	32	256	14,458	15,894	-1,436	90.97%	1	3
2027	846	195	28	32	256	14,715	16,858	-2,143	87.29%		
2028	846	196	28	32	256	14,971	16,858	-1,887	88.81%		
2029	846	195	28	32	256	15,227	16,858	-1,631	90.33%	1	4
2030	846	195	28	32	256	15,483	17,822	-2,339	86.88%		
2031	842	194	28	32	255	15,738	17,822	-2,084	88.31%		
2032	842	194	28	32	255	15,993	17,822	-1,829	89.74%		
2033	842	194	28	32	255	16,248	17,822	-1,574	91.17%	1	5
2034	842	194	28	32	255	16,502	18,786	-2,284	87.84%		
2035	842	194	28	32	255	16,757	18,786	-2,029	89.20%		
2036	842	194	28	32	255	17,012	18,786	-1,774	90.56%	1	6
Totals					4,347					6	

Middle Schools:

The methodology that was applied used a minimum threshold of 90 percent of design capacity usage in order to trigger the need for a new middle school to be built.

		Average Students per Dwelling Type										
		0.235	0.126	0.04								
Year	New Dwelling Units	S.F.	T.H.	M.F.	Total New Middle Sch. Students	Cumulative Middle Sch. Students	Cumulative PROGRAM Capacity	Students Relationship to Capacity	PROGRAM Capacity Usage %	New Middle School Needed	Cumulative Middle Schools Needed	
2019						7,186	8,170	-984	87.96%			
2020	846	107	14	11	132	7,318	8,170	-852	89.57%			
2021	846	107	14	11	132	7,449	8,170	-721	91.18%	1	1	
2022	846	107	14	11	132	7,581	9,320	-1,739	81.34%			
2023	846	107	14	11	132	7,712	9,320	-1,608	82.75%			
2024	846	107	14	11	132	7,844	9,320	-1,476	84.16%			
2025	846	107	14	11	132	7,975	9,320	-1,345	85.57%			
2026	846	107	14	11	132	8,107	9,320	-1,213	86.98%			
2027	846	107	14	11	132	8,238	9,320	-1,082	88.39%			
2028	846	107	14	11	132	8,370	9,320	-950	89.81%			
2029	846	107	14	11	132	8,501	9,320	-819	91.22%	1	2	
2030	846	107	14	11	132	8,633	10,470	-1,837	82.45%			
2031	842	106	13	11	131	8,764	10,470	-1,706	83.70%			
2032	842	106	13	11	131	8,895	10,470	-1,575	84.95%			
2033	842	106	13	11	131	9,025	10,470	-1,445	86.20%			
2034	842	106	13	11	131	9,156	10,470	-1,314	87.45%			
2035	842	106	13	11	131	9,287	10,470	-1,183	88.70%			
2036	842	106	13	11	131	9,418	10,470	-1,052	89.95%			
Totals					2,232						2	

High Schools:

The methodology that was applied used a minimum threshold of 90 percent of design capacity usage in order to trigger the need for a new high school to be built.

Year	New Dwelling Units	Average Students per Dwelling Type			Total New High Sch. Students	Cumulative High Sch. Students	Cumulative DESIGN Capacity	Students Relationship to Capacity	DESIGN Capacity Usage %	New High School Needed	Cumulative High Schools Needed
		S.F.	T.H.	M.F.							
2019					9,725	10,650	-925	91.31%	1	1	
2020	846	127	16	21	165	9,890	12,800	-2,910	77.27%		
2021	846	127	16	21	165	10,055	12,800	-2,745	78.55%		
2022	846	127	16	21	165	10,220	12,800	-2,580	79.84%		
2023	846	127	16	21	165	10,385	12,800	-2,415	81.13%		
2024	846	127	16	21	165	10,550	12,800	-2,250	82.42%		
2025	846	127	16	21	165	10,715	12,800	-2,085	83.71%		
2026	846	127	16	21	165	10,880	12,800	-1,920	85.00%		
2027	846	127	16	21	165	11,045	12,800	-1,755	86.29%		
2028	846	127	16	21	165	11,210	12,800	-1,590	87.58%		
2029	846	127	16	21	165	11,375	12,800	-1,425	88.87%		
2030	846	127	16	21	165	11,540	12,800	-1,260	90.16%	1	2
2031	842	127	16	21	164	11,704	14,950	-3,246	78.29%		
2032	842	127	16	21	164	11,868	14,950	-3,082	79.39%		
2033	842	127	16	21	164	12,032	14,950	-2,918	80.48%		
2034	842	127	16	21	164	12,196	14,950	-2,754	81.58%		
2035	842	127	16	21	164	12,361	14,950	-2,589	82.68%		
2036	842	127	16	21	164	12,525	14,950	-2,425	83.78%		
Totals					2,800					2	

Stafford County School Board Growth Forecast

The School Board commissioned an assessment of the current schools to determine where and when existing schools will approach and achieve over capacity due to projected growth. A summary table of the findings is provided.

Fall 2020 Ten-Year Membership Forecast – Stafford County Public Schools

Forecast Assumptions:

1. 2019-20 membership report supplied by SCPS, capture date: 9/30/19, Pre-K located at North Star and Rising Star.
 2. Active residential development data supplied by Stafford County Planning, 8/1/19.
 3. September 30, 2020 official count is an anomaly caused by the COVID-19 pandemic.
- SPDM File: 20191026

Elementary School	2019-20		2020-21		Projected Enrollment by School Year									
	Design Capacity	Actuals	Actuals	Count Year	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31*
Kate Waller Barrett ES	950	858	772	858	841	843	854	864	878	910	950	969	983	1,007
Margaret Brent ES	950	905	739	848	860	878	885	895	910	913	920	935	948	960
Anthony Burns ES	950	760	865	826	826	840	854	864	883	895	897	897	897	897
Conway ES	950	885	945	892	881	882	895	895	892	888	890	890	888	888
Falmouth ES	794	649	627	615	595	594	593	600	604	631	631	650	666	683
Ferry Farm ES	732	645	560	620	611	606	611	622	622	632	642	651	657	665
Garrisonville ES	768	543	536	564	572	571	572	571	571	588	567	569	570	571
Grafton Village ES	754	722	565	726	734	738	741	741	749	750	754	756	760	763
Hampton Oaks ES	950	871	784	888	889	888	885	884	884	895	912	920	924	934
Hartwood ES	649	548	535	556	635	738	775	785	785	783	782	792	800	806
Moncure ES	964	882	849	854	831	856	882	914	962	1,019	1,059	1,087	1,129	
Park Ridge ES	843	793	830	858	884	925	904	904	986	1,018	1,054	1,072	1,084	1,106
Rockhill ES	843	668	619	716	721	732	735	746	739	739	737	739	739	739
Rocky Run ES	950	846	884	873	880	885	889	899	906	895	889	896	903	906
Stafford ES	794	726	695	766	818	834	837	842	835	835	836	840	842	842
Widewater ES	843	682	567	645	741	746	742	745	745	745	782	810	842	871
Winding Creek ES	925	873	757	820	955	976	1,001	1,011	1,018	1,001	987	987	986	981
Total Elementary (K-5)	14,609	12,665	11,947	13,201	13,310	13,495	13,695	13,892	14,004	14,192	14,378	14,527	14,701	

Middle School	2019-20		2020-21		Projected Enrollment by School Year									
	Design Capacity	Actuals	Actuals	Count Year	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31*
Dixon-Smith MS	1,100	805	780	786	765	762	762	774	774	773	774	776	778	780
Drew MS	650	630	657	632	663	673	682	675	675	676	680	683	684	700
Gayle MS	1,100	950	960	966	972	981	979	1,008	1,055	1,090	1,090	1,105	1,106	1,123
Heim MS	1,100	990	990	1,034	1,058	1,095	1,136	1,174	1,200	1,200	1,210	1,228	1,256	1,275
Poole MS	1,100	896	944	957	983	1,011	1,045	1,088	1,119	1,141	1,156	1,179	1,199	
Stafford MS	1,100	985	946	1,095	1,101	1,120	1,126	1,152	1,181	1,181	1,188	1,172	1,165	
Thompson MS	1,100	1,032	996	955	983	993	997	995	1,046	1,077	1,097	1,091	1,106	
Wright MS	920	808	908	851	821	821	828	838	850	855	861	861	857	859
Total Middle (6-8)	8,170	7,186	7,130	7,276	7,346	7,456	7,562	7,690	7,702	7,900	8,018	8,088	8,133	8,211

High School ¹	2019-20		2020-21		Projected Enrollment by School Year									
	Design Capacity	Actuals	Actuals	Count Year	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31*
Brooke Point HS	2,125	1,951	2,080	2,167	2,297	2,371	2,431	2,485	2,525	2,591	2,655	2,733	2,802	
Colonial Forge HS	2,175	2,003	1,956	2,062	2,144	2,158	2,177	2,174	2,174	2,169	2,185	2,235	2,255	
Mountain View HS	2,150	1,983	2,054	2,041	2,052	2,028	1,990	1,955	1,932	1,943	1,954	1,995	2,016	
North Stafford HS	2,050	1,768	1,812	1,803	1,838	1,996	2,083	2,186	2,273	2,356	2,428	2,454	2,514	
Stafford HS	2,150	2,000	2,022	2,151	2,188	2,237	2,249	2,261	2,285	2,293	2,305	2,311	2,319	
Total High (9-12)	10,650	9,725	9,924	10,234	10,579	10,779	10,930	11,064	11,190	11,352	11,527	11,728	11,907	

Total - K-12	33,429	29,576	29,001	30,711	31,255	31,750	32,185	32,658	33,094	33,562	33,995	34,388	34,815
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* The SCPS Demographic Planning Department used a 3-year average growth trend to extrapolate the 2030 forecast. The membership forecast for School Years 2021 to 2029 generated by University, LLC for SCPS in 2019-20.
¹ High school membership totals exclude six (6) high school aged students receiving educational services at Appalachian Regional Jail intended for planning purposes only.

Parks and Recreation**Location/Site Selection Criteria:**

- All parks should be co-located with other public facilities where appropriate.
- Acquisition of parkland adjacent to existing parks, athletic complexes and historic sites should be acquired for creation of buffers and to allow park expansion.
- Consider public/private partnerships or any other joint opportunities in the delivery of park and recreation service delivery.
- Encourage Virginia Department of Transportation (VDOT) to construct bicycle lanes and/or paths in conjunction with road widening projects.
- Locate sites adjacent to existing or planned residential areas to promote non-vehicular access and shorten drive time.
- Sites with athletic components requiring high water and/or sewage disposal must be located within the existing USA.
- Location of historical sites and natural area parks will be determined by the presence of historical and cultural resources, environmental features, the significance of wildlife habitat, the presence of endangered, threatened or state-listed flora and fauna, and the potential for educational, interpretive and low-impact recreational activities.

Facility Recommendations/Timing:

- 1,445 = Existing Acres of County Parkland
- 0.0092 = Acres of Existing County Parkland/Capita
- 12 = Acres per 1,000 people (County Standard)
- 1,883 = Needed Acres of Parkland as of the April 1, 2020 Population
- 438 = Deficit of County Parkland that exists as of January 1, 2021
- \$470,000 = Cost to acquire and develop one acre of new County Parkland in 2009
- 8.0% = Annual Inflation Rate

Year	Population	Change in Population	Accumulating Population Increase	Acres of Parkland/Capita Per Year	Total Parkland Needed at this Year
2020	156,927				
2021	159,550	2,623	2,623	31.5	469.5
2022	162,174	2,624	5,247	31.5	501.0
2023	164,797	2,623	7,870	31.5	532.5
2024	167,421	2,624	10,494	31.5	564.0
2025	170,044	2,623	13,117	31.5	595.4
2026	172,668	2,624	15,741	31.5	626.9
2027	175,291	2,623	18,364	31.5	658.4
2028	177,915	2,624	20,988	31.5	689.9
2029	180,538	2,623	23,611	31.5	721.4
2030	183,161	2,623	26,234	31.5	752.8
2031	185,770	2,609	28,843	31.3	784.1
2032	188,379	2,609	31,452	31.3	815.4
2033	190,988	2,609	34,061	31.3	846.8
2034	193,597	2,609	36,670	31.3	878.1
2035	196,206	2,609	39,279	31.3	909.4
2036	198,815	2,609	41,888	31.3	940.7
Totals	-	-	-	502.7	-
	Total Needed in addition to deficit				502.7
	Total needed including deficit				940.7

Libraries

Location Criteria:

- Provide new facilities to adequately and equitably serve all areas of the County. Schedule library acquisition and/or construction to respond to both current unmet demand and new growth when it occurs.
- Future library sites shall be located within the existing Urban Services Area (USA). Exceptions may be made when the only way to meet LOS Standards is to locate the library outside the USA.
- Sites should be located along main travel corridors with consideration of minimizing users' drive time. The site should be chosen to support the mission of providing library material and services to the greatest number of people.
- Generally library sites should be at least six (6) acres in size to allow for a full size branch with adequate parking.
- An alternative to construction of new facilities is to establish new libraries in leased commercial spaces such as shopping centers. In Fredericksburg and other locations, public libraries serve as anchor stores and can draw one to two thousand citizens a day. Branches could be located within the Redevelopment Areas.

Site Selection/Design Criteria:

- Convenience and accessibility to the maximum number of users, direct access to a major arterial road.
- Preferred sites should have both north/south and east/west access.
- High visibility from major vehicular and pedestrian access routes.
- Proximity to compatible traffic-generating land uses, with evaluation similar to the needs for commercial retail business.
- Provide drive times 15 minutes or less to most parts of the service area.
- Accommodate a facility of at least 25,000 square feet.
- Provide parking at the rate of 4 spaces per 1,000 square feet of building space.
- Be incorporated into a variety of settings, including neighborhoods, adjacent to schools, or co-location with other public facilities as feasible, with relief to some criteria for co-location sites as determined by the Central Rappahannock Regional Library (CRRL).

Facility Recommendations/Timing:

- 69,907 = Existing square feet of Library building as of April 1, 2020
- 0.45 = Existing Square feet per capita as of April 1, 2020
- 156,927 = Needed Square footage of Library building as of the 2020 Census
- 1.00 = Recommended Square feet of Library building per capita (County Standard)
- 87,020 = Deficit of Square footage of Library building that exists as of April 1, 2020
- 25,000 = Square feet for Library building (County Standard, per FY2022 CIP)

Year	Total Population Annually	Change in Population Annually	Accumulating Population Increase	Additional Library Square Footage Needed for this Year	Total Library Square Footage Needed at this Year	New Libraries Needed	Total Number of New Libraries Needed
2020	156,927				87,020	3	3
2021	159,550	2,623	2,623	2,185	89,205	0	3
2022	162,174	2,624	5,247	2,186	91,391	0	3
2023	164,797	2,623	7,870	2,185	93,576	0	3
2024	167,421	2,624	10,494	2,186	95,762	0	3
2025	170,044	2,623	13,117	2,185	97,946	0	3
2026	172,668	2,624	15,741	2,186	100,132	1	4
2027	175,291	2,623	18,364	2,185	102,317	1	4
2028	177,915	2,624	20,988	2,186	104,503	0	4
2029	180,538	2,623	23,611	2,185	106,688	0	4
2030	183,161	2,623	26,234	2,185	108,873	0	4
2031	185,770	2,609	28,843	2,173	111,046	0	4
2032	188,379	2,609	31,452	2,173	113,220	0	4
2033	190,988	2,609	34,061	2,173	115,393	0	4
2034	193,597	2,609	36,670	2,173	117,566	0	4
2035	196,206	2,609	39,279	2,173	119,739	0	4
2036	198,815	2,609	41,888	2,173	121,913	0	4
-	-	-	Totals	34,893	-	-	4

Government and Judicial

Facility Recommendations/Timing:

- 328,030 = Existing square feet of Government building as of July 1, 2015
- 2.34 = Square feet per capita as of July 1, 2015 (County Standard)
- \$259 = Cost of New Government building (per square footage)
- 8.00% = Annual Inflation Rate

Year	Population	Change in Population	Accumulating Population Increase	Additional Gov't Building Square Footage Needed for this Year	Total Gov't Square Footage Needed at this Year
2015	140,176	0	0	0	0
2016	141,915	1,739	1,739	4,069	4,069
2017	145,699	3,784	5,523	8,855	12,924
2018	149,110	3,411	8,934	7,982	20,906
2019	151,689	2,579	11,513	6,035	26,940
2020	156,927	5,238	16,751	12,257	39,197
2021	159,550	2,623	19,374	6,138	45,335
2022	162,174	2,624	21,998	6,140	51,475
2023	164,797	2,623	24,621	6,138	57,613
2024	167,421	2,624	27,245	6,140	63,753
2025	170,044	2,623	29,868	6,138	69,891
2026	172,668	2,624	32,492	6,140	76,031
2027	175,291	2,623	35,115	6,138	82,169
2028	177,915	2,624	37,739	6,140	88,309
2029	180,538	2,623	40,362	6,138	94,447
2030	183,161	2,623	42,985	6,138	100,585
2031	185,770	2,609	45,594	6,105	106,690
2032	188,379	2,609	48,203	6,105	112,795
2033	190,988	2,609	50,812	6,105	118,900
2034	193,597	2,609	53,421	6,105	125,005
2035	196,206	2,609	56,030	6,105	131,110
2036	198,815	2,609	58,639	6,105	137,215
Totals	-	-	-	-	137,215

Targeted Growth Area Public Facility Needs

The following section identifies the public facility needs for each individual Targeted Growth Area, as referenced in Chapter 3 of this document. These estimates are considered a portion of the total Countywide facility needs identified in the first part of this Appendix.

Courthouse Planning Area

Assumptions:

Persons per Household (2020 CENSUS)	Courthouse Dwelling Units	Population
3.10	5,440	16,864

1. Parks and Recreation

LOS	Population	Area Demand
12 acres per 1,000 people	16,864	202 acres

2. Fire and Rescue

LOS	Population	Demand	Station	Number of Fire Stations
1.122 sq. ft. per capita	16,864	18,921 sq. ft.	21,000 sq. ft.	0.90

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	1,500 Units	Gen. Rate	750 Units	Gen. Rate	3,190 Units		
Elementary	.431	647	.265	199	.113	360	1,206	1.25
Middle	.235	353	.126	95	.06.04	128	576	0.50
High	.281	422	.153	115	.074	236	773	0.40
Total Students		1,422		409		724	2,555	

4. Libraries

LOS	Population	Demand	Library Size	Number of Libraries
1.0 sq. ft. per capita	16,864	16,864 sq. ft.	25,000 sq. ft.	0.67

Central Stafford Business Area

Assumptions:

Persons per Household (2020 CENSUS)	Central Stafford Dwelling Units	Population
3.10	1,750	5,425

1. Parks and Recreation

LOS	Population	Demand
12 acres per 1,000 people	5,425	65.1 acres

2. Fire and Rescue

LOS	Population	Demand	Station	No. of Fire Stations
1.122 sq. ft. per capita	5,425	6,087 sq. ft.	21,000 sq. ft.	0.29

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	550 Units	Gen. Rate	200 Units	Gen. Rate	1,000 Units		
Elementary	.431	237	.265	53	.113	113	403	0.42
Middle	.235	129	.126	25	.04	40	194	0.17
High	.281	155	.153	31	.074	74	260	0.12
Total Students		521		109		227	857	

4. Libraries

LOS	Population	Demand	Library Size	No. of Libraries
1.0 sq. ft. per capita	5,425	5,425 sq. ft.	25,000 sq. ft.	0.22

Berea Planning Area

Assumptions:

Persons per Household (2020 CENSUS)	Berea Dwelling Units	Population
3.10	1,650	5,115

1. Parks and Recreation

LOS	Population	Area Demand
12 acres per 1,000 people	5,115	61 acres

2. Fire and Rescue

LOS	Population	Demand	Station	No. of Fire Stations
1.122 sq. ft. per capita	5,115	5,739 sq. ft.	21,000 sq. ft.	0.27

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	500 Units	Gen. Rate	400 Units	Gen. Rate	750 Units		
Elementary	.431	216	.265	106	.113	85	407	0.42
Middle	.235	118	.126	50	.04	30	198	0.17
High	.281	141	.153	61	.074	56	258	0.12
Total Students		475		217		171	863	

4. Libraries

LOS	Population	Demand	Library Size	No. of Libraries
1.0 sq. ft. per capita	5,115	5,115 sq. ft.	25,000 sq. ft.	0.20

Falmouth Gateway Planning Area

Assumptions:

Persons per Household (2020 CENSUS)	Falmouth Gateway Dwelling Units	Population
3.10	1,650	5,115

1. Parks and Recreation

LOS	Population	Area Demand
12 acres per 1,000 people	5,115	61 acres

2. Fire and Rescue

LOS	Population	Demand	Station	No. of Fire Stations
1.122 sq. ft. per capita	5,115	5,739 sq. ft.	21,000 sq. ft.	0.27

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	500 Units	Gen. Rate	400 Units	Gen. Rate	750 Units		
Elementary	.431	216	.265	106	.113	85	407	0.42
Middle	.235	118	.126	50	.04	30	198	0.17
High	.281	141	.153	61	.074	56	258	0.12
Total Students		475		217		171	863	

4. Libraries

LOS	Population	Demand	Library Size	No. of Libraries
1.0 sq. ft. per capita	5,115	5,115 sq. ft.	25,000 sq. ft.	0.20

Boswell's Corner Planning Area

Assumptions:

Persons per Household (2020 CENSUS)	Boswell's Corner Dwelling Units	Population
3.10	80	248

1. Parks and Recreation

LOS	Population	Area Demand
12 acres per 1,000 people	248	3 acres

2. Fire and Rescue

LOS	Population	Demand	Station	No. of Fire Stations
1.122 sq. ft. per capita	248	278 sq. ft.	21,000 sq. ft.	0.01

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	0 Units	Gen. Rate	80 Units	Gen. Rate	0 Units		
Elementary	.431		.265	21	.113		21	0.02
Middle	.235		.126	10	.04		10	0.01
High	.281		.153	12	.074		12	0.006
Total Students				43			43	

4. Libraries

LOS	Population	Demand	Library Size	No. of Libraries
1.0 sq. ft. per capita	248	248 sq. ft.	25,000 sq. ft.	0.01

C. 80-20 Growth Policy Analysis – 5-yr Comp Plan Update

July 7, 2021

Recent Permit Trends

Building Permits per year (over 5-year period)

Inside USA	785	73.7%
Outside USA	280	26.3%
Total	1,065	100%

To be Built

Approved Subdivision Lots - Total

Inside USA	4,576	78.7%
Outside USA	1,234	21.3%
Total	5,810	100%

Buildout Trends

The A-1 zoning district density changes approved in 2021 has the effect of reducing the potential future buildout on A-1 zoned properties by up to half of the original buildout potential.

Countywide Buildout Potential

Under 3-acre lot size (previous ordinance) – 12,260 future units

With 6-acre gross density (current ordinance) – 6,222 future units

Outside of the USA

Under 3-acre lot size (previous ordinance) – 7,484 future units

With 6-acre gross density (current ordinance) – 3,720 future units

Summary

The growth trends should begin to edge closer to the 80-20 ratio based on the To Be Built ratios and reductions to the projected buildout based on the latest A-1 zoning changes.

D. TDA County-wide Acreage Needs

This table represents the minimum acreage that Stafford County would need to designate for Targeted Development Areas (TDA) based on a generalized county-wide evaluation given the alternatives that provide varying degrees of development intensity. This information is based on the methodology presented during a session on Urban Development Areas at the 2010 CPEAV Zoning Law Seminar on July 23, 2010 in Charlottesville, Virginia

	UDA Alternatives		
	Low Density Alternative	Medium/Mixed Densities	High Density
	All Single Family Dwellings (10,570)	1/3 Single Family, 1/3 Townhouse, 1/3 Multi-family (3,523 units each)	All Multi-family Dwellings (10,570)
Land Use	Acres	Acres	Acres
Residential	2,642	2,349	881
Commercial/Employment	574	574	574
Total	3,216	2,923	1,455

Note: The ultimate area should be adjusted to account for public land and right of way.

Assumptions

2021 Amended TDA Buidlout Projection - 10,570 dwelling units
 32,767 new residents

Commercial / Employment based on County estimate of 1 million square feet of floor area per year, or 10 million square feet over 10 years.

Conversion to acreage: $10,000,000 / 0.4 \text{ (FAR)} / 43,560 \text{ (sq ft/ac)} = 573.92 \sim 574 \text{ Acres}$

Densities:
 Single Family: 4 du/acre
 Townhouse: 6 du/acre
 Multi-family: 12 du/ac

E. Affordable Housing

Introduction: Affordable Housing

Affordable Housing (Workforce Housing) is safe, decent housing where costs (mortgage or rent plus utilities) does not exceed 30 % of gross household income. Households that spend more than 30% of their gross income on housing costs are considered to be cost burdened. These households may also be classified as Asset Limited, Income Constrained, Employed (ALICE). They make enough money not to be classified as being in poverty but may have difficulty affording essentials such as childcare, healthcare and housing. Nearly half of all renters in the County (45.2%) are ALICE.

Workforce: 50% to 120% of median family income (\$110,446 in Stafford County) therefore: \$55,223 to \$132,535 (2019)

Homeownership expands individual opportunities to accumulate wealth, enables a family to exert greater control over its living environment, creates incentives for households to better maintain their homes, and may benefit children of homeowners. Homeownership also benefits local neighborhoods because owner-occupiers have a financial stake in the quality of the local community. (HUD 2005)

Communities that have had success producing more Affordable Housing have developed the attitude that Affordable Housing is part of the Economic Development Infrastructure. It is more than just a quality of life issue. Citizens who work in the communities where they live spend more of their incomes in their communities thus dramatically increasing tax revenues for their localities.

In virtually all communities nationwide, the magnitude of the housing need is likely to dwarf available resources. (The Brookings Institution, 2003)

Special Challenges of Low-Income Housing:

In the suburbs, local governments are politically dominated by homeowners, who comprise a majority of residents and are the most vocal. The major asset of most homeowners is their home. They have strong incentives to want the market values of homes to rise. They typically oppose any policies might reduce home values. They think letting more affordable units into their communities would do that and might also lower the quality of local schools and raise property taxes. So very few want to permit new low-cost housing near them, or to accept low-income neighbors. (Brookings Institution, 2003)

Rationale for Creating Affordable Housing:

Families who pay more than 30 percent of their income for housing are considered cost burdened (Alice) and may have difficulty affording necessities such as food, clothing, transportation and medical care. Everyone needs a place to live, regardless of age, job, race, disability, income or station in life. Although housing has often been cast as a "social" issue, it is

in fact a broader concern, cutting across many disciplines, including economics, social work, and public health, in addition to urban planning.

Consequences of Affordable Housing Shortages:

A common measure of community-wide affordability is the number of homes that a household with a certain percentage of median income can afford. For example, a community might track the percentage of its housing that is affordable to households earning 60% of median income. In addition to the distress it causes families who cannot easily find a place to live, lack of affordable housing is considered by many urban planners to have negative effects on a community's overall health. From an economic development perspective, lack of affordable housing may impact the ability to attract some businesses to the locality due to a shortage of workers. Lack of affordable housing can also contribute to traffic congestion on transportation arteries in the County due to workers living out of the County and depending upon those roadways for access to and from work.

Implications for Affordable Housing initiatives:

Affordable housing is the hardest form of real estate to make viable in the long run, because it maintains a dual mission: (1) be financially healthy, and (2) provide affordability to low income residents. These two goals are diametrically opposite — almost every decision involves trading one off against another.

To be viable at both missions, affordable housing requires the injection of government financial resources to fill the gap between what the market requires for quality, and what poor people can afford. It is a mistake to start an affordable housing initiative with too little government resource — all the financial wizardry imaginable may disguise but will not prevent its inevitable, and expensive, failure. (Affordable Housing Institute, 2006)

Federal Programs for Low and Affordable Housing:

- Low Income Housing Tax Credits (LIHTCs) and Historic Tax Credits
- HUD/FHA multifamily loans insured under all applicable sections of the National Housing Act
- HUD's Housing Choice Voucher Program for rental assistance programs
- Public housing, including privatization and revitalization of public housing under HUD's HOPE VI and mixed finance programs
- Tax-exempt bonds for housing and community development
- Representing local, regional and national non-profit developers, lenders and intermediaries in connection with acquisition, development, management and financing of housing projects
- Fannie Mae and Freddie Mac multifamily loan and investment programs

Housing assistance from the federal government for lower income households can be divided into three parts.

- “Tenant based” subsidies given to an individual household, known as the Housing Choice Voucher Program
- “Project based” subsidies given to the owner of housing units that must be rented to lower income households at affordable rates with oncome restrictions, and
- Public Housing, which is usually owned and operated by the government. (Some public housing projects are managed by subcontracted private agencies.)

Stafford County has no Public Housing Authority or public housing projects.

Sample Stafford County Employee Salaries (2020):

Fire & Rescue Technician - Grade B10; min \$50,960 mid \$68,806.40 max \$86,623

Deputy Sheriff I - Field Operations - Grade A09; min \$47,632 mid 64,292.80 max \$80,974.40

Administrative Specialist 1 - Grade A03; min \$31,740.80 mid \$42,848 max \$53,955.20

Human Resources Specialist - Grade A08; min \$44,512 mid \$60,091.20 max \$75,670.40

Parks Maintenance Worker I - Grade A01; min \$27,726.40 mid \$37,419.20 max \$47,123.80

The beginning salary for a teacher with a bachelor’s degree and no years of experience contracted to work 200 days earns \$48,000.

Teacher with a bachelor’s degree and 10-years of experience contracted to work 200 days earns \$52,900

NOTE: All salaries are for full-time employees

Market Trends: Stafford County Home Costs (2020)

Average Sold Price - \$400,106

- 8.29% increase from 2019

Median Sold Price - \$385,000

- 7.54% increase from 2019

Average days on the market – 24

- 40% decrease from 2019

During the Year 2020, the County was impacted by the COVID-19 Virus Pandemic market trends were substantially impacted by that event resulting in a-typical sales prices and time on the market.

What Other Communities Have Done to Address the Problem:

1. Affordable Dwelling Unit Ordinance - requires a percentage of new development to include affordable housing units. This ordinance must include incentives for developers or it actually increases the cost of housing instead of reducing it. This requires establishment of a Housing Authority to administer the program.
2. Forgive cash proffers and development related fees for affordable housing units
3. Density bonus for developments that include a pre-determined number of Affordable Housing Units
4. Dedicating One Cent from Property Taxes to Address Funding of Affordable Housing
5. Participate in Partnerships with Business Community and Other stakeholders to establish a non-profit entity to purchase and manage sale of affordable housing units
6. Use of County-Owned Surplus Land to Contribute to Affordable Housing Units
7. Seek Major Employer Contributions to Affordable Housing Fund
8. Determine the number of Affordable Housing Units currently in the community and take steps to conserve those units.
9. Participate in a Regional Affordable Housing Taskforce with community stakeholders to expand opportunities for affordable housing in the County.

F. Stafford Regional Airport Land Use Compatibility Study

A. Introduction

The Stafford Regional Airport is located in an area of the County that is anticipated to experience growth in the future. The area surrounding the Stafford Regional Airport was primarily agricultural and rural residential with very low density housing when it was initially sited in 1987. The growth pattern in the area has changed since that time with the construction of the Centerport Parkway in 2006 and amendments to the Future Land Use Plan in 2010 which allows for the potential of higher density development. The Airport Master Plan anticipates the extension of the existing runway and an increase in operations.

The Comprehensive Plan recognizes the need to plan for growth that is compatible with the airport in the following ways:

Chapter 2 (page 2-26) includes a recommendation for the development of land use compatibility standards:

Objective 4.9. Minimize the noise impacts and potential safety hazards generated by general aviation at public and private airfields in the County.

Policy 4.9.1. The County should develop land use compatibility standards for new development to conform to within the aircraft approach patterns of airports and landing strips.

Chapter 6 (page 6-10) includes the recognition of the current zoning overlay district:

Overlay Districts

In addition to the base zoning districts, the Stafford County Zoning Ordinance contains eight overlay districts. The purposes of the districts vary from protecting historical and environmental resources, reducing conflicts between established facilities, and mitigating potential hazards.

Overlay districts add a variety of standards to the underlying districts. These standards could include use restrictions, preservation requirements, or stricter density regulations. The following is a list of the overlay districts used in Stafford County:

AD Airport Impact - Provides an overlay zone in areas subject to intense and/or frequent emissions of noise and vibration from airports and prevents obstructions of airport zones which may result in an air navigation hazard.

An Airport Planning Area is established in order to further define and address the specific planning considerations related to land use compatibility including potential impacts related to exposure to aircraft noise, land use safety with respect both to people on the ground and the occupants of aircraft; the protection of airport airspace; and general concerns related to aircraft overflights. The Airport Planning Area consists of Airport Impact Zones that are defined in section C of this chapter.

B. Background of the Stafford Regional Airport

The Stafford Regional Airport is located in the center of Stafford County and is situated approximately 40 miles southwest of Washington D.C., 50 miles north of Richmond, Virginia and approximately 5 miles north of Fredericksburg, Virginia.

The need for a new public general aviation airport in Stafford County was determined in 1972 as part of the National Airport System Plan. In 1977 Stafford County conducted a feasibility study which detailed a need for a transport category airport in the region. A series of environmental studies were conducted between 1977 and 1992 and resulted in the final selection of an airport site in the central Stafford County area, adjacent to Interstate 95. Construction of the Airport began in 1997 and the airport opened in December 2001. The Airport was completed for just over \$41M dollars, \$5M under its allocated budget. This included an investment of \$820k from the Stafford Regional Airport Authority, almost \$39M from the Federal Aviation Administration (FAA) and approximately \$1.25M in Commonwealth of Virginia funding. The Airport Improvement Program Handbook states, with regard to any airport sponsor, "It (the airport sponsor) will take the appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft."

Significant airport development of more than \$14M has occurred since the Airport was originally constructed with the bulk coming from the FAA. This construction includes the addition of T- Hangars, two corporate hangars, apron areas, auto parking, fuel farm, security fencing, an instrument landing system (ILS), an approach lighting system and a new terminal building that opened in January 2014. The FAA and DOAV provide nearly all of the funding for future airport improvements and it is imperative that Stafford County establish and maintain high quality development compatibility standards to insure that future expenditures are used to improve the airport instead of noise abatement measures due to poor development planning.

The Airport is governed by a seven member Airport Authority (Stafford Regional Airport Authority or SRAA). These appointed members serve four year terms and represent Stafford County (four members), Prince William County (two members), and the City of Fredericksburg, Virginia (one member). A fulltime airport manager is located at the Stafford Regional Airport and handles the daily operation of the facility.

The Stafford Regional Airport service area includes Stafford County and portions of eight surrounding counties plus the City of Alexandria and Washington D.C. as determined by the Virginia Department of Aviation (DOAV) 2003 Virginia Air Transportation System Plan (VATSP) and airport records.

The Stafford Regional Airport is served by a single 5,000' x 100' grooved runway (15-33) as shown on the Airport Layout Plan in Exhibit 1. This runway is oriented 150 and 330 degrees and has a full-length parallel taxiway. Runway 15-33 utilizes High Intensity Runway Lights (HIRL) which can be operated by pilots using the Airport's Unicom frequency (122.725). Medium

Intensity Taxiway Lighting (MITL) is also available to pilots to assist in night operations, giving the facility 24-hour operational capability.

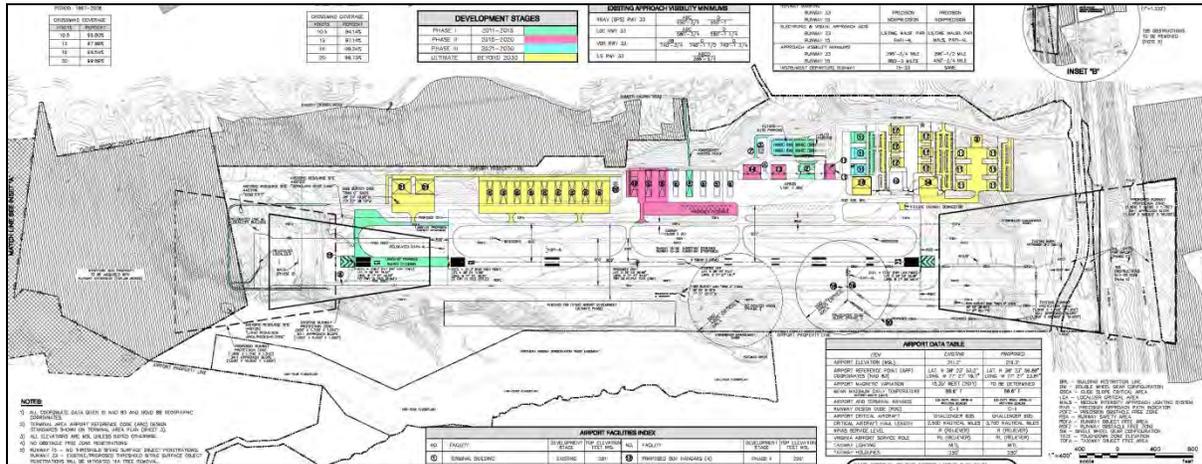


Exhibit 1: Airport Layout Plan

The Stafford Regional Airport currently has three instrument approach procedures consisting of an ILS approach, VOR approach, and a GPS approach. The ILS is an Instrument Landing System which uses radio waves broadcast from the Airport to align aircraft with the approach path to the runway. Runway 33 at the Airport has a Category 1 ILS System which enables aircraft with IFR (Instrument Flight Rules) equipment to land at RMN in inclement weather. Non-Precision instrument approaches (GPS or RNAV) for runway 15 have been developed and reviewed by the FAA but not implemented at this time.

Aircraft operating at the Stafford Regional Airport use existing traffic patterns based on the type and speed of the aircraft. The Airport currently operates with a standard left-hand traffic pattern for runway 33 and a nonstandard right-hand pattern for runway 15 as shown in Exhibit 2. This nonstandard pattern was temporarily implemented due to the proximity of a landfill which can serve as a bird attractant. Airport layout plans call for reinstating the standard left-hand traffic pattern on Runway 15 once the closest landfill cell to the Airport is closed as shown in Exhibit 3.

An operation is defined as either a takeoff or a landing at the airport. Existing airport activity exceeds 23,000 operations per year and a modest growth rate of approximately 1,000 operations per year for the next several years is projected. This figure is supported by the FAA and DOAV as indicated in the approved Airport Master Plan update that was completed in April 2013.

According to the 2011 Virginia Statewide Economic Impact Study, the Stafford Regional Airport provided 105 direct and indirect jobs and contributed \$18.2M in economic activity to the region in 2010. This impact demonstrates the value that the Stafford Regional Airport adds to the region as an economic engine.

(Source: *Stafford Regional Airport Compatible Land Use Study, May 2014, Talbert and Bright, Inc.*)

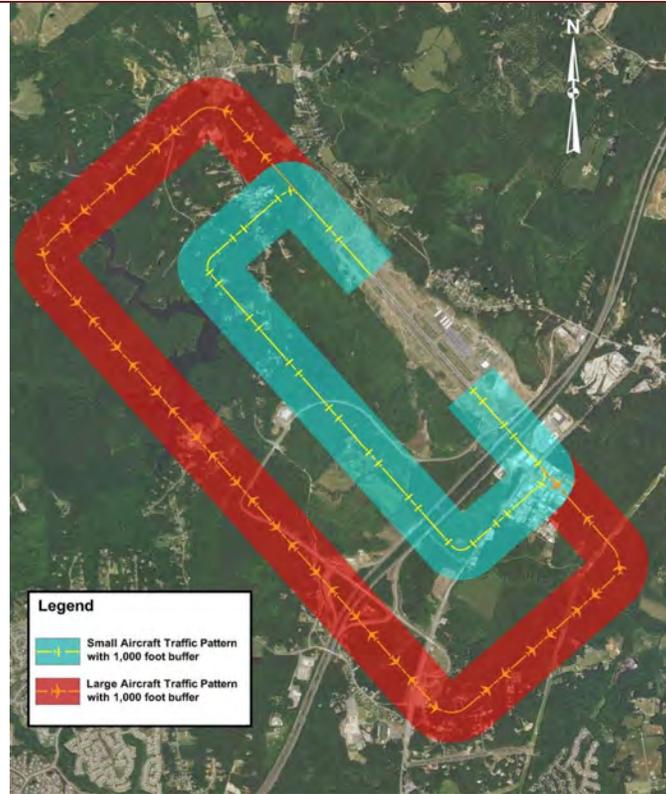


Exhibit 2: Non-standard Traffic Pattern

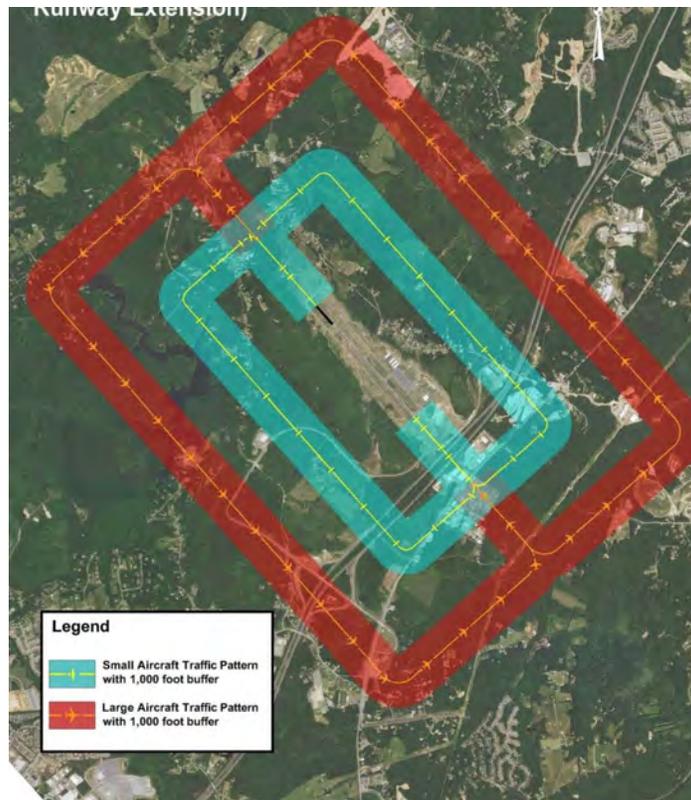


Exhibit 3: Standard Traffic Pattern

C. Airport Impact Zones

The Airport Impact Zones that make up the Airport Planning Area define and address the specific planning considerations related to land use compatibility in the area identified in the Airport Impact Overlay District and the Stafford Regional Airport Master Plan. The specific planning considerations include potential impacts related to exposure to aircraft noise, land use safety with respect both to people on the ground and the occupants of aircraft; the management of airport airspace; and general concerns related to aircraft overflights. This Plan designates Airport Impact Zones that closely correspond with the existing Airport Impact Zoning Overlay District. The zones are utilized in establishing the corresponding land use compatibility standards.

Approach zones reflect the approach and departure areas for the runway and are divided into several sub areas.

Approach –Final, Runway Protection Zone (AP-1). The closest area at the end of each runway, beginning 200-feet from the end of each runway, extending approximately two thousand five hundred (2,500) feet to the east and one thousand seven hundred (1,700) feet to the west.

Approach – Mid (AP-2). The area that fans out from the Runway Protection Zone, extending fourteen thousand (14,000) feet to the east and ten thousand (10,000) feet to the west.

Approach – Outer (AP-3). The area that fans out to the east of the runway that extends from fourteen thousand (14,000) feet to fifty thousand (50,000) feet from the runway.

Approach – Transitional (AP-T). A 5,000 foot wide area extending along each side of the Outer Approach, beyond the Conical zone.

Transitional (T). The area that fans away perpendicular to any airport runway centerline and approach surfaces

Horizontal zones include the area that is established by swinging arcs of ten thousand (10,000) feet radii from the center of the end of the primary surface of an airport runway and connecting adjacent arcs by drawing lines tangent to those areas. The horizontal zone excludes the approach and transitional zones. The area is divided into two sub-areas for the purpose of land use compatibility.

Horizontal – Inside Flight Pattern (H-1). The inner portion of the Horizontal zone that encompasses the majority of the existing and future aircraft traffic patterns.

Horizontal – Outside Flight Pattern (H-2). The outer portion of the Horizontal Zone that encompasses the outer edge of the Jet/Turboprop (large) aircraft traffic patterns.

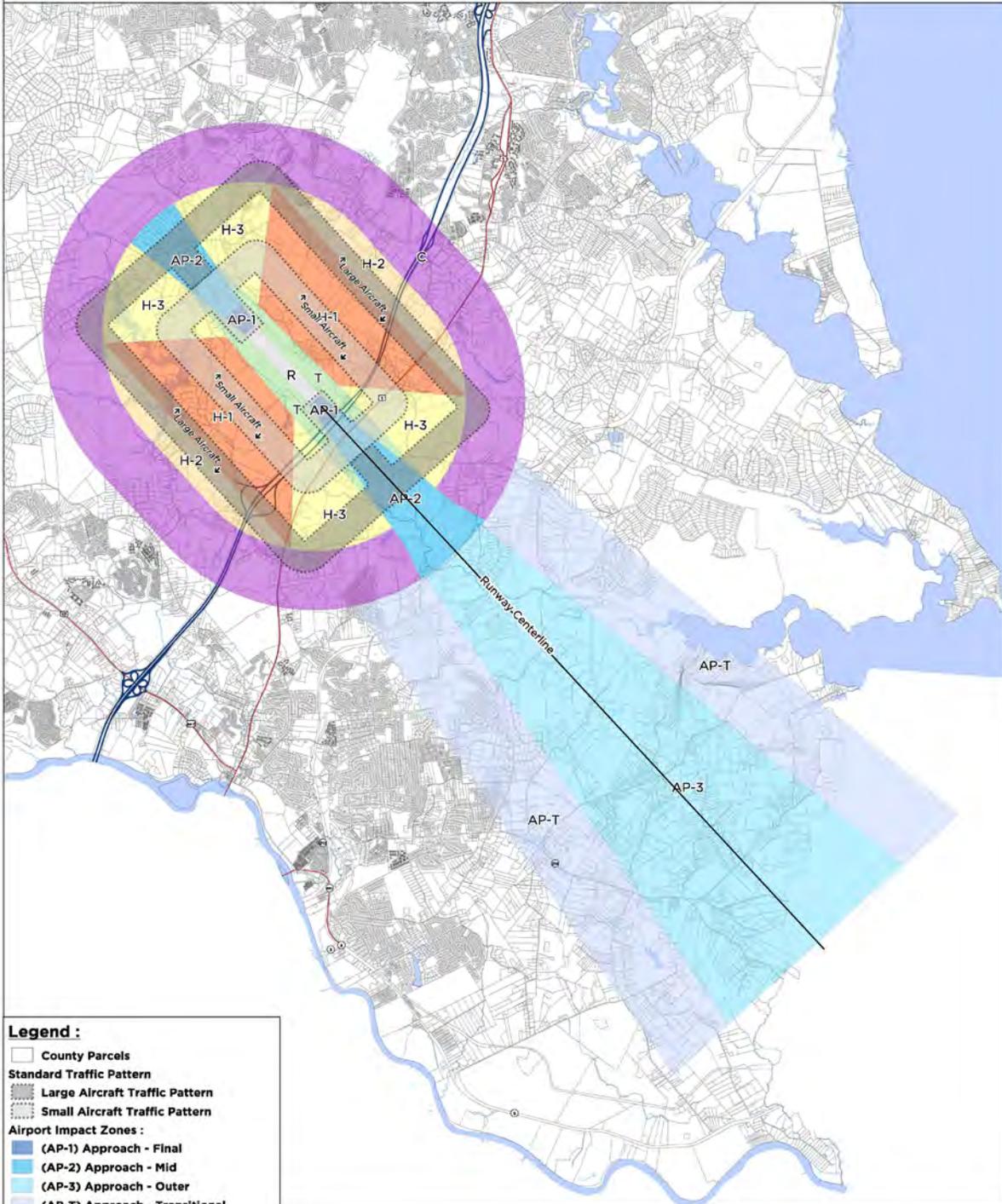
Horizontal – Turning Areas (H-3). The area of the Horizontal zone that encompasses the portion of the traffic pattern area where turning movements occur, where aircraft generate louder noise and there is increased accident probability.

Conical (C). The area that surrounds and commences at the periphery of the horizontal zone (10,000 feet from the Runway Clear Zone) and extends outward from there for a distance of four thousand (4,000) feet.



Airport Land Use Compatibility Zones With Parcels

Produced by the Stafford County GIS Office
540-658-4033 | www.StaffordCountyGIS.org



Legend :

- County Parcels
- Standard Traffic Pattern**
- Large Aircraft Traffic Pattern
- Small Aircraft Traffic Pattern
- Airport Impact Zones :**
- (AP-1) Approach - Final
- (AP-2) Approach - Mid
- (AP-3) Approach - Outer
- (AP-T) Approach - Transitional
- (C) - Conical Zone
- (H-1) Horizontal Inside Flight Pattern
- (H-2) Horizontal Outside Flight Pattern
- (H-3) Horizontal Turning Zone
- (R) Runway
- (T) Transitional

0 0.75 1.5 3 Miles

Coordinate System: NAD 1983 NADN StatePlane Virginia North FIPS 4561 Feet
Produced: 1/1/2015
MAD Path: W:\users\GIS\workspace\Planning\Airport Impact Analysis\AirportImpact\Drawings\20150122_ParcelLand

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

D. Land Use Compatibility Guidelines

The following guidelines are proposed in order to better address the potential for incompatible land uses and development within the Airport Planning Area:

GOAL: Stafford County shall promote the appropriate use of land in the Airport Planning Area to maintain and support the viability of the Stafford Regional Airport and protect and promote the general health, safety, welfare of the citizens, and overall economy in the airport area.

OBJECTIVE 1: Identify the compatibility of various land uses and establish development standards in relation to airport operations to minimize potential impacts related to exposure to aircraft noise, land use, and safety with respect both to people on the ground and the occupants of aircraft and ensure the protection of airport airspace.

Policy 1.1 General concerns related to aircraft overflights shall be identified and mitigated during the development review process for all applications for uses within the Airport Planning Area.

Policy 1.2: All development within the Airport Planning Area shall be consistent with the Land Use Compatibility Matrix (Table 1) that identifies whether uses are Compatible, require Additional Review or are Incompatible within each Airport Impact Zone.

Policy 1.3: The compatibility guidelines shall be applied in conjunction with the requirements of the Future Land Use Plan recommendations.

Policy 1.4: The impacts of the following factors shall be considered for any development application within the Airport Planning Area:

1. Height of all structures and vegetation per the FAR Part 77 requirements;
2. Management of earth disturbances and the creation of open dirt areas during activities such as farming and construction to minimize dust emissions;
3. Reflective surfaces which cause glare, including storm water retention ponds, solar panels and/or light-colored or mirrored building materials;
4. Light emissions shining upward into the flight path, flashing lights or lights arranged in a linear pattern;
5. Uses that generate smoke, steam or fog;
6. Potential to attract wildlife and create habitat, such as open space and agricultural uses;
7. Number of people per unit of area per proposed use;
8. Existence of above ground storage of large quantities of materials that are hazardous, such as flammable, explosive, corrosive, or toxic materials;
9. Location of proposed uses where mobility of users is limited, such as schools, hospitals and nursing homes;
10. Location of critical community infrastructure, such as power plants, electrical substations, and public communications facilities, away from areas where damage or destruction could occur and cause significant adverse effects to public health and welfare beyond the immediate vicinity of the facility;

11. Proposed percentage of open space, including usable open space, in relation to the development area. For the purposes of this document, usable open space should be open areas that are long, level and free of obstacles that could serve as an emergency landing site to promote public safety. The ideal site would be at least 300 feet by 75 feet and be clear of obstacles;
12. Compatibility of all proposed uses with the Compatibility Matrix in Table 1.

Policy 1.5: The following standards shall apply to all development within the Airport Planning Area:

1. Final subdivision plats, site specific development plans, or any other document filed as part of any approval process with Stafford County shall contain the following disclosure statement:

*All or a portion of this property lies within the Airport Overlay District.
Persons on the premises may be exposed to noise and other effects as may
be inherent in airport operations;*
2. Avigation easements shall be dedicated to Stafford Regional Airport for all new residential, commercial, industrial, institutional or recreational buildings or structures intended for habitation or occupancy by humans or animals to allow unobstructed passage for aircraft related to the height requirements per FAR Part 77;
3. Applicable use restrictions shall apply only to the area of development within the respective compatibility zone;
4. Height restrictions are effective at all times;
5. Underground utilities are encouraged for all development located within approach zones (AP-1 & AP-2) and traffic pattern areas (H-1, H-2, & H-3);
6. Minimize the occurrence of sunlight glare and wildlife attractants from stormwater management ponds affecting pilots by limiting the size of ponds to under ½ acre in size and encouraging dry ponds;
7. All development within the Airport Planning Area must, at a minimum, be consistent with Federal Aviation Regulation Part 77 and Advisory Circular 150/5300-13A and any subsequent revisions.

Policy 1.6: Uses identified in Table 1 as requiring “Additional Review” shall follow the specific development standards identified in Table 2. The factors to consider during “Additional Review” shall include, but may not be limited to: size, scope and scale of a development, such as the area, building height, and number and square footage of structures; proposed use(s); location of the development in relation to the airport; location of uses on an individual site; proposed mitigation measures; population concentrations; and project externalities, defined as impacts related to the development of the project that may extend beyond the limits of the project both horizontally and vertically.

Policy 1.7: The following additional standards shall apply to Non-Residential Uses that require Additional Review in Table 1:

1. Activities and structures associated with the use shall not exceed the maximum building envelope ratio and/or site population limitation;
2. Incorporate shielding, such as the use of full cut-off lighting, lower intensity or other techniques to avoid the occurrence of light emissions shining upward into the flight path; flashing lights; or lights arranged in a linear pattern;
3. Waste disposal facilities shall not be located within 10,000 feet of the runway protection zone;
4. Provision of new private airfields or runways shall not be permitted within the planning area;
5. Additional open space requirements, height limitations and square footage limitations will apply to uses with concentrations of people.

Policy 1.8: The following additional standards shall apply to Residential Uses that require Additional Review in Table 1:

1. Development proposals shall not exceed the maximum density limitations established and further described in the Table 2 Additional Review Standards;
2. Development within the airport operations area shall be constructed to include sound insulation methods to achieve maximum internal noise levels of 45 dBc Ldn (average daily noise level);
3. Disclosure notification for all future purchasers of the property will be required for all residential development within an airport compatibility zone;
4. Provide contiguous open space in conjunction with clustering of residential development areas.

Policy 1.9: Specific projects which are Not Compatible, as identified in Table 1 may be appropriate if it can be demonstrated that the specific project would not negatively impact airport operations or safety of the general public upon additional review, consistent with the guidelines.

Policy 1.10: If a proposed use is not listed in Table 1, the use determined to be most similar would apply and would be evaluated against the related Additional Review criteria and any other standards deemed appropriate.

Policy 1.11: The County shall support efforts of the Airport Authority or other entity to acquire land and/or purchase development rights by coordinating receiving areas outside of the planning area in order to encourage compatible land uses within the planning area.

IMPLEMENTATION POLICIES

Policy 1.12: For projects in the Airport Planning Area, the County shall coordinate review of all proposed development applications, including, but not limited to, zoning reclassifications, conditional use permits, site plans, and preliminary plans, with the Airport Authority for compatibility with airport operations and plans for the purpose of receiving advisory comments and encouraging participation at County development review meetings.

Policy 1.13: The Zoning Ordinance shall be revised to implement the Compatibility Guidelines recommendations, including use restrictions, and development and building standards, and make commensurate adjustments to the Airport Overlay District.

Policy 1.14: Comprehensive Plan amendments and Ordinance amendments applicable to land within the Airport Planning Area shall be reviewed for compatibility with the Regional Airport Master Plan, Compatibility Matrix (Table 1) and related criteria and standards.

TABLE 1: CONSOLIDATED LAND USE COMPATIBILITY MATRIX

ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH - MID -14,000' EAST -10,000' WEST	APPROACH - OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL - TURNING ZONE	CONICAL ZONE
USES									
INSTITUTIONAL									
<i>Assembly</i> (schools, place of worship, daycare)	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Hospitals</i>	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Community</i> (Police, fire and rescue, neighborhood centers)	NC	AR	AR	C	AR	AR	C	AR	C
<i>Vertical Infrastructure</i> (Electric Transmission, Water Towers, Telecommunication Towers)	NC	NC	AR	AR	NC	AR	AR	AR	AR
RESIDENTIAL									
<i>Single-Family - Rural</i> (Maintain 3 acre density with min. lot size of 1 acre outside the USA, while inside the USA, lot sizes can be smaller than 1 acre if significant areas are retained for open space and the lowest density recommendations of the land use plan are not exceeded)	NC	AR	AR	C	NC	AR	AR	AR	C
<i>Single-family - Small Lot (<1 acre) & Townhomes</i>	NC	NC	AR	C	NC	AR ¹	AR ¹	NC	C
<i>Multi-Family</i> (Three or more units per building)	NC	NC	AR	C	NC	AR ¹	AR ¹	NC	C
<i>Group Living</i> (Nursing homes, group homes)	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Transient Lodging</i>	NC	AR	C	C	NC	AR	AR	AR	C
COMMERCIAL (RETAIL/OFFICE)									
<i>General Retail & Service</i> (shopping centers & stores, restaurants, convenience, vehicle fueling)	NC	AR	C	C	AR	AR	C	AR	C
<i>Automobile related</i> (sales lot, repair, storage)	NC	C	C	C	AR	C	C	C	C
<i>Low-rise Office</i> (1-3 stories)	NC	AR	C	C	AR	AR	C	AR	C
<i>Mid/High-rise Office</i> (4+ stories)	NC	NC	AR	C	NC	AR	AR	NC	C
INDUSTRIAL									
<i>Light</i> (Light Manufacturing, Storage, Warehouse)	NC	AR	C	C	AR	AR	C	C	C
<i>Heavy</i> (Landfill, Heavy Manufacturing, bulk fuel storage, mining, uses that emit smoke or create sun glare)	NC	NC	NC	AR	NC	AR	AR	AR	AR

¹ Residential uses within zones H-1 and H-2 are discouraged. Individual projects may be considered appropriate if it is determined that it satisfactorily addresses the Additional Review factors highlighted in Table 2.

TABLE 1: CONSOLIDATED LAND USE COMPATIBILITY MATRIX

ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH - MID -14,000' EAST -10,000' WEST	APPROACH - OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL - TURNING ZONE	CONICAL ZONE
USES									
ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH - MID -14,000' EAST -10,000' WEST	APPROACH - OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL - TURNING ZONE	CONICAL ZONE
USES									
RECREATION AND OPEN SPACE									
<i>Passive</i> (trails & natural areas)	NC	AR	C	C	NC	AR	C	AR	C
<i>Active</i> (community sports fields, golf, indoor facilities)	NC	AR	AR	C	NC	AR	C	AR	C
<i>Amusement</i> (Stadiums, amusement parks, fairgrounds)	NC	NC	AR	C	NC	AR	AR	NC	C
AGRICULTURAL									
<i>Grazing, Crops</i>	AR	AR	C	C	AR	AR	C	AR	C
<i>Processing</i> (Lumber mill, grain elevators and silos)	NC	NC	C	C	NC	AR	AR	AR	AR
OTHER									
<i>Aboveground storage tanks of fuel and flammable materials (except residential uses)</i>	NC	NC	NC	C	NC	NC	C	NC	C

Key: **C** = Compatible
AR = Additional Review – uses or activities that may be compatible with airport operations depending on their location and specifics of each project. Refer to design standards.
NC = Not Compatible – uses or activities that should not be permitted

ADDITIONAL REVIEW STANDARDS

Overview

Uses identified in Table 1 requiring “Additional Review” shall follow the specific development standards identified in Tables 2 and 3. The factors to consider during “Additional Review” shall include, but may not be limited to: size, scope and scale of a development, such as the area, building height, and number and square footage of structures; proposed use(s); location of the development in relation to the airport; location of uses on an individual site; proposed mitigation measures; population concentrations; and project externalities, defined as impacts related to the development of the project that may extend beyond the limits of the project both horizontally and vertically.

Residential proposals (Single-family - small lot & Multi-family) within the H-1 and H-2 zones

In consideration of a new residential rezoning request from the A-1 or A-2 zoning district, where all of the Additional Review criteria is satisfied, projects not exceeding a density increase of 50% over the current density may be considered Compatible. Rezoning from any commercial or other residential zoning district that adds or increases the permitted residential density is considered Not Compatible.

Uses in the AP-3, Approach Outer zone requiring Additional Review

Given the size and extent of the AP-3 zone, which extends east to King George County, uses may be deemed more compatible the farther away they are from the airport. Application of the additional review standards will be based on the location on a case by case basis and dependent on the site conditions and specific development proposal.

TABLE 2: ADDITIONAL REVIEW STANDARDS

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
INSTITUTIONAL		
<i>Assembly (schools, place of worship, daycare)</i>	H-1; H-2	<ul style="list-style-type: none"> • Limit population concentration thresholds within the low to mid- level range (see Table 3); • Limited to independently mobile populations;

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
		<ul style="list-style-type: none"> Public and private grade schools and stand-alone daycare are not permitted; Provide usable open space.
<i>Assembly (schools, place of worship, daycare)</i>	AP-3	<ul style="list-style-type: none"> Uses considered generally compatible; siting located laterally offset of the extended centerline of the runway is preferred.
<i>Hospitals</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> Permitted if deemed a critical service need by the Fire/Safety division; Limited to independently mobile patients and/or short term care of critical patients or use as a triage center; Provide usable open space; Limit building height to 1 story.
<i>Community (Police, fire and rescue, neighborhood centers)</i>	AP-2; AP-3; T; H-1; H-3	<ul style="list-style-type: none"> Emergency services are permitted if deemed a critical service need by the Fire/Safety division; Provide usable open space.
<i>Vertical Infrastructure (Electric Transmission, Water Towers, Telecommunication Towers)</i>	AP-T; H-1; H-2; H-3; C	<ul style="list-style-type: none"> Permitted if it does not interfere with airport communications and does not exceed height limitations, or otherwise causes safety concerns; Monopole type of structure is preferred over lattice or guy-wire type; Consider the height of the tower in relation to the site elevation.
RESIDENTIAL		
<i>Single-Family - Rural (Maintain 3 acre density with min. lot size of 1 acre outside the USA, while inside the USA, lot sizes can be smaller than 1 acre if significant areas are retained for open space and the lowest density recommendations of the land use plan are not exceeded)</i>	AP-2; AP-3; H-1; H-2; H-3	<ul style="list-style-type: none"> Encourage clustering with usable open space requirement; Encourage TDR program participation as a sending area; Require real estate disclosure notice on initial deed of transfer within the AP-2, H-1, H-2, and H-3 zones; Require notification statement on all plans of development and marketing literature; Encourage noise mitigation measures as part of construction if under the flight pattern to reduce internal noise levels at or below 45dB.

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
<i>Single-family - Small Lot (less than 1 acre) & Townhomes</i>	AP-3	<ul style="list-style-type: none"> • Encourage clustering with usable open space requirement; • Minimum of 50 percent overall open space, including usable open space; • Require notification statement on all plans of development and marketing literature.
<i>Single-family - Small Lot (less than 1 acre) & Townhomes</i>	H-1, H-2	<ul style="list-style-type: none"> • Use prohibited within 3000 feet of the centerline of the runway; • Areas of a proposal located within routine overflight zone should meet the usable and site open space requirements; • Development should be clustered outside of the overflight zone area; • Require real estate disclosure notice on initial deed of transfer; • Require notification statement on all plans of development and marketing literature; • Encourage noise mitigation measures as part of construction if under the flight pattern.
<i>Multi-Family (Three or more units per building)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> • Use prohibited within 3000 feet of the centerline of the runway; • Areas of a proposal located within routine overflight zone traffic pattern should be utilized to meet the usable and site open space requirements within a residential development; Cluster residential density outside of the overflight area if feasible; • Limit number of units per building; • Limit height to three stories; • Require real estate disclosure notice on initial deed of transfer within the H-1 and H-2 zones; • Require notification statement on all plans of development and marketing literature; • Encourage noise mitigation measures as part of construction if under the flight pattern.
<i>Group Living (Nursing homes, group homes)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> • Population concentration thresholds within low to mid-level range shall not be exceeded (see Table 3); • Limited to independently mobile patients;

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
		<ul style="list-style-type: none"> Require notification statement on all plans of development and marketing literature.
<i>Transient Lodging</i>	AP-2; H-3	<ul style="list-style-type: none"> Use should not exceed a height of 3 stories; Population concentration thresholds within low to mid-level range shall not be exceeded (see Table 3); Encourage noise mitigation measures as part of construction if under the flight pattern; Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.
<i>Transient Lodging</i>	H-1; H-2	<ul style="list-style-type: none"> Use should not exceed a height of 3 stories; Population concentration limits for site and single-acre shall not be exceeded (see Table 3); Encourage noise mitigation measures as part of construction if under the flight pattern; Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.
COMMERCIAL (RETAIL/OFFICE)		
<i>General Retail & Service (shopping centers & stores, restaurants, convenience, vehicle fueling)</i>	AP-2; T; H-1; H-3	<ul style="list-style-type: none"> Population concentration limits for site and single-acre shall not be exceeded (see Table 3); Larger shopping centers should provide usable open space; Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.
<i>Automobile related (sales lot, repair, storage)</i>	T	<ul style="list-style-type: none"> Limited to vehicle storage or open space; Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.
<i>Low-rise Office (1-3 stories)</i>	AP-2; AP-3; T; H-1; H-3	<ul style="list-style-type: none"> Provide usable open space requirements; Maximum population thresholds shall not be exceeded (see Table 3); Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.
<i>Mid/High-rise Office (4+ stories)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> Population concentration limits for site and single-acre shall not be exceeded (see Table 3); Consider limitations to building height based on the elevation of the site and proximity to the airport and flight patterns; Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
INDUSTRIAL		
<i>Light (light manufacturing, storage, warehouse)</i>	AP-2; T; H-1	<ul style="list-style-type: none"> • Low level of population concentration limits shall not be exceeded (see Table 3); • Compatible without externalities; • Provide usable open space; • Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.
<i>Heavy (landfill, heavy manufacturing, mining, uses that emit smoke or create sun glare)</i>	AP-T; H-1; H-2; C; H-3	<ul style="list-style-type: none"> • Compatible without externalities; • Provide usable open space; • Utilities that affect public health, safety and welfare not permitted within 4,000 feet of the runway; • Consider limitations to structure height based on the elevation of the site and proximity to the airport and flight patterns; • Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.
RECREATION AND OPEN SPACE		
<i>Passive (trails & natural areas)</i>	AP-2; H-3	<ul style="list-style-type: none"> • Avoid the incorporation of elements, vegetation and/or materials that attract birds, • Limit water retention areas to no greater than .5-acres; • Limit height and types of new and existing vegetation in accordance with the FAR Part 77 requirements.
<i>Active (community sports fields, golf, indoor facilities)</i>	AP-2; AP-3; H-1; H-3	<ul style="list-style-type: none"> • Population concentration limits for site and single-acre shall not be exceeded (see Table 3); • Limit water retention areas to no greater than .5-acres; • Avoid new features, vegetation and/or materials that attract birds.
<i>Amusement (Stadiums, amusement parks, fairgrounds)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> • Compatible with increased open space; • Within population concentration limits for site and per acre (see Table 3); • High intensity uses, such as stadiums, are not permitted; • Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>

POPULATION CONCENTRATION THRESHOLDS

Overview

This table is to be utilized when an Additional Review Standard in Table 2 refers to population concentration. These population concentration thresholds serve as a measurement tool to determine whether the population density for a given use may be too intense for a particular zone. The thresholds are measured across an entire site (site-wide) and within a portion of a site (single-acre).

- Site-wide Average Intensity: calculated by determining the total number of people expected to be on the site at any given time under normal conditions and dividing by the total number of acres of the project site.
- Single-Acre Intensity: calculated by determining the total number of people expected to be within any one-acre portion of the site at one time.

TABLE 3: POPULATION CONCENTRATION THRESHOLDS

ZONE(S)	SITE-WIDE AVERAGE INTENSITY	SINGLE-ACRE INTENSITY
AP-1	Site-wide Intensity: Exceptions can be permitted for agricultural activities, roads, and automobile parking provided that FAA criteria are satisfied	
AP-2	Site-wide Intensity: Low to Mid: 40 - 50 people per acre Mid to High: 51 - 60 people per acre	Single-Acre Intensity: Low to Mid: 80 -100 people per acre Mid to High: 101 -120 people per acre

T	Site-wide Intensity: Low to Mid: 70 - 85 people per acre Mid to High: 86 -100 people per acre	Single-Acre Intensity: Low to Mid: 210 - 255 people per acre Mid to High: 256 - 300 people per acre
H-1; H-2	Site-wide Intensity: Low to Mid: 200 - 250 people per acre Mid to High: 251 - 300 people per acre	Single-Acre Intensity: Low to Mid: 800 - 1000 people per acre Mid to High: 1001 - 1200 people per acre
H-3	Site-wide Intensity: Low to Mid: 70 - 85 people per acre Mid to High: 86 - 100 people per acre	Single-Acre Intensity: Low to Mid: 210 - 255 people per acre Mid to High: 256 - 300 people per acre

Source: California Airport Land Use Planning Handbook (Handbook) released October 2011 by the California Department of Transportation, Division of Aeronautics.

STAFFORD REGIONAL AIRPORT SAMPLE REAL ESTATE DISCLOSURE STATEMENT

The following is a sample disclosure statement that is recommended to be incorporated into the initial sale of new homes located within the Airport Impact Areas:

STAFFORD REGIONAL AIRPORT DISCLOSURE

The purchaser(s) of property at the following address: _____, on Assessor’s Parcel _____, located in Stafford County Virginia, hereafter referred to as “property”, acknowledges that the property lies in proximity to Stafford Regional Airport, and that the property is subject to aircraft operations and aircraft overflight, with related noise and safety concerns.

While air traffic may be generalized into tracks, it is, by nature, dispersed. Aircraft may approach and depart the airport from any number of directions. Flight paths vary depending on a variety of factors including origin/destination, wind conditions and other aircraft in the traffic pattern. As a result, any property in the vicinity of an airport is likely to be subject to aircraft overflight and its impacts to some degree. Stafford County’s Comprehensive Plan has an exhibit that depicts the aircraft traffic patterns associated with the airport.

Flight patterns may shift or change over time. Changes in operations may occur due to weather, changes in users, changes in aircraft type, military missions, weather conditions, etc. The airport is relatively new and still growing. Runway expansion and expansion of ground facilities are planned that will likely increase the number of flights in and out of the airport. The Stafford Regional Airport has a Master Plan that identifies plans for future expansion and development needs.

The undersigned purchaser(s) of said tract of land certify(ies) that he/she (they) has (have) read the above disclosure statement and acknowledge(s) the pre-existence of the Stafford Regional Airport and the noise exposure due to the airport.

Dated this ____ day of _____, 20____.

Purchaser's Signature

Purchaser's Signature

Purchaser's Signature

STAFFORD REGIONAL AIRPORT SAMPLE NOTICE

For full disclosure of the proximity to Stafford Regional Airport to prospective purchasers, the following sample notice should be included on all subdivision and site plans and record plats filed with Stafford County and used in sales contracts, brochures and promotional documents, including any illustrative site plans, and homeowner's association documents:

“STAFFORD REGIONAL AIRPORT: This property is located within the proximity to Stafford Regional Airport, specifically the Airport Impact Areas and Aircraft Traffic Pattern areas around the airport, as identified in the Stafford County Comprehensive Plan and Stafford Regional Airport Master Plan. The property is likely to be subject to aircraft overflight and noise impacts of varying degrees.”

E. Analysis of the Planning Area

The following analysis shows the area of existing zoning classifications within each zone and the future land use designations, which identify the types of potential development that may occur. When comparing current zoning to future land use, the greatest potential for incompatible development to occur is within the Horizontal Zone. The majority of the area is zoned A-1, Agricultural, with the potential of being rezoned as the land is planned for Business and Industry, Suburban and Urban Development Area (UDA) future land use designations. The land use designations within the Horizontal Zone are described below:

Business and Industry – 1,533 acres - Uses include retail, wholesale, corporate and professional offices, research and development, entertainment, manufacturing, distribution and transportation; possible heavy industrial uses; new and used vehicle sales, including automobiles and boats.

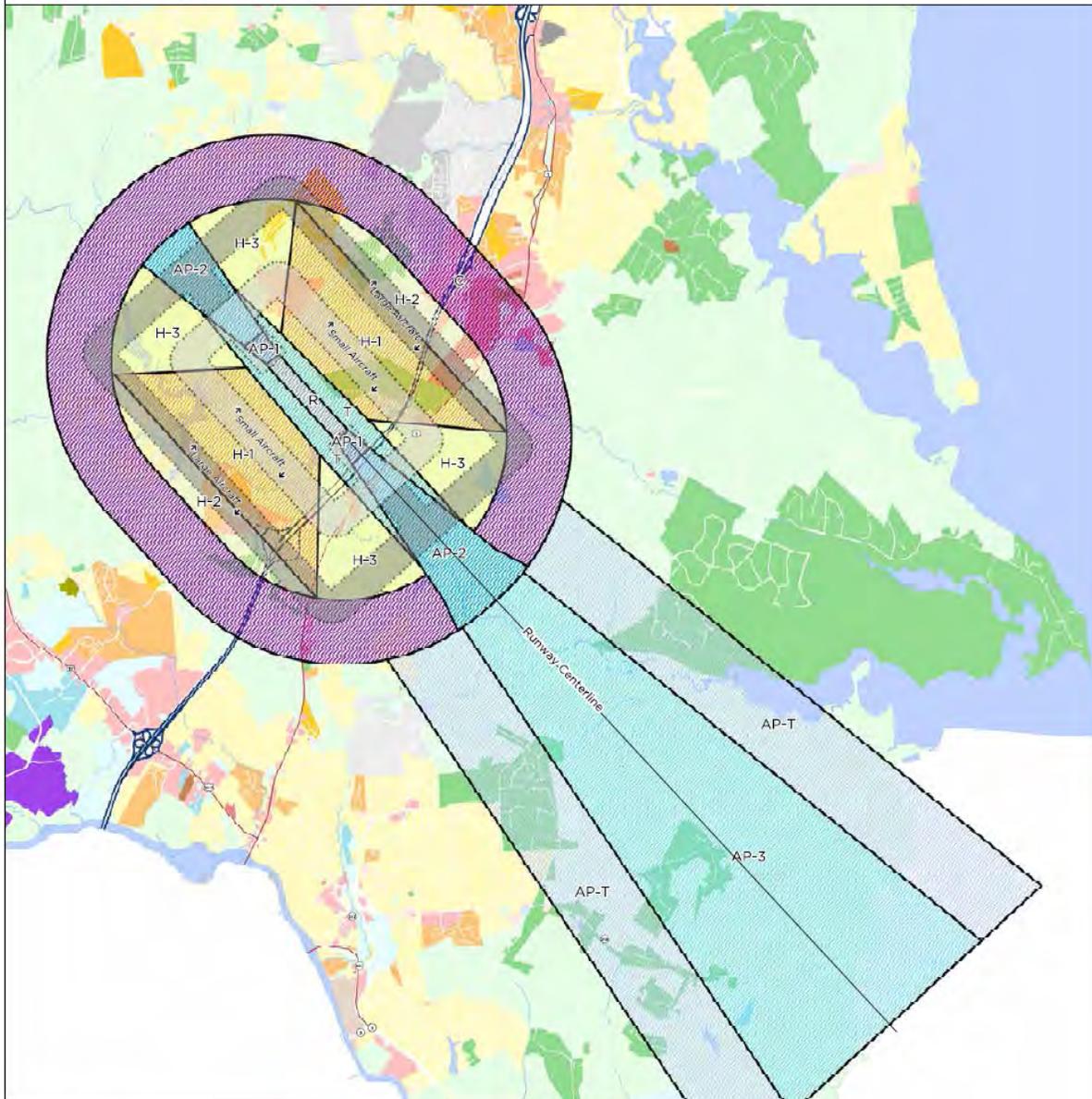
Suburban – 725 acres - Uses include single family detached dwelling units, typically on ¼ to ½ acre lots, maximum density of 3 du/ac; neighborhood and community oriented activity centers, places of worship, parks and play areas, and retail and business activities with a maximum floor area ratio (FAR) of 0.4.; industrial uses include warehousing, wholesaling, manufacturing, processing operations, mixed-use commercial/industrial development, and flex office space.

Urban Development Areas – mix of uses including approximately 8,829 dwelling units and 13,900,800 square feet of commercial retail and office space in an area totaling approximately 3,196 acres, 2,300 acres of which are within the Horizontal Zone.



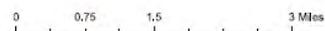
Airport Land Use Compatibility Zones With Zoning

Produced by the Stafford County GIS Office
540-658-4033 | www.StaffordCountyGIS.org



Legend :

<p>Standard Traffic Pattern</p> <ul style="list-style-type: none"> Large Aircraft Traffic Pattern Small Aircraft Traffic Pattern <p>Airport Impact Zones :</p> <ul style="list-style-type: none"> (AP-1) Approach - Final (AP-2) Approach - Mid (AP-3) Approach - Outer (AP-T) Approach - Transitional (C) - Conical Zone (H-1) Horizontal Inside Flight Zone (H-2) Horizontal Outside Flight Zone (H-3) Horizontal Turning Zone (R) Runway (T) Transitional <p>Zoning :</p> <ul style="list-style-type: none"> A1 - Agricultural A2 - Rural Residential R1 - Suburban Residential 	<ul style="list-style-type: none"> R2 - Urban Residential - Medium Density R3 - Urban Residential - High Density R4 - Manufactured Homes LC - Life Care/Retirement B1 - Convenience Commercial B2 - Urban Commercial B3 - Office M1 - Light Industrial M2 - Heavy Commercial SC - Suburban Commercial HI - Heritage Interpretation RC - Rural Commercial RBC - Recreational Business Campus UD - Urban Development PD1 - Planned Development 1 PD2 - Planned Development 2 PTND - Planned-Traditional Neighborhood
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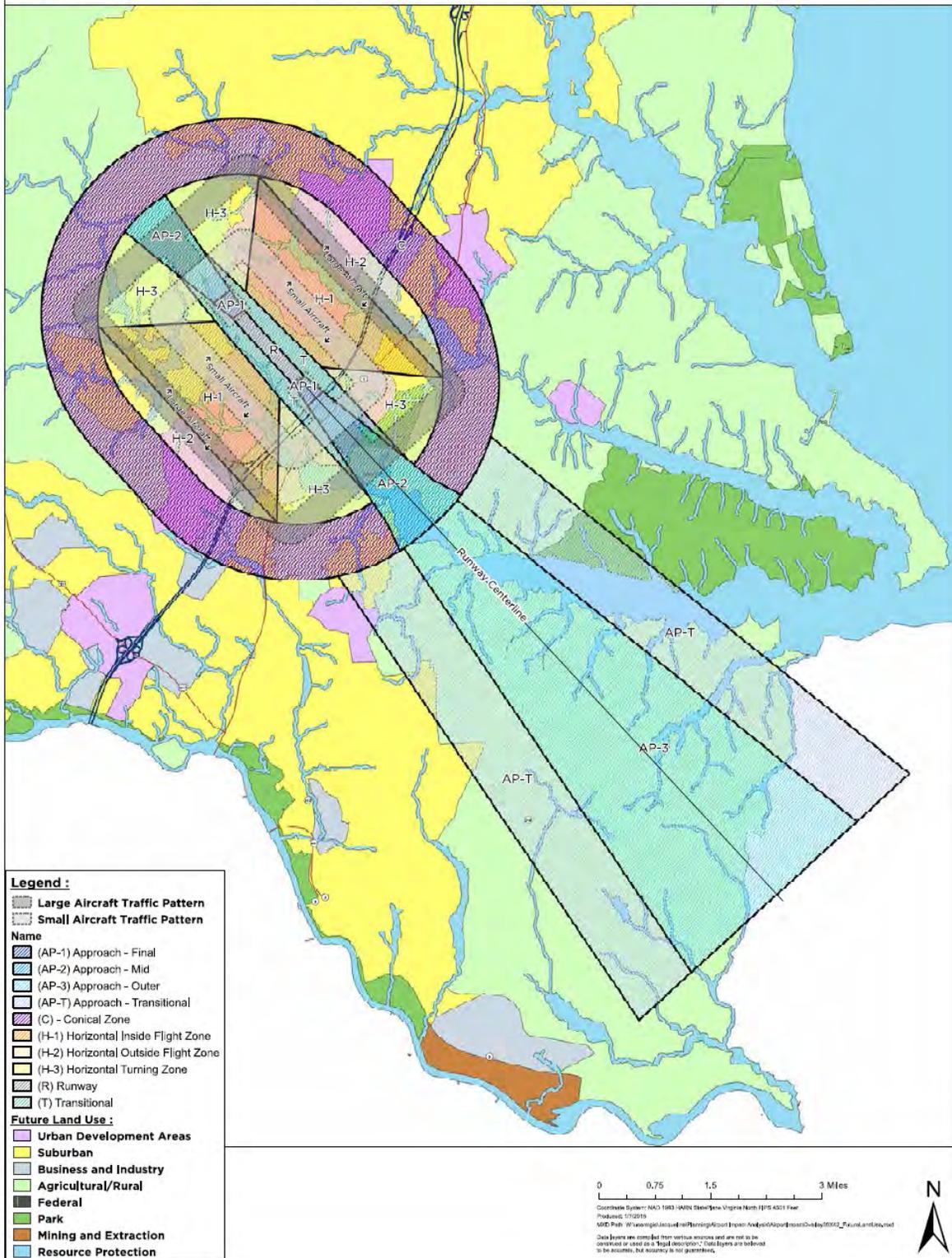


Coordinate System: NAD 1983 (NAD83) StatePlane Virginia North (FIPS 4201) Feet
 Produced: 5/12/2019
 Mxd Path: W:\gis\landuse\air\Planning\Airport Impact Analysis\AirportImpact\040419\0202_Zoning.mxd
 Data layers are compiled from various sources and are not to be considered or used as a legal description. Each layer is intended to be accurate, but accuracy is not guaranteed.



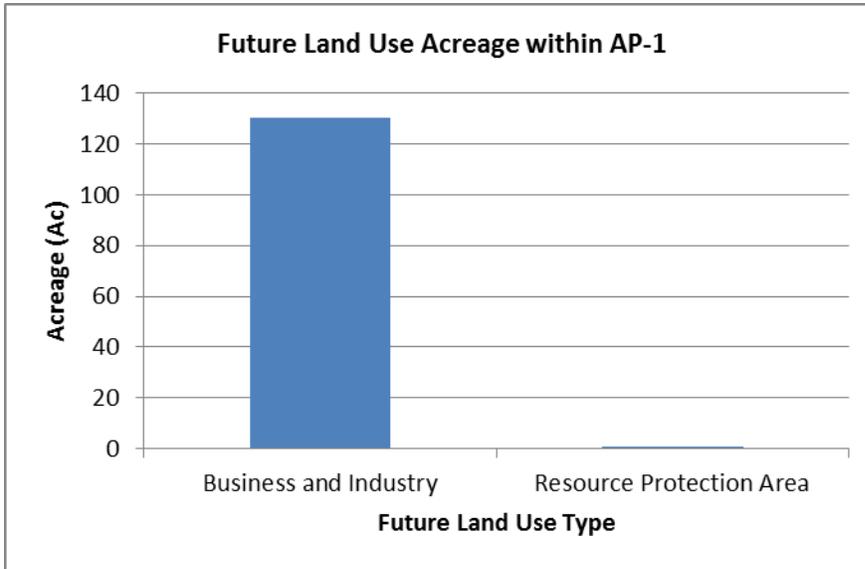
Airport Land Use Compatibility Zones With Future Land Use

Produced by the Stafford County GIS Office
540-658-4033 | www.StaffordCountyGIS.org

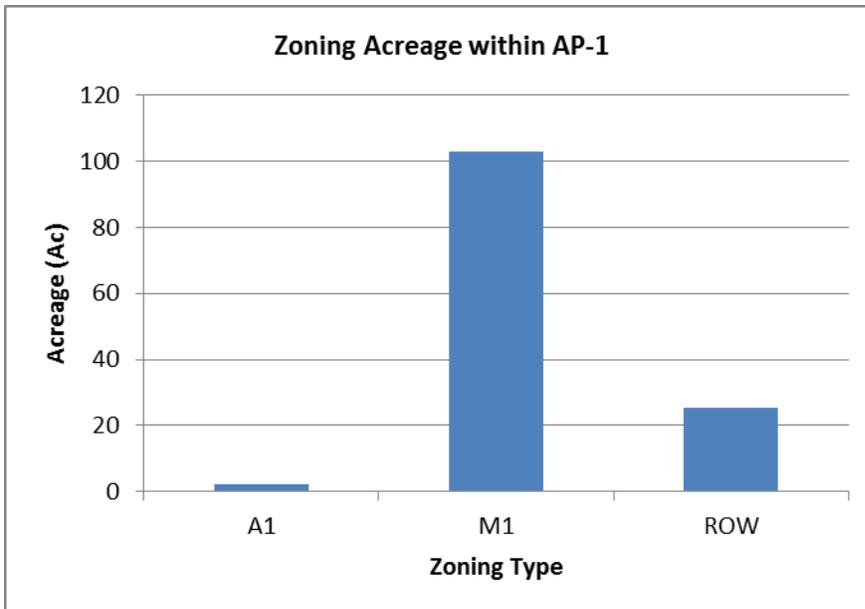


Existing Future Land Uses and Zoning District Classifications by Airport Impact Zone

1. Final Approach Compatibility Zone (AP-1)

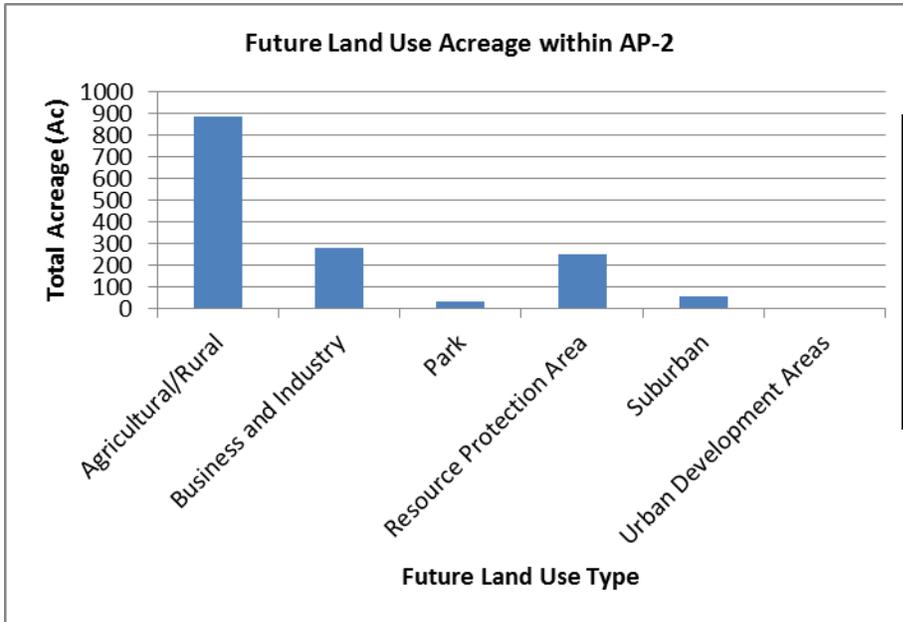


<u>Future Land Use</u>	<u>Acres</u>
Business and Industry	130.42
Resource Protection Area	0.21

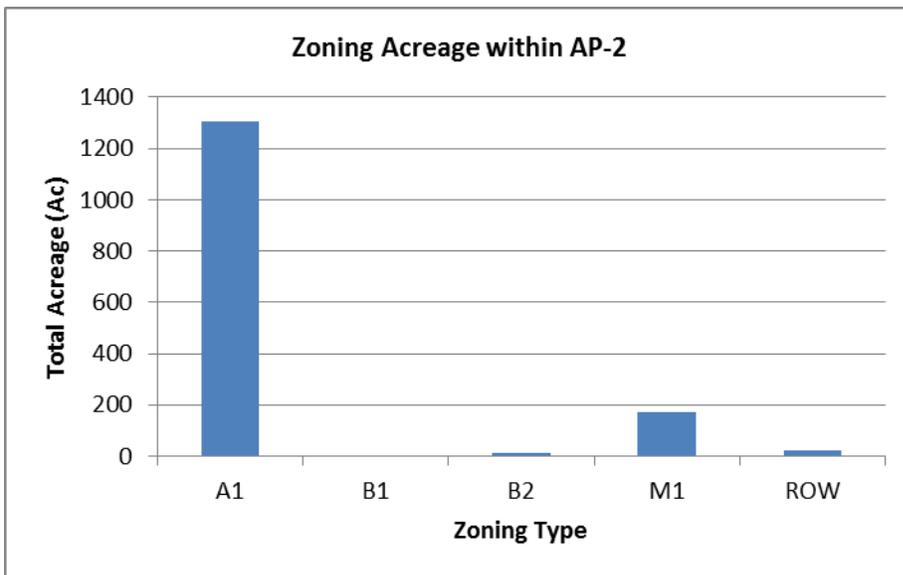


<u>Zoning</u>	<u>Acres</u>
A1	2.12
M1	103.05
ROW	25.46

2. Middle Approach Compatibility Zone (AP-2)

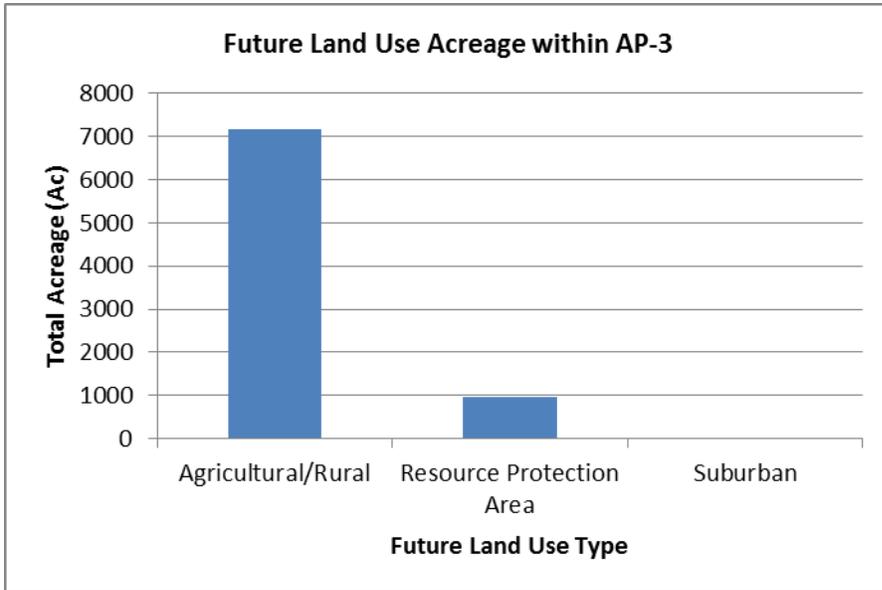


<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	885.18
Business and Industry	278.98
Park	36.74
Resource Protection Area	251.23
Suburban	57.30
Urban Development Areas	0.33

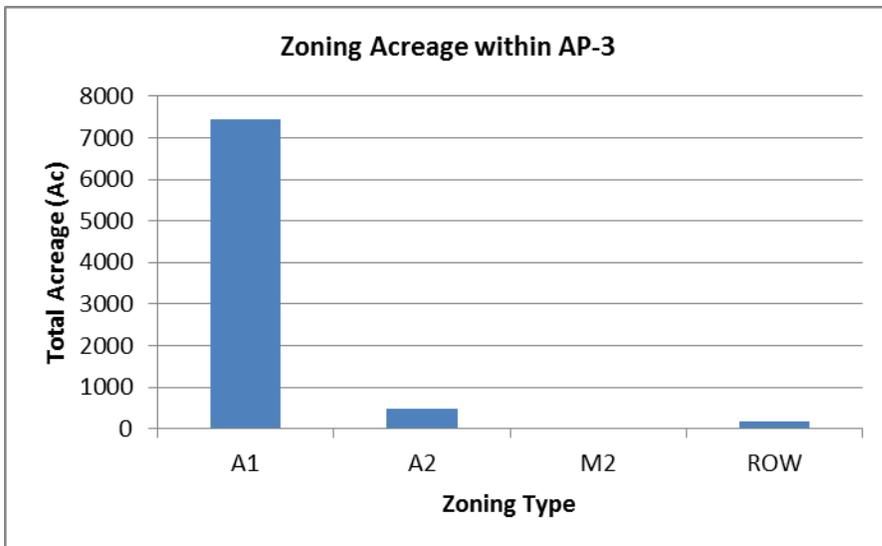


<u>Zoning</u>	<u>Acres</u>
A1	1303.13
B1	1.74
B2	12.48
M1	169.78
ROW	22.62

3. Outer Approach Compatibility Zone (AP-3)

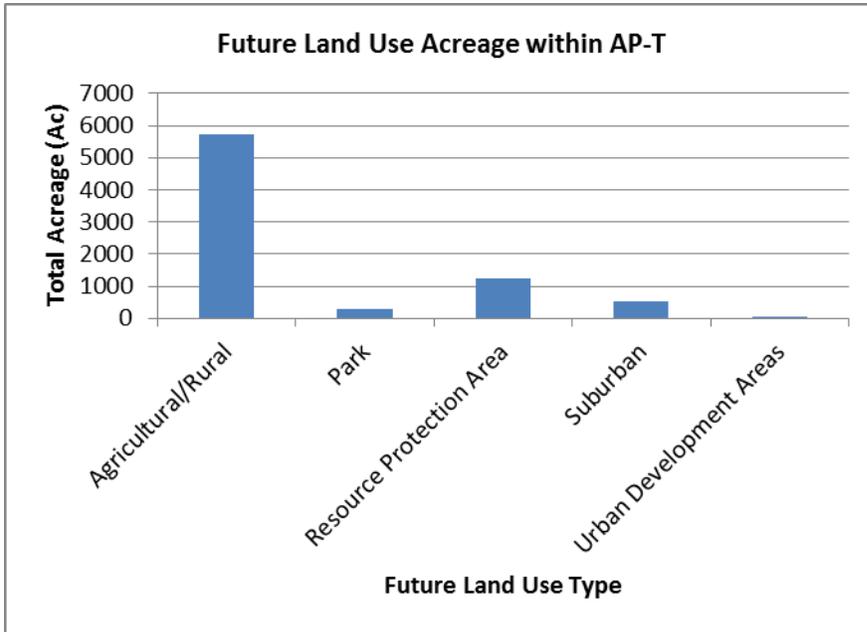


<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	7183.19
Resource Protection Area	962.46
Suburban	0.95

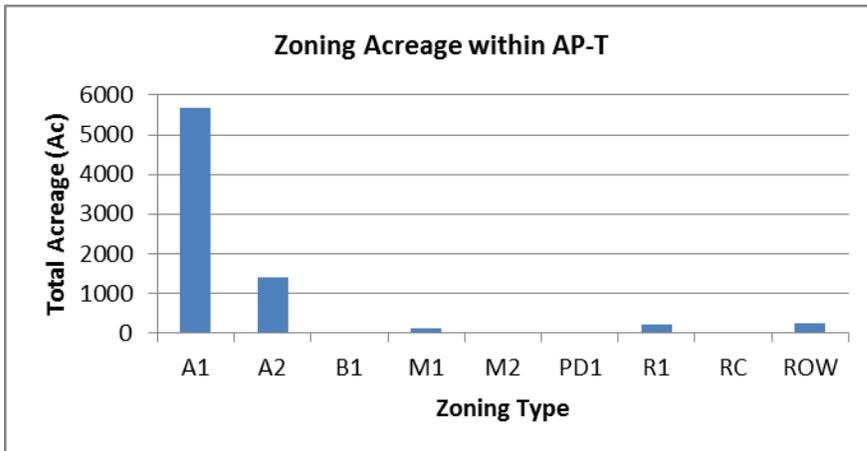


<u>Zoning</u>	<u>Acres</u>
A1	7430.01
A2	490.70
M2	31.96
ROW	184.95

4. Transitional Approach Compatibility Zone (AP-T)

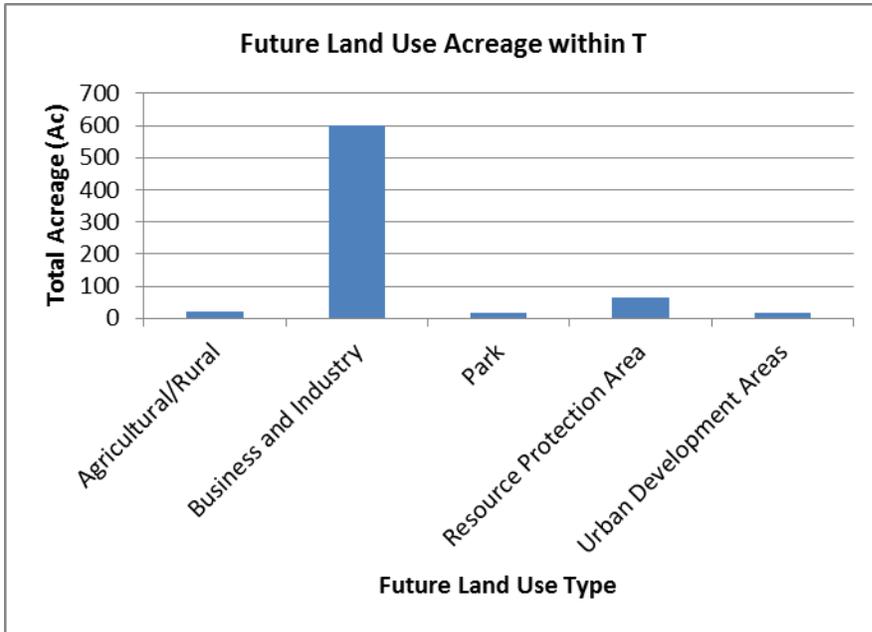


Future Land Use	Acres
Agricultural/Rural	5733.86
Park	273.53
Resource Protection Area	1232.03
Suburban	513.13
Urban Development Areas	63.26

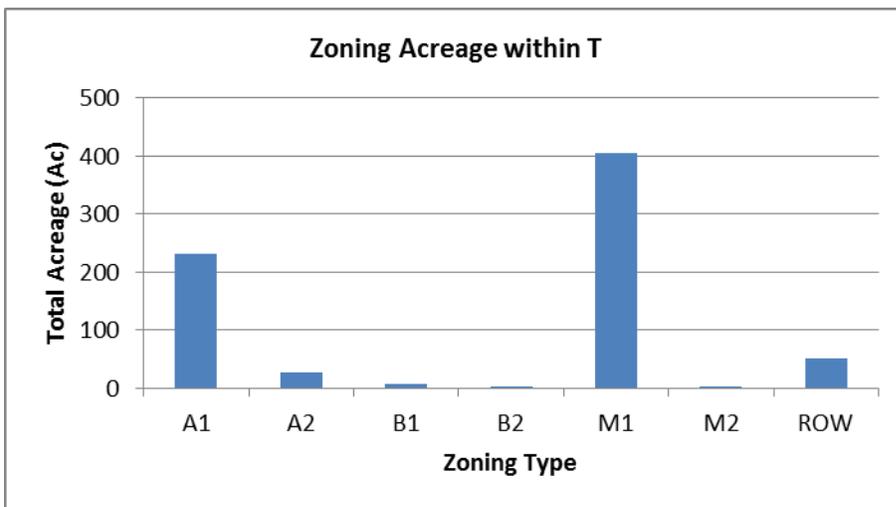


Zoning	Acres
A1	5689.74
A2	1404.22
B1	3.62
M1	109.61
M2	20.69
PD1	24.81
R1	232.76
RC	3.80
ROW	260.43

5. Transitional Compatibility Zone (T)

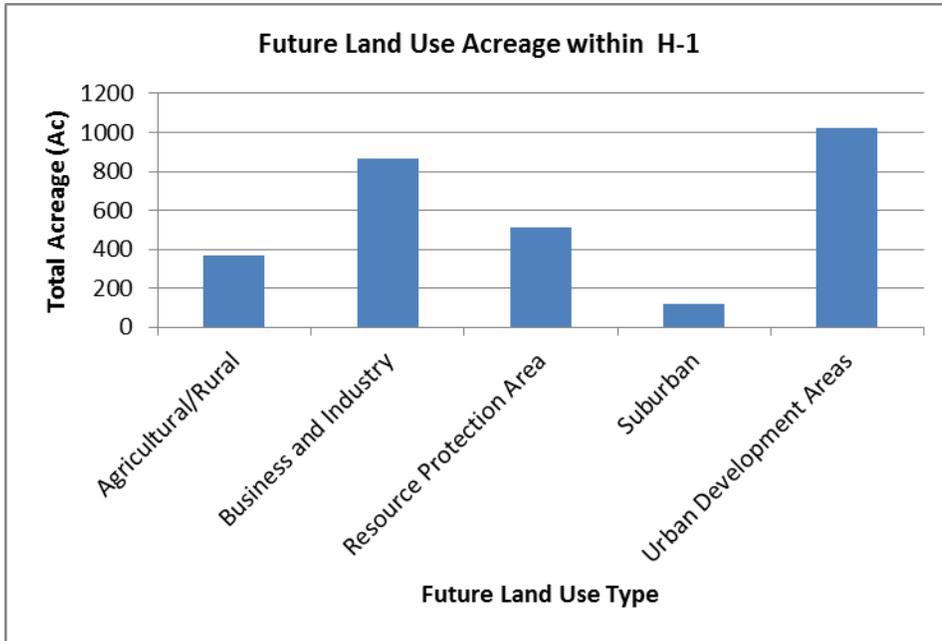


Future Land Use	Acres
Agricultural/Rural	19.69
Business and Industry	601.24
Park	17.16
Resource Protection Area	66.32
Urban Development Areas	16.74

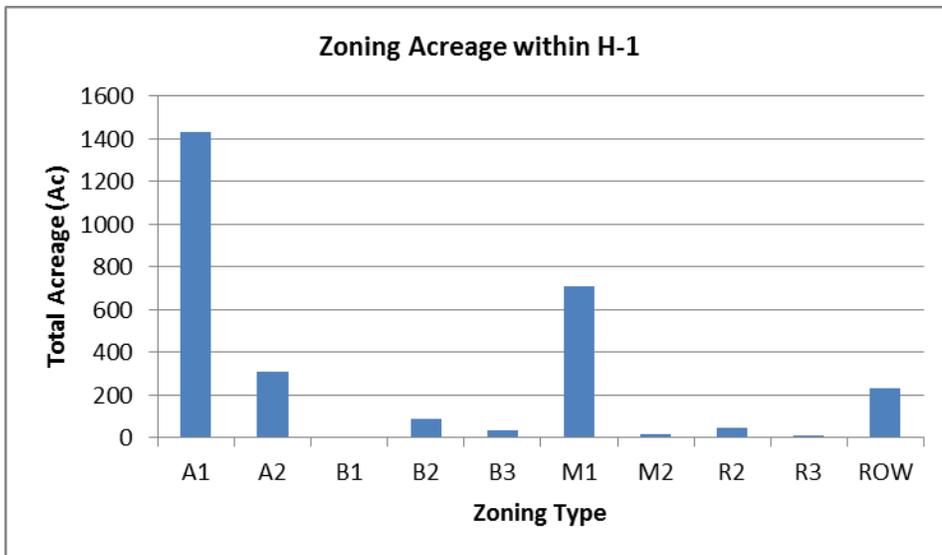


Zoning	Acres
A1	231.17
A2	27.46
B1	7.21
B2	2.11
M1	406.01
M2	1.33
ROW	51.36

6. Inner Horizontal Compatibility Zone (H-1)

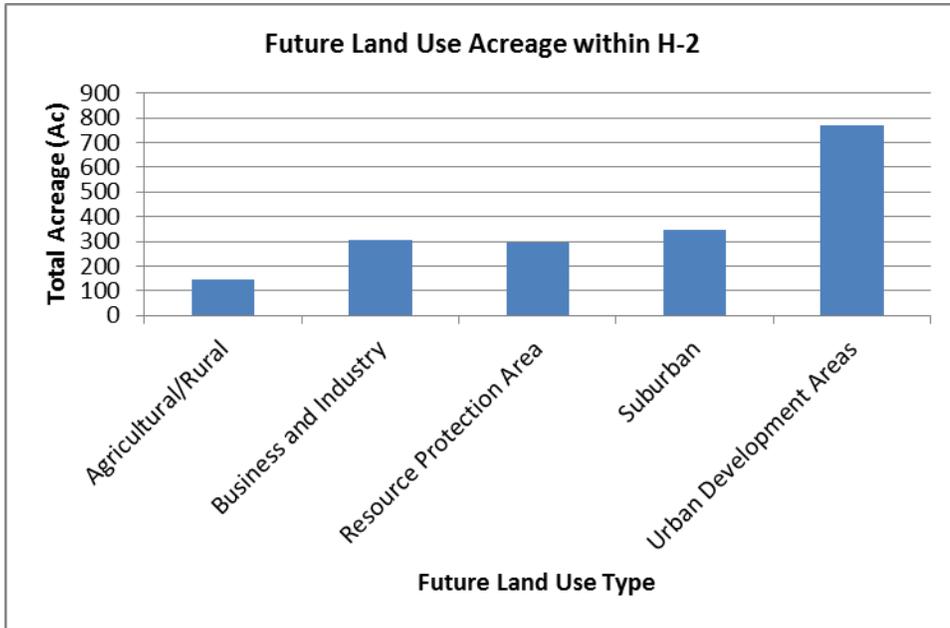


Future Land Use	Acres
Agricultural/Rural	367.09
Business and Industry	862.89
Resource Protection Area	513.69
Suburban	121.38
Urban Development Areas	1024.09

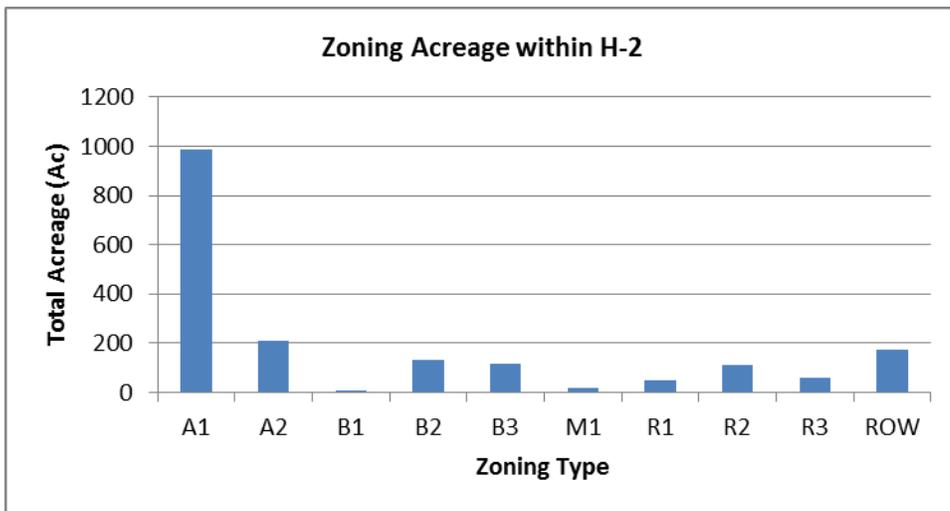


Zoning	Acres
A1	1431.06
A2	311.37
B1	0.40
B2	89.20
B3	36.59
M1	711.89
M2	15.96
R2	46.85
R3	12.34
ROW	233.49

7. Outer Horizontal Compatibility Zone (H-2)

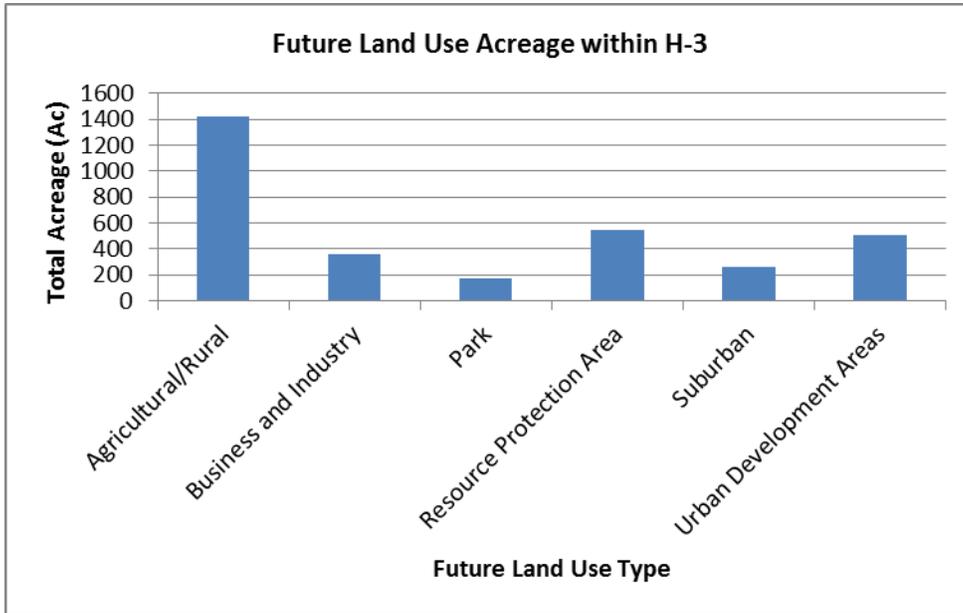


Future Land Use	Acres
Agricultural/Rural	144.72
Business and Industry	307.29
Resource Protection Area	296.36
Suburban	345.19
Urban Development Areas	770.89

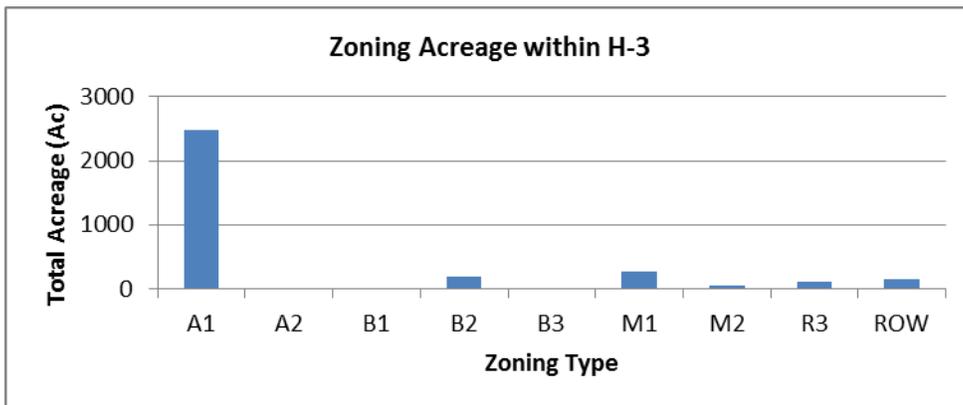


Zoning	Acres
A1	989.03
A2	210.99
B1	7.31
B2	129.36
B3	114.76
M1	16.78
R1	51.32
R2	110.35
R3	58.94
ROW	175.86

8. Horizontal Turning Zone (H-3)

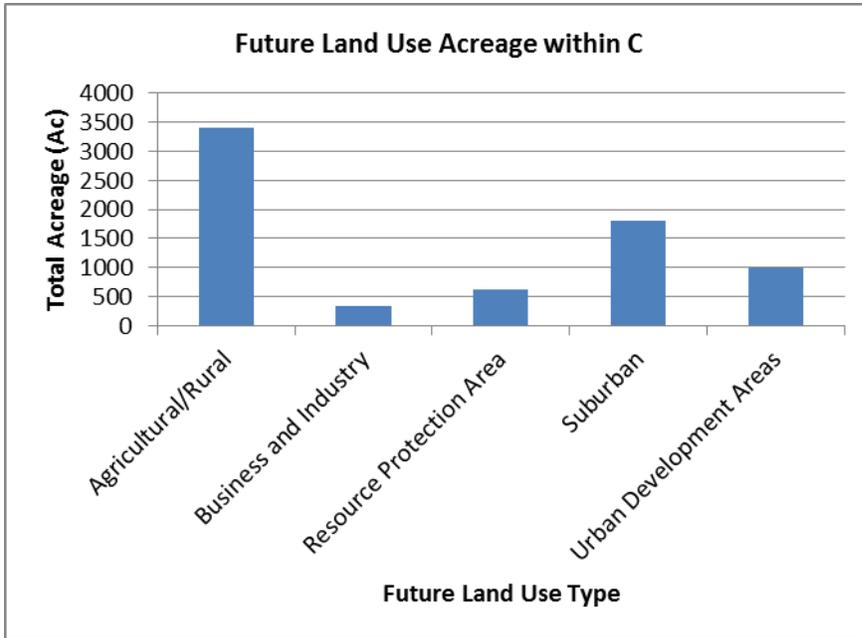


<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	1421.77
Business and Industry	363.01
Park	172.44
Resource Protection Area	546.92
Suburban	258.66
Urban Development Areas	505.66

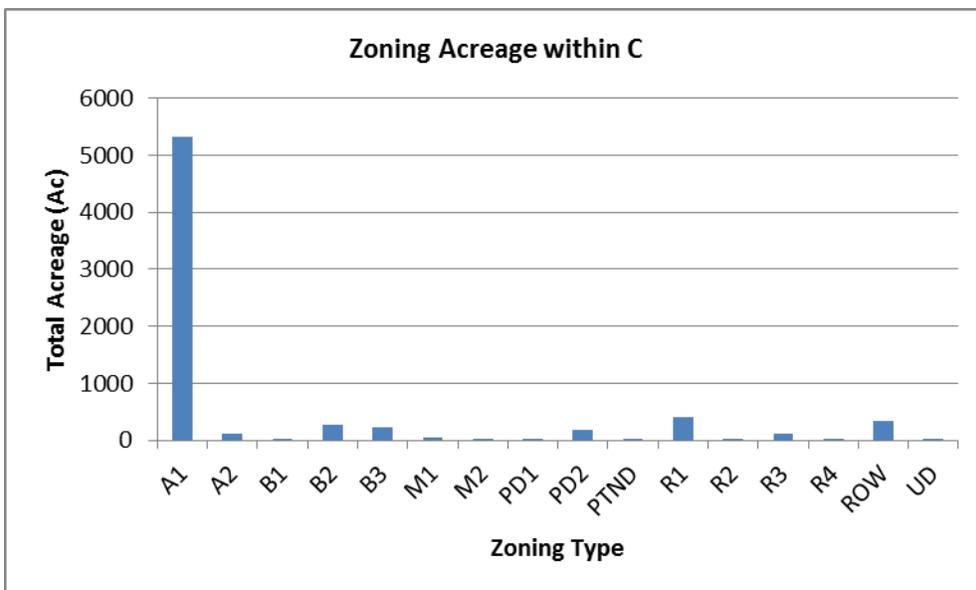


<u>Zoning</u>	<u>Acres</u>
A1	2488.64
A2	1.78
B1	19.31
B2	182.38
B3	5.23
M1	265.50
M2	41.38
R3	111.65
ROW	152.64

9. Conical Compatibility Zone (C)



<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	3413.87
Business and Industry	334.81
Resource Protection Area	617.88
Suburban	1802.59
Urban Development Areas	1000.08



<u>Zoning</u>	<u>Acres</u>
A1	5325.93
A2	125.04
B1	10.37
B2	262.13
B3	232.20
M1	39.43
M2	22.36
PD1	13.65
PD2	185.72
PTND	11.00
R1	412.15
R2	27.65
R3	119.17
R4	30.45
ROW	344.38
UD	11.68