

## 7. PLAN SUMMARY AND RECOMMENDATIONS

### 7.1 Chapter Overview

The update to the VATSP had a number of objectives which focused on the following:

- Establish Airport Demand
- Determine Airport Facilities Needs
- Review Airport Roles
- Measure Airport and Airport Facility Accessibility
- Estimate System Airport Development Costs

This final chapter of the VATSP update summarizes findings and conclusions from the previous chapters and identifies recommendations for each applicable study objective.

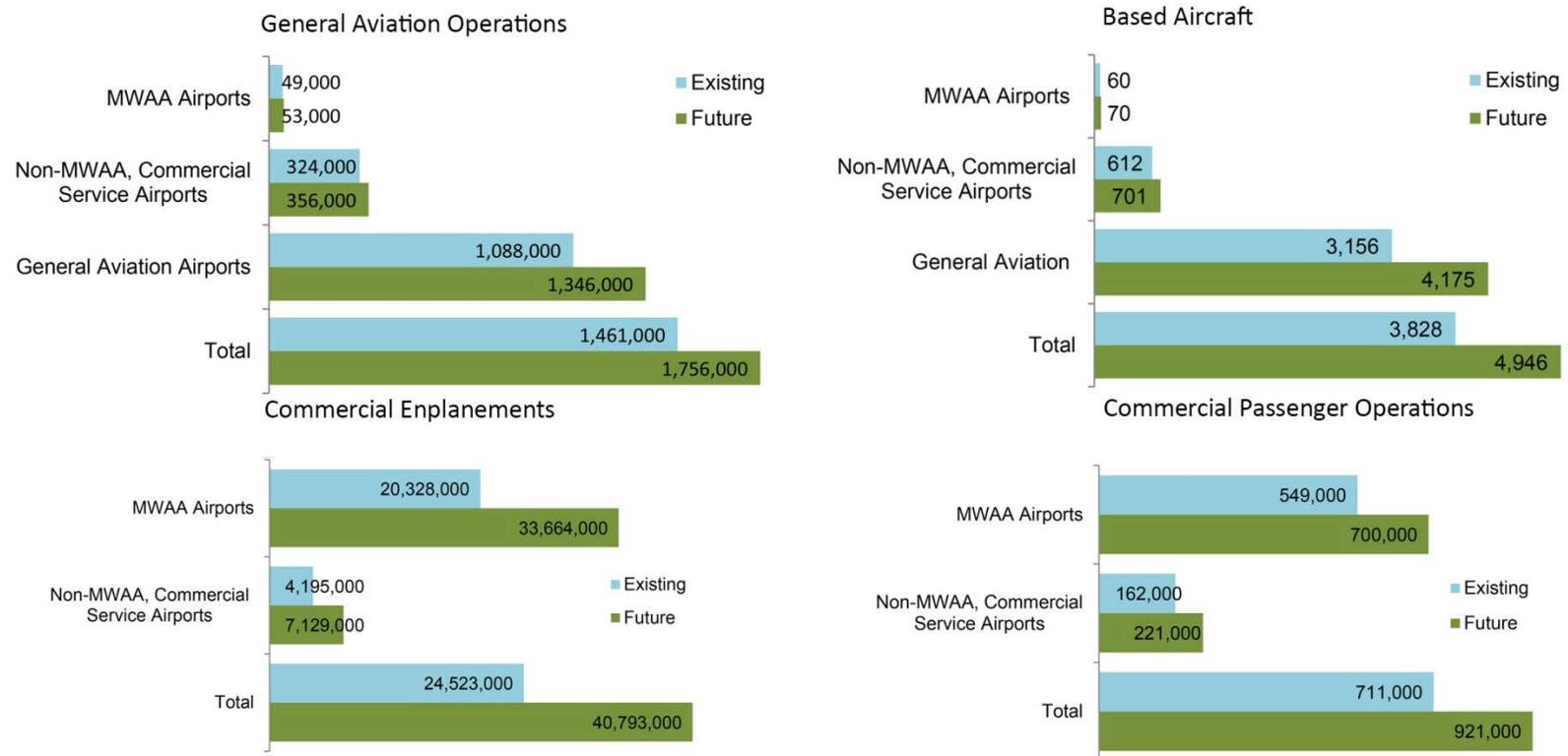
### 7.2 Airport Demand Objectives

It was the goal of the VATSP Update to develop reasonable forecasts of future aviation demand for the Commonwealth, as well as for individual system airports. To satisfy this objective, statewide and airport specific forecasts of demand were developed. **Figure 7-1** illustrates a summary of projected statewide demand for key activity components.

The VATSP also had an objective to determine if deviations from the preferred forecasts could have a significant impact on plan recommendations or on plan costs. Projections of aviation demand developed in the VATSP were used to establish airport specific needs for aircraft storage hangars, aircraft parking aprons, terminal building space, and paved auto parking. Costs and quantities for these same types of facilities were also obtained from each airport's master plan or Virginia's Airport Capital Improvement Program (ACIP). Combined cost estimates for general aviation and commercial service airports show that these four facility categories could comprise over 60 percent of all estimated development costs for Virginia airports within the 25 year planning horizon.

Information contained in FAA's National Aerospace Forecast considers how aviation demand in the U.S. may deviate between 2014 and 2023 based on several factors, including changes in the economy and projections of demand for the Virginia airports. FAA anticipated average annual rates of optimistic and pessimistic growth were extrapolated to 2037 to show how demand could deviate from the approved VATSP projections. The exercise to develop high and low projections of demand for the VATSP was undertaken to provide a sense of how demand could change over the forecast period and then to determine if these changes would have a notable impact on the final recommendations presented in the VATSP Update.

**Figure 7 - 1: Existing and Projected Statewide Demand for Key Activities**



Note: Based on year 2012 data for Existing and year 2037 VATSP Forecast for Future

Alternative high and low projections were compared to baseline forecasts. For this discussion, baseline projections are those that were approved by both DOAV and FAA during the course of this study. The estimated percent deviations, both high and low, for each demand category for the final forecast year of 2037 are shown below:

- Statewide Based General Aviation Aircraft – The high range (5,420) is 10 percent above baseline forecast (4,946); the low forecast (4,730) is 4 percent under the baseline forecast.
- Statewide Total Annual General Aviation Aircraft Operations - High range (1,804,000 million) annual operations are almost 3 percent above the baseline forecast (1,756,000 million); low range (1,717,000) forecast is 2 percent under baseline forecast.
- Statewide Commercial Service Airport Passenger Enplanements - High range (7,777,783 enplanements without Washington Dulles International and Ronald Reagan Washington National) is 9 percent above the baseline (7,128,741) enplanement forecast; the low (6,012,000) forecast is 16 percent under the baseline.
- Statewide Commercial Aircraft Operations – The high forecast (933,980 annual operations) forecast is 1.5 percent above baseline (920,141); the low (877,990) is 4.5 percent below baseline.
- Statewide Total Annual Aircraft Operations – The high forecast (2,737,980 annual commercial service and general aviation) is 2 percent above the baseline (2,676,141) forecast; low (2,594,990) range is 3 percent below the baseline forecast.

Based on the potential demand deviations noted here, costs for developing certain airport facilities that are demand driven could also vary. Combined costs through 2037 for all system airports in the hangar, terminal, aircraft apron, and auto parking categories are estimated at \$2.3 billion. If demand deviates either higher or lower than the VATSP forecasts approved by DOAV and FAA, costs for these facilities could increase or decrease accordingly. For more information on the impact of demand on facilities costs, see Table 6-8 and Table 6-9 in Chapter 6.

As reflected in the discussion above, the greatest potential for deviation from the VATSP's approved forecasts is in the commercial enplanement category. Commercial enplanements have a direct correlation to each airport's need for commercial aircraft apron, aircraft gates, auto parking space for commercial passengers, and terminal space. Virginia's commercial enplanements have the potential to be almost 10 percent higher than projected, or conversely, could be more than 15 percent lower than predicted in the VATSP Update. These potential swings in commercial passenger enplanements could impact anticipated facility needs and corresponding costs that are reflected in the VATSP.

It is worth noting that commercial service airports serving the Commonwealth continually monitor trends in commercial passenger demand, and these airports routinely explore the need to provide additional facilities based on anticipated growth in commercial passenger demand. Projections of passenger demand for the commercial service airports in Virginia are generally consistent with bottom-up enplanement projections

developed by each airport as well as with TAF projections developed by the FAA. Although airport development is driven at the local level, airport sponsors, DOAV, and the FAA will need to work together to determine viable expansion plans supported by a balance of future passenger demand and needs of the communities they serve.

### 7.2.1 Aviation Demand Response

Projections of demand contained in the VATSP update are developed at a state level. Specific airport and market area circumstances may cause deviations between the VATSP forecasts and forecasts developed as part of an airport specific master plan.

VATSP demand projections identify, quantify and define potential needs and costs for hangars, aircraft apron, auto parking and terminal space shown in the system plan. With the exception of aircraft apron areas, projects that are demand-driven may or may not be eligible for federal or state funding; revenue producing facilities typically do not qualify for public funding. Hangars, auto parking, aircraft apron areas, and terminal facilities are not likely to be expanded until airport-specific demand warrants development and not until funding sources have been identified and secured. Plans to expand facilities in these four categories should not be pursued until each airport has documented that local demand is sufficient to warrant expansion and investment.

## 7.3 Airport Facility Objectives

A comprehensive and unconstrained list of facilities needed by airport over the plan period was developed in Chapter 3 – Facility Requirements Analysis. Facility needs for individual airports were then totaled to demonstrate costs for statewide airport facility needs. The tool that determined facility needs were the Facility, Service, and Equipment (FS&E) Objectives established for each airport's proposed role category within the Virginia system. The system plan update included analyses to determine the ability of each Virginia airport to meet its FS&E Objectives based on its role in the state airport system. By comparing current conditions at each airport to its specific FS&E Objectives, any noted deficiencies were identified as being a facility need for that airport. A full list of FS&E Objectives can be found in Chapter 3, Table 3-2.

For each system airport, planned improvements from the AMP and/or ACIP were also collected. These projects were then compared to airport-specific projects identified through the FS&E review with the end result being a consolidated list of facility needs for each study airport. Unconstrained airport-specific FS&E Objectives for each airport are presented in Chapter 3 and the corresponding costs of these facilities are presented in Chapter 5. The following sections provide a statewide overview of the refined costs that will be used to respond to facility needs identified in the VATSP.

### 7.3.1 Costs to Implement FS&E Objectives

FS&E Objectives that enable Virginia airports to best fill their designated role in the Virginia Airport System were established. Project-level refinements are highlighted in Tables 3-11 to 3-36 in Chapter 3. Information from the VATSP Inventory and other data sources were used to determine which of the study airports currently meet or do not meet the objectives associated with their role in Virginia's airport system. The results of this analysis are contained in Chapter 3 of this Technical Report. The analysis concluded that in order to elevate the Virginia Airport System in terms of its ability to satisfy airport specific FS&E Objectives,

various projects, service improvements, and/or equipment purchases will be required. A resulting list of FS&E improvements was developed for each of the study airports.

Once all the actions needed to comply with appropriate FS&E Objectives were identified, a supporting review was undertaken of individual ACIPs and AMPs. The focus of this review was to identify system plan FS&E projects that were already programmed at the local level to segregate FS&E projects from ACIP and AMP projects to avoid reflecting duplicative costs. Ideally, each Virginia airport should fully comply with its FS&E Objectives established in the VATSP to improve system performance in many categories.

Chapter 5 of this report provides a detailed list of VATSP FS&E projects and ACIP and master plan projects for each airport. Appendix D provides development alternatives for the four proposed new general aviation airports. Further collaborative analysis of these unconstrained projects led to a refinement of the list and the corresponding costs. Estimated costs over the course of the study period for implementing the refined list of FS&E projects for airports in each role category are summarized in **Table 7-1**. Within the refined list, full build development costs were included for the proposed airports.

**Table 7 - 1: Costs to Meet FS&E Objectives 2014-2037**  
(in thousands of dollars)

VATSP Airport Service Role	Project Costs*
Commercial Service	\$230,399
Reliever	133,884
GA-Regional	449,901
GA-Community	181,670
Local Service	57,940
<b>TOTAL</b>	<b>\$1,053,794</b>

\*Escalated based on project year

Note: Totals have been rounded

### 7.3.2 Runway Extensions Recommended in FS&E Objectives

The VATSP identifies airports that would benefit from a runway extension to better meet the airport’s designated role in the state airport system. Since runway extensions are oftentimes costly and can be one of the more challenging types of projects to implement, this section focuses on examining runway extensions for feasibility. **Table 7-2** provides information on role related runway extensions.

VATSP analysis identified the need for airport role-related runway extensions at 18 airports. Extensions for some of the airports were not of sufficient length to justify project funding or implementation. As a result, current runway lengths for some of the identified airports are considered adequate for the airport to fulfill its role in the Virginia Airport System. Extensions less than 300 feet are not recommended for implementation in this VATSP Update as noted in Table 7-2.

An estimated \$142.8 million are needed to implement all recommended role-related runway extensions. It is important to note that efforts were undertaken in the VATSP to develop an airport specific planning level cost estimate by revising site specific conditions that are as realistic as possible, but actual costs may vary.

When available, costs for runway extensions were sourced from AMPs and ACIPs. For these runway extensions, necessary ancillary projects such as environmental assessments or land acquisition costs, when identified and directly associated with the extension project, were included in the summary cost. Some of the runway extensions shown in Table 7-2 are also recommended to help increase Virginia’s accessibility to Business Class Airports. Accessibility recommendations are discussed later in this chapter.

Before any of the extensions can be implemented, an approved AMP and ALP would need to be in place to support the need for the extension and to determine the most feasible length for the extension. An environmental analysis and document to examine potential environmental impacts for any of the extensions will also be required. The requirement for an environmental assessment lies in the National Environmental Policy Act (NEPA) at the Federal level, and in the Commonwealth, the requirements are included in the Code of Virginia and Virginia Administrative Code for the amendment of an airport license. They entail the examination of the social, economic and environmental impacts of the action, in this case a runway extension.

**Table 7 - 2: Runway Extensions to Meet VATSP FS&E Objectives**  
(in thousands of dollars)

Airport Name	Airport Code	Current Runway Length (feet)	Recommended Runway Length (feet)	Difference In Length (feet)	Cost Estimate for Extension	VATSP Service Role	Recommended State Role	Source
Hampton Roads Executive	PVG	5,350	5,500	150 <sup>1</sup>	\$727	Reliever	No Change	FS&E <sup>3</sup>
Hanover County	OFF	5,402	5,500	98 <sup>1</sup>	596	Reliever	No Change	FS&E <sup>3</sup>
Stafford Regional	RMN	5,000	5,500	500 <sup>2</sup>	17,713	Reliever	No Change	ACIP
Warrenton-Fauquier	HWY	5,000	5,500	500	2,926	Reliever	No Change	ALP/AMP
Blue Ridge Regional	MTV	4,999	5,500	501	9,418	GA-Regional	No Change	ALP/AMP
Culpeper Regional	CJR	5,000	5,500	500	2,447	GA-Regional	No Change	AMP
Farmville	FVX	4,400	5,500	1100 <sup>2</sup>	6,874	GA-Regional	No Change	ACIP
Lonesome Pine	LNP	5,400	5,500	100 <sup>1</sup>	476	GA-Regional	No Change	FS&E <sup>3</sup>
Tappahannock	XSA	4,300	5,000	700 <sup>2</sup>	1,562	GA-Regional	No Change	FS&E <sup>3</sup>
Tazewell County	JFZ	4,300	5,000	700	2,877	GA-Regional	No Change	ALP/AMP
Virginia Highlands	VJI	4,450	5,000	550 <sup>2</sup>	30,984	GA-Regional	No Change	ACIP
William M. Tuck	W78	4,011	5,000	989	2,510	GA-Regional	No Change	AMP

**Table 7 - 2: Runway Extensions to Meet VATSP FS&E Objectives (Continued)  
(in thousands of dollars\*)**

Airport Name	Airport Code	Current Runway Length (feet)	Recommended Runway Length (feet)	Difference In Length (feet)	Cost Estimate for Extension	VATSP Service Role	Recommended State Role	Source
Front Royal-Warren County	FRR	3,007	3,240	233 <sup>1</sup>	23,066	GA-Community	No Change	AMP
Louisa	LKU	4,300	5,500	1,200	6,106	GA-Community	GA-Regional	FS&E <sup>3</sup>
Luray Caverns	LUA	3,125	3,330	175 <sup>2</sup>	11,216	GA-Community	No Change	AMP
Shannon	EZF	2,910	3,050	140 <sup>1</sup>	508	GA-Community	No Change	FS&E <sup>3</sup>
Tangier Island	TGI	2,950	3,040	90 <sup>1</sup>	654	GA-Community	No Change	FS&E <sup>3</sup>
Virginia Tech-Montgomery Executive	BCB	4,550	5,500	950	22,164	GA-Community	GA-Regional	ACIP
<b>Total Cost For Extensions to Meet FS&amp;E Objectives</b>					<b>\$142,824</b>			
<b>Total Cost for Recommended Extensions<sup>1</sup></b>					<b>\$105,582</b>			

<sup>1</sup> Runway extensions less than 300 feet deemed financially impractical and not recommended

<sup>2</sup> DOAV in process of considering runway extension, final runway length TBD

<sup>3</sup> FS&E related runway extension costs are based on estimates

Notes: Projects identified to improve system performance have not been analyzed to determine whether or not they can be implemented. All projects must be identified and justified during the ALP or master planning process. Inclusion in the list above does not guarantee any federal or state funding for a project.

\*Totals have been rounded

Table 7-2 indicates which system airports warrant consideration for a longer runway over the next 25 years in order to best fill their designated role in Virginia’s airport system. In all instances where runway extensions are justified and pursued, local justification and support for these projects is essential to their implementation.

### 7.3.3 Costs to Implement Master Plan and Airport Capital Improvement Plan (ACIP) Improvements

In order for the VATSP to provide a more accurate reflection of airport-related development that will be needed at airports in the Commonwealth, a review was undertaken to identify airport-specific projects contained in Airport Capital Improvement Plans (ACIPs) and/or airport master plans. Through the separation of projects, it was possible to show development costs identified by the VATSP and also to consider costs for other projects identified through airport-specific planning initiatives. Blending the system planning, ACIP, and master planning projects and costs helps to provide a more accurate representation of what development will be needed at Virginia airports in the coming years, and what the anticipated cost for that development will be.

ACIP and master plan project development costs for all airports were assembled in each of the five airport role categories. Additional collaborative review resulted in a refined list of projects. The refined costs by airport role shown in **Table 7-3** are in addition to the FS&E costs outlined in the previous section.

**Table 7 - 3: Costs for ACIP and Master Plan Projects 2014-2037**  
(in thousands of dollars)

VATSP Service Role	Project Costs
<b>Commercial Service</b>	<b>\$1,410,983</b>
Reliever	339,481
<b>GA-Regional</b>	<b>1,002,896</b>
GA-Community	406,379
<b>Local Service</b>	<b>123,232</b>
<b>TOTAL</b>	<b>\$3,282,971</b>

Note: Totals have been rounded

### 7.3.4 Runway Extensions Identified in Master Plans and Airport- Specific ACIPs

As noted, it was an objective of the VATSP Update to not only identify development projects that were generated through the system plan’s technical analysis, but also to collect and list additional projects contained in airport specific master plans or ACIPs. In addition to the costs that are associated with the FS&E runway extensions, there are also a number of runway extensions sourced from ALPs, ACIPs, and master plans. **Table 7-4** presents runway extensions and their estimated costs for Virginia airports identified as part of a master plan or ACIP.

**Table 7 - 4: ACIP/ALP/MPU Runway Extensions\***  
(in thousands of dollars)

Airport Name	Airport Code	Current Runway Length (feet)	Recommended Runway Length (feet)	Difference In Length (feet)	Cost Estimate for Extension	VATSP Service Role	Source
Richmond International RWY 16L	RIC	9,003	10,703	500	\$3,109	CS	ALP
Richmond International RWY 34R	RIC	9,003	10,703	1,200	1,437	CS	ALP
Shenandoah Valley Regional	SHD	6,002	6,502	500	5,615	CS	ACIP
Leesburg Executive	JYO	5,500	6,000	500	1,816	RL	Sponsor Input
Manassas Regional	HEF	6,200	6,500	300	1,007	RL	Sponsor Input
Richmond Executive - Chesterfield County	FCI	5,500	Site Preparation		7,736	RL	ACIP/MPU
			6,300 (PH I)	800	8,111		
			7,000 (PH II)	700	8,435		
Middle Peninsula Regional	FYJ	5,000	6,300	1,300	1,574	GR	MPU
Dinwiddie County RWY 5-23	PTB	5,001	5,401	400	1,464	GR	ALP
Suffolk Executive RWY 4-22	SFQ	5,007	5,507	500	2,070	GR	MPU
Twin County	HLX	4,204	5,000	796	19,972	GC	ACIP/Website
Lake Anna	7W4	2,560	3,000	440	799	LO	ALP
Lunenburg County	W31	3,000	3,600	600	1,317	LO	ALP
<b>Total for 12 Runway Extensions</b>					<b>\$64,462</b>		

\*Only includes runway extensions not included in FS&E recommendations

Note: Projects identified in ACIPs have not been analyzed to determine whether or not they can be implemented. All projects must be identified and justified during the ALP or master planning process. Inclusion in the list above does not guarantee any federal or state funding for a project.

Airports in the VATSP classified as Local Service are generally the lowest activity airports in the Commonwealth, and these airports are most often used by single-engine aircraft. The characteristics for the customers that use Local Service airports are not expected to change. Since these airports are meeting the needs of their existing users, runway extension projects at these Local Service airports have a lower priority than other projects identified in the recommended plan.

### 7.3.5 Actions to Meet Virginia Licensing Standards

Virginia has established Licensing Standards for all system airports. These Standards help to promote safety for pilots and for property and people in areas surrounding each system airport. Chapter 3 of the VATSP update included a review that examined the ability of each system airport to meet Virginia’s most current Licensing Standards, which include the following:

- Minimum runway width 50 feet
- Runway Safety Area (RSA) equal to runway length plus 100 feet at each end
- Runway Safety Area (RSA) width 120 feet
- 15:1 unobstructed approach
- Runway Object Free Area (OFA) length equal to runway length
- Runway Object Free Area (OFA) width of 250 feet

It is a DOAV goal for all airports to comply with State Licensing Standards. Currently, there are a total of 16 airports that do not comply with one or more of the Standards. The actions needed to improve these airports and achieve compliance with the Standards are noted in **Table 7-5** below.

As these airports update their Master Plans or ALPs, the identified Standards-related projects should be included in these plans, assuming that they are not already or that the deficiency is resolved prior to the airport’s next master plan update. Since all of the Virginia Licensing Standards are focused on safety, it is important for system airports to implement projects that remedy licensing deficiencies and achieve compliance with the Standards where possible.

The airports that are not fully compliant with Virginia Licensing Standards are a mix of NPIAS and non-NPIAS airports. The NPIAS airports will be able to rely on both state and FAA funding to resolve Standards deficiencies. Non-NPIAS airports, comprised of both privately and publicly-owned airports, will need to rely exclusively on state funding to implement these upgrades.

Table 7-5 provides estimated costs for improving system airports to be fully compliant with Virginia Airport Licensing Standards.

**Table 7 - 5: Projects and Costs to Resolve Licensing Standards Deficiencies  
(in thousands of dollars)**

Airport (Airport Code) Airport Role	Project Name	Project Cost	NPIAS, Non-NPIAS*	Ownership
<b>Bridgewater Air Park (VBW)</b> Local Service	ROFA Improvements	\$155	Non-NPIAS	Privately-Owned
	Clear Part 77 Approach	155		
<b>Chase City Municipal (CXE)</b> Local Service	Clear Part 77 Approach	155	Non-NPIAS	Publicly-Owned
	ROFA Improvements	155		

**Table 7 - 5: Projects and Costs to Resolve Licensing Standards Deficiencies (Continued)**

Airport (Airport Code) Airport Role	Project Name	Project Cost	NPIAS, Non-NPIAS*	Ownership
<b>Crewe Municipal (W81)</b> Local Service	Clear Part 77 Approach	155	Non-NPIAS	Publicly-Owned
	ROFA Improvements	155		
<b>Lake Anna (7W4)</b> Local Service	Clear Part 77 Approach	155	Non-NPIAS	Privately-Owned
<b>Lake Country Regional (W63)</b> GA-Community	ROFA Improvements	155	Non-NPIAS	Publicly-Owned
	Clear Part 77 Approach	155		
<b>Lawrenceville-Brunswick Municipal (LVL)</b> Local Service	Clear Part 77 Approach	155	Non-NPIAS	Publicly-Owned
<b>New Market (8W2)</b> Local Service	ROFA Improvements	155	Non-NPIAS	Privately-Owned
<b>Shannon (EZF)</b> GA-Community	ROFA Improvements	155	Non-NPIAS	Privately-Owned
<b>Smith Mountain Lake (W91)</b> Local Service	Clear Part 77 Approach	155	Non-NPIAS	Privately-Owned
	ROFA Improvements	155		
<b>Wakefield Municipal (AKQ)</b> GA-Community	RSA Improvements	52	Non-NPIAS	Publicly-Owned
<b>New London (W90)</b> Local Service	ROFA Improvements	155	Non-NPIAS	Privately-Owned
	RSA Improvements	52		
	Clear Part 77 Approach	155		
<b>Grundy Municipal (GDY)</b> Local Service	Clear Part 77 Approach	155	NPIAS	Publicly-Owned
	ROFA Improvements	155		
<b>Falwell (W24)</b> Local Service	RSA Improvements	52	Non-NPIAS	Privately-Owned
	ROFA Improvements	155		
	Clear Part 77 Approach	155		
<b>Newport News-Williamsburg International (PHF)</b> Commercial Service	ROFA Improvements	155	NPIAS	Publicly-Owned
	RSA Improvements	52		
<b>Total Cost to Resolve Licensing Standards Deficiencies</b>		<b>\$ 3,463</b>		

\*All NPIAS, privately- and publicly-owned airports in the VATSP are public use airports

### 7.3.6 Actions to Meet Criteria for Virginia’s Basic Airport Unit

DOAV’s Program Manual outlines minimum facilities and services that should be in place or available at each system airport. While the Basic Airport Unit defines each facility and/or service, it does not specify the quantity of each facility or service that is needed. Quantities of specific facilities and/or services were established in Chapter 3 as part of the system plan’s FS&E objectives.

Virginia's Basic Airport Unit includes the following:

- Runway
- Runway lighting
- Visual navigation aids
- Stub taxiway
- Aircraft parking apron
- Terminal building
- Auto parking
- Access road
- Fuel

A review of the system concluded that most all airports in the Virginia system currently meet all Basic Airport Unit criteria. There are, however, seven airports that require further development in order to fulfill all aspects of the Basic Airport Unit.

The Basic Unit Criteria for a Terminal is further subdivided into four elements. In addition to a public terminal building, the facility must have electric lighting, a public telephone, and restroom facilities to fully meet the requirements. A lack of a public telephone was the most prevalent missed criteria. With new advances in technology and the high rate of mobile telephone ownership, installing a public telephone is a lower priority than it has been in the past. As airport master plans and ALPs are prepared for these airports, consideration should be given to identifying a location for facilities related to the Basic Airport Unit criteria. The non-NPIAS airports shown below are not eligible for FAA funding to address any project needs shown below. Five of the seven airports shown in **Table 7-6** will need to rely on DOAV and local funding to address deficiencies pertaining to compliance with Basic Airport Unit criteria.

**Table 7 - 6: Projects and Costs to Resolve Basic Airport Unit Deficiencies  
(in thousands of dollars)**

Airport (Airport Code) Airport Role	Project Name	Project Type	Project Cost	NPIAS, Non-NPIAS*	Ownership
<b>Bridgewater Air Park (VBW)</b> <b>Local Service</b>	Terminal and Pilot Service Improvements (Shelter & Restroom)	Terminal	\$73	Non-NPIAS	Privately-Owned
	Fuel Improvements (Avgas)	Airside	52		
<b>Chase City Municipal (CXE)</b> <b>Local Service</b>	Terminal and Pilot Service Improvements (Shelter, Restroom, & Phone)	Terminal	83	Non-NPIAS	Publicly-Owned
	Utility Improvements (Electrical)	Airside	10		
	Terminal and Pilot Service Improvements (Shelter, Restroom, & Phone)	Terminal	83	Non-NPIAS	Publicly-Owned
<b>Gordonsville Municipal (GVE)</b> <b>Local Service</b>	Utility Improvements (Electrical)	Airside	10		
	Utility Improvements (Electricity)	F&E	10	Non-NPIAS	Privately-Owned
<b>Lake Anna (7W4)</b> <b>Local Service</b>	Terminal and Pilot Services (Shelter, Restroom, & Phone)	Terminal	83		
	Fuel Improvements (Avgas)	F&E	52		
<b>New London (W90)</b> <b>Local Service</b>	Airport Lighting System	Airside	1,066	Non-NPIAS	Privately-Owned

**Table 7 - 6: Projects and Costs to Resolve Basic Airport Unit Deficiencies  
(Continued)**

Airport (Airport Code) Airport Role	Project Name	Project Type	Project Cost	NPIAS, Non- NPIAS*	Ownership
Grundy Municipal (GDY) Local Service	Fuel Farm	F&E	118	NPIAS	Publicly- Owned
	Airport Lighting System	Airside	1,036		
Tangier Island (TGI) GA-Community	Construct New Terminal	Terminal	4,499	NPIAS	Publicly- Owned
	Fuel Improvements (24/7 and Avgas)	Airside	104		
<b>Total Cost to Resolve Basic Airport Deficiencies</b>			<b>\$7,279</b>		

\*The airports not fulfilling the criteria of providing a public phone include: Accomack County, Lake Country Regional, Crewe Municipal, Danville Regional, Front Royal-Warren County, Lawrenceville-Brunswick Municipal, Lee County, Lunenburg County, New Kent County, New Market, Orange County, Shannon, Smith Mountain Lake, Tazewell County, and Twin County.

### 7.3.7 Airport Facility Recommendations

As part of the system plan update, review and analysis has been undertaken to identify the following:

- Actions and projects needed to resolve airport deficiencies as they relate to the system plan's FS&E objectives.
- Actions and projects needed to implement recommendations in current master plans and ACIPs.
- Projects that are needed to address runway length deficiencies as determined by final airport system role or by master plan analysis.
- Actions and projects needed to address deficiencies related to Virginia State Airport Licensing Standards.
- Actions and projects needed to address deficiencies related to the Virginia airport Basic Unit Criteria.

For the system plan update, costs to improve system performance are included in one of two categories: costs needed to meet the study's FS&E objectives or costs needed to implement master plan and ACIP recommendations. Within the costs shown are new projects for extending runways to meet airport role objectives, extending runways to meet master plan recommendations, costs to resolve deficiencies in Virginia Airport Licensing Standards, and cost to resolve deficiencies in Virginia's Basic Airport Unit criteria. These costs are summarized in **Table 7-7**.

**Table 7 - 7: System Development Cost Summary (in thousands of dollars)**

System Cost Category	Total Project Costs
FS&E Objectives	\$1,053,794
Master Plan/ACIP Projects	3,282,971
<b>TOTAL</b>	<b>\$4,336,765</b>

Project Purpose	Costs Per Objective
Extend Runways to Meet FS&E Objectives	\$105,582
Additional Runway Extensions from Master Plan/ACIP	64,462
Resolve Airport Licensing Standards Deficiencies	3,596
Resolve Basic Unit Deficiencies	7,279
<b>TOTAL</b>	<b>\$180,919</b>

The cost summaries shown above are embedded in the costs shown to meet FS&E objectives and to implement master plans. Runway, Standards, and Basic Unit Costs are included in the airport project lists drawn from FS&E objectives and airport master plans.

Chapter 5 and associated appendices illustrate airport specific projects needed to meet FS&E objectives, to implement current master plans and ACIPs, to address Licensing Standards or Basic Airport Unit deficiencies, or to extend existing runways. In addition to providing information on needed projects, Chapter 5 also provides cost estimates associated with each project.

## 7.4 Airport Accessibility Objectives

For Virginia’s system of airports to be balanced and viable, the system should provide reasonable access to meet the needs of residents, businesses, and visitors. Chapter 4, Alternatives Analysis, includes GIS analysis to measure various facets of system accessibility. Recommendations related to accessibility to commercial service airports, privately-owned airports, publicly-owned non-NPIAS airports, and for all airports from both the ground and the air are discussed in this section.

### 7.4.1 Accessibility to Commercial Service Airports

Virginia is served by a variety of airports that have scheduled commercial airline service. This includes two large commercial service airports, Washington Dulles International and Ronald Reagan Washington, that serve Northern Virginia and the Washington DC areas. In addition, some areas of Virginia are in proximity to commercial service airports in adjacent states. **Figure 7-2** shows all commercial service airports that provide accessibility for Virginia’s residents, businesses and visitors.

Measuring accessibility via a 45-minute drive time to commercial service airports puts 78.4 percent of all residents in the Commonwealth within access to an airport with scheduled airline service. GIS analysis shows that 1.1 percent of this coverage is provided by airports in adjacent states. As the population in Virginia increases within the service areas of the commercial service airports, as is projected and demonstrated in the detailed accessibility maps in Chapter 4, the percent of the state’s population that is within 45 minutes or less of a commercial service airport will increase slightly. Ideally, a high percentage of the state’s population should have access to an airport with scheduled airline service.

It is worth noting, that a 45-minute drive time service area for a commercial service airport is very conservative. Passengers often drive 60 minutes to reach an airport with commercial airline service, but can drive up to 90 to 120 minutes for preferences related to non-stop flights, lower fares, carrier choices, and aircraft size. Figure 6-3 in Chapter 6 illustrates this coverage. If all service areas for commercial service airports in and near Virginia are increased to 60 minutes, by 2020, 87.1 percent of Virginia's population will be within a service area of an existing commercial service airport. Service areas of 90 minutes would increase coverage to 98.6 percent and service areas of 120 minutes would increase coverage to 99.8 percent in 2020.

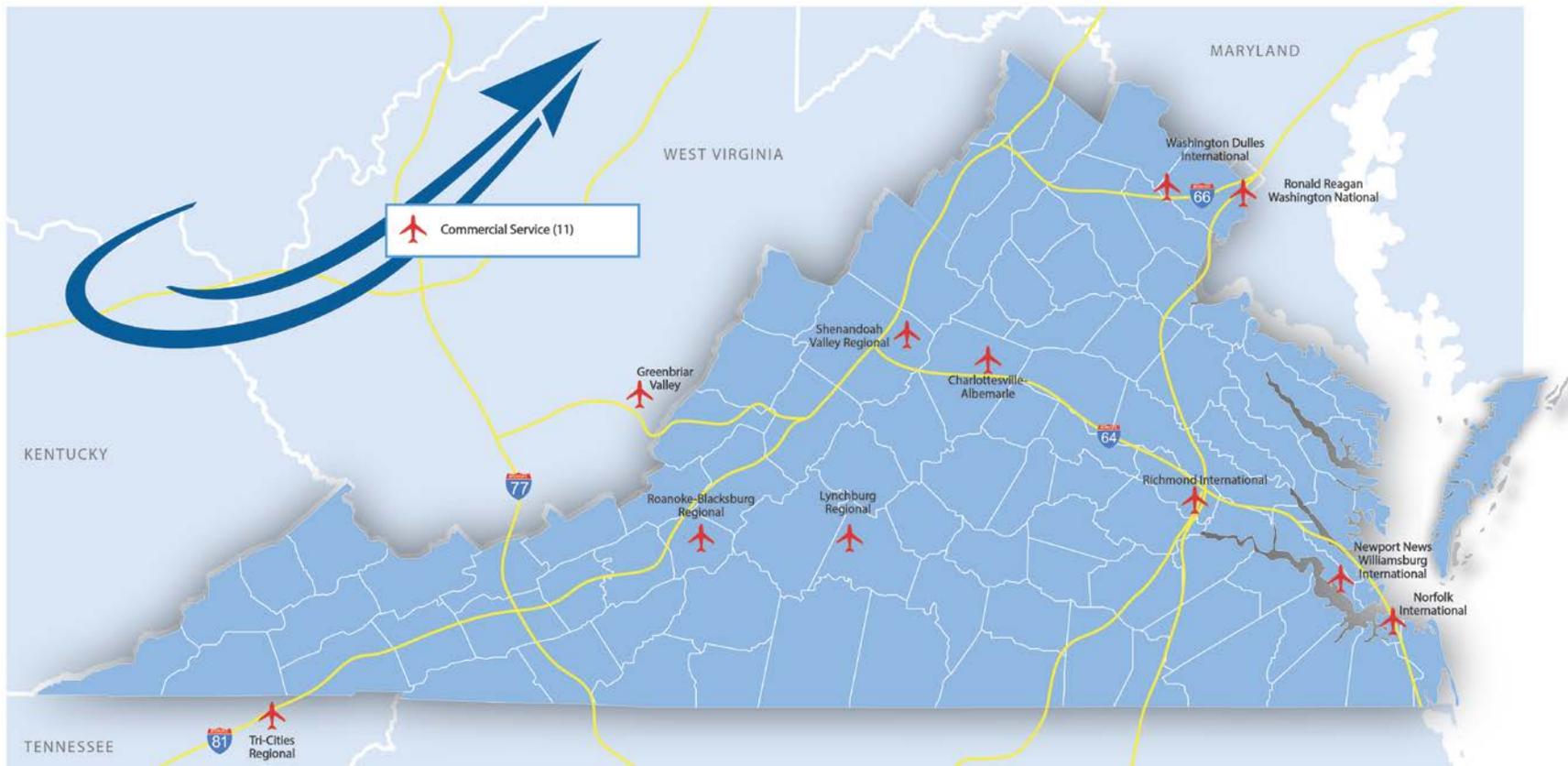
In recent years, consolidation and cutbacks in the airline industry have created a situation in which very few airports have attracted first time scheduled airline service. There have been some instances in which carriers similar to Allegiant have introduced service to non-commercial service airports. Allegiant's operating model, more often than not, is to provide start-up service at an existing commercial service airport. It is not anticipated that additional airports in Virginia will have commercial airline service.

All commercial service airports in Virginia are classified by the FAA as Primary Commercial Service airports, meaning that they enplane at least 10,000 passengers each year. This classification qualifies each airport to receive a minimum of \$1 million in federal entitlement funding. If annual passenger enplanements fall below 10,000, federal annual entitlement funding falls to \$150,000, a significant difference. A major objective for commercial service airports in Virginia is to keep enplanement levels at all commercial service airports above 10,000.

Commercial service airports in Virginia are included in the NPIAS, making them eligible for funding from the FAA. The VATSP supports the maintenance and development of these airports to meet future passenger demand. The VATSP Update produced cost estimates for upgrading and maintaining Virginia's commercial service airports in the amount of \$1,641,382,000. This estimate is for the entire planning period and does not include MWAAs airports.

**Figure 7-2** shows the locations for commercial service airports in Virginia as well as for commercial service airports in neighboring states that provide commercial airline accessibility for Virginia residents and businesses within a 45-minute drive time.

Figure 7 - 2: Commercial Service Airports Serving Virginia Demand within a 45-minute Drive Time



### 7.4.2 Ground Accessibility to Any Airport

Commercial service and general aviation airports in Virginia support intra-state, inter-state, and international travel needs. Airports improve the efficiency of businesses throughout the Commonwealth and bring thousands of visitors to the state each year. Airports in the Commonwealth also help to support many other activities and industries such as scientific research, agriculture, health care, education, and various state and federal agencies. As a result, residents, business, and others should have convenient access to one or more system airports.

There are currently 66 airports in the Virginia Airport System. As this report has shown, there are also some airports in close proximity in neighboring states that also provide additional access to air transportation. GIS analysis completed for the VATSP Update shows that by 2020, 95.2 percent of all Virginia residents will be within a 45-minute drive of a commercial service airport or a 30-minute drive of one or more general aviation airports. This accessibility rating is based on existing airports both in Virginia and in nearby states.

As mentioned in the section on recommended airport roles, there are four new general aviation airports included in the recommended plan. If these airports are developed within the next 20 years, accessibility for Virginia residents to any system airport will increase to over 96 percent. Given the costs to build the proposed new VATSP airports, increasing overall airport accessibility alone is likely not sufficient justification for building the new airports.

These proposed new airports provide other benefits to the system beyond increased accessibility. They provide access to areas of the Commonwealth with growing population centers and may be emerging business centers. In addition, the locations of these proposed airports are such that they provide back up for non-NPIAS and privately-owned general aviation system airports. It is assumed that if new system airports are developed they would come into the system as General Aviation-Regional Airports that are included in the NPIAS, making them eligible for FAA funding. Airports included in the NPIAS provide greater long-term stability for the system.

### 7.4.3 Air Accessibility to Any Airport

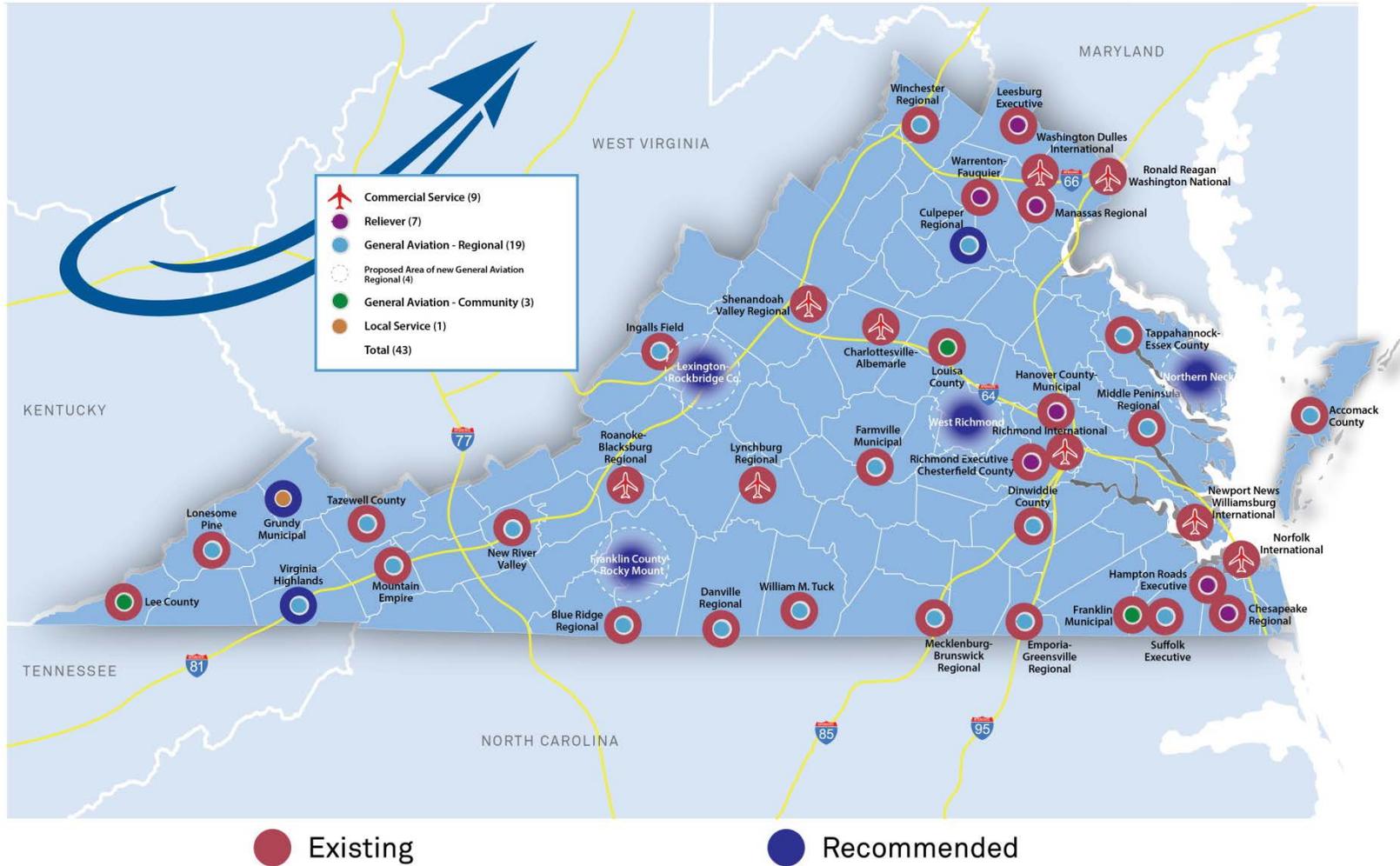
Having reliable airside access for aircraft operators using Virginia's public use airports is very important. Two airport assets that help to make airports more reliable and more accessible during periods of reduced visibility are on-site weather reporting equipment and an approach to at least one runway that is supported by vertical guidance (minimum of RNAV/LPV).

#### 7.4.3.1 Approach with Vertical Guidance

FS&E Objectives, as developed in the VATSP Update, call for airports included in Virginia's Commercial Service, Reliever, and General Aviation-Regional roles to have an approach that is supported by vertical guidance. While not an FS&E Objective for Virginia airports in the General Aviation Community role, data collected to support VATSP analysis shows that some airports included in the General Aviation-Community role also have an approach to at least one runway end that is supported by vertical guidance. At the time the Alternatives Analysis was completed for the VATSP, Virginia Highlands and Culpeper are the only airports in the Commercial Service, Reliever, or General Aviation-Regional role that did not have an approach supported by vertical guidance.

**Figure 7-3** shows all airports in the system with at least one approach supported by vertical guidance. This figure also shows airports, including new and replacement airports that should have an upgraded approach to meet their assigned system role.

Figure 7 - 3: Existing and Recommended Airports Providing Approaches with Vertical Guidance



### 7.4.3.2 On- Site Weather Reporting Equipment

Over the past few years, DOAV has funded a significant initiative to provide on-site weather reporting equipment for almost all system VATSP airports. Only three airports, Falwell, New London, and Smith Mountain Lake, all of which are privately-owned and fall within the Local role category, chose to decline installation of on-site weather reporting equipment. It is the ultimate goal of DOAV to have 100% of their system airports equipped with weather reporting systems; therefore, the VATSP Update recommends on-site weather reporting for these three airports.

If the Grundy replacement and the four proposed new airports are developed, these airports should also have on-site weather reporting equipment.

### 7.4.4 Accessibility Provided by Privately- Owned Airports

Within Virginia's system of 57 general aviation airports, there are 10 airports that are privately-owned. Privately-owned system airports range in scope from Hampton Roads Executive, serving over 200 based aircraft, to Lake Anna which serves two based aircraft. Because Hampton Roads is currently designated by the FAA as an official "Reliever," this one privately-owned Virginia airport is included in the NPIAS and is eligible for federal funding. The fact that Hampton Roads Executive has accepted federal funding for its development helps to ensure that this privately-owned airport will remain an airport over the planning period.

Privately-owned general aviation airports play a role in serving general aviation demand in Virginia. Some aircraft owners prefer to be based at privately-owned airports because they sometimes offer a less congested operating environment, and their rates and charges may be more competitive. Aircraft owners also choose to base at privately-owned airports because the airport's location is the most convenient to the aircraft owner's residence or business.

Chapter 6 reviewed various aspects of the privately-owned airports that could serve as indicators on their future availability. In reality, the stability of all of the privately-owned airports is most directly related to airport ownership; something that cannot be predicted.

The GIS analysis for privately-owned system airports shows that they contribute 1.1 percent of additional system accessibility for all of Virginia. It is possible that over the planning period one or more of the privately-owned airports could "drop out" of the system. However, there are publicly-owned airports in Virginia's system that are in proximity to most of the privately-owned airports, and these public airports appear to have the capacity to absorb demand that could result from privately-owned airport closures.

As funds are available and projects warrant, DOAV provides grants to privately-owned public-use system airports. Chapter 5 of this VATSP Update provides information on projects to be considered at privately-owned public-use airports. These projects relate to:

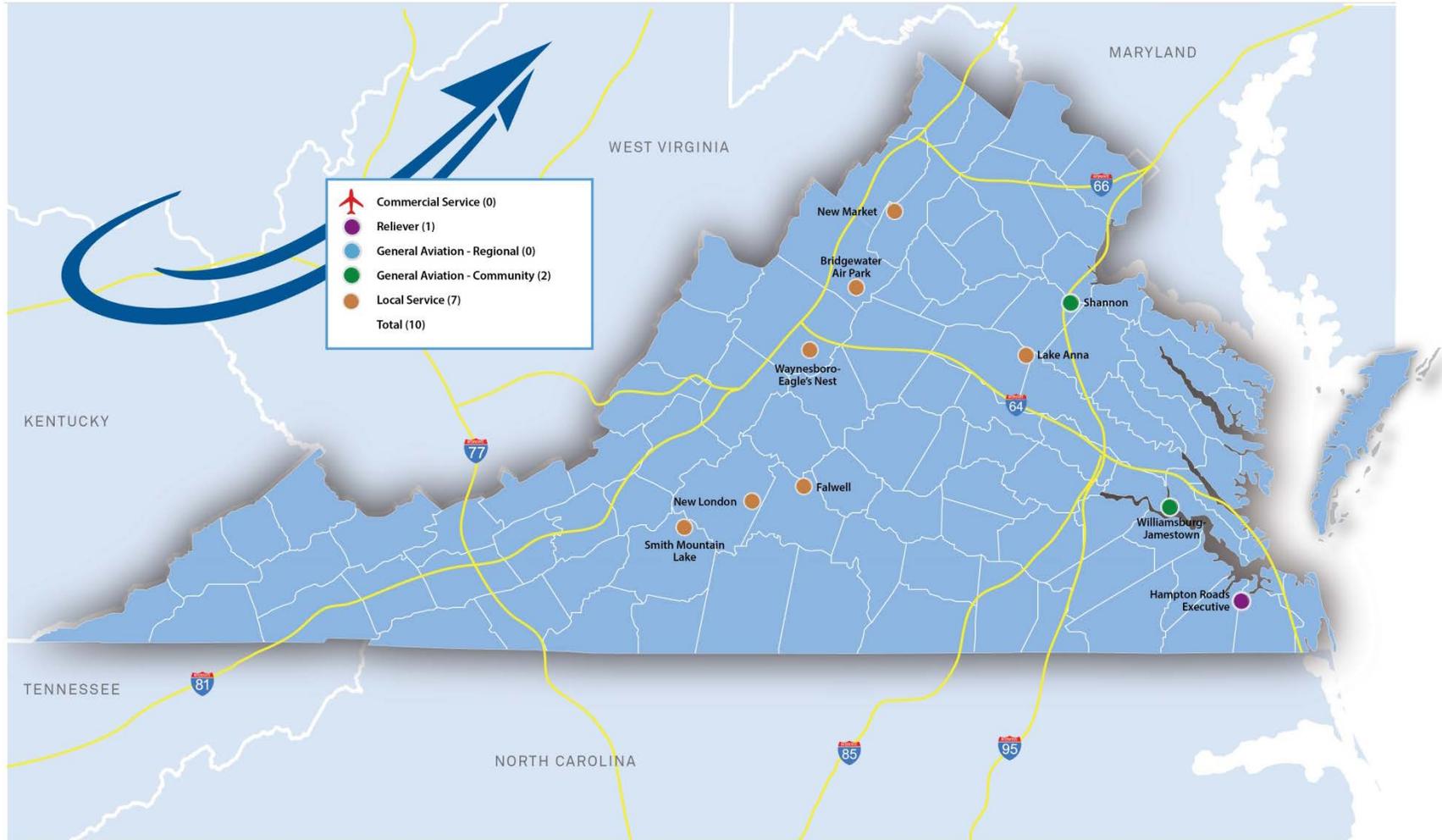
- Improvements that are needed to comply with Virginia Airport Licensing Standards and Virginia's Basic Unit Airport guidelines;
- FS&E Objectives for each privately-owned, public-use airport's system role;
- Projects that are part of a master plan, ALP, or ACIP for these airports.

DOAV is in the business of supporting airports and maintaining a viable airport system. To the extent that state funds permit, the Commonwealth will continue to make grants available to privately-owned, public-use system airports in the future. DOAV has a priority ranking system for awarding grants that

considers factors such as the type of project, the airport's role in the State Airport System, and airport ownership. For the nine privately-owned airports as a group, excluding Hampton Roads, the VATSP identified \$119 million in maintenance and development projects over the planning period. Individual project costs for each of the privately-owned airports are presented in Chapter 5.

For planning purposes, the VATSP Update assumes that all privately-owned public-use general aviation airports will remain operational over the planning period. These airports and their recommended roles in the State Airport System are shown in **Figure 7-4**.

**Figure 7 - 4: Privately-Owned, Public Use System Airports**



#### 7.4.5 Accessibility Provided by Publicly- Owned, Non- NPIAS General Aviation Airports

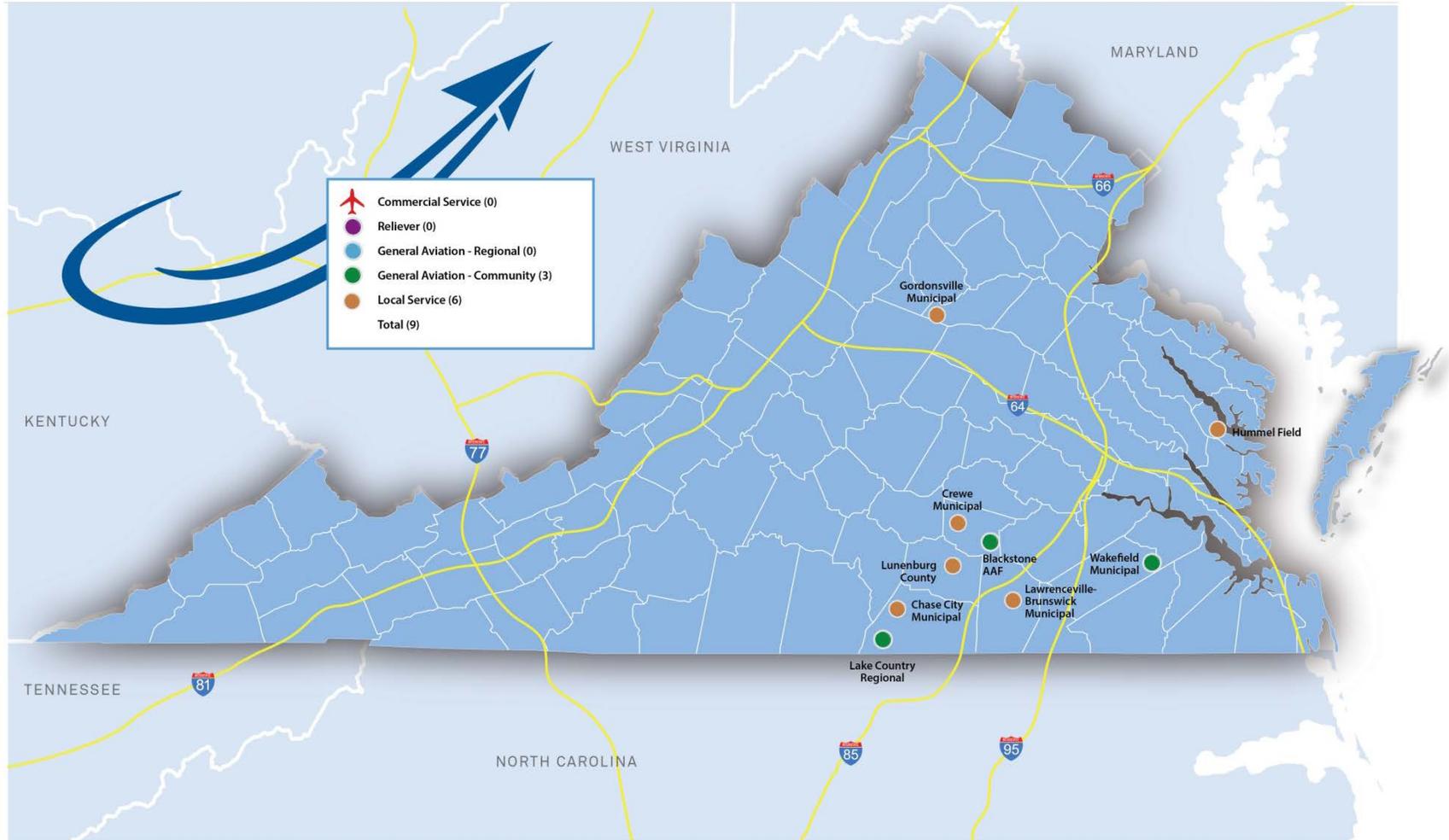
Of the 57 general aviation airports in the Virginia system, there are nine that have a public owner but are not included in the NPIAS. In addition, two airports, Emporia-Greenville (General Aviation Regional) and Brookneal-Campbell County (General Aviation Community), are categorized as unassigned in FAA's Asset Study. As such they currently remain in the NPIAS, but their long term inclusion is questionable if criteria to meet any of their asset role categories are not fulfilled by the next asset evaluation in 2016. Under public ownership, non-NPIAS airports are not eligible to compete for FAA funds.

When publicly-owned airports are not included in the NPIAS, it is most often because the airport does not meet the NPIAS minimum entry criteria, is located at an inadequate site, cannot be expanded and improved to provide safe and efficient airport features and facilities, or is within 20 miles of an existing NPIAS airport. These or other conditions or characteristics have contributed to the lack of NPIAS inclusion for these airports. As a group, the publicly-owned, non-NPIAS airports are projected to contribute 1.0% percent to Virginia's accessibility rating for all Virginia and neighboring airports by 2020.

As part of the VATSP Update, airports that are publicly-owned but that are not included in the NPIAS have improvements that have been identified related to FS&E Objectives, Licensing Standards, Basic Airport Unit objectives, and individual airport plans. Total development and maintenance costs for all publicly-owned, non-NPIAS airports in the Virginia system as estimated by the VATSP Update are \$ 150,212,000

**Figure 7-5** shows publicly-owned, non-NPIAS airports in the Virginia Airport System. This figure also shows recommended system roles for these airports. A high percentage of airports that are classified as publicly-owned, non-NPIAS are included in Virginia's Local Airport role.

**Figure 7 - 5: Publicly-Owned, Non-NPIAS Airports**



### 7.4.6 Accessibility to Business Class Airports

A primary objective of the VATSP Update was to identify areas of the Commonwealth that are served by an airport that is capable of serving most, if not all, types of business jets. Business Class airports serve business needs and support economic growth and diversification. Access to a Business Class airport was one of the lowest percentages of accessibility for the Virginia population. By improving access to business class airports by upgrading existing airports and introducing new ones, the Commonwealth of Virginia can benefit from the local investment, jobs, and the economic activity they bring.

Information from the National Business Aircraft Association (NBAA) was used to establish basic characteristics for a Business Class Airport. The three characteristics used in the VATSP for a Business Class Airport included a runway length of at least 5,500 feet, an approach supported by vertical guidance (RNAV/LPV at a minimum), and a weather reporting station (AWOS III or ASOS). These characteristics relate to the capital improvements tied to business class aircraft service. With these attributes, an existing general aviation airport can be more attractive to business-related aviation and the benefits it offers.

#### 7.4.6.1 Existing Business Class Airports

As part of the Alternatives Analysis, airports in Virginia and nearby airports in neighboring states that have all three of these characteristics were identified. Business Class Airports can be either general aviation or commercial service airports. For accessibility, the VATSP analysis considered a 30-minute drive time for all airports. Airports in Virginia and in neighboring states that currently have all Business Class Airport characteristics include:

- Charlottesville-Albemarle (Commercial Service)
- Chesapeake Regional
- Danville Regional
- Ingalls Field
- Leesburg Executive
- Lynchburg Regional (Commercial Service)
- Manassas Regional
- New River Valley
- Newport News-Williamsburg International (Commercial Service)
- Norfolk International (Commercial Service)
- Richmond International (Commercial Service)
- Richmond Executive-Chesterfield County
- Roanoke-Blacksburg Regional (Commercial Service)
- Shenandoah Valley Regional (Commercial Service)
- Washington Dulles International (Commercial Service)
- Ronald Reagan Washington National (Commercial Service)
- Winchester Regional
- Greenbrier Valley (Commercial Service/West Virginia)
- Eastern West Virginia Regional- Shepherd Field (West Virginia)
- Tri-Cities Regional (Commercial Service/Tennessee)

Out of the 22 Virginia and neighboring state airports that now have all the characteristics for a Business Class Airport, 11 of these are also commercial service airports. GIS analysis showed that 74.2 percent of Virginia's residents have access to these airports within a drive time interval of 30 minutes or less.

#### 7.4.6.2 Recommended Improvements for Additional Business Class Airports

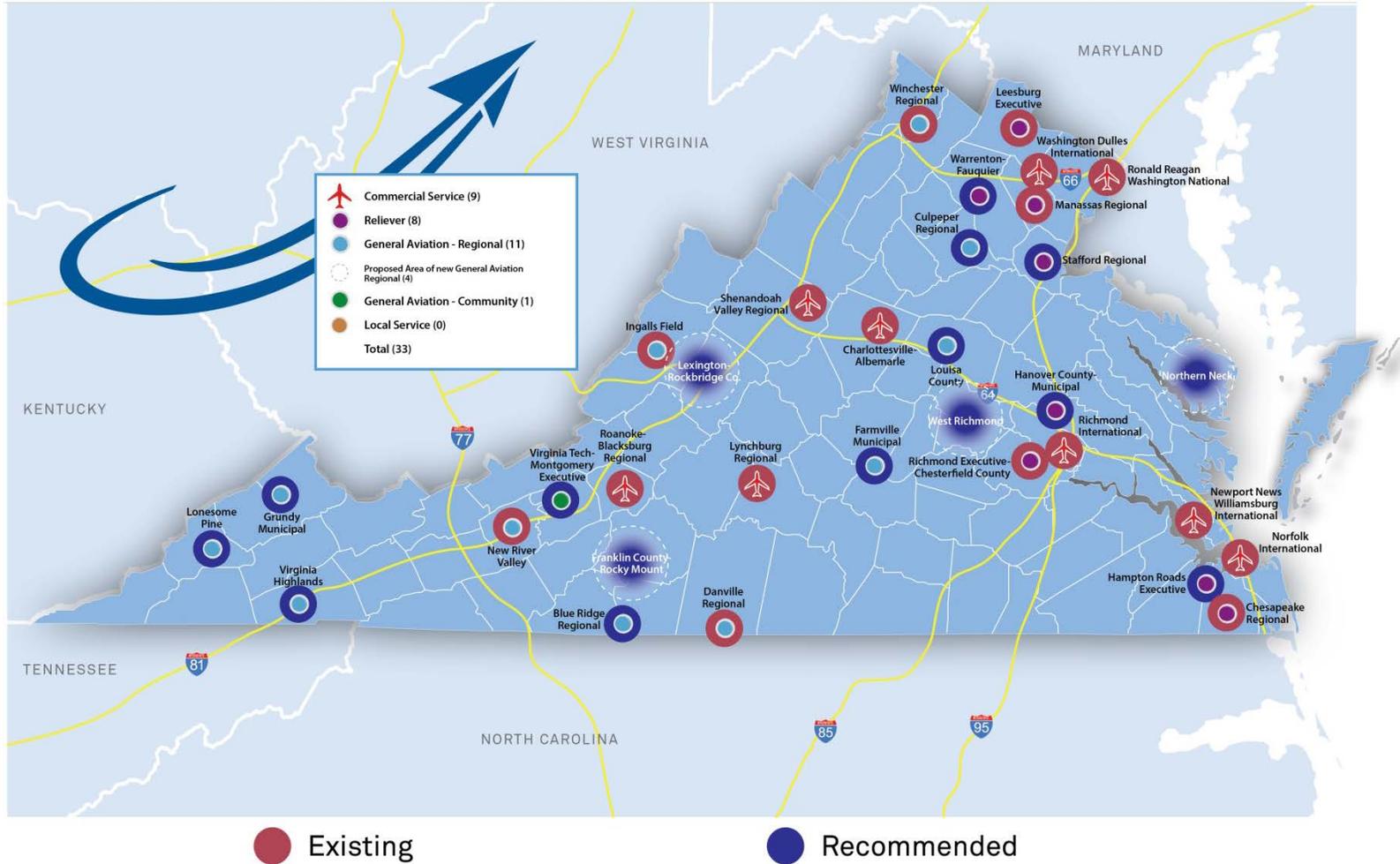
As part of Chapter 4, GIS analysis was completed to identify areas of the Commonwealth that are beyond the service areas of the existing Business Class Airports. These "gap" areas were reviewed to identify anticipated growth in population and employment and existing and planned transportation corridors. Based on the Alternatives Analysis and the subsequent Sensitivity Analysis, areas of the Commonwealth that could benefit from and support a Business Class Airport were identified. Existing airports recommended for runway extensions to 5,500 feet to make them fully compliant with all characteristics for a Business Class Airport are included in Table 7-2.

As shown, runway extensions at Hampton Roads Executive, Hanover County Municipal, and Lonesome Pine to reach the target of 5,500 feet are fairly minimal. As a result, the existing runway lengths at these three airports were determined to be sufficient for each of these airports to fulfill a role as a Business Class Airport. If these additional airports are upgraded, considering the 22 existing business airports along with the additional 12 airports, accessibility to a Business Class Airport would increase from 74.2 percent to 85.8 percent. The cost to implement the recommended business class runway extensions is estimated to reach \$67,649,000.

#### 7.4.6.3 Potential System Enhancements to Improve Business Class Airport Accessibility

This update to the VATSP includes the recommendation for one replacement and four new general aviation airports. If these airports are developed, it is DOAV's objective to build these facilities to meet all of the characteristics of a Business Class Airport. **Figure 7-6** shows current, recommended, and potential Business Class Airports.

Figure 7 - 6: Existing and Recommended Business Class Airports



#### 7.4.6.4 Recommendations for Airport Accessibility

The VATSP Update assumes that over the planning period, no new commercial service airports will be built. It is possible that an air carrier could choose to provide new service at a non-commercial service airport. This would be a market-driven decision and is not necessarily a recommendation of the VATSP.

The four recommended new airports could help improve ground accessibility to any system airport. In addition, these airports could help improve accessibility to and from the airports with on-site weather reporting and at least one runway approach supported by vertical guidance. Virginia Highlands and Culpeper should all be improved in terms of their approach capabilities; based on their role in the Virginia airport system, these airports should both have an approach with vertical guidance. As conditions permit, on-site weather reporting equipment should be provided at Falwell, New London, and Smith Mountain Lake.

The VATSP assumes that privately-owned system airports will continue to play a role in meeting the Commonwealth's general aviation needs. However, the fact that these facilities are privately-owned does not ensure that all of these airports will remain operational over the next twenty years. VATSP analysis indicates that the publicly-owned airport system should have sufficient capacity to absorb activity that is now accommodated at the privately-owned airports, should that become necessary. As funds permit, privately-owned system airports should be improved, at a minimum, to meet Licensing Standards and Basic Airport Unit criteria.

There are also 11 non-NPIAS, publicly-owned airports in the Virginia system. Six are identified as Local Service Airport Role, signifying, on a relative basis, a lower contribution to the system's success. Four of these airports are included in the General Aviation-Community Airport role, and one airport, Emporia-Greensville Regional, is included in Virginia's General Aviation-Regional Airport role category. Emporia-Greensville Regional accommodated just over 1,000 annual take-offs and landings when the inventory information was collected for the VATSP. This low level of activity contributed to this airport remaining unclassified by the FAA in their Asset Study.

A major DOAV objective is to improve system performance relative to the number of system airports that can serve a full range of general aviation business jets. Based on current airport facilities, 20 Virginia airports and three airports in neighboring states meet Business Class Airport characteristics. The VATSP recommends runway extensions at eight airports to improve accessibility to Business Class Airports. If new and replacement airports are developed, these facilities should be built so that the airports have the approach and runway length characteristics of a Business Class Airport.

## 7.5 Airport Role Objectives

### 7.5.1 Recommended Airport Role Changes

Within Virginia’s airport system, the 66 airports are currently assigned to various state-designated roles. Role designations for Virginia’s airport system include Commercial Service, Reliever, General Aviation-Regional, General Aviation-Community and Local Service. One objective of the VATSP update was to review each airport’s current role classification and to identify recommended role changes. This review considered current as well as future conditions as they relate to aviation activity, changes in population and employment, and changes in accessibility. The review helped to provide context for determining if airport role changes within the state system may be warranted.

Since the VATSP was last updated, the Commonwealth has experienced growth in population, existing employers have added staff, and the state has attracted new businesses. A review identified several airports for which an upgrade to their role classification appears to be warranted. These airports have experienced changes to their operational fleet mix, including increased operations by larger twin-engine and business jet aircraft. In addition, these airports are in parts of the Commonwealth that have experienced and that are expecting continued population and employment growth.

System airports that are recommended for role changes in the state system are shown in **Table 7-8**. Costs to improve each of these airports to best fulfill their new system role are included in Chapter 5.

**Table 7 - 8: Recommended Changes to State Airport Roles**

Airport Name	Current VATSP Service Role	Recommended VATSP Service Role
Louisa County	GA-Community Airport	GA-Regional Airport
Virginia Tech-Montgomery Executive	GA-Community Airport	GA-Regional Airport
Grundy Municipal	Local Service Airport	GA-Regional Airport

### 7.5.2 Recommended Roles for Replacement and New System Airports

The recommended plan includes both new airports in addition to one replacement airport. While the Virginia airport system is for the most part a mature system, there are areas in the Commonwealth that could benefit from and may be able to support new general aviation airports. A key to these new and replacement airports being developed is local support. Without local government and community support, these additional system airports will not be developed. By including these new facilities in the VATSP, DOAV recognizes the potential need for their recommended system roles.

As shown in Chapter 6, the cost to develop a new airport is significant, thus funding and support from the FAA would be essential to develop these additional airports. Two new airport sites and one replacement site were included in the prior update to the VATSP. New airports were previously identified for Lexington-Rockbridge County and Franklin County-Rocky Mount; both of these potential new airports are recognized by the FAA and are included in the most current version of the NPIAS. A new general aviation airport for the Northern Neck area of Virginia was also included in prior VATSP recommendations. However, the FAA’s NPIAS does not currently include this recommendation. The NPIAS does include the replacement of the existing airport serving the Grundy area.

This update to the VATSP retains the new Northern Neck area airport. In addition, a new general aviation airport to serve the areas west of Richmond is also recommended. The areas west of the Richmond metropolitan area are experiencing rapid growth, as are areas east and south of Charlottesville. Longer term, there may be sufficient business growth in this area of the Commonwealth to support a new general aviation airport. As a result, this update to the VATSP includes a recommendation to consider the need, feasibility and support for a new general aviation airport to serve future populations west of Richmond.

The process to develop a new general aviation airport requires multiple steps including feasibility, site selection, planning/engineering, financial analysis, and environmental impact analysis before implementation or construction can begin. Included in these steps are outreach and communications efforts with the public, elected officials, and various local, regional, state and federal agencies. The costs to develop new general aviation airports, as shown in Chapter 6, are significant, but there can be considerable long-term cost savings if airports are initially developed to their maximum build-out rather than being developed in various phases. Further, experience has shown that future expansion of an airport, once it is built, becomes exponentially more challenging. As a result, it is DOAV’s objective to have any new general aviation airport built initially to meet the characteristics of a General Aviation-Regional Airport. A General Aviation-Regional Airport in the Virginia system should ideally have a minimum runway length of 5,500 feet and be served by an approach with vertical guidance. As a result, it is recommended that the one replacement airport and the four new general aviation airports be included in the General Aviation-Regional Airport role category of the Virginia Airport System.

As part of the VATSP, cost estimates for one replacement airport and the four new general aviation airports were developed. At this point, these estimates are non-site specific. Actual costs to develop these facilities could vary; in particular, actual land acquisition costs could have a notable impact on VATSP cost estimates.

As discussed, this update to the VATSP includes recommendations for one replacement airport and four new general aviation airports; cost estimates for each follow in **Table 7-9**.

**Table 7 - 9: Costs for Replacement and Proposed New Regional Airports  
(in thousands of dollars)**

Proposed New or Replacement Airport	Development Cost
Replacement Airport Grundy Municipal	\$51,784
New Airport Northern Neck	56,908
New Airport West Richmond	56,908
New Airport Franklin County-Rocky Mount	57,159
New Airport Lexington-Rockbridge County	60,329
<b>TOTAL</b>	<b>\$283,088</b>

### 7.5.3 Airport Role Recommendations

Roles for both the Louisa County Airport and the Virginia Tech-Montgomery County are recommended to be changed from their current roles as General Aviation Community Airports to General Aviation Regional Airports. It is a DOAV objective that as new or replacement airports are developed, these airports shall ultimately have facilities and services that meet the objectives for a General Aviation Regional Airport.

## 7.6 System Development Cost Objectives

One of the most important objectives of the VATSP Update was to identify total unconstrained development cost. To help satisfy this objective, costs were identified in the VATSP from both the top down and the bottom up. Top down costs are those associated with meeting FS&E Objectives for each system airport as established by the airport’s respective role in Virginia’s Airport System. Chapter 3 of the VATSP examined each airport’s ability to meet its appropriate FS&E Objectives, and Chapter 5 presented costs estimates for each airport associated with identified development needs.

In addition to the FS&E analysis, extensive research was also completed to assemble bottom up development costs for each airport. These costs were obtained from individual airport master plans, ALPs, and ACIPs. Ultimately, the two sets of costs were compared to ensure that projects and costs were not duplicated. Based on development costs in the Recommended Plan, costs by airport role are summarized in **Table 7-10**. These costs include the four potential new airports and the replacement airport at Grundy.

**Table 7 - 10: Development Costs for All Virginia Airports  
(in thousands of dollars)**

VATSP Service Role	Project Costs
Commercial Service	\$1,641,382
Reliever	473,365
GA-Regional	1,452,797
GA-Community	588,049
Local Service	181,172
<b>TOTAL</b>	<b>\$4,336,765</b>

Various airports in Virginia’s Airport System qualify to compete for discretionary funding from the FAA and these same airports also receive various levels of entitlement funding from the FAA. Levels of entitlement funding for commercial service airports vary based on annual enplanements. All general aviation airports included in the NPIAS receive annual entitlement funding of \$150,000, assuming that the airport has an FAA approved project. All of Virginia’s commercial service airports receive funding from the FAA, and 39 of the 57 general aviation airports qualify to compete for FAA funds. Generally, the FAA does not provide funding for revenue producing facilities. While the formula is not always consistent, especially at commercial service airports, the FAA typically funds 90 percent of eligible projects. The remaining 10 percent of the project cost is covered by a combination of state and local funds.

Non-NPIAS, publicly-owned airports, are not eligible for funding from the FAA. Typically, eligible projects at these airports are funded 80 percent by DOAV and 20 percent by the local airport’s public sponsor. DOAV’s guidelines for projects that they will fund differs from some FAA guidelines on funding eligibility.

Privately-owned NPIAS and non-NPIAS airports are eligible for DOAV funding. For these airports private funds have to come from third party entities if state funds are not available. Generally state

funding is the only public funding source for the airports available to maintain, operate or develop their airports.

Using FAA and DOAV funding eligibility guidelines, total system development costs for all airports were assigned to federal (FAA), state (DOAV), and local/private categories. Estimated funding, by source, for the VATSP planning period is shown below. To obtain a better perspective on anticipated funding requirements, the costs shown above were annualized below. Annual funding needs to improve Virginia’s Airport System to meet VATSP FS&E Objectives, implement master plans and ACIP recommendations, and develop the four new replacement airports are shown in **Table 7-11**.

**Table 7 - 11: Development Costs for All Virginia Airports by Funding Source  
(in thousands of dollars)**

<b>Funding Source</b>	<b>Total Planning Period Project Costs</b>
Federal	\$2,991,273
State	505,776
Local	839,716
<b>TOTAL</b>	<b>\$4,336,765</b>
<b>Funding Source</b>	<b>Average Annual Project Costs (0-10 Years)</b>
Federal	\$219,725
State	32,197
Local	60,259
<b>TOTAL</b>	<b>\$312,181</b>

Historically, FAA and DOAV funds for airport improvements have varied. Changes in the Authorizations from the Airport Improvement Program (AIP) have resulted in different levels of funding from the FAA. Also, FAA funding for eligible airports has varied in recent years between 90 and 95 percent. These changes and other factors have impacted average annual funds from the FAA in support of Virginia airports. For DOAV, changes in revenues from the state’s transportation taxes and other appropriation factors have also resulted in changing levels of DOAV funding.

Because FAA and DOAV annual funding levels have varied, several years of historical federal and state funding for Virginia airports were examined to develop an estimate of average annual funding. While these averages in future years will undoubtedly vary, for this analysis, the comparisons provide at least some relative sense of the anticipated needs versus funds by source that may be available to address airport needs as identified in the VATSP Update. Comparisons of average annual funding needs within the next ten years to the FAA and DOAV funds that may be available to address those needs follow in **Table 7-12**.

**Table 7 - 12: Average Annual Funding Needs vs. Historic Average Annual Funds**

	<b>Average Annual Funding Needs (0-10 Years)</b>	<b>Historic Average Annual Funds (2009-2014)</b>
<b>Federal</b>	\$219,724,583	\$49,741,953 <sup>1</sup>
<b>State</b>	32,197,334	20,351,979 <sup>2</sup>
<b>Local</b>	60,259,466	Not Available

<sup>1</sup> FAA Airport Improvement Program Grant Histories

[http://www.faa.gov/airports/aip/grant\\_histories/](http://www.faa.gov/airports/aip/grant_histories/)

<sup>2</sup> DOAV

This information helps to provide a general sense of funding gaps that may exist and need to be resolved in order to implement the recommended plan from the VATSP Update. The project list for the next ten years is more robust than beyond ten years. These next ten years show a funding gap that is unlikely to close without additional allocations as project needs grow and the project list for ten to twenty years continues to expand with updated ACIPs and Master Plans.

It is important to note that airport-specific recommendations presented in the VATSP will need to be implemented by individual airports and their sponsors and owners. While the DOAV and FAA can help provide funding support for recommendations contained in the VATSP, each airport, the communities they support, and the airport owner and sponsors must accept, support, and implement VATSP recommendations.

The FAA and DOAV both have criteria to prioritize their airport investment. As a result, some projects identified will have a lower priority in terms of DOAV and FAA funding. Further, one of DOAV’s top priorities is to use its funding to match grants from the FAA so Commonwealth funds are used to leverage the maximum in FAA funds for their system airports.

## 7.7 State Funding

Scheduling the implementation of airport improvements will be determined primarily by the means to fund and finance the recommended development. Chapter 5 introduced the funding sources available at the federal, state and local level as well as the eligibility requirements at each level. This chapter has refined and focused the recommended plan to best meet demand by improving facilities and providing airport accessibility for the public. This section focuses on the funding sources at the state level to develop these proposed projects and strengthen the Virginia aviation system in line with the VATSP recommendations.

There are two state funding sources for aviation improvement projects offered by the DOAV: the Commonwealth Airport Fund (CAF) and the Aviation Special Fund.

### 7.7.1 Commonwealth Airport Fund

The Commonwealth Airport Fund budget for Fiscal Year (FY) 2015 is \$20,119,375.00. This fund is applied to capital projects. The fund is divided into air carrier entitlement funding, air carrier and reliever discretionary funding and general aviation discretionary funding. Typically the Commonwealth Airport Fund is split between these three categories at 55%, 30% and 15%, respectively. The amount of money available through the Commonwealth Airport Fund (CAF) each fiscal year is not a set amount, but rather

is determined through a formula related to the amount of transportation tax collections. The types of projects eligible for the CAF include:

- Runway, Taxiway and Apron Construction/Rehabilitation
- Land and Easement Acquisition
- Airport Master Plans and Environmental Plans
- Airport Access Roads
- Fueling Systems
- ARFF Equipment and Snow Removal Equipment
- Hangar Site Preparation
- Terminal and Maintenance Equipment Buildings

**Table 7-13** summarizes the past six year funding history of the CAF. Projects within the VATSP that would be funded by the CAF correspond to the Airside, Landside, Planning, and Terminal categories of project types as well as a portion of FS&E recommendations.

**Table 7 - 13: Capital Airport Funds, Funding History (in thousands of dollars)**

Fiscal Year	General Aviation Discretionary Funds Allocated	Air Carrier-Reliever Discretionary Funds Allocated	Air Carrier Airport Entitlement Funds*	Total Annual CAF Funds Allocated
2009	\$2,891	\$11,734	\$11,655	\$26,280
2010	2,624	5,120	8,324	16,068
2011	2,160	5,947	10,922	19,030
2012	3,312	4,882	12,005	20,200
2013	3,377	6,155	12,399	21,931
2014	3,844	4,033	12,154	20,031
<b>Sub-Total</b>	<b>\$18,209</b>	<b>\$37,872</b>	<b>\$67,459</b>	
<b>2009-2014 TOTAL</b>				<b>\$123,540</b>

\*Funds include MWAAs airports

Source: DOAV

### 7.7.2 Aviation Special Funds

Aviation Special Funds are applied to the Maintenance Program, Facilities and Equipment Program and Voluntary Security Program. The FY 2015 budget for the Aviation Special Fund is \$2,900,000. Of this total, \$1,000,000 is allocated for the Maintenance Program, \$1,400,000 is applied to the F&E Program and \$500,000 is for the Voluntary Security Program, a program which only applies to General Aviation Airports.

### 7.7.2.1 Maintenance Program

Each airport may receive up to \$100,000 annually for maintenance. Examples of eligible projects include:

- Obstruction removal
- Pavement maintenance
- Repair airfield lighting and quarterly/annual inspections
- AWOS inspection & repair
- Maintenance equipment
- Terminal building maintenance

If a sponsor has reached the fiscal year limit for maintenance allocations per airport, a project request may be submitted under the Airport Capital Program for consideration by the Virginia Aviation Board.

### 7.7.2.2 Facilities and Equipment Program

This program funds the installation of NAVAID projects at Virginia airports. These communication, navigation, and information systems increase the safety and efficiency of the system.

### 7.7.2.3 Voluntary Security Program

Funding for Voluntary Security Programs is limited to GA airports certified as a Secure Virginia Airport. These projects are funded at the 90 percent state and 10 percent local level.

- Fencing
- Access Control Systems
- Surveillance Systems
- Signage
- Lighting
- Security Barriers
- Airport Security Plan & Audits\*

\* (100 percent State funded)

### 7.7.3 State Funding and the Recommended Plan

State funding is allocated to sponsors with projects that meet regulatory and policy obligations, provide maximum benefit to the public, and improve access to airports. When evaluating the projects to be funded, the request is evaluated based on the project's merit, the airport role, and the sponsor's responsibility. Project funding is limited, and project needs over the plan period are varied. **Table 7-14** below presents the VATSP state funding needs role and development time frames.

**Table 7 - 14: State Funding Needs over the Plan Period (2012-2037)**  
(in thousands of dollars)

VATSP Service Role	Capital Funding Needs	Special Funding Needs				Total
		F&E	Maintenance	Security		
Commercial Service	\$119,065	\$331	\$406	N/A	\$119,801	
Reliever	36,417	443	335	0	37,196	
GA-Regional	123,744	1,117	152	378	125,390	
Local Service	64,080	642	412	0	65,133	
GA-Community	155,321	2,740	51	143	158,255	
<b>Total</b>	<b>\$498,627</b>	<b>\$5,273</b>	<b>\$1,356</b>	<b>\$521</b>	<b>\$505,776</b>	

Plan Period Phases	Capital Funding Sources	Special Funding Sources				Total
		F&E	Maintenance	Security		
0-5 years*	\$200,653	\$2,572	\$1,280	\$230	\$204,734	
5-10 years*	130,295	1,137	69	278	131,780	
10+ years*	167,679	1,563	7	12	169,262	

\*Projects with unknown start dates were distributed proportionately among the included timeframes

## 7.8 Funding Level Gap Analysis

**Figure 7-7** illustrates the gap between the estimated costs of the total airport system development needs identified in the VATSP Update, versus the estimated funding available from the Commonwealth and the FAA for the planning periods of 0-5 years, 5-10 years and 10-25 years. The estimated costs of these recommended improvements were compiled from individual airport CIPs and airport master plans, and by costing the necessary airport upgrades and improvements to meet the FS&E Objectives developed in this plan. This analysis resulted in over \$4 billion in development needs over the 25-year timeframe. Nearly 75 percent of that \$4 billion, or more than \$3 billion of needs, was identified in the latest airport CIPs.

The estimated annual investment required to implement the projects identified in the VATSP Update during years 0-10 are:

- \$32 million in Commonwealth funding needs, versus the \$23.5 million in historical funds available on average between 2009 and 2014
- \$220 million in federal funding needs, versus the \$74.4 million in historical funds available on average between 2009 and 2014
- \$60 million in local funds

The gap analysis illustrated in Figure 7-7 only includes funds available from the Commonwealth and the FAA. The figure shows historical funding from 2009 through 2014 and then projected funding from these sources from 2014 through 2039 – the 25-year planning horizon. This comparison of the annual cost of the recommended system development needs to the available funding resulted in the following.

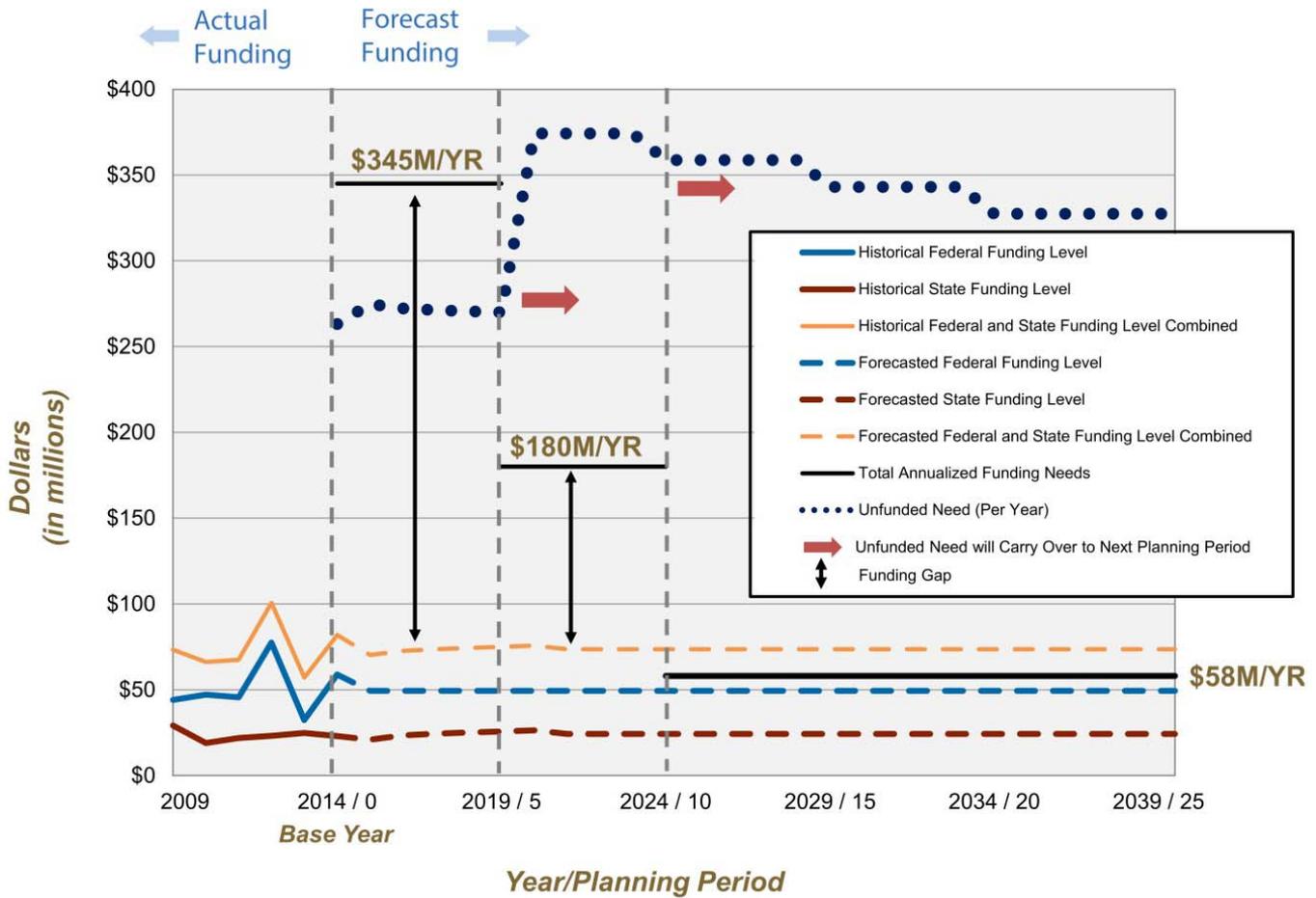
- **0-5 Year Planning Period:** Annual system needs are \$345 million while the total projected annual funding available from the Commonwealth and the FAA will average about \$75 million for an annual shortfall in years 0-5 of approximately \$270 million.
- **5-10 Year Planning Period:** The recommended system needs cost is \$180 million per year, compared to a forecasted average funding level of \$74 million for an annual shortfall in years 5-10 of approximately \$106 million.
- **10-25 Year Planning Period:** The identified system needs are \$58 million a year versus the same average annual funding level of \$74 million. As discussed below, unfunded needs from the 0-5 year and 5-10 year periods will be carried over into the out years. Therefore, the actual system needs for years 10-25 could approach six times the \$58 million amount shown in Figure 7-7, depending on the level of system needs deferred. Thus, the annual shortfall could range from \$329 million to \$360 million during this period.

All unfunded needs are therefore carried over into the next year throughout each planning period and into the next planning period as well, accumulating to levels well above the estimated costs of \$180 million and \$58 million respectively for years 5-10 and 10-25. The trend line of those unfunded costs is also shown on the figure illustrating how unfunded needs are deferred to later years during the 25-year planning period because of this shortfall.

The trend line was developed by subtracting the total forecasted FAA and Commonwealth funding levels from the annualized funding needs in the 0-5 year period. In the 5-10 year period, the unfunded annualized needs were carried over from the 0-5 year period and added to the unfunded needs of the 5-10 year period. This resulted in approximately \$370 to \$380 million of unfunded needs in the 5-10 year period. Likewise, the unfunded needs from the 5-10 year period were carried over to the 10-25 year period and added to the \$58 million in funding needs per year. As illustrated below, due to the funding surplus over forecasted funding needs in the 10-25 year period, approximately \$15.6 million can be applied to reduce the annual funding gap from the initial \$360 million to \$329 million at the end of this period.

This figure clearly shows that Virginia's aviation system has far more unfunded needs than funding resources available from the Commonwealth and the FAA.

Figure 7 - 7: Funding Level Gap Analysis



## 7.9 Recommended System

Table 7-15 shows all airports in the updated Virginia Airport Transportation System Plan. This table also shows the following:

- Each airport's recommended role in the Virginia Airport System
- Each airport's ownership status/NPIAS status
- Each airport's role in FAA Asset
- Each airport's total estimated development costs for the planning period.

**Table 7 - 15: Recommended Airport System**

Airport Name	Airport Code	Current VATSP Service Role	Proposed VATSP Service Role	Current FAA Asset Role	Ownership and NPIAS Status	Total Refined Development Cost
Charlottesville-Albemarle	CHO	Commercial Service	No Change	N/A	Public, NPIAS	\$164,098,000
Lynchburg Regional	LYH	Commercial Service	No Change	N/A	Public, NPIAS	140,303,000
Newport News-Williamsburg International	PHF	Commercial Service	No Change	N/A	Public, NPIAS	77,565,000
Norfolk International	ORF	Commercial Service	No Change	N/A	Public, NPIAS	717,504,000
Richmond International	RIC	Commercial Service	No Change	N/A	Public, NPIAS	234,545,000
Roanoke-Blacksburg Regional	ROA	Commercial Service	No Change	N/A	Public, NPIAS	245,955,000
Shenandoah Valley Regional	SHD	Commercial Service	No Change	N/A	Public, NPIAS	61,412,000
Chesapeake Regional	CPK	Reliever	No Change	Regional	Public, NPIAS	55,768,000
Hampton Roads Executive	PVG	Reliever	No Change	Regional	Private, NPIAS	29,560,840
Hanover County Municipal	OFP	Reliever	No Change	Regional	Public, NPIAS	87,427,000
Leesburg Executive	JYO	Reliever	No Change	Regional	Public, NPIAS	39,228,000
Manassas Regional	HEF	Reliever	No Change	National	Public, NPIAS	57,939,000
Richmond Executive-Chesterfield County	FCI	Reliever	No Change	Regional	Public, NPIAS	95,561,000
Stafford Regional	RMN	Reliever	No Change	Local	Public, NPIAS	40,366,000
Warrenton-Fauquier	HWY	Reliever	No Change	Regional	Public, NPIAS	67,515,000
Accomack County	MFV	Regional	No Change	Local	Public, NPIAS	34,372,000
Blue Ridge Regional	MTV	Regional	No Change	Regional	Public, NPIAS	91,442,000
Culpeper Regional	CJR	Regional	No Change	Regional	Public, NPIAS	93,301,000
Danville Regional	DAN	Regional	No Change	Local	Public, NPIAS	98,838,000
Dinwiddie County	PTB	Regional	No Change	Local	Public, NPIAS	39,590,000
Emporia-Greenville Regional	EMV	Regional	No Change	Unclassified	Public, NPIAS	40,263,000
Farmville Municipal	FVX	Regional	No Change	Local	Public, NPIAS	40,806,000
Ingalls Field	HSP	Regional	No Change	Basic	Public, NPIAS	20,549,000
Lonesome Pine	LNP	Regional	No Change	Local	Public, NPIAS	66,241,000
Mecklenburg-Brunswick Regional	AVC	Regional	No Change	Local	Public, NPIAS	42,710,000
Middle Peninsula Regional	FYJ	Regional	No Change	Local	Public, NPIAS	56,804,000
Mountain Empire	MKJ	Regional	No Change	Local	Public, NPIAS	22,571,000
New River Valley	PSK	Regional	No Change	Local	Public, NPIAS	32,885,000
Suffolk Executive	SFQ	Regional	No Change	Regional	Public, NPIAS	31,898,000
Tappahannock-Essex County	XSA	Regional	No Change	Local	Public, NPIAS	32,905,000
Tazewell County	JFZ	Regional	No Change	Basic	Public, NPIAS	75,610,000
Virginia Highlands	VJI	Regional	No Change	Regional	Public, NPIAS	147,947,000
William M. Tuck	W78	Regional	No Change	Local	Public, NPIAS	53,960,000
Winchester Regional	OKV	Regional	No Change	Regional	Public, NPIAS	198,801,000
Blackstone AAF	BKT	Community	No Change	N/A	Public, Non-NPIAS	18,207,000
Brookneal-Campbell County	OV4	Community	No Change	Unclassified	Public, NPIAS	14,777,000
Franklin Municipal	FKN	Community	No Change	Local	Public, NPIAS	12,341,000

**Table 7 - 15: Recommended System (Continued)**

Airport Name	Airport Code	Current Virginia Role	Proposed Virginia Role	Current FAA Asset Role	Ownership and NPIAS Status	Total Refined Project Cost
Front Royal-Warren County	FRR	Community	No Change	Local	Public, NPIAS	36,364,000
Lake Country Regional	W63	Community	No Change	N/A	Public, Non-NPIAS	17,568,000
Lee County	OVG	Community	No Change	Basic	Public, NPIAS	37,573,400
Louisa County	LKU	Community	Regional	Local	Public, NPIAS	44,075,000
Luray Caverns	LUA	Community	No Change	Basic	Public, NPIAS	23,010,000
New Kent County	W96	Community	No Change	Local	Public, NPIAS	57,246,000
Orange County	OMH	Community	No Change	Local	Public, NPIAS	27,909,000
Shannon	EZF	Community	No Change	N/A	Private, Non-NPIAS	19,551,000
Tangier Island	TGI	Community	No Change	Basic	Public, NPIAS	9,661,000
Twin County	HLX	Community	No Change	Basic	Public, NPIAS	55,411,000
Virginia Tech-Montgomery Executive	BCB	Community	Regional	Regional	Public, NPIAS	130,031,000
Wakefield Municipal	AKQ	Community	No Change	N/A	Public, Non-NPIAS	22,105,000
Williamsburg-Jamestown	JGG	Community	No Change	N/A	Private, Non-NPIAS	62,220,000
Bridgewater Air Park	VBW	Local	No Change	N/A	Private, Non-NPIAS	5,274,000
Chase City Municipal	CXE	Local	No Change	N/A	Public, Non-NPIAS	8,595,000
Crewe Municipal	W81	Local	No Change	N/A	Public, Non-NPIAS	5,558,000
Falwell	W24	Local	No Change	N/A	Private, Non-NPIAS	470,000
Gordonsville Municipal	GVE	Local	No Change	N/A	Public, Non-NPIAS	14,433,000
Grundy Municipal (Replacement)	GDY	Local	Regional	Basic	Public, NPIAS	51,784,000
Hummel Field	W75	Local	No Change	N/A	Public, Non-NPIAS	45,400,000
Lake Anna	7W4	Local	No Change	N/A	Private, Non-NPIAS	15,916,000
Lawrenceville-Brunswick Municipal	LVL	Local	No Change	N/A	Public, Non-NPIAS	7,496,000
Lunenburg County	W31	Local	No Change	N/A	Public, Non-NPIAS	10,850,000
New London	W90	Local	No Change	N/A	Private, Non-NPIAS	2,676,000
New Market	8W2	Local	No Change	N/A	Private, Non-NPIAS	5,940,000
Smith Mountain Lake	W91	Local	No Change	N/A	Private, Non-NPIAS	3,157,000
Waynesboro-Eagle's Nest	W13	Local	No Change	N/A	Private, Non-NPIAS	3,623,000
Northern Neck (New Airport)	N/A	N/A	Regional	N/A	N/A	56,908,000
West Richmond (New Airport)	N/A	N/A	Regional	N/A	N/A	56,908,000
Franklin County-Rocky Mount (New Airport)	N/A	N/A	Regional	N/A	N/A	57,159,000
Lexington/Rockbridge County (New Airport)	N/A	N/A	Regional	N/A	N/A	60,329,000
<b>Total Refined Project Cost</b>						<b>\$4,336,765,240</b>

**Figure 7-8** illustrates the recommended Virginia Airport System. More detailed information on costs for individual system airports is presented in Chapter 5 of this report and its appendix. For more information on Virginia role changes and current FAA asset role categories, see Chapter 3, Table 3-2.

For recommendations identified in this plan to be implemented, a collaborative effort will be needed. This collaborative effort involves the owner or public sponsor of each airport, DOAV, and the FAA. By working together, DOAV’s objectives for maintaining Virginia’s first class airport system that meets both the commonwealth’s transportation and economic needs can be achieved.

Figure 7 - 8: Recommended Virginia Aviation System

