



# NORTH CAROLINA AIRPORTS SYSTEM PLAN

## Overview of the Plan

Airports are an essential element of North Carolina’s intermodal transportation system, and the North Carolina Department of Transportation (NCDOT) Division of Aviation (DOA) is responsible for being an effective steward for the statewide airport system. The DOA’s goal is to provide a fully integrated, safe, efficient and seamless transportation link between the people and products of North Carolina and national and international destinations. Strengthening this link will facilitate economic development and help improve the quality of life within the State.

With funding support and active involvement from the Federal Aviation Administration (FAA), the DOA developed the North Carolina Airports System Plan (NCASP) to understand the condition of the current system and plan for its future needs. The NCASP is a tool for the DOA and FAA to facilitate continued, successful development of the system, with an emphasis on planning for the airport system as a whole. Additionally, the NCASP recommends policies and guidelines that promote the vision and mission of the DOA. The plan evaluates the existing system and trends in the industry and provides recommendations for how the North Carolina airport system can be developed to respond to future challenges and promote system sustainability.

While analyzing the system and conducting the study, other needs arose that required separate evaluation. These additional analyses and elements included the following:

- ✈ Airport Pavement Management System (APMS), Pavement Condition Indexes (PCIs) and Pavement Classification Numbers (PCNs)
- ✈ Assessment of the Statewide Automated Weather Observation System (AWOS) Conditions
- ✈ Pilot Survey
- ✈ General Aviation Airport Return on Investment (ROI) Case Studies
- ✈ Localizer Performance with Vertical Guidance (LPV) Evaluations
- ✈ Aeronautical Surveys for FAA’s Airports Geographic Information System (AGIS)
- ✈ North Carolina Airport Development Programs and Policies Guide (NCADPP)



Results of the entire NCASP effort are documented and available from the DOA and reflect the magnitude of the overall NCASP project’s scope.



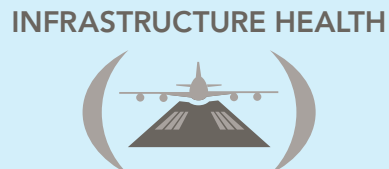
# Vision and Goals of the System

VISION: PROVIDE AN AIRPORT SYSTEM THAT  
"Connects **people** and places in North Carolina – **safely** and **efficiently** – with **accountability** and **environmental** sensitivity"

Goals established for the North Carolina airport system include:

- ✈ **Safe:** The State should be served by a system of airports that is safe, secure and meets applicable FAA design standards that will satisfy the current and future aviation needs.
- ✈ **Efficient:** The State should be served by an efficient airport system with sufficient facilities and services to maintain the airports and address the current and future needs of the aviation community.
- ✈ **Integrated:** The State should be served by a system of airports that supports integration with other modes of transportation.
- ✈ **Compliant:** The State should be served by a system of airports that complies with all federal, state and local environmental regulatory requirements.
- ✈ **Connected:** The State should be served by a system of airports that promotes and supports aviation educational and community outreach programs.

These five goals were integrated into three categories that were used to evaluate the performance of the State's airport system. The three goal categories of the NCASP include:



# Overview of the North Carolina Airport System

The NCASP focuses on the 72 publicly-owned, public use airports which make up the North Carolina airport system. The airports vary in size and function and contribute to North Carolina’s aviation and economic needs in different ways. To reflect these different functions, DOA previously implemented an Airport Groupings Model to determine the role an individual airport is meant to play in the given community. The following factors were considered to determine an airport’s role in the State system:

CHARACTERISTICS OF THE ASSOCIATED COUNTY		AIRPORT-SPECIFIC CHARACTERISTICS	
✈ Total population	✈ Gross retail sales	✈ Available infrastructure	✈ Topographical constraints present
✈ Population growth rate	✈ Tourism revenues	✈ Local support	✈ Airspace restraints present
✈ Annual per capita income		✈ Proximity to other airports	

These same characteristics were updated with current available data in the Model, with a new grouping or role established for the commercial service airports in the State. The updated Model results were analyzed and each system airport was assigned one of four State airport roles as depicted to the right.

Airports with commercial service are Yellow airports and the other colors represent general aviation airports. The updated airport groupings on the following page represent 15 changes to the previous 2004 groupings, reflecting the changing socioeconomic characteristics that were analyzed.

**Yellow Airport:** ✈ + 6,500' RUNWAY

**Red Airport:** ✈ + 6,000' RUNWAY

**Blue Airport:** ✈ + 5,000' RUNWAY

**Green Airport:** ✈ + 4,200' RUNWAY

The airport groupings were used to establish baseline performance of the system, as well as evaluating opportunities to improve the future system performance. Anson County-Jeff Cloud Field (AFP) was analyzed as a Green airport based on the results of the updated Model. The recommendations task revealed that AFP should transition from a Green to a Blue airport to support the projected near-term economic growth of that region. Two additional airports should be monitored for growth in the region that might support a transition in their grouping (IXA and ACZ).



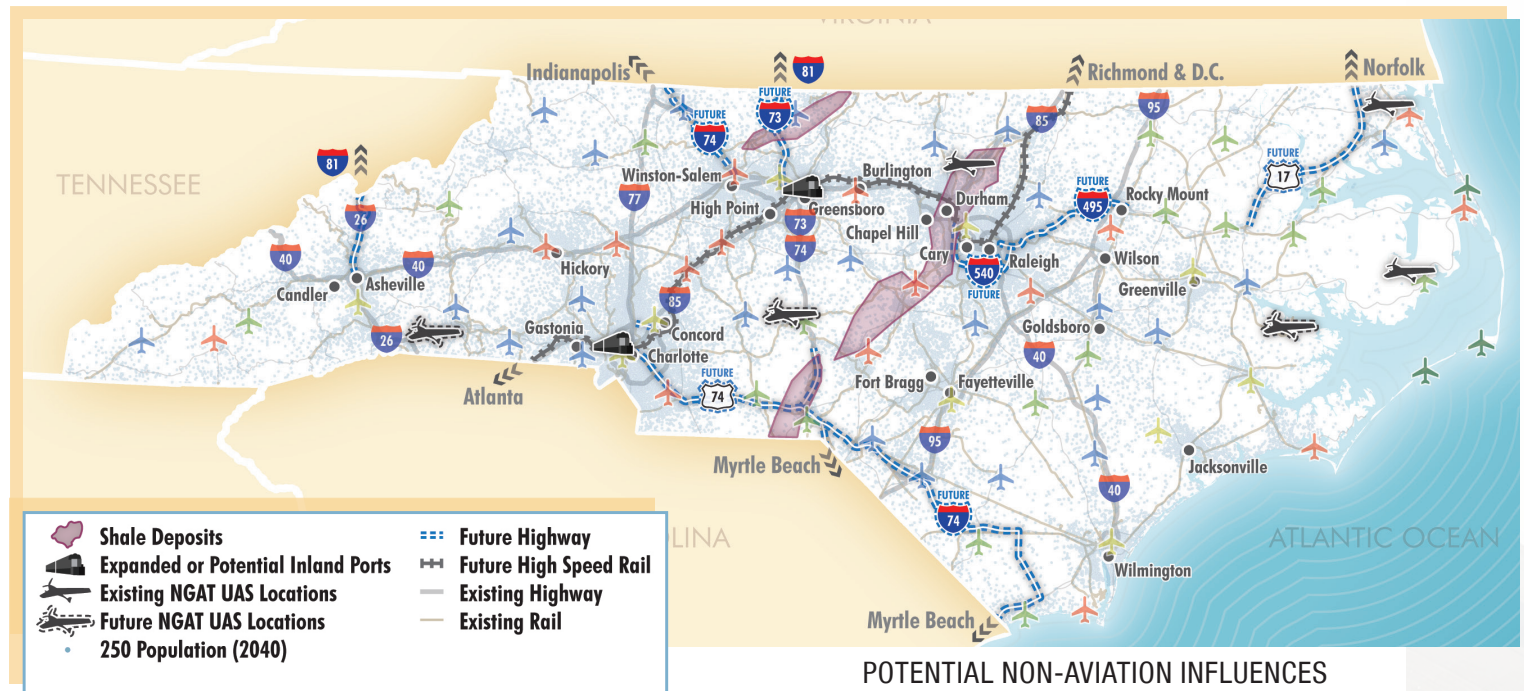
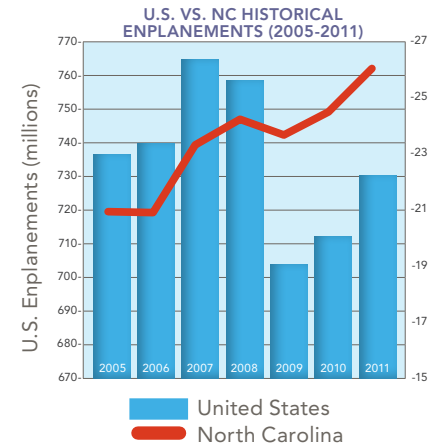


# Aviation Forecasts and Future Demand

Forecasts are developed to analyze the future trends in aviation activity that have the potential to impact airport needs. The NCASP forecast analysis found that, in general, North Carolina is growing faster than the national average for numerous aviation, demographic and economic factors. For example, the red line in the graph shows a fairly consistent growth in commercial passenger traffic (enplanements) in North Carolina between 2005 and 2011. When compared with the U.S. as a whole, North Carolina has tended to fare better than the national average in terms of passenger enplanements.

Similarly, North Carolina has shown a steady increase in population since 2000, with significant growth forecasted to occur over the next 15 to 20 years. The Raleigh-Durham-Cary metropolitan area is expected to more than double in population over the next 20 years. As aviation activity is directly related to the size and economics of an area, an increase in aviation demand is expected.

In addition to population growth, there are other non-aviation related factors that can influence aviation demand. These include items such as the construction of new highways or the presence of a resource which may facilitate economic growth in an area and result in increased aviation demand. Other factors that might reduce aviation demand could include environmental permitting or regulation. Future, non-aviation influences in North Carolina were considered relative to the future needs of the State's airport system.



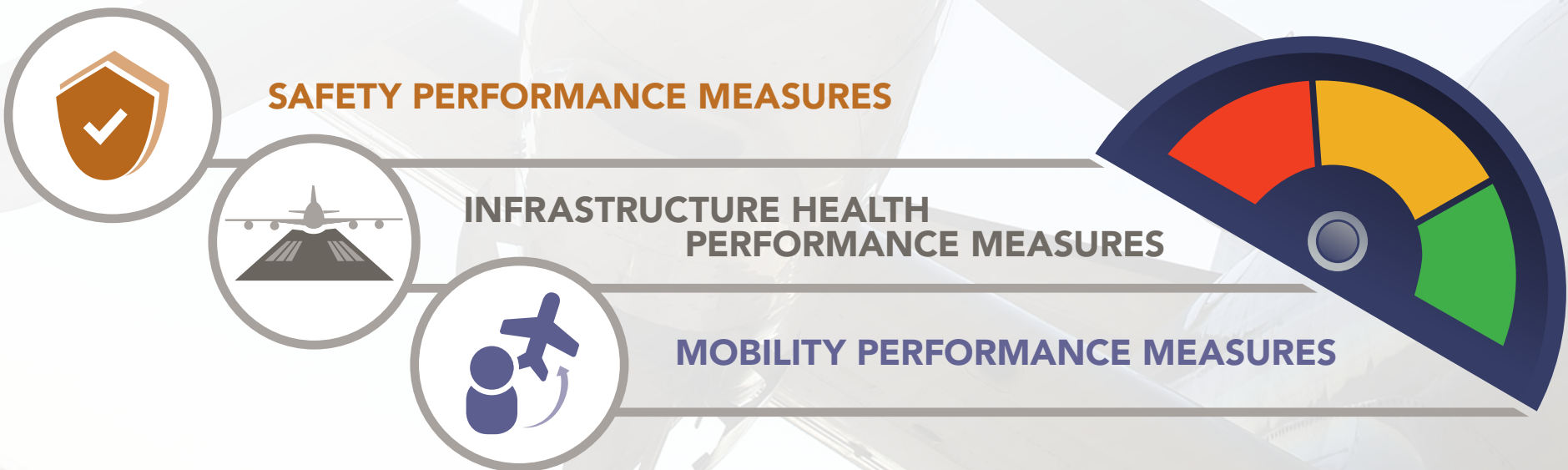
# System Performance

The NCASP employed a performance-based analysis to evaluate the current state of the airport system. Using the three goal categories, a series of performance measures were developed to operationalize the goals and objectively assess the system's performance in each category. In all, 23 performance measures were analyzed, including a single measure that evaluated each airport's ability to meet facility objectives as detailed in the DOA's Airport Development Plan (ADP).

The Performance Measurement evaluation was a multi-step process that included:

- ✈ Analysis of current system performance based on inventory data collected from airports in November 2012
- ✈ Consideration of existing projects underway or programmed in the near term that would impact the measures
- ✈ Evaluation of the ability of airports to improve facilities or provide services, especially those with known physical constraints that were unlikely to be resolved


This analysis resulted in the development of a target for each performance measure. The target represents the attainable statewide performance taking into account given known physical constraints. For example, a target of 100% was not set for runway length, since it is not feasible for some airports to meet their length objective. The current performance and targets are summarized in the table on the following pages.



SYSTEM OBJECTIVE	CURRENT PERFORMANCE	TARGET PERFORMANCE
<b>(✓) SAFETY PERFORMANCE MEASURES</b>		
Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end.	40%	100% of capable
Percent of system airports addressing wildlife issues.	100%	100%
Percent of system airports with an Airport Emergency Plan.	57%	100%
Percent of system airports with a General Aviation Security Plan.	26%	100%
Percent of system airports that support search and rescue operations.	61%	Informational
Percent of hospitals in the state within 30 minutes of a system airport with Instrument Meteorological Conditions (IMC) capability, on-site weather reporting and jet fuel availability.	89%	90%
Percent of system airports meeting 2013 FAA taxiway geometry standards.	3%	100%
Percent of system airports meeting FAA threshold siting surface requirements.	Not Available*	100%
<b>(✈️) INFRASTRUCTURE HEALTH PERFORMANCE MEASURES</b>		
Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current Airport Reference Codes (ARCs).	88%	94%
Percent of airports meeting all mandatory items in ADP (ALP / Part 77 Zoning / Minimum Standards and Rules and Regulations / Fire Extinguisher).	81% / 89% / 78% / 99%	Informational
Percent of airports meeting all system objectives in ADP.		
Runway Approach	Not Available*	100%
Runway Safety Area (RSA)	81%	100%
RPZ	40%	100% of capable
Pavement Conditions (primary runway / taxiway / apron)	77% / 69% / 61%	100%
Runway Length / Runway Width	68% / 79%	85% / 100%
Pavement Strength	79%	100%
Visual Navigational Aids	44%	94%
Runway Edge Lighting	94%	94%
Weather Reporting Capability	85%	100%
Standard Instrument Approach Procedure (SIAP)	57%	85%
Taxiway	65%	98%
Aircraft Apron	88%	100% to meet demand
General Aviation Terminal Building	33%	100%
Taxiway and Apron Edge Lighting	83%	94%



**SYSTEM OBJECTIVES AND PERFORMANCE**

SYSTEM OBJECTIVE	CURRENT PERFORMANCE	TARGET PERFORMANCE
Airfield Signage	50%	100%
Ground Communication	58%	100%
Approach Lighting	32%	85%
Aircraft Rescue and Firefighting (ARFF) Equipment / Mutual-Aid Agreement	33% / Not Available*	100% of Part 139 airports /100%
Hangars	56%	100% based on demand
Airfield Maintenance Equipment / Storage Building	48%	100% based on demand
Perimeter Fencing	21%	100%
Fuel Facilities (AvGas / Jet fuel / Self-serve fuel)	Not Available*	Determined on a case-by-case basis
Percent of system airports that are adequately accessible in terms of signage and wayfinding.	69%	100%
 <b>MOBILITY PERFORMANCE MEASURES</b>		
Percent of population within 30 minutes of a system airport by role grouping.	94%	94%
Percent of total employment / businesses within 30 minutes of a system airport.	97%	98%
Percent of system airports with a published instrument approach procedure.	92%	93%
Percent of population within 30 min of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250' & 3/4m), ground transportation).	77%	89%
Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline.	89%	89%
Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports.	Not Available*	Informational
Percent of system airports with 24/7 fueling.	91%	100%
Percent of system airports with Jet Fuel.	88%	Informational
Percent of system airports operating below 60% operational capacity levels.	100%	100%
Percent of system airports meeting service objectives (Fixed-Base Operator (FBO), pilot training, maintenance, charter/aircraft rental, terminal amenities).	Not Available*	Informational
Percent of system airports that are incorporated in local comprehensive transportation plans.	79%	100%

\*Certain data were not collected or available from airports to support a valid evaluation of performance. The DOA intends to gather this information in the future to enable evaluation of these performance measures.

Examples of performance measures used to evaluate the system are presented in the following pages.



# Performance Measure Example

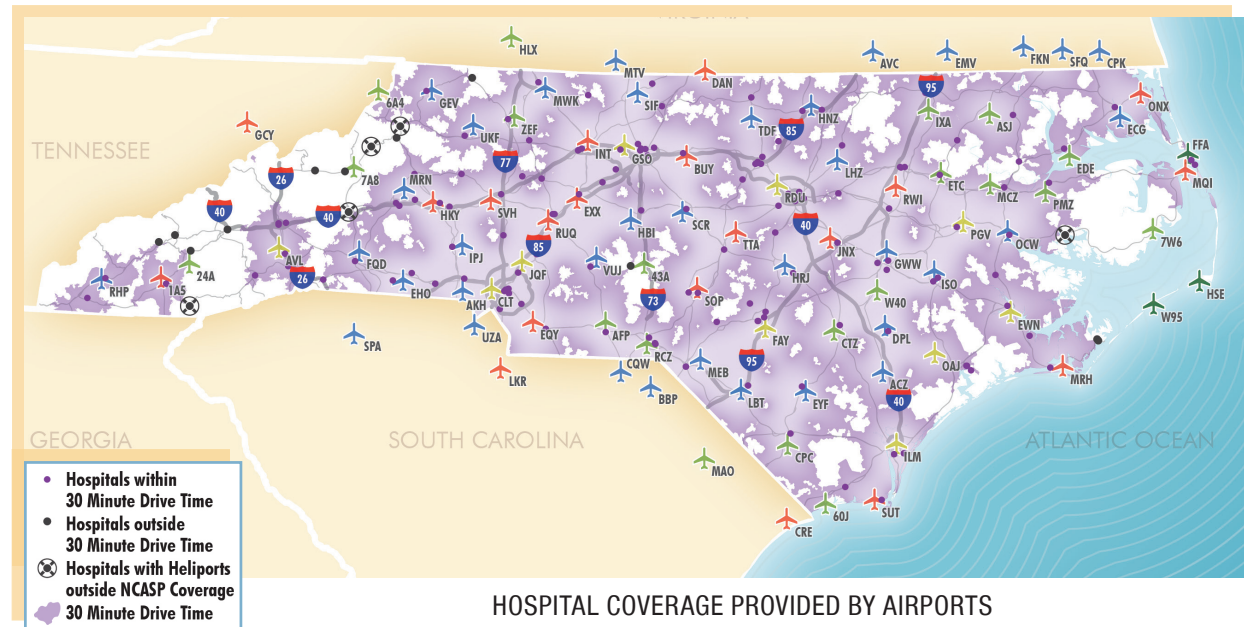
## Hospital Coverage Provided by Airports

North Carolina airports play an important role in serving emergency medical requests. Many medical staff use aviation to reach patients in more rural areas of the State and to quickly transport patients to larger hospitals. There are specific airport facilities and capabilities that must be available in order to accommodate these needs such as access in all weather conditions and fuel needed by the operators.

**Measure:** Percent of hospitals in the State within 30 minutes of a system airport with IMC capability, on-site weather reporting and jet fuel availability.

**System Performance:** 89% of all hospitals in the State currently fall within a 30-minute drive time of at least one North Carolina airport that meets all of these criteria.

When airports outside the borders of North Carolina that are within a 30-minute drive time of a North Carolina hospital are considered, this coverage increases to 90%.



### Future System Performance and Recommendations:

To further increase accessibility to 94% of all North Carolina hospitals:

- ✦ Add on-site weather reporting at Henderson Field, Elkin Municipal, Mount Olive Municipal and Plymouth Municipal airports.
- ✦ As an alternative to airports, helipads at airports and heliports at hospitals can be considered, especially in areas where terrain may prohibit the construction of an airport. Avery County/Morrison Field has a global positioning

system (GPS) approach from Memorial Mission Hospital to its lighted helipad to support medical emergency transport. This cooperation demonstrates the linkage and importance of accessibility for aviation activities. The addition of an AWOS at the airport would provide even better accessibility.

It is also recommended that additional heliport/helipad site selection studies be performed in the western, mountainous part of the State in order to provide aviation services to the currently unserved hospitals.

# Performance Measure Example

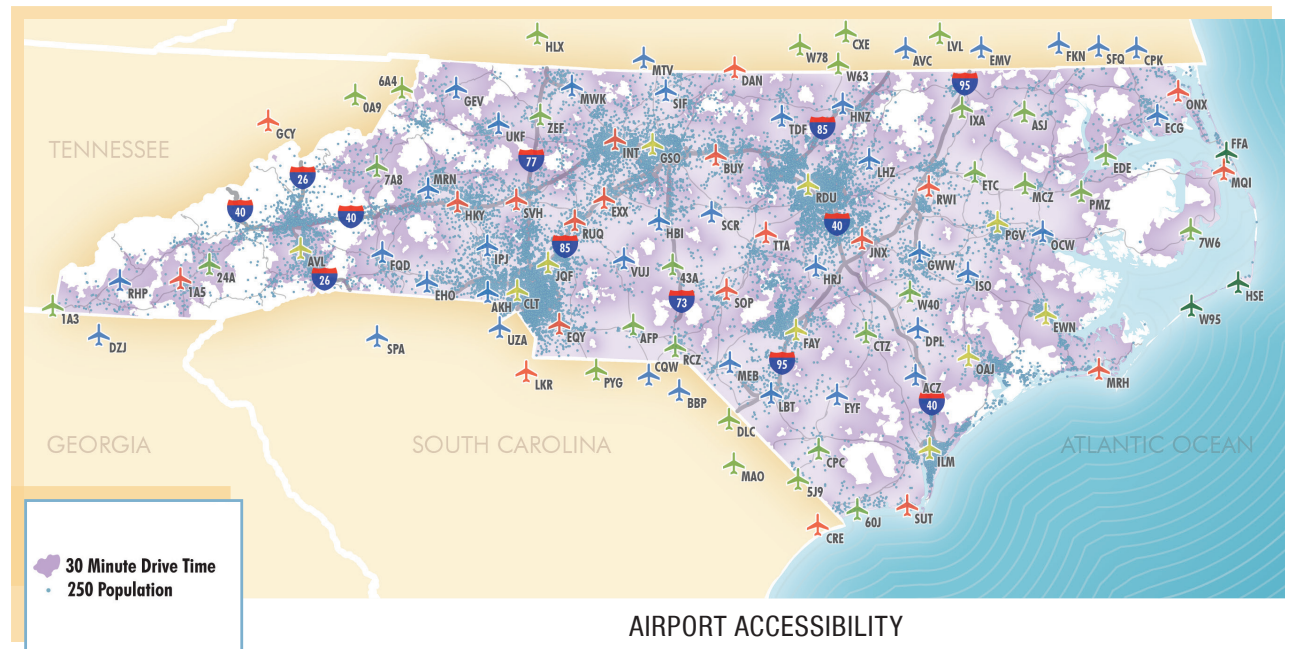
## Airport Accessibility

North Carolina strives to provide a well-rounded and accessible system of airports. Airports serve multiple types of aviation needs including commercial airline service, general aviation activities and business-oriented flights. North Carolina strives to provide a well-rounded and accessible airport system that can meet the needs of all residents, visitors and businesses by providing adequate aviation facilities in strategic locations throughout the State that offer a variety of services and facilities.

**Measure:** Percent of population and total employment/businesses within 30 minutes of a system airport.

**System Performance:** 94% of North Carolina's population and 97% of its businesses are within a 30-minute drive to a system airport. Approximately 89% of the population is within one hour's drive of an airport with commercial airline service and 85% of the population is within two hour's drive of Charlotte-Douglas International Airport (CLT) and Raleigh-Durham International Airport (RDU), the State's two busiest airports.

**Future System Performance and Recommendations:** The accessibility of North Carolina airports is good relative to the population and employment centers. One recom-



mendation to improve current coverage is to consider heliports and helipads to provide aviation service to areas where the terrain prohibits the construction of an airport. This is relevant especially for the western, mountainous part of the State.

Additionally, as both the population and economy of North Carolina grow, there may need to be additions or upgrades to the system in order to continue to provide sufficient aviation services to residents, visitors and businesses. The following are recommended for consideration:

- ✈ Monitor counties for increased growth or economic activity that could create greater aviation demand. This may create support for an airport role transition.
- ✈ The decision for a commercial airline to provide service to an airport lies with the

airline. The DOA can continue to provide support to airports that are looking to attract new commercial service.

- ✈ Evaluate airports that cannot provide facilities or services nor meet the aviation demand of the surrounding area for replacement. This might include airports that cannot meet requirements for runway length, taxiways or instrument approach procedures due to physical constraints.



# Recommendations

In order to meet the target goals established in the NCASP, both airport-specific and system-wide actions are needed. Airport-specific projects should be included in individual airport planning documents, such as master plans and airport layout plans (ALPs). Since the DOA is not the owner or operator of the system airports, the recommended projects must be implemented from the bottom-up by the airports, with support from DOA.

In addition to airport-specific projects, there are system-wide recommendations that will facilitate meeting goals and generally improving the performance and efficiency of the airport system.

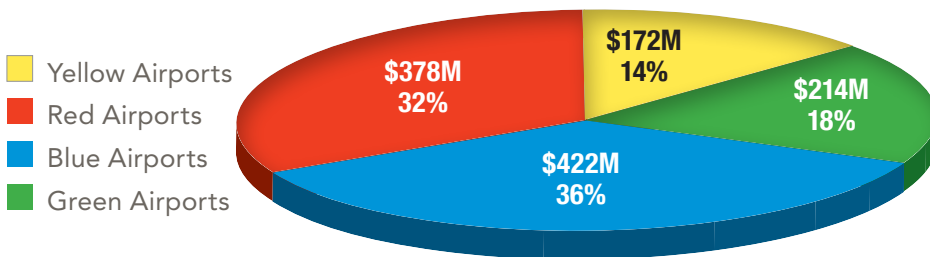
## RECOMMENDED DOA-LED EFFORTS:

- ✈ **Statewide Electrical System Evaluation** – Consider a statewide electrical evaluation program focused on maintenance and safety of the system and its devices and monitoring the conversion to LED lighting.
- ✈ **Data Maintenance Program** – Organize and maintain data from the NCASP and make it accessible in the DOA's individual airport files so that the data can be referenced when airports apply for grants or funding. Additionally, develop a performance dashboard that links with Partner Connect to monitor airport performance based on NCASP measures and objectives.
- ✈ **Airport Emergency Plan and General Aviation Security Plan Guidance** – Provide assistance to airports when developing these plans such as providing access to existing guidance developed by the FAA, the Transportation Security Administration (TSA) and the Airport Cooperative Research Program (ACRP).
- ✈ **Pavement Maintenance and Rehabilitation Program** – Continue with the statewide APMS study to update pavement condition data and ensure that the pavement at system airports is properly maintained.
- ✈ **Wildlife Management Program** – Disseminate annual survey to identify and monitor follow-up actions for wildlife hazard mitigation based on wildlife assessments and site visits. Additionally, provide training on wildlife management to the entire North Carolina aviation community.
- ✈ **Search and Rescue Data Dissemination** – Annually collect information on airports' search and rescue capabilities and share the information with local and state emergency responders.
- ✈ **ALP and Aeronautical Surveys** – Provide funding for airports to update their ALP at least every 10 years, with funding provided to conduct an initial FAA-approved aeronautical survey (compliant with FAA Advisory Circular 150/5300-18B) to identify airport approach obstructions and hazards.

# Costs

Based on the recommendations in the NCASP, it is estimated that \$1.2 billion will be needed to meet the target goals for the plan’s performance measures and ADP objectives. These costs represent planning-level estimates to increase performance and respond to future needs.

## ESTIMATED COSTS BY AIRPORT GROUPING

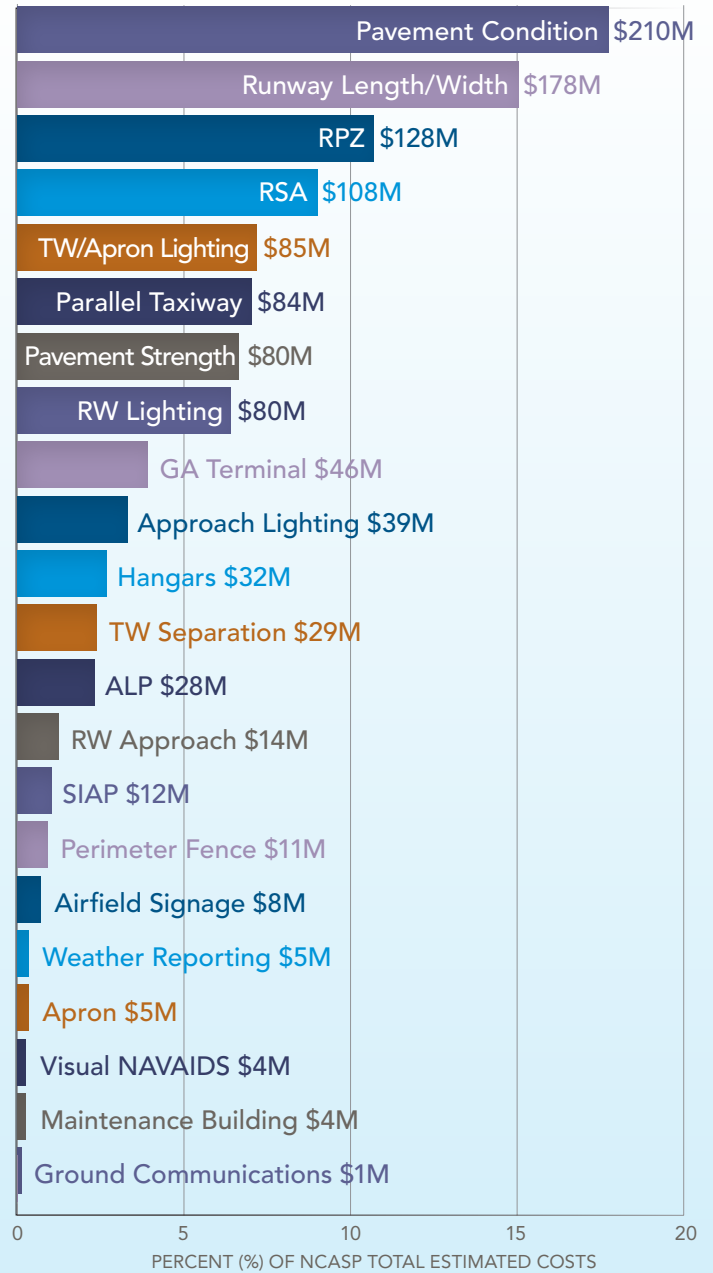


## NCASP ESTIMATED COSTS = \$1.2 BILLION

There are additional aviation needs that are not captured in the NCASP cost estimates that have been identified by individual airports that go above and beyond those identified in the NCASP. These projects reflect other maintenance and specific development needs that have been evaluated at the local level that may or may not be eligible for federal and State funding. When these additional projects are considered, the financial needs of the State airport system over the next 20 years amounts to approximately \$3.2 billion.

Currently, the DOA receives on average approximately \$42 million annually from FAA and North Carolina DOT to distribute to the system airports for safety improvement, mobility and infrastructure health projects. On the other hand, the system needs over \$144 million per year in order to address the total State and individual airport needs that have been identified. Adequate funding will be essential to the success of the plan and for the development of a safe, economically viable and modern system of airports.

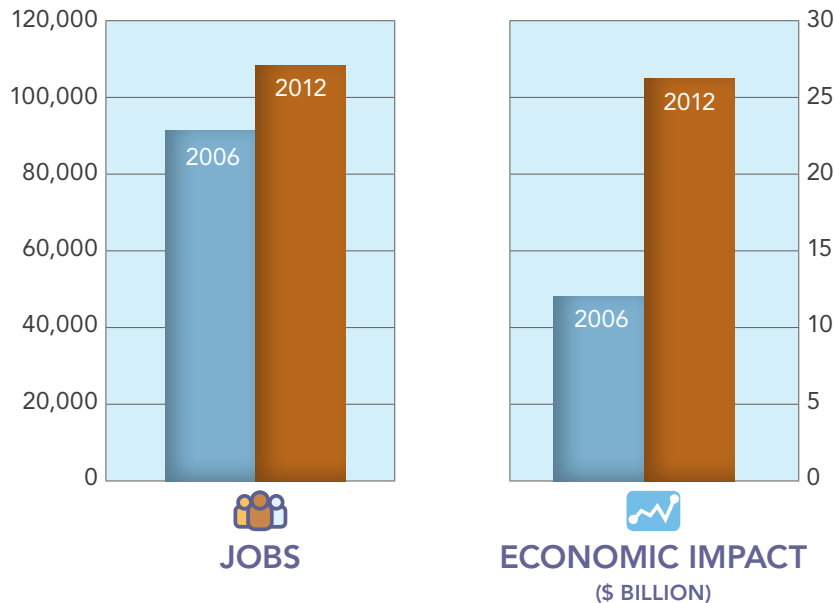
## NCASP 20-YEAR PROJECT TYPES/TOTALS



# Economic Impact and Case Studies

Over the years, North Carolina has continued to assess the economic impact and benefit of the airport system to the local, regional and statewide economies. The latest analysis, conducted in 2012, showed that the total economic output or contribution of North Carolina's publicly-owned airports was approximately \$25.9 billion. The system supports over 108,500 jobs and provides \$771 million in direct government revenue.

The 2012 analysis showed an 18.8% increase in the number of aviation jobs and a \$14 billion increase in annual economic impact in North Carolina since the last aviation economic impact study in 2006. DOA plans to continue updating the economic analysis routinely, with another update planned for



Source: 2012 Economic Contribution of Airports in North Carolina

2015/2016 to continue to evaluate the contributions of the State's airport system to the broader statewide economy.

In addition to quantifying the specific economic impacts of the airports, the NCASP included an evaluation of three airports and the changes in their local economic conditions that are directly tied to improvements that were made at the airports. Brief findings of these case studies revealed the following:

**SUT** Cape Fear Regional Jetport first provided a paved runway in 1987 which began to attract high-end clientele who accessed the airport via private and chartered aircraft. Today, 60% of annual operations are attributed to tourism, with travelers visiting the 60 miles of beach and 40 golf courses in the area. The remaining 40% of annual operations account for corporate airport users which recently increased due to local business expansion, including an influx of technology and energy companies to the area.

**MWK** Over the last 45 years, the Mount Airy/Surry County Airport has played an important role in building the local economy. Pike Electric, the largest private employer in Surry County, moved its corporate campus to private property adjacent to the east side of the airport and representatives from Pike Electric describe the airport as "an integral part" of the company's operations. MWK is extending its runway to accommodate larger corporate airport activity, leading to increased economic activity in the region.

**SVH** Statesville Regional Airport is a leading example of how airports can have a successful and symbiotic relationship with local and regional political entities. These resources include, but are not limited to, having the support of its local leadership, good airport management and a vision for success. The airport has been an integral element of the success of local companies Lowe's and Newell Rubbermaid. Investment from federal, state and local funds has been used to extend the runway and improve the approach, which resulted in over 300% growth in the economic impact over the past 20 years.



## Summary

The NCASP takes a holistic look at the North Carolina aviation system and its needs over the next 20 years. The process and results of this statewide system plan provide insight into the current state of the airport system with respect to the characteristics or factors that are deemed most important for the development of a safe and efficient airport system that will meet aviation demand today and into the future. North Carolina airports will continue to evolve and adapt to changes in the State and in local communities, and the performance measures put forth in this plan will provide both a baseline as well as general reference to ensure development is balanced and efficient.

Based on the NCASP, routine updates to and development of individual airport master plans and ALPs will be necessary to provide bottom-up implementation and ensure that the goals of the plan are realized. The timing for master plan or ALP updates will be coordinated with the FAA based on the needs of the airports. Local communities, the State and the FAA must strategically invest in, maintain and grow the airports in North Carolina in order to meet the increasing demands placed on the statewide, national and international transportation system. Investment in the aviation system is necessary for airports to continue to meet the needs of residents, visitors and businesses throughout North Carolina, the country and the world.

Full documentation of the NCASP can be found at: <http://www.ncdot.gov/aviation/>



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