Chapter Two

Study Area Profile

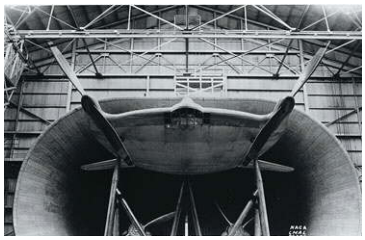
This chapter provides important information about the military and civilian entities within the Hampton-Langley Joint Land Use Study (JLUS) study area. The following chapter presents an overview of the history and current operations at Langley Air Force Base (AFB). Profiles and analyses of development trends and growth potential in the jurisdictions within the Hampton-Langley JLUS study area are also provided.

Identifying and describing the activities performed on the military installation provides valuable insight into the importance of Langley AFB as a national strategic asset. This information will enable stakeholders to make informed decisions about the future development and economic growth of their communities adjacent and proximate to the Base, which ultimately impacts its continued existence and future role. It also provides the military with a baseline understanding of the types of activities occurring outside the installation when considering future missions and operations.

2.1 LANGLEY AFB

History

Langley Air Force Base, Virginia, is among the oldest continuously active air bases in the United States (US). The history of Langley AFB parallels the history of military aviation in the United States, first as an element of the Army and then as a separate military department. In December 1916, the land that became Langley Field was the first property ever purchased by the US for aviation purposes. The War Department bought the site for the Army's young air "arm" to build an Aeronautical Experimental Station and Proving Ground, an airfield for aeronautical research, experiments, and flight tests. An air base for national defense purposes was not conceived in the early years of aviation. In 1916, the National Advisory Council for Aeronautics (NACA), predecessor to the National Aeronautics and Space Administration (NASA), established the need for a joint airfield and proving ground for Army, Navy, and NACA aircraft. NACA determined that the site must be near water for over-water flying, exhibit minimal slope and contain minimal vegetation for expansion and to accommodate landing and take-off operations of aircraft, and be located near an Army post. The NACA began construction of its first aeronautical laboratory at Langley Field in 1917. It was the federal government's first and only civilian aeronautical laboratory in the 1920s and 1930s. The advent of World War I altered the Army's plans for Langley Field, and it became an air station with coastal defense responsibilities. The years between the two world wars are considered the "Golden Age" of aviation, characterized by rapid advances in technology. The Base was also the first site of a school for the training of airmen in the doctrine of aerial combat; ultimately, this school was moved to Maxwell AFB in 1931.



A V-173 'Flying Pancake' in Langley NACA Wind Tunnel circa 1941

Langley AFB has historically functioned as a headquarters, first for the Army and later for the Air Force major command responsible for fighter aircraft. In 1935, the General Headquarters, Air Force was established at Langley AFB, in recognition that an "air force" was a combat force in its own right, rather than just a supporting organization to Army units. Just prior to the creation of the Department of Defense (DOD) in 1947 and the establishment of the Air Force, Langley AFB became home to Tactical Air Command (TAC). The arrival of TAC and jet aircraft marked the beginning of a new era in the history of the field, and in January 1948, Langley Field officially became Langley Air Force Base. During this period, the Air Force realigned its roles with fighter and pursuit aircraft organized within TAC and long-range strategic bombers as components of Strategic Air Command (SAC). In 1992, the Air Force again realigned and merged TAC and SAC into Air Combat Command (ACC).

Over its history, units stationed at Langley AFB have been tapped to assist in virtually all of the nation's military engagements. The aircraft types assigned to the Base have paralleled the history of military aviation and have included a wide variety of lighter-than-air aircraft (airships), as well as the more traditional heavier-than-air aircraft. *Source: Langley AFB AICUZ Update, July 2007; www.globalsecurity.org*

Units

Langley AFB is home to Headquarters, Air Combat Command and the newly established 633d Air Base Wing (ABW), which serves as the installation's host organization. One of ACC's most distinguished flying units, the 1st Fighter Wing (FW), also calls Langley AFB home. Figure 2-1 illustrates Langley's organizational structure.

The Base is host to a number of associate units that provide direct command, control, communications, and intelligence support to ACC. These include the Global Cyberspace Integration Center (GCIC) and the Deployable Ground Station 1 (DGS-1). Langley AFB is also an aerial port of embarkation (APOE) for the rapid deployment of fighter aircraft, supporting forces, and units from neighboring military installations to meet worldwide mission requirements.
Source: Langley AFB General Plan, May 26, 2009

Headquarters, Air Combat Command

Air Combat Command is the primary force provider of combat airpower to America's warfighting commands. To support global implementation of national security strategy, ACC operates fighter, bomber, reconnaissance, battle-management, and electronic-combat aircraft. It also provides command, control, communications and intelligence systems, and conducts global information operations.

As a force provider, ACC organizes, trains, equips, and maintains combat-ready forces for rapid deployment and employment while ensuring strategic air defense forces are ready to meet the challenges of peacetime air sovereignty and wartime air defense. ACC numbered air forces provide the air component to US Central and Southern Commands with Headquarters ACC serving as the air component to US Northern and Joint Forces Commands. ACC also augments forces to US European, Pacific, and Strategic Commands. *Source: www.acc.af.mil*

Figure 2-1. Langley AFB Organization Chart

A pair of F-22s approaching the Langley AFB runway

633d Air Base Wing

The 633d Air Base Wing became Langley's host unit on October 21, 2009, as part of the Joint Basing effort. Joint Basing is a Base Realignment and Closure (BRAC)-directed, DOD-wide initiative where a lead service is directed to take over the management and provision of installation support for two or more bases. Under this effort, Langley AFB will assume these roles for Fort Eustis, as well as for itself. As the host unit at Langley AFB, the 633 ABW operates and maintains one of the largest fighter bases in the ACC. *Source: Brian Baie, Planner, Langley AFB, August 31, 2008; forteustiswheel.com; www.langley.af.mil*

1st Fighter Wing

The 1st Fighter Wing's mission is to "train, organize, and equip expeditionary Airmen; deploy, fight, and win; provide world class support to Team Langley." To accomplish their mission, the men and women of the 1 FW are organized into four groups: the Operations Group, Maintenance Group, Mission Support Group, and Medical Group. Over 20 squadrons comprise the four groups. *Source: www.langley.af.mil*

192d Fighter Wing

The 192d Fighter Wing is an Air National Guard component of the Virginia National Guard, located in Sandston, Virginia, and at Langley AFB. As one of Virginia's National Guard components, the Wing augments the active-duty Air Force components in the performance of their missions and other joint forces operations. The 192 FW provides tactical air support using the F-22 Raptor as an associate unit of the 1 FW. The Wing has 124 officers and 734 enlisted members. *Source: www.langley.af.mil*

National Aeronautics and Space Administration Langley Research Center (LaRC)

NASA's Langley Research Center was the initial home of the first astronauts, the Mercury, the Center is working to design and test a new launch abort system for the next generation space capsules. Langley scientists study the atmosphere to improve life on Earth and to better understand the conditions planes and spacecraft fly through. LaRC engineers work on technologies to make civilian and military planes safer, quieter, and more efficient, while designing tomorrow's supersonic and hypersonic aircraft. Langley researchers analyze materials and structures to help spacecraft withstand unforgiving extraterrestrial environments. *Source: www.nasa.gov*

2.2 CURRENT MISSION — OPERATIONS

The primary mission performed at Langley AFB is that of the Base's host command, the 1 FW. The 1 FW has three fighter squadrons (FS) assigned to Langley AFB, the 27 FS and 94 FS have F-22 Raptor fighters assigned to them, and the 71 FS operates the F-15C Eagle. Langley AFB is one of only four F-22 bases. The other installations are Holloman AFB, New Mexico; Elmendorf AFB, Alaska; and Hickam AFB, Hawaii. The 192 FW, an Air National Guard unit, augments the 1 FW by integrating its flight crews with the 27 FS and 94 FS. Active components and Air National Guard units fly side-by-side in 1 FW aircraft.

Air Operations

The F-22 Raptor is the Air Force's new fighter aircraft. Its combination of stealth, supercruise, maneuverability, and integrated avionics, coupled with improved supportability, represents an exponential leap in war-fighting capabilities. The Raptor performs both air-to-air and air-to-ground missions. The F-22 is designed to project air dominance rapidly and at great distances. The combination of sleek aerodynamic design and increased thrust allows the F-22 to cruise at supersonic airspeeds (greater than Mach 1.0) without using afterburner – a characteristic known as supercruise. This feature greatly expands the F-22's operating envelope in both speed and range over current fighters, which must use the fuel-consuming afterburner to operate at supersonic speeds. The sophisticated F-22 design, advanced flight controls, thrust vectoring, and high thrust-to-weight ratio provide the F-22 with the capability to outmaneuver all current and projected aircraft.

F-22 Raptor

Length: *62.08 ft*
Wingspan: *44.5 ft*
Speed: *Mach 2 class*
Ceiling: *Above 50,000 ft*
Role: *Air-to-air*
Air-to-ground
Range:
More than 1,859 miles w/ 2 x external fuel tanks

Height: *16.67 ft*
Crew: *1*
Armament:
1 x 20mm multibarrel internally mounted gun w/480 rounds of ammunition
Air-to-air Loadout
2 x AIM-9 Sidewinders
6 x AIM-120 AMRAAM
Air-to-ground Loadout
2 x 1,000 lb GBU-32 JDAM
2 x AIM-120 AMRAAM

The F-15C Eagle is an all-weather and extremely maneuverable tactical fighter designed to permit the Air Force to gain and maintain air supremacy over the battlefield. First developed in the 1970s, it has been modified extensively over the years to improve its target acquisition and navigational capabilities.

F-15C Eagle

Length: *63.8 ft*
Wingspan: *42.8 ft*
Speed: *1,875 mph (Mach 2+)*
Ceiling: *60,000 ft*
Role: *Air-to-air*
Range:
3,450 miles w/ 3 x external fuel tanks & conformal fuel tanks

Height: *18.5 ft*
Crew: *1*
Armament:
1 x 20mm multibarrel internally mounted gun w/940 rounds of ammunition
Air-to-air Loadout
AIM-7L/M Sparrows
AIM-9F/M Sidewinders
AIM-120 AMRAAM

In addition to the 1 FW, the Air National Guard has a detachment stationed at the base performing air defense and surveillance of the airspace between Virginia and Texas. Aircraft are kept in an alert hangar at the west end of the Base, north of the runway and are prepared to scramble on very short notice should the need arise.

NASA has a small fleet of aircraft at its NASA LaRC hangar, also located on the west end of the Base. NASA operates these aircraft for aeronautical research.

The Services Squadron (1st SVS) operates a morale, welfare, and recreation non-appropriated fund activity for flight instruction and aircraft rental. Commonly known as an Aero Club, its aircraft and facilities are available to its members. The Aero Club fleet consists of reciprocating, single- and twin-engine propeller driven aircraft. Membership is limited to patrons having an employment related link to the DOD, either as service members, retirees, or civilian employees.

2.3 FUTURE MISSION — OPERATIONS

TO BE DEVELOPED AS INPUT IS RECEIVED FROM THE AIR FORCE

2.4 INSTALLATION SETTING

Langley AFB is located in the Hampton Roads region of southeastern Virginia. The Base is located at an elevation of 11 feet above mean sea level (MSL) between two branches of the Back River with the City of Poquoson to the north, across the Back River (Northwest Branch). There are approximately 9.5 miles of shoreline adjacent to Langley's northern, eastern, and southern boundaries. According to Code of Federal Regulations, Title 33, Part 334, there is a restricted area along Langley's shoreline measuring 35 yards off of the mean high water mark (see Figure 2-2). This area is shown on National Oceanic and Atmospheric Administration (NOAA) navigation charts.

To the northwest of Hampton and the Base is York County; the City of Newport News abuts the western boundary of the City of Hampton. Across the Southwest Branch of the Back River lies the balance of the City of Hampton and further to the east is Chesapeake Bay.

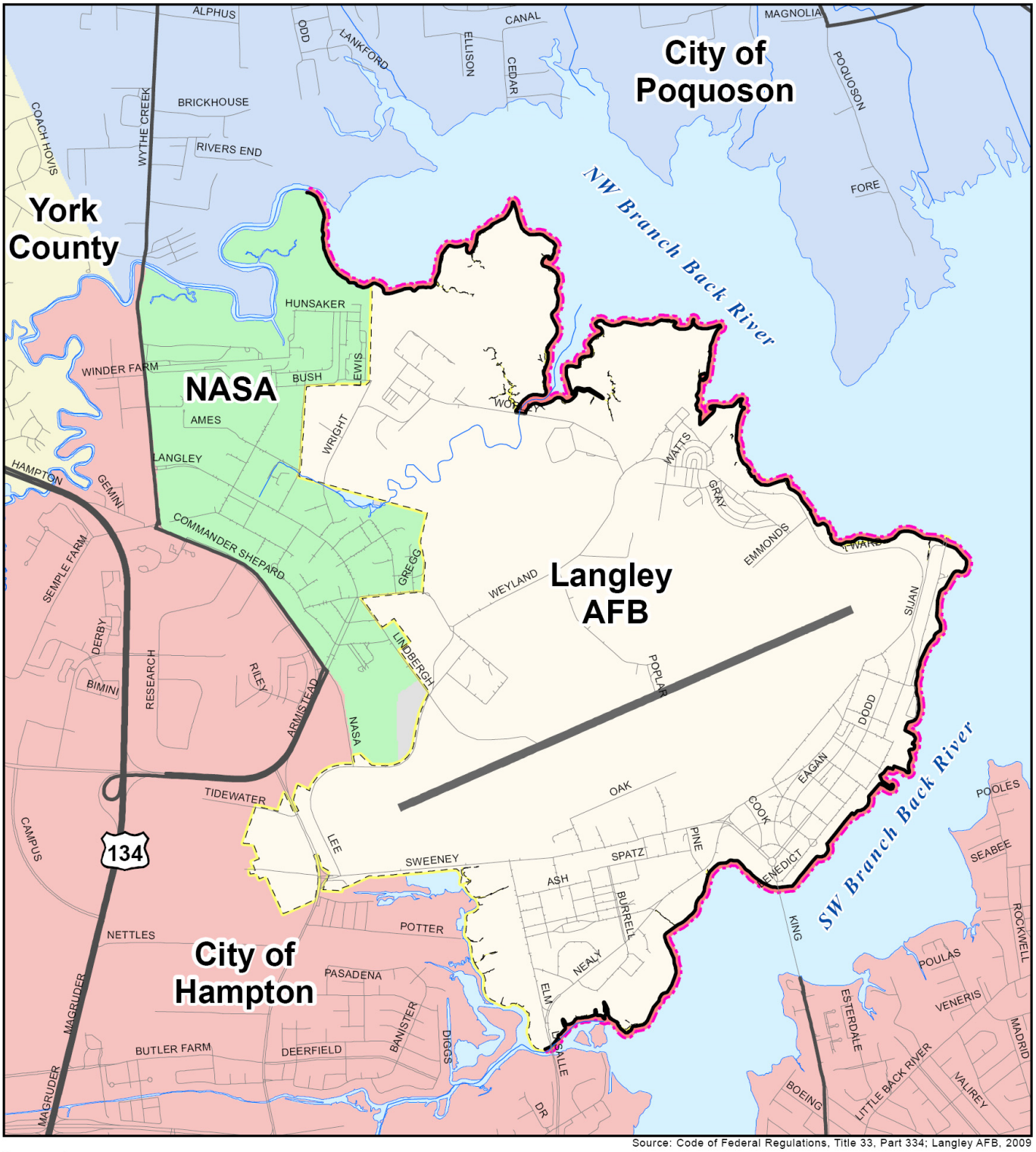
Langley AFB has three major parcels of real estate: the main base in the City of Hampton, the Bethel Manor housing area in York County, and the Big Bethel Reservoir. The reservoir forms a boundary between York County and the cities of Hampton and Newport News. The Langley AFB main base is located on a peninsula between two tidal tributaries of Chesapeake Bay (the York River and the James River). The topography of the area is characterized as a coastal plain with minimal variation in terrain.

Aircraft Operations Areas

Langley AFB

The Langley AFB Main Base occupies approximately 2,883 acres, with a runway complex consisting of a single runway (08/26). Runway 08/26 is 10,000 feet long by 150 feet wide oriented along an east-west axis, with intersecting taxiways and ramp space to the south for taxiing and parking of 1 FW aircraft. Current noise contours from Langley's aircraft extend predominantly to the northeast and to the southwest off of the installation's runway; however, the contours also extend to the north and south from the centerline of the runway, albeit not as far as from the runway ends. The day-night average A-weighted sound level (DNL) 65 decibel (dB) contour extends west from the center of the runway approximately 5.5 miles. To the east, the contour extends 7.5 miles from the center of the runway, which reflects the usage pattern favoring Runway 08. To the sides of the runway, the 65 dB contour extends southward approximately 1.5 miles; to the north, the 65 dB contour extends further north, approximately 1.9 miles. The DNL metric is the average noise level over a 24-hour period with a 10-dB penalty added to aircraft flights that occur between 10 PM and 7 AM to account for their increased annoyance. A key noise metric is the 65 dB as it relates to land uses in the vicinity of airports. Usually no restrictions are recommended below this noise threshold. According to Air Force land use recommendations, residential land use should be located below DNL 65 dB whenever possible.

Another important aspect of air operations at Langley AFB is aircraft safety. The Air Force has identified accident potential zones (APZ) associated with the installation's aircraft operations. These safety zones are the Clear Zone (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). The CZ for Langley's runway is 3,000 feet wide by 3,000 feet long. APZ I for this runway is 3,000 feet wide by



Source: Code of Federal Regulations, Title 33, Part 334; Langley AFB, 2009

Legend

- Restricted Area (35 yards from shoreline)
- **Jurisdictional Boundary**
  - City of Hampton
  - City of Poquoson
  - N. A. S. A.
  - York County
- Langley AFB
- Runway
- Water Body
- River / Stream
- State Highway
- Local

0 0.25 0.5 1 Miles

Figure 2-2
Langley AFB Restricted Waters

5,000 feet long, and APZ II is 3,000 feet wide by 7,000 feet long. The APZs extending north of the northeast end of the runway are primarily located over the Back River, while the APZs extending south of the southwest end of the runway include portions the City of Hampton. Additional details pertaining to Langley's aircraft noise and safety may be found in Chapter 3 of this JLUS report.

NASA LaRC's OV-10A

Additional ramp space for aircraft parking north of the runway, at the west and east ends, is used by the NASA LaRC and an Aero Club, respectively. NASA LaRC operates several varieties of aircraft: BE-200 King Air; Cessna 206; Cirrus SR-22; Lancair Columbia 300; OV-10A Bronco; and a UH-1H helicopter. North of the runway and east of the NASA LaRC hangar is an Alert Hangar for the Air National Guard.

The north portion of a former crosswind runway is now used as a taxiway and, occasionally, for aircraft parking.

The airfield at Langley AFB lies within controlled airspace. The term controlled airspace refers to airspace within which aircraft separation (i.e., air traffic control [ATC]) is provided by the Federal

Aviation Administration (FAA) or Air Force air traffic controllers. Separation of aircraft is achieved through a combination of a terminal radar approach control (TRACON) facility in Norfolk operated by the FAA and a control tower at Langley AFB operated by Air Force air traffic controllers. Closest to Langley AFB is a Class D airspace area, which extends outward from the airfield for approximately five miles and upward to an elevation of 2,500 feet MSL. Figure 2-3 shows the different classes of airspace in the National Airspace System. *Source: Langley AFB Air Installation Compatible Use Zone Update, July 2007*

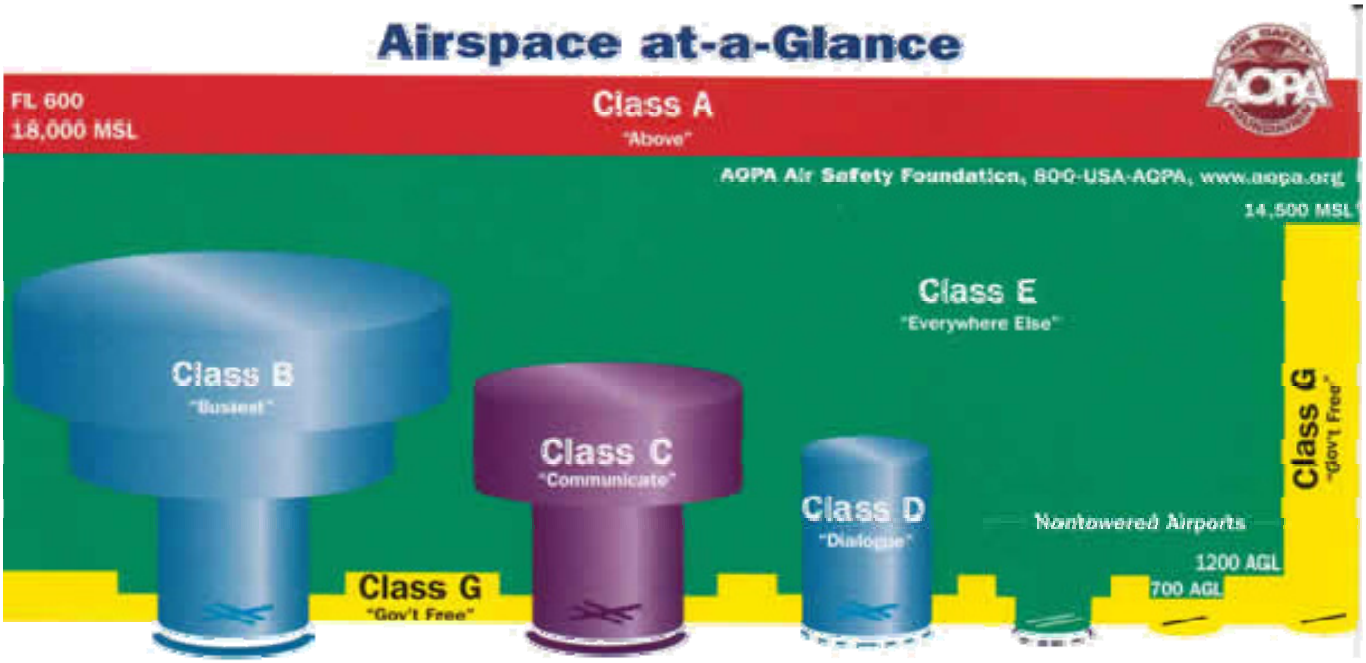


Figure 2-3. National Airspace System (NAS) Airspace Classes

2.5 INSTALLATION DEMOGRAPHICS

For Fiscal Year (FY) 2008, Langley AFB supported nearly 26,000 personnel. This number includes almost 11,000 Active Duty military, Air Force Reserve, and Air National Guard personnel and nearly 13,000 Active Duty military dependents. There were 2,331 civilians employed at Langley AFB, of which 619 people were Non-appropriated Fund (NAF), contractors, and private business. Table 2-1 provides a detailed listing of the installation's FY08 demographics. *Source: Fiscal Year 2008 Economic Impact Analysis, Langley AFB, September 30, 2008*

2.6 INSTALLATION ECONOMIC IMPACT

Langley AFB generates a significant economic impact on the economies of the surrounding jurisdictions. The installation's Economic Impact Analysis for FY08 indicates that the Base had a financial impact of nearly $1.3 billion. Just over half of that figure was attributed to annual payroll to military and civilian personnel, while over one-third was in local expenditures (construction, services, materials, supplies, and equipment). Langley AFB estimated that 6,577 indirect jobs were created by the installation and its activities, which equated to a value of nearly $203 million.

Figure 2-4 provides a comparison breakdown of Langley's economic impact.

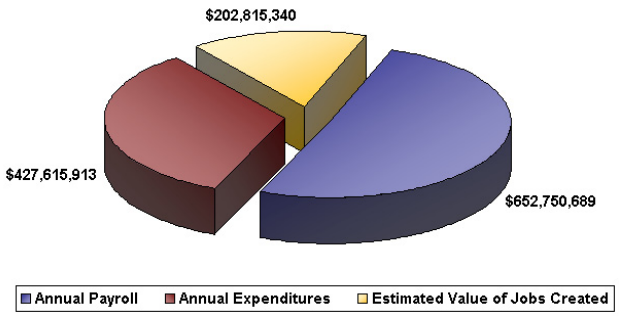


Figure 2-4. Economic Impact, Langley AFB (FY08)

Table 2-1. Population Distribution, Langley AFB (FY08)

Category	Population	Percentage
Appropriated Fund Military	**10,758**	**41%**
Active Duty	*9,867*	
Air National Guard/Air Force Reserve	*891*	
Active Duty Military Dependants	**12,846**	**50%**
Appropriated Fund Civilians	**1,712**	**7%**
General Schedule	*1,502*	
Federal Wage Board	*124*	
Other (Senior Executive, Senior Level, General Manager)	*86*	
Non-appropriated Fund, Contract Civilians, Private Business	**619**	**2%**
Civilian NAF	*350*	
Civilian Base Exchange	*185*	
Contract Civilians (not elsewhere included)	*52*	
Private Businesses On-Base	*32*	
Total Population	**25,935**	**100%**

Source: Langley AFB FY08 Economic Impact Analysis, September 30, 2009

2.7 MILITARY HOUSING

Langley AFB provides on-base housing for military families and unaccompanied personnel, as well as temporary lodging for visitors. There are 1,216 housing units for families. The installation has 9 buildings with 889 beds for unaccompanied personnel. Of that number, 883 beds are for permanently assigned personnel, and 6 beds in one of the 9 buildings are for temporary / visiting personnel assigned to Langley AFB. According to the Langley Economic Impact Analysis for FY08, nearly 83 percent of Langley's military personnel and their dependents (19,538 people) lived off-base, while 4,066 people resided on-base.

In addition to housing for families and unaccompanied personnel, the Langley Inn offers 367 rooms with 561 beds for visitors and authorized guests. Table 2-2 summarizes these assets and the installation's capacity to house families, military personnel, and visitors.

Housing and lodging in the local area will be sought to fill demand exceeding Langley's capacity.

Family housing at Langley AFB was privatized in September 2007. The sole Langley AFB family housing area is Bethel Manor, which is located less than three miles northwest of the installation's West Gate. In addition to Bethel Manor, there are 244 housing units on Langley AFB, which are historic buildings. At end state in September 2014, the installation is scheduled to maintain a family housing inventory of 1,431 units.

Additional dormitories and lodging facilities are planned for Langley AFB. A new 72-room dormitory will be completed in February 2010, and in December 2010, a new 210-room, 210-bed Visitors Quarters building will be added to the lodging inventory. One or more of the older lodging facilities will eventually be vacated, but the final details have not been finalized.

Source: Ryan Baie, Planner, Langley AFB, September 9, 2009

Table 2-2. Housing and Lodging at Langley AFB

	Units / Rooms / Buildings	Bed Spaces
Family Housing	1,216 units	N/A
Dormitories	9 buildings	889
Permanent Party	*8 buildings*	*883*
Temporary Duty	*1 building*	*6*
Lodging	367 rooms	561
Visiting Officers Quarters	*101 rooms*	*115*
Visiting Airman Quarters	*116 rooms*	*116*
Temporary Living Facilities	*150 rooms*	*330*

Source: Ryan Baie, Planner, Langley AFB, September 9, 2009

2.8 COMMITTEES AND AGENCIES

Two committees or agencies have established working relationships with Langley AFB and jurisdictions within the Hampton-Langley JLUS study area. These entities can be important planning assets in developing and implementing joint land use recommendations.

Hampton Roads Planning District Commission

The Hampton Roads Planning District Commission (HRPDC) is one of 21 Planning District Commissions in the Commonwealth of Virginia. It is a regional organization representing 1.6 million people and the area's 16 local governments, including the cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg, and the counties of Gloucester, Isle of Wight, James City, Southampton, Surry, and York. Planning District Commissions are voluntary associations and were created in 1969 pursuant to the *Virginia Area Development Act* and a regionally executed Charter Agreement. The HRPDC was formed in 1990 by the merger of the Southeastern Virginia Planning District Commission and the Peninsula Planning District Commission.

The HRPDC serves as a resource of technical expertise to its member local governments. It provides assistance on local and regional issues pertaining to Economics, Physical and Environmental Planning, Emergency Management, and Transportation. The HRPDC staff also serves as the support staff for the Hampton Roads Metropolitan Planning Organization, which is responsible for transportation planning and decision-making in the region. As a Virginia Planning District, the HRPDC is also the Affiliate Data Center for the region, providing economic, environmental, transportation, census, and other relevant information to businesses, organizations and citizens. *Source:* www.hrpdc.org

Hampton Federal Area Development Authority

The Hampton Federal Area Development Authority (HFADA) is a seven-member board comprised of City of Hampton residents who are appointed by the Hampton City Council. The HFADA's purpose is to enable more efficient cooperation with the federal government and to increase the value of federal installations in the City. This is accomplished by promoting the development of federal employee housing, including military family housing, office buildings, and other infrastructure through increased coordination among military, private industry, and academic and research institutions located in the City of Hampton and in the Hampton Roads area. *Source: City of Hampton Federal Area Development Authority presentation, April 10, 2009*

Bird/Wildlife Aircraft Strike Hazard

As the result of an F-15 bird strike at Langley AFB that occurred in 2000, the Air Force contracted with the US Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS), Wildlife Service (WS) for two personnel to be located in the Langley AFB Safety Office. The mission of these personnel is to enhance the installation's aircraft safety program by providing technical expertise necessary for successful Bird/Wildlife Aircraft Strike Hazard (BASH) mitigation. The USDA team is comprised of a wildlife biologist and a biotechnician who have been integrated into the Langley AFB Flight Safety Team. They work directly with Flight Safety personnel, monitor bird activities, conduct bird sweeps of the Langley AFB airfield, train aircraft maintenance crews in bird strike procedures, and conduct bird strike investigations. They also work closely with Langley's Environmental Civil Engineer Department, Entomology, Base Operations, and with the FAA. *Source: Jared Kwitowski, USDA, September 8, 2009; www.aphis.usda.gov/wildlife_damage*

2.9 COUNTY AND CITY PROFILES

Hampton Roads Region

Hampton Roads, Virginia, is a prime mid-Atlantic region located in Southeastern Virginia. The region encompasses two areas linked by the Hampton Roads and the Virginia Peninsula. Unlike many of the metropolitan areas across the country, Hampton Roads' population nucleus is not confined to one central city, but is spread among several growing cities of significant size (see Figure 2-5). Therefore, Hampton Roads is a term that not only refers to its contiguous communities, but also to the entire metropolitan area.

Figure 2-5. Hampton Roads Region

The South Hampton Roads region (Southside) includes the cities of Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach. These cities are often referred to as the Tidewater area. The Peninsula consists of the cities of Hampton, Newport News, Poquoson, and Williamsburg, as well as the counties of Gloucester, James City, and York. Williamsburg, James City County, and York County are often referred to as the Historic Triangle because they played host to many important events in American history. In 1992, the US Office of Management and Budget (OMB) added the Isle of Wight County, Virginia, and Currituck County, North Carolina, to the Metropolitan Statistical Area (MSA) due to commuting patterns between the two counties and the existing MSA.

Since 1983, the US OMB has recognized Hampton Roads as a group of communities exhibiting economic and social integration. Hampton Roads is the fourth largest metropolitan area in the southeastern United States, and the largest between Washington, D.C., and Atlanta, Georgia. The military has long been a mainstay of the Hampton Roads economy, and today the region is home to the largest concentration of military personnel in the nation, with forces stationed at numerous facilities including Naval Station Norfolk, Langley AFB, Oceana NAS, Little Creek Amphibious Base, Fort Eustis, Fort Monroe (scheduled to be closed by 2011), and Fort Story. The area also boasts 29 miles of Atlantic Ocean beaches. *Source: www.langley.af.mil; www.americasfirstregion.com; www.visithamptonroads.com*

City of Hampton

Encompassing slightly less than 52 square miles, the City of Hampton is located at an elevation of three feet above MSL at the mouth of the James River. The City is bounded on the east by Chesapeake Bay, on the north by the City of Poquoson and York County, and on the west by the City of Hampton Roads. Langley AFB occupies the far northeastern portion of the City. Hampton ranks as the 7th most populous city in Virginia with an estimated 2008 population of 145,494. Hampton was established in 1610 and is the oldest continuously settled English-speaking community in the US.

Hampton is an independent city. Virginia's independent cities are not politically part of a county, even though geographically they may be completely surrounded by one. Several Virginia municipalities, even though they may be more populous than some existing independent cities, are incorporated towns. These towns always form part of a county. Incorporated towns have limited powers, which vary by their charter. They typically share many aspects such as courts and public school divisions with the county they are located within. All the cities in the Hampton-Langley JLUS study area are independent cities.

Source: Hampton Roads Regional Benchmarking Study, Hampton Roads Planning District Commission, December 2008; factfinder.census.gov; Peninsula Multi-Jurisdictional Natural Hazards Mitigation Plan, January 2006; Matrix Design Group, 2009

City of Newport News

The City of Newport News is an independent city established as a town in 1880 and incorporated as a city in 1896. In the 1960s, the City merged with Warwick County to create today's incorporated area. It encompasses 70 square miles in the Tidewater region of Virginia, bordering the Atlantic Ocean. Of the City's total area, approximately 51 square miles is land and the remainder is water (James River). The City borders James City County on the northwest, York County on the north and northeast, and the City of Hampton on the east. Newport News shares water borders with Portsmouth on the southeast, Suffolk on the south across Hampton Roads, the Isle of Wight County on the southwest and west, and Surry County on the northwest across the James River. Newport News, along with Norfolk and Portsmouth, constitutes the Port of Hampton Roads, which is part of the State Port Authority. With a 2008 estimated population of almost 180,000 residents, the City ranks as the 6th largest in Virginia in terms of population.

Source: Hampton Roads Regional Benchmarking Study, Hampton Roads Planning District Commission, December 2008; www.langley.af.mil; factfinder.census.gov; Peninsula Multi-Jurisdictional Natural Hazards Mitigation Plan, January 2006; en.wikipedia.org; Matrix Design Group, 2009

City of Poquoson

The City of Poquoson is an independent city located on a peninsula located at the southwestern end of the Virginia Peninsula. The City is bounded by York County to the north, the City of Hampton to the south, and Chesapeake Bay to the east. The City encompasses 16 square miles of land and another 63 square miles of water, which equates to approximately 82 percent of Poquoson's area being comprised of water. Poquoson was formerly part of York County, but it became an incorporated town in 1952 and an independent city in 1975.

Source: Hampton Roads Regional Benchmarking Study, Hampton Roads Planning District Commission, December 2008; factfinder.census.gov; en.wikipedia.org; Matrix Design Group, 2009

York County

York County is a 106-square mile county located on the north side of the Virginia Peninsula in the Hampton Roads region. The County is comprised of many small communities and is situated on the York River and many tributaries. The county seat is the unincorporated town of Yorktown. The County shares land borders with the independent cities of Poquoson, Newport News, and Williamsburg, and James City County. It also shares a border along the York River with Gloucester County. York County was formed in 1634 as Charles River Shire, one of the original eight shires (counties) of the Virginia Colony making it one of the oldest counties in the US.

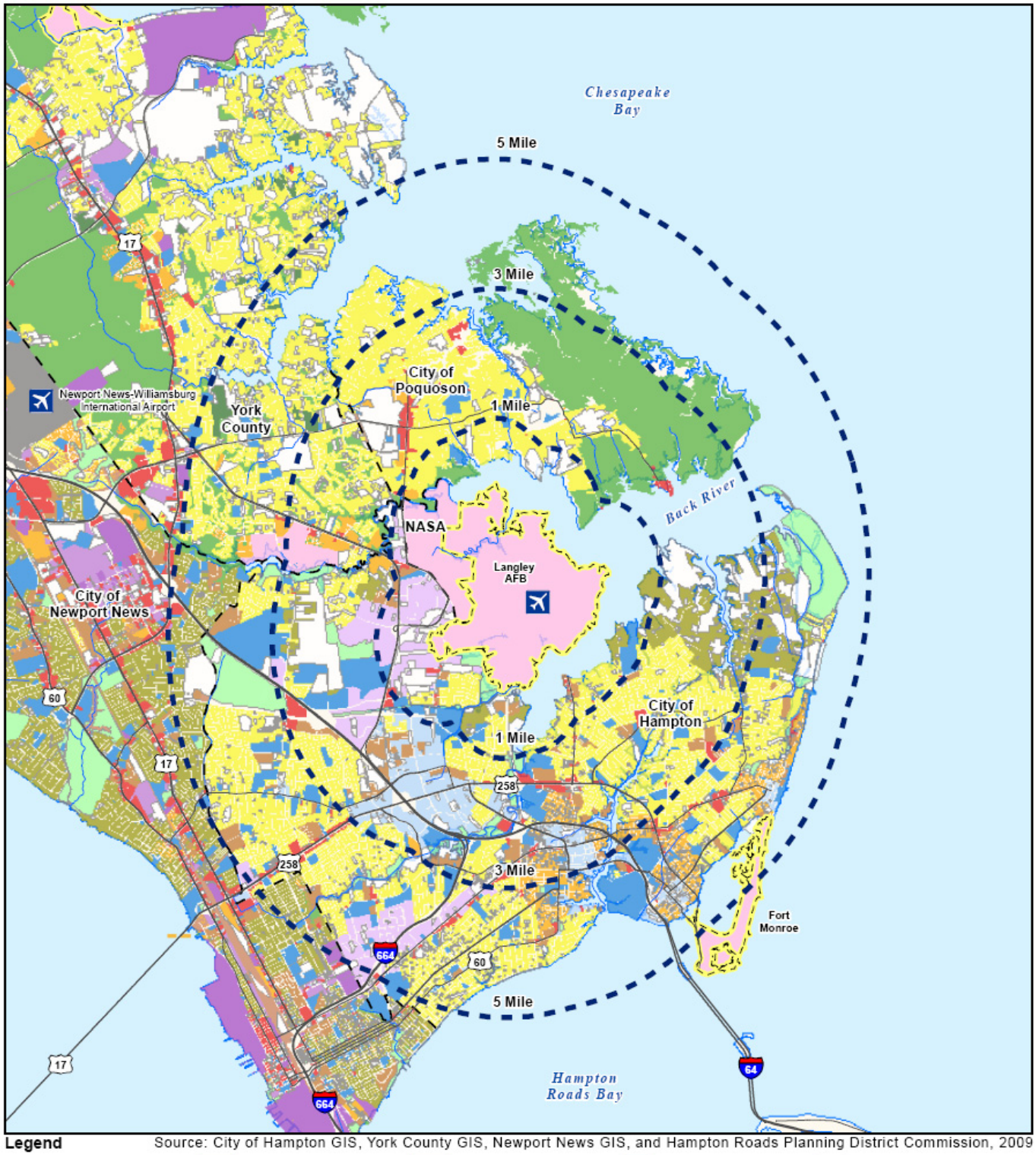
Source: Hampton Roads Regional Benchmarking Study, Hampton Roads Planning District Commission, December 2008; www.langley.af.mil; factfinder.census.gov; Peninsula Multi-Jurisdictional Natural Hazards Mitigation Plan, January 2006; en.wikipedia.org; Matrix Design Group, 2009

2.10 CURRENT DEVELOPMENT OVERVIEW WITHIN STUDY AREA

Existing and Future Land Use

The pattern of existing land use illustrates the current physical use of the land surrounding Langley AFB. It identifies where existing land use compatibility and incompatibility exists adjacent to, and within proximity of, the installation. For the vast majority of Air Force installations, land use compatibility is gauged in terms of compatibility with aircraft operations, which relates primarily to aircraft noise and safety zones.

The Hampton Roads area and the Hampton-Langley JLUS study area are largely developed; however, vacant and undeveloped land does exist. The most compatible designations for Langley AFB are those that would not be impacted or would be minimally impacted by the noise and vibration resulting from the Base's aircraft operations. The July 2007 Langley AFB Air Installation Compatible Use Zone Update (AICUZ) identifies the noise contours generated by the installation's aircraft, and delineates areas were varying degrees of impacts may be experienced by the local populace. The existing and future land uses established by the study area jurisdictions are illustrated on Figures 2-6 and 2-7 and have been quantified by type in Tables 2-3 and 2-4, based on a one, three, and five mile radius from the Langley AFB boundary, respectively. Additional discussion regarding compatibility and existing and future land uses within the study area may be found in Chapter 3 of this report.



Legend Source: City of Hampton GIS, York County GIS, Newport News GIS, and Hampton Roads Planning District Commission, 2009

Existing Land Use

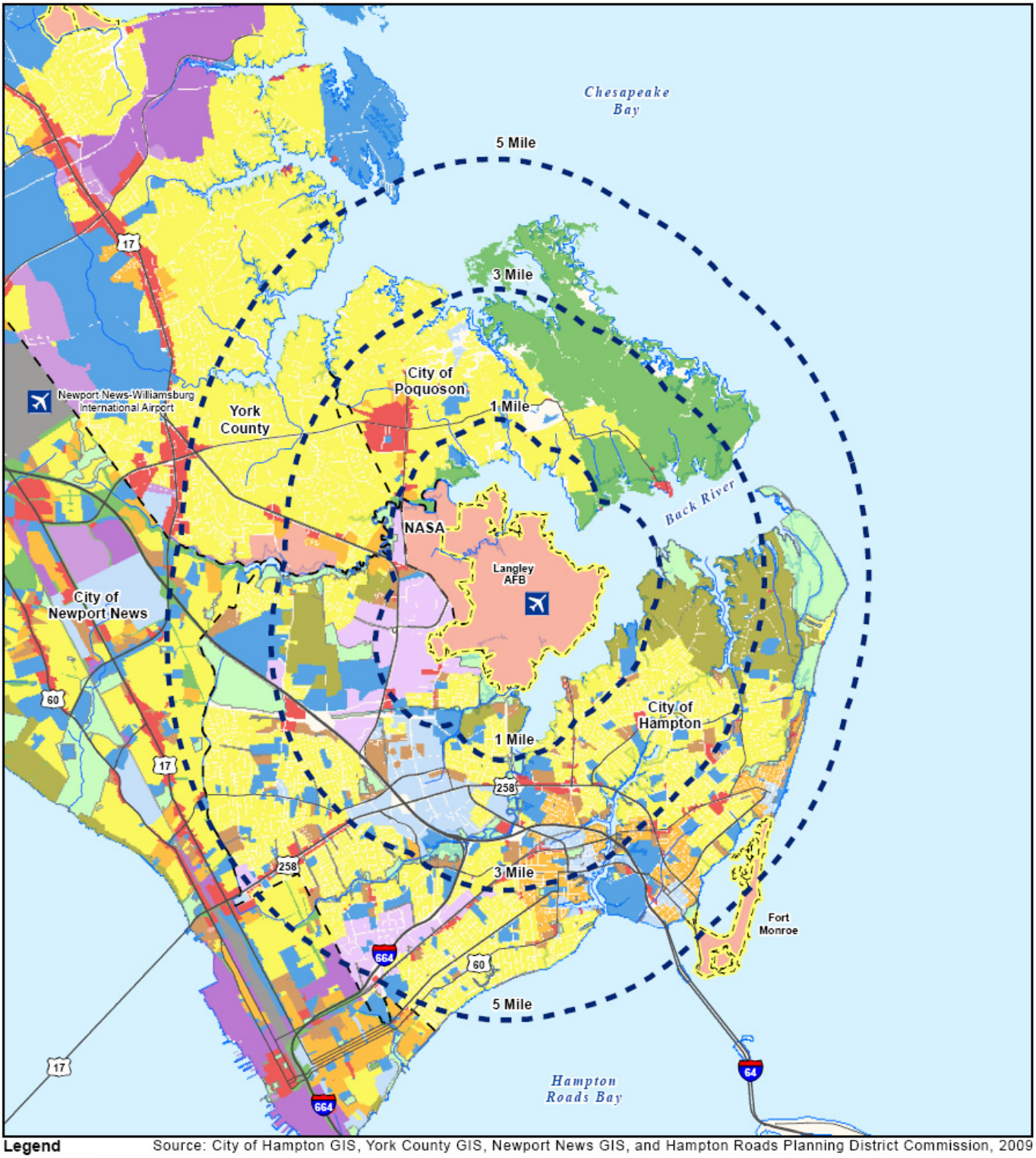
- Agriculture
- Commercial/Office
- Conservation
- Heavy Industrial
- High Density Residential
- Industrial/Office Park
- Light Industrial
- Low Density Residential
- Medium Density Residential
- Military
- Mixed Use
- Open Space
- Public/Semi-Public
- Right-of-Way/Utilities
- Rural Residential
- Unassigned/Undesignated
- Vacant
- Airport
- Jurisdictional Boundary
- Military Installation
- Water Body
- River / Stream

Major Roads

- Interstate
- Highway

0 1 2 4 Miles

Figure 2-6
Existing Land Use



Legend

Source: City of Hampton GIS, York County GIS, Newport News GIS, and Hampton Roads Planning District Commission, 2009

Future Land Use

- Commercial/Office
- Conservation
- Heavy Industrial
- High Density Residential
- Industrial/Office Park
- Light Industrial
- Low Density Residential
- Medium Density Residential
- Military
- Mixed Use
- Open Space
- Public/Semi-Public
- Right-of-Way/Utilities
- Rural Residential
- Airport
- Jurisdictional Boundary
- Military Installation
- Water Body
- River / Stream

Major Roads

- Interstate
- Highway

0 1 2 4 Miles

Figure 2-7
Future Land Use

Table 2-3. Existing Land Use in Proximity to Langley AFB

Land Use Classification	Distance in Relation to Langley AFB					
	Within 1 Mile		Within 3 Miles		Within 5 Miles	
	Acreage	Percentage of Total	Acreage	Percentage of Total	Acreage	Percentage of Total
Agriculture	0	0.0%	18	0.1%	176	0.4%
Commercial/Office	53	1.2%	535	2.3%	866	2.1%
Conservation	242	5.3%	3,501	15.1%	5,374	12.7%
Heavy Industrial	0	0.0%	0	0.0%	36	0.1%
High Density Residential	131	2.9%	737	3.2%	1,341	3.2%
Industrial/Office Park	0	0.0%	0	0.0%	7	0.0%
Light Industrial	666	14.6%	1,135	4.9%	1,724	4.1%
Low Density Residential	1,219	26.6%	7,448	32.1%	14,901	35.3%
Medium Density Residential	18	0.4%	641	2.8%	1,367	3.2%
Military	777	17.0%	1,011	4.4%	1,310	3.1%
Mixed Use	10	0.2%	1,200	5.2%	1,449	3.4%
Open Space	161	3.5%	584	2.5%	1,898	4.5%
Public/Semi-Public	347	7.6%	1,704	7.3%	3,713	8.8%
Right-of-Way/Utilities	0	0.0%	1	0.0%	15	0.0%
Rural Residential	279	6.1%	1,250	5.4%	2,535	6.0%
Unassigned/ Undesignated	0	0.0%	14	0.1%	28	0.1%
Vacant	672	14.7%	3,421	14.7%	5,457	12.9%
Total	**4,576**		**23,200**		**42,198**	

Source:

1-Mile: City of Hampton; Hampton Roads Planning District Commission (for Poquoson); Matrix Design Group, 2009

3-Miles: Cities of Hampton, Hampton Roads Planning District Commission (for Poquoson), and York County; Matrix Design Group, 2009

5-Miles: Cities of Hampton and Newport News, Hampton Roads Planning District Commission (for Poquoson), and York County; and Matrix Design Group, 2009

Table 2-4. Future Land Use in Proximity to Langley AFB

Land Use Classification	Distance in Relation to Langley AFB					
	Within 1 Mile		Within 3 Miles		Within 5 Miles	
	Acreage	Percentage of Total	Acreage	Percentage of Total	Acreage	Percentage of Total
Commercial/Office	72	1.6%	753	3.2%	1,145	2.7%
Conservation	241	5.3%	3,219	13.8%	4,887	11.5%
Heavy Industrial	0	0.0%	0	0.0%	34	0.1%
High Density Residential	139	3.0%	798	3.4%	1,377	3.2%
Light Industrial	995	21.7%	1,482	6.4%	2,112	5.0%
Low Density Residential	1,389	30.3%	8,824	37.9%	19,225	45.1%
Medium Density Residential	19	0.4%	717	3.1%	1,551	3.6%
Military	777	17.0%	1,027	4.4%	1,373	3.2%
Mixed Use	25	0.6%	1,431	6.2%	1,714	4.0%
Open Space	200	4.4%	1,025	4.4%	2,665	6.2%
Public/Semi-Public	347	7.6%	1,695	7.3%	3,614	8.5%
Rural Residential	376	8.2%	2,291	9.8%	2,945	6.9%
Total	4,580		23,262		42,641	

Source:

1-Mile: City of Hampton; Hampton Roads Planning District Commission (for Poquoson); Matrix Design Group, 2009

3-Miles: Cities of Hampton, Hampton Roads Planning District Commission (for Poquoson), and York County; Matrix Design Group, 2009

5-Miles: Cities of Hampton and Newport News, Hampton Roads Planning District Commission (for Poquoson), and York County; and Matrix Design Group, 2009

Zoning

The pattern of zoning is an important component to understand the existing and permissible regulations associated with land development adjacent to, and surrounding, Langley AFB, as well as throughout the Hampton-Langley JLUS study area. The zoning districts established by the JLUS jurisdictions have been quantified in Table 2-5 based on a one, three, and five mile radius, respectively, from the Langley AFB boundary. These are illustrated on Figure 2-8. Additional discussion regarding compatibility and zoning within the study area may be found in Chapter 3 of this report.

Table 2-5. Zoning in Proximity to Langley AFB

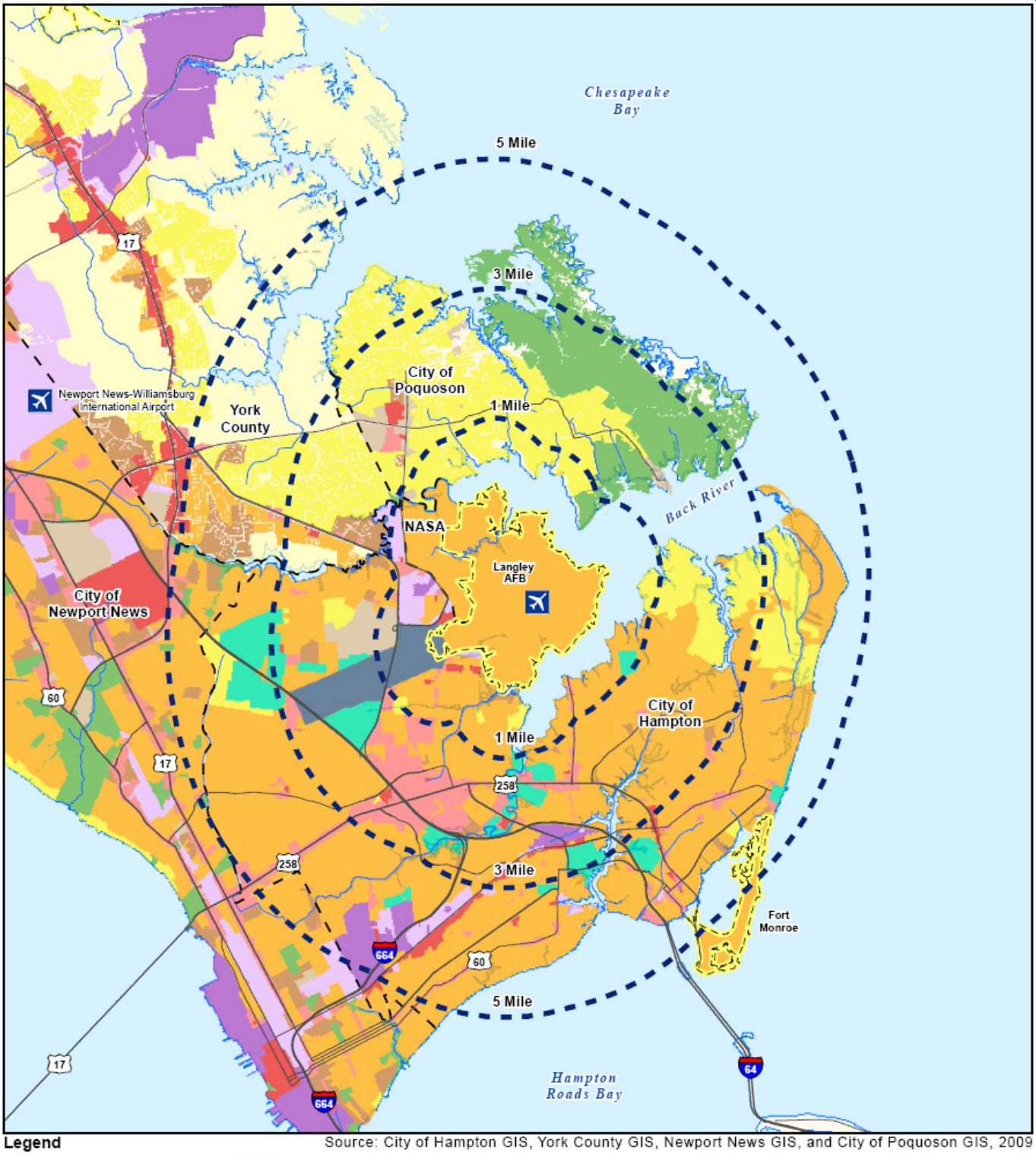
Zoning Category	Distance in Relation to Langley AFB					
	Within 1 Mile		Within 3 Miles		Within 5 Miles	
	Acreage	Percentage of Total	Acreage	Percentage of Total	Acreage	Percentage of Total
High Density Residential	22	0.5%	469	1.8%	1,039	2.2%
High Intensity Commercial	72	1.5%	283	1.1%	518	1.1%
High Intensity Industrial	33	0.7%	175	0.7%	705	1.5%
Langley Flight Approach District	411	8.4%	942	3.7%	942	2.0%
Low Density Residential	1,068	21.8%	6,381	25.1%	8,951	19.3%
Low Intensity Commercial	135	2.8%	1,741	6.9%	2,470	5.3%
Low Intensity Industrial	349	7.1%	440	1.7%	763	1.6%
Medium Density Residential	2,491	50.8%	10,044	39.5%	21,785	46.9%
Office/Research and Development	146	3.0%	777	3.1%	777	1.7%
Overlay Zoning Districts	63	1.3%	1,031	4.1%	1,866	4.0%
Parks/Conservation	110	2.2%	2,765	10.9%	4,024	8.7%
Unassigned	0	0.0%	0	0.0%	7	0.0%
Very Low Density Residential	0	0.0%	350	1.4%	2,554	5.5%
Total	4,900		25,396		46,402	

Source:

1-Mile: Cities of Hampton and Poquoson; Matrix Design Group, 2009

3-Miles: Cities of Hampton and Poquoson, and York County; Matrix Design Group, 2009

5-Miles: Cities of Hampton, Newport News, and Poquoson, and York County; and Matrix Design Group, 2009



Legend

Source: City of Hampton GIS, York County GIS, Newport News GIS, and City of Poquoson GIS, 2009

Zoning

- High Density Residential
- High Intensity Commercial
- High Intensity Industrial
- Langley Flight Approach District
- Low Density Residential
- Low Intensity Commercial
- Low Intensity Industrial
- Medium Density Residential
- Office/Research and Development
- Overlay Zoning Districts
- Parks/Conservation
- Unassigned
- Very Low Density Residential
- Airport
- Jurisdictional Boundary
- Military Installation
- Water Body
- River / Stream

Major Roads

- Interstate
- Highway

0 1 2 4 Miles

Figure 2-8
Zoning

2.11 REGIONAL ASSESSMENT

Transportation

Roadways

The Hampton Roads region is a major hub for transportation on the East Coast. As a result, it is served by numerous freeways and highways. The Hampton Roads Beltway consists of Interstates 64 and 664 and is considered to be the nucleus of the regional road network. The network services the core regional cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Suffolk, and Virginia Beach and also provides key connections to the remaining jurisdictions. The Beltway begins and ends at the Interstate 64/Interstate 664 split in the City of Hampton and is connected from the west by Interstate 64 on the Peninsula. This provides key linkages to the cities of Newport News, Poquoson, and Williamsburg, and James City and York counties. The Beltway is connected to US Highways 17, 58, and 460 on the Southside (Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach), providing links to Isle of Wight and Southampton counties. US Highways 58 and 460 and Interstate 64 provide alternative linkages between the Hampton Roads region and Interstate 95, which is the main north-south connector for the eastern seaboard (see Figure 2-9). *Source: Hampton Community Plan, February 8, 2006*

The Virginia Peninsula is connected to South Hampton Roads by two bridge-tunnels. The first is the Hampton Roads Bridge-Tunnel (HRBT), which extends 3.5 miles along Interstate 64. The HRBT and Interstate 64 connect the South Hampton Roads cities of Norfolk and Virginia Beach with the Peninsula cities of Hampton and Newport News. The facility is toll-free and is operated and maintained by the Virginia Department of Transportation (VDOT). The second bridge-tunnel is the Monitor-Merrimac Memorial Bridge-tunnel (MMMBT). This 4.6-mile-long crossing includes Interstate 664. It is a four-lane bridge-tunnel composed of bridges, trestles, man-made islands, and tunnels under a portion of the Hampton Roads Bay at the confluence of the James, Nansemond, and Elizabeth Rivers. The last major connection between the Virginia Peninsula and land to the south is the James River Bridge. This is a four-lane divided highway lift bridge across the James River. It is owned and operated by VDOT and is the eastern most such crossing without a tunnel component.

The bridge carries US Highway 17, US Highway 258, and State Route 32 across the River near its mouth at Hampton Roads. The bridge connects Newport News on the Peninsula with Isle of Wight County in the South Hampton Roads region.

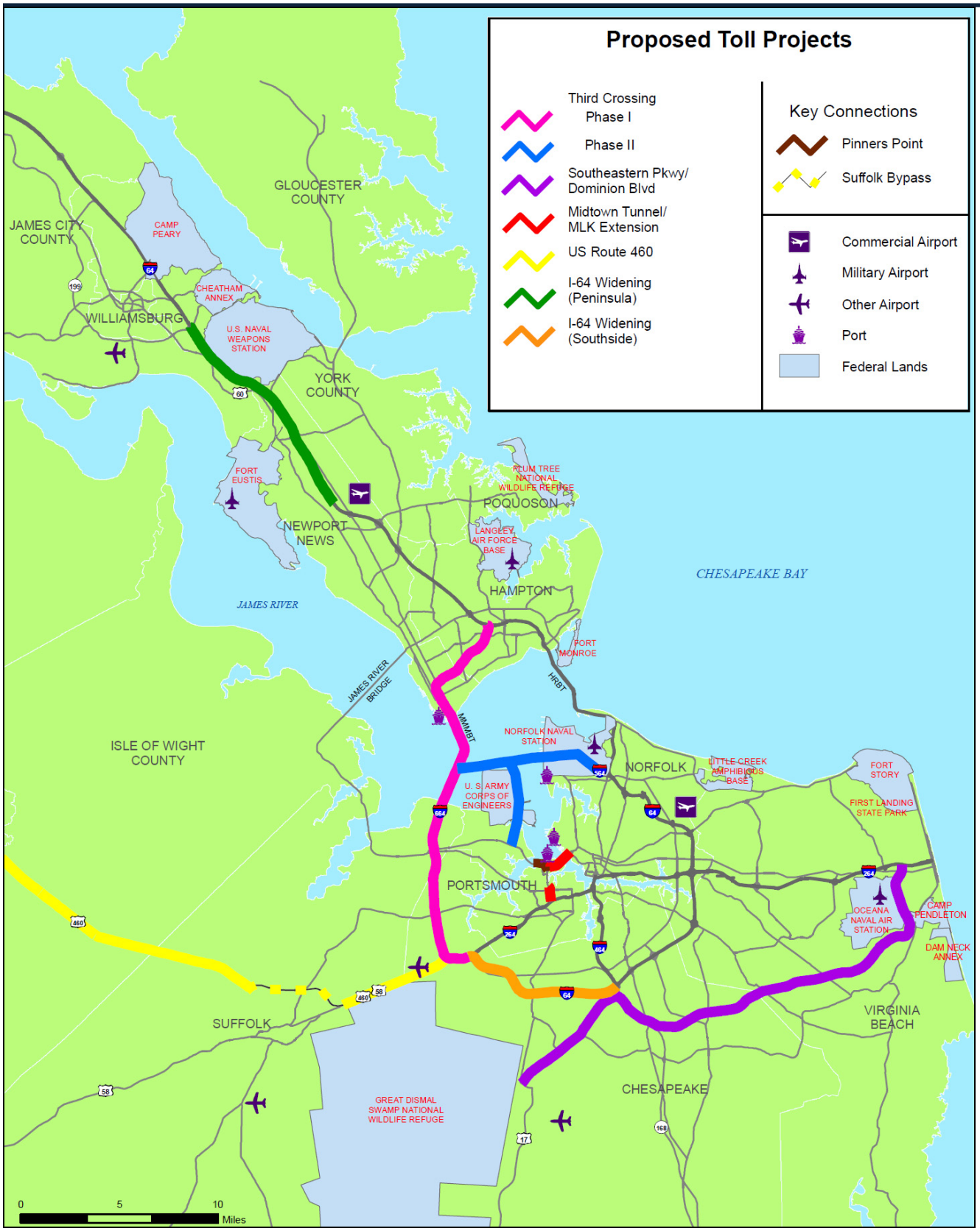
As noted in the December 2007 *Hampton Roads 2030 Long-Range Transportation Plan (LRTP)*, prepared by the Hampton Roads Planning District Commission, there are a number of roadway improvement projects identified for the region. These projects are identified for the Virginia Peninsula, as well as for South Hampton Roads. The majority of the projects impacting the region involve widening existing roadways for distances of up to four miles with several projects encompassing distances of up to 21 miles. A small number of projects are to provide new alignments. There are six multi-jurisdictional projects identified in the LRTP, which are expected to significantly improve current traffic congestion and vehicular movement through the Hampton Roads region. These six projects require additional state funding and tolls (see Figure 2-10). The two projects on the Peninsula are Interstate 64 Widening (Peninsula) and the Hampton Roads Third Crossing. These projects are detailed below.

Legend

- Port
- Airport / Airfield - Military
- Airport - Civilian
- Jurisdictional Boundary
- Military Installation
- Water Body
- Interstate
- Highway

0 3 6 12 Miles

Figure 2-9
Regional Transportation



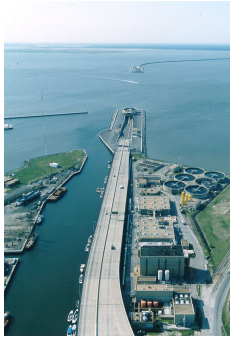
Source: Hampton Roads Transportation Authority (www.hrpdc.org/HRTA/Projects.htm)

Figure 2-10. Hampton Roads Key Roadway Improvements

The project to widen Interstate 64 on the Peninsula from Williamsburg southward to approximately the Newport News-Williamsburg International Airport will address current congestion beginning at Williamsburg. This location is a key access point to the Peninsula utilized by travelers from Washington, D.C., and Richmond. The project calls for widening a 21-mile section of the Interstate, from Exit 255 to Exit 242, and incorporating tolls. Preliminary plans will increase the roadway from four lanes to either six or eight lanes.

One of the largest projects in the 2030 LRTP is the Hampton Roads Third Crossing, which will be a new bridge-tunnel crossing Hampton Roads Bay. The Hampton Roads Third Crossing Study was initiated in late 1993 to investigate methods of improving mobility across Hampton Roads and relieving congestion at the Interstate 64 Hampton Roads Bridge-Tunnel. Several alternatives were considered in selecting a crossing design. The Commonwealth Transportation Board reviewed these Corridors in 1997 and selected Corridor 9, which would support Single Occupancy Vehicles, High Occupancy Vehicles, trucks, buses, and passenger rail. It involves:

- Widening Interstate 664 in Newport News to eight lanes; constructing two new tubes parallel to the MMMBT, which adds four more lanes for travel;
- Constructing an additional new multimodal tube to add transit/rail lines from the MMMBT to a point near the Norfolk Naval Station;



Monitor-Merrimac Memorial Bridge-Tunnel in Newport News

- Adding a new four-lane highway connector from the new bridge-tunnel to the Western Freeway in Portsmouth; and
- Widening Interstate 664 to six lanes from the MMMBT to the Bowers Hill interchange.

A Final Environmental Impact Statement was prepared in 2001 evaluating the impact of building a new crossing of Hampton Roads. In 2002, the General Assembly offered a ballot referendum involving a one percent increase in sales tax throughout the region to fund six new projects, including the Third Crossing; however, the referendum failed. In 2007, the General Assembly created the Hampton Roads Transportation Authority (HRTA) to levy a series of taxes to help finance the six regional priority projects of the Hampton Roads Transportation Planning Organization (HRTPO), which is included under the HRPDC. However, in 2008, the Virginia Supreme Court ruled that it is unconstitutional for a nonelected body to tax. VDOT is still looking for ways to fund this project and several others in the Hampton Roads region. According to VDOT, there is no funding available in the foreseeable future. *Source: www.virginiadot.org; Andy Pickard, Hampton Roads Planning District Commission, September 30, 2009; en.wikipedia.org;*

Air Transportation

Aircraft operations are conducted at several military installations and civilian airports dispersed throughout the Hampton-Langley JLUS study area and in the nearby Hampton Roads region (see Figure 2-9). In addition to Langley AFB, there are two airports within the study area – Felker Army Airfield at Fort Eustis and Newport News-Williamsburg International Airport. The Newport News-Williamsburg International Airport is located only eight miles northwest of Langley AFB. It has two runways (8,003 feet long and 6,526 feet long) and is served by commercial passenger airlines such as Air Tran Airways, Delta Connection, and US Airways Express Airlines. The airport also has general aviation facilities. For a 12-month period ending

March 31, 2007, the airport experienced an average of 313 aircraft operations per day, of which 32 percent were local general aviation, 25 percent were transient general aviation, 22 percent were military, and 21 percent were commercial.

Another five airports are situated in the nearby region (Norfolk International Airport, Williamsburg-Jamestown Airport, Hampton Roads Executive Airport, Norfolk Naval Air Station (NAS) / Chambers Field, and Oceana NAS / Apollo Soucek Field). The Norfolk International Airport is about 16 miles southeast of Langley AFB. It has two runways, one measuring 9,001 feet long and the other measuring 4,875 feet in length. Passenger carriers such as American Airlines, Continental Airlines, Delta, Northwest Airlines, Southwest Airlines, United Express, and US Airways operate at the airport. For a 12-month period ending December 31, 2006, the airport experienced an average of 352 aircraft operations per day, of which 44 percent were commercial, 23 percent were local general aviation, 16 were air taxi, 9 percent were transient general aviation, and 8 percent were military.

The Williamsburg-Jamestown Airport is a small general aviation airport approximately 22 miles northwest of Langley AFB. The airport maintains one 3,204-foot long asphalt runway. As of February 29, 2008, an average of 70 aircraft operations per day occurred, of which 52 percent were local general aviation, 38 percent were transient general aviation, 9 percent were air taxi, and less than 1 percent were military.

The Hampton Roads Executive Airport is located approximately 21 miles southwest of Langley AFB in Chesapeake, Virginia. The airport is a general aviation facility and serves business and recreation users. The sole runway at the Hampton Roads Executive Airport is asphalt and measures 4,056 feet in length; however, there is a project underway to replace this runway and extend it by 1,350 feet. For a 12-month period ending June 30, 2007, the airport experienced an average of 352 aircraft operations per day, of which 72 percent were transient general aviation, 25 percent were local general aviation, 2 percent were air taxi, and less than 1 percent were military.

According the 2007 *State of Transportation in Hampton Roads* report by the Hampton Roads Planning District Commission, air travel in Hampton Roads has increased substantially over the years leading up to 2005. Over 2.4 million passengers boarded flights at both Hampton Roads passenger airports, Norfolk International and Newport News-Williamsburg International, in 2005.

The number of passengers boarding flights at Hampton Roads' airports increased 41 percent between 2000 and 2005, while during that time national air travel only grew 4 percent. Norfolk International Airport passenger traffic followed this general trend until 2005; however, with the national economic decline and high fuel prices, passenger volumes showed a decrease beginning in 2006. Maintaining this trend, for the months of January through May 2009, Norfolk International Airport passenger traffic was 4.6 percent below 2008 passenger traffic counts.

Unlike Norfolk International, the Newport News-Williamsburg International Airport experienced increases in passenger volumes between 2006 and 2008, with the largest increase (37 percent) occurring between 2007 and 2008. Estimates for 2009 passenger traffic indicate that the airport will experience a 32 percent decrease in passenger volume compared with 2008.

Source: The State of Transportation in Hampton Roads, Hampton Roads Planning District Commission, January 2007; www.airnav.com; www.hamptonroadsexecutiveairport.com; ORFstats, Norfolk Airport Authority, June 19, 2009; Jessica Wharton, Newport News-Williamsburg Public Relations Officer, September 9, 2009

Water Transportation

Ports

Most facets of the Hampton Roads economy, including the military, ports, and shipbuilding and repair, rely on the Hampton Roads Harbor and its tributaries. The Port of Virginia handled

over 33 million tons of total cargo in 2004. While the Port remains the largest exporter of coal in the world, the amount of coal exported through the Port of Virginia has diminished greatly since the mid-1990s. All of the growth that has occurred at the Port in recent years is due to increases in general cargo, which includes containerized and break-bulk cargo.

There are several facilities that comprise the Port of Virginia – Newport News Marine Terminal, Norfolk International Terminals, Portsmouth Marine Terminal, and the Virginia Inland Port. The Newport News Marine Terminal is a 141-acre complex and is the Port of Virginia's main break-bulk terminal. Located just over eight miles southwest of Langley AFB, the facility has 42,720 feet of direct rail access/rail track provided by CSX. It maintains 3,480 feet of total pier space serviced by four cranes. It offers direct cargo loading on and off ships to and from the CSX break-bulk rail service, covered storage, container storage, and accessibility from three major Virginia roadways.

The 648-acre Norfolk International Terminals is located 12 miles southeast of Langley AFB and is the Port of Virginia's largest terminal. This facility is serviced by 14 of the largest, most efficient cranes in the world. They can reach 245 feet and can offload container ships loaded with cargo. Norfolk International Terminals has 5 berths, 14 container cranes, 3 finger piers, a roll on/roll off berth, covered and container storage, and 89,300 feet of direct rail access, which will soon connect directly to the Commonwealth Railway Project. The main channel leading to the terminal is 50 feet deep and is being deepened to 55 feet.

Located about four miles south of the Norfolk International Terminals, the Portsmouth Marine Terminal includes 219 acres and is the Port of Virginia's second largest terminal. The terminal has 3,540 feet of wharf, 3 berths, and 6 cranes and is able to handle container, break-bulk, and roll on/roll off cargo. The Portsmouth Marine Terminal also has direct access to both CSX and Norfolk Southern (NS) railways and will soon connect to the Commonwealth Railway.

The Virginia Inland Port is located west of Washington, D.C., in Warren County, Virginia. Cargo from the other three state-owned terminals travels here five days a week, bringing the Port of Virginia 220 miles closer to the US Market and 75 international shipping lines. The facility also contains 17,820 linear feet of on-site rail serviced by Norfolk Southern railroad. The Virginia Inland Port is within one mile of Interstate 66 and within five miles of Interstate 81. The facility is also a US Customs-designated port of entry. *Source: The State of Transportation in Hampton Roads, Hampton Roads Planning District Commission, January 2007; www.portofvirginia.com*

Ferry

Marine public transportation services are also available in Hampton Roads. Hampton Roads Transit provides ferry service between Waterside in Downtown Norfolk and High Street Landing in Portsmouth. Over 320,000 passengers used this service in 2005. The Virginia Department of Transportation also operates a free passenger and vehicular ferry service between Jamestown and Scotland in Surry County. This service carried 997,000 vehicles across the James River in 2005, up from 895,000 vehicles in 2000. This connects the upper side of the Peninsula with Surry County and other Southside localities. Pedestrian ferry service is provided by the Elizabeth River Ferry, which consists of three 150-passenger paddle-wheel ferry boats. *Source: Hampton Community Plan, February 8, 2006*

Cruise Lines

In addition to commercial marine activities, the Hampton Roads area services the cruise industry. In 2005, 105,000 passengers sailed on cruises from Norfolk, which is up from 35,000 passengers in 2002.

Environmental Resources

The Virginia Peninsula and the Commonwealth of Virginia provide essential habitat for wildlife and fish populations. The Hampton-Langley JLUS

study area is located on the Virginia Peninsula and is home to several wildlife refuges, nature parks, preserves, and wetlands. Some of the larger of these are detailed below.

National Wildlife Refuge

Most refuges were established to protect and enhance wetlands for the conservation of migratory birds; some were established to provide habitat for endangered species. These areas are located mainly along or near the coast in the eastern half of the state. Refuges promote wildlife diversity and protect wildlife habitat and natural systems, like wetland habitats, that serve communities and people by holding flood waters and filtering pollutants.

The Plum Tree Island National Wildlife Refuge is one of four refuges that comprise the Eastern Virginia Rivers National Wildlife Refuge Complex. The refuge is situated on the southwestern corner of Chesapeake Bay in the City of Poquoson, which is a strategic location approximately midpoint on the Atlantic Flyway. The Refuge's 3,501 acres provide terrestrial and aquatic habitats that are ideally suited for migratory birds and fish. Elevations range from mudflats that are submerged at high tide to approximately five feet above mean sea level. The topography is relatively flat, except for a series of forested hummocks that are remnants of ancient dune lines.

Hundreds of species depend on a healthy marsh/estuarine system to feed, rest, and reproduce. This is particularly true in and around the area of the Refuge. To date, approximately one hundred different bird species have been observed including northern harrier, black duck, sedge wren, sharp-tailed sparrow, bald eagle, peregrine falcon, black-necked stilts, and little blue heron. Mammals include white-tailed deer, raccoon, muskrat, and red fox, among others. Endangered and threatened sea turtles (primarily loggerhead turtles) are known to frequent the waters surrounding the refuge. Fish such as striped bass, mullet, spot, and white perch along with shellfish (oysters, clams, and blue crab) also benefit from the protected marsh.

Source: www.fws.gov/northeast; www.wildernet.com

Nature Park

The City of Hampton is home to the Sandy Bottom Nature Park, a 456-acre facility dedicated to wildlife management and environmental education. The park is bordered by Interstate 64 to the north and Hampton Roads Center Parkway to the south and is less than three miles west of the Langley AFB in general alignment with the centerline of the installation's runway. It includes a 10,000-square foot nature center overlooking Sandy Bottom Lake. *Source: www.hampton.gov/sandybottom*

Nature Preserve

The Grandview Nature Preserve, located in the City of Hampton, covers 475 acres of salt marsh and tidal creeks. It also includes 2.5 miles of secluded Chesapeake Bay beachfront. The Preserve is located approximately four miles east of the Langley AFB runway. A portion of the Preserve is inline with the runway while the majority is south of centerline.

Source: http://www.hampton.va.us/parks/parks_and_trails.html; www.virginia.org

Wetlands

Wetlands are lands that are flooded or saturated at or near the ground surface for varying periods of time during the year. Water is produced through rainfall, snowmelt, river overflow, ocean-driven tides, rising lake levels, or ground water coming to the soil surface. There are many wetland definitions; some are technical definitions used by scientists to describe and inventory wetlands, while others are regulatory definitions that define lands administered by government regulations and zoning ordinances.

Langley AFB is located on the Hampton Flat, which is the principal physiographic feature in the lower part of York County and the cities of Newport News and Hampton. The surface of the Hampton Flat slopes gently toward the sea at one foot per mile. The flat typically has poor

drainage, and wetlands are abundant except along the banks of the Hampton and Back Rivers where prior dredging and filling activities have destroyed them.

The Hampton-Langley JLUS study area also includes tidal wetlands. These include nonvegetated mudflats exposed at low tide, rocky shores (with or without algae), salt and brackish marshes (tidally flooded grasslands), and mangrove swamps (salty shrub thickets and forests in the tropics). These areas are periodically flooded by tides, some every day and many less often (some only by storm tides). They occur along the Atlantic, Pacific, Arctic, and Gulf of Mexico coastlines.

Wetlands are important for a number of reasons. These include: surface water storage (flood control), shoreline stabilization (wave damage protection/shoreline erosion control), streamflow maintenance (maintaining aquatic habitat and aesthetic appreciation opportunities), groundwater recharge (some types replenish water supplies), sediment removal and nutrient cycling (water quality protection), supporting aquatic productivity (fishing, shellfishing, and waterfowl hunting), production of trees (timber harvest), production of palatable herbaceous growth (livestock grazing and haying), production of peaty soils (peat harvest), and provision of plant and wildlife habitat (hunting, trapping, plant/wildlife/nature photography, nature observation, and aesthetics).

Source: www.fws.gov/northeast/wetlands; Integrated Natural Resources Management Plan, Langley AFB, December 7, 2007