

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:

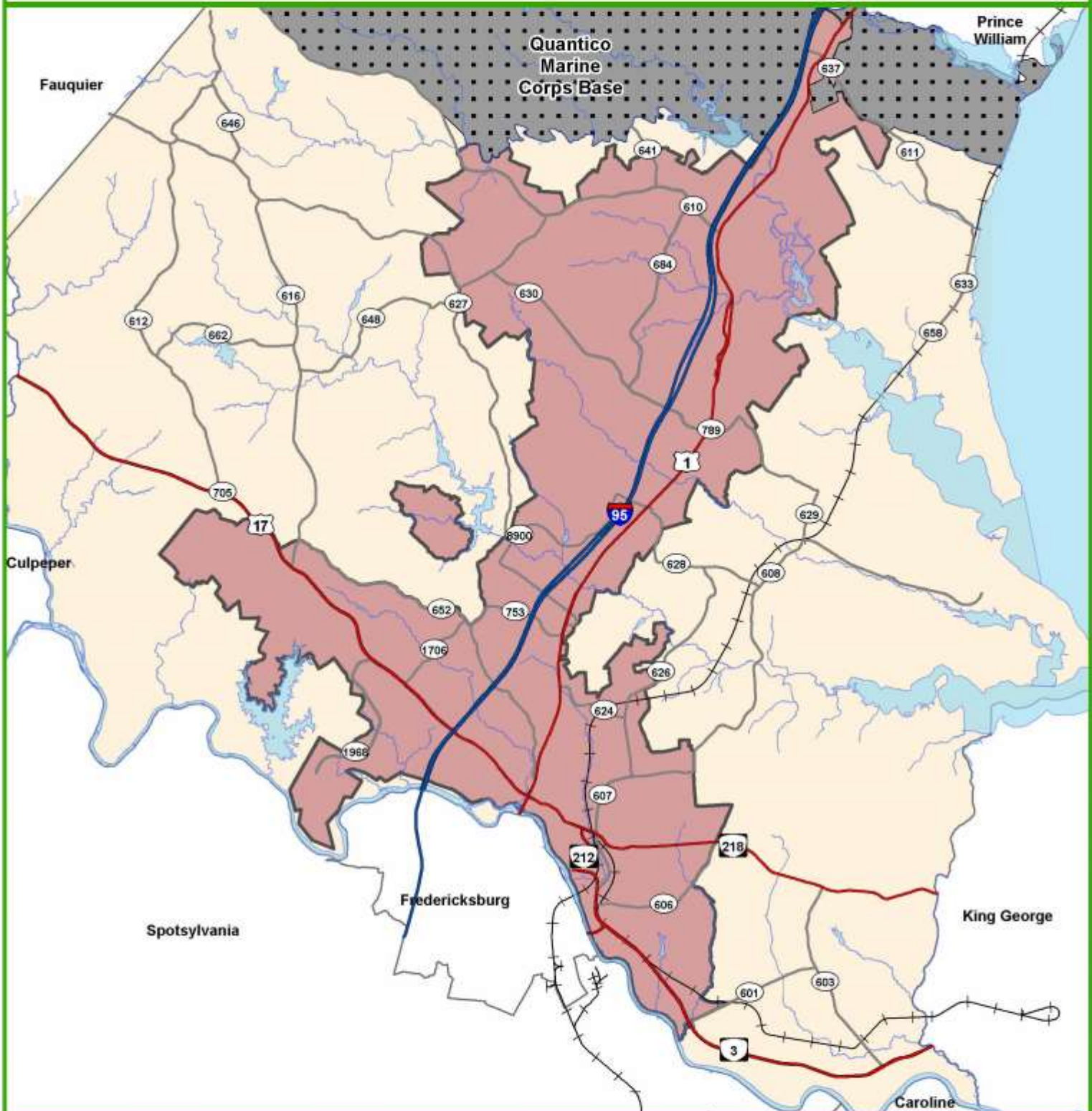
- The Land Uses within the Urban Services Area (USA) have been generalized as Targeted Development Areas, Suburban areas, and Business and Industry areas.
- The USA boundary has been designated to consider infill development to access public water and sewer in the established suburban and industrial 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.



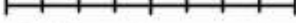
FIGURE 3.1
Urban Services Areas
Stafford County Comprehensive Plan
Stafford County, Virginia
 September 8, 2021



Legend :

 Urban Services Area

0 4,700 9,400 18,800 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.

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

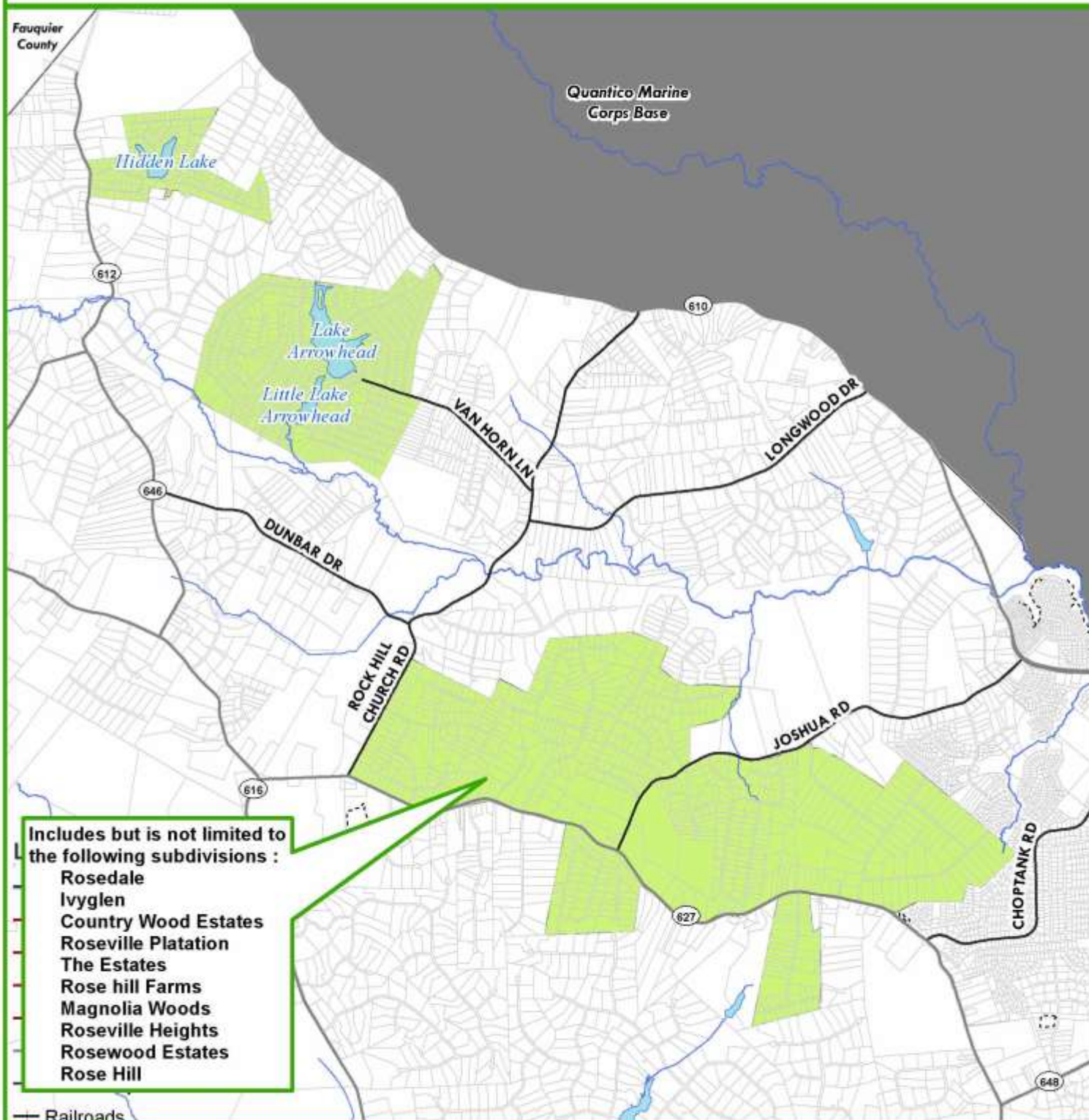
Rock Hill Sewer Service Area – this area includes several rural residential communities in the northwest corner of the County. The area, identified in Figure 3.2, is primarily built out and is characteristic of older rural residential neighborhoods with 1 to 3 acre lots that utilize private wells and 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

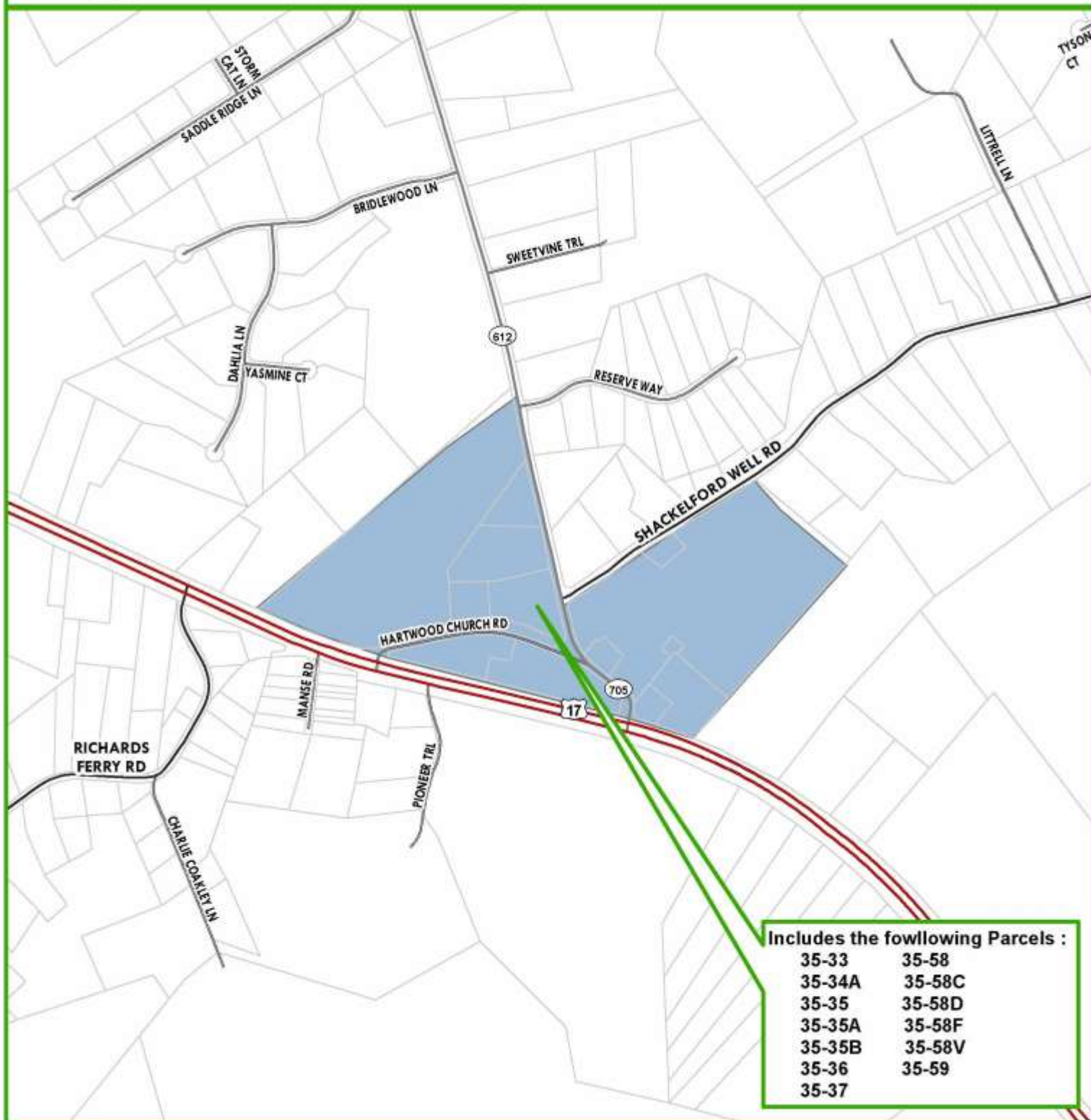


0 1,250 2,500 5,000 Feet

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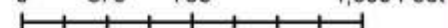
FIGURE 3.3
Hartwood Water Service Area
Stafford County Comprehensive Plan
Stafford County, Virginia
 September 8, 2021



Legend :

 Hartwood Water Service Area

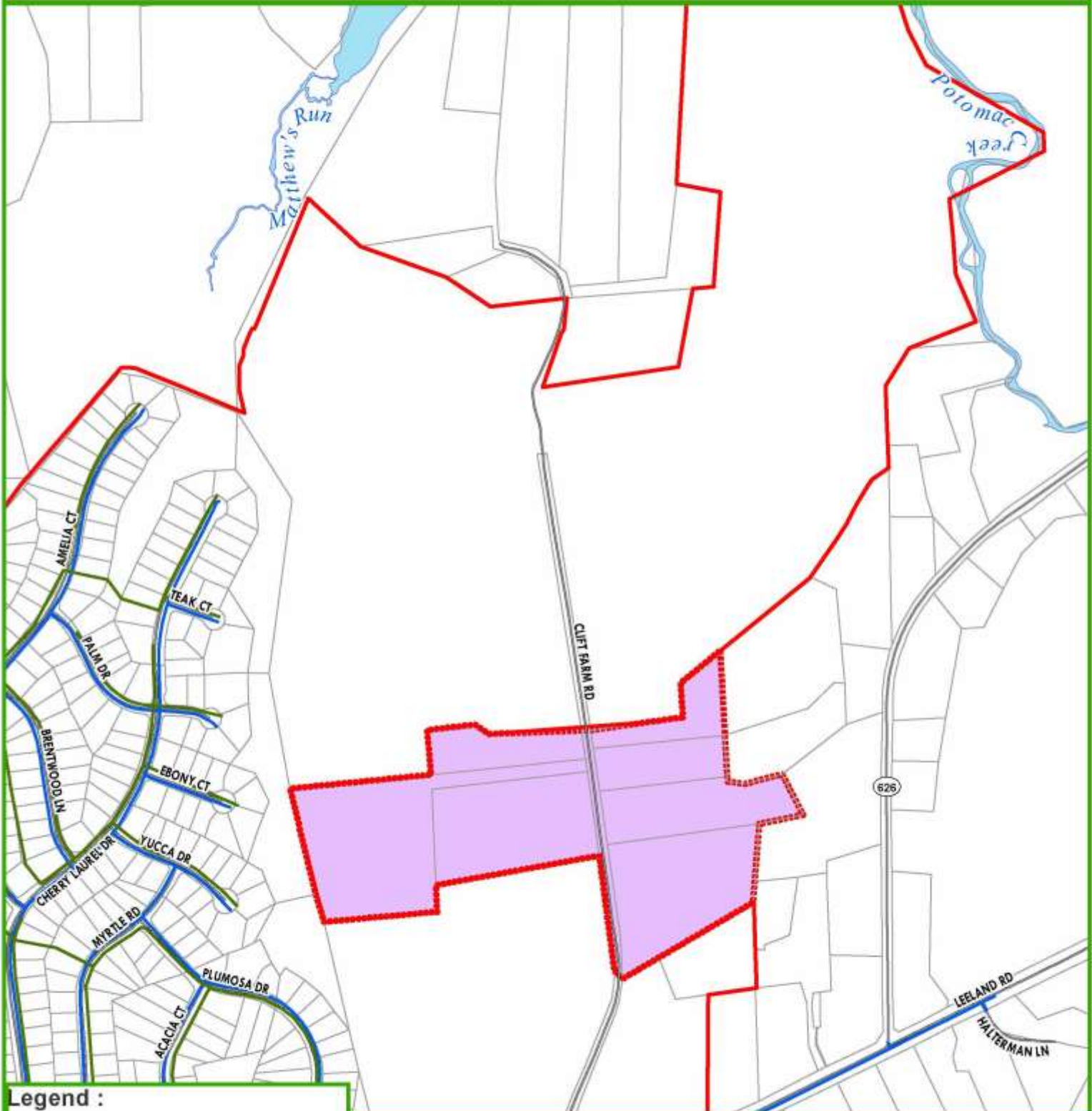
0 375 750 1,500 Feet



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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

0 287.5 575 1,150 Feet

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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

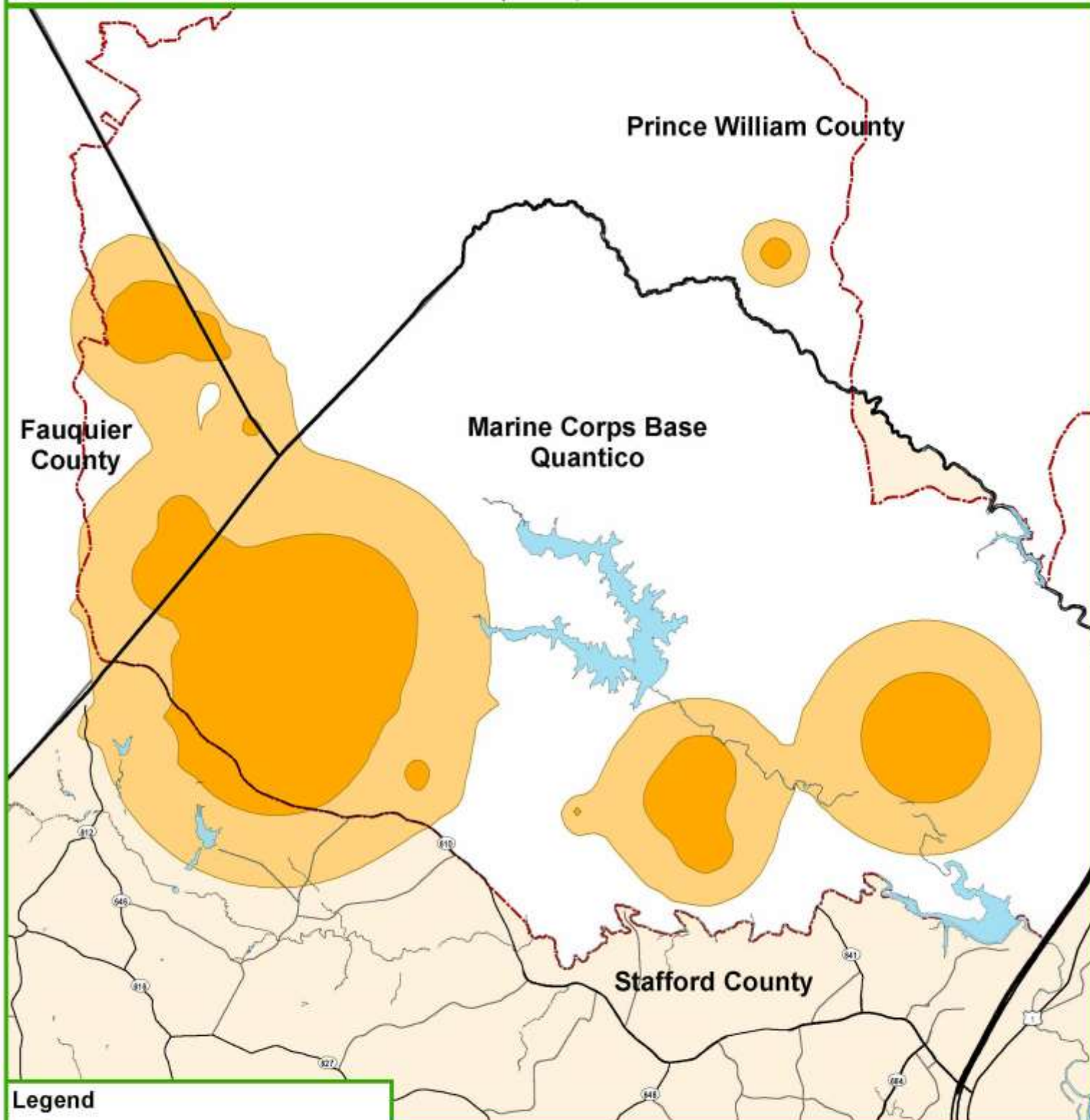
greatest degree of impact are noise sensitive land uses located in proximity to the ordnance ranges, such as high density residential, hospitals, day care and nursing facilities, religious buildings, schools, outdoor amphitheaters and other similar uses. Land uses that are incompatible because they can 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

0 0.5 1 2 Miles

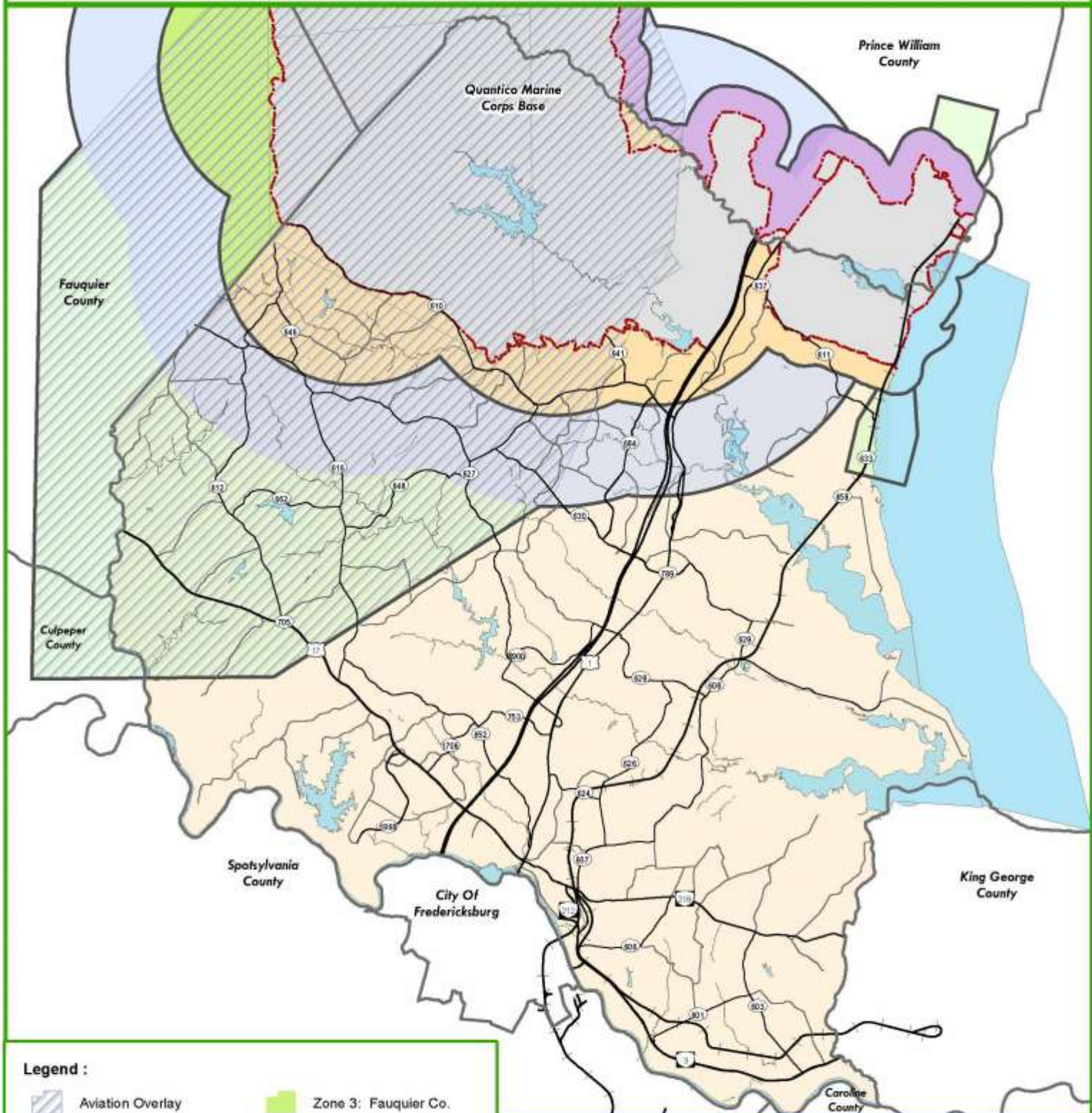
Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.



FIGURE 3.6

Military Influence Area - Zone Overview **Stafford County Comprehensive Plan** **Stafford County, Virginia**

September 8, 2021

**Legend :**

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

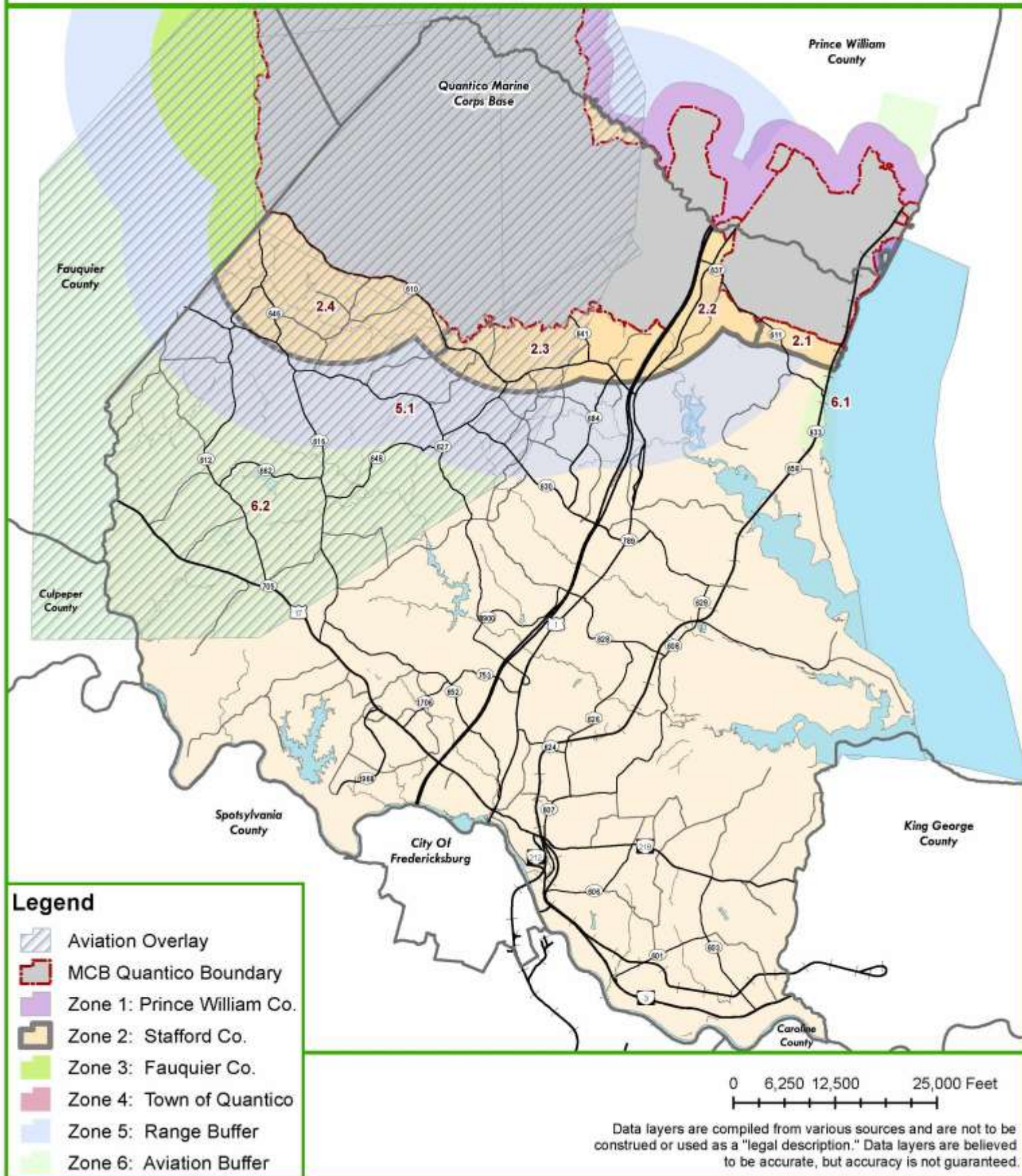


Table 3.1 Military Influence Area Suggested Land Use Compatibility

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

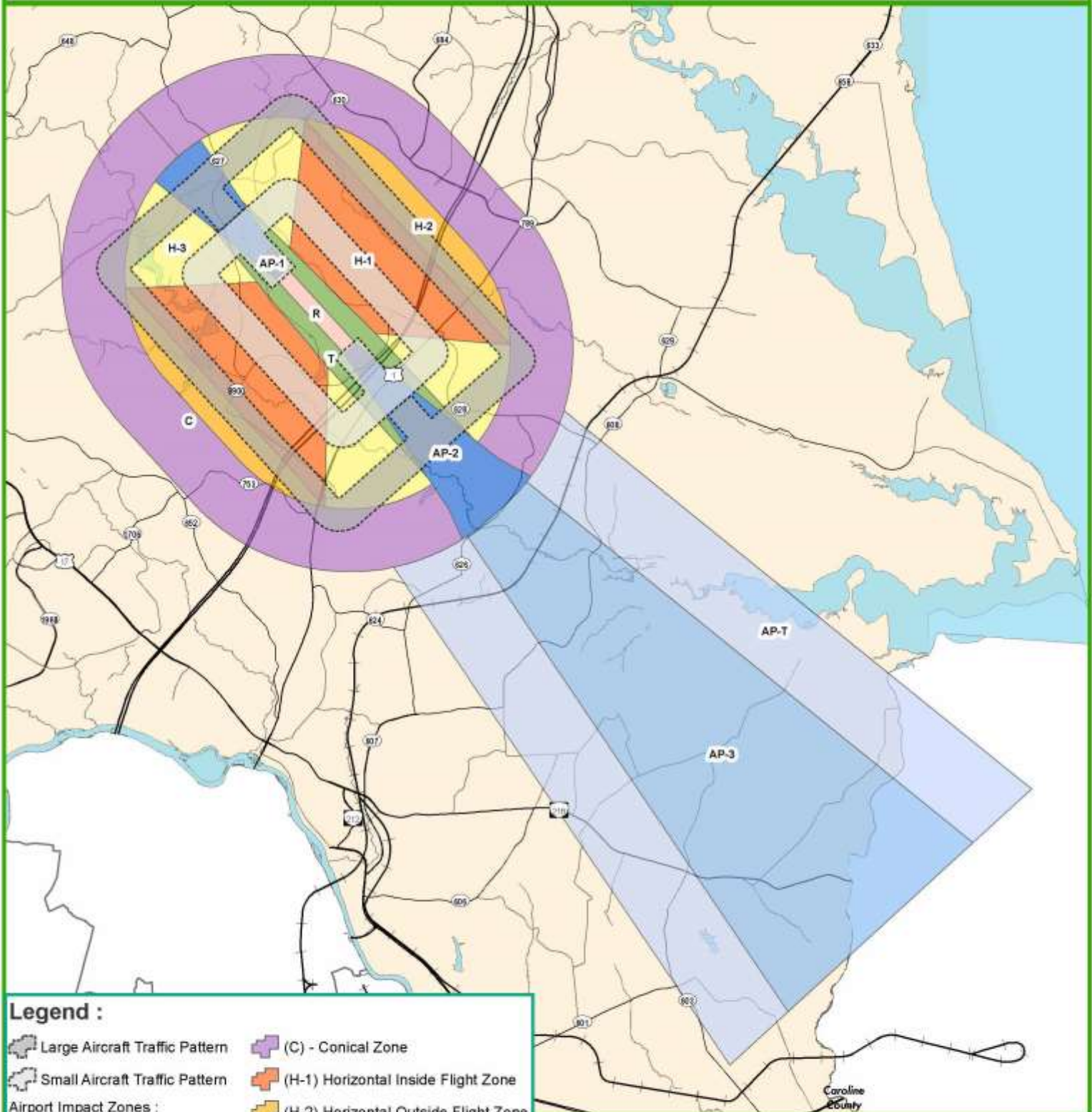
To support a future land use pattern that promotes safety and quality of life of the population around the airport and economic viability of the airport itself, the compatible land uses recommended in the Study have been incorporated into the Future Land Use recommendations in Section 3.6 of this Chapter.

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

0 5,000 10,000 20,000 Feet

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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.

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