# CHAPTER 3
# FACILITY REQUIREMENTS

## 3.1 INTRODUCTION

To properly plan for the future requirements of Newport News/Williamsburg International Airport, it is necessary to translate the forecasts of aviation demand into the specific types and quantities of facilities that are needed to accommodate the projected demand. This master plan derived the forecast and considered facility needs based on phases. Based on the forecast of activity, short-term, mid-term, and long-term phases correspond to 2017, 2027, and 2032 respectively. The need for new or expanded facilities is often driven by capacity shortfalls that leave an airport unable to accommodate forecast growth with existing facilities. However, the requirements for new or improved facilities can also be driven by other circumstances. For example, facilities may be needed to comply with updated standards developed and adopted by the FAA or other regulatory agencies, accommodate the strategic vision for the Airport, or replace outdated or inefficient facilities that are prohibitively costly to maintain or modernize. These circumstances can have a significant impact on future needs and have been considered in this analysis for the Airport.

The findings of the capacity analyses and facility requirement determinations form the foundation for the identification of development alternatives. Evaluation of those alternatives defines a development plan to meet future demand. Critical future investment decisions will be based on these analyses.

The facility requirements analysis begins with a review of emerging industry trends that may influence the need for future facilities. The majority of this chapter is devoted to assessments in each of the following major functional areas of the Newport News/Williamsburg International Airport:

- Airfield and Airspace
- Commercial Passenger Terminal
- Landside Facilities
- General Aviation Facilities
- Support Facilities
- Utilities

This chapter includes a section that summarizes the key findings of the facility requirement assessments that will be carried forward to the identification and evaluation of alternatives.

## 3.2 SUMMARY OF MAJOR AIRPORT FACILITY NEEDS

The major airport facility needs are a result of FAA airport design standards, customer services concerns, an airport strategic vision, or a forecast need. Both customer services and strategic vision needs are business driven and don't necessarily have a corresponding aircraft operation or passenger enplanement to trigger the development. However, an airport design standard, and a forecast need must consider future aircraft operations and passenger enplanement levels, and establish points within the planning period to implement necessary facility improvements to accommodate the need

Listed below is a summary of the major facility needs to adequately accommodate the forecast activity, address FAA design standards, elevate customer service concerns, and to meet the strategic vision for the Airport. Certain items will require further analysis to determine the optimum layout and compatibility, this analysis will occur in the following chapter, Identification and Evaluation of Alternatives.

Short-term (Phase I)

- Analyze the existing airfield configuration with FAA design guidelines provided in Engineering Brief No. 75: Incorporation of Runway Incursion Prevention into Taxiway and Apron Design.
- Evaluate the feasibility of separating airport users from non-airport user on the on-Airport roadway system in order to provide better access into the Airport and terminal circulation.
- Acquire control of land beneath Runway 7, 2 and 20's RPZ either by acquisition or avigation easements.
- Add right-angled exit taxiways to enable a more efficient aircraft traffic flow off of Runway 7/25 and Runway 2/20.
- Examine size improvements for public restroom within the short-term to accommodate the projected growth in annual passengers.
- Implement Virginia Department of Aviation's NAVAIDS recommendations as appropriate throughout the planning period.
- Add one new large conventional hangar in the short-term and three additional in the long-term to accommodate the projected growth in corporate jets.

Mid-Term (Phase II)

- Examine the feasibility of consolidating the security screening checkpoint area
- Determine the feasibility of incorporating an in-line checked baggage screening system
- Expand the inbound baggage claim area
- Add a baggage claim device within the short-term to accommodate the projected growth in annual passengers.
- Replace two 10-unit T-Hangars in the mid-term and add one additional 10-unit T-Hangar in the long-term.

Long-Term (Phase III)

- Replace the primary ARFF vehicle within this planning period.
- Improve vehicle access improvements from an I-64 interchange and Jefferson Avenue.

## 3.3 EMERGING TRENDS

The aviation industry is changing rapidly and this evolution may have a significant impact on the size, quantity, and type of facilities needed to accommodate future demand. The rapid pace of change in the aviation industry is expected to continue. All master planning efforts should examine industry trends and identify those that will influence their capacity needs. Some of the emerging trends in the aviation industry that should be considered in the master plan for Newport News/Williamsburg International Airport include:

- Ticket lobbies may look very different in the not too distant future. Future terminals will not have vast areas for ticket counter space and queues because emerging technology will largely eliminate the need for them. Rather, self-serve kiosks will be extensively used to enable passengers to print their own boarding passes and drop off their own baggage. Many airport terminal buildings do not have the flexibility to adapt their floor plans to accommodate future technological changes.

- Sustainability initiatives will push airports toward energy-efficient buildings and improved systems that can be difficult to accommodate in older buildings.

- There is a growing need to increase aviation revenues, including concession revenues in the terminal, and to develop revenue-producing uses for on-airport property that are not currently needed for aviation-related functions.

In general, many of the emerging trends in the aviation industry focus on providing energy efficient buildings that can accommodate technology advances in passenger processing activities in the terminal building. The other major influence will be an increasing need to expand airport revenue streams beyond the traditional aviation related activities.

## 3.4 AIRPORT DESIGN CLASSIFICATION

Airport design classification identifies the FAA's Airport Reference Code, critical aircraft for the Airport and related airport design standards necessary during the planning periods.

### 3.4.1 Airport Role and Service Level

The Newport News/Williamsburg International Airport is identified in the FAA's *National Plan of Integrated Airports System (NPIAS)* as a Primary Commercial Service, Small Hub facility. The Airport is also projected to remain a Small Hub throughout the 20-year airport master planning horizon. These classifications are used for FAA planning and funding purposes. A Primary Commercial Service airport is one that enplanes more than 10,000 passengers annually. A Small Hub, as defined by the FAA, is a primary commercial service airport that accommodates more than 0.05 percent, but less than 0.25 percent, of annual U.S. enplanements.

### 3.4.2 Airport Reference Code (ARC)

The FAA's ARC and critical aircraft for the Newport News/Williamsburg International Airport during each of the planning periods is identified in Table 3-1. The existing critical aircraft category at the

Airport is ARC C-III, and ultimately planned for ARC D-IV. Although various segments of the airfield may have different ARCs applied for design purposes; these segments cannot be greater than the largest ARC for the Airport, which is an ARC D-IV. The ARC is the FAA classification for determining airport geometric standards based on the largest airplane conducting at least 500 annual itinerant operations (combination of takeoffs and landings) at the Airport. The critical aircraft is evaluated by approach speed, wingspan and tail height, serving as the basis for determining the airport's design, structure, and equipment needs for airfield, runway and terminal facilities; see the Forecast Chapter for a discussion on critical aircraft.

*Table 3-1*
**AIRPORT REFERENCE CODE (ARC) – EXISTING & FUTURE**

| **Existing / Future** | **ARC Approach Category** | **Approach Speed (knots)** | |
|---|---|---|---|
| | Category A | < 91 knots | |
| | Category B | 91 to < 121 knots | |
| Existing | Category C | 121 to < 141 knots | |
| Future | Category D | 141 to < 166 knots | |
| | Category E | > 166 knots | |
| **Existing / Future** | **ARC Design Group** | **Wingspan (ft)** | **Tail Height (ft)** |
| | Group I | < 49' | < 20 |
| | Group II | 49' to < 79' | 20' to < 30' |
| Existing | Group III | 70' to < 118' | 30' to < 45' |
| Future | Group IV | 118' to < 171' | 45' to < 60' |
| | Group V | 171' to < 214' | 60' to < 66' |
| | Group VI | 214' to < 262' | 66' to < 80' |

Note; Combined, the approach category and design group yields the Airport Reference Code (ARC) which determines the type of airplane (family) that the airport is designed to accommodate.

Source: FAA Advisory Circular 150/5300-13

## 3.5 METEOROLOGICAL CONDITIONS

Climate conditions have an influence on aircraft performance, and airfield dimensional and separation standards. Temperature, precipitation, winds, visibility and cloud ceiling heights are important climate factors used to assess weather intensities, and the aircraft operational impacts associated with Runways 7/25 and 2/20.

### 3.5.1 Climate Summary

The average annual temperature for Newport News is 61° Fahrenheit, ranging from 80°F in July to 34°F in January, with an average maximum temperature of 87°F occurring during July. There are 33 days on which temperature exceeds 90°F, and more than 200 days exceeding 59°F (standard temperature). The average annual rainfall is 40.3 inches. On average annually, visual flight rules (VFR) conditions (ceiling of at least 1,000 feet and visibility of at least 3 miles) are experienced 91 percent of the time (331 days), with instrument flight rules (IFR) conditions (ceiling of less than 1,000 feet or visibility of less than 3 miles) occurring on average 9 percent (34 days) of the year.

### 3.5.2 Runway Orientation and Wind Analysis

Runway wind coverage analysis was conducted using the FAA's Airport Design Microcomputer Program Version 4.2D with data supplied by National Climatic Data Center from the weather reporting station at Newport News/Williamsburg International Airport during the period from 2000 through 2009. FAA planning standards recommend that the runway system provide a minimum of 95 percent wind coverage. If a single runway cannot provide this level of coverage, then a crosswind runway is warranted. As shown in Table 3-2, both runways individually are slightly below the minimum 95 percent wind coverage threshold for the 10.5-knot crosswind component during all-weather and IFR conditions; however, the wind coverage for the combined runway configuration is 97.97 percent. Accordingly, the airfield has adequate wind coverage and no additional (crosswind) runways are warranted for wind coverage.

*Table 3-2*
**RUNWAY CROSSWIND DATA (ALL-WEATHER WIND COVERAGE)**

| **Percent All-Weather Wind Coverage** | | | | |
|---|---|---|---|---|
| **Runway Orientation** | **10.5 Knots (%Component)** | **13 Knots (%Component)** | **16 Knots (%Component)** | **20 Knots (%Component)** |
| Runway 2 | 53.57% | 55.54% | 57.07% | 57.42% |
| Runway 20 | 54.98% | 56.51% | 57.61% | 57.89% |
| Combined 2/20 | 93.13% | 96.61% | 99.23% | 99.85% |
| Runway 7 | 51.48% | 52.42% | 53.24% | 53.41% |
| Runway 25 | 58.27% | 60.23% | 61.58% | 61.90% |
| Combined 7/25 | 94.37% | 97.25% | 99.41% | 99.90% |
| Both Runways | 97.97% | 99.33% | 99.86% | 99.98% |

| **Percent IFR-Weather Wind Coverage** | | | | |
|---|---|---|---|---|
| **Runway Orientation** | **10.5 Knots (%Component)** | **13 Knots (%Component)** | **16 Knots (%Component)** | **20 Knots (%Component)** |
| Runway 2 | 82.74% | 83.24% | 83.50% | 83.70% |
| Runway 20 | 76.58% | 76.58% | 76.58% | 76.58% |
| Combined 2/20 | 99.00% | 99.50% | 99.77% | 99.96% |
| Runway 7 | 83.79% | 83.86% | 83.90% | 83.90% |
| Runway 25 | 75.56% | 75.81% | 70.03% | 76.16% |
| Combined 7/25 | 99.13% | 99.46% | 99.72% | 99.84% |
| Both Runways | 99.41% | 99.62% | 99.77% | 99.96% |

Source: National Climatic Data Center, 2000-2009.

## 3.6 AIRFIELD

This section describes the airfield facility needs and the methods and planned timing upon which the facility requirements have been determined. Areas examined include the airfield capacity, runway length/width, taxiway systems, lighting aids, airfield safety areas/separation standards, and pavement strength. The airfield geometric design and site layout are determined by application of airport design standards contained in the FAA Advisory Circular 150/5300-13, *Airport Design.* Airport standards are determined with respect to the Airport's critical aircraft for each runway.

### 3.6.1 Airfield Capacity

The capacity to accommodate aircraft operations without unacceptable operational delays at Newport News/Williamsburg International Airport is presented in Table 3-3. These annual capacity estimates are based on FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay.* The values developed were compared to the long range forecast for the Airport to determine where any shortfalls exist or may develop.

Newport News-Williamsburg International Airport's Annual Service Volume is 269,000 annual aircraft operations. The ratio of annual demand to annual capacity ranges from 37.8 percent in 2010 to 51.7 percent in 2032. The FAA recommends that an airport starts planning for additional runway capacity when demand reaches 60 percent and begin construction when demand reaches 80 percent of the Annual Service Volume. By this measure, the need for additional airfield capacity planning would occur after the 20-year planning horizon, based on current operational trends. Should based aircraft increase, or other demand generators locate at the Airport, then the need for capacity enhancing projects could be realized in the outer years of the planning horizon.

*Table 3-3*
**CAPACITY ANALYSIS**

| | 2010 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|
| Annual Demand / Capacity | | | | | |
| Forecast Annual Operational Demand | 101,887 | 109,289 | 118,408 | 128,513 | 139,138 |
| Annual Service Volume | 269,000 | 269,000 | 269,000 | 269,000 | 269,000 |
| Annual Demand/Capacity | 37.0% | 40.6% | 44.0% | 47.8% | 51.7% |

Source: FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*

Adding a new runway is not needed to address short or medium-term operational demand. However, planning for additional capacity may need to begin near the end of this Master Plan's long-term horizon (2032). Therefore, the concept of a future 7/25 parallel runway identified on the current Airport Layout Plan should be carried forward as a long-term, post-planning period concept in this Master Plan. This will facilitate long-term land use compatibility planning and necessary airspace protection to allow the runway to be built with minimal off-airport impacts when demand warrants.

With this long-term recommendation in place to retain the possibility of a future runway, several short-term airfield modifications could be implemented to improve the airfield efficiencies. These short-term improvements would increase the annual capacity of the Airport and extend the usefulness of the existing runway configuration by reducing runway occupancy times. The additional analysis regarding these potential airfield solutions to improve the airfield operational efficiencies and capacity are presented in Chapter 4, Identification and Evaluation of Alternatives.

### 3.6.2 Runway Design

The runway analysis addresses the ability of the existing runways at the Airport to accommodate the forecast demand. At a minimum, runways must have the proper length, width, and strength to meet FAA recommended design standards within Advisory Circular 150/5300-13, *Airport Design* and Advisory Circular 150/5325, *Runway Length*, to safely accommodate the design aircraft. This section analyzes specific runway criteria and makes recommendations based on the forecast. Elements to be examined in this section include, runway designations, runway length, electronic and visual NAVAIDs, runway protection zone, and runway weight bearing capacity.

#### *3.6.2.1 Runway Designation*

Runway designation marking provided on the end of each runway indicate the runway's orientation according to the magnetic azimuth. The magnetic azimuth is determined by correcting the runway's true bearing for magnetic declination. The true bearing is shown in Table 3-4 for all runways. With the airport's annual magnetic declination changing 0.1 degrees west per year, it is unlikely that either runway will require re-designation during the planning period.

*Table 3-4*
**TRUE RUNWAY BEARING**

| Runways | True Bearing | Magnetic Variation | Runway Magnetic Azimuth |
|---|---|---|---|
| Runway 07 | 57° 48' 36" | 10° 41' W (0° 1'W / year) | 67° 29' 36" |
| Runway 25 | 237° 48' 36" | 10° 41' W (0° 1'W / year) | 248° 29' 36" |
| Runway 02 | 12° 47' 45" | 10° 41' W (0° 1'W / year) | 23° 28' 45" |
| Runway 20 | 192° 47' 45" | 10° 41' W (0° 1'W / year) | 203° 28' 45" |

Source: National Climatic Data Center and Survey Data, FAA Aeronautical Data Support, FAA National Aeronautical Navigational Services.

#### *3.6.2.2 Runway Length Requirement*

Runway length requirement is determined by the greater of the takeoff or landing performance characteristics of the existing and future critical aircraft operating at the Newport News/Williamsburg International Airport, or composite family of airplanes as represented by the critical aircraft's Airport Reference Code. The takeoff length, including takeoff run, takeoff distance, and accelerate-stop distance, is typically the more demanding of the runway length requirements.

The strategic vision of the Peninsula Airport Commission for Newport News/Williamsburg International Airport is the ability to support non-stop passenger and cargo service to extended US and European destinations. In order to achieve this strategic vision, it is necessary to provide a runway length sufficient for non-stop operations to identified domestic and European markets, based on existing and future critical aircraft, as shown on the current Airport Layout Plan.

The most likely potential markets to be served include popular recreational and business markets. The distances from the Airport to these potential destinations include:

- Dallas – 1,038 nm
- Salt Lake City – 1,658 nm
- Phoenix – 1,743 nm
- Las Vegas – 1,850 nm
- Los Angeles – 2,038 nm
- Seattle – 2,092 nm
- San Francisco – 2,165 nm
- Nassau – 726 nm
- Cancun – 1,105 nm
- London – 3,232 nm
- Paris – 3,288 nm

The primary runway should have sufficient length to accommodate 90 percent of the operational fleet on the longest reasonably expected flight stage length. For runway length planning purposes, a stage length of 2,200 nautical miles for domestic needs and 4,000 nautical miles for international would be the maximum, and full passenger loads would be expected. A runway length analysis was conducted using the FAA airport design software with general runway length guidance based on the Advisory Circular. The analysis used performance graphs for composite aircraft groups, adjusted for the Newport News' mean maximum temperature (87°F), airport field elevation (42 feet above mean sea level), the difference in runway end elevations (±2 feet), and an aircraft flight range greater than 500 nautical miles. The results of the runway length analysis are provided in Table 3-5 and indicate that the Airport has adequate runway length to accommodate projected domestic demand. To reach future potential international markets, a 10,000-foot runway will be required. Based on this analysis the Airport Layout Plan should continue to show the 1,997 foot runway extension to Runway 7/25. Actual planning and development of any increase in runway length will be triggered by the intent of a specific user to regularly serve the Airport and the documented need for additional length in order to economically operate the route.

*Table 3-5*
**FAA AIRCRAFT RUNWAY LENGTH REQUIREMENTS**

| Aircraft Category | FAA Recommended Runway Length |
|---|---|
| Small Airplanes (< 12,500 lbs) | 2,480' |
| 100% of Fleet (< 10 seats) | 3,610' |
| 100% of Fleet (> 10 seats) | 4,210' |
| Large Airplanes (12,501 lbs - 60,000 lbs) | |
| 75% of Fleet @ 60% Useful Load | 4,650' |
| 75% of Fleet @ 90% Useful Load | 6,510' |
| 100% of Fleet @ 60% Useful Load | 5,300' |
| 100% of Fleet @ 90% Useful Load | 8,040' |
| Large Airplanes (> 60,000 lbs) | |
| 1,800 Mile Stage Length | 7,320' |
| 2,000 Mile Stage Length | 7,620' |
| 2,200 Mile Stage Length | 7,920' |
| 3,500 Mile Stage Length | 9,540' |
| 4,000 Mile Stage Length | 10,030' |
| 5,500 Mile Stage Length | 11,040' |

Source: FAA Airport Design Microcomputer Program 4.2D

### *3.6.2.3 Runway Widths*

The existing runways conform to the FAA runway width design standards of 150 feet.

### *3.6.2.4 Runway Protection Zone*

For the protection of people and property on the ground, the FAA has identified an area of land located off each runway end as the Runway Protection Zone (RPZ). The size of the zones varies according to the design aircraft characteristics, visual approaches, and the lowest instrument approach visibility minimum defined for each runway. It is desirable to have all areas within the RPZ cleared, or at a minimum, through airport land use control measures, such as fee simple ownership or avigation easements.

In addition, RPZs also provide coverage to all runway ends for instrument approaches. The list below illustrates the existing approaches (with the lowest visibility minimum) that serve PHF, and a complete list of the published instrument approaches is provided with Chapter 1, Existing Conditions.

- Runway 7 ILS/LOC (1/2 mile minimum)
- Runway 25 ILS/LOC (3/4 mile minimum)
- Runway 2 RNAV (1 mile minimum)
- Runway 20 RNAV (1 mile minimum)

Carried forward from the previous Master Plan and the recently completed Facilities and Equipment (NAVAID) study by the Virginia Department of Aviation, the Airport intends to convert Runways 2 from a non-precision to a precision approach. The reason to make these improvement as explained in the previous study were to enable the Airport to utilize both of its existing runways for its critical aircraft in peak hour.

It is important to ensure that the larger dimensions of an instrument approach RPZ are available and planned to accommodate future upgrades and remain shown on the Airport Layout Plan. It is recommended that that the Airport purchase all land located within the existing and future RPZ. If it is not feasible to own the property, avigation easement should be in place to limit equipment and building height and ensure compatible land use. The RPZ dimensional standards for the Airport's existing and future RPZs are shown in Table 3-6. The following are areas the airport should acquire or control by easement:

- Runway 7's RPZ, 3.4 acres are neither owned nor control by an aviation easement.
- Runway 25's RPZ all land is owned or controlled by an aviation easement.
- Runway 2's RPZ 5.8 acres are neither owned nor controlled by an avigation easement
- Runway 20's RPZ, 1.3 acres are neither owned nor controlled by an avigation easement

*Table 3-6*
**RUNWAY PROTECTION ZONE DIMENSIONS**

| | **Existing** | | | | **Future** | | | |
|---|---|---|---|---|---|---|---|---|
| **Runway** | **7** | **25** | **2** | **20** | **7** | **25** | **2** | **20** |
| Length | 2,500' | 1,700' | 1,700' | 1,700' | Same | 2,500' | 2,500' | Same |
| Inner Width | 1,000' | 1,000' | 500' | 500' | Same | 1,000' | 1,000' | Same |
| Outer Width | 1,750' | 1,510' | 1,010' | 1,010' | Same | 1,750' | 1,750' | Same |
| Acreage | 78.914 | 48.978 | 29.465 | 29.465 | Same | 78.914 | 78.914 | Same |

Source: FAA Advisory Circular 150/5300-13

### *3.6.2.5 Runway Design Standards*

The section describes the facility standards necessary for meeting the strategic goals of the Airport, as well as the performance and dimensional characteristics of the critical aircraft category designated for each runway. Compliance with FAA airport geometric and separation standards, without modification to standards, is intended to meet a minimum level of airport operational safety and efficiency.

Table 3-7 compares the FAA airport design standards for the primary Runway 7/25 and Table 3-8 compares crosswind Runway 2/20, based on the existing and future airport reference code. A checkmark denotes whether the standards are met. Note that all runway ends do not have blast pads; however, erosion from jet blast does not appear to be an issue at this time minimizing the need for this pavement.

*Table 3-7*
**PRIMARY RUNWAY DESIGN STANDARDS**

| | Runway 7/25 (Primary) | | | |
|---|---|---|---|---|
| **Airfield Component** | **Existing ARC D-V** | **Future ARC D-IV** | **Existing Met (✓)** | **Future Met (✓)** |
| Rwy Width | 150' | Same | ✓ | ✓ |
| Rwy Shoulder Width | 35' | 25' | | ✓ |
| Rwy Blast Pad Width | 220' | 200' | ✓ | ✓ |
| Rwy Blast Pad Length | 400' | 200' | | |
| Rwy Safety Area (RSA) Width | 500' | Same | ✓ | ✓ |
| Rwy Safety Area (RSA) Length Prior to Threshold | 600' | Same | ✓ | ✓ |
| Rwy Safety Area (RSA) Length Beyond Rwy End | 1,000' | Same | ✓ | ✓ |
| Rwy Object Free Area (OFA) Width | 800' | Same | ✓ | ✓ |
| Rwy Object Free Area (OFA) Length Beyond Rwy End | 1,000' | Same | ✓ | ✓ |
| Rwy Obstacle Free Zone (OFZ) Width | 400' | Same | ✓ | ✓ |
| Rwy Obstacle Free Zone (OFZ) Length Beyond Rwy End | 200' | Same | ✓ | ✓ |
| Precison Obstacle Free Zone (OFZ) Width | 800' | Same | ✓ | ✓ |
| Precison Obstacle Free Zone (OFZ) Length Beyond Rwy End | 200' | Same | ✓ | ✓ |
| Rwy to Taxiway Centerline Separation | 400' | Same | ✓ | ✓ |
| Rwy Centerline to Holdline Separation | 250' | Same | ✓ | ✓ |
| Rwy Centerline to Aircraft Parking Area | 500' | Same | ✓ | ✓ |
| Twy Centerline to Parallel Taxiway/Taxilane Separation | 267' | 215' | ✓ | ✓ |
| Twy Centerline to Fixed or Movable Object | 160' | 130' | ✓ | ✓ |

Source: FAA Advisory Circular 150/5300-13

*Table 3-8*
**CROSSWIND RUNWAY DESIGN STANDARDS**

| | Runway 2/20 (Crosswind) | | |
|---|---|---|---|
| **Airfield Component** | **Existing ARC C-III** | **Future ARC C-III** | **Future Met (✓)** |
| Rwy Width | 150' | Same | ✓ |
| Rwy Shoulder Width | 20' | Same | ✓ |
| Rwy Blast Pad Width | 140' | Same | |
| Rwy Blast Pad Length | 200' | Same | ✓ |
| Rwy Safety Area (RSA) Width | 500' | Same | ✓ |
| Rwy Safety Area (RSA) Length Prior to Threshold | 600' | Same | ✓ |
| Rwy Safety Area (RSA) Length Beyond Rwy End | 1,000' | Same | ✓ |
| Rwy Object Free Area (OFA) Width | 800' | Same | ✓ |
| Rwy Object Free Area (OFA) Length Beyond Rwy End | 1,000' | Same | ✓ |
| Rwy Obstacle Free Zone (OFZ) Width | 400' | Same | ✓ |
| Rwy Obstacle Free Zone (OFZ) Length Beyond Rwy End | 200' | Same | ✓ |
| Precison Obstacle Free Zone (OFZ) Width | 800' | Same | ✓ |
| Precison Obstacle Free Zone (OFZ) Length Beyond Rwy End | 200' | Same | ✓ |
| Rwy to Taxiway Centerline Separation | 400' | Same | ✓ |
| Rwy Centerline to Holdline Separation | 250' | Same | ✓ |
| Rwy Centerline to Aircraft Parking Area | 500' | Same | ✓ |
| Twy Centerline to Parallel Taxiway/Taxilane Separation | 152' | Same | ✓ |
| Twy Centerline to Fixed or Movable Object | 93' | Same | ✓ |

Source: FAA Advisory Circular 150/5300-13

### 3.6.3 Airfield Configuration

Reducing the risk of runway incursions is a top FAA priority[1]. According to FAA Engineering Brief No. 75, Incorporation of Runway Incursion Prevention into Taxiway and Apron Design, more than half of the runway incursions studied were associated with aircraft taxiing across an active runway. Therefore, the FAA recommends consideration of effective means of making the entry to a runway obvious to pilots. A key element of reducing runway incursions is to provide the best possible visual cues to the pilot of the runway hold position, which occasionally requires reconfiguring the airfield geometry. Review of the airfield configurations at PHF shows that several areas might benefit from focused study. Figure 3-1 identities airfield areas that conflict with Engineering Brief No. 75 principles or FAA AC 150/5440-1K, *Standards for Airport Markings*.

With the existing airfield configuration, Runway 7/25 and Runway 2/20 intersect in such a way that the various taxiways may be less than optimally configured to minimize the possibility of runway incursions. A summary of the less than optimal condition follows:

- The holding position for Runway 7 and Runway 2 on Taxiway A between the two runway ends is limited to approximately 50 feet. Due to this taxiway configuration, the holdline for Runway 7 is approximately 300 feet from the centerline of Runway 7, and the holdline for Runway 2 is 250 feet from the centerline of Runway 2. Therefore, the space allowed for holding aircraft is less than 50 feet. This is not large enough for many of the aircraft operating at the Airport including the Critical Design Aircraft.

  Therefore, aircraft departing Runway 2 and taxiing from the main commercial/GA ramps must hold short north of Runway 7, wait until Runway 7 is clear, and then be given clearance to cross Runway 7 and depart Runway 2. A similar situation involving aircraft departing Runway 7 having to hold short of Runway 2 will arise as the South Corporate Ramp is developed. While operationally safe, the configuration is less than optimal.

- The combined hold point could result in pilot confusion regarding runway usage. During times of low visibility, at night, or when the tower is closed, departing pilots may become confused on where the runway ends are located, potentially increasing the chance of an aircraft departing on the wrong runway.

- Engineering Brief No. 75 discourages the use of entrance taxiways that are not at a right angle, which occurs on the entrance of Taxiway A onto Runway 7 (the portion of Taxiway A located in between Runway 7 and Runway 2). Right-angled taxiways are the recommended standard for all runway-taxiway intersections (except for acute angle exit taxiways), as they provide the best visual perspective in both directions to a pilot approaching a runway intersection.

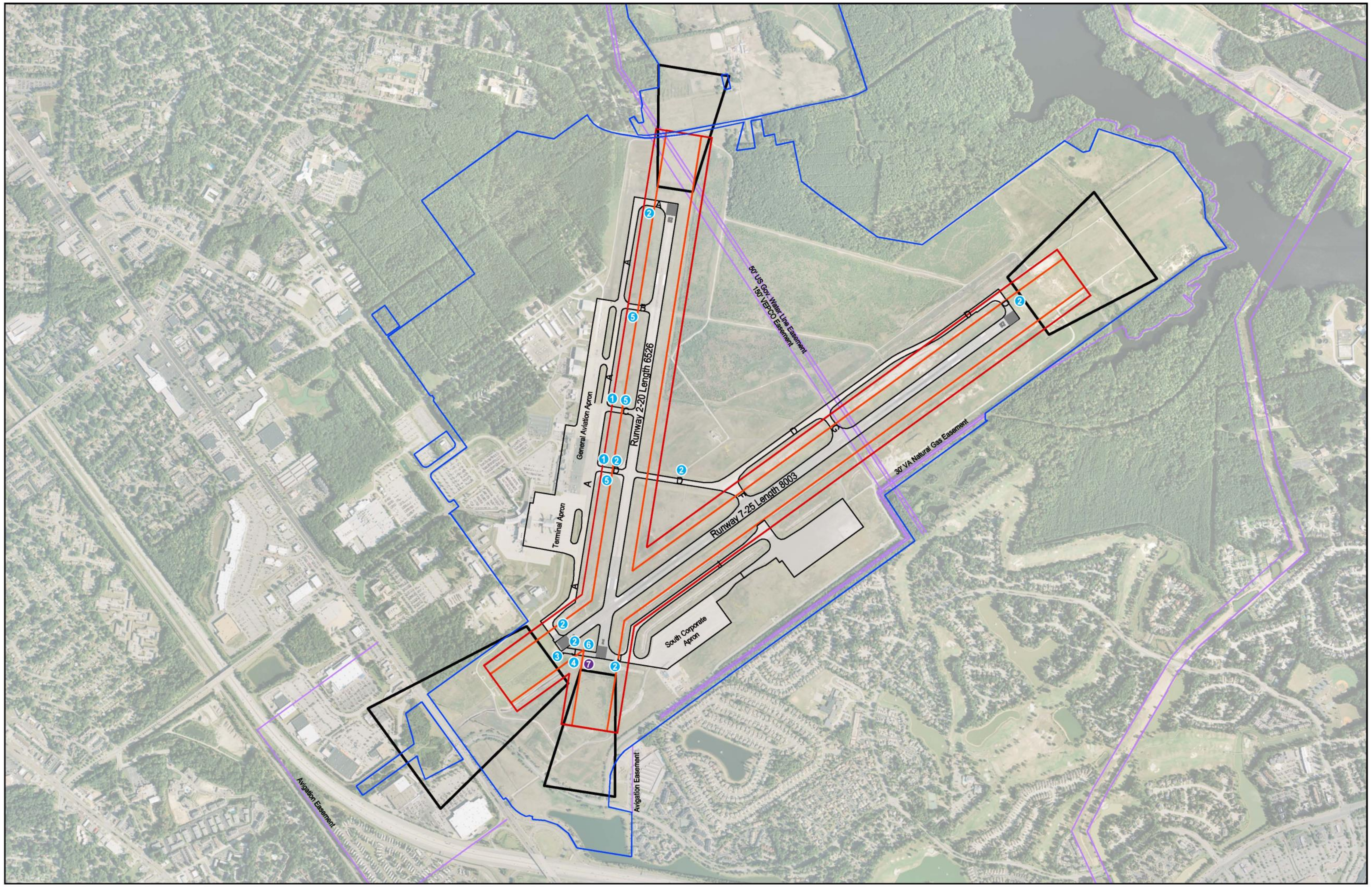
- Short, non-standard taxiway segments connecting to a runway are also discouraged, as they can place aircraft where they encounter a runway holding position almost immediately upon entry onto the taxiway segment. This can catch a flight crew by surprise, which increases the risk of failing to hold short of an active runway.

[1] A Runway Incursion is defined by the FAA as, "Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft."

There are three locations where an aircraft can taxi straight from the ramp to the runway. Although these direct taxi routes were designed to enable landing aircraft to taxiing promptly to the ramp, they have the unintended result of leading some departing aircraft to mistakenly taxi onto or across an active runway. Current FAA guidance is to create taxiway geometry that requires pilots to consciously make turns to promote situational awareness. FAA Engineering Brief No. 75 states specifically, “Especially troublesome are taxiways from the terminal area that form a straight line to the midsection of a runway.”

Currently, Taxiways C and D form a straight line from the aircraft parking area onto the midsection of Runway 2/20, while Taxiways A (entrance taxiway to Runway 20) and B do not. The geometry of Taxiways C and D should be resolved.

Alternatives to mitigate these intersection issues will be evaluated in the Alternatives Chapter.




| Conflict | FAA Engineering Brief No. 75 Principle |
|---|---|
| 1 | Limit the number of aircraft crossing an active runway, particularly in the middle third of the runway. |
| 2 | Avoid taxiway nomenclature assigning the same name to a taxiway making several turns along its route. |
| 3 | Connect entrance taxiways to the runway end at a right angle. |
| 4 | Avoid the use of short, non-standard taxiway segments connecting to the runway. |
| 5 | Avoid taxiway layouts providing straight, direct access onto a runway from a terminal or parking apron area. |
| 6 | Locate taxiways outside the Runway Safety Areas of intersecting runway. |

| Conflict | FAA AC 150/5340-1K Design Standard |
|---|---|
| 7 | For non-perpendicular runway intersections, additional holdline distance may be required to ensure that all airplane features remain outside the runway safety area of the intersecting runways. |

**Legend**

- Existing Runway Protection Zone (RPZ)
- Airport Property Line
- Easements to Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)

*Figure 3-1*
**AIRFIELD CONFIGURATION**

### 3.6.4 Taxiway Design

The taxiway analysis addresses specific requirements relative to the ability of the existing taxiways to accommodate the current and projected demand. At a minimum, taxiways must provide efficient circulation, have the proper strength, and meet recommended FAA design standards to safely accommodate the design aircraft. Airport runways should be supported by a system of taxiways that provides an access interface between the runways and the aircraft parking and hangar areas. Taxiways are classified as:

- Parallel - these taxiways facilitate the movement of aircraft to and from the runway.
- Exit Taxiway – these taxiways provide a means of entering and exiting the runway (does not include those taxiways designated as connector, parallel, or apron edge taxiway).
- Apron Taxiway - these taxiways provide primary aircraft access in an aircraft parking apron.
- Apron Taxilane - these taxilanes provide access to individual aircraft parking positions and/or hangar areas.

The airport's design aircraft determines taxiway design standards and dimensional criteria. Certain portions of the taxiway system at the Airport were designed for aircraft above the airplane design group of the forecasted critical aircraft contained in this Master Plan. The development alternatives will continue to show these taxiways at their current design group configuration; however, upon reaching a point in the life cycle that requires significant capital investment, these taxiways should be designed to Group IV standards absent any change in critical aircraft designation for the Airport. Since the future critical aircraft at Newport News/Williamsburg International Airport is a Design Group IV aircraft, and some existing facilities meet standards for both a smaller (Group II) and larger (Group V) Design Group, it is recommended that critical airfield taxiways maintain the FAA Design Group Standards they were built to meet, where there is not a significant construction or maintenance cost to do so. Furthermore, a specific area may not exceed the overall airport reference code.

Depending upon the demand, portions of an airfield may be designed for one aircraft type and other portions for a different aircraft type. At Newport News/Williamsburg International Airport all of the taxiways should meet the recommended design standards for Design Group IV. The FAA recommended design standards for taxiways and taxilanes are provided in Table 3-9, along with the existing taxiway standards at the Airport. A checkmark denotes whether the standards are met and a N/A denotes that this criteria is not applicable.

In addition, Engineering Brief No. 75 also suggests avoiding using taxiway nomenclature that assigns the same name to a taxiway making several turns along its route. This occurs in several places on the PHF airfield, including the Taxiway A entrances onto Runways 2, 20 and 7, the Taxiway D entrance onto Runway 25, and the connecting Taxiway D on both sides of Runway 2/20. Designating different taxiway names along a prescribed taxiway route forces a pilot to look for the next sequential taxiway segment where a turn is required.

*Table 3-9*
**TAXIWAY DESIGN STANDARDS**

| Item | Design Group | | | Taxiway (Design Group) | | | | Existing Met (✓) |
|---|---|---|---|---|---|---|---|---|
| | III | IV | V | A (III) | B (III) | C (III) | D (V) | |
| Centerline Separation | | | | | | | | |
| Runway to Taxiway | 400' | 400' | 400' | 500' | N/A | N/A | 500' | ✓ |
| Taxiway to Taxiway | 152' | 215' | 267' | N/A | N/A | N/A | N/A | ✓ |
| Taxiway Width | 60' | 75' | 75' | 75' | 75' | 75' | 75' | ✓ |
| Taxiway Shoulder Width | 20' | 25' | 35' | N/A | N/A | N/A | N/A | ✓ |
| Taxiway Safety Area Width | 118' | 171' | 214' | 118' | 118' | 118' | 214' | ✓ |
| Taxiway Object Free Area Width | 186' | 259' | 320' | 186' | 186' | 186' | 320' | ✓ |
| Taxilane Object Free Area Width | 162' | 225' | 276' | N/A | N/A | N/A | N/A | ✓ |

| Item | Design Group | | | Taxiway | | | | Existing Met (✓) |
|---|---|---|---|---|---|---|---|---|
| | III | IV | V | F (III) | G (III) | J (V) | L (V)* | |
| Centerline Separation | | | | | | | | |
| Runway to Taxiway | 400' | 400' | 400' | N/A | N/A | 400' | 700' | ✓ |
| Taxiway to Taxiway | 152' | 215' | 267' | N/A | N/A | 300' | 300' | ✓ |
| Taxiway Width | 60' | 75' | 75' | 75' | 75' | 75' | 75' | ✓ |
| Taxiway Shoulder Width | 20' | 25' | 35' | N/A | N/A | N/A | N/A | ✓ |
| Taxiway Safety Area Width | 118' | 171' | 214' | 118' | 118' | 214' | 214' | ✓ |
| Taxiway Object Free Area Width | 186' | 259' | 320' | 320' | 320' | 320' | 320' | ✓ |
| Taxilane Object Free Area Width | 162' | 225' | 276' | N/A | N/A | N/A | 276' | ✓ |

Source: FAA Advisory Circular 150/5300-13
Note: The Airport does not currently have a Taxiw ay E, H, I, or K.
* Taxilane

### *3.6.4.1 Parallel Taxiways*

The primary taxiways include Taxiway A, which serves most ramp traffic as well as aircraft clearing Runway 2/20, and Taxiway D, which serves much of the traffic on Runway 7/25 and provides some cross-field taxi capability.

Taxiway A is primarily a parallel taxiway to Runway 2/20, although the end connector taxiways to that runway share the same designation. For most of the length of the taxiway, the runway centerline/taxiway centerline separation is 520 feet, which exceeds the minimum standards for all aircraft that are anticipated to use the Airport.

Taxiway D runs parallel to Runway 7/25 from the approach end of Runway 25 to a point approximately 4,600 feet down the runway. At that point, Taxiway D makes a 45° turn away from the runway, intersects Runway 2/20, and then connects with Taxiway A at the ramp. Although a full-length parallel taxiway would be more efficient in handling traffic, it would need to be routed on the south side of Runway 7/25 to avoid the intersection of the two runways.

*3.6.4.2 Exit Taxiways*

Exit taxiways permit aircraft to exit and often enter the runway from the parallel or connecting taxiways. The exit taxiways need to be placed to allow pilots to clear a runway quickly and efficiently as possible. Taxiway geometry, the separation distance between the exit taxiways, location of exit taxiway from runway thresholds, and taxiway width all contribute to the ability of aircraft to clear the runway.

Within Advisory Circular 150/5300-13, Appendix 9, the FAA provides a table of the cumulative percentage of aircraft classes observed exiting existing runways at specific exit taxiway locations, which is provided in Table 3-10. This table also indicates the distance necessary to capture 80 percent of the aircraft classes The FAA recommends when selecting the location and type of exit, both the wet and dry runway conditions along with the occupancy times should be considered.

*Table 3-10*
**EXIT TAXIWAY CUMULATIVE UTILIZATION PERCENTAGES**

| Distance From Threshold to Exit | Wet Runway: Right & Acute Angled Exits | | | | Dry Runway: Right Angle Exits Percent of Groups | | | | Dry Runway: Acute Angle Exits Percent of Groups | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | A | B | C | D | A | B | C | D |
| 0 ft | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 500 ft | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% |
| 1,000 ft | 4% | 0% | 0% | 0% | 6% | 0% | 0% | 0% | 13% | 0% | 0% | 0% |
| 1,500 ft | 23% | 0% | 0% | 0% | 39% | 0% | 0% | 0% | 53% | 0% | 0% | 0% |
| 2,000 ft | 60% | 0% | 0% | 0% | 84% | 1% | 0% | 0% | 90% | 1% | 0% | 0% |
| 2,500 ft | 84% | 1% | 0% | 0% | 99% | 10% | 0% | 0% | 99% | 10% | 0% | 0% |
| 3,000 ft | 96% | 10% | 0% | 0% | 100% | 39% | 0% | 0% | 100% | 40% | 0% | 0% |
| 3,500 ft | 99% | 41% | 0% | 0% | 100% | 81% | 2% | 0% | 100% | 82% | 9% | 0% |
| 4,000 ft | 100% | 80% | 1% | 0% | 100% | 98% | 8% | 0% | 100% | 98% | 26% | 3% |
| 4,500 ft | 100% | 97% | 4% | 0% | 100% | 100% | 24% | 2% | 100% | 100% | 51% | 19% |
| 5,000 ft | 100% | 100% | 12% | 0% | 100% | 100% | 49% | 9% | 100% | 100% | 76% | 55% |
| 5,500 ft | 100% | 100% | 27% | 0% | 100% | 100% | 75% | 24% | 100% | 100% | 92% | 81% |
| 6,000 ft | 100% | 100% | 48% | 10% | 100% | 100% | 92% | 71% | 100% | 100% | 98% | 95% |
| 6,500 ft | 100% | 100% | 71% | 35% | 100% | 100% | 98% | 90% | 100% | 100% | 100% | 99% |
| 7,000 ft | 100% | 100% | 88% | 64% | 100% | 100% | 100% | 98% | 100% | 100% | 100% | 100% |
| 7,500 ft | 100% | 100% | 97% | 84% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 8,000 ft | 100% | 100% | 100% | 93% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 8,500 ft | 100% | 100% | 100% | 99% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 9,000 ft | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Source: FAA Advisory Circular 150/5300-13

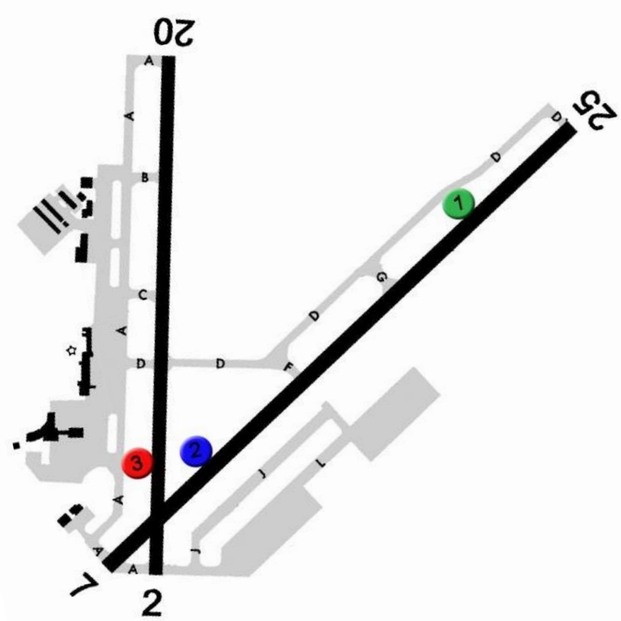
When evaluating the type of exit, the separation distance between the exit taxiways, the configuration of the taxiways, as well as the overall efficiency of the taxiway system at Newport

News/Williamsburg International Airport, it was determined that the taxiways at the Airport are sufficient to meet the demand placed upon them. However, it was also determined that several improvements could be made to the taxiway system that would improve a pilot's ability to clear the runway more quickly and increase the Airport's overall capacity.

The existing taxiway system, proposed improvements, and distance from the runway threshold along with the percent of Group A, B, and C aircraft accommodated are illustrated on Figure 3-2. The existing taxiway exits are appropriate for Group A, and B aircraft, but capacity gains would be experienced by adding three taxiway exits to more optimally serve Group C aircraft. These include a Runway 25 exit taxiway approximately 6,200 feet from the landing threshold, a Runway 7 exit approximately 6,000 down the runway, and a Runway 20 exit taxiway approximately 5,000 feet from the landing threshold.

Only right-angled taxiways are recommended as the exit taxiway options because of the existing taxiway geometry and FAA guidance on taxiway design. The Airport currently uses all right-angled taxiway exits because of the existing airfield layout, and peak hour traffic does not exceed 30 operations. According to FAA Advisory Circular 150/5300-13, *Airport Design*, acute-angled taxiways, also referred to as high speed exits, are used to enhance airport capacity when peak hour traffic exceeds 30 operations. Since peak hour traffic is not expected to exceed 30 operations by the end of the planning period, only right-angled taxiways were recommended as possible alternatives to address the existing taxiway traffic flow.

Figure 3-2
## EXIT TAXIWAY LOCATIONS




**Runway 7**

| Distance from Threshold | | Percent of Design Group Exiting Taxiway: A Dry | A Wet | B Dry | B Wet | C Dry | C Wet | D Dry | D Wet |
|---|---|---|---|---|---|---|---|---|---|
| **Existing** | | | | | | | | | |
| **Twy A** | - | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Twy F** | 3,330 | 100% | 96% | 39% | 10% | 0% | 0% | 0% | 0% |
| **Twy G** | 4,950 | 100% | 100% | 100% | 100% | 49% | 12% | 0% | 0% |
| **Twy D** | 7,950 | 100% | 100% | 100% | 100% | 100% | 100% | 93% | 93% |
| **Options:** | | | | | | | | | |
| **No. 1** | 6,000 | 100% | 100% | 100% | 100% | 92% | 48% | 71% | 10% |

**Runway 25**

| Distance from Threshold | | Percent of Design Group Exiting Taxiway: A Dry | A Wet | B Dry | B Wet | C Dry | C Wet | D Dry | D Wet |
|---|---|---|---|---|---|---|---|---|---|
| **Existing** | | | | | | | | | |
| **Twy A** | 7,950 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 93% |
| **Twy F** | 4,620 | 100% | 100% | 100% | 97% | 24% | 4% | 2% | 0% |
| **Twy G** | 3,000 | 100% | 96% | 39% | 10% | 0% | 0% | 0% | 0% |
| **Twy D** | - | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Options:** | | | | | | | | | |
| **No. 2** | 6,200 | 0% | 100% | 100% | 100% | 92% | 48% | 71% | 10% |

**Runway 2**

| Distance from Threshold | | Percent of Design Group Exiting Taxiway: A Dry | A Wet | B Dry | B Wet | C Dry | C Wet | D Dry | D Wet |
|---|---|---|---|---|---|---|---|---|---|
| **Existing** | | | | | | | | | |
| **Twy A** | 6,475 | 100% | 100% | 100% | 100% | 98% | 71% | 90% | 35% |
| **Twy B** | 4,955 | 100% | 100% | 100% | 100% | 49% | 12% | 9% | 0% |
| **Twy C** | 3,485 | 100% | 99% | 81% | 41% | 2% | 0% | 0% | 0% |
| **Twy D** | 2,625 | 99% | 84% | 10% | 1% | 0% | 0% | 0% | 0% |
| **Twy A** | - | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Options:** | | | | | | | | | |
| **No. 3** | 1,500 | 39% | 23% | 0% | | 0% | | 0% | |

**Runway 20**

| Distance from Threshold | | Percent of Design Group Exiting Taxiway: A Dry | A Wet | B Dry | B Wet | C Dry | C Wet | D Dry | D Wet |
|---|---|---|---|---|---|---|---|---|---|
| **Existing** | | | | | | | | | |
| **Twy A** | - | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Twy B** | 1,520 | 39% | 23% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Twy C** | 2,990 | 100% | 96% | 39% | 10% | 0% | 0% | 0% | 0% |
| **Twy D** | 3,850 | 100% | 100% | 98% | 41% | 8% | 0% | 0% | 0% |
| **Twy A** | 6,475 | 100% | 100% | 100% | 100% | 98% | 71% | 90% | 35% |
| **Options:** | | | | | | | | | |
| **No. 3** | 5,000 | 100% | 100% | 100% | 100% | 49% | 12% | 9% | 0% |

#### *3.6.4.3 Taxilanes*

Taxilane L runs parallel to Taxiway J, and is approximately 1,000 feet long. Taxilane L is located approximately 300 feet southeast of the Taxiway J centerline, which according to FAA AC 150/5300-13, meets ADG V standards for both taxilane centerline to parallel taxiway centerline (267 feet), and the taxilane object free area width (276 feet). Taxilane L is the only apron taxilane serving the south corporate apron.

Two 25-foot wide taxilanes are located north of the secondary general aviation apron, providing access to privately owned hangars. The taxilane centerline separation is 79 feet, meeting ADG I parallel taxilane centerline separation standards (64 feet), and the ADG I taxilane object free area width (79 feet).

#### *3.6.4.4 Apron Taxiways/Taxilanes*

Aircraft taxi capability around the perimeter of the terminal apron is provided. This taxi capability is considered a non-movement area, meaning that the air traffic control tower does not direct aircraft operations in this area. When an area is designated as a non-movement area, reduced dimensional standards may be applied. These standards will vary based on the function of the taxilane location in relation to the passenger terminal.

The apron taxiways and taxilanes around the passenger terminal and south corporate apron are designed to accommodate ADG V aircraft and exhibit adequate space for the critical aircraft anticipated to use the Airport within the planning period. Apron taxiways and taxilanes in the general aviation areas north of the passenger terminal are designed to accommodate at a maximum ADG III aircraft. No apron taxiway/taxilanes improvements are anticipated within the planning period.

### 3.6.5 Pavement Strength & Condition

The Airport's paved airfield surface totals nearly 4,858,213 square feet (111 acres), with pavements ranging from excellent to poor condition. The Airport conducts PCI surveys every few years with the most recent survey on September 16, 2008. Based on the PCI inspection the airport paved surfaces are in very good to fair condition. The exception is the secondary general aviation apron, and a small aircraft ramp near the Runway 7 end, which are both in poor condition.

In addition, pavement strength is an important criterion in determining the usability of the airfield. The weights of the more demanding aircraft currently using or expected to use the Newport News/Williamsburg International Airport are listed on Table 3-11.

*Table 3-11*
**AIRCRAFT WEIGHTS**

| Aircraft | Aircraft Size (Passengers) | Gear Type | Maximum Take-Off Weight |
|---|---|---|---|
| **General Aviation Aircraft** | | | |
| Light/Small Business Jet | 4 - 6 Passengers | Single Wheel | 8,000 - 20,000 lbs. |
| Medium Business Jet | 6 - 10 Passengers | Dual Wheel | 20,000 - 45,000 lbs. |
| Large Business Jet | 10 - 16 Passengers | Dual Wheel | 45,000 - 95,000 lbs. |
| **Air Carrier Aircraft** | | | |
| Boeing 737 Series | 108 - 177 Passengers | Dual Wheel | 138,500 - 187,700 lbs. |
| AirBus 320 Series | 110 - 185 Passengers | Dual Wheel | 150,000 - 206,000 lbs. |
| MD 80 Series | 155 Passengers | Dual Wheel | 140,000 - 160,000 lbs. |
| Boeing 757 Series | 180 - 234 Passengers | Dual Wheel Tandem | 255,000 - 272,500 lbs. |
| Boeing 767 Series | 216 - 248 Passengers | Dual Wheel Tandem | 315,000 - 450,500 lbs. |

The recommended runway, taxiway, and apron pavement strengths at the Airport for each major pavement component are listed on Table 3-12.

*Table 3-12*
**RECOMMENDED PAVEMENT STRENGTHS**

| Pavement Area | Existing Pavement Strength | Recommended Pavement Strength |
|---|---|---|
| Runway 7/25 | 100,000 lbs. SW<br>200,000 lbs. DW<br>350,000 lbs. DT | 200,000 lbs. DW<br>350,000 lbs. DT |
| Runway 2/20 | 100,000 lbs. SW<br>200,000 lbs. DW<br>350,000 lbs. DT | 200,000 lbs. DW<br>350,000 lbs. DT |
| Runway 7/25 Parallel Taxiway System | 165,000 - 200,000 lbs. DW<br>325,000 - 400,000 lbs. DT | 200,000 lbs. DW<br>350,000 lbs. DT |
| Runway 2/20 Parallel Taxiway System | 100,000 - 200,000 lbs. DW<br>225,000 - 400,000 lbs. DT | 200,000 lbs. DW<br>350,000 lbs. DT |
| Apron (Air Carrier) | 200,000 lbs. DW<br>400,000 lbs. DT | 200,000 lbs. DW |
| Apron (South Corporate Ramp) | 115,000 - 200,000 lbs. DW<br>380,000 lbs. DT | 95,000 lbs. DW |
| Apron (General Aviation) | 65,000 - 160,000 lbs. DW<br>225,000 lbs. DT | 20,000 lbs. DW |
| Hangar Taxilanes<br>(Light, Piston, & Turboprop Aircraft) | 30,000 - 60,000 lbs SW | 12,500 lbs. DW |

Source: FAA Advisory Circular 150/5320-6e, w w w .airnav.com, and PHF Airport Records, 2011

### 3.6.6 Modifications to Standards

The previous ALP identified a design issue that required a deviation or modification to airport design standards. The FAA approval date was October 2003. The conditions are identified in Table 3-13 . The trees within the Object Free Area (OFA) and Runway Safety Area (RSA) have been removed, and upgrades to Runways 7, 25, and 2 were made.

Table 3-13
**MODIFICATIONS TO STANDARDS**

| Runway | Description | Mitigation | Status |
|---|---|---|---|
| **Deviations From Airport Design Standards** | | | |
| Runway 25 | Trees within RSA Beyond Runway End | Trees to be removed | Completed |
| Runway 25 | Trees within Runway Object Free Area | Trees to be removed | Completed |
| Runway 20 | Trees within Runway Object Free Area | Trees to be removed | Completed |
| **Modification To Airport Design Standards** | | | |
| Runway 7 | Catch Basin within RSA | Upgrade RSA to Standard | Completed |
| Runway 7 | Ditch in corner of RSA Beyond Runway End | Upgrade RSA to Standard | Completed |
| Runway 25 | Grades within RSA Beyond Runway End | Upgrade RSA to Standard | Completed |
| Runway 2 | Grade (Ditch) within RSA Beyond Runway End | Upgrade RSA to Standard | Completed |
| Runway 20 | Road, Trees, Fence within RSA, ROFA, Beyond Runway End | Allow Objects to Remain Until Runway is Extended | Not Completed |
| Runway 20 | House, Building within RPZ. "Controlled Activity Area" | Purchase Land, Remove House and Building | Not Completed |

Source: PHF ALP October 2003

## 3.7 NAVIGATIONAL AND VISUAL AIDS

Navigational and visual aids consist of equipment and markings that helps pilots locate the Airport and provides either horizontal, vertical, or a combination of horizontal and vertical guidance information. While such aids are useful to pilots under all conditions, they are particularly critical during periods of low visibility (such as rain or fog) and at night. These aids provide information to pilots about the aircraft's horizontal alignment, height, the location of Airport facilities, and the aircraft's position on the airfield.

### 3.7.1 Navigational Aids

All of the existing runways at Newport News/Williamsburg International Airport have appropriate navigational aids in working condition; however, the glide slopes for Runway 7 and 25 are within the runway object free area and should be relocated outside of the runway object free area.

According to the recently completed Facilities and Equipment (NAVAID) Study by the Virginia Department of Aviation, the following airport navigational aid improvements are recommended:

- Provide ADS-B coverage while on the ground, in order to provide traffic surveillance, terrain avoidance, and weather data. This installation is a critical component for Next Generation Air Transportation System.
- Provide LAAS coverage to augment existing global positioning system. This will enhance the existing signal strength and accuracy.
- Develop an LPV approach to Runway 2, 20, and 7, which will improve the pilot's ability to detect the landing environment.
- Develop an RNAV approach with LPV landing minimums for Runway 2, 20, and 7, which will improve all-weather capability of this runway and the airport overall.
- Develop a CAT II ILS approach for Runway 7, which will improve all-weather capability of the primary runway.

### 3.7.2 Visual Aids

This system consists of a variety of lighting and marking aids used to guide the pilot both in the air and on the ground. The visual aids at the Airport are in serviceable condition and are in need of routine maintenance. It is recommended that the visual approach indicator lights (VASIs) on Runways 2, 20, and 25 be replaced with precision approach path indicators (PAPI), which are the current standard for visual descent guidance. In addition, a PAPI should be installed on Runway 7 as well. It is also recommended and supported by the Facilities and Equipment (NAVAID) Study by the Virginia Department of Aviation that the runway end identifier lights (REILs) on Runways 2, 20, and 25 be replaced with medium intensity approach lighting systems with runway alignment indicator lights (MALSR), which will enhance the visual information provided to pilots on runway alignment during landing.

In addition to the master plan recommendations the Facilities and Equipment (NAVAID) Study by the Virginia Department of Aviation recommends these additional visual aid improvements:

- Install centerline lights for Runway 7/25, to improve visibility of the runway environments.

- Install touchdown zone lights for Runway 7 and 25, which will improve the visibility of the runway environment for pilots.
- Install midfield and roll-out runway visual range (RVR) equipment to improve the Airports ability to measure visibility.

### 3.7.3 Airfield Signage

The FAA recommends that all airports install a system of runway and taxiway guidance signs in accordance with the standards found in FAA Advisory Circular 150/5340-18C, *Standards for Airport Signage Systems*. Guidance signs include mandatory holding position signs for runway-runway and runway-taxiway intersections, instrument landing system critical areas, and runway approach areas. Additional taxiway guidance signs include runway and taxiway location, runway exit, taxiway direction, inbound/outbound destination, and informational signage. Signage at the Newport News/Williamsburg International Airport meet the FAA recommended standard.

## 3.8 COMMERCIAL PASSENGER TERMINAL

The existing capacity of the commercial passenger terminal is analyzed, and the future facility requirements are estimated, based on the aviation activity forecast, and airport terminal planning guidelines in this section. The methodologies used include:

- Airport Passenger Terminal Planning and Design – Airport Cooperative Research Program Report 25, 2010, volumes 1 and 2
- Checkpoint Design Guide, Revision 3, Transportation Security Administration (TSA), 2011
- Federal Aviation Administration (FAA) Advisory Circular, AC No: 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*,1988
- Planning Guidelines and Design Standards for Checked Baggage Inspection Systems, Version 3.0, 2009
- The Apron and Terminal Building Planning Manual, Parsons, 1975
- The IATA Airport Development Reference Manual, 2009.
- Airport Technical Design Standards – Passenger Processing Facilities, U.S. Department of Homeland Security, U.S. Customs and Border Protection, August 2009

Analyses were performed for four different growth scenarios as they relate to the forecast years (2017, 2022, 2027, and 2032):

- Base Case: Master Plan Base Forecast
- Scenario 1: Slow Growth Rate
- Scenario 2: Aggressive Growth Rate
- Scenario 3: Very Aggressive Growth Rate

To simplify each analysis, the terminal building was broken down into functional areas that delineate types of space by use. For each scenario and for each functional area, the amount of space required to accommodate the forecast enplanements is compared to the existing space.

### 3.8.1 Terminal Facility Requirements

Summary tables for all four different scenarios are presented in Appendix F, Terminal Facility Requirements. Floor plans of the terminal, Concourse A, and Concourse B are shown in Figure 3-3 and Figure 3-4. For the purposes of this section, the Base Case (FAA TAF Forecast) illustrated in Table 3-14 is used to establish the future terminal facility requirements.

The areas indicated are the minimum net square footage requirements, from a functional standpoint, and may be exceeded in the final recommended plan due to other considerations including architectural design and tenant needs. This section describes the general functional areas of the terminal building.

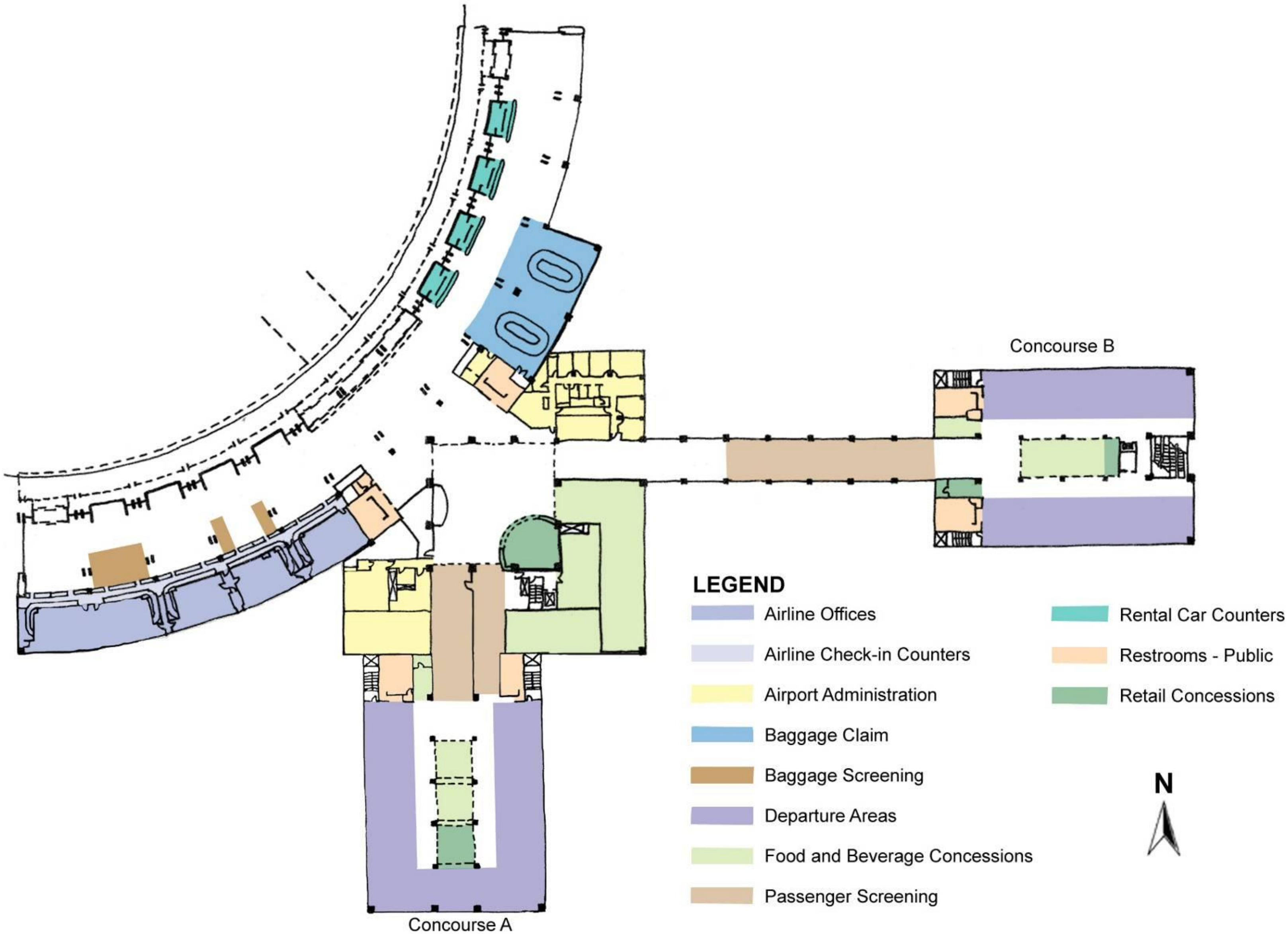



*Figure 3-3*
**PASSENGER TERMINAL FLOOR PLAN - GATE LEVEL**

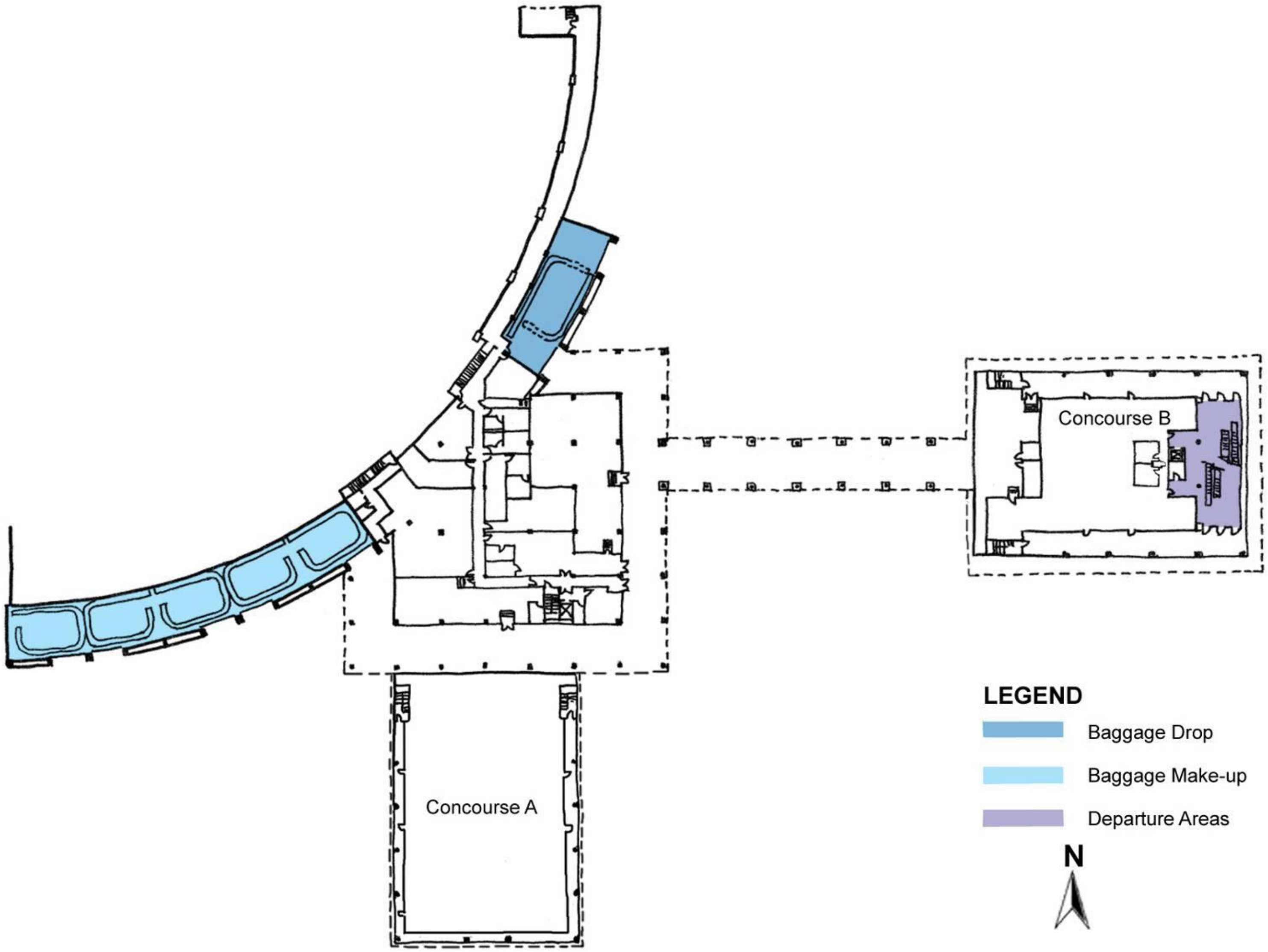



*Figure 3-4*
**PASSENGER TERMINAL FLOOR PLAN – APRON LEVEL**

*Table 3-14*
**TERMINAL FACILITY REQUIREMENTS**

| Description | Existing | Forecast Years | | | | Surplus / (Shortfall) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2017 | 2022 | 2027 | 2032 | 2017 | 2022 | 2027 | 2032 |
| **Annual Enplaned Passengers** | 504,000 | 616,000 | 711,000 | 821,000 | 948,000 | | | | |
| Peak Hour Enplaned/Deplaned | 390 | 510 | 540 | 570 | 590 | | | | |
| **Airline Space** | | | | | | | | | |
| Ticket Counter Length | 196 lf | 132 lf | 139 lf | 146 lf | 146 lf | 64 lf | 57 lf | 50 lf | 50 lf |
| Ticketing & Outbound Baggage | 16,132 sf | 15,500 sf | 16,025 sf | 16,550 sf | 16,550 sf | 632 sf | 107 sf | (418) sf | (418) sf |
| Ticket Counter Area | 2,080 sf | 1,320 sf | 1,390 sf | 1,460 sf | 1,460 sf | 760 sf | 690 sf | 620 sf | 620 sf |
| Ticket Counter Active Area | 976 sf | 1,320 sf | 1,390 sf | 1,460 sf | 1,460 sf | (344) sf | (414) sf | (484) sf | (484) sf |
| Ticket Counter Queueing | 2,866 sf | 3,300 sf | 3,475 sf | 3,650 sf | 3,650 sf | (434) sf | (609) sf | (784) sf | (784) sf |
| Ticket Offices and Administration | 3,785 sf | 3,960 sf | 4,170 sf | 4,380 sf | 4,380 sf | (175) sf | (385) sf | (595) sf | (595) sf |
| Outbound Baggage Area | 6,425 sf | 5,600 sf | 5,600 sf | 5,600 sf | 5,600 sf | 825 sf | 825 sf | 825 sf | 825 sf |
| Baggage Claim Length | 160 lf | 214 lf | 227 lf | 239 lf | 248 lf | (54) lf | (67) lf | (79) lf | (88) lf |
| Inbound Baggage and Claim | 5,618 sf | 11,384 sf | 12,031 sf | 12,709 sf | 13,144 sf | (5,766) sf | (6,413) sf | (7,091) sf | (7,526) sf |
| Baggage Claim Area | 3,217 sf | 7,084 sf | 7,491 sf | 7,909 sf | 8,184 sf | (3,867) sf | (4,274) sf | (4,692) sf | (4,967) sf |
| Inbound Baggage Area | 2,401 sf | 4,300 sf | 4,540 sf | 4,800 sf | 4,960 sf | (1,899) sf | (2,139) sf | (2,399) sf | (2,559) sf |
| Operations Facilities | 1,768 sf | 3,100 sf | 3,600 sf | 4,200 sf | 4,800 sf | (1,332) sf | (1,832) sf | (2,432) sf | (3,032) sf |
| Passenger Departure Lounges | 18,364 sf | 19,643 sf | 20,276 sf | 20,947 sf | 21,378 sf | (1,279) sf | (1,912) sf | (2,583) sf | (3,014) sf |
| **Airline Space Subtotal** | **41,882 sf** | **49,627 sf** | **51,932 sf** | **54,406 sf** | **55,872 sf** | | | | |
| **TSA Spaces** | | | | | | | | | |
| Security Screening Checkpoint | 6,851 sf | 16,334 sf | 16,554 sf | 16,774 sf | 16,914 | (9,483) sf | (9,703) sf | (9,923) sf | (10,063) sf |
| Checkpoint Conc. A | 3,015 | 8,167 | 8,277 | 8,387 | 8,457 | (5,152) sf | (5,262) sf | (5,372) sf | (5,442) sf |
| Checkpoint Conc. B | 3,836 | 8,167 | 8,277 | 8,387 | 8,457 | (4,331) sf | (4,441) sf | (4,551) sf | (4,621) sf |
| Baggage Screening | 1,195 sf | 14,003 sf | 14,043 sf | 14,083 sf | 14,103 sf | (12,808) sf | (12,848) sf | (12,888) sf | (12,908) sf |
| Hold Baggage System | 1,195 sf | 10,703 sf | 10,703 sf | 10,703 sf | 10,703 sf | (9,508) sf | (9,508) sf | (9,508) sf | (9,508) sf |
| Baggage Screener Area | - sf | 2,700 sf | 2,700 sf | 2,700 sf | 2,700 sf | (2,700) sf | (2,700) sf | (2,700) sf | (2,700) sf |
| Baggage Inspection Support Facilites | - sf | 600 sf | 640 sf | 680 sf | 700 sf | (600) sf | (640) sf | (680) sf | (700) sf |
| Administration and Support Offices | 2,817 sf | 4,577 sf | 4,577 sf | 4,577 sf | 4,577 sf | (1,760) sf | (1,760) sf | (1,760) sf | (1,760) sf |
| **TSA Spaces Subtotal** | **10,863 sf** | **34,914 sf** | **35,174 sf** | **35,434 sf** | **35,594 sf** | **(24,051) sf** | **(24,311) sf** | **(24,571) sf** | **(24,731) sf** |

| Description | Existing | Forecast Years | | | | Surplus / (Shortfall) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2017 | 2022 | 2027 | 2032 | 2017 | 2022 | 2027 | 2032 |
| **Annual Enplaned Passengers** | 504,000 | 616,000 | 711,000 | 821,000 | 948,000 | | | | |
| Peak Hour Enplaned/Deplaned | 390 | 510 | 540 | 570 | 590 | | | | |
| **Concessions** | | | | | | | | | |
| General Concessions | 1,513 sf | 1,200 sf | 1,300 sf | 1,500 sf | 1,800 sf | 313 sf | 213 sf | 13 sf | (287) sf |
| Food and Drink | 7,342 sf | 4,200 sf | 4,800 sf | 5,600 sf | 6,400 sf | 3,142 sf | 2,542 sf | 1,742 sf | 942 sf |
| Other Concessions | 4,120 sf | 6,200 sf | 7,200 sf | 8,300 sf | 9,500 sf | (2,080) sf | (3,080) sf | (4,180) sf | (5,380) sf |
| **Concession Subtotal** | **11,781 sf** | **11,600 sf** | **13,300 sf** | **15,400 sf** | **17,700 sf** | 181 sf | (1,519) sf | (3,619) sf | (5,919) sf |
| **Public Space** | | | | | | | | | |
| Public Circulation | 40,640 sf | 46,300 sf | 53,400 sf | 61,700 sf | 71,200 sf | (5,660) sf | (12,760) sf | (21,060) sf | (30,560) sf |
| Washrooms | 3,191 sf | 6,280 sf | 6,580 sf | 6,880 sf | 7,030 sf | (3,089) sf | (3,389) sf | (3,689) sf | (3,839) sf |
| **Public Space Subtotal** | **43,831 sf** | **52,580 sf** | **59,980 sf** | **68,580 sf** | **78,230 sf** | **(8,749) sf** | **(16,149) sf** | **(24,749) sf** | **(34,399) sf** |
| **GROUND TRANSPORTATION** | **2,388 sf** | **3,300 sf** | **3,800 sf** | **4,400 sf** | **5,100 sf** | **(912) sf** | **(1,412) sf** | **(2,012) sf** | **(2,712) sf** |
| **AIRPORT ADMINISTRATION** | **10,916 sf** | **5,821 sf** | **5,972 sf** | **6,896 sf** | **7,963 sf** | 5,095 sf | 4,944 sf | 4,020 sf | 2,953 sf |
| **FEDERAL INSPECT. SERV.** | **11,442 sf** | **11,442 sf** | **11,442 sf** | **11,442 sf** | **11,442 sf** | 0 sf | 0 sf | 0 sf | 0 sf |
| **UTILITIES** | **11,959 sf** | **11,642 sf** | **11,945 sf** | **13,793 sf** | **15,926 sf** | 317 sf | 14 sf | (1,834) sf | (3,967) sf |
| **Total Terminal Area (Rounded)** | **146,256 sf** | **180,927 sf** | **193,545 sf** | **210,351 sf** | **227,828 sf** | | | | |

*3.8.1.1* *Airline Space*

The airlines are usually the primary tenants of the terminal and their care and processing of the passengers transitioning between ground and air transportation is the primary activity of most airport terminals. In many ways the services that the airlines provide to the passenger reflect directly on the airport and the community it serves. The overall area of the Airline Space in the existing terminal is approximately 42,000 square feet. It is composed of the following functional areas: ticket counter length, ticket counter area, ticket counter active area, ticket counter queuing, ticket offices and administration, outbound baggage area, baggage claim length, baggage claim area, inbound baggage area, operations facilities and passenger departure lounges.

*TICKET COUNTER LENGTH*

Ticket counters are used for the check-in of passengers and baggage as well as to sell tickets. These are typically located near the entrance to the terminal. Ticket counters are normally placed in a straight line that runs parallel to the entrance doors. However, with the growing use of online/smart phone check-in and the introduction of check-in kiosks at many airports, this is becoming less of a requirement, as the kiosks can either be installed into the face of the counters or grouped together in front of the traditional check-in frontage. The traditional counters still provide an interface where checked baggage is delivered to the airline for transport or other travel issues are addressed by an agent.

The Newport News/Williamsburg International Airport main terminal is built on a simple curve that matches that of the landside roadway. As such, the ticket counter elements are parallel in that they are concentric with the entrance doors along the southwestern leg of the building. There are currently 196 lineal feet of ticket counter made up of 32 check-in positions, 14 of which are not currently assigned to an airline. Of those 14, six have been blocked by the placement of TSA baggage screening equipment. The analysis shows the existing counter length exceeds the projected demand for all of the indicated forecast years by at least 34 percent.

*TICKET COUNTER AREA*

The ticket counter area includes the counter itself and the area from behind the counter to the back wall. At PHF that distance is currently approximately 10 feet. This area allows for the circulation of agents behind the counters and access to the take-away baggage system.

The existing ticket counter area is approximately 2,080 square feet, which exceeds the forecasted requirements.

*TICKET COUNTER ACTIVE AREA*

The ticket counter active area is the space in front of the ticket counters that allows passengers to circulate between the queuing area and the ticketing area. At PHF this distance is approximately seven feet.

The existing ticket counter active area is approximately 976 square feet, which is deficient relative to the five, 10, 15 and 20 year forecasts by 35 to 50 percent.

*TICKET COUNTER QUEUING*

Typically, check-in queues are located between the entrance doors and the check-in area as they are at PHF. Sufficient open area should be provided in front of the check-in counters and kiosks so that the longest queue to be reasonably expected during a peak period can be accommodated without blocking circulation to other areas of the terminal.

The existing queuing dedicated to ticketing is approximately 2,866 square feet, which should be increased by 15 percent for the five year forecast and 27 percent for the twenty year forecast.

*TICKET OFFICES AND ADMINISTRATION*

Airline office space is traditionally located behind the check-in counter with access to the baggage make-up area as it is at PHF. The location behind the check-in area was a necessity when cash and other monetary products, such as ticket stock, were in abundance at the check-in counters. Today, with most transactions taking place with credit cards, there is less reason to have the airline offices located directly behind the check-in counters except that it is more convenient for airline staff. The adjacency next to the baggage make-up area is used predominately as a break and training area for airline personnel. The office space is used primarily by the agents as a work space, but all of the functions can also be accommodated in a multipurpose room. The airline manager's office may also be in this location.

The existing airline ticketing office space available at the Airport consists of approximately 3,787 square feet. This indicates a short-term deficiency of approximately five percent and a long-term deficiency of approximately 16 percent.

*OUTBOUND BAGGAGE AREA*

Outbound baggage area, or baggage make-up, is the space where the airline assembles the outbound baggage by outbound flight. There are presently five take-away belts behind the airline ticket counters that deliver screened baggage to the lower level make-up area for transport to the aircraft.

The actual baggage make-up area accounts for approximately 6,425 square feet of space within the existing terminal, which exceeds that required for forecast year demands in the Base Case (FAA TAF) Scenario by 26 percent. The affect on this space with respect to other growth scenarios will be further explored in Chapter 4, Identification and Evaluation of Alternatives.

*BAGGAGE CLAIM LENGTH*

Baggage claim length is the frontage around the perimeter of the baggage claim device that is available for passengers to retrieve baggage from the operating carousel. The existing baggage claim devices are located so that they abut the airside exterior wall. As such, there is no circulation around the back side of each device and access to the frontage, for baggage retrieval, is reduced as it approaches the back wall.

The total dimensional frontage of the two existing devices is 160 linear feet. Frontage requirements for forecast years range from 214 linear feet (2017) to 248 linear feet (2032), thus indicating deficiencies from 34 percent to 55 percent, respectively.

*BAGGAGE CLAIM AREA*

Baggage claim can consist of any arrangement that allows a passenger to retrieve their checked baggage after a flight is completed. This can consist of placing the baggage on the apron and allowing passengers to identify and claim their baggage to elaborate circulating devices located within the passenger terminal that rotate and allow the passenger to retrieve their luggage as it passes by. The size of the baggage claim is dependent upon the number of seats on the largest arriving aircraft, the number of deplaning passengers with checked baggage, and the average pieces of baggage per passenger.

The baggage claim retrieval area is the area where the passengers and perhaps their meeters and greeters gather to wait for the checked baggage to be delivered. This area must be immediately adjacent to the baggage claim area and preferably should have immediate access to the arrival curb of the passenger terminal building. It must be sized to accommodate the number of passengers that have checked baggage, their baggage carts if these are available, and perhaps their meeters and greeters.

The existing baggage claim equipment consists of two revolving baggage claim devices that are fed from the lower level inbound baggage area via a through-the-floor conveyor. Each device takes up approximately 446 square feet within the baggage claim area. The active area for passengers is approximately 2,325 square feet, for a total claim lobby area of 3,217 sf. As shown in Table 3-15 both the amount of baggage claim device area as well as the active area for passenger access will need to be increased to meet the forecasted demands. The overall Baggage Claim Area would need to be increased approximately 120 percent to meet the five year demand, and by over 154 percent to meet the 20 year demand.

*Table 3-15*
**BAGGAGE CLAIM AREA FORECAST REQUIREMENTS**

| Description | Actual 2010 | | Forecast 2017 | | 2022 | | 2027 | | 2032 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Peak Hour Deplaning Passengers | 390 | | 510 | | 540 | | 570 | | 590 | |
| Peak 20 min. Deplaned Passengers (50%) | 195 | | 255 | | 270 | | 285 | | 295 | |
| **Common Baggage Claim** | | | | | | | | | | |
| Passenger claiming bags (70%) | | | 179 | | 189 | | 200 | | 207 | |
| Meeter/Greeter (80% of Passengers Claiming) | | | 143 | | 151 | | 160 | | 165 | |
| No. of bags/ Passengers (0.91 bags/Passenger) | | | 162 | | 172 | | 182 | | 188 | |
| Sloped Bed Public Frontage | 160 | lf | 214 | lf | 227 | lf | 239 | lf | 248 | lf |
| **Claim Device Length** | 160 | lf | 214 | lf | 227 | lf | 239 | lf | 248 | lf |
| **Claim Lobby and Services Area** | | | | | | | | | | |
| Baggage Claim Device Area | 892 | sf | 1,080 | sf | 1,140 | sf | 1,200 | sf | 1,240 | sf |
| Active Area & Passenger Access | 2,325 | sf | 5,360 | sf | 5,670 | sf | 5,990 | sf | 6,200 | sf |
| Lost Bag Services | 0 | | 644 | sf | 681 | sf | 719 | sf | 744 | sf |
| **Total Baggage Claim Lobby** | 3,217 | sf | 7,084 | sf | 7,491 | sf | 7,909 | sf | 8,184 | sf |

*INBOUND BAGGAGE AREA*

The inbound baggage area is located on Level 1 of the terminal building. This area, located between the aircraft parking area and baggage claim, is used for the off-loading of the baggage carts onto the baggage claim devices. The area should be a minimum of 12 feet wide. If the baggage carts are maneuvered by tug, an additional ten feet is preferable to allow for cart maneuvering and space for the baggage handler to stand while off-loading the baggage. The length of this area should be at least as long as the baggage claim room, with direct access to the baggage claim room. Ideally, the length of the input area should be at least as long as the baggage cart train, the tug, and maneuvering area. Depending on the aircraft that is being off-loaded, these trains can be as long as four baggage carts and the tug; trains any longer than that become unwieldy and tip over while being pulled.

At PHF there are two overhead doors (each 18'-0" wide) that open up to allow tugs into the baggage drop off area. There are two conveyors that transport baggage up and into the baggage claim area. The east conveyor has about 22 feet of flat belt for baggage loading. The west conveyor has about 30 feet of flat belt.

There is currently approximately 2,400 sf of inbound baggage area. The analysis shows that the current size of this area would need to be increased by 79 percent for the five year projection, 89 percent for the 10 year projection, 100 percent for the 15 year projection, and 107 percent for the 20 year projection.

*OPERATIONS FACILITIES*

Airline operational areas are typically for the airline crews for flight planning, break and locker spaces for ramp personnel, storage areas for aircraft supplies, and limited maintenance space. All of these functions require that the operational spaces be located adjacent or in close proximity to the aircraft parking apron.

The Airport currently has operational areas located on the lower level of Concourse B totaling approximately 1,768 sf. The projected demand for operational space indicates the need to increase the area by 75 percent to meet the five year forecast to an increase of over 171 percent to meet the 20 year forecast.

*PASSENGER DEPARTURE LOUNGES*

Departure lounges are those areas located after the passenger security checkpoint and adjacent to departure gates where passengers congregate to wait for their flight to be called and board their plane. Passengers are free to come and go from the departure lounge to use the restrooms and explore the concessions, as long as they do not leave the secure side of the terminal.

The Newport News/Williamsburg International Airport has departure lounges located in Concourses A and B. The upper level lounges are large rectangular spaces with departure gates and passenger seating along the perimeters. These lounges do have direct access to concession areas. Passengers access aircraft from this level via passenger boarding bridges. The upper level of Concourse A has four gates, and the upper level of Concourse B has five gates. Concourse B also has two gates on the lower level, for aircraft ground boarding, that have dedicated passenger departure lounges, which comprises 11 total gates.

The total existing upper level departure lounge area is approximately 17,767 square feet. The total lower level existing departure lounge area in Concourse B is approximately 597 sf. The combined total (18,364 sf) is only marginally deficient (3 percent) in meeting the demands of the five year forecast, and 12 percent deficient in meeting the 20 year forecast.

*3.8.1.2 TSA Spaces*

All passengers and baggage boarding a commercial aircraft must be security screened prior to boarding the aircraft. Security screening is intended to prevent hijackings and deter the transport of explosive, incendiary, or deadly and dangerous weapons on board a commercial aircraft. The TSA is responsible for all screening activities. TSA spaces include security screening checkpoints, baggage screening, and administration offices.

*SECURITY SCREENING CHECKPOINT*

Consideration must be given to the location and number of screening stations to simplify passenger flow though the terminal and to plan for an optimal number of security personnel. Enough area must be allowed to efficiently and effectively house the required screening equipment, personnel, and passengers while allowing enough flexibility and space to allow the security screening checkpoint to be able to adapt to the ever-changing security requirements. Passenger security checkpoint(s) should be located between the check-in area and the departure lounge area. It does not need to be directly adjacent to either of these areas, but there must be a clear intuitive path from the check-in area to the passenger security checkpoint and from the passenger security checkpoint to the departure lounges.

At PHF there are three security screening checkpoints, two on Concourse A and one on Concourse B. The different zones within each checkpoint include areas for queuing, security screening, and a secured deplaning corridor.

As passenger security screening becomes more rigorous, it inevitably takes a longer period of time to screen each passenger. This multiplies with the number of passengers, and during peak periods queues will form prior to the passenger security checkpoint. The TSA's stated goal is that passengers should not have to wait in line longer than 10 minutes when all lanes of the checkpoint are open. The queue should, in general, be sized to accommodate this number of passengers. The security checkpoint queue should be located immediately before the security checkpoint in such a way that it does not block other facilities in the terminal or other flows of traffic. There will be periods of time, such as the Mondays after holidays and certain holidays, when the queue will overflow. This is considered acceptable if it occurs infrequently and for short periods of time.

Within the security screening area itself, use of Advanced Imaging Technology (AIT) scanners for passenger screening and AIT X-rays for carry-on bag screening are emerging trends. The number of required double X-ray AIT lanes and double X-ray/walk-through metal detector lanes are estimated based on the peak 30-minute enplanements and the O&D percentage for the Airport. A peak 30-minute period is the industry standard for computing checkpoint requirements per terminal planning guidelines, as it best captures the surged flow during the peak hour.

Persons using the checkpoint are assumed to first proceed to the AIT lane. If the AIT lane is busy, then they are sent to a WTMD lane. A minimum of one AIT double X-ray lane is assumed to be required at a checkpoint.

The deplaning corridor is the secure corridor by which arriving passengers leave the plane and travel to the non-secure side of the terminal. Non-passengers are not allowed into this corridor. The corridor is often located adjacent to the passenger security checkpoint, but it can also be remote from the checkpoint where passengers can travel directly to baggage claim. Once a person has traveled to the non-secure side of the terminal via this corridor, they must be rescreened before they can re-enter the secure side of the terminal. TSA monitors the deplaning corridor to make sure that the flow is only one way.

Table 3-16 and Table 3-17 show the checkpoint area forecast requirements for Concourse A and B, respectively.

*Table 3-16*
**CONCOURSE A – CHECKPOINT AREA FORECAST REQUIREMENTS**

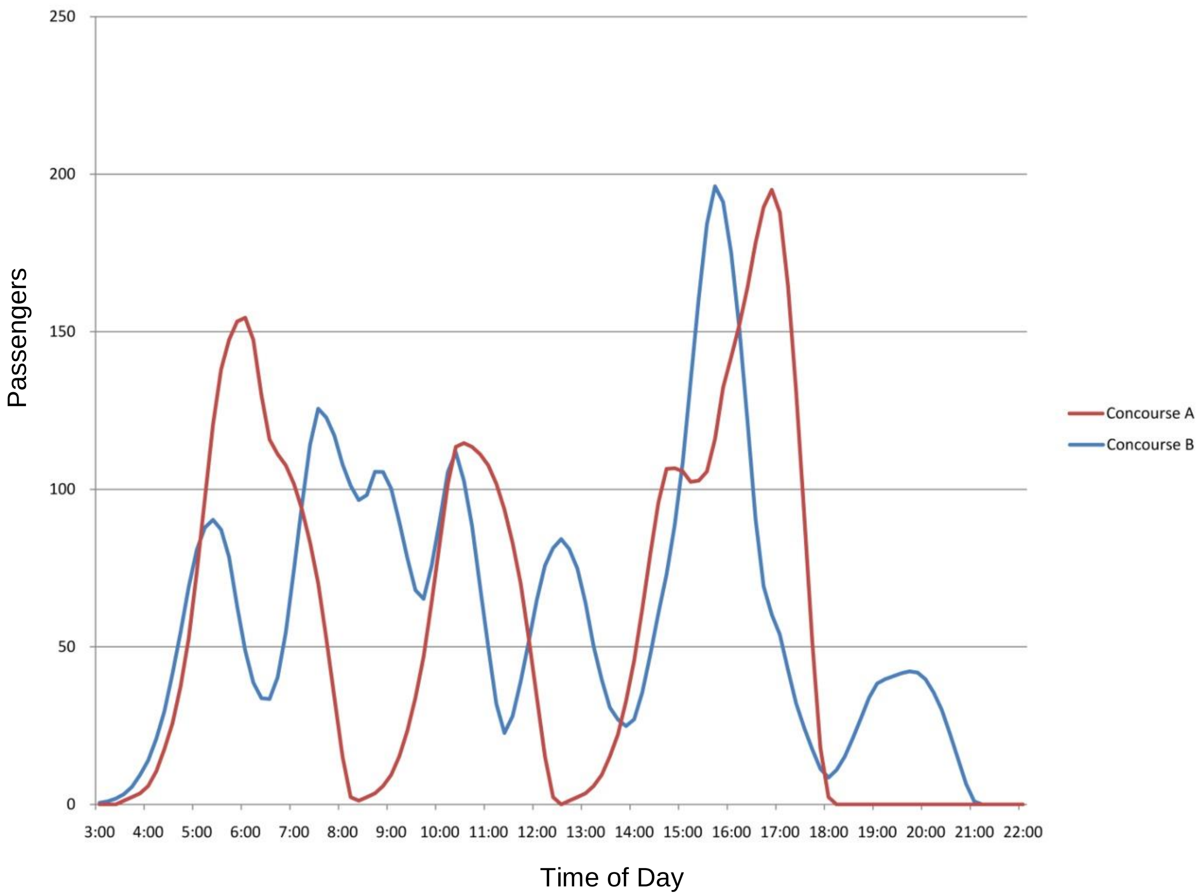
| | Actual | | Forecast | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **2010** | | **2017** | | **2022** | | **2027** | | **2032** | |
| Peak Hour Enplanements | 390 | | 510 | | 540 | | 570 | | 590 | |
| Peak Hour Concourse A | 195 | | 255 | | 270 | | 285 | | 295 | |
| Crew and Staff Personnel (1% Peak Hour Enplanement) | | | 3 | | 3 | | 3 | | 3 | |
| 30 min. Peak Population | 117 | | 155 | | 164 | | 173 | | 179 | |
| **CONCOURSE A SECURITY SCREENING CHECKPOINT** | | | | | | | | | | |
| **Passenger Inspection** | | | | | | | | | | |
| No. Security Screening Lanes (172 Pass/Hr/Position) | | | 2 | | 2 | | 2 | | 2 | |
| No. TSA Agents | | | 16 | | 16 | | 16 | | 16 | |
| Queuing Space (30 min. Pop. Capacity) | 617 | sf | 1,860 | sf | 1,970 | sf | 2,080 | sf | 2,150 | sf |
| Devestiture Area | | | 800 | sf | 800 | sf | 800 | sf | 800 | sf |
| Primary Inspection Area | 1,573 | sf | 1,376 | sf | 1,376 | sf | 1,376 | sf | 1,376 | sf |
| Secondary Inspection Area | | | 1,376 | sf | 1,376 | sf | 1,376 | sf | 1,376 | sf |
| TSA Inspection Search Rooms | 381 | sf | 160 | sf | 160 | sf | 160 | sf | 160 | sf |
| Supervisor Station | | | 275 | sf | 275 | sf | 275 | sf | 275 | sf |
| Deplaning Sterile Corridor | 444 | sf | 2,320 | sf | 2,320 | sf | 2,320 | sf | 2,320 | sf |
| (20ft w ide x 116ft long) | | | | | | | | | | |
| **Total Security Screening Checkpoint** | 3,015 | sf | 8,167 | sf | 8,277 | sf | 8,387 | sf | 8,457 | sf |

*Table 3-17*
**CONCOURSE B – CHECKPOINT AREA FORECAST REQUIREMENTS**

| | Actual | | Forecast | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **2010** | | **2017** | | **2022** | | **2027** | | **2032** | |
| Peak Hour Enplanements | 390 | | 510 | | 540 | | 570 | | 590 | |
| Peak Hour Concourse B | 195 | | 255 | | 270 | | 285 | | 295 | |
| Crew and Staff Personnel (1% Peak Hour Enplanement) | | | 3 | | 3 | | 3 | | 3 | |
| 30 min. Peak Population | 117 | | 155 | | 164 | | 173 | | 179 | |
| **CONCOURSE B SECURITY SCREENING CHECKPOINT** | | | | | | | | | | |
| **Passenger Inspection** | | | | | | | | | | |
| No. Security Screening Lanes (172 Pass/Hr/Position) | | | 2 | | 2 | | 2 | | 2 | |
| No. TSA Agents | | | 16 | | 16 | | 16 | | 16 | |
| Queuing Space (30 min. Pop. Capacity) | 1,336 | sf | 1,860 | sf | 1,970 | sf | 2,080 | sf | 2,150 | sf |
| Devestiture Area | | | 800 | sf | 800 | sf | 800 | sf | 800 | sf |
| Primary Inspection Area | 1,914 | sf | 1,376 | sf | 1,376 | sf | 1,376 | sf | 1,376 | sf |
| Secondary Inspection Area | | sf | 1,376 | sf | 1,376 | sf | 1,376 | sf | 1,376 | sf |
| TSA Inspection Search Rooms | | | 160 | sf | 160 | sf | 160 | sf | 160 | sf |
| Supervisor Station | | | 275 | sf | 275 | sf | 275 | sf | 275 | sf |
| Deplaning Sterile Corridor | 586 | sf | 2,320 | sf | 2,320 | sf | 2,320 | sf | 2,320 | sf |
| (20ft w ide x 116ft long) | | | | | | | | | | |
| **Total Security Screening Checkpoint** | 3,836 | sf | 8,167 | sf | 8,277 | sf | 8,387 | sf | 8,457 | sf |

Figure 3-5 shows the volume comparison between the two checkpoints in the determination of the peak hour passengers for each. It illustrates that the peak departure period for both checkpoints is in the afternoon and that the loads shared by each are essentially the same.

*Figure 3-5*
**PEAK HOUR PASSENGERS**




The current condition of the checkpoints indicates a significant deficiency when compared to the forecasted demands.

- Concourse A:
  - Increase the queuing area by more than three times to meet the five year forecast, and with increasing passenger growth, up to almost four times for the 20 year projection.
  - Add a second screening position which will allow this checkpoint to function effectively into the 20 year forecasted demand. To accommodate this additional machinery, the area would need to grow by 75 percent.
  - Increase the deplaning corridor by over five times to meet the forecast requirements

- Concourse B:
  - Increase the queuing area by about 39 percent to meet the five year forecast, and with increasing passenger growth, up to 91 percent for the 20 year projection.

- o Add a second screening position which will allow this checkpoint to function effectively into the 20 year forecasted demand. To accommodate this additional machinery, the area would need to be increased by 44 percent.
- o Add a TSA inspection room and a supervisor station totaling approximately 435 sf.
- o Increase the deplaning corridor by almost four times to meet the forecast requirements.

The TSA considers a consolidated checkpoint advantageous since it optimizes their staffing and provides some redundancy in the event of screening equipment failure. A consolidated checkpoint would have spatial requirements of approximately 14,300 square feet for the five year forecast to approximately 15,000 square feet for the 20 year projection. A comparison between independent security checkpoints area requirements and a consolidated checkpoint is provided in Table 3-18. Alternatives for a consolidated checkpoint are presented in the next chapter.

*Table 3-18*
**CONSOLIDATED CHECKPOINT AREA REQUIREMENTS**

| Description | Actual 2010 | Forecast 2017 | | 2022 | | 2027 | | 2032 | |
|---|---|---|---|---|---|---|---|---|---|
| **SECURITY SCREENING CHECKPOINT** | | | | | | | | | |
| **Area Requirements** | | | | | | | | | |
| Concourse A | | 8,167 | sf | 8,277 | sf | 8,387 | sf | 8,457 | sf |
| Concourse B | | 8,167 | sf | 8,277 | sf | 8,387 | sf | 8,457 | sf |
| Total Security Screening Area Requirements | | 16,334 | sf | 16,554 | sf | 16,774 | sf | 16,914 | sf |
| **Consolidated Checkpoint Alternative** | | **14,300** | **sf** | **14,566** | **sf** | **14,831** | **sf** | **15,000** | **sf** |

*BAGGAGE SCREENING*

After the events of September 11, 2001, the screening of all checked baggage for explosives or other incendiary devices was mandated by Congress. At PHF, baggage is checked in at the ticket counter, and then transported by the passenger to TSA for screening. Currently there are five baggage screening machines (each having an associated Trace Detection System table nearby) located in the airline ticketing lobby space. These machines are set up such that they obstruct the use of six check-in counters. The total existing space allocated for these machines is 1,195 square feet.

Per Table 3-19, baggage screening demands for the five, 10, 15, and 20 year projections will require a significant increase in the amount of space, as well as the inclusion of TSA Baggage Screening support spaces that include a threat resolution room, staff support spaces, conveyor control room, and conveyor maintenance and storage.

It is important to note that the required area would not be increased in the current configuration as the existing baggage screening is a manual operation that occurs in the ticketing lobby. The intent is that the screening activity would be relocated to behind the ticketing area and reconfigured into a fully automated system. This option is developed in Chapter 4, Identification and Evaluation of Alternatives. Upon relocation of the baggage screening machines and support, that space previously occupied will again become part of the airline ticketing area.

*Table 3-19*
**BAGGAGE SCREENING AREA FORECAST REQUIREMENTS**

| Description | Actual | | Forecast | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2010 | | 2017 | | 2022 | | 2027 | | 2032 | |
| Peak Hour Enplanement | 390 | | 510 | | 540 | | 570 | | 590 | |
| Peak Hour No. Baggage Checked (0.9 Bag/PHE) | | | 459 | | 486 | | 513 | | 531 | |
| Alarmed Bags (13% False Alarm Rate) | | | 60 | | 63 | | 67 | | 69 | |
| **BAGGAGE INSPECTION FACILITIES** | | | | | | | | | | |
| **Hold Baggage System (HBS)** | | | | | | | | | | |
| Explosive Detection System Units (220 bag/hr+1) | | | 4 | | 4 | | 4 | | 4 | |
| Checked Baggage Inspection System | | | 6,400 | | 6,400 | | 6,400 | | 6,400 | |
| No. On Screen Resolution Operators | | | 3 | | 3 | | 3 | | 3 | |
| On Screen Resolution | | | 300 | sf | 300 | sf | 300 | sf | 300 | sf |
| Baggage Encoding Station | | | 3,600 | sf | 3,600 | sf | 3,600 | sf | 3,600 | sf |
| EDS Maint. / Storage | | | 400 | sf | 400 | sf | 400 | sf | 400 | sf |
| **Total Hold Baggage System** | 1,195 | sf | 10,703 | sf | 10,703 | sf | 10,703 | sf | 10,703 | sf |
| **Baggage Screener Area (CBRA)** | | | | | | | | | | |
| Explosive Trace Detection Units (20 Sec./Bag) | | | 3 | | 3 | | 3 | | 3 | |
| Checked Baggage Resolution Area | | | 900 | sf | 900 | sf | 900 | sf | 900 | sf |
| TSA Staff Support Spaces | | | 1,800 | sf | 1,800 | sf | 1,800 | sf | 1,800 | sf |
| **Total Baggage Screener Area** | 0 | sf | 2,700 | sf | 2,700 | sf | 2,700 | sf | 2,700 | sf |
| **Baggage Inspection Support Facilites** | | | | | | | | | | |
| Conveyor Control Room and IT | | | 230 | sf | 250 | sf | 260 | sf | 270 | sf |
| Conveyor Maint. And Storage | | | 370 | sf | 390 | sf | 420 | sf | 430 | sf |
| **Total Baggage Support Area** | 0 | sf | 600 | sf | 640 | sf | 680 | sf | 700 | sf |
| **Administration and Support Offices (TSA)** | | | | | | | | | | |
| TSA Support Space | | | | | | | | | | |
| TSA Agent Breakroom | 0 | | 1,280 | sf | 1,280 | sf | 1,280 | sf | 1,280 | sf |
| Tranning Room | 0 | | 320 | sf | 320 | sf | 320 | sf | 320 | sf |
| Storage Room | 0 | | 160 | sf | 160 | sf | 160 | sf | 160 | sf |
| TSA Administration Office Area | 2,817 | sf | 2,817 | sf | 2,817 | sf | 2,817 | sf | 2,817 | sf |
| **Total TSA Administration Area** | 2,817 | sf | 4,577 | sf | 4,577 | sf | 4,577 | sf | 4,577 | sf |

*TSA OFFICES AND SUPPORT AREAS*
The TSA requires some areas adjacent to the passenger security checkpoint for office space, but the majority of the offices, lockers, break and training spaces can be remote from the passenger security checkpoint. They must be within easy walking distance of the checkpoint, but can be located in an area of reduced demand.

Currently, the TSA occupies approximately 2,817 square feet of space in the lower level of Concourse B. The demand forecast for five years is the same as for 20 years, resulting in a total requirement of 4,577 sf. Thus, the existing condition is 62 percent deficient.

### *3.8.1.3 Concessions*

Concessions are amenities that are provided by merchants or other service providers for the convenience of the passenger through a lease, rental agreement or other arrangement with an airport that allows the service or product provider to offer that amenity on airport property, usually within the terminal. The operators of the concession typically pay the airport a fee or a share of the profits in order to have access to that airport's passengers. If the airport is offering these goods or services directly to the passenger, it is considered an amenity rather than a concession.

Concessions can be broken down into general concessions (retail), food and drink, and other concessions (services, conference rooms, etc). After the attacks of September 2001, passengers were induced to arrive at the airport earlier for security screening, creating a greater need for food, beverage and retail concessions on the secure side of the passenger security checkpoint. This is particularly true of those airports where the passenger security checkpoint is open during all operating hours of the terminal, as is the case at PHF.

*GENERAL CONCESSIONS*
Passengers have come to expect that at a minimum they will be able to pick up a newspaper at an airport. As an airport grows and the passengers spend more time in the airport, they begin to look for enhanced shopping options. This typically will start at paperback books and magazines, will flow to toiletries and local souvenirs, and eventually to specialty retail for clothing and other goods as the airport traffic grows.

Currently, the Airport has both secure side and non-secure side general concessions, these general concessions are "news and gift shop concessionaire". The majority of the general concession component is landside in the main terminal area, with a smaller amount located in Concourse B. Combined, these elements occupy approximately 1,513 square feet, which is acceptable when compared to the five, 10 and 15 year forecast. At 20 years, that same amount of space will be deficient by approximately 19 percent.

*FOOD AND DRINK*
The passenger has also come to expect that an airport will, at a minimum, be able to provide coffee, water, soft drinks, and a few snacks. These can be provided via vending machines at the very smallest airports, but more selection is expected at larger airports – from sandwiches to full-service restaurants. Depending on the culture of the community, one or more bars may also become viable.

The Newport News/Williamsburg International Airport terminal houses a restaurant on the non-secure side and two café-style concessions on the secure side (one located in each concourse). Combined, the food and drink concessions (along with their associated kitchen and storage space) occupy approximately 7,342 square feet.

Calculations based on the forecasted demand of passenger enplanements and typical airport restaurant use patterns would indicate that this amount of space exceeds those requirements by at approximately 15 percent for even the 20 year forecast.

*OTHER CONCESSIONS*

Any amenity that a concessionaire wants to offer to a passenger can be located at an airport, with the exception of those that might compromise security. Other typical concessions might include pay telephones, shoe shine stands, postal facilities, ATMs, business centers, video arcades, massage, advertising, and event or product displays. There are also four vacant counter locations opposite the airline check-in counters on the southwest side of the terminal

In addition to some vending machines, newspaper kiosks and telephones, Newport News/Williamsburg International Airport also has a prominent USO located right off the main lobby space, as well as available conference room space. These elements occupy 4,120 square feet of space and are not passenger demand driven requirements, rather a local community factor of annual enplaned passengers. Each airport serves a different community and each community has different expectations of what services should be provided at their airport. Demand forecasts for other revenue concessions are determined using a standard factor from annual enplaned passenger. These calculations result in a 6,200 square feet within five years, up to a 9,500 square feet within 20 years, thus identifying a significant deficiency.

### *3.8.1.4 <u>Rental Car</u>*

Rental car concessions are almost synonymous with airports. Passengers not local to the community will need transportation. Rental car counters, back offices and space for passenger queues should be located along the path of travel of the arriving passenger. Typically, as is the case at PHF, rental car counters are located within or adjacent to the baggage claim area. Parking for the rental cars themselves is usually located within easy walking distance of the exit door of the terminal, although at larger airports shuttle buses are typically used to transport passengers to the car ready lot.

The Airport currently has four rental car counters in use, located directly across the main circulation hall from the baggage claim in the northeast portion of the terminal. The four rental car counter areas in use currently occupy 638 square feet in the form of rental car counters and associated offices. An additional 556 sf is allotted to the customer transaction area and a queuing space of approximately eight feet in front of each counter. Thus in total, 1,194 sf is attributed to rental car concessions.

The five, 10, 15, and 20 year projections indicate the size needed for this functional area needs to be substantially increased to be 3,300, 3,800, 4,400 and 5,100 square feet, respectively.

### *3.8.1.5 Public Areas*

Public areas are those areas of the terminal not already discussed where the general public is free to go even if they are not a passenger. While these areas also accommodate passengers, they are generally where the majority of the people who are seeing passengers off on a flight (well-wishers) or people who are waiting for a passenger to arrive on a flight (meeters and greeters), will typically spend most of their time. Primarily, this includes public circulation and washrooms.

*PUBLIC CIRCULATION*
Circulation is all of the areas such as halls, lobbies, plazas, stairs, elevators, and escalators that allow passengers, employees, and terminal visitors to travel from one functional area to another. The circulation distance should be kept as short as possible while still being able to accommodate the full peak hour population of the terminal with a condition of stable flow, acceptable delays for short periods of time, and adequate levels of comfort.

Within the zones of public circulation should be sufficient seating for the terminal visitors who are waiting for passengers to either depart or arrive. This is particularly important in accommodating aged or disabled people. In terminals where the deplaning corridor is adjacent to the security checkpoints (as at PHF), the waiting and seating area should be placed in the vicinity of the non-secure side of the security checkpoint in such a way as to have a clear view of the deplaning corridor without impeding the flow of the corridor or the security checkpoint queue. At the Airport, this occurs primarily in the main lobby space directly underneath the pyramidal glass skylight.

Circulation is further divided into non-secure (landside) circulation and secure (airside) circulation. Secure circulation is that which occurs after one passes through the checkpoint or any areas that require special badging or keying requirements. Non-secure circulation occurs prior to the checkpoint in areas where the public is allowed to freely travel. Table 3-20 illustrates the existing circulation area and forecasted requirements.

*Table 3-20*
**CIRCULATION AREA FORECAST REQUIREMENTS**

| | Actual | | Forecast | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **2010** | | **2017** | | **2022** | | **2027** | | **2032** | |
| Annual Enplaned Passengers | 504,000 | | 616,000 | | 711,000 | | 821,000 | | 948,000 | |
| **Planning Criteria** | | | | | | | | | | |
| Secured Airside Circulation. Plan Factor = 0.030 sf/ ANNEP | 17,564 | sf | 18,500 | sf | 21,400 | sf | 24,700 | sf | 28,500 | sf |
| Non-Secured Landside Circulation Factor = 0.045 sf/ ANNEP | 23,076 | sf | 27,800 | sf | 32,000 | sf | 37,000 | sf | 42,700 | sf |
| **Total Public Circulation** | 40,640 | sf | 46,300 | sf | 53,400 | sf | 61,700 | sf | 71,200 | sf |

The total circulation space within the PHF terminal amounts to approximately 40,640 square feet. As shown above, that amount will need to be increased by 14 percent, 32 percent, 52 percent, and 75 percent for the five, 10, 15 and 20 year forecasts respectively.

*WASHROOMS*

Public restrooms must be available on both the non-secure and the secure sides of the terminal. The non-secure side restrooms should be centrally located between check-in and baggage claim unless the terminal is so large that separate facilities are warranted or when the areas are on different levels. If check-in and baggage claim are separated by level or considerable distance, the restrooms should also be split to be able to serve both the inbound and outbound passengers and their respective terminal visitors.

At PHF, the non-secure (landside) restrooms are properly located at the throat from the check-in / baggage claim hall to the main lobby. These facilities account for approximately 876 sf. Secure (airside) restrooms are located in each concourse, and they total 2,015 sf.

Public restroom areas should include space for family restrooms and janitor facilities. Per Table 3-21, washroom facilities will need to be almost doubled to meet the five year forecast projection, and more than doubled to meet the demands of the 20 year projection.

Table 3-21
**PUBLIC RESTROOM FORECAST REQUIREMENTS**

| Description | Actual | | Forecast | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2010 | | 2017 | | 2022 | | 2027 | | 2032 | |
| Peak Hour Enplanements | 390 | | 510 | | 540 | | 570 | | 590 | |
| Peak 30 min. deplaning Passengers | 234 | | 306 | | 324 | | 342 | | 354 | |
| **Toilet Rooms Landside** | | | | | | | | | | |
| 80% Deplaning Factor | | | 245 | | 259 | | 274 | | 283 | |
| 50% Use Facility | | | 122 | | 130 | | 137 | | 142 | |
| Men (65%) | | | 80 | | 85 | | 89 | | 93 | |
| Women (35%) | | | 43 | | 46 | | 48 | | 50 | |
| Time in Use (1.5 min./men) | | | 120 | min. | 128 | min. | 134 | min. | 140 | min. |
| Time in Use (3 min./w omen) | | | 129 | min. | 138 | min. | 144 | min. | 150 | min. |
| No. Fixtures (men) | | | 12 | | 13 | | 14 | | 14 | |
| No.Fixtures (w omen) | | | 13 | | 14 | | 15 | | 15 | |
| No. Modules | | | 3 | | 3 | | 3 | | 3 | |
| Toilet Area | 876 | | 3,750 | sf | 4,050 | sf | 4,350 | sf | 4,350 | sf |
| Family Rooms Area | 65 | | 300 | sf | 300 | sf | 300 | sf | 300 | sf |
| Janitor Area | 29 | | 360 | sf | 360 | sf | 360 | sf | 360 | sf |
| **Subtotal** | | | 4,410 | sf | 4,710 | sf | 5,010 | sf | 5,010 | sg |
| **Toilet Rooms Airside** | | | | | | | | | | |
| Peak 10 Minute Deplaning Population | | | 128 | | 135 | | 143 | | 148 | |
| 80% Deplaning Factor | | | 102 | | 108 | | 114 | | 118 | |
| 40% Use Facility | | | 41 | | 43 | | 46 | | 47 | |
| Men (50%) | | | 21 | | 22 | | 23 | | 24 | |
| Women (50%) | | | 21 | | 22 | | 23 | | 24 | |
| Time in Use (1.5 min./men) | | | 32 | min. | 33 | min. | 35 | min. | 36 | min. |
| Time in Use (3 min./w omen) | | | 63 | min. | 66 | min. | 69 | min. | 72 | min. |
| No. Fixtures (men) | | | 4 | | 4 | | 4 | | 4 | |
| No.Fixtures (w omen) | | | 7 | | 7 | | 7 | | 8 | |
| No. Modules | | | 1 | | 1 | | 1 | | 1 | |
| Toilet Area | 2,015 | | 1,650 | sf | 1,650 | sf | 1,650 | sf | 1,800 | sf |
| Family Rooms Area | 99 | | 100 | sf | 100 | sf | 100 | sf | 100 | sf |
| Janitor Area | 107 | | 120 | sf | 120 | sf | 120 | sf | 120 | sf |
| **Subtotal** | | | 1,870 | sf | 1,870 | sf | 1,870 | sf | 2,020 | sg |
| **Total Restroom Facilities Area** | 3,191 | sf | 6,280 | sf | 6,580 | sf | 6,880 | sf | 7,030 | sf |

### *3.8.1.6 Airport Administration*

The airport administrative spaces include airport administration offices, support spaces, maintenance/storage spaces and airport police.

Airport administration offices technically are considered public use areas, although the large majority of passengers rarely take the opportunity to visit these offices. Because they are considered public, the administrative offices should be accessible to the public. It is practical to have the administrative offices located within the terminal in order for the staff to take care of the day to day operation of the Airport. Support spaces include break areas, locker rooms, dedicated restrooms, etc. Administration and support spaces at PHF occupy approximately 4,456 sf.

Storage and maintenance spaces at PHF are located primarily on the lower level of the main terminal building, and occupy about 5,587 sf.

The Airport police has a small office on the upper level near the baggage claim and a larger area, complete with a detention room, on the lower level. Combined, all Airport police space occupies about 873 sf.

All told, the airport administration space within the Newport News/Williamsburg International Airport terminal accounts for 10,916 square feet, which exceeds the 20 year forecasted demand and is adequate through the planning period.

### *3.8.1.7 Federal Inspection Service (FIS)*

An FIS space is dedicated to the processing of incoming foreign flights as per the *Airport Technical Design Standards – Passenger Processing Facilities, US Department of Homeland Security, U.S. Customs and Border Protection*, August 2009. Passengers enter into a secure area, are processed through U.S. Customs and then allowed to enter the main portion of the terminal. At PHF, the FIS space is located on the lower level of Concourse A. Although the current projections do not forecast any incoming foreign flights, it is an amenity that the Airport does have and may choose to employ at some future time. The space allocated to this function is finished and is approximately 11,400 sf. The Airport has begun a project to improve the interior to properly accommodate Federal Inspection Services.

### *3.8.1.8 Utilities*

Utility spaces within an airport terminal building are necessary for the structure to operate properly, have a comfortable environment, and be secure. Included are mechanical spaces, electrical spaces, and telecommunication spaces.

For mechanical spaces, sufficient room must be allowed to adequately house the mechanical equipment that provides the heating, cooling, ventilation, electricity, communications, data, and plumbing needs of the building. Consideration should also be given to the plenums and chases that distribute these services from the equipment room or rooms to the remainder of the terminal. For this reason, the mechanical room or rooms should be located as centrally as possible while still allowing access for equipment to be replaced and maintained periodically without disturbing the public or interrupting the functioning of the terminal. For these reasons, the mechanical equipment rooms are often placed on an outside wall of the terminal and directly accessed from the outdoors via one or more large doors.

The mechanical, electrical, and boiler rooms at the PHF terminal are located in the lower level along the north, south and east perimeter walls below the main lobby space, in the west end of lower level Concourse B, and the north lower level end of Concourse A.

Utility spaces occupy approximately 11,959 sf throughout the terminal. Demand projections show that this is adequate for the five and 10 year projections, yet 15 percent and 33 percent shy of the forecasted requirements for the 15 and 20 year projections, respectively.

#### *3.8.1.9 Miscellaneous*

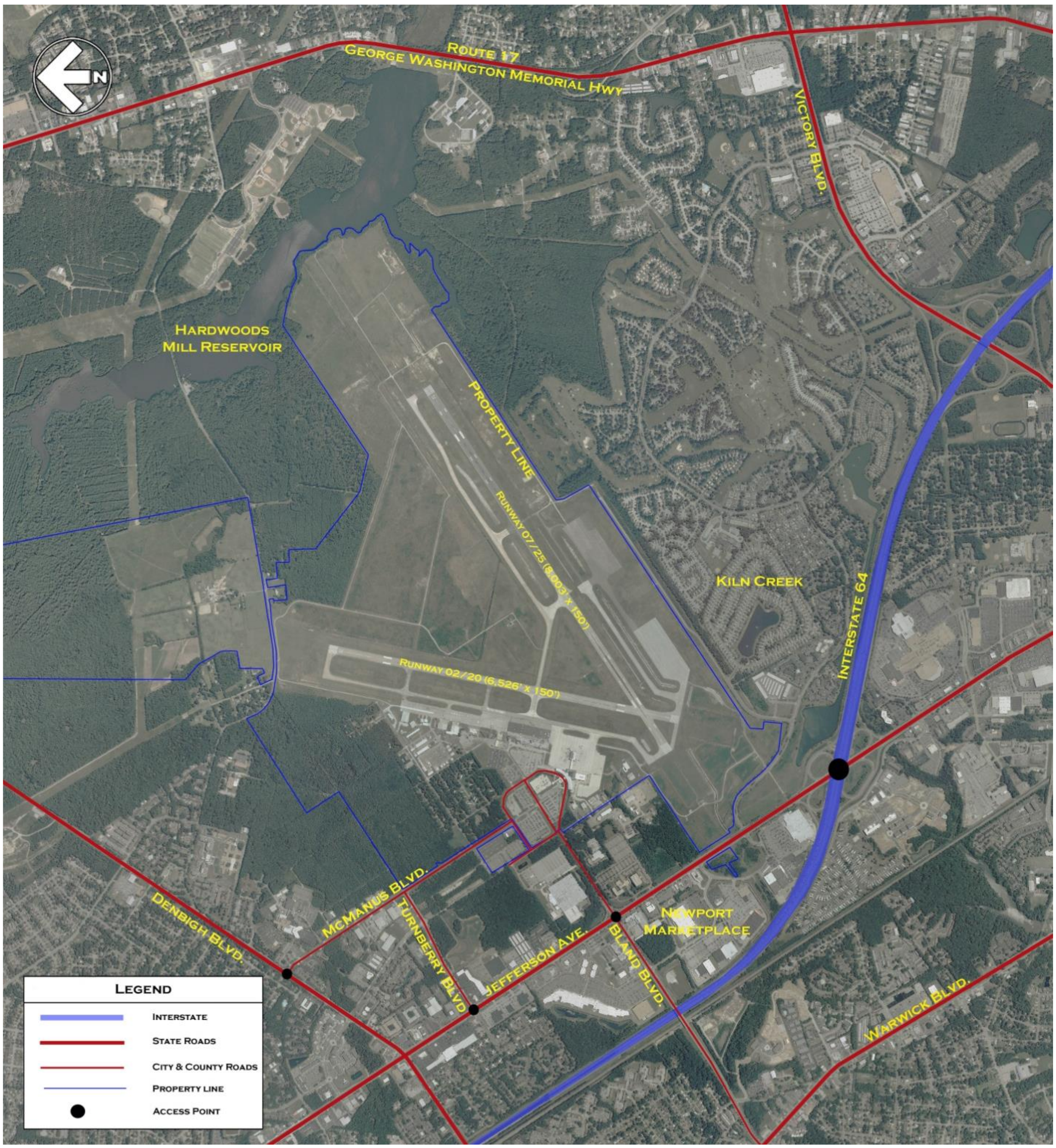
The building structure is generally the difference between the gross, overall size of a building and the net cumulative area of the individual rooms This difference represents the area of the columns, walls, shafts, and other structural supports of the building and is usually approximately 7 to 10 percent of the gross building area.

The net building area of the existing terminal was measured to be approximately 145,062 square feet. The gross building area for the terminal is approximately 156,182 sf. Building structure accounts for about 7.12 percent of the building area.

## 3.9 AIRPORT VEHICLE ACCESS

Airport access systems consist of connecting roadways that enable arriving and departing airport users to enter and exit the airport landside facilities and parking facilities. Surface access is composed of both off and on airport access. An aerial map of the vehicle access roads near the Airport is provided in Figure 3-6.

*Figure 3-6*
**AIRPORT VEHICLE ACCESS**



### 3.9.1 Off-Airport Access

The regional transportation network consists of two major roadways that serve the Airport – Interstate 64 (I-64) and Route 17. The primary access to the Airport is on Jefferson Avenue. Bland Boulevard is the main access off Jefferson Avenue to terminal loop road, general aviation, and vehicle parking facilities. In addition, access to the terminal loop road, general aviation, and vehicle parking facilities can also be achieved by way of McManus Boulevard. Each of these roadway elements Interstate 64, Jefferson Avenue, Bland Boulevard, and McManus Boulevard, will be evaluated to determine their impact to the overall airport system.

#### *3.9.1.1 Interstate 64*

The Airport is located northeast of I-64. I-64 connects Richmond, Williamsburg, and James City County to the northwest and Hampton, Poquoson, Norfolk, Portsmouth, and Virginia Beach to the southeast. The portion of I-64 relevant to Airport access is approximately seven miles long. This segment is south of the Airport from Exit 256 (intersection of Highway 171 and I-64) to north of the Airport at Exit 250 (intersection of Highway 105 and I-64). The issue is congestion and ease of entry to/from the Airport from I-64.

The study segment south of the Airport consists of four lanes in each direction, while the segment to the north of the Airport has two lanes in both directions. Recent VDOT, Hampton Road TPO, and City of Newport News traffic studies suggest widening I-64 within the study area, which would help ease congestion on I-64 and Jefferson Avenue. The congestion and deficiency on the roadways adjacent to the Airport are caused by non-airport traffic.

The previous master plan recommended a Bland Boulevard and I-64 interchange, which would improve the efficiency of traffic flow in the area and provide multi-modal capabilities. However, since the previous master plan, land development around the Airport has made this interchange difficult to implement.

Therefore, either improvements to the existing Jefferson Avenue/I-64 interchange or the construction of a new interchange after Jefferson Avenue and before Denbigh Boulevard would be advantageous for access to Newport News/Williamsburg International Airport. This interchange would improve the efficiency of traffic flow and provide the potential for a multi-modal facility to accommodate bus transit, light rail, and high-speed rail, for airport users and other travelers.

#### *3.9.1.2 Jefferson Avenue*

The Airport is located to the northeast of Jefferson Avenue. A major arterial road within the City of Newport News, Jefferson Avenue extends from the tip of the peninsula northwest, approximately 20 miles, until it crosses into the City of Williamsburg as Merrimac Trail. The portion of Jefferson Avenue that is relevant to Airport access is approximately two miles long. This segment is south of the Airport from the intersection of I-64 to north of the Airport at the intersection of Denbigh Boulevard.

The study segment south of the Airport (Bland Avenue to I-64) consists of three lanes, both directions. The issue to the south is that vehicles on Jefferson Avenue must merge with vehicle traffic exiting I-64, as well as traffic from several high-volume “big box” retailers, a business park and residential areas. Within this one-mile segment there are limited turn lanes and exit opportunities; therefore, each driver is competing with the others to merge and navigate through a dense traffic area across multiple lanes of traffic quickly in order to reach their desired destination. Widening the northbound lanes or adding dedicated lanes to separate the through traffic from the retail traffic and airport users would increase the capacity of roadway and improve the ease of all drivers navigating the area, including airport users.

The final note for the south segment of Jefferson Avenue is the development of the light rail line proposed to parallel Bland Boulevard. This light rail would help reduce the overall vehicle congestion and improve the Airport's multi-modal connectivity, while complementing the improvements to I-64 as well. However, the light rail would not resolve the issue of this segment entirely.

The Jefferson Avenue study segment north of the Airport (Denbigh Boulevard to Bland Avenue) consists of three lanes, both directions. The issue within this segment is similar to the south segment, but the problems are not as severe. Ease of access and wayfinding are more important concerns. Similar to the south segment, high traffic volume during peak times make access to the Airport difficult to navigate. A dedicated southbound lane and additional wayfinding signage would ease navigating this dense and congested route to the Airport.

#### *3.9.1.3 Bland Boulevard*

Bland Boulevard is the main access route to the Airport property, including the terminal loop road, general aviation, and vehicle parking facilities. Bland Boulevard is approximately one mile long, starting at the intersection of Warwick Boulevard and Eastwood Drive and travels northeast over I-64 and across Jefferson Avenue, where it ends on Airport property. The portion of Bland Boulevard that is most relevant to Airport access is approximately three-quarters of a mile, specifically, where Bland crosses I-64 to Airport property.

The study segment is a divided boulevard having two lanes in both directions. The segment between I-64 and Jefferson Avenue is approximately a half a mile long and is underutilized due to the limited access to the retail centers and lack of access onto the interstate. The primary users of this segment are residents utilizing Warwick Boulevard.

The segment between Jefferson Avenue and the Airport Loop Road is approximately a quarter mile long. Recent traffic observations suggest that a large volume of the traffic is utilizing Bland and McManus Boulevard to bypass portions of Jefferson and Denbigh Boulevard rather than to access the Airport. Data suggests that a portion of these bypass drivers are employees of Mary Immaculate Hospital, which is located on the corner Denbigh and McManus. Access to the hospital via Bland Boulevard is convenient and direct if driving from the south.

The issue within this segment is ease of access, way finding and congestion with non-airport users. Separating or redirecting the "bypassing" traffic going to the hospital, or reconnecting with Denbigh and Jefferson from the airport users will improve the ease of access for the drivers heading to or from the Airport.

#### *3.9.1.4 McManus Boulevard*

McManus Boulevard is the secondary access road to the Airport. McManus Boulevard starts north of the Airport where it intersects Denbigh Boulevard and travels about one mile southeast, parallel to Jefferson Avenue, until it intersects with the Airport Loop Road and Bland Boulevard. The entire length of McManus Boulevard is relevant to Airport access.

At times, vehicles become backed up at the stops signs (T- intersection of the Airport loop road (Siemens) and McManus. The heavy traffic can cause delay for Airport users. In addition, drivers from the Avis/Budget rental car facility must make left-hand turns across oncoming traffic, resulting in additional delays and a potentially unsafe situation. The issue here is the same as on Bland Boulevard: ease of access, wayfinding and congestion with non-airport users. Separating or redirecting the “bypassing” traffic, going to the hospital, or reconnecting with Jefferson Avenue from the airport users, will improve the ease of access for the drivers heading to or from the Airport.

Considering the existing vehicle traffic issues, it is recommended that these roadways be modified to improve the functionality and reduce the conflict with local traffic, while providing a long-term solution for airport access to and from the interstate system. It is also recommended to consider opportunities to incorporate intermodal access to the Airport. Alternatives for these non-airport improvements are discussed in Chapter 4, Identification and Evaluation of Alternatives.

### 3.9.2 On-Airport Access

On-airport access roadways are subdivided into two categories: public and restricted access roadways. Public roads are, as the name indicates, roadways that are available for public use and provide access to general aviation, airfield facilities and commercial services facilities. Restricted access roadways are located on airport property and generally provide access to on-airport facilities, such as navigational aids, perimeter fencing, and aprons that cannot be accessed by the general public.

#### *3.9.2.1 Public Access*

On-airport public access roadways are subdivided into two categories: general public access and the terminal loop road. General public access provides vehicle access to all areas of on airport property except for the terminal building. The terminal loop road provides access to the passenger terminal building and vehicle parking lots.

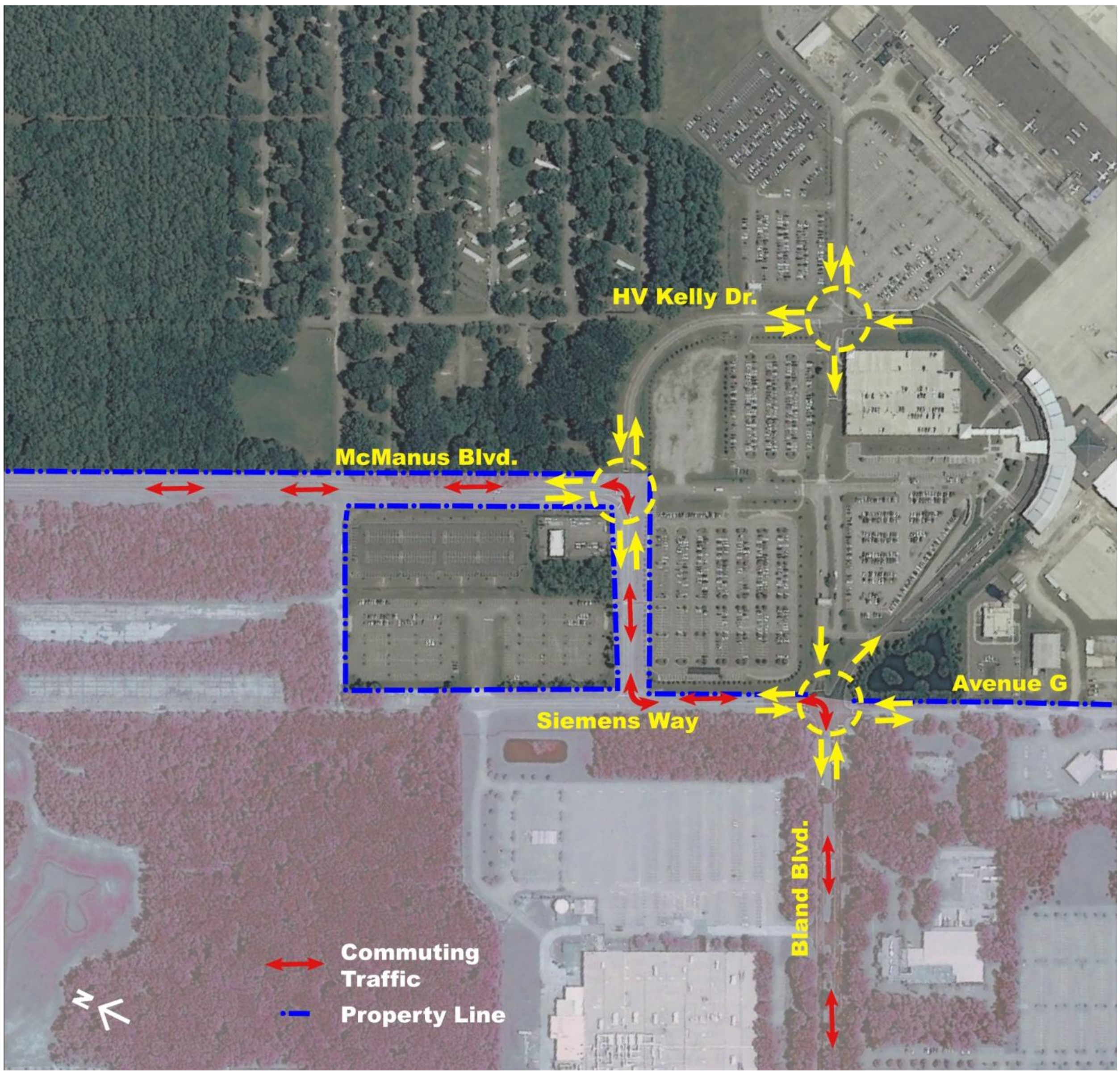
*GENERAL PUBLIC ACCESS*
The general public access roadways are Bland Boulevard, Lear Drive, Cherokee Drive, G Avenue, Corporate Drive, and Air Park Drive, which provide access to the south side of the Airport. Kentucky Drive, and Providence Boulevard provide access to the north and east side of the Airport. These on-airport general public access roads are currently adequate to serve the demand. As new development areas are identified, such as growth to the south development area, the development of the infield, or any landside development, it may be necessary to expand or improve the access roads.

*TERMINAL LOOP ROAD*
The existing terminal loop road is currently accessed off either Bland or McManus Boulevard. The two-way, primarily one-lane road circulates around the short- and long-term parking lots, accesses

the general aviation areas, and passes in front of the commercial service passenger terminal. It continues past the entrance and exits to the taxi-ready lot, and the rental car ready/return lot.

There are three stop signs, one stop light, a transition from one-way to two-lane traffic, and merging non-aviation vehicle traffic that drivers must navigate to complete a cycle of the airport loop road. This is a complicated and unconventional airport loop road that results in delays, unnecessary congestions, and disoriented drivers. This circulation pattern is shown in Figure 3-7.

*Figure 3-7*
**TERMINAL LOOP ROADWAY SYSTEM**



Traffic observations indicate that a high volume of vehicles on the terminal loop road system are utilizing Bland and McManus Boulevard to bypass portions of Jefferson and Denbigh Boulevard, rather than to access the Airport. This bypassing traffic creates congestion, delays and difficulty accessing the Airport during peak periods. The issue is not the capacity of the terminal loop roadway, rather it is the shared use of roadways that provide access to the terminal.

It is generally accepted that airports of a similar size and passenger volume to Newport News/Williamsburg International Airport should have a dedicated one-way terminal loop roadway, with a minimum of two 12-foot wide lanes, access to parking facilities within the interior of the loop, and the terminal curb front to the right of the vehicle's driver.

Considering these generally accepted principles, industry proven terminal loop road design, and vehicle traffic issues the Airport is currently facing, it is recommended that the Airport establish a dedicated one-way terminal loop roadway. This will improve the ease of access, reduce congestion, delays, and improve the effectiveness of the terminal loop roadway system. Alternatives for airport roadway improvements are analyzed in Chapter 4, Identification and Evaluation of Alternatives.

*TERMINAL CURB FRONT*

The number of lineal feet needed for loading and unloading of passenger is determined by the type and volume of vehicle traffic anticipated during peak periods. The number of peak hour vehicles projected to utilize the terminal curb during the various peak hours over the planning period have also been calculated as shown in Table 3-22.

The peak hour of vehicles considers "meeters and greeters" as well as the different modes of transportation available for airport users. The peak hour of deplaning and enplaning passengers does not occur during the same hour; therefore, the total peak hour passenger vehicles is approximately 60 percent of the total.

*Table 3-22*

**PEAK HOUR VEHICLES AT TERMINAL CURB FRONT**

| | **Actual** | **Forecast** | | | |
|---|---|---|---|---|---|
| **Description** | **2010** | **2017** | **2022** | **2027** | **2032** |
| Vehicles Associated with Enplanning Passengers | 185 | 241 | 255 | 270 | 279 |
| Vehicles Associated with Deplaning Passengers | 185 | 241 | 255 | 270 | 279 |
| **Total Peak Hour Vehicles** | **221** | **290** | **307** | **324** | **335** |

The required curb space is related to the airport's individual priorities for privately owned vehicles, taxis, buses, and other public transportation vehicles. The number of lineal feet existing today and needed during the planning period to accommodate the mix of vehicle has been calculated as shown in Table 3-23.

*Table 3-23*
**TERMINAL CURB DEMAND PROJECTIONS**

| | Actual | | Forecast | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **2010** | | **2017** | | **2022** | | **2027** | | **2032** | |
| **Curbfront** | | | | | | | | | | |
| Length of Curb Required | 320 | lf | 290 | lf | 370 | lf | 390 | lf | 400 | lf |
| **Total Surplus/(Deficit)** | | | **30** | **lf** | **(50)** | **lf** | **(70)** | **lf** | **(80)** | **lf** |

The overall effective curb length appears to be adequate through about year 2017. With the level of enplanements expected in 2017, it is expected that 50 lineal feet of curb will be required. In addition, by 2032, it is expected that an additional 30 linear feet will be required.

Some existing operational issues along the terminal curb front include:

- Curb imbalance and congestion along terminal roadway from passenger queues lining up at ticketing and middle doors
- Wide crosswalks limit usable curb frontage
- Excessive wait time for passengers at the terminal curb front
- Overall operating in a non-linear curb front environment

Although these are generally management-related issues, (administrative, signage, policing, etc.), recommendations for the terminal curb front are addressed in Chapter 4, Identification and Evaluation of Alternatives.

#### *3.9.2.2 Restricted Access*

There are approximately 32 restricted vehicle access gates providing secure and monitored vehicle access onto the airfield, primarily for emergency access. About five are used for tenant access to the apron and hangar areas. These same roads and access points are also used by Airport maintenance crews to gain access with machinery and service equipment. Fuel transport trucks access the fuel farm through Gate 5. The Airport does not currently have a completed service road around the perimeter of the Airport. It is recommended that a full perimeter road be established to serve security and maintenance needs.

### 3.9.3 Parking Facilities

the parking at the airport has been divided into three principle user groups: public parking, rental car parking, and employee parking. This section analyzes the parking requirements of each.

#### *3.9.3.1 Public Parking*

Newport News/Williamsburg International Airport currently provides both surface parking and garage parking positions for passenger vehicles with access to/from Bland Boulevard. The surface parking lots provide approximately 2,120 spaces, while the parking garage provides an additional 505 total public parking spaces (200 of which are uncovered). The garage also provides 210 rental car spaces, which will be discussed in the next section. The public parking supply and rates are shown in Table 3-24 and illustrated in Figure 3-8.

*Table 3-24*
**PUBLIC PARKING SUPPLY**

| Lot Description | Rate* | Parking Spaces |
|---|---|---|
| **Main Passenger Parking Areas** | | |
| Short-Term | \$3/hr, \$30 daily max | 60 |
| Garage (Covered) | \$2/hr, \$10 daily max | 505 |
| Yorktown (Long-Term) | \$1/hr, \$7 daily max | 230 |
| Williamsburg (Long-Term) | \$1/hr, \$7 daily max | 522 |
| Newport News (Long-Term) | \$1/hr, \$7 daily max | 244 |
| Gloucester (Economy Lot) | \$1/hr, \$5 daily max | 473 |
| Gravel Lot Unpaved | \$1/hr, \$5 daily max | 211 |
| **Subtotal** | | **2,245** |
| **Main General Aviation and Employee Parking Area** | **Free** | **370** |
| **Overflow and Cell Phone Lot** | **Free** | **380** |
| **Rental Car (Ready-Return Area)** | N/A | **210** |
| **Grand Total** | | **3,205** |

*Rates are current as of September 2011

*Figure 3-8*
**PUBLIC PARKING**


The existing and future parking demands for passenger and non-passenger users, other than employees are depicted in Table 3-25. In order to determine the future parking requirements a ratio of parking spaces per enplanements was used and can be expressed as a ratio of spaces per thousand annual originating enplanements. The industry norm for small hub airports is a ratio of 3.5 to 3.0 spaces per 1,000 enplanements. This ratio is applied to the forecast enplanements throughout the planning period.

As regional transportation organizations implement their multi modal alternatives the demand for traditional parking spaces will decrease, which will reduce the ratio over time. In addition, over time it can be anticipated that the traditional gasoline vehicle user will transition to an alternative fuel/hybrid/electric vehicle user. These new vehicles and their users could be encouraged to have a preferred parking location and a garage equipped to handle hybrid/electric vehicles.

*Table 3-25*
**PUBLIC PARKING DEMAND PROJECTIONS**

| Description | Actual 2010 | Forecast 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|
| Annual Enplanements | 504,000 | 616,000 | 711,000 | 821,000 | 948,000 |
| Total Parking Demand | | | | | |
| Parking Spaces Available | 2,245 | 2,245 | 2,245 | 2,245 | 2,245 |
| Parking Spaces Needed | 1,764 | 2,118 | 2,400 | 2,720 | 3,081 |
| Surplus/(Deficit) Parking Spaces | 481 | 128 | (155) | (475) | (836) |

*3.9.3.2 Rental Car Parking*

There are approximately 210 spaces for rental cars located on the first level of the parking garage. Projections of the need for rental car ready/return spaces are shown in Table 3-26. As passenger traffic increases, it is projected that rental car transactions will increase at the same rate. Fleet sizes will grow and more spaces will be needed to accommodate the operation. The rental car operation is sufficient through 2027; however, by 2032, approximately 46 additional spaces will be needed to provide customers with an acceptable rental car service.

*Table 3-26*
**RENTAL CAR READY/RETURN PARKING DEMAND PROJECTIONS**

| Description | Actual 2010 | Forecast 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|
| **Ready Rental Car Parking** | | | | | |
| Parking spaces | 210 | 111 | 161 | 203 | 256 |
| Surplus/(Deficit) Parking Spaces | - | 99 | 49 | 7 | (46) |

*3.9.3.3 Employee Parking*

There are 370 spaces available for employees to park in, these spaces are located adjacent to the terminal building. The employees parking area is also utilized as an overflow for general aviation user. Employees parking at the Airport include but are not limited to; Airport Authority employees, TSA employees, car rental employees, and airline employees. Current employee parking demand is estimated to be at approximately 49 employee parking spaces. Projections of employee parking demand through the planning period are provided in Table 3-27.

*Table 3-27*
**EMPLOYEE PARKING DEMAND PROJECTIONS**

| Description | Actual 2010 | Forecast 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|
| **Employee Parking** | | | | | |
| Parking spaces | 370 | 49 | 72 | 90 | 114 |
| Surplus/(Deficit) Parking Spaces | - | 321 | 298 | 280 | 256 |

### *3.9.3.4 Overflow and Cell Phone Lot*

The cell phone lot has approximately 380 spaces. The entrance to this lot is provided along McManus Boulevard. This parking lot allows drivers to wait until they receive a call from a passenger in the terminal building, at which time the driver can exit the parking lot and pick up the passenger at the terminal building. This lot is free of charge, and during peak periods is used by the rental car agencies for vehicles before they are placed in the ready/return lot. The cell phone lot is appropriately sized; however, additional wayfinding is recommended to improve it use.

### *3.9.3.5 Taxi Ready Lot*

The taxi ready lot is located to the right of the terminal loop road before the terminal building. This lot is restricted to registered cab companies only as a staging area before a customer requests pickup at the curbfront of the passenger terminal. This lot has approximately 30 spaces and is sufficiently sized for future demand.

## 3.10 GENERAL AVIATION

General aviation aircraft facility requirements at an airport consist of fixed base operator services, hangars and apron space. Assessing future facility needs requires an analysis of the existing and future general aviation operation levels, based aircraft estimates, and the capacity and condition of existing facilities.

### 3.10.1 Fixed Base Operator (FBO)

The Airport has two fixed-base operators, which are businesses that provide fuel, maintenance, storage and other support services for the operators of general aviation aircraft. No developments are forecast that would alter the need for FBOs, and growth is forecast to be within the existing businesses' ability to provide services.

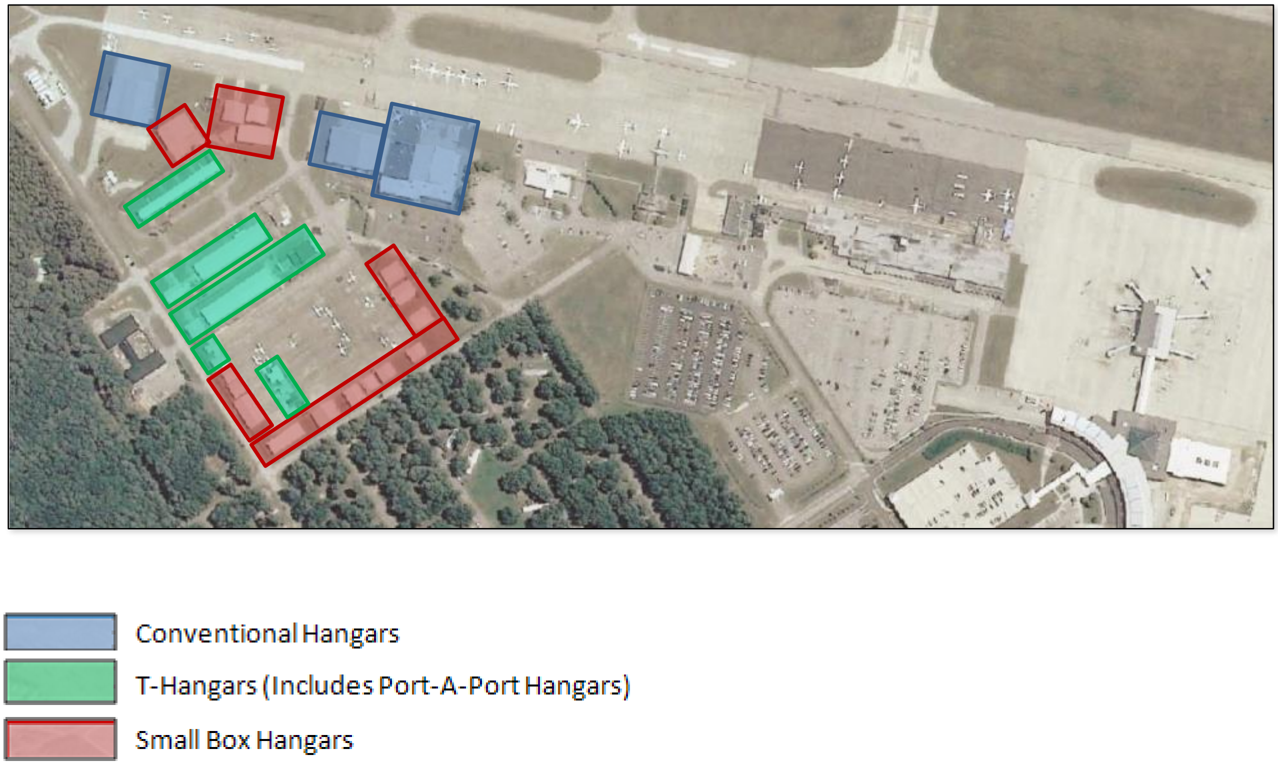
No changes are anticipated in either number of FBOs or their locations unless the South Corporate Apron becomes the center of operations for based and/or itinerant turbine-powered general aviation aircraft. At that point, a facility on the South Corporate Apron may be important to providing the services required at that location.

### 3.10.2 Hangars

The quantity of general aviation hangar space required at an airport depends on local weather conditions, aircraft fleet mix, airport security and user preference, in addition to the total number of based aircraft. Airports in moderate climates typically see only about 20 percent of users opting for more expensive hangars over apron tie-downs. In more extreme climates – those with severe winters, high precipitation and intense sunshine – users are more likely to hangar their based aircraft. Due in part to the coastal location of the Airport, approximately 50 percent of aircraft based at the Airport are hangared. Operators of single-engine aircraft and light twins are likely to opt for T-hangars or small box hangars, while corporate operations are typically based at conventional hangars.

The primary general aviation hangar area is north of the air carrier apron and its primary axis runs parallel to Runway 2/20. There are 36 hangars at the Airport – 27 conventional and small box hangars, six Port-A-Port hangars, and three T-hangar buildings containing 10 units each. See Figure 3-9 for a graphic depicting these various hangars in the primary general aviation hangar area. Conventional and small box hangars are the most common hangar types at commercial service airports and usually vary from 3,000 sq. ft. to 14,000 sq ft. in storage capacity at Newport News/Williamsburg International. Airport. T-hangars, which also include Port-a-Port hangars, are more commonly used at general aviation airports because they are more economical than conventional or small box hangars. These hangars usually range in size from 1,500 sq. ft to 3,000 sq. ft. There is a secondary general aviation area behind the primary area, and a largely undeveloped South Corporate Apron, which is located on the south side of Runway 7/25.

*Figure 3-9*
**PRIMARY GENERAL AVIATION HANGAR AREA**




Forecast growth in the number of based aircraft and the current condition of some of the existing hangars indicates that additional hangar demand is likely to arise during the planning period. The Airport's designation of the south ramp as a location for growth of corporate aircraft should accommodate part of the demand for future locations of privately owned corporate hangars.

Current hangar utilization rates on the secondary GA ramp indicates that approximately 40 piston singles and twins are currently hangared in both small conventional hangars and T-hangars. This amount of hangar space is forecast to increase to 53 by 2017 and 66 by 2032. Assuming all existing hangars remain, hangar demand for piston aircraft would increase by six small conventional hangars and one 10-unit T-hangar by 2032. Additionally, developing the south apron into the primary base for general aviation jets would mean establishing hangar space for 23 jets by 2017 and 33 by 2032. Table 3-28 shows the number of aircraft forecast to require hangar space.

*Table 3-28*
**FORECAST AIRCRAFT STORAGE UTILIZATION**

| | 2010 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|
| Small Conventional Hangar | 15 | 17 | 19 | 21 | 21 |
| T-Hangar | 35 | 38 | 40 | 43 | 45 |
| Large Conventional Hangar | 19 | 23 | 26 | 28 | 33 |
| Tiedown | 37 | 40 | 42 | 46 | 49 |

Source: Airport Record, 2011

The existing large conventional hangars, which average about 14,000 square feet each, are currently occupied and a preliminary inspection shows them to be in good condition or better. Demand for large conventional hangars would typically be driven by an aviation-oriented business or a corporate flight department. Due to the forecast of a substantial increase in based jets, up to three additional large conventional hangars may be required by 2032.

The airport's general aviation area contains 21 small box hangars, which average 3,000 square feet each. While hangars of that size can fit multiple aircraft, depending on aircraft size, only three currently contain two aircraft, while the rest of the occupied box hangars contain only one aircraft.

Currently eight small box hangars are vacant, but a preliminary inspection finds three of those hangars to be in fair to poor condition and replacement should be considered. Two occupied hangars are in fair to poor condition. Replacement of those five hangars should be considered within the planning period. Demand for small box hangars is largely price-driven and based on the aircraft owners' plans for the hangar in addition to aircraft storage. Based on current utilization patterns, existing vacancies will be enough to meet the demand through 2032 as long as the five hangars in poor or fair condition either remain marketable or are replaced.

T-hangars are a popular choice for aircraft owners based at the Airport. For the purposes of this discussion, the Port-a-Ports are combined with the T-hangars, since both are similar in size and shape. Both house single aircraft in a staggered, back-to-back configuration that maximizes the number of aircraft that can be hangared in a given area while still giving each aircraft direct access to the ramp. Airport records show existing T-hangars and Port-a-Ports currently house 35 aircraft.

One of the existing 10-unit T-hangar buildings is in fair to poor condition, and contains units that are not deep enough to house any but the smallest GA aircraft. Consideration should be given to replacing it with a 230-foot-by-54-foot building that would accommodate a broader range of aircraft. In addition, several of the Port-a-Ports are in poor condition. Forecast T-hangar demand will have the T-hangars fully occupied by 2017, and an additional 10-unit T-hangar will be necessary at that time to meet demand. By the end of the planning period, the fourth 10-unit T-hangar building is forecast to be fully occupied. Additional T-hangar space would be required if the existing buildings that are in fair to poor condition are not either kept usable or replaced with new facilities. Table 3-29 shows forecast hangar demand.

*Table 3-29*
**HANGAR BUILDING REQUIREMENTS**

| | 2010 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|
| Small Conventional Hangars | | | | | |
| Existing | 21 | 21 | 21 | 21 | 21 |
| Required | 15 | 17 | 19 | 21 | 21 |
| Additional Required | 0 | 0 | 0 | 0 | 0 |
| Replacement Required | -- | 3 | 0 | 0 | 0 |
| 10-Unit T-Hangars (includes port-a-ports) | | | | | |
| Existing | 4 | 4 | 4 | 4 | 4 |
| Required | 4 | 4 | 5 | 5 | 5 |
| Additional Required | 0 | 0 | 1 | 1 | 1 |
| Replacement required | -- | 2 | 2 | 0 | 0 |
| Large Conventional Hangars | | | | | |
| Existing | 8 | 8 | 9 | 11 | 14 |
| Required | 7 | 9 | 11 | 14 | 17 |
| Additional Required | 0 | 1 | 2 | 3 | 3 |
| Replacement Required | -- | 0 | 0 | 0 | 0 |

### 3.10.3 General Aviation Aprons

General aviation aprons serve several purposes. They provide long-term tie-down space for based aircraft who do not have hangar space, and they provide parking, fueling and short-term tie-down space for transient general aviation aircraft. Facilities must supply adequate space of each type, as well as provide circulation space to allow aircraft to taxi or be towed to and from the various facilities and taxiways. The moderate long-term growth that is forecast in based GA aircraft and transient aircraft will require additional GA apron space to park and service aircraft. Transient aircraft are currently parked on about 21,000 square yards of apron space adjacent to the two existing FBOs. Existing transient aircraft require about 12,200 square yards of apron space. Itinerant traffic is forecast to grow 39 percent by 2032, and at that point would take up 18,700 square yards of the itinerant GA apron (see Table 3-30).

Forecast growth in the number of based aircraft (105 in 2010 to 148 in 2032), will put additional demands on the general aviation apron for tie-down space. Required apron space for based aircraft will increase from the current 36,200 square yards to 48,600 square yards by 2032, which is well within the Airport's total apron space. Note that this analysis includes allocating apron space to all jet aircraft, even though nearly all based jets have associated hangar space. This was done because most jet operators remove the aircraft from the hangars during working hours for maintenance or staging purposes. Table 3-31 outlines the apron space requirements for each type of aircraft.

*Table 3-30*
**ITINERANT AIRCRAFT PARKING APRON REQUIREMENTS**

| | 2017 | | | | 2022 | | | |
|---|---|---|---|---|---|---|---|---|
| | **SEP** | **MEP** | **Jet** | **Total** | **SEP** | **MEP** | **Jet** | **Total** |
| Transient Aircraft on Ramp | 17 | 2 | 6 | 25 | 19 | 2 | 7 | 28 |
| Transient Aircraft Tie-Down | | | | | | | | |
| Square Yards Needed | 6,800 | 1,200 | 5,000 | 13,000 | 7,500 | 1,400 | 5,800 | 14,700 |
| Square Yards Available | | | | 21,000 | | | | 21,000 |
| Additional Needed | | | | 0 | | | | 0 |

| | 2027 | | | | 2032 | | | |
|---|---|---|---|---|---|---|---|---|
| | **SEP** | **MEP** | **Jet** | **Total** | **SEP** | **MEP** | **Jet** | **Total** |
| Transient Aircraft on Ramp | 21 | 2 | 9 | 32 | 22 | 2 | 10 | 35 |
| Transient Aircraft Tie-Down | | | | | | | | |
| Square Yards Needed | 8,500 | 1,500 | 7,000 | 17,000 | 9,000 | 1,500 | 8,200 | 18,700 |
| Square Yards Available | | | | 21,000 | | | | 21,000 |
| Additional Needed | | | | 0 | | | | 0 |

*Table 3-31*
**BASED AIRCRAFT APRON REQUIREMENTS**

| | 2017 | | | | | 2022 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **SEP** | **MEP** | **T-Prop** | **Jet** | **Total** | **SEP** | **MEP** | **T-Prop** | **Jet** | **Total** |
| Based Aircraft | 80 | 9 | 6 | 23 | 112 | 85 | 10 | 7 | 26 | 128 |
| # Tied Down | 35 | 1 | 4 | 23 | 59 | 37 | 1 | 4 | 26 | 68 |
| Square Yards Needed | 14,000 | 600 | 3,200 | 18,400 | 36,200 | 14,800 | 600 | 3,200 | 20,800 | 39,400 |
| Square Yards Available | | | | | 229,000 | | | | | 229,000 |
| Additional Needed | | | | | 0 | | | | | 0 |

| | 2027 | | | | | 2032 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **SEP** | **MEP** | **T-Prop** | **Jet** | **Total** | **SEP** | **MEP** | **T-Prop** | **Jet** | **Total** |
| Based Aircraft | 90 | 10 | 9 | 28 | 137 | 95 | 10 | 10 | 33 | 148 |
| # Tied Down | 40 | 1 | 5 | 23 | 69 | 42 | 1 | 6 | 33 | 82 |
| Square Yards Needed | 16,000 | 600 | 4,000 | 22,400 | 43,000 | 16,800 | 600 | 4,800 | 26,400 | 48,600 |
| Square Yards Available | | | | | 229,000 | | | | | 229,000 |
| Additional Needed | | | | | 0 | | | | | 0 |

SEP - Single Engine Piston
MEP - Multi Engine Piston

## 3.11 AVIATION SUPPORT FACILITIES

Support facilities at an airport encompass a broad set of functions that exist to ensure the airport is able to fill its primary role and mission in a smooth, safe and efficient manner. Support facilities at Newport News/Williamsburg International Airport include:

- Aircraft Rescue and Fire Fighting facility
- Airport maintenance and snow removal equipment storage
- Cargo Facilities
- Airport fuel farm
- Air Traffic Control Tower
- Fencing

### 3.11.1 Aircraft Rescue and Fire Fighting (ARFF) Facility

Airports that serve air carrier flights are required to provide aircraft rescue and fire fighting (ARFF) facilities and equipment. ARFF equipment requirements for commercial service airports are determined by an index ranking based on aircraft size, number of emergency vehicles and scheduled daily departures. As published by the FAA, the Newport News/Williamsburg International Airport is FAR Part 139 Class I, with an ARFF Index B, but can meet Index C standards when required.

Even under the aggressive growth forecasts, passenger counts are not expected to grow to the point that would induce airlines to shift to large enough aircraft to put the Airport into the Index D category. Therefore, two ARFF vehicles will be sufficient throughout the study period. The primary ARFF vehicle is a 2000 Oshkosh TI-1500 will reach the end of its useful life during the planning period and should be replaced. The existing 8,000-square-foot facility, which contains six vehicle bays and also houses security and communications operations functions, is in fair condition. Facility replacement may be considered as a building lifecycle issue rather than a required space issue. For that reason, the existing temporary City of Newport News Fire Department facility adjacent to the current ARFF facility would make an excellent replacement ARFF facility once the Fire Department relocates to its permanent off-airport facility downtown. This new facility is immediately adjacent to the existing ARFF facility and will not affect the three-minute response time required for the Airport.

### 3.11.2 Airport Maintenance and SRE Storage

The demand for airport maintenance facilities is directly related to the amount of pavement, lighting equipment, terminal building size, and overall grounds maintenance the airport staff is required to maintain. It can be assumed that as the airfield and/or facilities are enlarged, the maintenance facilities may also need to be expanded and perhaps relocated.

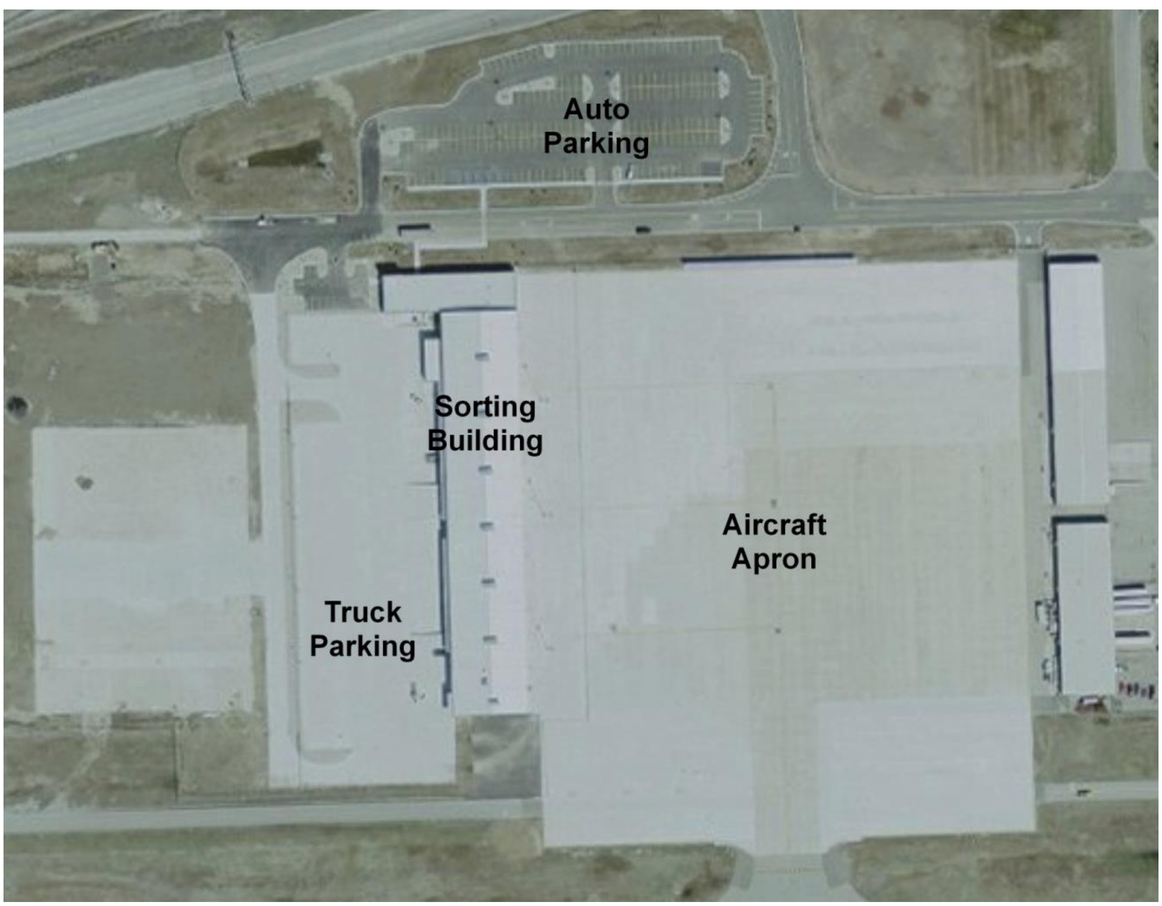
Because no large-scale infrastructure additions are anticipated, the maintenance facilities at Newport News/Williamsburg International Airport are adequate. Based on the forecast, existing facilities are adequate.

### 3.11.3 Cargo Facilities

Air cargo facilities are facilities dedicated to providing air mail and air freight/air express. Presently, the Airport has minimal air cargo operations with no buildings or apron areas dedicated exclusively to air cargo operations. Significant demand for dedicated cargo facilities is not expected to develop rapidly within the study period. However, it is reasonable to suggest that, when cargo becomes a viable option at the Airport, over time it would develop to resemble a typical midsize package distribution center.

Such a facility would be capable of processing up to 15,000 packages per hour. The layout of a potential distribution center would include an aircraft apron (approximately 520,000 feet), a sorting building (approximately 80,000 sq. ft.), truck parking (approximately 120,000 sq. ft.), and auto parking (70,000 sq. ft.). The cargo aircraft apron would be capable of supporting three ARC C-IV aircraft or smaller. Access to the truck parking, where loading and unloading of packages occurs, would have to be restricted by security gates and fencing. Access to the highway is also an important element to consider when siting a possible future location. Figure 3-10 graphically depicts the layout of a proposed cargo distribution center. The facility shown is located at Flint Bishop International Airport. For planning purposes, the airport should preserve land for potential use as a dedicated cargo facility.

*Figure 3-10*
**POTENTIAL CARGO DISTRIBUTION CENTER LAYOUT**



### 3.11.4 Airport Fuel Farm

Fuel storage requirements at the Airport depend on the level of aircraft traffic, fleet mix, and fuel delivery schedules. Airport records show an average of 122 gallons of Jet A fuel pumped per turbine aircraft operation and 14 gallons of 100LL pumped per piston aircraft operation. Table 3-32 outlines fuel storage requirements.

The operations at Newport News/Williamsburg International Airport are unusual because of the relatively large number of based jets used for local operations. Because the jets involved are former military turbojet aircraft, Jet-A fuel consumption per operation is relatively high. Current Jet-A storage capacity is 180,000 gallons. Three-day supply requirements are approximately 113,094 gallons currently, and forecast to rise to 154,452 gallons by 2032. Therefore, additional storage will be required by the end of the study period, if actual growth in operations is consistent with forecast growth, and if average consumption per operation remains at current levels. Changes in aircraft fleet mix, for example turboprops being replaced by jets, or piston twins being replaced by turboprops, will likely increase demand for Jet-A. Similarly, increases (or decreases) in airline service will also affect future Jet-A storage needs.

*Table 3-32*
**FUEL FACILITY REQUIREMENTS**

| | 2010 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|
| Peak Month Average Day Operations | 340 | 364 | 395 | 428 | 464 |
| 100 LL | | | | | |
| Peak Month Average Day Operations | 31 | 33 | 36 | 39 | 42 |
| 3 Day Fuel Need (Gallons) | 1,302 | 1,386 | 1,512 | 1,638 | 1,764 |
| Available Storage | 24,000 | 24,000 | 24,000 | 24,000 | 24,000 |
| Additional Storage Needed | 0 | 0 | 0 | 0 | 0 |
| Jet A | | | | | |
| Peak Month Average Day Operations | 309 | 331 | 359 | 389 | 422 |
| 3 Day Fuel Need (Gallons) | 113,094 | 121,146 | 131,394 | 142,374 | 154,452 |
| Available Storage | 180,000 | 180,000 | 180,000 | 180,000 | 180,000 |
| Additional Storage Needed | 0 | 0 | 0 | 0 | 0 |

### 3.11.5 Air Traffic Control Tower

Interviews with air traffic control tower personnel indicated that current facilities are adequate to meet present operations as well as forecast growth in operations.

### 3.11.6 Fencing

Airport perimeter fencing is instrumental to overall airport security and wildlife control. It aids in meeting the security requirements of the Transportation Security Administration (TSA, 49 CFR 1542), complies with Title 14 Part 139 of the Code of Federal Aviation Regulations, *Certification and Operations; Land Airports Service Certain Air Carriers*, and assists in keeping people and wildlife outside the operations area on an airport. The airfield at Newport News/Williamsburg

International Airport is currently entirely enclosed with a perimeter fence 8 feet high. No additional requirements are expected.

## 3.12 UTILITIES

The availability of water, sanitary sewer, natural gas, electric, telephone, internet and storm water drainage to, from, and within an airport should be considered in determining the base capabilities upon which future development can be built. Generally, water distribution, storm water collection and sanitary sewage collection are governmental responsibilities with capital investments required to be identified well in advance of developing new or expanding existing areas. Natural gas, electricity, telephone, and internet services are provided by the private sector, which may assess capacity and demand on a more frequent basis to ensure service continuity. The following sections identify the provider of the various utility services, existing and future utility capacities, and locations of dedicated facilities.

### 3.12.1 Potable Water and Sanitary Sewer

The airport water supply is provided by the City of Newport News, Department of Public Utilities. The previous Airport Master Plan suggested water conservation measures would be needed due to an expected deficit in water supply. However, since that time, there is no indication of a current deficit in anticipated water supply. A 4-inch potable water pipe serves the passenger terminal building, while similar or smaller service is provided to the Airport in various locations to serve the existing tenants and future development.

Sewer pumping stations and associated pipes are responsible for elevating the waste to ensure continuous downpipe transfer to a treatment facility. The nearest sewer pumping station is #221-Patrick Henry, located to the south of the main passenger terminal complex. The waste collected internally at the Airport is fed to the sewer pumping station and connects to Line NF-019-1000, a 30 inch Pre-Stressed Concrete Cylinder Pipe (PCCP) that is part of the Hampton Roads Sanitation District (HRSD). The HRSD serves an area greater than 700 square miles, spanning both the north and south shores of the peninsula. Treatment of waste from the Airport is provided by James River Wastewater Treatment Plant.

In addition to the capacities, the easements granted and held for water and sanitary sewer influence the location and development of tenant and Airport projects. Substantial areas of Airport property have been dedicated as easements for the transport of water, including a central north south corridor and an eastern corridor. Other smaller easements have been dedicated as needed to provide the appropriate access for maintenance and upkeep by the easement owners. Depending on project needs, vacating and rerouting existing easement corridors could involve enough time and cost that projects are designed and built around easements.

### 3.12.2 Natural Gas and Electricity

Natural gas is furnished by Virginia Natural Gas. Electricity is supplied by Dominion Virginia Power. Both natural gas and electricity enter the Airport terminal area from the intersection of H.V. Kelly Drive and McManus Boulevard, and enter the north end of the passenger terminal building. There is an adequate supply of natural gas and electricity to support the existing and future demands of the Airport.

A major Dominion Virginia Power easement is located from the east side of Harwoods Mill Reservoir to north portion of the Airport, north of Oriana Road/State Route 620. This major transmission and access easement, as well as other grants of easement for power throughout the Airport influence the location and development of future tenant and Airport projects.

### 3.12.3 Storm Water Drainage

The Airport has a storm water management program in place to manage storm water discharges mainly caused by industrial activity associated with Airport operations, and is subject to the Chesapeake Bay Prevention Act. The Airport has implemented Best Management Practices (BMPs) to minimize the impact of storm water on the environment. Such program measures include the coordinating of Airport-wide training programs, the sampling and inspection program for the storm water outfalls, increased Airport scutiny of discharges, coordinating the Storm Water Pollution Prevention Team (SWPPT), conducting a Pollution Prevention Opportunity Assessment (PPOA), implementing a Spill Prevention Countermeasure and Control Plan (SPCC), and similar activities. Site-specific BMPs addressing good housekeeping, preventive maintenance and inspections, spill prevention and response, shop-specific employee training, and shop-specific recordkeeping are also in place in the Storm Water Management Manual. In addition, an Airport team conducts an annual site compliance inspection to ensure the effectiveness of the Airport Storm Water Pollution Prevention Program (SWPPP).

As part of the SWPPP, the Airport is responsible for eight outfalls within its 1,670 acres of property. Four of these outfalls discharge into the Harwood's Mill Reservoir and four discharge into Lucas Creek. Seven of the eight outfalls are open ditches, while one is a reinforced concrete pipe, which feeds into Deep Creek. Within the property, at least 111 acres are paved for aircraft use, another 35 acres are paved for vehicle use, and approximately 15 acres are buildings. This is approximately 161 acres of impervious surface area or 10 percent of the entire Airport. This percentage is consistent with an undeveloped open area, which typically has zero to ten percent of impervious surface area. The Airport's impervious surface area greatly influences the amount of storm water runoff into neighboring bodies of water.

The Mid-Atlantic Water District of the EPA implemented a Total Daily Maximum Load (TMDL) plan for the Chesapeake Bay area in 2010, and the full effect of the document is still being evaluated in the context of area wastewater management and solids treatment capacity. While there is no immediate effect on wastewater management capacity, the ability to treat solids and wastewater is being re-evaluated for the James River area. It will need to be monitored to ensure continuous service to accommodate long-range expansion and future improvements that may add demand to the system.

### 3.12.4 Telephone/Communications

Cox Communications and Verizon are the wired landline telephone providers for the Airport and Airport tenants. Cox Communication has installed infrastructure upgrades to deliver video, phone, and high-speed internet service to businesses in and around the Airport. There is ample landline communication infrastructure to support the existing and future demands at the Airport. Wireless communications are dependent on the cellular carriers and third party cellular capacity providers to respond to demand as needed, and can provide capacity as service demands dictate.

### 3.12.5 Co-mingled Recycling

Tidewater Fiber Corporation (TFC) in conjunction with the City of Newport News, conducts co-mingled, single-stream recycling for the Airport. Co-mingled, single-stream recycling is the collection of plastic, paper, glass, etc. within a single container. The Airport has blue bins that sit alongside trash containers and in key locations throughout the passenger terminal building. These bins are emptied periodically throughout the day and emptied into two eight-yard commercial front-loaded recycling containers. These containers are collected by TFC twice a week. At pickup, each container, on average, contain 275 pounds of recyclables. This equates to 4,400 pounds a month, or 52,800 pounds a year of recyclable goods. TFC has the capability to increase bin pickup frequencies to accommodate any increased recycling collection in the future.